Message

From: Hankanen Marie [Marie.Hankanen@transportstyrelsen.se]
Sent: 2/9/2018 8:21:53 AM
To: Laszlo.Windhoffer@faa.gov; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; Log Thobias [Thobias.Log@transportstyrelsen.se]; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: SV: NAA-Only ESSTsg

Dear all,

Deliberative Process / Ex. 5

Best regards

Marie Hankanen
Swedish Transport Agency
Environmental Expert
Maritime and Civil Aviation Department
Olai Kyrkogata 35
SE- 601 73 Norrköping
Sweden
Direct +46-10-495 37 37
Phone +46-771-503 503
SMS +46-708-82 06 88

Från: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Skickat: den 8 februari 2018 21:11
Till: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; Log Thobias <Thobias.Log@transportstyrelsen.se>; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; Hankanen Marie <Marie.Hankanen@transportstyrelsen.se>; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett.Cullen@epa.gov
Ämne: RE: NAA-Only ESSTsg

Dear All,

Deliberative Process / Ex. 5

Laszlo Windhoffer
Federal Aviation Administration
T. +1-202-267-4741

-----Original Appointment-----
From: Windhoffer, Laszlo (FAA)
Sent: Friday, January 26, 2018 4:27 PM
To: Windhoffer, Laszlo (FAA); FOCA - Theo.Rindlisbacher@bazl.admin.ch (Theo.Rindlisbacher@bazl.admin.ch); jerome.sarda@aviation-civile.gouv.fr; Ricardo Antonio Binotto Dupont (ricardo.Dupont@anac.gov.br); Bailey, Wendy; Transport Canada - David Bilcock (david.bilcock@tc.gc.ca); werner.hoermann@easa.europa.eu; Fernandez, Jorge (FAA); Jacob, Daniel (FAA); martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; Netherlands MINIENM - Michael Lunter (michael.lunter@minienm.nl) (michael.lunter@minienm.nl); thobias.log@transportstyrelsen.se; Iovinelli, Ralph (FAA); erika.herms@easa.europa.eu; Liu, Sandy (FAA); Bethan Owen; Cointin, Rebecca (FAA); Hileman, James (FAA); Locke, Maryalice (FAA); Windhoffer,

Laszlo (FAA) (Laszlo.Windhoffer@faa.gov); marie.hankanen@transportstyrelsen.se; FRANKEN Willem (willem.franken@easa.europa.eu); Mueller, John (mueller.john@epa.gov); jonathan.gilad@aviation-civile.gouv.fr; University of Civil Aviation China - Yang Xiaojun (xiaojunyoung@hotmail.com); Didyk-Wells, Nicole (FAA); jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; Dickson, Neil
Subject: NAA-Only ESSTsg
When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Deliberative Process / Ex. 5

Personal Phone / Ex. 6

Appointment

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 1/30/2018 2:07:44 PM
To: Laszlo.Windhoffer@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov

Subject: FW: NAA-Only ESSTsg
Attachments: NAA-Only ESSTsg Telecon; CTG ESSTsg: TCCA input for NAA discussion; RE: CTG ESSTsg T8-4
Location: See telecon/Webex info below

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:30:00 PM
Show Time As: Busy

FYI

-----Original Appointment-----
From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Friday, January 26, 2018 4:29 PM
To: Laszlo.Windhoffer@faa.gov; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: NAA-Only ESSTsg
When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Attached are relevant emails for our NAA supersonic discussion today (fyi, as you probably have all of these).

Deliberative Process / Ex. 5

Personal Phone / Ex. 6

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 1/29/2018 9:40:57 PM

Subject: NAA-Only ESSTsg Telecon

Start: 1/30/2018 1:30:00 PM
End: 1/30/2018 2:15:00 PM
Show Time As: Busy

From: Mueller, John
Sent: Monday, January 29, 2018 4:05 PM
To: Leggett, Cullen; Manning, Bryan
Subject: FW: NAA-Only ESSTsg Telecon
Attachments: CTG ESSTsg: TCCA input for NAA discussion

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: CAEP CTG

Here are David's Bilcock's thoughts on SST. I tend to agree with him.

I will set up a room for tomorrow's call. Optional for either of you.

From: Bilcock, David [mailto:david.bilcock@tc.gc.ca]
Sent: Friday, January 26, 2018 4:53 PM
To: 'Laszlo.Windhoffer@faa.gov' <Laszlo.Windhoffer@faa.gov>; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy <wendy.bailey@tc.gc.ca>; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John <mueller.john@epa.gov>; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: RE: NAA-Only ESSTsg Telecon

All,

Deliberative Process / Ex. 5

David Bilcock
Senior Engineer, Powerplants & Emissions / Ingénieur principal, Groupe moteurs et émissions
National Aircraft Certification / Certification nationale des aéronefs
Ph. / tél.: (613) 617-6821
facsimile / télécopieur: (613) 996-9178

e-mail: David.Bilcock@tc.gc.ca
Transport Canada / Transports Canada,

159, Cleopatra Dr, Nepean (AARD)
Ontario, K1A 0N5
Government of Canada / Gouvernement du Canada

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Friday, January 26, 2018 4:25 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy <wendy.bailey@tc.gc.ca>; Bilcock, David <david.bilcock@tc.gc.ca>; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: NAA-Only ESSTsg Telecon

Dear NAAs,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, S.W.
Washington, DC 20591
T: +1-202-267-4741

Message

Sent: 7/16/2018 7:34:37 PM
To: Upton, Eric [Eric.Upton@gulfstream.com]; Laszlo Windhoffer (Laszlo.Windhoffer@faa.gov) [Laszlo.Windhoffer@faa.gov]; Jerome Sarda [jerome.sarda@aviation-civile.gouv.fr]
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: RE: ESSTsg 17 April Telecon

Hey, When is the next ESSTsg call

Regards,
Cullen Leggett
+1 734-214-4514

From: Upton, Eric [mailto:Eric.Upton@gulfstream.com]
Sent: Friday, April 20, 2018 8:08 AM
To: Madden, Paul C <Paul.Madden@Rolls-Royce.com>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Herms Erika <erika.herms@easa.europa.eu>; Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; Cowart, Robbie <robbie.cowart@gulfstream.com>; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; Etter, Charles <charles.etter@gulfstream.com>; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: RE: ESSTsg 17 April Telecon

Hi Paul,

Deliberative Process / Ex. 5

Regards,

Eric Upton, PhD

Environmental/Performance Specialist
Gulfstream Aerospace Corporation
Eric.Upton@gulfstream.com
ph: 912-395-8458
fax: 912-965-8850

From: Madden, Paul C [mailto:Paul.Madden@Rolls-Royce.com]
Sent: Friday, April 20, 2018 7:57 AM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Herms Erika <erika.herms@easa.europa.eu>; Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; Cowart, Robbie <robbie.cowart@gulfstream.com>; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; Etter, Charles <charles.etter@gulfstream.com>; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; Upton, Eric <Eric.Upton@gulfstream.com>; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.lovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Upton, Eric <Eric.Upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: 19 April 2018 18:44
To: Herms Erika <erika.herms@easa.europa.eu>; Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com;

guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; Madden, Paul C <Paul.Madden@Rolls-Royce.com>; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon

All,

Deliberative Process / Ex. 5

Best regards,
Cullen Leggett
+1 734-214-4514

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, April 19, 2018 9:07 AM
To: Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com;

jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen <Leggett.Cullen@epa.gov>; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon

Dear Bethan and all,

Deliberative Process / Ex. 5

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

EASA

Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 19 April 2018 13:54
To: Laszlo.Windhoffer@faa.gov; Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se;

theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: Re: ESSTsg 17 April Telecon

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Best wishes,

Bethan

Dr Bethan Owen
Research Fellow
Manchester Metropolitan University
Telephone 01824-709583
Mobile 07920083914
Normal student office hours are Weds 10am-1pm
but please check first as I am often travelling

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From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Wednesday, 18 April 2018 at 16:36
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov" <samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>, "Eric.Upton@gulfstream.com" <eric.upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Dear All,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Tuesday, April 17, 2018 9:17 AM*
Subject: *RE: ESSTsg 17 April Telecon*

Dear All,

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Thursday, April 12, 2018 12:39 PM*
Subject: *ESSTsg 17 April Telecon*

Dear ESSTsg Team,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

TELECON/WEBEX:

Personal Phone / Ex. 6

Personal Phone / Ex. 6

Webex access: https://www.connectmeeting.att.com
(meeting number = telephone number, passcode = code)

László Windhoffer
László Windhoffer
Federal Aviation Administration
T +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Dear All,

Deliberative Process / Ex. 5

Thank you

Laszlo Windhoffer
Federal Aviation Administration
T +1-202-267-4741

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Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 7/16/2018 7:35:52 PM
To: Eric Upton [Eric.Upton@gulfstream.com]; Jerome Sarda [jerome.sarda@aviation-civile.gouv.fr]; Laszlo Windhoffer (Laszlo.Windhoffer@faa.gov) [Laszlo.Windhoffer@faa.gov]
Subject: RE: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Deliberative Process / Ex. 5

Regards,
Cullen Leggett
+1 734-214-4514

From: Dickson, Neil [mailto:NDickson@icao.int]
Sent: Tuesday, July 03, 2018 9:46 AM
To: Bristow A <wolfe.philip@epa.gov>; Log T <thobias.log@transportstyrelsen.se>; Abdain Z <Zainal.abidin@emirates.com>; Abidin Z <Zainal.abidin@emirates.com>; Agarwal A <aa681@mit.edu>; Ahrens D <denise.ahrens@rolls-royce.com>; Allyn D <daniel.m.allyn@boeing.com>; Altherr D <daltherr@aerioncorp.com>; Anglade A <a.anglade@enac.gov.it>; Anvid <david.anvid@delta.com>; Archilla V <archillapv@inta.es>; Arrowsmith <stephen.arrowsmith@easa.europa.eu>; Arsad J <Jauhari_ARSAD@caas.gov.sg>; Bailey <wendy.bailey@tc.gc.ca>; Balasubramanian S <Sathya.Balasubramanian.CTR@dot.gov>; Baughcum S <steven.l.baughcum@boeing.com>; Beauregard M <MBeauregard@AIAC.ca>; Benito <arturo.benito@upm.es>; Berryann A <andy@boom.aero>; Berton J <Jeff.Berton@nasa.gov>; Bilcock D <david.bilcock@tc.gc.ca>; Boichenko <chemmotology@ukr.net>; Bonnefoy <bonnefoy_philippe@bluesky-d2d.com>; Bonnet A <arnaud.bonnet@embraer.com.br>; Box L <laurent.box@eurocontrol.int>; Carnelly <daniel.carnelly@airbus.com>; Chang C <clarence.t.chang@nasa.gov>; Christie S <s.christie@mmu.ac.uk>; Cointin R <rebecca.cointin@faa.gov>; Collin D <dominique.collin@snecma.fr>; Cotti <Ecotti@NBAA.org>; Cousineau Y <yves.cousineau@tc.gc.ca>; Crayford A <crayfordap1@cardiff.ac.uk>; De Lepinay I <ivan.de-lepinay@easa.europa.eu>; Dehestru G <guillaume.dehestru@dassault-aviation.com>; Deniskov V <V.Deniskov@antonov.kiev.ua>; Denk K <keremdenk@gmail.com>; Detragiache M <mariachiara.detragiache@asd-europe.org>; Dickson, Neil <NDickson@icao.int>; Dolejsi W <WCDolejsi@cessna.textron.com>; Dourado E <eli@boomsupersonic.com>; Jim Dow <Jdow@iccaia.org>; Dudebout <rudolph.dudebout@honeywell.com>; Dupont R <ricardo.dupont@anac.gov.br>; Etter <charles.etter@gulfstream.com>; Eyers <chris@limitedskies.com>; Fajari A <ajaria96@yahoo.co.id>; Ferdian Hussein B <baronferdianhussein@airasia.com>; Fleming G <Gregg.Fleming@dot.gov>; Fleuti <emanuel.fleuti@zurich-airport.com>; Franken <willem.franken@easa.europa.eu>; Frenandez J <jorge.fernandez@faa.gov>; Fudge, Ted <Ted.Fudge@CANSO.org>; Fujiwara <fuji@chofu.jaxa.jp>; Galotti, Vincent <Vgalotti.iccaia@gmail.com>; Garrison M <Mike.garrison@boeing.com>; Gerring, Holly <gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Gillette <warren.gillette@faa.gov>; Gowen H <hayley.gowen@bis.gsi.gov.uk>; Grandi F <fabio.grandi@faa.gov>; Hankanen M <marie.hankanen@transportstyrelsen.se>; Hemmings <bill.hemmings@transportenvironment.org>; Herms <Erika.herms@easa.europa.eu>; Hileman J <James.Hileman@faa.gov>; Hinderberger M <mhinderberger@aerioncorp.com>; Hiromitsu N <nagayoshi_hiromitsu@ihi.co.jp>; Hoermann <werner.hoermann@easa.europa.eu>; Hoke J <james.hoke@pw.utc.com>; Holsclaw C <curtis.holsclaw@faa.gov>; Horie N <naohiro_horie@mhiahq.com>; Huttenhower H <Hillary.Huttenhower@pw.utc.com>; Iglesias A <aiglesias@mfom.es>; Iovinelli <Ralph.Iovinelli@faa.gov>; Jacob D <daniel.jacob@faa.gov>; Janicke U <uj@janicke.de>; Johnson M <mark.johnson3@rolls-royce.com>; Jung J <jjung@aci.aero>; Kartika D <kartikadinakartika@gmail.com>; Kenney M <mkenney@kbenv.com>; Kharina A <karin@theicct.org>; Kim B <Brian.Kim@pw.utc.com>; Kittery J <jean-luc.kittery@aviation-civile.gouv.fr>; Kozel <progress@ivchenko-progress.com>; Kramer S <stephen.kramer@pw.utc.com>; Kusukame T <takuya_kusukame@mitsubishiaircraft.com>; Lee <d.s.lee@mmu.ac.uk>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lim L <L.Lim@mmu.ac.uk>; Lindsey, Leah <lindsey.leah@epa.gov>; Lobo P <Prem.Lobo@nrc-cnrc.gc.ca>; Locke M <maryalice.locke@faa.gov>; Locke M <maryalice.locke@faa.gov>; Lunter <michael.lunter@minienm.nl>; Lye <david.lye@aero.bombardier.com>; Madden <paul.madden@rolls-royce.com>;

Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Majjigi R <muni.majjigi@ge.com>; Manning, Bryan <manning.bryan@epa.gov>; Marks <julie.marks@faa.gov>; Matischeck J <jrmatisheck@aerioncorp.com>; Maurice L <lourdes@boomsupersonic.com>; McCaldon <kian.mccaldon@pwc.ca>; McConnachie D <McConnachie_Dominic@bah.com>; McKinney <randal.mckinney@pw.utc.com>; Medvedev Y <yuriy.medved@gmail.com>; Mery Y <yoann.mery@snecma.fr>; Miake-Lye <rick@aerodyne.com>; Middel J <jan.middel@nlr.nl>; Mirzoyan A <mirzoyan@ciam.ru>; Morgenstern J <john.morgenstern@lmco.com>; Moriyama M <moriyama-m2ff@mlit.go.jp>; Morris <kevin.morris@adsgroup.org.uk>; Muehlhausen M <matthew.r.muehlhausen@boeing.com>; Mueller, John <mueller.john@epa.gov>; Nobrega K <krisha.nobrega@embraer.com.br>; Oshimizu M <masaya_oshimizu@mitsubishiaircraft.com>; Owen <b.owen@mmu.ac.uk>; Pagliarello M <MPagliarello@aci-na.org>; Patserin <03503@ivchenko-progress.com>; Peeters P <paul.peeters1000@gmail.com>; Penanhoat <olivier.penanhoat@snecma.fr>; Percheron T <Thierry.Percheron@dassault-aviation.com>; Perelgritz J <jean-francois.perelgritz@airbus.com>; Peter <Peter.Zimm@icfi.com>; Plohr <Martin.Plohr@dlr.de>; Pohle T <tpohle@airlines.org>; Renard C <charles.renard@airbus.com>; Riegle <leslie.riegle@aia-aerospace.org>; Rindlisbacher <Theo.Rindlisbacher@bazl.admin.ch>; Roeler T <tim.roesler@liberty.rolls-royce.com>; Roetger <RoetgerT@iata.org>; Russell R <raymond@boom.aero>; Rutherford <Dan@theicct.org>; Sabnis J <sabnis@mit.edu>; Saito <Marcelo.saito@anac.gov.br>; Samulski, Michael <samulski.michael@epa.gov>; Sarda J <jerome.sarda@aviation-civile.gouv.fr>; Savvidis C <Charalambos.Savvidis@uba.de>; Scata D <donald.scata@faa.gov>; Scavuzzi J <jscavuzzi@aci.aero>; Schaefer M <martin.schaefer@bmvi.bund.de>; Schaufele R <roger.schaufele@faa.gov>; Seeberg I <inger.seeberg@cph.dk>; Seeliger K <katharina.seeliger@airbus.com>; Seidel J <jonathan.a.seidel@nasa.gov>; Sipatov <sipatov@avid.ru>; Skillen G <gskillen7@gmail.com>; Smallwood G <Greg.Smallwood@nrc-cnrc.gc.ca>; Smit H <hans.smit@airbus.com>; Smith <simon.smith@rolls-royce.com>; Soum F <frederic.soum@airbus.com>; Sow D <cheikhdjiby.sow@snecma.fr>; Sparrow V <vws1@psu.edu>; Speth R <speth@mit.edu>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Stimson <dkstimson@hotmail.com>; Sturdza P <sturdza@aerioncorp.com>; Takahashi H <h-hashimoto@aeif.or.jp>; Tobaldini L <luiz.tobaldini@embraer.com.br>; Upton E <Eric.Upton@gulfstream.com>; Vanek A <Adrienne.Vanek@faa.gov>; Verlhac S <stephane.verlhac@adp.fr>; Volkov <Volkov@ciam.ru>; Wetzel <Frank.Wetzel@uba.de>; Willford N <NWillford@txtav.com>; Williams P <paul.i.williams@manchester.ac.uk>; Windhoffer <laszlo.windhoffer@faa.gov>; Yang X <xiaojunyoung@hotmail.com>; Yasar G <gursu.tasar@tai.com.tr>; Yen, David <Yen.David@epa.gov>; Yen, David <Yen.David@epa.gov>; Zelina J <joseph.zelina@ge.com>
Cc: Bettega Michielin, Monique <MMichielin@icao.int>
Subject: RE: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Dear WG3,

Deliberative Process / Ex. 5

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
mobile: +1 514-812-0737
email: NDickson@icao.int

Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 15-Jun-18 11:48 AM
To: 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anglade A'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berryann A'; 'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carmody C'; 'Carnelly'; 'Chang C'; 'Christie S'; 'Cointin R'; 'Collin D'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Detragiache M'; Dickson, Neil; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hiromitsu N'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Huttenhower H'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame T'; 'Lee'; 'Leggett'; 'Lim L'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Owen'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Verlhac S'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'
Cc: Bettega Michielin, Monique
Subject: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Dear members of WG3,

Deliberative Process / Ex. 5

Best wishes

Neil on behalf of Bethan and Ralph, WG3 co-rapporteurs

Dr Neil Dickson
Chief, Environmental Standards Section

International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
mobile: +1 514-812-0737
email: NDickson@icao.int

Consider the environment before printing this e-mail

Message

From: Bilcock, David [david.bilcock@tc.gc.ca]
Sent: 2/8/2018 9:36:25 PM
To: 'Laszlo.Windhoffer@faa.gov' [Laszlo.Windhoffer@faa.gov]; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy [wendy.bailey@tc.gc.ca]; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: RE: NAA-Only ESSTsg

Laszlo, all,

Deliberative Process / Ex. 5

Kind regards,
Dave

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Thursday, February 08, 2018 3:11 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy ; Bilcock, David ; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett.Cullen@epa.gov
Subject: RE: NAA-Only ESSTsg
Dear All,

Deliberative Process / Ex. 5

Thank you

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741
-----Original Appointment-----
From: Windhoffer, Laszlo (FAA)
Sent: Friday, January 26, 2018 4:27 PM
To: Windhoffer, Laszlo (FAA); FOCA - Theo.Rindlisbacher@bazl.admin.ch (Theo.Rindlisbacher@bazl.admin.ch); jerome.sarda@aviation-civile.gouv.fr; Ricardo Antonio Binotto Dupont (ricardo.Dupont@anac.gov.br); Bailey, Wendy; Transport Canada - David Bilcock (david.bilcock@tc.gc.ca); werner.hoermann@easa.europa.eu; Fernandez, Jorge (FAA); Jacob, Daniel (FAA); martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; Netherlands MINIENM - Michael Lunter (michael.lunter@minienm.nl) (michael.lunter@minienm.nl); thobias.log@transportstyrelsen.se; Iovinelli, Ralph (FAA); erika.herms@easa.europa.eu; Liu, Sandy (FAA); Bethan Owen; Cointin, Rebecca (FAA); Hileman, James (FAA); Locke, Maryalice (FAA); Windhoffer, Laszlo (FAA) (Laszlo.Windhoffer@faa.gov); marie.hankanen@transportstyrelsen.se; FRANKEN Willem (willem.franken@easa.europa.eu); Mueller, John (mueller.john@epa.gov); jonathan.gilad@aviation-civile.gouv.fr; University of Civil Aviation China - Yang Xiaojun (xiaojunyoung@hotmail.com); Didyk-Wells, Nicole (FAA); jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; Dickson, Neil
Subject: NAA-Only ESSTsg
When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Deliberative Process / Ex. 5

USA Toll-Free: Personal Phone / Ex. 6
International:
ACCESS CODE:
Webex access: https://www.connectmeeting.att.com
(telephone number = meeting number and the passcode = code)

Message

From: Hankanen Marie [Marie.Hankanen@transportstyrelsen.se]
Sent: 2/9/2018 8:21:53 AM
To: Laszlo.Windhoffer@faa.gov; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; Log Thobias [Thobias.Log@transportstyrelsen.se]; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: SV: NAA-Only ESSTsg

Dear all,

Deliberative Process / Ex. 5

Best regards

Marie Hankanen
Swedish Transport Agency
Environmental Expert
Maritime and Civil Aviation Department
Olai Kyrkogata 35
SE- 601 73 Norrköping
Sweden
Direct +46-10-495 37 37
Phone +46-771-503 503
SMS +46-708-82 06 88

Från: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Skickat: den 8 februari 2018 21:11
Till: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; Log Thobias ; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; Hankanen Marie ; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett.Cullen@epa.gov
Ämne: RE: NAA-Only ESSTsg

Dear All,

Deliberative Process / Ex. 5

Thank you

Deliberative Process / Ex. 5

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

-----Original Appointment-----
From: Windhoffer, Laszlo (FAA)
Sent: Friday, January 26, 2018 4:27 PM
To: Windhoffer, Laszlo (FAA); FOCA - Theo.Rindlisbacher@bazl.admin.ch (Theo.Rindlisbacher@bazl.admin.ch); jerome.sarda@aviation-civile.gouv.fr; Ricardo Antonio Binotto Dupont (ricardo.Dupont@anac.gov.br); Bailey, Wendy; Transport Canada - David Bilcock (david.bilcock@tc.gc.ca); werner.hoermann@easa.europa.eu; Fernandez, Jorge (FAA); Jacob, Daniel (FAA); martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; Netherlands MINIENM - Michael Lunter (michael.lunter@minienm.nl) (michael.lunter@minienm.nl); thobias.log@transportstyrelsen.se; Iovinelli, Ralph (FAA); erika.herms@easa.europa.eu; Liu, Sandy (FAA); Bethan Owen; Cointin, Rebecca (FAA); Hileman, James (FAA); Locke, Maryalice (FAA); Windhoffer,

Laszlo (FAA) (Laszlo.Windhoffer@faa.gov); marie.hankanen@transportstyrelsen.se; FRANKEN Willem (willem.franken@easa.europa.eu); Mueller, John (mueller.john@epa.gov); jonathan.gilad@aviation-civile.gouv.fr; University of Civil Aviation China - Yang Xiaojun (xiaojunyoung@hotmail.com); Didyk-Wells, Nicole (FAA); jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; Dickson, Neil
Subject: NAA-Only ESSTsg
When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Deliberative Process / Ex. 5

USA Toll-Free
International Personal Phone / Ex. 6
ACCESS CODE
Webex access: https://www.connectmeeting.att.com
(telephone number = meeting number and the passcode = code)

Message

From: jerome.sarda@aviation-civile.gouv.fr [jerome.sarda@aviation-civile.gouv.fr]
on behalf of Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]
Sent: 7/17/2018 6:27:08 AM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
CC: Eric Upton [Eric.Upton@gulfstream.com]; Laszlo Windhoffer (Laszlo.Windhoffer@faa.gov) [Laszlo.Windhoffer@faa.gov]
Subject: Re: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern
Attachments: jerome_sarda.vcf

Hello Cullen,

Deliberative Process / Ex. 5

Jérôme

Le 16/07/2018 à 21:35, Leggett, Cullen a écrit :

Is there still an ESSTsg call on July 24th?

Regards,
Cullen Leggett
+1 734-214-4514

From: Dickson, Neil [mailto:NDickson@icao.int]
Sent: Tuesday, July 03, 2018 9:46 AM
To: Bristow A <wolfe.philip@epa.gov>; Log T <thobias.log@transportstyrelsen.se>; Abdain Z <Zainal.abidin@emirates.com>; Abidin Z <Zainal.abidin@emirates.com>; Agarwal A <aa681@mit.edu>; Ahrens D <denise.ahrens@rolls-royce.com>; Allyn D <daniel.m.allyn@boeing.com>; Altherr D <daltherr@aerioncorp.com>; Anglade A <a.anglade@enac.gov.it>; Anvid <david.anvid@delta.com>; Archilla V <archillapv@inta.es>; Arrowsmith <stephen.arrowsmith@easa.europa.eu>; Arsad J <Jauhari_ARSAD@caas.gov.sg>; Bailey <wendy.bailey@tc.gc.ca>; Balasubramanian S <Sathya.Balasubramanian.CTR@dot.gov>; Baughcum S <steven.l.baughcum@boeing.com>; Beauregard M <MBeauregard@AIAC.ca>; Benito <arturo.benito@upm.es>; Berryann A <andy@boom.aero>; Berton J <Jeff.Berton@nasa.gov>; Bilcock D <david.bilcock@tc.gc.ca>; Boichenko <chemmotology@ukr.net>; Bonnefoy <bonnefoy_philippe@bluesky-d2d.com>; Bonnet A <arnaud.bonnet@embraer.com.br>; Box L <laurent.box@eurocontrol.int>; Carnelly <daniel.carnelly@airbus.com>; Chang C <clarence.t.chang@nasa.gov>; Christie S <s.christie@mmu.ac.uk>; Cointin R <rebecca.cointin@faa.gov>; Collin D <dominique.collin@snecma.fr>; Cotti <Ecotti@NBAA.org>; Cousineau Y <yves.cousineau@tc.gc.ca>; Crayford A <crayfordap1@cardiff.ac.uk>; De Lepinay I <ivan.de-lepinay@easa.europa.eu>; Dehestru G <guillaume.dehestru@dassault-aviation.com>; Deniskov V <V.Deniskov@antonov.kiev.ua>; Denk K <keremdenk@gmail.com>; Detragiache M <mariachiara.detragiache@asd-europe.org>; Dickson, Neil <NDickson@icao.int>; Dolejsi W <WCDolejsi@cessna.textron.com>; Dourado E <eli@boomsupersonic.com>; Jim Dow <Jdow@iccaia.org>; Dudebout <rudolph.dudebout@honeywell.com>; Dupont R <ricardo.dupont@anac.gov.br>; Etter <charles.etter@gulfstream.com>; Eyers <chris@limitedskies.com>; Fajari A <ajaria96@yahoo.co.id>; Ferdian Hussein B <baronferdianhussein@airasia.com>; Fleming G <Gregg.Fleming@dot.gov>; Fleuti <emanuel.fleuti@zurich-airport.com>; Franken <willem.franken@easa.europa.eu>; Frenandez J <jorge.fernandez@faa.gov>; Fudge, Ted <Ted.Fudge@CANSO.org>; Fujiwara <fuji@chofu.jaxa.jp>; Galotti, Vincent <Vgalotti.iccaia@gmail.com>; Garrison M <Mike.garrison@boeing.com>; Gerring, Holly

<gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Gillette <warren.gillette@faa.gov>; Gowen H <hayley.gowen@bis.gsi.gov.uk>; Grandi F <fabio.grandi@faa.gov>; Hankanen M <marie.hankanen@transportstyrelsen.se>; Hemmings <bill.hemmings@transportenvironment.org>; Herms <Erika.herms@easa.europa.eu>; Hileman J <James.Hileman@faa.gov>; Hinderberger M <mhinderberger@aerioncorp.com>; Hiromitsu N <nagayoshi_hiromitsu@ihi.co.jp>; Hoermann <werner.hoermann@easa.europa.eu>; Hoke J <james.hoke@pw.utc.com>; Holsclaw C <curtis.holsclaw@faa.gov>; Horie N <naohiro_horie@mhiahq.com>; Huttenhower H <Hillary.Huttenhower@pw.utc.com>; Iglesias A <aiglesias@mfom.es>; Iovinelli <Ralph.Iovinelli@faa.gov>; Jacob D <daniel.jacob@faa.gov>; Janicke U <uj@janicke.de>; Johnson M <mark.johnson3@rolls-royce.com>; Jung J <jjung@aci.aero>; Kartika D <kartikadinakartika@gmail.com>; Kenney M <mkenney@kbenv.com>; Kharina A <karin@theicct.org>; Kim B <Brian.Kim@pw.utc.com>; Kittery J <jean-luc.kittery@aviation-civile.gouv.fr>; Kozel <progress@ivchenko-progress.com>; Kramer S <stephen.kramer@pw.utc.com>; Kusukame T <takuya_kusukame@mitsubishiaircraft.com>; Lee <d.s.lee@mmu.ac.uk>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lim L <L.Lim@mmu.ac.uk>; Lindsey, Leah <lindsey.leah@epa.gov>; Lobo P <Prem.Lobo@nrc-cnrc.gc.ca>; Locke M <maryalice.locke@faa.gov>; Locke M <maryalice.locke@faa.gov>; Lunter <michael.lunter@minienm.nl>; Lye <david.lye@aero.bombardier.com>; Madden <paul.madden@rolls-royce.com>; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Majjigi R <muni.majjigi@ge.com>; Manning, Bryan <manning.bryan@epa.gov>; Marks <julie.marks@faa.gov>; Matischeck J <jrmatisheck@aerioncorp.com>; Maurice L <lourdes@boomsupersonic.com>; McCaldon <kian.mccaldon@pwc.ca>; McConnachie D <McConnachie_Dominic@bah.com>; McKinney <randal.mckinney@pw.utc.com>; Medvedev Y <yuriy.medved@gmail.com>; Mery Y <yoann.mery@snecma.fr>; Miake-Lye <rick@aerodyne.com>; Middel J <jan.middel@nlr.nl>; Mirzoyan A <mirzoyan@ciam.ru>; Morgenstern J <john.morgenstern@lmco.com>; Moriyama M <moriyama-m2ff@mlit.go.jp>; Morris <kevin.morris@adsgroup.org.uk>; Muehlhausen M <matthew.r.muehlhausen@boeing.com>; Mueller, John <mueller.john@epa.gov>; Nobrega K <krisha.nobrega@embraer.com.br>; Oshimizu M <masaya_oshimizu@mitsubishiaircraft.com>; Owen <b.owen@mmu.ac.uk>; Pagliarello M <MPagliarello@aci-na.org>; Patserin <03503@ivchenko-progress.com>; Peeters P <paul.peeters1000@gmail.com>; Penanhoat <olivier.penanhoat@snecma.fr>; Percheron T <Thierry.Percheron@dassault-aviation.com>; Perelgritz J <jean-francois.perelgritz@airbus.com>; Peter <Peter.Zimm@icfi.com>; Plohr <Martin.Plohr@dlr.de>; Pohle T <tpohle@airlines.org>; Renard C <charles.renard@airbus.com>; Riegle <leslie.riegle@aia-aerospace.org>; Rindlisbacher <Theo.Rindlisbacher@bazl.admin.ch>; Roeler T <tim.roesler@liberty.rolls-royce.com>; Roetger <RoetgerT@iata.org>; Russell R <raymond@boom.aero>; Rutherford <Dan@theicct.org>; Sabnis J <sabnis@mit.edu>; Saito <Marcelo.saito@anac.gov.br>; Samulski, Michael <samulski.michael@epa.gov>; Sarda J <jerome.sarda@aviation-civile.gouv.fr>; Savvidis C <Charalambos.Savvidis@uba.de>; Scata D <donald.scata@faa.gov>; Scavuzzi J <jscavuzzi@aci.aero>; Schaefer M <martin.schaefer@bmvi.bund.de>; Schaufele R <roger.schaufele@faa.gov>; Seeberg I <inger.seeberg@cph.dk>; Seeliger K <katharina.seeliger@airbus.com>; Seidel J <jonathan.a.seidel@nasa.gov>; Sipatov <sipatov@avid.ru>; Skillen G <gskillen7@gmail.com>; Smallwood G <Greg.Smallwood@nrc-cnrc.gc.ca>; Smit H <hans.smit@airbus.com>; Smith <simon.smith@rolls-royce.com>; Soum F <frederic.soum@airbus.com>; Sow D <cheikhdjiby.sow@snecma.fr>; Sparrow V <vws1@psu.edu>; Speth R <speth@mit.edu>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Stimson <dkstimson@hotmail.com>; Sturdza P <sturdza@aerioncorp.com>; Takahashi H <h-hashimoto@aeif.or.jp>; Tobaldini L <luiz.tobaldini@embraer.com.br>; Upton E <Eric.Upton@gulfstream.com>; Vanek A <Adrienne.Vanek@faa.gov>; Verlhac S <stephane.verlhac@adp.fr>; Volkov <Volkov@ciam.ru>; Wetzel <Frank.Wetzel@uba.de>; Willford N <NWillford@txtav.com>; Williams P <paul.i.williams@manchester.ac.uk>; Windhoffer <laszlo.windhoffer@faa.gov>; Yang X <xiaojunyoung@hotmail.com>; Yasar G <gursu.tasar@tai.com.tr>; Yen, David <Yen.David@epa.gov>; Yen, David <Yen.David@epa.gov>; Zelina J <joseph.zelina@ge.com>

Cc: Bettega Michielin, Monique <MMichielin@icao.int>
Subject: RE: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Dear WG3,

Deliberative Process / Ex. 5

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
mobile: +1 514-812-0737
email: NDickson@icao.int

Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 15-Jun-18 11:48 AM
To: 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anglade A'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berryann A'; 'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carmody C'; 'Carnelly'; 'Chang C'; 'Christie S'; 'Cointin R'; 'Collin D'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Detragiache M'; Dickson, Neil; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hiromitsu N'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Huttenhower H'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame T'; 'Lee'; 'Leggett'; 'Lim L'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Owen'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Verlhac S'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'
Cc: Bettega Michielin, Monique
Subject: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Dear members of WG3,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Best wishes

Neil on behalf of Bethan and Ralph, WG3 co-rapporteurs

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
mobile: +1 514-812-0737
email: NDickson@icao.int

Consider the environment before printing this e-mail

Appointment

From: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Sent: 5/29/2018 5:06:45 PM
To: maryalice.locke@faa.gov

Subject: Accepted: FESG Supersonic Call
Location: Personal Phone / Ex. 6
Start: 5/31/2018 3:00:00 PM
End: 5/31/2018 4:00:00 PM
Show Time As: Busy

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 5/15/2018 11:55:43 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Accepted: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 6/26/2018 1:30:00 PM
End: 6/26/2018 3:30:00 PM
Show Time As: Busy

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 5/15/2018 11:55:23 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Accepted: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 7/24/2018 1:30:00 PM
End: 7/24/2018 3:30:00 PM
Show Time As: Busy

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 5/15/2018 11:55:10 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Accepted: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/21/2018 1:30:00 PM
End: 8/21/2018 3:30:00 PM
Show Time As: Busy

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 5/15/2018 11:54:59 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Accepted: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 9/11/2018 1:30:00 PM
End: 9/11/2018 3:30:00 PM
Show Time As: Busy

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/17/2018 1:33:33 PM
To: Laszlo Windhoffer (Laszlo.Windhoffer@faa.gov) [Laszlo.Windhoffer@faa.gov]; Eric Upton [Eric.Upton@gulfstream.com]
Subject: NNTO - Cullen Leggett - eSST Call

Best regards,

Cullen Leggett

U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) +1 734-214-4514
(fax) +1 734-214-4816
Leggett.Cullen@EPA.gov

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 7/12/2018 7:08:38 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: FW: Exclusive: U.S. and Europe clash over global supersonic jet noise standards | Reuters

Regards,
Cullen Leggett
+1 734-214-4514

From: Cullen Leggett [mailto:cullen.leggett@gmail.com]
Sent: Thursday, July 12, 2018 15:02 PM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: Exclusive: U.S. and Europe clash over global supersonic jet noise standards | Reuters

https://www.reuters.com/article/us-airplane-supersonic-usa-exclusive/exclusive-u-s-and-europe-clash-over-global-supersonic-jet-noise-standards-idUSKBN1K21YQ

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/20/2018 2:39:47 PM
To: maryalice.locke@faa.gov

Subject: Tentative: FESG-FTG call on supersonic forecasts
Location: Personal Matters / Ex. 6

Start: 4/26/2018 2:00:00 PM
End: 4/26/2018 3:30:00 PM
Show Time As: Busy

Appointment

From: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Sent: 8/10/2018 6:23:48 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Discussion with FAA/EPA on P&W studies and perspective on SST.

Please forward as appropriate to other members of your organizations.

Call w/ EPA/FAA on SST
Thursday, August 23, 2018
1:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 2 hrs

Personal Phone / Ex. 6

When it's time, join the meeting.

Join from a video system or application

Personal Phone / Ex. 6

Can't join the meeting?

IMPORTANT NOTICE: Please note that this Webex service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session.

Appointment

From: Kevin.Partowazam@faa.gov [Kevin.Partowazam@faa.gov]
Sent: 5/24/2018 8:17:35 PM
To: Kevin.Partowazam@faa.gov; Donald.Scata@faa.gov; kevin.welsh@faa.gov; curtis.holsclaw@faa.gov; Ralph.Iovinelli@faa.gov; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; Daniel.Williams@faa.gov; maryalice.locke@faa.gov; roger.schaufele@faa.gov; Gregg.Fleming@dot.gov; bonnefoy_philippe@bluesky-d2d.com; Andrea.S.Freeburg@faa.gov [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e8f2395e7a484a0fb732cfb418eb094b-Andrea.S.Freeburg@faa.gov]; VWSACS@engr.psu.edu; vws1@psu.edu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]

Subject: SG3 WP Matrix Review
Attachments: SG3 Paper Matrix Review Agenda v2.doc; Copy of SG3 Excel Matrix 20180529 - Tracking - Prep Meetingv2.xlsx
Location: AWA 10A AEE Large Conference Room AWA-FOB10A (FAA)

Start: 5/29/2018 4:00:00 PM
End: 5/29/2018 8:00:00 PM
Show Time As: Busy

12:25 update: current draft of matrix attached

12:00 update – Hi All, please use the below telecon:

Back-up telecon:

Personal Phone / Ex. 6

5/29 update:
Updated agenda that moves WG1 up to 12:30.

5/24 update:
Hi Everyone – you'll see we've now added an agenda to the meeting invite, which includes specific times for each SG3 Agenda Item. We plan to do our best to stick to these time slots so you only need to attend for the portion you're responsible for. We'll let everyone know if things are going fast or slow as we move through the agenda, so please try not to double-book yourselves.

5/14 update – added WebEx:

SG/3 Prep Meeting

Tuesday, May 29, 2018

12:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 5 hrs

Join by phone

Personal Phone / Ex. 6

Add to Calendar

When it's time, join the meeting.

Join from a video system or application

Dial 625289089@bluesky.my.webex.com

You can also dial 173.243.2.68 and enter your meeting number.

Can't join the meeting?

Appointment

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 4/26/2018 4:08:27 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]

Subject: Call with FAA on nvPM and SST papers
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 4/26/2018 6:30:00 PM
End: 4/26/2018 7:30:00 PM
Show Time As: Busy

Hi Mike,
I am available at 2:30pm this afternoon to discuss these papers. Please see my responses to your specific questions below for further details.

Thanks,
Ralph

From: Samulski, Michael [mailto:samulski.michael@epa.gov]
Sent: Thursday, April 26, 2018 10:08 AM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Scata, Donald (FAA) <Donald.Scata@faa.gov>
Subject: RE: Draft US papers for SG3: nvPM and SST

Ralph,

Would you be free this afternoon to discuss these papers? I'm available between 2:00 and 4:00.

I'm unclear on a couple of things:

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Mike

→ Join Skype Meeting

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Personal Phone / Ex. 6

Find a local number

Personal Phone / Ex. 6 (same as access code above)

Help

Personal Phone / Ex. 6

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 4/24/2018 4:07:17 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Gerring, Holly [gerring.holly@epa.gov]; Giannelli, Bob [Giannelli.Bob@epa.gov]; Leggett, Cullen [Leggett.Cullen@epa.gov]; Lindsey, Leah [lindsey.leah@epa.gov]; Manning, Bryan [manning.bryan@epa.gov]; Mueller, John [mueller.john@epa.gov]; Samulski, Michael [samulski.michael@epa.gov]; Stevens, JeffreyA [Stevens.JeffreyA@epa.gov]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]

Subject: FW: MDG-FESG nvPM SG2018 papers
Attachments: CAEPSG 20183 WPXX_Coordination_Items_Draft_042418.docx; CAEPSG.20183.IP.0xx.6.en_FESG-MDG_nvPM Analysis_2018-04-25_.docx; CAEPSG.20183.WP_FESG_Status_Report_Draft_042418.docx; CBin 9-10 Sensitivity Update_2018-04-26.pdf; ICAO 2015 Long Term Forecast IP.pdf; MDG-FESG Future work items proposal 20180426.xlsx; WP06_CAEP11_FESG-MDG07_nvPM Main Analysis_LTO_Results_Rev2_2018-04-22-uj.docx; WP07_CAEP11_FESG-MDG07_nvPM Main Analysis_GHG_Results_Rev1_2018-04-23-1-uj.docx
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 4/27/2018 2:00:00 PM
End: 4/27/2018 4:00:00 PM
Show Time As: Tentative

Here is my collection of draft MDG-FESG SG2018 papers and spreadsheets and presentation materials for today's call.

-----Original Appointment-----
From: Maeroff, Bruce
Sent: Tuesday, April 24, 2018 12:07 PM
To: Maeroff, Bruce; Gerring, Holly; Giannelli, Bob; Leggett, Cullen; Lindsey, Leah; Manning, Bryan; Mueller, John; Samulski, Michael; Stevens, JeffreyA; Yen, David; Kinsey, John
Subject: MDG-FESG nvPM SG2018 papers
When: Friday, April 27, 2018 10:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Subject: review MDG-FESG nvPM SG2018 papers
When: Friday, April 27, 2018 10:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Personal Phone / Ex. 6

MDG-FESG Participants,

Deliberative Process / Ex. 5

2018-APR-27: **Teleconference Line**
North America Toll-Free: Personal Phone / Ex. 6
International: Personal Phone / Ex. 6
ACCESS CODE Personal Phone / Ex. 6
Mobile clickable: Personal Phone / Ex. 6

Webinar
Web Conference URL: Personal Phone / Ex. 6
Meeting Number(s): Personal Phone / Ex. 6
Access Code Personal Phone / Ex. 6

Appointment

From: Kevin.Partowazam@faa.gov [Kevin.Partowazam@faa.gov]
Sent: 3/22/2018 4:45:55 PM
To: Kevin.Partowazam@faa.gov; Donald.Scata@faa.gov; kevin.welsh@faa.gov; curtis.holsclaw@faa.gov; Ralph.Iovinelli@faa.gov; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; Daniel.Williams@faa.gov; maryalice.locke@faa.gov; roger.schaufele@faa.gov; Gregg.Fleming@dot.gov; bonnefoy_philippe@bluesky-d2d.com; Andrea.S.Freeburg@faa.gov [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e8f2395e7a484a0fb732cfb418eb094b-Andrea.S.Freeburg@faa.gov]; Daniel.Jacob@faa.gov; Fabio.Grandi@faa.gov; sandy.liu@faa.gov; mehmet.marsan@faa.gov; VWSACS@engr.psu.edu; vws1@psu.edu; PetersStanleyMR@state.gov; CarnahanKC@state.gov; BacherKP@state.gov; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
CC: srliu@hotmail.com

Subject: SG3 U.S. Stakeholders Meeting (USG invite)
Attachments: 20180504_SG3_Stakeholder Prep Meeting Agenda_rev.docx
Location: FAA HQ, 800 Independence Ave., SW, Washington, DC 20591 - Room TBD

Start: 5/7/2018 4:00:00 PM
End: 5/7/2018 6:00:00 PM
Show Time As: Busy

Recurrence: (none)

5/7/18 Update:
Agenda attached

Original Invite:

Hi All,

Ahead of CAEP Steering Group 3 in June, FAA plans to hold a meeting with U.S. Stakeholders on May 7. FAA will be hosting the meeting in our headquarters building located at 800 Independence Ave., SW, Washington, DC 20591. Those attending in person should plan to arrive at least 15-20 minutes early to allow time to go through security and be escorted to the meeting room. Please plan to call Janeya Julien (202-267-3576) or Fran Akers (202-267-3577) to be taken to the meeting room after completing security. The meeting will start promptly at noon.

Those unable to attend in-person can plan to use the telecon line below:

Chairperson Passcode: Personal Phone / Ex. 6

Participant Passcode: Personal Phone / Ex. 6

Dial In Access: (USA Only)

Dial In Access: (Direct Dial)

Personal Phone / Ex. 6

Dial In Access (Alternate USA Only)

Dial In Access (Alternative Direct Dial)

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ICAO CAEP Steering Group Meeting 3
U.S. Stakeholder Prep Meeting

Monday May 7, 2018, 12:00 PM - 2:00 PM
FAA HQ – 800 Independence Ave., SW

AGENDA

1. Opening
2. Logistics
3. U.S. Papers
    - WP/xx – Views on the Global Market-Based Measures Task Force (GMTF)
    - WP/xx – Views on the Alternative Fuels Task Force
    - WP/xx – Views on the nvPM Emissions Standard
    - WP/xx – Views on a Public Regulatory Impact Analysis Report for nvPM Standards
    - WP/xx – Views on Supersonic Engine Emissions Certification
    - WP/xx – Views on Potential CAEP/12 Work Items Regarding Aircraft Engine NOx
    - WP/xx – Views on Noise and Civil Supersonic Flight
4. Other WG issues of interest
5. Future Work
6. AOB

Appointment

From: Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]
Sent: 3/9/2018 2:22:05 PM
To: Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]; Timothy Pohle [tpohle@airlines.org]; Juliana Scavuzzi [jscavuzzi@aci.aero]; Ricardo Dupont [ricardo.dupont@anac.gov.br]; Marcelo Saito [marcelo.saito@anac.gov.br]; Wendy Bailey [wendy.bailey@tc.gc.ca]; David Bilcock [david.bilcock@tc.gc.ca]; Greg Smallwood [greg.smallwood@nrc-cnrc.gc.ca]; Xiaojun Yang [xiaojunyoung@hotmail.com]; Willem Franken [willem.franken@easa.europa.eu]; Steve Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Erika Herms [erika.herms@easa.europa.eu]; Werner Hoermann [werner.hoermann@easa.europa.eu]; Martin Plohr [martin.plohr@dlr.de]; Frank Wetzel [frank.wetzel@uba.de]; David Anvid [david.anvid@delta.com]; David Altherr [daltherr@aerioncorp.com]; Eli Cotti [ecotti@nbaa.org]; Neil Dickson [ndickson@icao.int]; Denise Ahrens [denise.ahrens@rolls-royce.com]; Dan Allyn [daniel.m.allyn@boeing.com]; Andy Berryann [andy@boom.aero]; Arnaud Bonnet [arnaud.bonnet@embraer.com.br]; Robbie Cowart [robbie.cowart@gulfstream.com]; Guillaume Dehestru [guillaume.dehestru@dassault-aviation.com]; William Dolejsi [wcdolejsi@txtav.com]; Rudy Dudebout [rudolph.dudebout@honeywell.com]; Charles Etter [charles.etter@gulfstream.com]; Mike Garrison [mike.garrison@boeing.com]; Darrel Hornbaker [ddhornbaker@txtav.com]; Mark Johnson [mark.johnson3@rolls-royce.com]; Nakahama Keisuke [keisuke_nakahama@mitsubishiaircraft.com]; Brian Kim [brian.kim@pw.utc.com]; David Lye [david.lye@aero.bombardier.com]; Paul Madden [paul.madden@rolls-royce.com]; Jason Matisheck [jrmatisheck@aerioncorp.com]; Kian McCaldon [kian.mccaldon@pwc.ca]; John Morgenstern [john.morgenstern@lmco.com]; Kevin Morris [kevin.morris@adsgroup.org.uk]; Matt Muehlhausen [matthew.r.muehlhausen@boeing.com]; Krisha Nobrega [krisha.nobrega@embraer.com.br]; Thierry Percheron [thierry.percheron@dassault-aviation.com]; Jean-François Perelgritz [jean-francois.perelgritz@airbus.com]; Charles Renard [charles.renard@airbus.com]; Hans Smit [hans.smit@airbus.com]; Simon Smith [simon.smith@rolls-royce.com]; Frédéric Soum [frederic.soum@airbus.com]; Peter Sturdza [sturdza@aerioncorp.com]; Luiz Tobaldini [luiz.tobaldini@embraer.com.br]; Eric Upton [eric.upton@gulfstream.com]; Joseph Zelina [joseph.zelina@ge.com]; Anastasia Kharina [karin@theicct.org]; Paul Peeters [paul.peeters1000@gmail.com]; Artur Mirzoyan [mirzoyan@ciam.ru]; Jauhari Arsad [jauhari_arsad@caas.gov.sg]; Arturo Benito [arturo.benito@upm.es]; Marie Hankanen [marie.hankanen@transportstyrelsen.se]; Theo Rindlisbacher [theo.rindlisbacher@bazl.admin.ch]; Bethan Owen [b.owen@mmu.ac.uk]; Jeff Berton [jeff.berton@nasa.gov]; Clarence Chang [clarence.t.chang@nasa.gov]; Rebecca Cointin [rebecca.cointin@faa.gov]; Jorge Fernandez [jorge.fernandez@faa.gov]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph Iovinelli [ralph.iovinelli@faa.gov]; Daniel Jacob [daniel.jacob@faa.gov]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maryalice Locke [maryalice.locke@faa.gov]; Sandy Liu [sandy.liu@faa.gov]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Rick Miake-Lye [rick@aerodyne.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Jon Seidel [jonathan.a.seidel@nasa.gov]; Laszlo Windhoffer [laszlo.windhoffer@faa.gov]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Yuriy Medvedev [yuriy.medved@gmail.com]; Mahito Moriyama [moriyama-m2ff@mlit.go.jp]; Yoann Méry [yoann.mery@snecma.fr]; Olivier Penanhoat [olivier.penanhoat@snecma.fr]; Graham Skillen [gskillen7@gmail.com]; Don Stimson [dkstimson@hotmail.com]

Subject: Event Request Notification: CTG ESSTsg

Start: 4/17/2018 1:30:00 PM
End: 4/17/2018 3:00:00 PM
Show Time As: Tentative

Recurrence: (none)

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     Summary: CTG ESSTsg
   Organizer: jerome.sarda@aviation-civile.gouv.fr
   Attendees: tpohle@airlines.org jscavuzzi@aci.aero ricardo.dupont@anac.gov.br
marcelo.saito@anac.gov.br wendy.bailey@tc.gc.ca david.bilcock@tc.gc.ca
greg.smallwood@nrc-cnrc.gc.ca xiaojunyoung@hotmail.com willem.franken@easa.europa.eu
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ndickson@icao.int denise.ahrens@rolls-royce.com daniel.m.allyn@boeing.com andy@boom.aero
arnaud.bonnet@embraer.com.br robbie.cowart@gulfstream.com guillaume.dehestru@dassault-
aviation.com wcdolejsi@txtav.com rudolph.dudebout@honeywell.com
charles.etter@gulfstream.com mike.garrison@boeing.com ddhornbaker@txtav.com
mark.johnson3@rolls-royce.com keisuke_nakahama@mitsubishiaircraft.com
brian.kim@pw.utc.com david.lye@aero.bombardier.com paul.madden@rolls-royce.com
jrmatisheck@aerioncorp.com kian.mccaldon@pwc.ca john.morgen
 stern@lm
       Start: mar. avril 17, 2018 03:30:00 PM Z
         End: mar. avril 17, 2018 05:00:00 PM Z
    Location:

 Description:
 USA Toll-Free
International:
Access code:
Webex access:
      (meeting number = telephone number, passcode = code)
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Personal Phone / Ex. 6

Personal Phone / Ex. 6

Appointment

From: Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]
Sent: 3/9/2018 2:19:48 PM
To: Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]; Timothy Pohle [tpohle@airlines.org]; Juliana Scavuzzi [jscavuzzi@aci.aero]; Ricardo Dupont [ricardo.dupont@anac.gov.br]; Marcelo Saito [marcelo.saito@anac.gov.br]; Wendy Bailey [wendy.bailey@tc.gc.ca]; David Bilcock [david.bilcock@tc.gc.ca]; Greg Smallwood [greg.smallwood@nrc-cnrc.gc.ca]; Xiaojun Yang [xiaojunyoung@hotmail.com]; Willem Franken [willem.franken@easa.europa.eu]; Steve Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Erika Herms [erika.herms@easa.europa.eu]; Werner Hoermann [werner.hoermann@easa.europa.eu]; Martin Plohr [martin.plohr@dlr.de]; Frank Wetzel [frank.wetzel@uba.de]; David Anvid [david.anvid@delta.com]; David Altherr [daltherr@aerioncorp.com]; Eli Cotti [ecotti@nbaa.org]; Neil Dickson [ndickson@icao.int]; Denise Ahrens [denise.ahrens@rolls-royce.com]; Dan Allyn [daniel.m.allyn@boeing.com]; Andy Berryann [andy@boom.aero]; Arnaud Bonnet [arnaud.bonnet@embraer.com.br]; Robbie Cowart [robbie.cowart@gulfstream.com]; Guillaume Dehestru [guillaume.dehestru@dassault-aviation.com]; William Dolejsi [wcdolejsi@txtav.com]; Rudy Dudebout [rudolph.dudebout@honeywell.com]; Charles Etter [charles.etter@gulfstream.com]; Mike Garrison [mike.garrison@boeing.com]; Darrel Hornbaker [ddhornbaker@txtav.com]; Mark Johnson [mark.johnson3@rolls-royce.com]; Nakahama Keisuke [keisuke_nakahama@mitsubishiaircraft.com]; Brian Kim [brian.kim@pw.utc.com]; David Lye [david.lye@aero.bombardier.com]; Paul Madden [paul.madden@rolls-royce.com]; Jason Matisheck [jrmatisheck@aerioncorp.com]; Kian McCaldon [kian.mccaldon@pwc.ca]; John Morgenstern [john.morgenstern@lmco.com]; Kevin Morris [kevin.morris@adsgroup.org.uk]; Matt Muehlhausen [matthew.r.muehlhausen@boeing.com]; Krisha Nobrega [krisha.nobrega@embraer.com.br]; Thierry Percheron [thierry.percheron@dassault-aviation.com]; Jean-François Perelgritz [jean-francois.perelgritz@airbus.com]; Charles Renard [charles.renard@airbus.com]; Hans Smit [hans.smit@airbus.com]; Simon Smith [simon.smith@rolls-royce.com]; Frédéric Soum [frederic.soum@airbus.com]; Peter Sturdza [sturdza@aerioncorp.com]; Luiz Tobaldini [luiz.tobaldini@embraer.com.br]; Eric Upton [eric.upton@gulfstream.com]; Joseph Zelina [joseph.zelina@ge.com]; Anastasia Kharina [karin@theicct.org]; Paul Peeters [paul.peeters1000@gmail.com]; Artur Mirzoyan [mirzoyan@ciam.ru]; Jauhari Arsad [jauhari_arsad@caas.gov.sg]; Arturo Benito [arturo.benito@upm.es]; Marie Hankanen [marie.hankanen@transportstyrelsen.se]; Theo Rindlisbacher [theo.rindlisbacher@bazl.admin.ch]; Bethan Owen [b.owen@mmu.ac.uk]; Jeff Berton [jeff.berton@nasa.gov]; Clarence Chang [clarence.t.chang@nasa.gov]; Rebecca Cointin [rebecca.cointin@faa.gov]; Jorge Fernandez [jorge.fernandez@faa.gov]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph Iovinelli [ralph.iovinelli@faa.gov]; Daniel Jacob [daniel.jacob@faa.gov]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maryalice Locke [maryalice.locke@faa.gov]; Sandy Liu [sandy.liu@faa.gov]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Rick Miake-Lye [rick@aerodyne.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Jon Seidel [jonathan.a.seidel@nasa.gov]; Laszlo Windhoffer [laszlo.windhoffer@faa.gov]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Yuriy Medvedev [yuriy.medved@gmail.com]; Mahito Moriyama [moriyama-m2ff@mlit.go.jp]; Yoann Méry [yoann.mery@snecma.fr]; Olivier Penanhoat [olivier.penanhoat@snecma.fr]; Graham Skillen [gskillen7@gmail.com]; Don Stimson [dkstimson@hotmail.com]

Subject: Event Request Notification: CTG ESSTsg

Start: 3/27/2018 1:30:00 PM
End: 3/27/2018 3:00:00 PM
Show Time As: Tentative

Recurrence: (none)

```
     Summary: CTG ESSTsg
   Organizer: jerome.sarda@aviation-civile.gouv.fr
   Attendees: tpohle@airlines.org jscavuzzi@aci.aero ricardo.dupont@anac.gov.br
marcelo.saito@anac.gov.br wendy.bailey@tc.gc.ca david.bilcock@tc.gc.ca
greg.smallwood@nrc-cnrc.gc.ca xiaojunyoung@hotmail.com willem.franken@easa.europa.eu
stephen.arrowsmith@easa.europa.eu erika.herms@easa.europa.eu
werner.hoermann@easa.europa.eu jerome.sarda@aviation-civile.gouv.fr martin.plohr@dlr.de
frank.wetzel@uba.de david.anvid@delta.com daltherr@aerioncorp.com ecotti@nbaa.org
ndickson@icao.int denise.ahrens@rolls-royce.com daniel.m.allyn@boeing.com andy@boom.aero
arnaud.bonnet@embraer.com.br robbie.cowart@gulfstream.com guillaume.dehestru@dassault-
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brian.kim@pw.utc.com david.lye@aero.bombardier.com paul.madden@rolls-royce.com
jrmatisheck@aerioncorp.com kian.mccaldon@pwc.ca john.morgen
 stern@lm
       Start: mar. mars 27, 2018 03:30:00 PM Z
         End: mar. mars 27, 2018 05:00:00 PM Z
    Location:

 Description:
 USA Toll-Free
International:
Access code:
Webex access:
      (meeting number = telephone number, passcode = code)
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Personal Phone / Ex. 6

Appointment

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 1/30/2018 2:07:42 PM
To: Laszlo.Windhoffer@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov

Subject: FW: NAA-Only ESSTsg
Attachments: NAA-Only ESSTsg Telecon; CTG ESSTsg: TCCA input for NAA discussion; RE: CTG ESSTsg T8-4
Location: See telecon/Webex info below

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:30:00 PM
Show Time As: Tentative

FYI

-----Original Appointment-----
From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Friday, January 26, 2018 4:29 PM
To: Laszlo.Windhoffer@faa.gov; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: NAA-Only ESSTsg
When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Deliberative Process / Ex. 5

USA Toll-Free:
International:
ACCESS CODE:
Webex access:
(telephone number = meeting number and the passcode = code)

Personal Phone / Ex. 6

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 1/29/2018 9:12:39 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [Leggett.Cullen@epa.gov]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]

Subject: NAA SST call - optional
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:00:00 PM
Show Time As: Tentative

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/20/2018 3:04:17 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/21/2018 1:30:00 PM
End: 8/21/2018 3:30:00 PM
Show Time As: Free

Importance: High

Canceled by Bruce M 8/20/18

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/2/2018 5:56:44 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Call with GE/FAA on SST 2:30PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Tentative

-----Original Appointment-----
From: Zelina, Joseph (GE Aviation, US) [mailto:Joseph.Zelina@ge.com]
Sent: Wednesday, August 01, 2018 5:59 PM
To: Zelina, Joseph (GE Aviation, US); Mueller, John; Ralph.lovinelli@faa.gov
Subject: Supersonics Discussions
When: Tuesday, August 07, 2018 2:30 PM-3:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Skype Meeting

→ Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Toll-free number: Personal Phone / Ex. 6 English (United States)
Toll number: Personal Phone / Ex. 6 English (United States)
Find a local numb

Conference ID: Personal Phone / Ex. 6
Forgot your dial-in PIN? | Help | Legal

HAVING TROUBLE WITH SKYPE?

GE Employees and Contractors are encouraged to try the following:

- Use a Bluetooth or plug-in headset
- **Don't have a headset?** When joining from your computer, select 'Call me at' and enter your landline or mobile device number
- When joining from mobile, use 'call back' within the Skype for Business mobile app - click the ellipses button and choose 'call me back'
- If entering the meeting though SpeedTCON, choose the 'phone' option to call directly into the meeting using the conference line

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/2/2018 5:56:43 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Call with GE/FAA on SST 2:30PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Tentative

-----Original Appointment-----
From: Zelina, Joseph (GE Aviation, US) [mailto:Joseph.Zelina@ge.com]
Sent: Wednesday, August 01, 2018 5:59 PM
To: Zelina, Joseph (GE Aviation, US); Mueller, John; Ralph.Iovinelli@faa.gov
Subject: Supersonics Discussions
When: Tuesday, August 07, 2018 2:30 PM-3:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Skype Meeting

→ Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Toll-free number: Personal Phone / Ex. 6 English (United States)
Toll number: Personal Phone / Ex. 6 English (United States)
Find a local number

Conference ID: Personal Phone / Ex. 6
Forgot your dial-in PIN? | Help | Legal

HAVING TROUBLE WITH SKYPE?

GE Employees and Contractors are encouraged to try the following:

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- **Don't have a headset?** When joining from your computer, select 'Call me at' and enter your landline or mobile device number
- When joining from mobile, use 'call back' within the Skype for Business mobile app - click the ellipses button and choose 'call me back'
- If entering the meeting though SpeedTCON, choose the 'phone' option to call directly into the meeting using the conference line

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Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/2/2018 5:48:47 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Call with GE/FAA on SST 3:00PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Tentative

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/1/2018 8:18:33 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: Call w/P&W on SST - tentative

Start: 8/9/2018 6:00:00 PM
End: 8/9/2018 7:00:00 PM
Show Time As: Free

Importance: High

Ralph and I know this conflicts with the EPA/FAA biweekly, but it seems to be a time that works for both of us and P&W – stay tuned

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/2/2018 5:48:47 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Call with GE/FAA on SST 3:00PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Tentative

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/1/2018 8:37:47 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: Call w/P&W on SST - tentative

Start: 8/9/2018 6:00:00 PM
End: 8/9/2018 7:00:00 PM
Show Time As: Free

Importance: High

Ralph and I know this conflicts with the EPA/FAA biweekly, but it seems to be a time that works for both of us and P&W – stay tuned

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/1/2018 8:18:31 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Call w/P&W on SST - tentative

Start: 8/9/2018 6:00:00 PM
End: 8/9/2018 7:00:00 PM
Show Time As: Tentative

Ralph and I know this conflicts with the EPA/FAA biweekly, but it seems to be a time that works for both of us and P&W – stay tuned

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/15/2018 10:46:59 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 9/11/2018 1:30:00 PM
End: 9/11/2018 3:30:00 PM
Show Time As: Free

Importance: High

Deliberative Process / Ex. 5

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/15/2018 10:42:50 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/21/2018 1:30:00 PM
End: 8/21/2018 3:30:00 PM
Show Time As: Free

Importance: High

Canceled by Bruce M 8/20/18

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/15/2018 10:37:01 AM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 7/24/2018 1:30:00 PM
End: 7/24/2018 3:30:00 PM
Show Time As: Free

Importance: High

Canceled based on Ricardo Dupont email July 16, 2018 12:42 PM. **Deliberative Process / Ex. 5**

Deliberative Process / Ex. 5

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 9/5/2018 1:34:41 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 9/11/2018 1:30:00 PM
End: 9/11/2018 3:30:00 PM
Show Time As: Free

Importance: High

Deliberative Process / Ex. 5

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 7/19/2018 2:08:11 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 7/24/2018 1:30:00 PM
End: 7/24/2018 3:30:00 PM
Show Time As: Free

Importance: High

Canceled based on Ricardo Dupont email July 16, 2018 12:42 PM.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/11/2018 1:43:49 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Tentative

Discussion with FAA/EPA on P&W studies and perspective on SST.

Please forward as appropriate to other members of your organizations.

Call w/ EPA/FAA on SST
Thursday, August 23, 2018
1:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 2 hrs

Meeting number: Personal Phone / Ex. 6
Personal Phone / Ex. 6

When it's time, join the meeting.

Join from a video system or application
Dial **Personal Phone / Ex. 6**

When dialing into AT&T before joining WebEx, link your integrated audio by dialing #91, followed by your Attendee ID, then #

Join by phone

Call-in toll-free number (ATT Audio Conference): Personal Phone / Ex. 6 (US)

Call-in number (ATT Audio Conference): Personal Phone / Ex. 6 (US)

Show global numbers

Access Code: Personal Phone / Ex. 6

Can't join the meeting?

IMPORTANT NOTICE: Please note that this Webex service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session.

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/10/2018 6:23:47 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Tentative

Call-in/webex to be sorted out

Message

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 4/30/2018 3:12:35 PM
To: Ralph.Iovinelli@faa.gov
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov
Subject: RE: Draft nvPM and NOx Paper

Ralph,

Deliberative Process / Ex. 5

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Saturday, April 28, 2018 12:25 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov
Subject: RE: Draft nvPM and NOx Paper

Mike,

Deliberative Process / Ex. 5

Thanks,
Ralph

From: Samulski, Michael [mailto:samulski.michael@epa.gov]
Sent: Friday, April 27, 2018 4:07 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>
Subject: FW: Draft nvPM and NOx Paper

Ralph,

Deliberative Process / Ex. 5

Good luck and happy trails,

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Samulski, Michael
Sent: Friday, April 27, 2018 11:54 AM
To: ralph.iovinelli@faa.gov
Cc: Manning, Bryan <manning.bryan@epa.gov>; Cullen Leggett (leggett.cullen@epa.gov) <leggett.cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>
Subject: Draft nvPM and NOx Paper

Ralph,

Deliberative Process / Ex. 5

Mike

****

Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov

****

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/5/2018 11:20:53 AM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: Summary of SG WG3 day
Attachments: SG 2018 Singapore meeting notes.docx

Attached are my notes thus far. Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 4/12/2018 4:39:29 PM
To: erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: ESSTsg 17 April Telecon
Attachments: CAEPSG.20183.WP.0xx.5.en [WG3 Supersonic CO2 Standard Efforts Update] Draft 20180412.docx; CAEPSG.20183.WP.0xx.5.en [WG3 Supersonic Engine Emissions Updates] Draft 20180412.docx; CAEPSG.20183.WP0xx.5.en [WG3 Supersonic Engine Emissions Update] Draft 20180412 Attachment A.xlsx; ESSTsg 20180327 Telecon Minutes.docx

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

TELECON/WEBEX:
USA Toll-Free
International:
Access code:
Webex access:
(meeting number = telephone number, passcode = code)

Personal Phone / Ex. 6

Laszlo Windhoffer
László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Deliberative Process / Ex. 5

Thank you

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 4/30/2018 2:09:11 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
CC: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: RE: FAA SST paper at WG3

Deliberative Process / Ex. 5

From: Manning, Bryan
Sent: Monday, April 30, 2018 3:07 PM
To: Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Cc: Samulski, Michael <samulski.michael@epa.gov>
Subject: FAA SST paper at WG3

Hi John,

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 4/23/2018 8:41:45 PM
To: erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: ESSTsg Submissions for WG3-09 (Derby, UK)
Attachments: CAEP11-WG3-09_CTG-09_WP10 [Update on Progress to a Supersonic Emissions Standard].pdf; CAEP11-WG3-09_CTG-09_IP05 [FAA Views re SST Engine Certification].pdf; CAEP11-WG3-09_CTG-09_WP08 [Progress of WG3 Consideration of a Supersonic CO2 Standard for SG2018-3].pdf; CAEP11-WG3-09_CTG-09_WP09 [Update of WG3 Supersonic Engine Emissions Efforts for SG2018-3] APPENDIX A.pdf; CAEP11-WG3-09_CTG-09_WP09 [Update of WG3 Supersonic Engine Emissions Efforts for SG2018-3].pdf

Deliberative Process / Ex. 5

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Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 2/27/2018 1:51:16 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-8 Sao Jose Dos Campos, Brazil, February 26, 2018

Deliberative Process / Ex. 5

Bruce Maeroff

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Message

From: Herms Erika [erika.herms@easa.europa.eu]
Sent: 3/15/2018 5:52:25 PM
To: Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem [willem.franken@easa.europa.eu]; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; Hoermann Werner [werner.hoermann@easa.europa.eu]; Readman Guy [guy.readman@easa.europa.eu]; SAVVIDIS Charalambos [charalambos.savvidis@easa.europa.eu]; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: RE: ESSTsg Schedule & Actions
Attachments: CTG-8-WG10 extract - Appendix A.DOCX

Deliberative Process / Ex. 5

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: 12 March 2018 21:44
To: jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Herms Erika <erika.herms@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: ESSTsg Schedule & Actions
Importance: High

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

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Message

From: Yen, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=865CA449DD0F405A949A635615E68827-YEN, DAVID]
Sent: 9/21/2018 3:11:06 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: trip report for MDG-FESG08
Attachments: Trip report for MDG-FESG08 at Montreal_Sep2018.docx; MDG-FESG notes.docx; WP05_CAEP11_FESG-MDG08_Draft CAEP11 briefing_2018-09-20_rev.pdf

Hello team,

Attached are a one-page trip report and my meeting notes for your review.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,
David

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 2/27/2018 11:03:15 AM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: FW: ANNOUNCEMENT --- 2018 ANNUAL AVIATION EMISSION CHARACTERIZATION (AEC) RESEARCH ROADMAP MEETING
Attachments: bjm022718_2017_aec_roadmap_agenda.pdf

Please let me know of you are interested in me reserving a room and setting up a call in line for this meeting? It is May 22, 23, and 24, 2018.

I have attached the 2017 Agenda to give you an idea of the subjects. The 2018 agenda is not out yet.

Thank You,

Bruce Maeroff
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From: Richard C. Miake-Lye [mailto:rick@aerodyne.com]
Sent: Tuesday, February 27, 2018 5:01 AM
To: jeetendra.upadhyay@faa.gov
Cc: Kim, Brian PW <Brian.Kim@pw.utc.com>; Bruce E. Anderson <bruce.e.anderson@nasa.gov>; nicole.didyk-wells@faa.gov; Warren Gillette <warren.gillette@faa.gov>; Rangasayi Halthore <Rangasayi.Halthore@faa.gov>; James

Hileman <James.Hileman@faa.gov>; Ralph Iovinelli <Ralph.Iovinelli@faa.gov>; jennifer klettlinger <j.klettlinger@nasa.gov>; S. Daniel Jacob <Daniel.Jacob@faa.gov>; PehrsonJR@cdmsmith.com; jonathan.a.seidel@nasa.gov; Zelina, Joseph (GE Aviation, US <Joseph.Zelina@ge.com>; krussell@dfwairport.com; maryalice.locke@faa.gov Locke/AWA/FAA <maryalice.locke@faa.gov>; Mohammed.Majeed@faa.gov; Mike Kenney <MKenney@KBEnv.com>; George Noel <George.Noel@dot.gov>; Philip D. Whitefield <pwhite@mst.edu>; RFREEMAN@lawa.org; Rudolph.Dudebout@Honeywell.com; Randy Vander Wal <ruv12@psu.edu>; Sandy Webb <Sandy@EnvironmentalAssistant.com>; sarav@email.unc.edu; sbarrett@MIT.EDU; speth@MIT.EDU; Steven L. 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Subject: Re: ANNOUNCEMENT --- 2018 ANNUAL AVIATION EMISSION CHARACTERIZATION (AEC) RESEARCH ROADMAP MEETING

Richard C. Miake-Lye
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On Feb 26, 2018, at 3:15 PM, <jeetendra.upadhyay@faa.gov> <jeetendra.upadhyay@faa.gov> wrote:

2018 Annual Aviation Emission Characterization (AEC) Research Roadmap Meeting Announcement

Federal Aviation Administration (FAA) is pleased to announce the **2018 Annual Aviation Emission Characterization (AEC) Research Roadmap Meeting** which will be held on **May 22–24, 2018**, at the **National Academy of Sciences, 2101 Constitution Avenue, NW, in Washington, D.C.** The meeting is open to the government representatives, academicians, consultants, industries, and other stakeholders who are actively involved in research and policy making related to aviation emissions and their impact on health and environment.

The Aviation Emission Characterization (AEC) Roadmap is a collaboration of parties interested in aviation emissions characterization research and development and regulatory activities of government, industry, academia, and the public with a particular focus on aviation-related emissions. The meeting program will cover modeling, measurements, technologies and other regulatory aspects addressing topics of interest to policy makers, airport practitioners, researchers, and representatives of government, industry, and academic institutions.

Registration Information:
To register to the conference, please send us the following details:

1. Your name
2. Affiliation to the organization
3. Email and phone

Registration is free!

Audience can join the meeting by telephone too. Emission Division/FAA will provide more information on Telcon Line at later date. Please feel free to pass on our conference information to your colleagues, friends, other aviation, environmental-related professionals, and enthusiasts who might be interested in participating in the annual meeting.

For more information on the meeting, please check the website below:

Personal Address / Ex. 6

Please save the above meeting dates on your calendar. Feel free to contact me if you have any questions.

We look forward to meeting you in May 2018!

Best Regards,

Jeet (Jeetendra)

Jeetendra (Jeet) Upadhyay, Ph.D.
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Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 4/30/2018 12:26:58 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018 Papers have been added/Updated

The following papers have been added/updated for CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

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Message

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Subject: Re: ESSTsg 27 March Telecon
Attachments: image001.png; image002.jpg

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Bethan Owen <b.owen@mmu.ac.uk>
Date: Tuesday, 27 March 2018 at 20:47
To: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>, "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "charalambos.savvidis@easa.europa.eu" <charalambos.savvidis@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru"

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Subject: Re: ESSTsg 27 March Telecon

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Saturday, 24 March 2018 at 04:45
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "charalambos.savvidis@easa.europa.eu" <charalambos.savvidis@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov"

<samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>
Subject: ESSTsg 27 March Telecon

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

TELECON/WEBEX:
USA Toll-Free
International
Access code:
Webex access:
(meeting number = telephone number, passcode = code)

Personal Phone / Ex. 6

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, March 15, 2018 1:52 PM
To: Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com;

keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; gjannelli.bob@epa.gov; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; leggett.cullen@epa.gov; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Liu, Sandy (FAA) <sandy.liu@faa.gov>; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: RE: ESSTsg Schedule & Actions

Deliberative Process / Ex. 5

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: 12 March 2018 21:44
To: jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Herms Erika <erika.herms@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk;

jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: ESSTsg Schedule & Actions
Importance: High

Deliberative Process / Ex. 5

Lizzie Winklofer
Federal Aviation Administration
Office of Environment & Energy

Deliberative Process / Ex. 5

Message

From: jeetendra.upadhyay@faa.gov [jeetendra.upadhyay@faa.gov]
Sent: 5/21/2018 5:57:36 PM
To: alexis.zubrow@dot.gov [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=41688995dc804d8d8b1e14f2b38253a4-alexis.zubr]; ARichard@haleyaldrich.com; KANG@lawa.org; Anthony.Brown@nrc-cnrc.gc.ca; barbara.m.esker@nasa.gov; Banavar.Sridhar@nasa.gov; Brian.Kim@pw.utc.com; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; bruce.e.anderson@nasa.gov; Cecilia.Shaw@faa.gov; Cunping.Huang@faa.gov; ddelaure@ecn.purdue.edu; Daniel.Jacob@faa.gov; Darcy@rovolus.com; David.Bilcock@tc.gc.ca; david.p.duda@nasa.gov; damiller@edf.org; wuebbles@illinois.edu; epd@atac.com; erika.herms@easa.europa.eu; ew456@drexel.edu; Fabio.Grandi@faa.gov; fayette.s.collier@nasa.gov; francisco.castaneda@us.af.mil; Greg.Smallwood@nrc-cnrc.gc.ca; George Noel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user8081161b]; hp52@gatech.edu; heidmann@nasa.gov; James.Hileman@faa.gov; jeetendra.upadhyay@faa.gov; jennifer klettlinger [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=userc6c558d4]; jim.snoddy@nasa.gov; JNavarrete@nas.edu; PehrsonJR@cdmsmith.com; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; jonathan.a.seidel@nasa.gov; Joseph.Zelina@ge.com; jgodin@KBEnv.com; synyka@gmail.com; kchance@cfa.harvard.edu; klane@bu.edu; krussell@dfwairport.com [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=b0973100e68e48d88637f0b8235049f0-krussell@df]; caylyn.lanzl@navy.mil; Driver, Laurel [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2884c2e8b9a54b20b60143a9ca2c611a-LDRIVER]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mohammed.Majeed@faa.gov; maryalice.locke@faa.gov; Vigilante1@msn.com; Mhuddleston@synterracorp.com; michael.james@blueridgeresearch.com; mkenney@kbenv.com; Nathan.Brown@faa.gov; NWolfe@haleyaldrich.com; n.pavlenko@theicct.org; pwhite@mst.edu; Soucacos_philip@bah.com; Prem.Lobo@nrc-cnrc.gc.ca; Ralph.Iovinelli@faa.gov; ruv12@psu.edu; Rangasayi.Halthore@faa.gov; speth@MIT.EDU; raymond@boomsupersonic.com; rick@aerodyne.com; RFREEMAN@lawa.org; robert.howard.13.ctr@us.af.mil; robbynesta@gmail.com; roger.wayson@aecom.com; ryanhidayat.dgca@gmail.com; saadat.syed@pw.utc.com; sandy@environmentalassistant.com; sarav@email.unc.edu; zap@nau.edu.ua; Scott Herndon [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user39de61fc]; seastham@mit.edu; shobha.kondragunta@noaa.gov; sbarrett@mit.edu; steven.l.baughcum@boeing.com; ted.mcdonald@tc.gc.ca; Theo.Rindlisbacher@bazl.admin.ch; tpohle@airlines.org; Wajid.Chishty@nrc-cnrc.gc.ca; warren.gillette@faa.gov; wendy.bailey@tc.gc.ca; w.roquemore@us.af.mil; william.l.smith@nasa.gov; ahanna@email.unc.edu; Belle_Akshay@bah.com; David.christie@honeywell.com; Ebeony.CTR.Harris@faa.gov; fleo@massport.com; Giles.D.Strickler@faa.gov; K L [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user8190c13c]; mneiderhiser@ramboll.com; mkharkey@wisc.edu; Paul.yankowich@honeywell.com; Sahil.Jain@shell.com; Stacey.Zee@faa.gov
Subject: Welcome to 2018 AEC Research Roadmap Meeting- 22-24 May 2018
Attachments: AEC Annual Agenda-Final.pdf

Greetings,

I have re-attached the **Final 2018 Annual AEC Roadmap Meeting Agenda** for your reference. For speakers and audiences joining remotely, the first page of agenda has all necessary information regarding telcon and web conferencing address to join the meeting.

I have also included the weather information for Washington, DC. The forecast shows a slight chance of thunderstorm on both Tuesday and Wednesday; do not forget your umbrella. Thursday is sunny.
https://www.accuweather.com/en/us/washington-dc/20006/daily-weather-forecast/327659

Let me know if you have any questions.

I look forward to welcoming you tomorrow in DC!

Best Regards,

Jeet

Jeetendra (Jeet) Upadhyay, Ph.D.
Federal Aviation Administration
Office of Environment and Energy
Emissions Division (AEE-300)
800 Independence Ave., SW
Building 10A Room 902
Washington, DC 20591
(p) 202.267.0986
(f) 202.267.5594
(e) jeetendra.Upadhyay@faa.gov

Message

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 4/27/2018 8:07:24 PM
To: ralph.iovinelli@faa.gov
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: FW: Draft nvPM and NOx Paper
Attachments: CAEP11-SG2018-WPxx US Views re SST Engine Certification_v1+epa.docx

Ralph,

Deliberative Process / Ex. 5

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Samulski, Michael
Sent: Friday, April 27, 2018 11:54 AM
To: ralph.iovinelli@faa.gov
Cc: Manning, Bryan <manning.bryan@epa.gov>; Cullen Leggett (leggett.cullen@epa.gov) <leggett.cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>
Subject: Draft nvPM and NOx Paper

Ralph,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

Message

From: Burch, Julia [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=27B0CD43B0404BAB89AEF0C8D08C165F-BURCH, JULIA]
Sent: 5/7/2018 1:55:38 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
CC: Sutton, Tia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=25e87403f63143acbb959446512a372c-Sutton, Tia]
Subject: FW: LRM [CMB-115-159] DUE 05/10 @ 12noon TRANSPORTATION Letter on HR4 FAA Reauthorization Act of 2018
Attachments: 2018-05-03-HR4-S1405-Views Letter-to OMB.DOCX

This is more of an FYI. Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Saltman, Tamara
Sent: Monday, May 7, 2018 9:32 AM
To: Sutton, Tia <sutton.tia@epa.gov>; Burch, Julia <Burch.Julia@epa.gov>
Cc: Krieger, Jackie <Krieger.Jackie@epa.gov>; Clarke, Deirdre <clarke.deirdre@epa.gov>; Hopkins, Daniel <Hopkins.Daniel@epa.gov>; Terry, Sara <Terry.Sara@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Mroz, Jessica <mroz.jessica@epa.gov>
Subject: FW: LRM [CMB-115-159] DUE 05/10 @ 12noon TRANSPORTATION Letter on HR4 FAA Reauthorization Act of 2018

hi all –

Sorry this is a bit late getting to you – we dropped the ball here on Friday – but better late than never.

This is a DOT-drafted SAP on FAA re-authorization. Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Thundiyil, Karen
Sent: Friday, May 04, 2018 12:01 PM
To: Saltman, Tamara <Saltman.Tamara@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Mroz, Jessica <mroz.jessica@epa.gov>
Subject: FW: LRM [CMB-115-159] DUE 05/10 @ 12noon TRANSPORTATION Letter on HR4 FAA Reauthorization Act of 2018

DEADLINE: 12noon Thursday, May 10, 2018

Attached for your review is a draft DOT letter outlining the Administration's views on the House-passed FAA Authorization bill, H.R. 4, and the Senate bill (S. 1405), as ordered reported by committee. Bill texts of both bills are linked below. Please review the 9-page letter and send any comments by the deadline above. Thanks.

House-passed bill: https://www.congress.gov/bill/115th-congress/house-bill/4/text?q=%7B%22search%22%3A%5B%22hr4%22%5D%7D&r=1

Senate Commerce Committee bill and amendments:
https://www.commerce.senate.gov/public/index.cfm/pressreleases?ID=8D616600-D134-4131-B7A7-CD1FC50ADA1C

Message

From: jerome.sarda@aviation-civile.gouv.fr [jerome.sarda@aviation-civile.gouv.fr]
on behalf of Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]
Sent: 2/9/2018 2:09:12 PM
To: Timothy Pohle [tpohle@airlines.org]; Juliana Scavuzzi [jscavuzzi@aci.aero]; Ricardo Dupont [ricardo.dupont@anac.gov.br]; Marcelo Saito [marcelo.saito@anac.gov.br]; Wendy Bailey [wendy.bailey@tc.gc.ca]; David Bilcock [david.bilcock@tc.gc.ca]; Greg Smallwood [greg.smallwood@nrc-cnrc.gc.ca]; Xiaojun Yang [xiaojunyoung@hotmail.com]; Willem Franken [willem.franken@easa.europa.eu]; Steve Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Erika Herms [erika.herms@easa.europa.eu]; Werner Hoermann [werner.hoermann@easa.europa.eu]; Guy Readman [guy.readman@easa.europa.eu]; Charalambos Savvidis [charalambos.savvidis@easa.europa.eu]; Jérôme Sarda [jerome.sarda@aviation-civile.gouv.fr]; Martin Plohr [martin.plohr@dlr.de]; Frank Wetzel [frank.wetzel@uba.de]; David Anvid [david.anvid@delta.com]; David Altherr [daltherr@aerioncorp.com]; Eli Cotti [ecotti@nbaa.org]; Neil Dickson [ndickson@icao.int]; Denise Ahrens [denise.ahrens@rolls-royce.com]; Dan Allyn [daniel.m.allyn@boeing.com]; Andy Berryann [andy@boom.aero]; Arnaud Bonnet [arnaud.bonnet@embraer.com.br]; Robbie Cowart [robbie.cowart@gulfstream.com]; Guillaume Dehestru [guillaume.dehestru@dassault-aviation.com]; William Dolejsi [wcdolejsi@txtav.com]; Rudy Dudebout [rudolph.dudebout@honeywell.com]; Charles Etter [charles.etter@gulfstream.com]; Mike Garrison [mike.garrison@boeing.com]; Darrel Hornbaker [ddhornbaker@txtav.com]; Mark Johnson [mark.johnson3@rolls-royce.com]; Nakahama Keisuke [keisuke_nakahama@mitsubishiaircraft.com]; Brian Kim [brian.kim@pw.utc.com]; David Lye [david.lye@aero.bombardier.com]; Paul Madden [paul.madden@rolls-royce.com]; Jason Matisheck [jrmatisheck@aerioncorp.com]; Kian McCaldon [kian.mccaldon@pwc.ca]; John Morgenstern [john.morgenstern@lmco.com]; Kevin Morris [kevin.morris@adsgroup.org.uk]; Matt Muehlhausen [matthew.r.muehlhausen@boeing.com]; Krisha Nobrega [krisha.nobrega@embraer.com.br]; Thierry Percheron [thierry.percheron@dassault-aviation.com]; Jean-François Perelgritz [jean-francois.perelgritz@airbus.com]; Charles Renard [charles.renard@airbus.com]; Hans Smit [hans.smit@airbus.com]; Simon Smith [simon.smith@rolls-royce.com]; Frédéric Soum [frederic.soum@airbus.com]; Peter Sturdza [sturdza@aerioncorp.com]; Luiz Tobaldini [luiz.tobaldini@embraer.com.br]; Eric Upton [eric.upton@gulfstream.com]; Joseph Zelina [joseph.zelina@ge.com]; Anastasia Kharina [karin@theicct.org]; Paul Peeters [paul.peeters1000@gmail.com]; Artur Mirzoyan [mirzoyan@ciam.ru]; Jauhari Arsad [jauhari_arsad@caas.gov.sg]; Arturo Benito [arturo.benito@upm.es]; Marie Hankanen [marie.hankanen@transportstyrelsen.se]; Theo Rindlisbacher [theo.rindlisbacher@bazl.admin.ch]; Bethan Owen [b.owen@mmu.ac.uk]; Jeff Berton [jeff.berton@nasa.gov]; Clarence Chang [clarence.t.chang@nasa.gov]; Rebecca Cointin [rebecca.cointin@faa.gov]; Nicole Didyk Wells [nicole.didyk-wells@faa.gov]; Jorge Fernandez [jorge.fernandez@faa.gov]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph Iovinelli [ralph.iovinelli@faa.gov]; Daniel Jacob [daniel.jacob@faa.gov]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maryalice Locke [maryalice.locke@faa.gov]; Sandy Liu [sandy.liu@faa.gov]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Rick Miake-Lye [rick@aerodyne.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Jon Seidel [jonathan.a.seidel@nasa.gov]; Laszlo Windhoffer [laszlo.windhoffer@faa.gov]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Yuriy Medvedev [yuriy.medved@gmail.com]; Mahito Moriyama [moriyama-m2ff@mlit.go.jp]; Yoann Méry [yoann.mery@snecma.fr]; Olivier Penanhoat [olivier.penanhoat@snecma.fr]
Subject: CTG Vol.II call - February 13
Attachments: CTG Vol II ahg telecon - Draft Agenda 20180213.doc; CTG Vol II ahg telecon - Draft Minutes 20180123 - Updated 20180208.doc; Annex 16+ETM Vol II maintenance tool v7.2 Updated 20180123.xlsx; A16V2 Exemptions Update.docx; jerome_sarda.vcf

Deliberative Process / Ex. 5

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/20/2018 3:26:10 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: RE: Draft email to Ralph re:SST paper attached

Looks good to me

Best regards,
Cullen Leggett
+1 734-214-4514

From: Mueller, John
Sent: Friday, April 20, 2018 11:17 AM
To: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: Draft email to Ralph re:SST paper attached

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 2/13/2018 8:06:09 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: FW: NAA-Only ESSTsg
Attachments: 20180206 List of Potential SST Emissions Tasks.docx

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From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Thursday, February 08, 2018 3:11 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John <mueller.john@epa.gov>; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: RE: NAA-Only ESSTsg

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

-----Original Appointment-----
From: Windhoffer, Laszlo (FAA)
Sent: Friday, January 26, 2018 4:27 PM
To: Windhoffer, Laszlo (FAA); FOCA - Theo.Rindlisbacher@bazl.admin.ch (Theo.Rindlisbacher@bazl.admin.ch); jerome.sarda@aviation-civile.gouv.fr; Ricardo Antonio Binotto Dupont (ricardo.Dupont@anac.gov.br); Bailey, Wendy; Transport Canada - David Bilcock (david.bilcock@tc.gc.ca); werner.hoermann@easa.europa.eu; Fernandez, Jorge (FAA); Jacob, Daniel (FAA); martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; Netherlands MINIENM - Michael Lunter (michael.lunter@minienm.nl) (michael.lunter@minienm.nl); thobias.log@transportstyrelsen.se; Iovinelli, Ralph (FAA); erika.herms@easa.europa.eu; Liu, Sandy (FAA); Bethan Owen; Cointin, Rebecca (FAA); Hileman, James (FAA); Locke, Maryalice (FAA); Windhoffer, Laszlo (FAA) (Laszlo.Windhoffer@faa.gov); marie.hankanen@transportstyrelsen.se; FRANKEN Willem (willem.franken@easa.europa.eu); Mueller, John (mueller.john@epa.gov); jonathan.gilad@aviation-civile.gouv.fr; University of Civil Aviation China - Yang Xiaojun (xiaojunyoung@hotmail.com); Didyk-Wells, Nicole (FAA); jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; Dickson, Neil
Subject: NAA-Only ESSTsg
When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Deliberative Process / Ex. 5

USA Toll-Free:
International: Personal Phone / Ex. 6
ACCESS CODE:
Webex access:
(telephone number = meeting number and the passcode = code)

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/7/2018 12:56:24 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018 added/updated Papers

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 4/20/2018 3:16:38 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: Draft email to Ralph re:SST paper attached
Attachments: Email to Ralph on SST April 20 2018.docx

Message

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 4/27/2018 3:54:00 PM
To: ralph.iovinelli@faa.gov
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Draft nvPM and NOx Paper
Attachments: SG2018 potential future work items on NOx v8.docx; CAEPSG.20183.WPXX_USViewsNVPM_v3.docx

Ralph,

Deliberative Process / Ex. 5

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/3/2018 1:29:05 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: FW: SBU - SG3 Background eBook and Matrix
Attachments: SG3 Excel Matrix 20180531.xlsx

From: Donald.Scata@faa.gov [mailto:Donald.Scata@faa.gov]
Sent: Sunday, June 03, 2018 8:36 PM
To: Rebecca.Cointin@faa.gov; bonnefoy_philippe@bluesky-d2d.com; Gregg.Fleming@dot.gov; curtis.holsclaw@faa.gov; James.Hileman@faa.gov; Mueller, John <mueller.john@epa.gov>; kevin.welsh@faa.gov; Kevin.Partowazam@faa.gov; PetersStanleyMR@state.gov; Ralph.Iovinelli@faa.gov; vws1@psu.edu; VWSACS@engr.psu.edu; Daniel.Williams@faa.gov
Subject: SBU - SG3 Background eBook and Matrix

Hi Everyone –

Deliberative Process / Ex. 5

Best,

Don

Personal Address / Ex. 6

Donald S. Scata Jr.
Senior International Advisor
Office of Environment & Energy
Federal Aviation Administration
202.267.3281 (w)
202.441.5568 (c)

Appointment

From: Kevin.Partowazam@faa.gov [Kevin.Partowazam@faa.gov]
Sent: 5/7/2018 12:01:21 PM
To: Donald.Scata@faa.gov; kevin.welsh@faa.gov; curtis.holsclaw@faa.gov; Ralph.Iovinelli@faa.gov; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; Daniel.Williams@faa.gov; maryalice.locke@faa.gov; roger.schaufele@faa.gov; Gregg.Fleming@dot.gov; bonnefoy_philippe@bluesky-d2d.com; Andrea.S.Freeburg@faa.gov [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e8f2395e7a484a0fb732cfb418eb094b-Andrea.S.Freeburg@faa.gov]; Daniel.Jacob@faa.gov; Fabio.Grandi@faa.gov; sandy.liu@faa.gov; mehmet.marsan@faa.gov; VWSACS@engr.psu.edu; vws1@psu.edu; PetersStanleyMR@state.gov; CarnahanKC@state.gov; BacherKP@state.gov; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
CC: srliu@hotmail.com

Subject: SG3 U.S. Stakeholders Meeting (USG invite)
Attachments: 20180504_SG3_Stakeholder Prep Meeting Agenda_rev.docx
Location: FAA HQ, 800 Independence Ave., SW, Washington, DC 20591 - Room TBD

Start: 5/7/2018 4:00:00 PM
End: 5/7/2018 6:00:00 PM
Show Time As: Tentative

Recurrence: (none)

5/7/18 Update:
Agenda attached

Original Invite:

Hi All,

Ahead of CAEP Steering Group 3 in June, FAA plans to hold a meeting with U.S. Stakeholders on May 7. FAA will be hosting the meeting in our headquarters building located at 800 Independence Ave., SW, Washington, DC 20591. Those attending in person should plan to arrive at least 15-20 minutes early to allow time to go through security and be escorted to the meeting room. Please plan to call Janeya Julien (202-267-3576) or Fran Akers (202-267-3577) to be taken to the meeting room after completing security. The meeting will start promptly at noon.

Those unable to attend in-person can plan to use the telecon line below:

Chairperson Passcode
Participant Passcode: Personal Phone / Ex. 6

Dial In Access: (USA Only)

Dial In Access: (Direct Dial)

Personal Phone / Ex. 6

Dial In Access (Alternate USA Only)

Dial In Access (Alternative Direct Dial)

Personal Phone / Ex. 6

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/20/2018 3:13:57 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: FAA SST paper

John,

Deliberative Process / Ex. 5

Best regards,

Cullen Leggett

U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) +1 734-214-4514
(fax) +1 734-214-4816
Leggett.Cullen@EPA.gov

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 4/27/2018 2:03:46 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: FW: CAEP/11 WG3-9 - Derby, United Kingdom, 30 April to 4 May 2018 - WG3-9 Plenary Papers...

FYI – I put these on the H drive

From: Dickson, Neil [mailto:NDickson@icao.int]
Sent: Thursday, April 26, 2018 5:35 PM
To: Wolfe, Philip <wolfe.philip@epa.gov>; Log T <thobias.log@transportstyrelsen.se>; Abdain Z <Zainal.abidin@emirates.com>; Abidin Z <Zainal.abidin@emirates.com>; Agarwal A <aa681@mit.edu>; Ahrens D <denise.ahrens@rolls-royce.com>; Allyn D <daniel.m.allyn@boeing.com>; Altherr D <daltherr@aerioncorp.com>; Anvid <david.anvid@delta.com>; Archilla V <archillapv@inta.es>; Arrowsmith <stephen.arrowsmith@easa.europa.eu>; Arsad J <Jauhari_ARSAD@caas.gov.sg>; Bailey <wendy.bailey@tc.gc.ca>; Balasubramanian S <Sathya.Balasubramanian.CTR@dot.gov>; Baughcum S <steven.l.baughcum@boeing.com>; Beauregard M <MBeauregard@AIAC.ca>; Benito <arturo.benito@upm.es>; Berryann A <andy@boom.aero>; Berton J <Jeff.Berton@nasa.gov>; Bilcock D <david.bilcock@tc.gc.ca>; Boichenko <chemmotology@ukr.net>; Bonnefoy <bonnefoy_philippe@bluesky-d2d.com>; Bonnet A <arnaud.bonnet@embraer.com.br>; Box L <laurent.box@eurocontrol.int>; Carmody C <colleen.carmody@tc.gc.ca>; Carnelly <daniel.carnelly@airbus.com>; Chang C <clarence.t.chang@nasa.gov>; Christie S <s.christie@mmu.ac.uk>; Cointin R <rebecca.cointin@faa.gov>; Collin D <dominique.collin@snecma.fr>; Cooreman B <barbara.cooreman@asd-europe.org>; Cornier <isabelle.cornier@adp.fr>; Cotti <Ecotti@NBAA.org>; Cousineau Y <yves.cousineau@tc.gc.ca>; Crayford A <crayfordap1@cardiff.ac.uk>; De Lepinay I <ivan.de-lepinay@easa.europa.eu>; Dehestru G <guillaume.dehestru@dassault-aviation.com>; Deniskov V <V.Deniskov@antonov.kiev.ua>; Denk K <keremdenk@gmail.com>; Didyk N <nicole.didyk@faa.gov>; Dolejsi W <WCDolejsi@cessna.textron.com>; Dourado E <eli@boomsupersonic.com>; Jim Dow <Jdow@iccaia.org>; Dudebout <rudolph.dudebout@honeywell.com>; Dupont R <ricardo.dupont@anac.gov.br>; Etter <charles.etter@gulfstream.com>; Eyers <chris@limitedskies.com>; Fajari A <ajaria96@yahoo.co.id>; Ferdian Hussein B <baronferdianhussein@airasia.com>; Fleming G <Gregg.Fleming@dot.gov>; Fleuti <emanuel.fleuti@zurich-airport.com>; Franken <willem.franken@easa.europa.eu>; Frenandez J <jorge.fernandez@faa.gov>; Fudge, Ted <Ted.Fudge@CANSO.org>; Fujiwara <fuji@chofu.jaxa.jp>; Galotti, Vincent <Vgalotti.iccaia@gmail.com>; Garrison M <Mike.garrison@boeing.com>; Gerring, Holly <gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Gillette <warren.gillette@faa.gov>; Gowen H <hayley.gowen@bis.gsi.gov.uk>; Grandi F <fabio.grandi@faa.gov>; Hankanen M <marie.hankanen@transportstyrelsen.se>; Hemmings <bill.hemmings@transportenvironment.org>; Herms <Erika.herms@easa.europa.eu>; Hileman J <James.Hileman@faa.gov>; Hinderberger M <mhinderberger@aerioncorp.com>; Hoermann <werner.hoermann@easa.europa.eu>; Hoke J <james.hoke@pw.utc.com>; Holsclaw C <curtis.holsclaw@faa.gov>; Horie N <naohiro_horie@mhiahq.com>; Iglesias A <aiglesias@mfom.es>; Iovinelli <Ralph.Iovinelli@faa.gov>; Jacob D <daniel.jacob@faa.gov>; Janicke U <uj@janicke.de>; Johnson M <mark.johnson3@rolls-royce.com>; Jung J <jjung@aci.aero>; Kartika D <kartikadinakartika@gmail.com>; Kenney M <mkenney@kbenv.com>; Kharina A <karin@theicct.org>; Kim B <Brian.Kim@pw.utc.com>; Kittery J <jean-luc.kittery@aviation-civile.gouv.fr>; Kozel <progress@ivchenko-progress.com>; Kramer S <stephen.kramer@pw.utc.com>; Kusukame Y <takuya_kusukame@mitsubishiaircraft.com>; Lee <d.s.lee@mmu.ac.uk>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lim L <L.Lim@mmu.ac.uk>; Lindsey, Leah <lindsey.leah@epa.gov>; Lobo P <Prem.Lobo@nrc-cnrc.gc.ca>; Locke M <maryalice.locke@faa.gov>; Locke M <maryalice.locke@faa.gov>; Lunter <michael.lunter@minienm.nl>; Lye <david.lye@aero.bombardier.com>; Madden <paul.madden@rolls-royce.com>;

Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Majjigi R <muni.majjigi@ge.com>; Manning, Bryan <manning.bryan@epa.gov>; Marks <julie.marks@faa.gov>; Matischeck J <jrmatisheck@aerioncorp.com>; Maurice L <lourdes@boomsupersonic.com>; McCaldon <kian.mccaldon@pwc.ca>; McConnachie D <McConnachie_Dominic@bah.com>; McKinney <randal.mckinney@pw.utc.com>; Medvedev Y <yuriy.medved@gmail.com>; Mery Y <yoann.mery@snecma.fr>; Miake-Lye <rick@aerodyne.com>; Middel J <jan.middel@nlr.nl>; Mirzoyan A <mirzoyan@ciam.ru>; Morgenstern J <john.morgenstern@lmco.com>; Moriyama M <moriyama-m2ff@mlit.go.jp>; Morris <kevin.morris@adsgroup.org.uk>; Muehlhausen M <matthew.r.muehlhausen@boeing.com>; Mueller, John <mueller.john@epa.gov>; Nobrega K <krisha.nobrega@embraer.com.br>; Oshimizu M <masaya_oshimizu@mitsubishiaircraft.com>; Owen <b.owen@mmu.ac.uk>; Pagliarello M <MPagliarello@aci-na.org>; Patserin <03503@ivchenko-progress.com>; Peeters P <paul.peeters1000@gmail.com>; Penanhoat <olivier.penanhoat@snecma.fr>; Percheron T <Thierry.Percheron@dassault-aviation.com>; Perelgritz J <jean-francois.perelgritz@airbus.com>; Peter <Peter.Zimm@icfi.com>; Plohr <Martin.Plohr@dlr.de>; Pohle T <tpohle@airlines.org>; Renard C <charles.renard@airbus.com>; Riegle <leslie.riegle@aia-aerospace.org>; Rindlisbacher <Theo.Rindlisbacher@bazl.admin.ch>; Roeler T <tim.roesler@liberty.rolls-royce.com>; Roetger <RoetgerT@iata.org>; Russell R <raymond@boom.aero>; Rutherford <Dan@theicct.org>; Sabnis J <sabnis@mit.edu>; Sagues C <CAMILLE.SAGUES@airbus.com>; Saito <Marcelo.saito@anac.gov.br>; Samulski, Michael <samulski.michael@epa.gov>; Sarda J <jerome.sarda@aviation-civile.gouv.fr>; Savvidis C <charalambos.savvidis@easa.europa.eu>; Scata D <donald.scata@faa.gov>; Scavuzzi J <jscavuzzi@aci.aero>; Schaefer M <martin.schaefer@bmvi.bund.de>; Schaufele R <roger.schaufele@faa.gov>; Seeberg I <inger.seeberg@cph.dk>; Seeliger K <katharina.seeliger@airbus.com>; Seidel J <jonathan.a.seidel@nasa.gov>; Sipatov <sipatov@avid.ru>; Skillen G <gskillen7@gmail.com>; Smallwood G <Greg.Smallwood@nrc-cnrc.gc.ca>; Smit H <hans.smit@airbus.com>; Smith <simon.smith@rolls-royce.com>; Soum F <frederic.soum@airbus.com>; Sow D <cheikhdjiby.sow@snecma.fr>; Sparrow V <vws1@psu.edu>; Speth R <speth@mit.edu>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Stimson <dkstimson@hotmail.com>; Sturdza P <sturdza@aerioncorp.com>; Takahashi H <h-hashimoto@aeif.or.jp>; Tobaldini L <luiz.tobaldini@embraer.com.br>; Upton E <Eric.Upton@gulfstream.com>; Vanek A <Adrienne.Vanek@faa.gov>; Volkov <Volkov@ciam.ru>; Wetzel <Frank.Wetzel@uba.de>; Willford N <NWillford@txtav.com>; Williams P <paul.i.williams@manchester.ac.uk>; Windhoffer <laszlo.windhoffer@faa.gov>; Yang X <xiaojunyoung@hotmail.com>; Yasar G <gursu.tasar@tai.com.tr>; Yen, David <Yen.David@epa.gov>; Yen, David <Yen.David@epa.gov>; Zelina J <joseph.zelina@ge.com>; nagayoshi_hiromitsu@ihi.co.jp; Hillary.Huttenhower@pw.utc.com
Cc: Bettega Michielin, Monique <MMichielin@icao.int>
Subject: RE: CAEP/11 WG3-9 - Derby, United Kingdom, 30 April to 4 May 2018 - WG3-9 Plenary Papers...

Deliberative Process / Ex. 5

From: Dickson, Neil
Sent: 4-Apr-18 7:52 PM
To: 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berryann A'; 'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carmody C'; 'Carnelly'; 'Chang C'; 'Christie S'; 'Cointin R'; 'Collin D'; 'Cooreman B'; 'Cornier'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Didyk N'; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame Y'; 'Lee'; 'Leggett'; 'Lim L'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Owen'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Sagues C'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'; 'nagayoshi_hiromitsu@ihi.co.jp'
Cc: Bettega Michielin, Monique
Subject: CAEP/11 WG3-9 - Derby, United Kingdom, 30 April to 4 May 2018

Deliberative Process / Ex. 5

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Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 4/6/2018 7:26:17 PM
To: erika.herms@easa.europa.eu; Eric.Upton@gulfstream.com; Paul.Madden@Rolls-Royce.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; OA.Closed.OA.Closed.charalambos.savvidis@easa.local; charles.renard@airbus.com; clarence.t.chang@nasa.gov; robbie.cowart@gulfstream.com; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; Denise.Ahrens@Rolls-Royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; charles.etter@gulfstream.com; frank.wetzel@uba.de; frederic.soum@airbus.com; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; guy.readman@easa.europa.eu; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; Mark.Johnson3@Rolls-Royce.com; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; sandy.liu@faa.gov; Simon.Smith@Rolls-Royce.com; Stephen.Arrowsmith@easa.europa.eu; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; xiaojunyoung@hotmail.com; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yoann.mery@snecma.fr; yuriy.medved@gmail.com
CC: twouptons@mac.com
Subject: RE: Reminder of comment deadline tomorrow for ESSTsg papers

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Friday, April 06, 2018 10:53 AM
To: Upton, Eric <Eric.Upton@gulfstream.com>; Madden, Paul C <Paul.Madden@Rolls-Royce.com>; andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; SAVVIDIS Charalambos <OA.Closed.OA.Closed.charalambos.savvidis@easa.local>; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie <robbie.cowart@gulfstream.com>; daltherr@aerioncorp.com; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; ecotti@nbaa.org; eli@boomsupersonic.com; Etter, Charles <charles.etter@gulfstream.com>; frank.wetzel@uba.de; frederic.soum@airbus.com; giannelli.bob@epa.gov; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; Readman Guy <guy.readman@easa.europa.eu>; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; leggett.cullen@epa.gov; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; manning.bryan@epa.gov; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; martin.plohr@dlr.de; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.peeters1000@gmail.com; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; raymond@boomsupersonic.com; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; samulski.michael@epa.gov; Liu, Sandy (FAA) <sandy.liu@faa.gov>; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; Hoermann Werner <werner.hoermann@easa.europa.eu>; FRANKEN Willem <willem.franken@easa.europa.eu>; wolfe.philip@epa.gov; xiaojunyoung@hotmail.com; yen.david@epa.gov; yoann.mery@snecma.fr; yuriy.medved@gmail.com

Cc: Eric Upton <twouptons@mac.com>
Subject: RE: Reminder of comment deadline tomorrow for ESSTsg papers

Deliberative Process / Ex. 5

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Sent: 06 April 2018 13:08
To: Madden, Paul C <Paul.Madden@Rolls-Royce.com>; andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; SAVVIDIS Charalambos <OA.Closed.OA.Closed.charalambos.savvidis@easa.local>; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie <robbie.cowart@gulfstream.com>; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; ecotti@nbaa.org; eli@boomsupersonic.com; Herms Erika <erika.herms@easa.europa.eu>; Etter, Charles <charles.etter@gulfstream.com>; frank.wetzel@uba.de; frederic.soum@airbus.com; giannelli.bob@epa.gov; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; Readman Guy <guy.readman@easa.europa.eu>; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Laszlo.Windhoffer@faa.gov; leggett.cullen@epa.gov; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; manning.bryan@epa.gov; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.peeters1000@gmail.com; Ralph.lovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; samulski.michael@epa.gov; sandy.liu@faa.gov; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org;

wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; Hoermann Werner <werner.hoermann@easa.europa.eu>; FRANKEN Willem <willem.franken@easa.europa.eu>; wolfe.philip@epa.gov; xiaojunyoung@hotmail.com; yen.david@epa.gov; yoann.mery@snecma.fr; yuriy.medved@gmail.com
Cc: Eric Upton <twouptons@mac.com>
Subject: RE: Reminder of comment deadline tomorrow for ESSTsg papers

Deliberative Process / Ex. 5

From: Madden, Paul C [mailto:Paul.Madden@Rolls-Royce.com]
Sent: Thursday, April 05, 2018 6:10 PM
To: Upton, Eric <Eric.Upton@gulfstream.com>; andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; charalambos.savvidis@easa.europa.eu; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie <robbie.cowart@gulfstream.com>; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; ecotti@nbaa.org; eli@boomsupersonic.com; erika.herms@easa.europa.eu; Etter, Charles <charles.etter@gulfstream.com>; frank.wetzel@uba.de; frederic.soum@airbus.com; giannelli.bob@epa.gov; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; guy.readman@easa.europa.eu; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Laszlo.Windhoffer@faa.gov; leggett.cullen@epa.gov; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; manning.bryan@epa.gov; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; samulski.michael@epa.gov; sandy.liu@faa.gov; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; Stephen.Arrowsmith@easa.europa.eu; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; wolfe.philip@epa.gov; xiaojunyoung@hotmail.com; yen.david@epa.gov; yoann.mery@snecma.fr; yuriy.medved@gmail.com

Cc: Eric Upton <twouptons@mac.com>
Subject: RE: Reminder of comment deadline tomorrow for ESSTsg papers

Deliberative Process / Ex. 5

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 5/4/2018 2:40:18 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
CC: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: final update attached
Attachments: CAEP11 WG3-9 highlights.docx

Message

From: Ralph.Iovinelli@faa.gov [Ralph.Iovinelli@faa.gov]
Sent: 4/20/2018 1:18:25 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov
Subject: draft FAA paper re SST cert
Attachments: CAEP11-WG3-CTG9-IPxx FAA Views re SST Engine Certification_v4.docx

Cullen, John, Bryan,
Per our discussion yesterday, attached is a draft IP for WG3/CTG re SST certification. Your feedback is welcomed, Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,
Ralph

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 3/12/2018 8:43:45 PM
To: jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; stephen.arrowsmith@easa.europa.eu; erika.herms@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; charalambos.savvidis@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: ESSTsg Schedule & Actions
Attachments: CAEP11_WG3-08_CTG-08_WP10 ESSTsg Update 20180221 rev1.pdf; CAEP11_WG3_8_FL06 Possible Recommendation for Chapter 3 on Supersonic Emissions Standards revised_02032018.pdf

Importance: High

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/4/2018 10:38:09 AM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018 Papers have been added/updated on the H: Drive

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
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2000 Traverwood Drive
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Message

From: Upton, Eric [Eric.Upton@gulfstream.com]
Sent: 4/20/2018 12:07:32 PM
To: Madden, Paul C [Paul.Madden@Rolls-Royce.com]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Herms Erika [erika.herms@easa.europa.eu]; Bethan Owen [B.Owen@mmu.ac.uk]; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem [willem.franken@easa.europa.eu]; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; Hoermann Werner [werner.hoermann@easa.europa.eu]; Readman Guy [guy.readman@easa.europa.eu]; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise [Denise.Ahrens@Rolls-Royce.com]; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; Cowart, Robbie [robbie.cowart@gulfstream.com]; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; Etter, Charles [charles.etter@gulfstream.com]; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P [Mark.Johnson3@Rolls-Royce.com]; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A [Simon.Smith@Rolls-Royce.com]; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Madden, Paul C [mailto:Paul.Madden@Rolls-Royce.com]
Sent: Friday, April 20, 2018 7:57 AM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Herms Erika <erika.herms@easa.europa.eu>; Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; Cowart, Robbie <robbie.cowart@gulfstream.com>; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; Etter, Charles <charles.etter@gulfstream.com>; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; Upton, Eric <Eric.Upton@gulfstream.com>; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Upton, Eric <Eric.Upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: 19 April 2018 18:44
To: Herms Erika <erika.herms@easa.europa.eu>; Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; Madden, Paul C <Paul.Madden@Rolls-Royce.com>; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk;

matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, April 19, 2018 9:07 AM
To: Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com;

mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.lovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen <Leggett.Cullen@epa.gov>; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 19 April 2018 13:54
To: Laszlo.Windhoffer@faa.gov; Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.lovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-

m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: Re: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Wednesday, 18 April 2018 at 16:36
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock

<david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov" <samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>, "Eric.Upton@gulfstream.com" <eric.upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: *Windhoffer, Laszlo (FAA)*
Sent: *Thursday, April 12, 2018 12:39 PM*
Subject: *ESSTsg 17 April Telecon*

Deliberative Process / Ex. 5

TELECON/WEBEX:
USA Toll-Free
International:
Access code:
Webex access:
(meeting number = telephone number, passcode = code)

Personal Phone / Ex. 6

Laszlo Windhoffer

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Deliberative Process / Ex. 5

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 9/19/2018 7:38:40 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-10 Montreal, Canada, September 24, 2018

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

Message

From: Madden, Paul C [Paul.Madden@Rolls-Royce.com]
Sent: 4/20/2018 11:57:22 AM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Herms Erika [erika.herms@easa.europa.eu]; Bethan Owen [B.Owen@mmu.ac.uk]; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem [willem.franken@easa.europa.eu]; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; Hoermann Werner [werner.hoermann@easa.europa.eu]; Readman Guy [guy.readman@easa.europa.eu]; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise [Denise.Ahrens@Rolls-Royce.com]; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P [Mark.Johnson3@Rolls-Royce.com]; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A [Simon.Smith@Rolls-Royce.com]; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com [eric.upton@gulfstream.com]
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: 19 April 2018 18:44
To: Herms Erika <erika.herms@easa.europa.eu>; Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen

<Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; Johnson, Mark P <Mark.Johnson3@Rolls-Royce.com>; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; Madden, Paul C <Paul.Madden@Rolls-Royce.com>; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; Smith, Simon A <Simon.Smith@Rolls-Royce.com>; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, April 19, 2018 9:07 AM
To: Bethan Owen <B.Owen@mmu.ac.uk>; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br;

robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob <Giannelli.Bob@epa.gov>; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen <Leggett.Cullen@epa.gov>; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; rick@aerodyne.com; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; jonathan.a.seidel@nasa.gov; Wolfe, Philip <wolfe.philip@epa.gov>; Yen, David <Yen.David@epa.gov>; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 19 April 2018 13:54
To: Laszlo.Windhoffer@faa.gov; Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com;

jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: Re: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Wednesday, 18 April 2018 at 16:36
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov"

<samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>, "Eric.Upton@gulfstream.com" <eric.upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Deliberative Process / Ex. 5

From: *Windhoffer, Laszlo (FAA)*
Sent: *Tuesday, April 17, 2018 9:17 AM*
Subject: *RE: ESSTsg 17 April Telecon*

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Eric and Laszlo

TELECON/WEBEX:
USA Toll-Free
International:
Access code:
Webex access:
(meeting number = telephone number, passcode = code)

Personal Phone / Ex. 6

László Windhoffer
Laszlo Windhoffer
Federal Aviation Administration
T. +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Message

From: Kim, Brian PW [Brian.Kim@pw.utc.com]
Sent: 5/3/2018 11:31:13 PM
To: Ralph.Iovinelli@faa.gov; B.Owen@mmu.ac.uk
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Subject: RE: [T] WG3 draft SG2018 Papers

Ralph, Bethan,

Deliberative Process / Ex. 5

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Subject: [External] RE: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Thanks,
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Subject: RE: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Best Regards,
Bethan and Ralph

From: Iovinelli, Ralph (FAA)
Sent: Wednesday, May 02, 2018 11:01 AM
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Subject: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Best Regards,

Message

From: Dickson, Neil [NDickson@icao.int]
Sent: 3/9/2018 2:47:18 PM
To: Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Log T [thobias.log@transportstyrelsen.se]; Abdain Z [Zainal.abidin@emirates.com]; Abidin Z [Zainal.abidin@emirates.com]; Agarwal A [aa681@mit.edu]; Ahrens D [denise.ahrens@rolls-royce.com]; Allyn D [daniel.m.allyn@boeing.com]; Altherr D [daltherr@aerioncorp.com]; Anvid [david.anvid@delta.com]; Archilla V [archillapv@inta.es]; Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Arsad J [Jauhari_ARSAD@caas.gov.sg]; Bailey [wendy.bailey@tc.gc.ca]; Balasubramanian S [Sathya.Balasubramanian.CTR@dot.gov]; Baughcum S [steven.l.baughcum@boeing.com]; Beauregard M [MBeauregard@AIAC.ca]; Benito [arturo.benito@upm.es]; Berryann A [andy@boom.aero]; Berton J [Jeff.Berton@nasa.gov]; Bilcock D [david.bilcock@tc.gc.ca]; Boichenko [chemmotology@ukr.net]; Bonnefoy [bonnefoy_philippe@bluesky-d2d.com]; Bonnet A [arnaud.bonnet@embraer.com.br]; Box L [laurent.box@eurocontrol.int]; Carmody C [colleen.carmody@tc.gc.ca]; 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Subject: WG3 Conference call schedule

Attachments: CAEP11_WG3_ad hoc group telecon schedule_180309.xlsx

Dear WG3,

Deliberative Process / Ex. 5

Neil

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Consider the environment before printing this e-mail

Message

From: Madden, Paul C [Paul.Madden@Rolls-Royce.com]
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Subject: RE: Draft CTG report to SG2018 (FLXXX)

Deliberative Process / Ex. 5

Should the very last bit in the Appendix be grey?

Cheers, Paul

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Subject: Draft CTG report to SG2018 (FLXXX)

Dear WG3,

Deliberative Process / Ex. 5

Thanks.
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Subject: RE: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Thanks,
Bethan and Ralph

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Subject: RE: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Please have all comments to WG co-Rapps by end of meeting tomorrow (Thursday).

Best Regards,
Bethan and Ralph

From: Iovinelli, Ralph (FAA)
Sent: Wednesday, May 02, 2018 11:01 AM
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Subject: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Please have all comments to PMTG co-leads by end of meeting tomorrow (Thursday).

Best Regards,
Bethan and Ralph

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Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 5/3/2018 4:30:29 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
CC: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: Today's update
Attachments: CAEP11 WG3-9 highlights.docx

We'll be going through all of the papers to SG tomorrow in a pretty thorough fashion. **Deliberative Process / Ex. 5**

Deliberative Process / Ex. 5

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/3/2018 10:33:16 AM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018 WG3 Plenary added papers
Attachments: CAEP11-WG3-09_FL07 [CTG report to SG20183].docx; CAEP11_WG3_WorkProgramme_2018May03.xlsx

The following 2 papers has been added for CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018 at: H:/ASD/Aircraft-Documents/CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018

Deliberative Process / Ex. 5

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Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 5/3/2018 9:23:57 AM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
CC: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: Yesterday's update
Attachments: CAEP11 WG3-9 highlights.docx

It occurred to me that we got kicked out of the room so quick yesterday I forgot to send this along.

Message

From: Ralph.Iovinelli@faa.gov [Ralph.Iovinelli@faa.gov]
Sent: 5/3/2018 8:22:48 AM
To: erika.herms@easa.europa.eu; NDickson@icao.int; B.Owen@mmu.ac.uk; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; thobias.log@transportstyrelsen.se; Zainal.abidin@emirates.com; Zainal.abidin@emirates.com; aa681@mit.edu; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; daltherr@aerioncorp.com; david.anvid@delta.com; archillapv@inta.es; Stephen.Arrowsmith@easa.europa.eu; Jauhari_ARSAD@caas.gov.sg; wendy.bailey@tc.gc.ca; S.Balasubramania.CTR@dot.gov; steven.l.baughcum@boeing.com; MBeauregard@AIAC.ca; arturo.benito@upm.es; andy@boom.aero; Jeff.Berton@nasa.gov; david.bilcock@tc.gc.ca; chemmotology@ukr.net; bonnefoy_philippe@bluesky-d2d.com; arnaud.bonnet@embraer.com.br; laurent.box@eurocontrol.int; colleen.carmody@tc.gc.ca; daniel.carnelly@airbus.com; clarence.t.chang@nasa.gov; S.Christie@mmu.ac.uk; Rebecca.Cointin@faa.gov; dominique.collin@snecma.fr; barbara.cooreman@asd-europe.org; isabelle.cornier@adp.fr; ecotti@nbaa.org; yves.cousineau@tc.gc.ca; crayfordap1@cardiff.ac.uk; ivan.de-lepinay@easa.europa.eu; guillaume.dehestru@dassault-aviation.com; V.Deniskov@antonov.kiev.ua; keremdenk@gmail.com; WCDolejsi@cessna.textron.com; eli@boomsupersonic.com; Jdow@iccaia.org; rudolph.dudebout@honeywell.com; ricardo.dupont@anac.gov.br; charles.etter@gulfstream.com; chris@limitedskies.com; ajaria96@yahoo.co.id; baronferdianhussein@airasia.com; Gregg.Fleming@dot.gov; emanuel.fleuti@zurich-airport.com; willem.franken@easa.europa.eu; jorge.fernandez@faa.gov; Ted.Fudge@CANSO.org; fuji@chofu.jaxa.jp; Vgalotti.iccaia@gmail.com; Mike.garrison@boeing.com; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; warren.gillette@faa.gov; hayley.gowen@bis.gsi.gov.uk; Fabio.Grandi@faa.gov; marie.hankanen@transportstyrelsen.se; bill.hemmings@transportenvironment.org; James.Hileman@faa.gov; mhinderberger@aerioncorp.com; werner.hoermann@easa.europa.eu; james.hoke@pw.utc.com; curtis.holsclaw@faa.gov; naohiro_horie@mhiahq.com; aiglesias@mfom.es; Daniel.Jacob@faa.gov; uj@janicke.de; mark.johnson3@rolls-royce.com; jjung@aci.aero; kartikadinakartika@gmail.com; mkenney@kbenv.com; karin@theicct.org; Brian.Kim@pw.utc.com; jean-luc.kittery@aviation-civile.gouv.fr; progress@ivchenko-progress.com; stephen.kramer@pw.utc.com; takuya_kusukame@mitsubishiaircraft.com; D.S.Lee@mmu.ac.uk; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; L.Lim@mmu.ac.uk; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Prem.Lobo@nrc-cnrc.gc.ca; maryalice.locke@faa.gov; maryalice.locke@faa.gov; michael.lunter@minienm.nl; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; muni.majjigi@ge.com; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; jrmatisheck@aerioncorp.com; lourdes@boomsupersonic.com; kian.mccaldon@pwc.ca; McConnachie_Dominic@bah.com; yuriy.medved@gmail.com; yoann.mery@snecma.fr; rick@aerodyne.com; jan.middel@nlr.nl; mirzoyan@ciam.ru; john.morgenstern@lmco.com; moriyama-m2ff@mlit.go.jp; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; krisha.nobrega@embraer.com.br; masaya_oshimizu@mitsubishiaircraft.com; MPagliarello@aci-na.org; 03503@ivchenko-progress.com; paul.peeters1000@gmail.com; olivier.penanhoat@snecma.fr; Thierry.Percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; Peter.Zimm@icfi.com; Martin.Plohr@dlr.de; tpohle@airlines.org; charles.renard@airbus.com; leslie.riegle@aia-aerospace.org; Theo.Rindlisbacher@bazl.admin.ch; tim.roesler@liberty.rolls-royce.com; RoetgerT@iata.org; raymond@boom.aero; Dan@theicct.org; sabnis@mit.edu; CAMILLE.SAGUES@airbus.com; Marcelo.saito@anac.gov.br; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jerome.sarda@aviation-civile.gouv.fr; charalambos.savvidis@easa.europa.eu; Donald.Scata@faa.gov; jscavuzzi@aci.aero; martin.schaefer@bmvi.bund.de; roger.schaufele@faa.gov; inger.seeberg@cph.dk; katharina.seeliger@airbus.com; jonathan.a.seidel@nasa.gov; sipatov@avid.ru; gskillen7@gmail.com;

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Subject: RE: Draft CTG report to SG2018 (FLXXX)

Thank you Erika and Jerome.

Dear WG3,

Deliberative Process / Ex. 5

Best Regards,
Bethan and Ralph

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Wednesday, May 02, 2018 7:26 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; NDickson@icao.int; B.Owen@mmu.ac.uk; wolfe.philip@epa.gov; thobias.log@transportstyrelsen.se; Zainal.abidin@emirates.com; Zainal.abidin@emirates.com; aa681@mit.edu; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; daltherr@aerioncorp.com; david.anvid@delta.com; archillapv@inta.es; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Jauhari_ARSAD@caas.gov.sg; wendy.bailey@tc.gc.ca; Balasubramanian, Sathya CTR (Volpe) <S.Balasubramania.CTR@dot.gov>; steven.l.baughcum@boeing.com; MBeauregard@AIAC.ca; arturo.benito@upm.es; andy@boom.aero; Jeff.Berton@nasa.gov; david.bilcock@tc.gc.ca; chemmotology@ukr.net; bonnefoy_philippe@bluesky-d2d.com; arnaud.bonnet@embraer.com.br; laurent.box@eurocontrol.int; colleen.carmody@tc.gc.ca; daniel.carnelly@airbus.com; clarence.t.chang@nasa.gov; S.Christie@mmu.ac.uk; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; dominique.collin@snecma.fr; barbara.cooreman@asd-europe.org; isabelle.cornier@adp.fr; ecotti@nbaa.org; yves.cousineau@tc.gc.ca; crayfordap1@cardiff.ac.uk; DE LEPINAY Ivan <ivan.de-lepinay@easa.europa.eu>; guillaume.dehestru@dassault-aviation.com; V.Deniskov@antonov.kiev.ua; keremdenk@gmail.com; Didyk-Wells, Nicole (FAA) <nicole.didyk-wells@faa.gov>; WCDolejsi@cessna.textron.com; eli@boomsupersonic.com; Jdow@iccaia.org; rudolph.dudebout@honeywell.com; ricardo.dupont@anac.gov.br; charles.etter@gulfstream.com; chris@limitedskies.com; ajaria96@yahoo.co.id; baronferdianhussein@airasia.com; Fleming, Gregg G (Volpe) <Gregg.Fleming@dot.gov>; emanuel.fleuti@zurich-airport.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; Ted.Fudge@CANSO.org; fuji@chofu.jaxa.jp; Vgalotti.iccaia@gmail.com; Mike.garrison@boeing.com; gerring.holly@epa.gov; giannelli.bob@epa.gov; Gillette, Warren (FAA) <warren.gillette@faa.gov>; hayley.gowen@bis.gsi.gov.uk; Grandi, Fabio (FAA) <Fabio.Grandi@faa.gov>; marie.hankanen@transportstyrelsen.se; bill.hemmings@transportenvironment.org; Hileman, James (FAA) <James.Hileman@faa.gov>; mhinderberger@aerioncorp.com; Hoermann Werner <werner.hoermann@easa.europa.eu>; james.hoke@pw.utc.com; Holsclaw, Curtis (FAA) <curtis.holsclaw@faa.gov>; naohiro_horie@mhiahq.com; aiglesias@mfom.es; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; uj@janicke.de;

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Subject: Draft CTG report to SG2018 (FLXXX)

Dear WG3,

Deliberative Process / Ex. 5

Please provide your feedback by Friday 10a.m.
Thanks.
Erika and Jérôme

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

EASA

Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: 02 May 2018 22:55
To: NDickson@icao.int; B.Owen@mmu.ac.uk; wolfe.philip@epa.gov; thobias.log@transportstyrelsen.se; Zainal.abidin@emirates.com; Zainal.abidin@emirates.com; aa681@mit.edu; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; daltherr@aerioncorp.com; david.anvid@delta.com; archillapv@inta.es; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Jauhari_ARSAD@caas.gov.sg; wendy.bailey@tc.gc.ca;

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Subject: RE: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,
Bethan and Ralph

From: Iovinelli, Ralph (FAA)
Sent: Wednesday, May 02, 2018 11:55 AM
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Subject: RE: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Please have all comments to WG co-Rapps by end of meeting tomorrow (Thursday).

Best Regards,
Bethan and Ralph

From: Iovinelli, Ralph (FAA)
Sent: Wednesday, May 02, 2018 11:01 AM
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Subject: WG3 draft SG2018 Papers

Dear WG3,

Deliberative Process / Ex. 5

Please have all comments to PMTG co-leads by end of meeting tomorrow (Thursday).

Best Regards,
Bethan and Ralph

Message

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 5/2/2018 7:49:44 PM
To: Charmley, William [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fb1828fb00af42ffb68b9e0a71626d95-Charmley, William]
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: Draft USG papers to ICAO SG
Attachments: Deliberative Process / Ex. 5

Bill,

As we discussed, we worked with FAA on 4 papers to steering group related to air emissions from aircraft engines. Currently, the papers are under review by Kevin Welsh. Note that the IGIA (public US stakeholders) meeting related to SG positions is on Monday. I expect these papers will be discussed at that meeting.

The 4 papers are attached and brief summaries are below:

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Mike

****

Michael Samulski
U.S. Environmental Protection Agency
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****

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
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Subject: WG3-9 Derby, United Kingdom, April 30, 2018 WG3-09 Plenary papers have been added to the H Drive
Attachments: Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
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Message

From: Upton, Eric [Eric.Upton@gulfstream.com]
Sent: 5/1/2018 10:40:02 PM
To: andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; charalambos.savvidis@easa.europa.eu; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie [robbie.cowart@gulfstream.com]; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; denise.ahrens@rolls-royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; erika.herms@easa.europa.eu; Etter, Charles [charles.etter@gulfstream.com]; frank.wetzel@uba.de; frederic.soum@airbus.com; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; guy.readman@easa.europa.eu; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Laszlo.Windhoffer@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; mark.johnson3@rolls-royce.com; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; sandy.liu@faa.gov; simon.smith@rolls-royce.com; Stephen.Arrowsmith@easa.europa.eu; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; Upton, Eric [Eric.Upton@gulfstream.com]; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; xiaojunyoung@hotmail.com; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yoann.mery@snecma.fr; yuriy.medved@gmail.com
Subject: Revisions of WP08 and WP09

Deliberative Process / Ex. 5

Hello Colleagues,

For those of you who have been enjoying the WG3 meeting in Derby, I have attached MS Word revisions of the two papers we discussed today.
Erika and I spent some time this evening improving them.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Please let me know if you have any questions, and I'll see you in the morning.

Regards,

Eric Upton, PhD
Environmental/Performance Specialist
Gulfstream Aerospace Corporation
Eric.Upton@gulfstream.com
ph: 912-395-8458
fax: 912-965-8850

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 5/1/2018 4:58:50 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: Today's update attached
Attachments: **Deliberative Process / Ex. 5**

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 5/1/2018 4:49:28 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Fw: Squaring US Positions on Supersonic with Other Things

---

From: Ralph.Iovinelli@faa.gov <Ralph.Iovinelli@faa.gov>
Sent: Tuesday, May 1, 2018 12:40 PM
To: Paul.Madden@Rolls-Royce.com; Leggett, Cullen; Mueller, John; Daniel.Jacob@faa.gov
Cc: Joseph.Zelina@ge.com
Subject: RE: Squaring US Positions on Supersonic with Other Things

Deliberative Process / Ex. 5

From: Madden, Paul C [mailto:Paul.Madden@Rolls-Royce.com]
Sent: Tuesday, May 01, 2018 12:15 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; leggett.cullen@epa.gov; mueller.john@epa.gov; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>
Cc: Joseph.Zelina@ge.com
Subject: RE: Squaring US Positions on Supersonic with Other Things

Deliberative Process / Ex. 5

Cheers, Paul

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: 01 May 2018 16:14
To: Madden, Paul C <Paul.Madden@Rolls-Royce.com>; leggett.cullen@epa.gov; mueller.john@epa.gov; Daniel.Jacob@faa.gov
Cc: Joseph.Zelina@ge.com
Subject: RE: Squaring US Positions on Supersonic with Other Things

Paul,

Deliberative Process / Ex. 5

Thanks,
Ralph

From: Madden, Paul C [mailto:Paul.Madden@Rolls-Royce.com]
Sent: Tuesday, May 01, 2018 10:40 AM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; leggett.cullen@epa.gov; 'Mueller, John' <mueller.john@epa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>
Cc: Joseph Zelina (GE Aviation, US) (Joseph.Zelina@ge.com) <Joseph.Zelina@ge.com>
Subject: Squaring US Positions on Supersonic with Other Things
Importance: High

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks, Paul

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An e-mail response to this address may be subject to interception or monitoring for operational reasons or for lawful business practices.
(c) 2017 Rolls-Royce plc
Registered office: 62 Buckingham Gate, London SW1E 6AT Company number: 1003142. Registered in England.

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 5/1/2018 3:16:27 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
CC: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: FW: Squaring US Positions on Supersonic with Other Things

Deliberative Process / Ex. 5

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Tuesday, May 01, 2018 4:14 PM
To: Paul.Madden@Rolls-Royce.com; Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>; Daniel.Jacob@faa.gov
Cc: Joseph.Zelina@ge.com
Subject: RE: Squaring US Positions on Supersonic with Other Things

Paul,

Deliberative Process / Ex. 5

Thanks,
Ralph

From: Madden, Paul C [mailto:Paul.Madden@Rolls-Royce.com]
Sent: Tuesday, May 01, 2018 10:40 AM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; leggett.cullen@epa.gov; 'Mueller, John' <mueller.john@epa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>
Cc: Joseph Zelina (GE Aviation, US) (Joseph.Zelina@ge.com) <Joseph.Zelina@ge.com>
Subject: Squaring US Positions on Supersonic with Other Things
Importance: High

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks, Paul

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Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 5/1/2018 3:06:25 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
CC: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Fw: Squaring US Positions on Supersonic with Other Things
Attachments: FAA Supersonic Noise Executive Director-AEE-1 - (2018) Legal Interpretation.pdf

Importance: High

Deliberative Process / Ex. 5

From: Madden, Paul C <Paul.Madden@Rolls-Royce.com>
Sent: Tuesday, May 1, 2018 10:40 AM
To: Ralph.Iovinelli@faa.gov; Leggett, Cullen; Mueller, John; Daniel.Jacob@faa.gov
Cc: Joseph Zelina (GE Aviation, US) (Joseph.Zelina@ge.com)
Subject: Squaring US Positions on Supersonic with Other Things

Deliberative Process / Ex. 5

Thanks, Paul

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Message

From: Dan Rutherford [dan@theicct.org]
Sent: 8/30/2018 4:55:43 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
CC: Bryan Comer [bryan.comer@theicct.org]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Brandon Graver [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user0e3b7bdb]; Revelt, Jean-Marie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e9a49fd1df8e4ea59fad579c16cc1fe0-Revelt, Jean-Marie]
Subject: Re: catch up?

That's fine. Looks like 12:30 ET also works on this end.

Dan

On Aug 30, 2018, at 9:52 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Sorry, I put 12:30 Pacific in my email, but meant 12:30 Eastern (9:30 Pacific). Will that time work for you? 3:30 won't work for us.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Thursday, August 30, 2018 12:32 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>; Revelt, Jean-Marie <revelt.jean-marie@epa.gov>
Subject: Re: catch up?

Mike,

12:30 PT/3:30 ET tomorrow sounds good. Looking forward to it.

I should have included this on the first email, but attached is the draft paper on implementing ICAO's CO2 standard in the US. The key finding is 7 of the 10 largest US carriers are already expected to meet the INP standard fleetwide in 2028, with another two carriers able to comply with small (< 2%) improvements. This opens up the option of applying the standard to in-use aircraft/airlines from 2028 since no additional improvements will be required if the standard is applied only to OEMs.

Happy to talk you through the details tomorrow if you'd like.

Dan

On Aug 30, 2018, at 4:57 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Dan,

Good to hear from you. I think it would be a good idea for us to catch up too.

In addition to the items you listed below, I would like to talk about aircraft PM and NOx. Also, there are a couple of technical issues related to marine that I would like to discuss.

How does 12:30 Pacific tomorrow sound for a call? I am also copying Jean Marie Revelt, who I would like to have join us.

Bryan is out today and tomorrow. So, if there are still open questions related to aircraft, we can schedule a follow-up call that includes him next week.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Wednesday, August 29, 2018 5:59 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>
Subject: catch up?

Hi Mike,

Hope you've been well and enjoying some time off this summer.

With MEPC 73 and the pre-CAEP/11 working group meetings coming up next month in Montreal, I thought it would be good to connect again. I'd be quite interested in your take on where things may go with the EEDI review, HFO ban work, and supersonic engine emission standards in particular. You can find our latest work on these attached to this email.

Separately, we're finalizing a working paper on implementing ICAO's CO2 standard in the US that I thought you should be aware of.

Would you have any time either this Friday (8/31) or next week (9/5~9/7) for a quick call? Please let me know when would work for you.

Thanks,

Dan

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 7/17/2018 12:24:57 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: Reviving supersonic passenger flights to harm environment: study

Reviving supersonic passenger flights to harm environment: study

Jamie Freed **REUTERS**

(Reuters) - Reviving supersonic passenger flights will harm the environment as the jets will not likely be able to comply with existing fuel efficiency, pollution and noise standards for subsonic aircraft, according to a study released on Tuesday.

U.S. based startups Aerion Supersonic, Boom Supersonic and Spike Aerospace are all aiming to revive ultra-fast flights by the mid-2020s by modifying existing engines rather than spending billions of dollars to make a new one to serve a market that has been dormant since Concorde stopped flying in 2003.

Modified engines will burn five-to-seven times more fuel per passenger than subsonic jets, exceed global limits for new subsonic jets by 40 percent for nitrogen oxide and 70 percent for carbon dioxide, the International Council on Clean Transportation (ICCT) said.

The ICCT said, based on its study, supersonic jet makers would be unlikely to meet environmental standards unless they used a new engine design with technology like a variable cycle that would operate differently at take-off than in cruise mode.

The alternative is for policymakers to ease standards for supersonic jets, the ICCT adds.

The United States is already pushing for different standards for ultra-fast planes but facing resistance from European nations that want tough rules on noise.

“There are reasons to be worried about the environmental impact of reintroducing supersonic aircraft,” said Daniel Rutherford, aviation director at the U.S.-based independent non-profit research organization.

“A modest first step is for manufacturers to commit to meeting existing standards for new aircraft,” added Rutherford, a co-author of the ICCT study.

ENGINE HEADWINDS

But finding an efficient engine for supersonic jets is tough in an industry that has for decades been catering to subsonic planes by improving fuel efficiency, expanding range and reducing noise through the use of larger fans.

Supersonic jets are most efficient at cruising altitude with smaller engines that are far noisier on takeoff, like those on fighter jets or old 727s that do not meet modern airport noise standards. Smaller engines help reduce aerodynamic drag when flying above mach speed - the speed of sound.

Lockheed Martin Corp (LMT.N)-backed Aerion has selected a GE (GE.N) engine core used in F-16 fighter jets and Boeing Co (BA.N) 737s as the basis for the engine on its planned jet, which will have a top speed of Mach 1.4.

Boom and Spike, which plan top speeds of Mach 2.2 and Mach 1.6 respectively, have yet to select engines.

"Even if you built something new, I think you are going to be struggling," said Daniel Edgington-Mitchell, an aerospace engineering lecturer at Melbourne's Monash University.

"I think that is why there is such a push in the United States to reconsider the standards particularly for supersonic aircraft because it is just going to be really difficult."

Reporting by Jamie Freed in Singapore, additional reporting by Allison Lampert in Montreal; Editing by Himani Sarkar

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
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2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
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ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/7/2018 1:38:12 AM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: RE: SST stuff

Thanks Mike – no problem. Deliberative Process / Ex. 5
Deliberative Process / Ex. 5 Time will tell.

From: Samulski, Michael
Sent: Wednesday, June 06, 2018 9:21 PM
To: Mueller, John <mueller.john@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>
Subject: RE: SST stuff

Sorry. I'm just seeing this now.

Deliberative Process / Ex. 5

I wouldn't rule it out though.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Mueller, John
Sent: Tuesday, June 05, 2018 7:46 AM
To: Samulski, Michael <samulski.michael@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>
Subject: SST stuff

Guys,

Deliberative Process / Ex. 5

Any thoughts you have would be appreciated by COB (your time) today.

Thanks,
John

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 4/6/2018 12:59:16 PM
To: Eric.Upton@gulfstream.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; charalambos.savvidis@easa.europa.eu; charles.renard@airbus.com; clarence.t.chang@nasa.gov; robbie.cowart@gulfstream.com; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; denise.ahrens@rolls-royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; erika.herms@easa.europa.eu; charles.etter@gulfstream.com; frank.wetzel@uba.de; frederic.soum@airbus.com; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; guy.readman@easa.europa.eu; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; mark.johnson3@rolls-royce.com; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; sandy.liu@faa.gov; simon.smith@rolls-royce.com; Stephen.Arrowsmith@easa.europa.eu; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; xiaojunyoung@hotmail.com; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yoann.mery@snecma.fr; yuriy.medved@gmail.com
CC: twouptons@mac.com
Subject: RE: Reminder of comment deadline tomorrow for ESSTsg papers

Deliberative Process / Ex. 5

Dear ESSTsg,

Deliberative Process / Ex. 5

Laszlo Windhoffer
Federal Aviation Administration
T: +1.202.267.4741

From: Upton, Eric [mailto:Eric.Upton@gulfstream.com]
Sent: Thursday, April 05, 2018 5:04 PM
To: andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; charalambos.savvidis@easa.europa.eu; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie <robbie.cowart@gulfstream.com>; daltherr@aerioncorp.com; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; denise.ahrens@rolls-royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; erika.herms@easa.europa.eu; Etter, Charles <charles.etter@gulfstream.com>; frank.wetzel@uba.de; frederic.soum@airbus.com; giannelli.bob@epa.gov; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; guy.readman@easa.europa.eu; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; leggett.cullen@epa.gov; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; manning.bryan@epa.gov; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; mark.johnson3@rolls-royce.com; martin.plohr@dlr.de; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; raymond@boomsupersonic.com; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; samulski.michael@epa.gov; Liu, Sandy (FAA) <sandy.liu@faa.gov>; simon.smith@rolls-royce.com; Stephen.Arrowsmith@easa.europa.eu; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; Upton, Eric <Eric.Upton@gulfstream.com>; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; wolfe.philip@epa.gov; xiaojunyoung@hotmail.com; yen.david@epa.gov; yoann.mery@snecma.fr; yuriy.medved@gmail.com
Cc: Eric Upton <twouptons@mac.com>
Subject: Reminder of comment deadline tomorrow for ESSTsg papers

Hello Colleagues,

A quick reminder that tomorrow evening is the deadline for additional contributions, comments, and improvements for the ESSTsg Steering Group papers.

Deliberative Process / Ex. 5

Please let Laszlo or I know if you have any other questions or concerns.

Regards,

Eric Upton, PhD
Environmental/Performance Specialist

Gulfstream Aerospace Corporation
Eric.Upton@gulfstream.com
ph: 912-395-8458
fax: 912-965-8850

Message

From: Dickson, Neil [NDickson@icao.int]
Sent: 4/4/2018 11:44:45 PM
To: Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Log T [thobias.log@transportstyrelsen.se]; Abdain Z [Zainal.abidin@emirates.com]; Abidin Z [Zainal.abidin@emirates.com]; Agarwal A [aa681@mit.edu]; Ahrens D [denise.ahrens@rolls-royce.com]; Allyn D [daniel.m.allyn@boeing.com]; Altherr D [daltherr@aerioncorp.com]; Anvid [david.anvid@delta.com]; Archilla V [archillapv@inta.es]; Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Arsad J [Jauhari_ARSAD@caas.gov.sg]; Bailey [wendy.bailey@tc.gc.ca]; Balasubramanian S [Sathya.Balasubramanian.CTR@dot.gov]; Baughcum S [steven.l.baughcum@boeing.com]; Beauregard M [MBeauregard@AIAC.ca]; Benito [arturo.benito@upm.es]; Berryann A [andy@boom.aero]; Berton J [Jeff.Berton@nasa.gov]; Bilcock D [david.bilcock@tc.gc.ca]; Boichenko [chemmotology@ukr.net]; Bonnefoy [bonnefoy_philippe@bluesky-d2d.com]; Bonnet A [arnaud.bonnet@embraer.com.br]; Box L [laurent.box@eurocontrol.int]; Carmody C [colleen.carmody@tc.gc.ca]; 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Frenandez J [jorge.fernandez@faa.gov]; Fudge, Ted [Ted.Fudge@CANSO.org]; Fujiwara [fuji@chofu.jaxa.jp]; Galotti, Vincent [Vgalotti.iccaia@gmail.com]; Garrison M [Mike.garrison@boeing.com]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Gillette [warren.gillette@faa.gov]; Gowen H [hayley.gowen@bis.gsi.gov.uk]; Grandi F [fabio.grandi@faa.gov]; Hankanen M [marie.hankanen@transportstyrelsen.se]; Hemmings [bill.hemmings@transportenvironment.org]; Herms [Erika.herms@easa.europa.eu]; Hileman J [James.Hileman@faa.gov]; Hinderberger M [mhinderberger@aerioncorp.com]; Hoermann [werner.hoermann@easa.europa.eu]; Hoke J [james.hoke@pw.utc.com]; Holsclaw C [curtis.holsclaw@faa.gov]; Horie N [naohiro_horie@mhiahq.com]; Iglesias A [aiglesias@mfom.es]; Iovinelli [Ralph.Iovinelli@faa.gov]; Jacob D [daniel.jacob@faa.gov]; Janicke U [uj@janicke.de]; Johnson M [mark.johnson3@rolls-royce.com]; Jung J [jjung@aci.aero]; Kartika D [kartikadinakartika@gmail.com]; Kenney M [mkenney@kbenv.com]; Kharina A [karin@theicct.org]; Kim B [Brian.Kim@pw.utc.com]; Kittery J [jean-luc.kittery@aviation-civile.gouv.fr]; Kozel [progress@ivchenko-progress.com]; Kramer S [stephen.kramer@pw.utc.com]; Kusukame Y [takuya_kusukame@mitsubishiaircraft.com]; Lee [d.s.lee@mmu.ac.uk]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lim L [L.Lim@mmu.ac.uk]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Lobo P [Prem.Lobo@nrc-cnrc.gc.ca]; Locke M [maryalice.locke@faa.gov]; Locke M [maryalice.locke@faa.gov]; Lunter [michael.lunter@minienm.nl]; Lye [david.lye@aero.bombardier.com]; Madden [paul.madden@rolls-royce.com]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Majjigi R [muni.majjigi@ge.com]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Marks [julie.marks@faa.gov]; Matischeck J [jrmatisheck@aerioncorp.com]; Maurice L [lourdes@boomsupersonic.com]; McCaldon [kian.mccaldon@pwc.ca]; McConnachie D [McConnachie_Dominic@bah.com]; McKinney [randal.mckinney@pw.utc.com]; Medvedev Y [yuriy.medved@gmail.com]; Mery Y [yoann.mery@snecma.fr]; Miake-Lye [rick@aerodyne.com]; Middel J [jan.middel@nlr.nl]; Mirzoyan A [mirzoyan@ciam.ru]; Morgenstern J [john.morgenstern@lmco.com]; Moriyama M [moriyama-m2ff@mlit.go.jp]; Morris [kevin.morris@adsgroup.org.uk]; Muehlhausen M [matthew.r.muehlhausen@boeing.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Nobrega K [krisha.nobrega@embraer.com.br]; Oshimizu M [masaya_oshimizu@mitsubishiaircraft.com]; Owen

[b.owen@mmu.ac.uk]; Pagliarello M [MPagliarello@aci-na.org]; Patserin [03503@ivchenko-progress.com]; Peeters P [paul.peeters1000@gmail.com]; Penanhoat [olivier.penanhoat@snecma.fr]; Percheron T [Thierry.Percheron@dassault-aviation.com]; Perelgritz J [jean-francois.perelgritz@airbus.com]; Peter [Peter.Zimm@icfi.com]; Plohr [Martin.Plohr@dlr.de]; Pohle T [tpohle@airlines.org]; Renard C [charles.renard@airbus.com]; Riegle [leslie.riegle@aia-aerospace.org]; Rindlisbacher [Theo.Rindlisbacher@bazl.admin.ch]; Roeler T [tim.roesler@liberty.rolls-royce.com]; Roetger [RoetgerT@iata.org]; Russell R [raymond@boom.aero]; Rutherford [Dan@theicct.org]; Sabnis J [sabnis@mit.edu]; Sagues C [CAMILLE.SAGUES@airbus.com]; Saito [Marcelo.saito@anac.gov.br]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Sarda J [jerome.sarda@aviation-civile.gouv.fr]; Savvidis C [charalambos.savvidis@easa.europa.eu]; Scata D [donald.scata@faa.gov]; Scavuzzi J [jscavuzzi@aci.aero]; Schaefer M [martin.schaefer@bmvi.bund.de]; Schaufele R [roger.schaufele@faa.gov]; Seeberg I [inger.seeberg@cph.dk]; Seeliger K [katharina.seeliger@airbus.com]; Seidel J [jonathan.a.seidel@nasa.gov]; Sipatov [sipatov@avid.ru]; Skillen G [gskillen7@gmail.com]; Smallwood G [Greg.Smallwood@nrc-cnrc.gc.ca]; Smit H [hans.smit@airbus.com]; Smith [simon.smith@rolls-royce.com]; Soum F [frederic.soum@airbus.com]; Sow D [cheikhdjiby.sow@snecma.fr]; Sparrow V [vws1@psu.edu]; Speth R [speth@mit.edu]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Stimson [dkstimson@hotmail.com]; Sturdza P [sturdza@aerioncorp.com]; Takahashi H [h-hashimoto@aeif.or.jp]; Tobaldini L [luiz.tobaldini@embraer.com.br]; Upton E [Eric.Upton@gulfstream.com]; Vanek A [Adrienne.Vanek@faa.gov]; Volkov [Volkov@ciam.ru]; Wetzel [Frank.Wetzel@uba.de]; Willford N [NWillford@txtav.com]; Williams P [paul.i.williams@manchester.ac.uk]; Windhoffer [laszlo.windhoffer@faa.gov]; Yang X [xiaojunyoung@hotmail.com]; Yasar G [gursu.tasar@tai.com.tr]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Zelina J [joseph.zelina@ge.com]; nagayoshi_hiromitsu@ihi.co.jp

Subject: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Attachments: CAEP11_WG3_ad hoc group telecon schedule_180404.xlsx

Dear WG3,

Deliberative Process / Ex. 5

Personal Matters / Ex. 6

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
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Consider the environment before printing this e-mail

ASCENT Grant Process

Date: 2018-Apr-3

Version 2.2

Grants process: New Projects

1. AEE will create a Notice of Funding Opportunity (NFO) that identifies a research project with a title, description, estimate of available funds, period of performance, name(s) of project Program Manager(s) (or Project PM), and a deadline for the response to be received by the Project PM. The deadline should be nominally 3 weeks from the date the universities receive the NFO.

    - The NFO template is available in the templates repositories

2. The Center Of Excellence Program Manager (COE PM, Jim Hileman) will communicate the NFO to COE Co-Directors (Mike Wolcott and John Hansman) with copy provided to the Project PM and the AEE Division Managers (DMs).

3. The COE Co-Directors will communicate the NFO to all COE universities, sponsors, and Advisory Committee members. The COE Co-Directors will ask the COE universities to develop a proposal to meet the objectives identified in the NFO. Sponsors and Advisory Committee members are welcome to provide comments on the NFO to the ASCENT Community (AEE, other sponsors, ASCENT Co-Directors, universities, and/or Advisory Committee members) as they see fit.

4. One or more Principal Investigator (PIs) may take a lead, form teams of researchers from COE universities (may invite non-COE researchers as appropriate) and develop a brief proposal that will serve as a response to the NFO and that expresses a desire to submit a full proposal. The NFO response should include the team members (university and non-university collaborators), approach description (not to exceed two pages), expected deliverables, timeline and preliminary project cost. These must be submitted to the COE Co-Directors by the indicated deadline (send email to both wolcott@wsu.edu and rjhans@mit.edu).

5. The COE Co-Directors will review the NFO responses and then submit to AEE (Project PM and COE PM) without any filtration.

6. The Project PM will review the NFO responses(s) and complete the Proposal Evaluation Package. The Project PM will then discuss internally with Division Manager, the COE PM,

and others as needed to evaluate the response(s), down-select if multiple were submitted, and reach a recommendation for the selection of the final team(s). The Project PM can request additional clarifying information (e.g., CV, relevant publications) as necessary. The final decision will be made based on the response meeting the objectives, team qualification, schedule, cost, and technical merit. One or more projects may be funded from a single NFO or a decision can be made to select no team or ask that multiple teams merge.

- The Proposal Evaluation Package template is available in the templates repositories

7. Project PM will present recommendation for the final team(s) to their DM and to the COE PM. In the event of disagreements, the COE PM will make the final selection.

8. The Project PM will communicate the final decision to PIs with cc to COE Co-Directors, AEE DM, and COE PM. Decisions should be communicated by the Project PM to the PIs within 6 weeks of the response deadline.

   This approach is meant to provide equal opportunity to all COE universities in planning and being a part of a project team.

Grants process: New Projects and Continuing Projects

9. The Project PM will work with lead PI to develop a full proposal following ASCENT template. PI will submit the final full proposal via Grants.gov and AEE will approve the proposal for funding. The PI needs to share the final package with the Project PM for final verification and approval. In order for the proposal to be approved by the COE PM without delay the Project PM must verify the following:

   - If the project proposal is for the continuation of an existing project:
     1. The Title used in all forms must be identical to that of the prior amendment. Please refer to the list provided on the P drive.
     2. There should not be a gap in the Period of Performance between amendments. A gap would result in a No Cost Extension (NCE) being issued and only one NCE is allowed throughout the life of a project.
   - All of the forms submitted are based on the appropriate ASCENT COE template where available. All the templates are provided on the P drive.
   - All of the forms have been properly completed per the provided instructions and all instructions have been removed from the final document. All input should be clearly written, free of spelling and grammatical errors, and neatly formatted. *This documentation undergoes scrutiny inside and outside the agency and should properly represent the level of professionalism of the ASCENT COE community.*

- The Project's webpage on the ASCENT COE website is up to date or, in the case of new projects, the Team has prepared the appropriate contents so that the page can be quickly created once the project starts.

- All of the reports, articles and papers that have been published thus far under the Project need to be on the National Transportation Library in accordance with the Project's Data Management Plan. This will be confirmed with one of the sections in the proposal template.

10. The contracts team will retrieve the package submitted to Grants.com and prepares the evaluation package for final review by the COE PM. Submissions are process in the order in which they are received and any error in the package needing correction by the Project PM or Project Team will result in the submission to be moved to the bottom of the queue.

11. The completed Grant Request Form will be distributed internally for signature by the Fund Certifier, Division Manager, and lastly by the COE PM.

12. The completed and signed Grant Request Form will be submitted to the FAA Tech Center for review by acquisition and legal and ultimately awarding.

Grants process: End of the Period of Performance

1. At the end of each period of performance the PM and project team will need to make sure that all the all the deliverables for that award have been met and submitted. The documents that will need to be submitted are:

    - The Project report.
    - Any other deliverables as specified in the proposal.
    - The SF-425 Report marked PARTIAL, if the project will continue, or FINAL if the project has been completed.
    - All project's products have been posted on the ASCENT COE website and copies submitted for publication on National Transportation Library (NTL) along with all the required information.

2. For projects reaching their final completion will have any unused funding either reprogrammed to a different project at the same university, or de-obligated. Funds cannot be used past its period of validity (generally 3 years).

Notes:

- Grants process information, Checklist, and timeline location on the P drive:

  P:\AEE-3 Shared\PM Guidance\Grant

- Templates repositories:

  P:\AEE-3 Shared\PM Guidance\Grant\Templates
  https://ascent.aero/resources/

- Information on how to submit a project to the National Transportation Library (NTL):

  https://ntl.bts.gov/submitting-content

- Information on how to submit a project to the DOT Research Hub:

  << Work in Progress – Currently being handled by FAA AEE >>

Grants process: Documents Checklist

Required Document	New Project with Funds	Add Funds	No-Cost Extension Request
SF-424 Application for Federal Assistance	Yes	Yes	Yes
Research and Related Budget	Yes	Yes	
Proposal Narrative	Yes	Yes	Yes
Research & Related Personal Data	Yes		
Research & Related Other Project Information	Yes		
Research & Related Senior/Key Person Profile	Yes		
Research & Related Project/Performance Site Location(s)	Yes		
Project Participant Form	Yes	Yes	Yes
Data Management Plan	Yes	Yes[1]	
Additional Funds Justification Statement[2]		Yes	
Project Website Content Creation/Update	Yes	Yes	
Evaluation from Technical Monitor	Yes	Yes	
Budget Verification Signed by COE PM[3]	Yes[3]	Yes[3]	
Grant Request Form	Yes	Yes	Yes

University Provided
FAA Provided

[1] The Data Management Plan is only required if the research task's Scope of Work (SOW) changes.

[2] If you are adding additional funds, there needs to be a justification from the Tech Monitor or University as to why funds are being added. This can be a simple email or Word document included in the application package. Please be sure that the justification includes a summary of what has been accomplished thus far with the original funding, along with a description of what the additional funding is for.

[3] The Budget Verification form is required if the budget forms and/or proposal submitted from the school has any mention of the term "tuition", to include the use of "graduate student education fees, graduate remission fees, etc." If there is NO mention of any term relating to tuition, please note on the Grant Request Form that *"Budget Verification Form Not Required"*.

ASCENT COE Notice of Funding Opportunity (COE-2018-B)

Project Title: GIS-based Noise Estimation Tool

FAA Project Manager: Joe DiPardo (joseph.dipardo@faa.gov)

Nominal Funding Level: $250,000

Period of Performance: 1Year

Deadline for response to this NFO: April 25, 2018

Project Description:

The emergence of Unmanned Aircraft Systems (UAS) and their rapid development in terms of numbers, technologies, and projected applications has raised the need for assessing the noise implications of widespread use within the National Airspace System (NAS). Noise modeling is currently done using the Aviation Environmental Design Tool (AEDT), which is a software system that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences. The tool is primarily designed to model the impact of traditional fixed and rotary-wing aircraft with a high degree of precision and as such it relies on detailed performance and operational data. Unmanned systems, however, are very different than traditional aircraft both in terms of technologies and operational concepts, which in conjunction with a lack of detailed data make AEDT an unsuitable tool for modeling them. The goal of this project is to develop a tool that allows a user to easily develop operational scenarios and quickly calculate and display the resulting estimated noise contours based on precomputed data.

The tool will conceptually consist of three primary components: a Geographic Information System (GIS) interface, a noise computation engine, and an underlying database. The GIS interface will provide the user with the tools necessary to visually develop trajectories and then associate operational information inclusive of equipment type, altitude, number of operations, and time of day. The fleet and operational levels information will be used by the noise computation engine to calculate the impact on the ground under the trajectories. The engine will be based on the concept of precomputed noise grids and tiling, where small vehicle-specific precomputed noise grids will be scaled, added, and then placed end-to-end under the flight trajectories to develop the related noise impacts. The database component will provide the storage infrastructure for the reference precomputed grid noise data and any other information required to preserve the work. While the tool will be initially designed for use with UAS, the design will have to ensure that flexibility will be provided to allow modeling of other technologies. For example, given the appropriate grid data the tool could be extended to provide quick estimates for current fixed and rotary-wing aircraft or to estimate the en-route noise footprint of future supersonic aircraft.

The GIS interface will have to provide all of the customary functionalities users have come to expect from such systems plus the tools specific to the creation of trajectories, operational information, and display of the results. While the implementation of the AEDT application currently relies on a proprietary ESRI product for the GIS capabilities in its interface, for this generic tool the team will have to recommend other available GIS software environments, including open source software, which would be suitable for this application. This selection process will be a key part of the project as it will have the dual purpose of selecting the component for use in this tool and for use in AEDT at a later stage. The process should include, but not be limited to, the following list of tasks:

- Review the current ESRI ArcGIS interface is implemented in AEDT considering:

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  - How the code is structured and integrated with the other components;
  - The risk that expected updates to the Microsoft Windows operating system, .NET framework, and MS-SQL database architecture will pose to its ability to continue meeting users' requirements.
- Assess the candidate alternative GIS software environments considering:
  - Whether they will meet future AEDT user needs;
  - The extent of the code changes to the AEDT application necessary to integrate the recommended GIS software;
  - Advantages or disadvantages of open source GIS software, such as the availability of continued software support, ease of use, compatibility with existing software architecture, licensing, etc. Potential options should be explored and disclosed;
  - The risk posed by expected updates to the Microsoft Windows operating system, .NET framework, and MS-SQL database architecture.
- Review what additional data visualization capabilities and geospatial analysis tools are available with different GIS software environments and how their integration can expand functionalities, improve data access, and increase analysis efficiency.
- Review any security, scalability and flexibility constraints associated to any proposed GIS software environments.
- Provide a preliminary assessment of how any proposed GIS software environments would work with emerging technologies such as cloud based computing, GPU enabled computing, or other emerging computational technologies.

The noise computation engine will be responsible for taking the operational input provided through the interface and generating the noise data for plotting on the GIS interface. The source noise data will consist of precomputed noise grid 'tiles'. Multiple tiles will be generated for each specific vehicle and will provide data for the noise generated on the ground under various conditions. The types of conditions to be represented will vary based on the aircraft operational capabilities, flight mode (e.g. takeoff, landing, cruise, etc.), and other parameters as required. The engine will retrieve each appropriate noise tile, scale it based on the number of events, and then provide the resulting output grid to the GIS interface which will plot it at the appropriate location. For modeling noise produced by moving vehicles the same tile will be reused by placing copies end-to-end under the flight path. Curved trajectories will be approximated using isosceles trapezoid tiles of various base angles. Addition of overlapping grids intersecting from different features will be based on proximity paring. The GIS interface will then provide visualization for various metrics including SEL, DNL, and Number of Events.

The database component will provide the central storage mechanism for both the reference data and the study data. As many data storage approaches and software are available, including open source software, the team will have to undertake an assessment to identify the better solution for this application and provide a recommendation. Items to be considered for the review will have to include, but not be limited to, the following:

- Advantages or disadvantages, such as the availability of continued software and user support, ease of use, compatibility with existing software platforms and architectures, licensing, etc.;
- Security, scalability and flexibility constraints;
- Compatibility with emerging technologies such as cloud based computing, GPU enabled computing, or other emerging computational technologies.

Responses received on or before COB April 25, 2018 will be evaluated and team(s) will be requested to provide a full length proposal for further evaluation and possible funding to carry out the work.

ED_002134_00001081-00002

ASCENT COE Notice of Funding Opportunity (COE-2018-C)

Project Title: Clean Sheet Supersonic Engine Design and Performance

FAA Project Manager: Laszlo Windhoffer (Laszlo.Windhoffer@faa.gov)

Nominal Funding Level: $250,000

Period of Performance: 1 Year

Deadline for response to this NFO: April 25, 2018

Project Description:

A number of aviation manufacturers are currently developing new supersonic aircraft designs for use in the commercial transport sector. In step with industry, National Airworthiness Auhorities are preparing for the arrival of these products by reviewing existing regulations and certification processes in the context of supersonic transportation. Furthermore, the International Civil Aviation Organization (ICAO) Committee on Aviation for Environmental Protection (CAEP) Working Groups (WG) on Noise and Emissions Technical Issues, which include representation from governments and industry, are also responding by coordinating discussions regarding the need to review and/or develop future noise and emissions standards for new supersonic aircraft and engines. Ultimately, the noise, fuel burn and emissions produced by these new aircraft and engine types will need to be investigated in order to fully understand their incremental environmental impacts.

Based on recent public announcements, some new supersonic aircraft designs would incorporate modified existing subsonic engines in order to accelerate the development process and ensure safety by using proven engine technology. In particular, these supersonic aircraft manufacturers are considering the use of existing engine cores with new fan designs. This new research opportunity will help the FAA to develop an understanding of the performance difference between a new, clean-sheet engine that is specifically designed for a supersonic civil transport aircraft, and one that utilizes an existing engine core.

The FAA seeks to understand the environmental performance in terms of fuel burn, engine noise and criteria pollutants that could be achieved with a new engine specifically built for a supersonic aircraft. The research team should focus on the engine design and treat the airframe as a black box that provides the engine requirements. The team should take into account the propulsion requirements for a range of supersonic aircraft designs that have been proposed by industry. The research team should utilize publicly available information to determine the variation in cruise Mach, range and payload that is being considered, in order to determine the engine requirements. The research team should then examine the range of technology available today to develop aircraft engines that could meet these requirements. The

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result should be a quantitative assessment of the range of engine noise, fuel burn, and criteria pollutants that could result from different choices in cruise Mach, payload and range. The research team is also expected to present the uninstalled engine performance, installed engine performance, engine component and flow path designs, and aircraft mission analysis. As a sensitivity study, the team is encouraged to consider the change in engine performance that would be needed to overcome the increased weight and drag that would accompany an airframe that is designed to reduce the strength of the generated sonic boom.

The outcomes of this research will be expected to be integrated within the system modeling effort of ASCENT Project 10, which is currently examining the change in fuel burn, noise and emissions due to civil supersonic aircraft operations entering the domestic and global fleets though 2050. It is expected that the fuel burn, noise and emissions performance of newly designed, purpose-built supersonic engines would then be incorporated into some or all of the aircraft flying within the scenarios of ASCENT Project 10. The FAA expects that frequent coordination with the ASCENT Project 10 research team will be necessary at some point in the future.

The researchers selected to work on this project are encouraged to (a) collaborate among universities and stakeholders; b) maximize the use of cost share opportunities and resources available; and c) utilize existing efforts.

As this is a analytical research exercise, it is expected that the full project would require 1 year of effort. Focus would be on the clean-sheet supersonic engine design and associated performance capabilities, followed by coordination with ASCENT COE Project 10 to achieve system level modeling results. This NFO would fund 12 months of effort. There is the potential for follow on work should it be deemed needed by the FAA and funding is available.

Notices of intent received before COB on April 25, 2018 will be evaluated and one team will be requested to provide a full length proposal for further evaluation and possible funding to carry out the work.

ED_002134_00001082-00002

Message

From: AVwebFlash [avweb@e.avflash.com]
Sent: 4/4/2018 7:02:02 AM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: AVwebFlash: Jet And C150 Collide, Two Killed

WORLD'S LEADING INDEPENDENT
AVIATION NEWS SERVICE
Volume 25, Number 14b
April 4, 2018

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Jet And C150 Collide, Two Killed

MARY GRADY

Two people died when a Cessna 150 collided with a Cessna 525 Citation jet on the runway at Marion Municipal Airport in Indiana on Monday afternoon, the FAA has reported. The C150 was attempting to take off to the southeast, at about 5:09 p.m., when it struck the tail of the Citation, which had just landed from the north. The tail of the jet was shorn off, and the C150 crashed and caught fire. The pilot and passenger in the 150, both from Indiana, were killed. The jet is registered to Avis Corporation, according to the local NewsChannel15. Five people, including the crew, were on board, and none were hurt.

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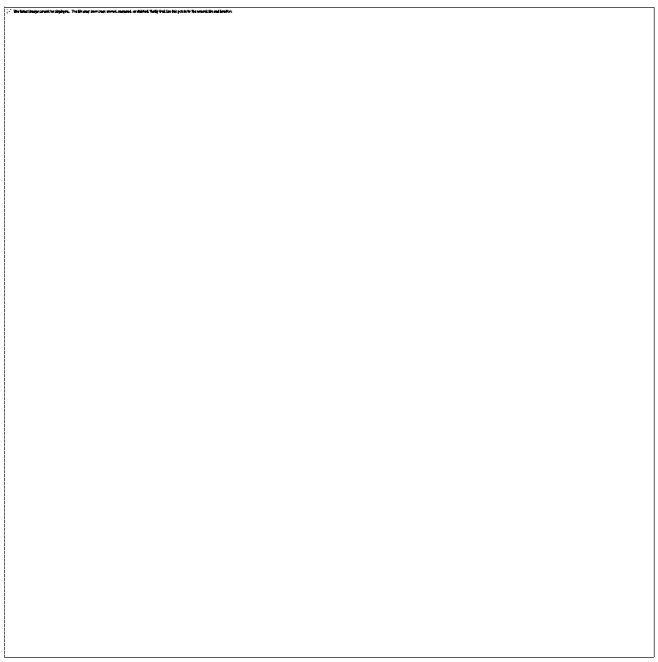
FedEx Express Expands Pilot Outreach

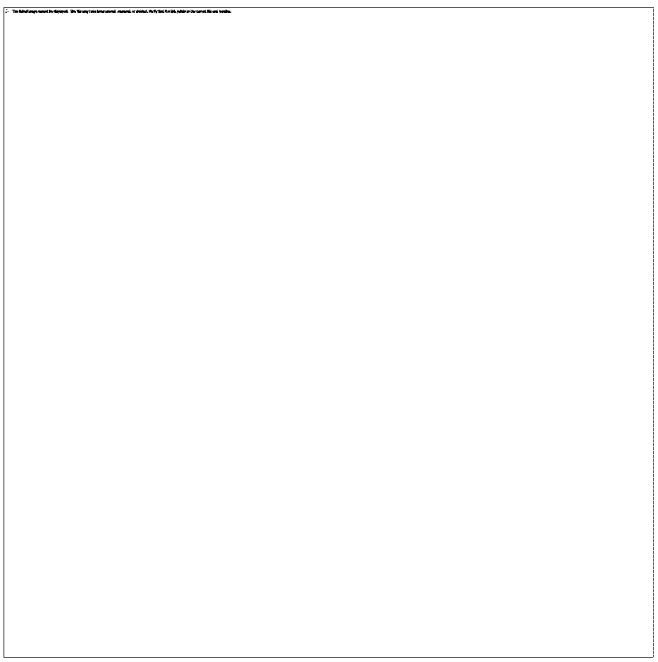
MARY GRADY



FedEx Express is joining a recent trend in the industry to develop a pipeline of pilots to fill seats in its larger jets, by creating clear pathways for new hires to get the training and opportunities they need for a productive career. The outreach program, beginning with Delta State University, in Mississippi, will aim to promote student interest in aviation careers.

NASA, Lockheed Martin To Build Supersonic X-Plane

MARY GRADY



NASA has awarded a $247 million contract to Lockheed Martin's Skunk Works to build a piloted quiet supersonic technology demonstrator, with first flight planned for summer 2021, officials announced at a news conference on Tuesday. Peter Coen, manager for the project at NASA's Langley Research Center in Virginia, said the key element in Lockheed Martin's design is "a brand-new shape."

Read more

Read more

Guest Blog: Selling The Fun, Not The Gewgaws

JASON BAKER

In aviation, we fall for every gimcrack and gimmick that pixels by. Shouldn't we get back to the basic fun of it?

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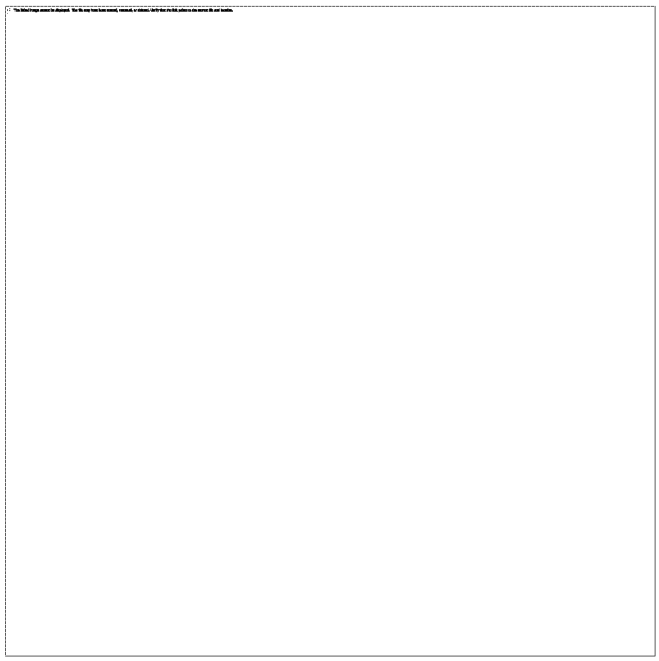
Concept Vehicle Uses Wing in Ground-Effect Technology

TIM COLE



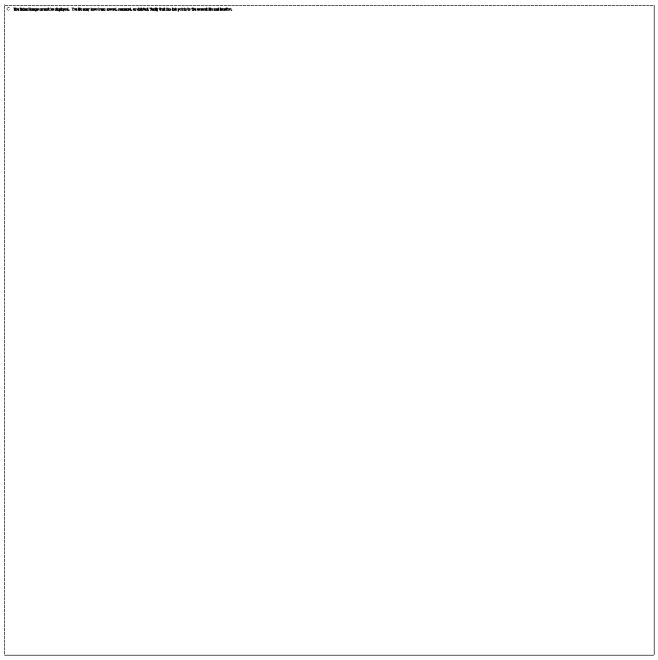
If speed, load-hauling and range represent the trifecta of motorized flight, many would argue you'll find that sweet spot in wing-in-ground effect technology, which has been kicking around for almost half a century. The Soviets tried it with their eight-engine Black Sea behemoths. Variations on the Alexander Lippisch-designed reverse delta single-engine skimmers have

been spotted in coastal and riverine settings from China to Australia.

Read more

The Royal Air Force Turns 100

JOY FINNEGAN

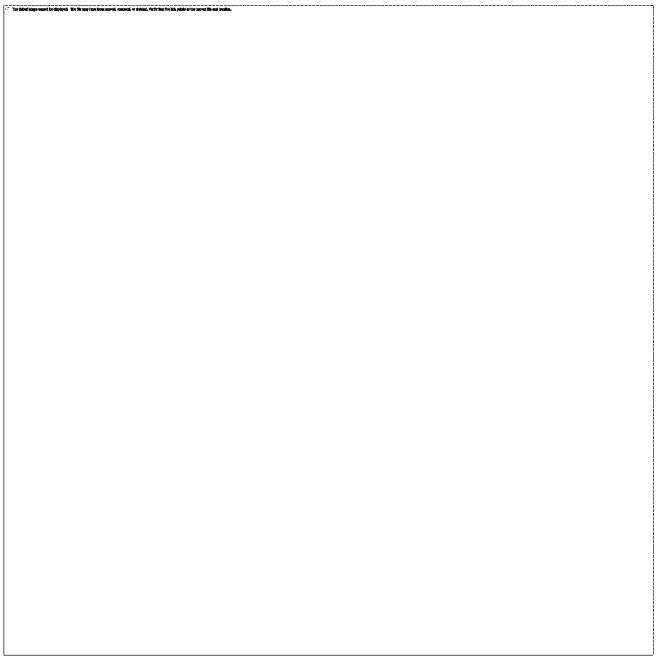


On April 1 the Royal Air Force celebrated its 100th birthday. The event is being celebrated by special events and activities across the UK running from April to the end of fall 2018. The main celebration event of RAF100 will take place on July 10 with a service in Westminster Abbey, followed by a parade in The Mall and a flight over Buckingham Palace.

Read more

Airshow Pilot OK After Crash

MARY GRADY



Airshow pilot Rob Holland was able to walk away after a forced landing that destroyed his custom MXS-RH aerobatic show plane last week. Holland said he was about 15 minutes into the flight, at 11,500 feet, when the airplane "had a catastrophic engine failure" and lost all power.

Read more

Question of the Week

NASA Super Computers Aim At Aircraft Noise

PAUL BERTORELLI

On an airliner, engines are a source of noise heard on the ground, but so is airflow over landing gear, flaps and slats. Using massive supercomputers to model airflow, NASA is seeking ways to reduce such noise. This AVweb video explains the project.

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For more information, call **(970) 726-5111** or click here.

Short Final: Bugs in a Jar

Spring brings with it the beginnings of rough air season, especially in mountainous terrain. This recent PIREP near Jeffco Airport (BJC) in Colorado puts it in vivid terms. BJC UA/OV BJC180010/TM 1823/FL075/TP C182/TB MOD/RM PILOT STATES/GETTING SHOOK LIKE A BUG IN A JAR

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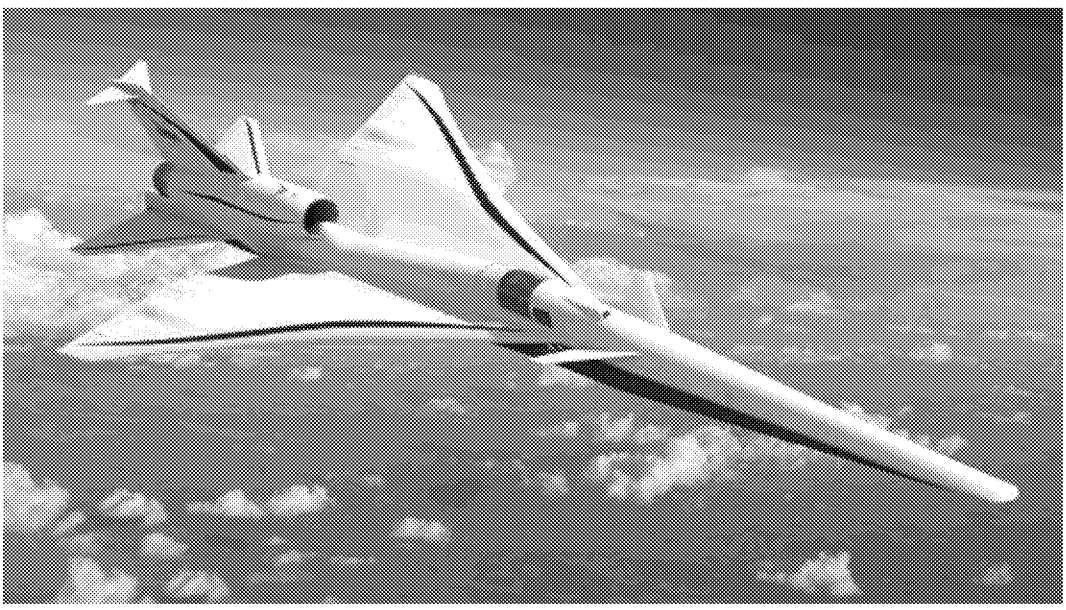
Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 4/3/2018 7:32:21 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: NASA hands massive supersonic contract to Lockheed Martin, with one catch: No sonic boom

NASA hands massive supersonic contract to Lockheed Martin, with one catch: No sonic boom

- **NASA awards $247.5 million cost-plus contract to Lockheed Martin to design and build a supersonic aircraft that does not create a traditional sonic boom.**
- **The defense contractor's Skunk Works division will continue development from a preliminary agency contract awarded in 2016.**
- **NASA will flight-test the experimental QueSST aircraft by the end of 2021.**

Michael Sheetz | @thesheetztweetz
Published 3 Hours Ago Updated 1 Hour Ago CNBC.com



Lockheed Martin

The Lockheed Martin Skunk Works' X-plane for NASA's Low-Boom Flight Demonstration contract.

Lockheed Martin has won a nearly quarter-billion dollar NASA contract to develop a plane capable of supersonic speed without creating the deafening sonic boom that comes with breaking the sound barrier.

The cost-plus NASA contract, valued at $247.5 million, will allow the defense contractor's secretive Skunk Works division to continue development of Lockheed Martin's Quiet Supersonic Technology (or QueSST) aircraft. This is "NASA's first X-plane in a generation," a Lockheed Martin spokesperson told CNBC on Tuesday.

"We look forward to applying the extensive work completed under QueSST to the design, build and flight test of the X-plane, providing NASA with a demonstrator to make supersonic commercial travel possible for passengers around the globe," program manager Peter Iosifidis said in a statement.

Under the low-boom flight demonstration contract, Lockheed Martin will have a prototype for NASA to test fly by the end of 2021.

Lockheed Martin has agreed to develop an experimental plane that will cruise at 55,000 feet and reach speeds of about 940 mph. While such an aircraft would traditionally create a sonic boom, NASA expects the new aircraft to create a sound of less than half the noise level — or more akin to the sound of a closing car door.

Current regulations ban commercial supersonic aircraft from operating over land. New companies like Boom Supersonic are trying to make use of the technology for transoceanic routes, with backing from investors like Richard Branson and Japan Airlines.

But Lockheed Martin and NASA want to advance the technology through noise reduction to overturn regulations. The new experimental plane is designed to return supersonic passenger air travel to routes over land. The last such flight was by the Concorde in October 2003.

This new contract is a separate venture from Lockheed Martin's work with Aerion Corp. to develop a supersonic business jet, the AS2, which has its first flight planned for 2023.

The NASA X-plane will be built at Lockheed Martin in Palmdale, California.

Bruce Maeroff
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Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
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2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
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ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

Message

From: Hoyer, Marion [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DCDB076983049369A80F430A9F1D067-HOYER, MARION]
Sent: 4/3/2018 6:25:46 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
CC: Parsons, Christy [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=bf0dabe0c058478294128cb3f842573d-Powers, Christina]; Cook, Rich [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0533cecf88ec45a986ff4d593f1c0737-Cook, Rich]
Subject: FW: Annual AEC Research Roadmap Meeting, 22-24 May 2018- TENTATIVE AGENDA
Attachments: Tentative Agenda_AEC Roadmap_2018_Ver.1.pdf

Are you planning to have a room where you listen in to parts of the AEC this year? If so, I might join you for some of this.

From: jeetendra.upadhyay@faa.gov [mailto:jeetendra.upadhyay@faa.gov]
Sent: Monday, March 12, 2018 4:36 PM
To: Anthony.Brown@nrc-cnrc.gc.ca; ARichard@haleyaldrich.com; Banavar.Sridhar@nasa.gov; Brian.Kim@pw.utc.com; bruce.e.anderson@nasa.gov; katie.constant-coup@faa.gov; daltherr@aerioncorp.com; david.p.duda@nasa.gov; dedoussi@mit.edu; DFusco@haleyaldrich.com; nicole.didyk-wells@faa.gov; dongwook.lim@asdl.gatech.edu; eli@boomsupersonic.com; fleo@massport.com; warren.gillette@faa.gov; Rangasayi.Halthore@faa.gov; James.Hileman@faa.gov; holger.pfaender@asdl.gatech.edu; hschlickenmaier@crownci.com; Cunping.Huang@faa.gov; huq@udel.edu; Ralph.Iovinelli@faa.gov; ivan.de-lepinay@easa.europa.eu; Daniel.Jacob@faa.gov; JNavarrete@nas.edu; jonathan.a.seidel@nasa.gov; Jonathan Levy <jonlevy@bu.edu>; Joseph.Zelina@ge.com; Kevin.Thomson@nrc-cnrc.gc.ca; kpreston@aci-na.org; krussell@dfwairport.com; larry.horowitz@noaa.gov; LiscinDS@utrc.utc.com; maryalice.locke@faa.gov; Mohammed.Majeed@faa.gov; martin.n.ross@aero.org; Mhuddleston@synterracorp.com; Paula.Miller@faa.gov; mkenney@kbenv.com; mkharkey@wisc.edu; George Noel <George.Noel@dot.gov>; pwhite@mst.edu; rick@aerodyne.com; robert.howard.13.ctr@us.af.mil; roger.wayson@wyle.com; ruv12@psu.edu; Samulski, Michael <samulski.michael@epa.gov>; Sandy@EnvironmentalAssistant.com; sarah.teigeiro@gardn.org; sbarrett@mit.edu; speth@MIT.EDU; jared.stout@faa.gov; synyka@googlemail.com; ted.mcdonald@tc.gc.ca; Theo.Rindlisbacher@bazl.admin.ch; tyacovitch@aerodyne.com; jeetendra.upadhyay@faa.gov; valenal@email.unc.edu; w.roquemore@us.af.mil; Wajid.Chishty@nrc-cnrc.gc.ca; Laszlo.Windhoffer@faa.gov; zap@nau.edu.ua; jennifer klettlinger <j.klettlinger@nasa.gov>; PehrsonJR@cdmsmith.com; RFREEMAN@lawa.org; Rudolph.Dudebout@Honeywell.com; sarav@email.unc.edu; steven.l.baughcum@Boeing.com; wendy.bailey@tc.gc.ca; ahanna@email.unc.edu; akao@environcorp.com; akhoday2@illinois.edu; alexander.polissar@dep.state.nj.us; alr@andrew.cmu.edu; RAlvarez@edf.org; andrew@ucar.edu; KANG@lawa.org; James.Arrighi@faa.gov; dave.atwood@faa.gov; barbara.m.esker@nasa.gov; benos@massport.com; Bernd.Kaercher@dlr.de; Nathan.Brown@faa.gov; cavalieri@wsu.edu; CGerencher@nas.edu; Charles.Frayne@US.AF.MIL; chengmd@ornl.gov; Christopher.M.Heath@nasa.gov; clarence.t.chang@nasa.gov; crshadd@sandia.gov; Csonka.CAAFI.ED@gmail.com; Cynthia.Ginestra@shell.com; Daniel.Czelusniak@faa.gov; damon.fordham@cadmusgroup.com; daniel.conley@navy.mil; David.christie@honeywell.com; David.j.luke@rolls-royce.com; Dcarbone@co.sanmateo.ca.us; ddn@aerodyne.com; derek.p.podboy@nasa.gov; Dolwick, Pat <Dolwick.Pat@epa.gov>; Domingo.sepulveda@pw.utc.com; dweibel@mit.edu; DZarubiak@haleyaldrich.com; ecotti@nbaa.org; Edwin.corporan@US.AF.MIL; epd@atac.com; Eric.Upton@gulfstream.com; erika.herms@easa.europa.eu; everett.palmer@nasa.gov; fayette.s.collier@nasa.gov; francisco.castaneda@us.af.mil; Frank.Bachman@ge.com; frank_binkowski@unc.edu; Gadavid@aol.com; Gearle.bailey@navy.mil; Giannelli, Bob <Giannelli.Bob@epa.gov>; gilles.bourgeois@tc.gc.ca; Fabio.Grandi@faa.gov; Greg.Smallwood@nrc-cnrc.gc.ca; h.pitsch@stanford.edu; hagen@mst.edu; Henry.B.Selkirk@nasa.gov; Scott Herndon <herndon@aerodyne.com>; curtis.holsclaw@faa.gov; Hoyer, Marion <hoyer.marion@epa.gov>; hp52@gatech.edu; Levent.Ileri@faa.gov; imad.khalek@swri.org; jacobson@stanford.edu; james.edwards@US.AF.MIL;

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Subject: Annual AEC Research Roadmap Meeting, 22-24 May 2018- TENTATIVE AGENDA

Hello All,

Please find the **Annual Aviation Emissions Characterization (AEC) Research Roadmap Meeting --TENTATIVE AGENDA** attached with this email. At this time, our FAA moderators are planning their sessions. I will send a more detail agenda with information on speakers and topics at later date.

I have already sent out the meeting invitation couple of weeks back. For those who still have not registered to meeting or interested in attending the meeting, please accept the invitation or reply me back to this message with your name and affiliation. Also, feel free to pass this meeting information to your colleagues who are interested in attending the meeting.

I look forward to seeing you in May 2018.

Best Regards,

Jeet

Jeetendra (Jeet) Upadhyay, Ph.D.
Federal Aviation Administration
Office of Environment and Energy
Emissions Division (AEE-300).
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Building 10A Room 902
Washington, DC 20591
(p) 202.267.0986
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Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 4/2/2018 7:30:32 PM
To: B.Owen@mmu.ac.uk; erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; charalambos.savvidis@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: RE: ESSTsg 27 March Telecon

Hi Bethan, et al,

Deliberative Process / Ex. 5

Thank you

Laszló Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: Thursday, March 29, 2018 7:10 AM
To: Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; charalambos.savvidis@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; giannelli.bob@epa.gov; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; leggett.cullen@epa.gov; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Liu, Sandy (FAA) <sandy.liu@faa.gov>; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: Re: ESSTsg 27 March Telecon

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Best wishes

Bethan

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but please check first as I am often travelling

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Manchester Metropolitan University

From: Bethan Owen <b.owen@mmu.ac.uk>
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Subject: Re: ESSTsg 27 March Telecon

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Best wishes,

Bethan

Dr Bethan Owen
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Manchester Metropolitan University

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Saturday, 24 March 2018 at 04:45
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "charalambos.savvidis@easa.europa.eu" <charalambos.savvidis@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov" <samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>
Subject: ESSTsg 27 March Telecon

Dear All,

As noted in our schedule & actions email below, we have our next call on 27 March at the usual time of 09:30 Eastern.

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Matters / Ex. 6

Laszlo Windhoffer
Federal Aviation Administration
T: +1.202.267.4741

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, March 15, 2018 1:52 PM
To: Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk;

jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; giannelli.bob@epa.gov; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; leggett.cullen@epa.gov; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Liu, Sandy (FAA) <sandy.liu@faa.gov>; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: RE: ESSTsg Schedule & Actions

Dear All,

Deliberative Process / Ex. 5

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

EASA

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Postal:Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: 12 March 2018 21:44
To: jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Herms Erika <erika.herms@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: ESSTsg Schedule & Actions
Importance: High

Dear ESSTsg,

Deliberative Process / Ex. 5

Please let us know if you have any questions.

Thank you,
Eric, Laszlo

Laszlo Windleffer
Federal Aviation Administration
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Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 7/19/2018 5:22:19 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: RE: Conversation w/Ralph on SST

Deliberative Process / Ex. 5

Regards,
Cullen Leggett
+1 734-214-4514

From: Mueller, John
Sent: Thursday, July 19, 2018 12:56 PM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: RE: Conversation w/Ralph on SST

Deliberative Process / Ex. 5

From: Leggett, Cullen
Sent: Thursday, July 19, 2018 11:47 AM
To: Manning, Bryan <manning.bryan@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: RE: Conversation w/Ralph on SST

Deliberative Process / Ex. 5

Regards,
Cullen Leggett
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From: Manning, Bryan
Sent: Thursday, July 19, 2018 11:31 AM
To: Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: RE: Conversation w/Ralph on SST

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
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From: Mueller, John
Sent: Thursday, July 19, 2018 11:22 AM
To: Manning, Bryan <manning.bryan@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: Conversation w/Ralph on SST

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,
John

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/13/2018 10:37:18 AM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: 1) Hypersonic airliner "may not be as hard as people think": Boeing CTO 2) Trump Choice Complicating FAA Administrator Nomination

1) Hypersonic airliner "may not be as hard as people think": Boeing CTO

- 10 August, 2018
- SOURCE: **FlightGlobal.com**
- BY: Stephen Trimble
- Washington DC

Hypersonic passenger travel still seems more like dreamy work of science fiction than a feasible commercial project, but this is now a fact: Boeing is working on it, and it's a serious project.

"It may not be as hard as people think it is," says Boeing chief technology officer Greg Hyslop, who quickly adds a caveat: "It's still going to be hard."

Boeing first unveiled its hypersonic airliner concept on 26 June at an aviation technology conference and highlighted it again at the Farnborough air show in July.

In an industry that has lacked a supersonic transport option since 2003, suddenly proposing a hypersonic airliner as a viable option within 20-30 years seems to register somewhere between the ambitious and the absurd.

But Boeing insists that it has found a combination of speed, materials and propulsion that can make a Mach 5-capable aircraft not only technologically achievable, but financially profitable at some point after around 2040.

They even think they have worked out a solution for one of the trickiest problems associated with hypersonic flight. To cruise at speeds around M5.0, the aircraft has to fly at an altitude between 90,000 and 95,000 feet. The passengers won't be wearing space suits, so they'll be seated in a pressurised cabin. So any event that causes a depressurisation at that altitude would be catastrophic.

"We're aware of it, and we'd thought about it," says Kevin Bowcutt, a Boeing senior technical fellow and chief scientist for hypersonics.

"And we have some very innovative approaches for dealing with it," he adds. "Basically, we've devised a concept that would keep the cabin pressurised even in a depressurisation event."

Bowcutt declines to elaborate further on the technical solution to the depressurisation problem.

Boeing's concept proposes a top velocity of five times the speed of sound. That happens to equal the commonly accepted threshold of hypersonic speed, but that wasn't the reason. According to Boeing's analysis, M5.0 is the limit achievable with the available structural, propulsive and fuel technology.

"We have the technology today and the design tools to do this," Bowcutt says. "We don't have to invent some new thing."

The engine for the hypersonic airliner is a good example. A M6.0 aircraft requires a supersonic combustion ramjet (or "scramjet") engine, a technology that still isn't mature after decades of research and demonstration. A M5.0 aircraft, however, has access to other propulsion options, Bowcutt says.

The fastest passenger-carrying aircraft with an air-breathing engine in history is the Lockheed SR-71A. It flew at speeds up to Mach 3.2 using two Pratt & Whitney J58 engines. The J58 featured a unique configuration called a turboramjet. The engine functioned like a turbojet up to about M2, then diverted air from the compressor into ducts that emptied in the afterburner. The effect was similar to a ramjet.

Boeing's hypersonic airliner also would use a turboramjet configuration, with some variations compared to the J58, Bowcutt says. Instead of ducting only a portion of the airflow around combustor over M2, Boeing's concept might bypass all of the airflow around the engine core at higher speeds, he says.

Bowcutt is familiar with hypersonic vehicles. He is credited as the "father of the X-51". He designed the vehicle in 1995 to become a missile, but it turned into a hypersonic demonstrator funded by the Air Force Research Laboratory. The X-51 used JP-7 fuel — the same kerosene formula that powered the SR-71A — as both a source of combustion and as a coolant system. Since the hypersonic airliner concept won't travel than M5.0, Bowcutt says, it doesn't require JP-7. Standard Jet-A fuel. Liquid methane or some combination of those fuels are options for the commercial aircraft.

Finally, Boeing selected M5.0 as the top speed because that greatly simplifies the structural materials. Instead of exotic, heat-absorbing materials like ceramic matrix composites, standard titanium alloys used in aircraft and jet engines today are strong enough to survive the surface temperatures ranging up to 600°C (1,100°F).

M5.0 is already 625% faster than a typical subsonic airliner cruising at M0.8, Bowcutt says. Higher speeds produce significantly greater challenges, with sharply dwindling returns. A M6.0 aircraft, for example, can fly only 20% faster than Boeing's concept, he explains, but requires the designer to use nickel instead of titanium and unproven scramjets instead of turboramjets.

That more than six-fold increase in speed also drives the business case for the hypersonic airliner.

Hyslop compares hypersonic technology to a supersonic airliner, like the M2.0 British Aerospace/Aerospatiale Concorde. That speed allowed the Concorde, in theory, to cross the Atlantic twice a day using the same crew (although British Airways and Air France chose not to exploit that advantage). By contrast, the hypersonic airliner, in theory, might be able to cross the Atlantic four or five times a day with the same crew, he says. The difference in utilisation rate potentially makes the hypersonic airliner more attractive than the costs of operating a supersonic jet, he says.

"Would that be the tipping out where it economically makes sense?" Hyslop asks, rhetorically. "This whole business about how frequently can you turn an airplane — the economic engineering — looks more intriguing to us the faster you can go. That might be a sweet spot."

2) Trump Choice Complicating FAA Administrator Nomination

By Russ Niles | August 12, 2018 **AVweb**

President Donald Trump's continued promotion of his personal pilot John Dunkin as the next FAA administrator is apparently the underlying cause of the lengthy delay in nominating a new administrator. And according to Politico and The Daily Beast it's frustrating congressional members on both sides on the aisle because a mutually acceptable candidate is already on the job. The publications say it's generally felt that Acting Administrator Dan Elwell would face little opposition in the nomination process, especially since he's been doing the job since Michael Huerta left in January. But Dunkin's presence is apparently forcing a stalemate.

Politico's analysis says the nomination of Dunkin would likely result in a protracted and polarized nomination battle in the Senate, something the Republicans don't want heading into the mid-term election. But Trump, who first proposed Dunkin for the job in the spring, is reportedly still lobbying for the nomination. The Daily Beast is suggesting the strategy now is to try to wait out Trump and leave things as they are until he loses interest. In the meantime, it would appear the first multi-year reauthorization of the agency in years is poised to pass and the lack of a confirmed administrator does not seem to be hindering any of the agency's work.

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Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/10/2018 4:46:39 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: NASA To Use X-59A QueSST Demonstrator To Seek Acceptance Of Low Booms

NASA To Use X-59A QueSST Demonstrator To Seek Acceptance Of Low Booms

Jul 20, 2018 William Garvey, Jessica A. Salerno and Molly McMillin | ***Business & Commercial Aviation*** **Aviation Week**

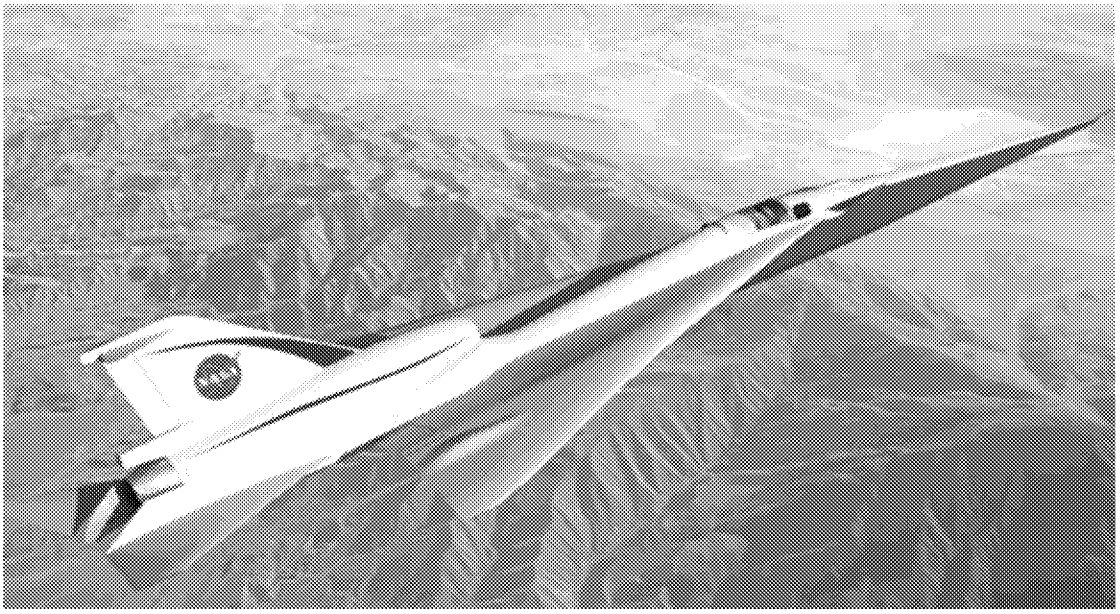
NASA has laid out a three-phase program to collect data on public acceptance of reduced sonic booms using the Lockheed Martin Skunk Works-developed low-boom demonstrator, which has been designated the X-59A QueSST.

Community response data gathered by the Low Boom Flight Demonstration (LBFD) program will be provided to the FAA and International Civil Aviation Organization to help define a standard for en route noise that will permit civil supersonic flight over land.

First flight of the X-59A from Skunk Works is scheduled for mid-fiscal 2021. In Phase 1, Lockheed will conduct initial checkout flights followed by envelope expansion flying into fiscal 2023, according to Craig Nickol, LBFD project manager.

The aircraft will then be handed over to NASA for Phase 2 — acoustic validation testing by Armstrong Flight Research Center at Edwards AFB in California. This will measure and characterize the reduced boom, or sonic "thump," in different flight and atmospheric conditions, he told the AIAA Aviation 2018 conference here June 28.

In Phase 3, "the rubber will hit the road," Nickol says, when the X-59A conducts a series of community-response tests. This will begin with an initial overflight survey at Edwards in the first half of fiscal 2023, followed by multiple campaigns in which the aircraft will be deployed to fly over representative U.S. communities in representative weather conditions.



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From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/9/2018 11:18:32 AM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: NASA To Start Quiet Boom Flights over Galveston in Fall

Business Aviation

NASA To Start Quiet Boom Flights over Galveston in Fall

by Chad Trautvetter
- August 7, 2018, 11:19 AM **AINonline**

Starting in November, NASA's F/A-18 testbed will be flown using a "quiet supersonic dive maneuver" to aim "quiet sonic thumps" at a community over Galveston to gauge residents' perception of the boom. (Photo: NASA)

To prepare for community overflights under its silent supersonic aircraft test program with the X-59 starting in 2023, NASA will fly an F/A-18 as it breaks through the speed of sound over Galveston, Texas, beginning in November. NASA's F/A-18 testbed will be flown using a "quiet supersonic dive maneuver" to "aim quiet sonic thumps at a specific area," a procedure that the agency first tested in 2011 over Edwards Air Force Base.

Teams from NASA Armstrong Flight Research Center, Langley Research Center, and Johnson Space Center, as well as industry partners, will conduct the data-gathering sonic-boom flights over Galveston. Afterward, some 500 resident volunteers will provide input via a secure website about what they've heard, if anything, and what they felt about the sound.

This effort will provide "key information" to support planning for NASA's future silent supersonic aircraft test program, which is intended to provide data supporting possible new noise standards and regulations allowing supersonic flight over land in the U.S.

"We are doing important research that is a precursor to a national effort to understand how people react to the sound of a quiet supersonic aircraft flying overhead," said NASA commercial supersonic technology project

manager Peter Coen. "We are learning about the best ways to engage communities, collect acoustic data, and conduct surveys in response to sounds that people…normally do not hear."

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Sent: 8/9/2018 10:07:29 AM
To: Daniel Jacob [Daniel.Jacob@faa.gov]; Laszlo Windhoffer [Laszlo.Windhoffer@faa.gov]; Maryalice Locke [maryalice.locke@faa.gov]; Ralph Iovinelli [Ralph.Iovinelli@faa.gov]; Warren Gillette [warren.gillette@faa.gov]
CC: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Draft Agenda Items for 2:00PM FAA/EPA call today (August 9) **Personal Security Detail / Ex. 6**

Hello All,

Below are suggested draft agenda items for the 2:00 FAA/EPA call today (August 9). Let us know if you have anything to add to the agenda.

Deliberative Process / Ex. 5

Thank You,

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Message

From: Herms Erika [erika.herms@easa.europa.eu]
Sent: 3/28/2018 10:49:07 AM
To: Bethan Owen [B.Owen@mmu.ac.uk]; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem [willem.franken@easa.europa.eu]; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; Hoermann Werner [werner.hoermann@easa.europa.eu]; Readman Guy [guy.readman@easa.europa.eu]; SAVVIDIS Charalambos [charalambos.savvidis@easa.europa.eu]; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: RE: ESSTsg 27 March Telecon

Hello Bethan,

Deliberative Process / Ex. 5

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

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An agency of the European Union

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 27 March 2018 21:48
To: Laszlo.Windhoffer@faa.gov; Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: Re: ESSTsg 27 March Telecon

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Best wishes,

Bethan

Dr Bethan Owen
Research Fellow
Manchester Metropolitan University
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Mobile 07920083914
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but please check first as I am often travelling

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http://www.mmu.ac.uk/emaildisclaimer "

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Saturday, 24 March 2018 at 04:45
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "charalambos.savvidis@easa.europa.eu" <charalambos.savvidis@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com"

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Subject: ESSTsg 27 March Telecon

Dear All,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Phone / Ex. 6

László Windhoffer
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Subject: RE: ESSTsg Schedule & Actions

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Deliberative Process / Ex. 5

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Subject: ESSTsg Schedule & Actions

Importance: High

Dear ESSTsg,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thank you,
Eric, Laszlo

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Message

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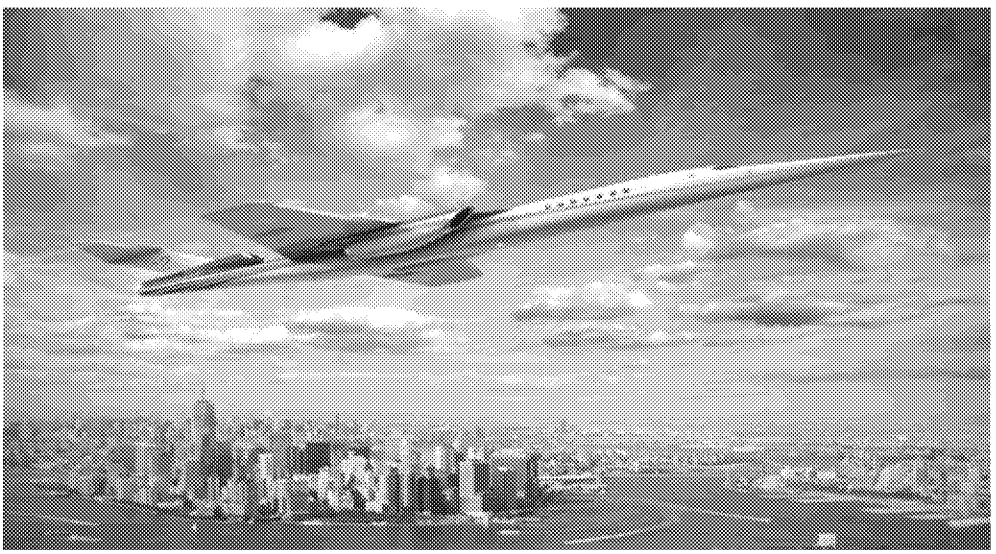
Subject: Aviation companies are plotting the return of supersonic flight — and they think their jets will be better than the Concorde

Aviation companies are plotting the return of supersonic flight — and they think their jets will be better than the Concorde

- Mark Matousek
- Apr. 29, 2018, 2:07 PM **Business Insider UK** **Aviation eBrief**



A rendering of Aerion's AS2 jet. Aerion

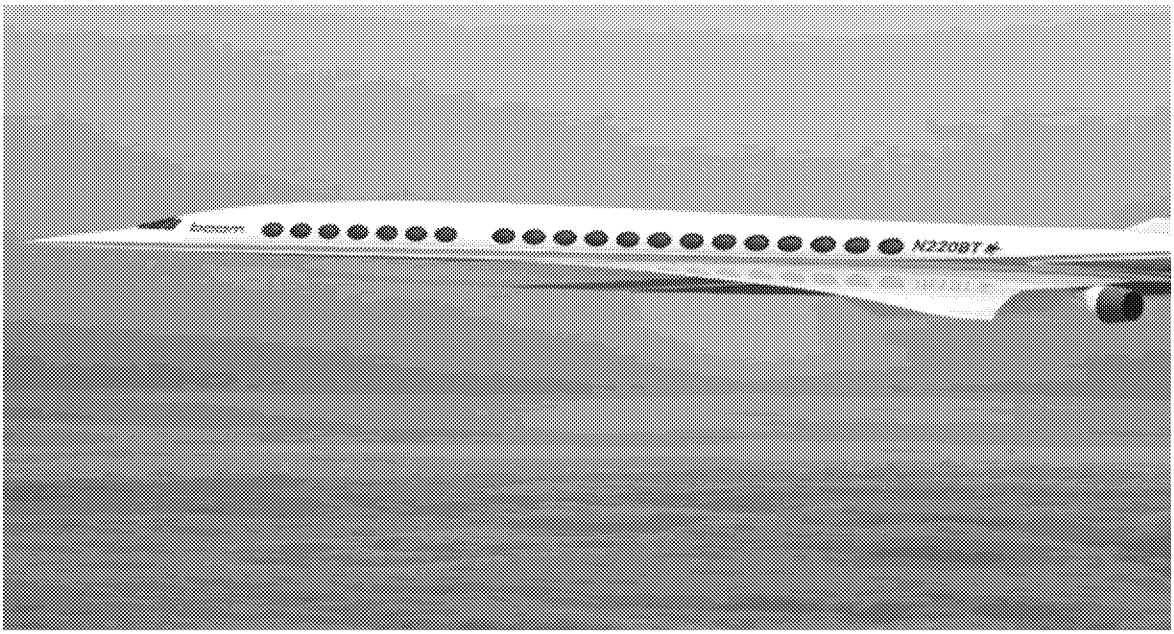
- **Since 2003, supersonic flight has been absent from the aviation industry.**
- **Aviation companies are hoping to introduce a new generation of supersonic jets over the next decade.**
- **They're touting new designs and materials they believe will improve performance.**

Since the Concorde was retired in 2003, supersonic flight has been absent from the aviation industry. Fifteen years later, three startups and a major defense contractor are plotting its return.

The Concorde made its first commercial flight in 1973, and for nearly 30 years, it allowed customers to cut overseas trips in half. A flight from New York to London would take about three hours and thirty minutes on the Concorde, compared to about seven hours on a standard, subsonic flight.

But the supersonic jet was expensive to operate, and the combination of a deadly accident in 2000 and an economic downturn after 9/11 led to its retirement in 2003.

Boom Supersonic wants to make flights affordable



Boom Supersonic thinks tickets on the XB-1 will cost around as much as today's business class fares. Boom

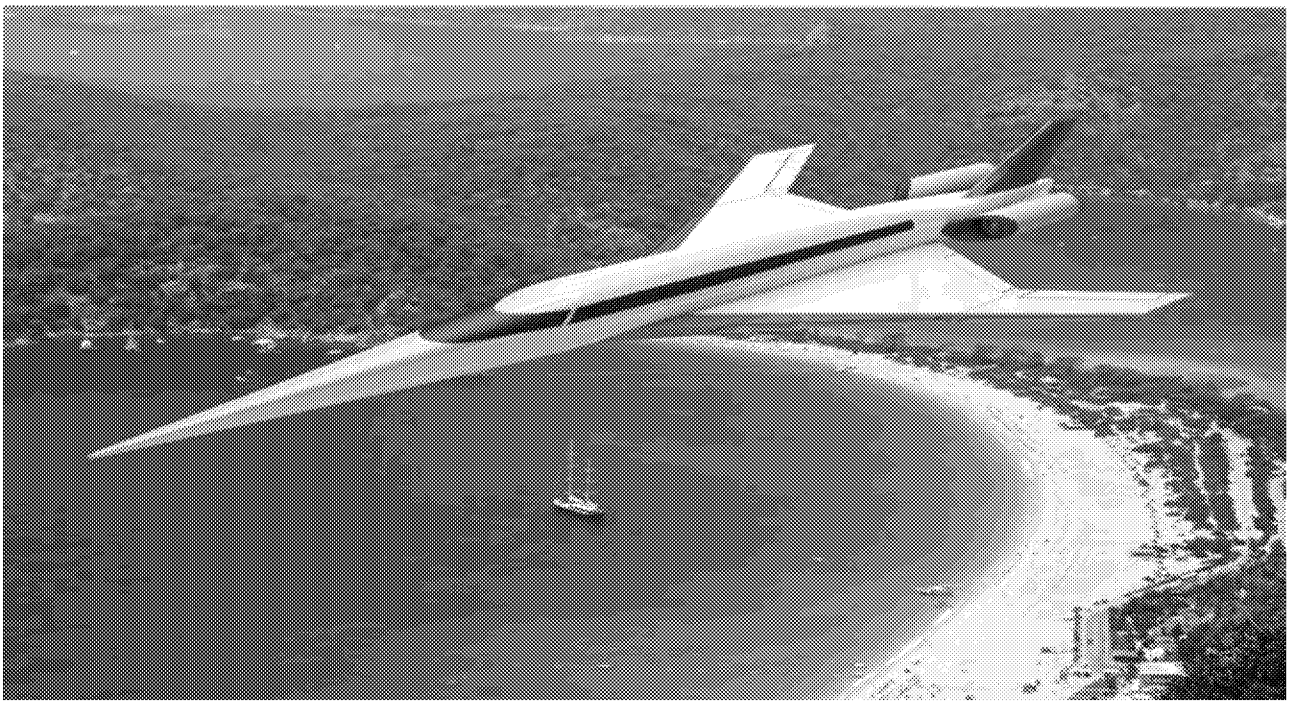
The companies working on the Concorde's successors believe improved designs and materials will result in superior performance. But their aircraft will still be expensive to operate and, given current regulations, unable to fly over land in the US and many other countries due to the loud sonic boom they produce.

Due to those constraints, the next generation of supersonic planes will focus primarily on business travelers and the kinds of wealthy clients who fly on private jets instead of commercial aircraft.

But one startup, Boom Supersonic, thinks its customers will be able to buy tickets on its 55-seat, XB-1 aircraft for a price similar to today's business class fares. The company says it will be able to fly at Mach 2.2 (Mach 1 is the speed of sound), which would make it the fastest commercial aircraft in history.

The XB-1 will be made from carbon composites and use design features the company says will improve its aerodynamic qualities. Boom has received over 75 pre-orders for the aircraft, which it plans to deliver in 2023, from customers including Japan Airlines and the Virgin Group. On Tuesday, Ctrip, China's leading online travel agency, announced its investment in the company.

Spike Aerospace believes it has conquered the sonic boom



Spike thinks the S-512's shape will help reduce its sonic boom. Spike Aerospace

Boom's competitors will focus on business executives who can afford to pay a premium for reduced travel times. Like Boom, they're touting their designs and materials.

Spike Aerospace CEO Vik Kachoria said the company's 18-seat, S-512 jet will reduce its sonic boom to a level that could be acceptable for flights over land due the jet's "cranked delta wing" shape, which resembles the Concorde with a lower portion of its wings removed. The company says the jet will be able to fly at Mach 1.6 and produce a perceived loudness level of less than 75 PLdB, lower than the Concorde's 105 PLdB. NASA has said 75 PLdB is the level at which supersonic aircraft could fly over land without creating a disruptive amount of noise.

"Engineering tools that weren't available when the Concorde was designed now enable us to really look at the aircraft and optimize it in a number of ways that make it more fuel efficient, make it quieter when it's flying—reduce that sonic boom—and provide a better experience for the passengers," Kachoria said in an interview with Business Insider.

The aircraft's main cabin replaces windows with wraparound screens that allow passengers to watch movies, display PowerPoint presentations, or watch footage captured by cameras on the jet's exterior. Spike plans to deliver the aircraft in 2023.

Aerion Supersonic hopes to be first to market

Aerion believes its AS2 jet will be the first to market. Aerion

Spike will compete most directly with Aerion Supersonic, which is aiming to deliver its 12-seat AS2 jet, with a maximum speed of 1.4 Mach, in 2025. The company has received an order of 20 aircraft from the fractional-ownership company Flexjet, and executive chairman and CEO Brian Barents said the aircraft will be the first to hit the market.

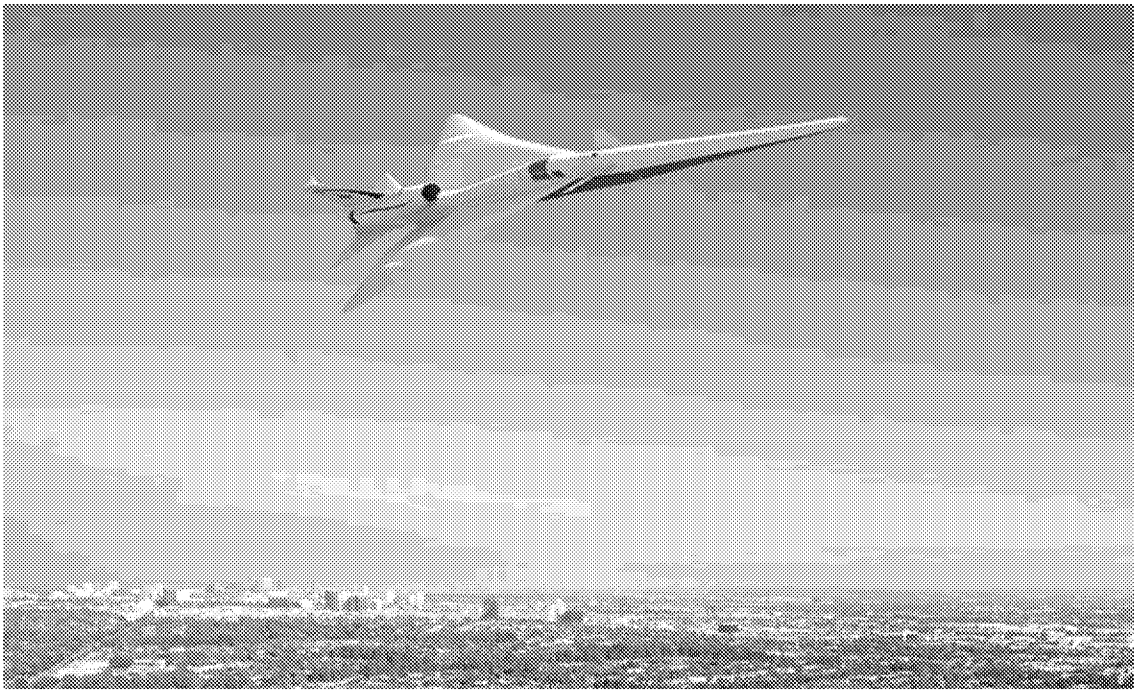
"We are on a clear path to bring this airplane to the market and be first to market," he said in an interview with Business Insider.

Barents emphasized the importance of using carbon fiber to build the AS2, and said the sturdy and lightweight material is one of the most significant developments in supersonic technology since the Concorde went out of commission. He said carbon fiber allows the jet to achieve supersonic natural laminar flow, a proprietary technology the company says can reduce drag on the wings by as much as 20% compared to the Concorde.

"Those design tools are not available to anyone else in the industry," Barents said.

In December, Aerion announced a potential partnership with Lockheed Martin that could result in a collaboration on the AS2. At the time of the announcement, Lockheed said it would spend a year deciding whether it wanted to join the project.

Lockheed-Martin is working with NASA



A rendering of what Lockheed-Martin's experimental aircraft may look like. NASA

David C. Richardson, the director of air vehicle technologies at Lockheed's Skunkworks, said other companies have approached it about potential collaborations on commercial supersonic aircraft over the past 15 years, but Lockheed turned down those proposals for various reasons, including insufficient funding, underdeveloped markets, and a reliance on regulatory changes.

Richardson said Aerion's proposal stood out because of the engineering behind the AS2 and the way Aerion described its commercial potential.

"It was the rigor of their technical work on the AS2 and their marketing and business story that led us to want to learn more and discover for ourselves what the potential could be of working together," he told Business Insider.

Lockheed may also have the best chance of influencing the regulations that forbid supersonic flight over land. Earlier this month, NASA announced that Lockheed had won a $247.5 contract to build an experimental aircraft designed to fly at supersonic speeds without producing a disruptive sonic boom. Lockheed will deliver the aircraft to NASA in late 2021, at which point the agency will test it over US cities to evaluate the amount of noise it emits.

Timelines for delivering aircraft may be optimistic

The Concorde went out of commission in 2003. AP

It's easy to become excited listening to the next generation of supersonic aircraft builders describe their products' capabilities, but aviation analyst Henry Harteveldt said some of their claims should be taken with a grain of salt.

Harteveldt, like Kachoria and Barents, doesn't think supersonic flight will be allowed over land in the next decade. In the near term, he said the aircraft companies like Aerion, Boom, and Spike are promoting can't be built with today's engine technology.

"Right now, we still have not made enough progress with the aircraft engines," he told Business Insider. " These are virtual aircraft that exist only in very slick video presentations and PowerPoint presentations and CAD designs. These are nothing more than RV campers with wings right now that will go nowhere without the engines."

While he believes the timelines set forth by Aerion, Boom, and Spike are optimistic (he expects supersonic flights to become available between 2027 and 2030), Harteveldt thinks that may be a good thing. Setting out ambitious, public objectives, could motivate them and ultimately improve their products.

"It's always good to have goals, right? If you don't have goals, you don't push yourself," he said.

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Subject: ICCT "Environmental performance of emerging supersonic transport aircraft" July 17, 2018 has been added to the H drive and attached below
Attachments: Environmental_Supersonic_Aircraft_20180717.pdf

ICCT's "Environmental performance of emerging supersonic transport aircraft" July 17, 2018 Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Environmental performance of emerging supersonic transport aircraft

Authors: Anastasia Kharina, Tim MacDonald, Dan Rutherford*

Date: July 17, 2018

Keywords: supersonic, aircraft fuel efficiency, NO_x, noise, ICAO

SUMMARY

Three U.S.-based startup companies are working to develop new supersonic transport (SST) aircraft for planned entry into service in the mid-2020s. There are currently no international environmental standards for such aircraft, which last flew in 2003. Policymakers are considering whether to develop new specific SST standards or to apply existing standards for subsonic aircraft to the new designs.

This paper provides a preliminary assessment of the environmental performance of new commercial SSTs. Results suggest that these aircraft are unlikely to comply with existing standards for subsonic aircraft. The most likely configuration of a representative SST was estimated to exceed limits for nitrogen oxides and carbon dioxide (CO_2) by 40% and 70%, respectively. A noise assessment concludes that emerging SSTs are likely to fail current (2018) and perhaps historical (2006) landing and takeoff noise standards.

On average, the modeled SST was estimated to burn 5 to 7 times as much fuel per passenger as subsonic aircraft on representative routes. Results varied by seating class, configuration, and route. In the best-case scenario, the modeled SST burned 3 times as much fuel per business-class passenger relative to recently certificated subsonic aircraft; in the worst case, it burned 9 times as much fuel compared to an economy-class passenger on a subsonic flight.

These findings suggest two pathways for further development of commercial SSTs. First, manufacturers could maximize the likelihood of meeting existing environmental standards by developing new aircraft based upon advanced, clean sheet engines. Second, policymakers could establish new environmental standards specifically for SSTs based upon the performance of poorer performing derivative engines. Such standards would allow for increased air pollution, noise, and CO_2 relative to new commercial aircraft.

INTRODUCTION

Aircraft produce about 3% of global carbon dioxide (CO_2) emissions and 11% of all CO_2 emissions from the transportation sector (EIA, 2018). The aviation sector is one of the fastest-growing sources of greenhouse gas emissions globally. Despite international agreements that call for reductions in CO_2, the International Civil Aviation Organization (ICAO) projects that CO_2 emissions from international aviation will triple from 2018 to 2050, given current trends (ICAO, 2013, 2016).

To mitigate this rise in CO_2 emissions, ICAO established two aspirational goals for international flights: fleet-wide fuel efficiency improvements of 2% annually through 2050, and zero net growth of aviation CO_2 emissions after 2020 (ICAO, 2010). In March 2017, ICAO formally adopted new global aircraft CO_2 emission standards for member states to implement starting in 2020. ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is expected to come into effect around the same time (ICCT, 2017).

Aircraft development is capital-intensive and risky; the vast majority of projects are undertaken by large airframe manufacturers, often with substantial government support. A more recent phenomenon is that of startups, often backed by major companies such as Boeing and Lockheed Martin, developing new aircraft

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* Kharina and Rutherford are with the International Council on Clean Transportation. McDonald is a Ph.D. candidate in the Department of Aeronautics and Astronautics at Stanford University.

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designs. Examples include companies developing electric-powered aircraft, such as Zunum Aero and Joby Aviation, and three companies in the United States developing new supersonic transport (SST) aircraft: Boom Supersonic, Spike Aerospace, and Aerion Corporation. Boom is developing a commercial airliner, while Spike and Aerion are focusing on supersonic business jets.

The potential return of supersonic flights could have large environmental and noise pollution consequences. In 2015, aviation was responsible for about 800 million metric tons of CO_2 emissions, or about as much as the German economy. New supersonic aircraft could lead to further emission increases if they are less fuel-efficient than new subsonic aircraft.

The previous generation of civil supersonic aircraft, the Aérospatiale/BAC Concorde and Tupolev Tu-144, took their first flights five decades ago. Currently, there are no environmental standards applicable to new supersonic designs. ICAO's Committee on Aviation Environmental Protection (CAEP) is now developing noise and emission certification standards for supersonic aircraft (FAA, 2018a).

This paper presents a preliminary analysis of a new commercial SST's performance in terms of fuel burn, CO_2 and nitrogen oxide (NO_x) emissions, and landing and takeoff (LTO) noise. Other environmental factors, including sonic boom, particulate matter, and stratospheric water vapor have not been addressed. The analysis uses publicly available data, expert engineering judgment, and an open-source aircraft conceptual aircraft design tool (SUAVE). The analysis addresses a key data gap since manufacturers are currently releasing little information about the environmental performance of their designs. The work is meant to inform policymakers' thinking about future standards for new supersonic designs until such time that higher-fidelity data is made available.

Table 1. SST startup companies.

Company	Aerion	Spike	Boom
Aircraft type	Business jet	Business jet	Airliner
Aircraft name	AS2	S-512 Quiet Supersonic Jet	—
Target entry into service	2025	2023	2023
Target speed	Mach 1.4	Mach 1.6	Mach 2.2
Target maximum range	7,780 km	11,500 km	8,300 km
Low-boom technology?	No	"Quiet supersonic flight technology"[1]	No
Corporate customers	Flexjet	—	Virgin Group Japan Airlines CTrip

[1] Spike Aerospace (2017b).

BACKGROUND

AIRCRAFT

There have been two commercial supersonic vehicles in the past: the Aérospatiale/BAC Concorde and the Tupolev Tu-144. Seventeen Tu-144s were manufactured, including 14 production aircraft that flew commercially 102 times before being decommissioned in 1978 (NASA, 2014). Concorde, while equally limited in production, had a more substantial service life. It flew its first scheduled supersonic passenger service in 1976 and the last in 2003. Both aircraft were powered by turbojet engines with afterburners, which led to high fuel burn and takeoff noise.

Three companies in the United States are currently developing new SSTs: Spike Aerospace, Aerion Corporation, and Boom Supersonic. Spike and Aerion are both focusing on business jet models, whereas Boom is developing a supersonic airliner.

Spike Aerospace (2017a), based in Boston, is collaborating with Siemens, MAYA Simulation, Greenpoint Technologies, BRPH, Aernnova, and Quartus Engineering Inc. Dubbed S-512, Spike's supersonic business jet is targeted to fly at Mach 1.6. Unlike Aerion and Boom, Spike's aircraft design would be powered by two engines, not three. It claims to use a "Quiet Supersonic Flight Technology" in designing its project airplane.

Aerion Corporation, Spike's competitor in delivering the first supersonic business jet, aims to perform the first flight of its AS2 aircraft in 2023 and to bring it into service in 2025. It is the only company to identify its engine manufacturer: General Electric. Aerion collaborated with Airbus in aircraft design and signed an agreement for co-development with Lockheed Martin, the developer of NASA's low-boom flight demonstrator experimental plane (or X-plane). This business jet is targeted to fly at Mach 1.4 using three engines.

Boom Supersonic is developing a 55-seat commercial jet capable of operating at Mach 2.2 with a design range of 4,500 nautical miles (8,300 km). Boom is not developing a specific technology or design to

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suppress sonic boom; instead, it is relying on the use of a newer engine and better aerodynamics than Concorde's to manage sonic boom. It is developing a one-third–scale supersonic airplane that will demonstrate Boom's technology prior to finalizing its airliner design. Boom claims that its aircraft "won't pollute any more than the subsonic business-class travel it replaces" (Dourado, 2018). Table 1 summarizes key elements of these three companies and their products.

Several government agencies are also involved in supersonic development. NASA has been a major player in SST technology development for decades, including building several supersonic X-planes. The agency's next supersonic X-plane, the Low Boom Flight Demonstrator, will be built by Lockheed Martin and delivered in 2021 (NASA, 2018). On the other side of the Atlantic, the European Union (EU) is funding the Regulation and Norm for Low Sonic Boom Levels, or RUMBLE. RUMBLE[1] aims to develop and assess sonic boom prediction tools, study the human response to sonic boom, and validate the findings using wind-tunnel experiments and flight tests. This is part of the effort by the EU to assess the "social acceptability" of new designs to support European regulatory development.

POLICY

The development of new supersonic aircraft designs will be influenced by international aviation standards. Those are decided by ICAO, the specialized UN agency that sets recommended standards and practices for civil aviation worldwide. Currently, international standards to support the certification of new supersonic aircraft and engines are not in place.

1 https://rumble-project.eu/#/.

The ICAO noise standard does not include a regulatory limit for supersonic aircraft (ICAO, 2014a). In 2004, CAEP formed a supersonic task group under its Working Group 1, which focuses on noise pollution. This group has been monitoring the development of supersonic technologies in order to develop eventual en-route (sonic boom) and LTO noise standards.

Although the United States is an active participant in CAEP negotiations, it is moving forward independently to regulate supersonic aircraft noise. Citing concerns about sonic boom, the Federal Aviation Administration (FAA, 1973) banned civilian aircraft from flying faster than Mach 1 over U.S. soil. This contributed to effectively banning Concorde operations over the continental United States and limited its movement to transoceanic routes. Language currently incorporated into the 2018 FAA reauthorization bill would undo that restriction (U.S. Government Publishing Office, 2018).

Separately, the FAA (2018a) is initiating a process to develop U.S.-specific standards for civil supersonic aircraft noise, including a proposed rule for LTO noise certification of supersonic aircraft. This rulemaking process may or may not be in line with ICAO's standard setting. If the United States sets its own standards for SSTs, other countries may adopt operational restrictions on those aircraft. Thus, it is unlikely that the U.S. government will adopt a national standard instead of coordinating internationally through ICAO.

On the emissions side, ICAO has aircraft engine emission certification standards for engines capable of supersonic flight based on the Concorde (ICAO, 2017a). However, in 2007, CAEP agreed that these stringency limits are outdated and should not be applied to new supersonic designs (ICAO, 2014b).

The lack of supporting standards for both noise and engine emissions complicates the development of new supersonic aircraft. Without international standards providing regulatory certainty that their aircraft can be sold and operated worldwide, major manufacturers will be reluctant to invest in new designs. But developing an emission standard within ICAO typically requires primary flight and engine test data for a wide variety of aircraft types. Negotiations among ICAO member states can be slow. For example, the 2016 ICAO CO_2 standard (ICCT, 2016) took seven years, or more than two CAEP cycles of three years each, to develop. Typically, an additional four years of lead time is provided before new standards take effect.

Two general approaches are under consideration: either to develop specific, SST-only standards for new aircraft, or to require that new designs comply with existing LTO NO_X, noise, and CO_2 standards for new subsonic airplanes. Separately, both the economic viability and public acceptability of new supersonics will depend in part on their fuel efficiency. Four metrics—NO_X emissions, noise, cruise CO_2 emissions, and mission fuel burn—are explored in this paper.

METHODOLOGY

SCOPE AND OVERALL APPROACH

According to the FAA (2018b), jet fuel consumption for commercial flights accounts for more than 90% of total U.S. jet fuel consumption for both domestic and international operations. Globally, general aviation is understood to be about 2% of total aviation fuel use (GAMA,

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2009). Because business jets are a small contributor to overall emissions, we decided to focus on commercial supersonics in this analysis.

The first step in the analysis is to identify a representative commercial SST design. Boom Supersonic, the only company currently developing such an aircraft, provided that basis. Boom has received support from a variety of investors and customers. In March 2017, Boom (2017) announced that it had received $41 million in funding including from Y Combinator, Sam Altman, Seraph Group, Eight Partners, and others. Japan Airlines provided $10 million in addition to 20 aircraft preorders, while Virgin Atlantic holds an option on 10 aircraft. All in all, Boom has received 76 aircraft commitments across five airline customers (Etherington, 2017).

Boom is aiming for a 2023 entry into service for its aircraft. Before building its airliner, Boom is building a one-third-scale demonstrator aircraft dubbed XB-1 or "Baby Boom." Subsonic flight tests are planned near Boom's hangar at Centennial, Colorado, followed by supersonic flights at Edwards Air Force Base in Southern California for technology validation purposes.

At the start of this project, Boom was contacted for information about the design and performance characteristics of its aircraft. General confirmation of publicly available data was provided, but no detailed information regarding engine specification was offered.

The following public information was available to support this assessment. A three-view drawing on Boom's website was used to develop the geometric representation necessary for aerodynamic calculations (see below). Boom also provides estimated routes, travel times, ticket prices, and fuel costs on its website. Relative to present-day subsonic service, supersonic travel on Boom airliners is claimed to save more than half the time it takes to fly trans-Atlantic, and a little less than that for trans-Pacific, because the latter would require a refueling stop due to range limitations. Boom estimates one-way ticket prices for three routes: $3,200 between Tokyo and San Francisco, $3,500 between Los Angeles and Sydney, and $2,500 between New York and London. The company also claims a fuel efficiency similar to that of existing premium-class twin-aisle aircraft.

The following sections describe the tools and assumptions used to estimate NO_x and CO_2 emissions, noise, and mission fuel burn of a reference commercial SST based on Boom's design. These values are compared against current ICAO subsonic emission standards and the fuel burn of equivalent commercial aircraft on representative missions.

TOOL SUMMARY

To evaluate new supersonic aircraft, we chose SUAVE (Lukaczyk et al., 2015), an open-source conceptual aircraft design tool with development currently led by Stanford University. It was specifically designed to be able to evaluate the performance of unconventional aircraft, including supersonic configurations.

The aerodynamics model derived from SUAVE was used for both subsonic and supersonic conditions (Lukaczyk et al., 2015). These low-fidelity methods have been validated against Concorde performance numbers. Details are available in the initial SUAVE paper, with minor refinements made over time. Because the reference SST aircraft is largely the same shape as the Concorde, we expect that these methods will hold. However, we also recognize the availability of more advanced design and manufacturing methods, such as using the area rule to design a fuselage with reduced wave drag. As a result, the overall lift/drag ratio of the vehicle was improved by an average of 10% from the value initially calculated under the low-fidelity methods.

The engine model used in this work is a low-fidelity model built into SUAVE. High-level engine cycle parameters—namely bypass ratio, overall pressure ratio, and turbine inlet temperature—are used as inputs into the model. Efficiencies of the engine components are based on technology level estimates from Mattingly (2006). From these parameters, the thermodynamic equations are solved across the engine components to find the temperature and pressure at each combustion stage, along with the final exit jet velocity.

Piano 5 aircraft performance and design software (Lissys Ltd., 2017) was used to compare estimated supersonic aircraft fuel burn with comparable subsonic transport. Two subsonic aircraft were chosen as baseline: Airbus A321LR (long range) and Boeing B787-9. The narrow-body A321LR was chosen because of its similarity in overall weight and range capacity to the Boom aircraft, which makes it suitable for trans-Atlantic flights. The B787-9 was chosen to represent conventional transoceanic travels on a twin-aisle aircraft without a refueling stop. Both aircraft are state-of-the-art subsonic aircraft at the time of writing and will be representative of newer in-service aircraft when new commercial SSTs enter into service.

The mission profile used in modeling is based roughly on the profile flown by Concorde. We used the full mission profile to include the fuel burn used in the climb portion of the mission. In the

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Table 2. Airframe parameters used for modeling.

Parameter	Value	Source
Maximum takeoff mass (kg)	77,000	www.flightglobal.com/news/articles/dubai-boom-to-make-a-big-noise-at-show-about-shorte-442767
Design range (km)	8,300	https://boomsupersonic.com/airliner
Maximum passengers	55	https://boomsupersonic.com/airliner
Design speed (Mach number)	2.2	https://boomsupersonic.com/airliner
Length (ft)	170	https://boomsupersonic.com/airliner
Wingspan (ft)	60	https://boomsupersonic.com/airliner
Reference geometric factor[a] (m^2)	80	Estimated
Balanced field length (ft)	10,000	https://boomsupersonic.com/airliner
Cruise altitude (ft)[b]	60,000	https://techcrunch.com/2017/01/12/boom-shows-off-its-xb-1-supersonic-demonstration-passenger-airliner
Engine	Medium-bypass-ratio turbofan, no afterburner	https://blog.boomsupersonic.com/why-we-dont-need-an-afterburner-a4e05943b101

[a] Reference geometric factor, which approximates an aircraft's pressurized floor area, is used to calculate the CO_2 standard metric value. The metric value is used to demonstrate compliance with ICAO's CO_2 standard (see below).
[b] We reduced the cruise altitude slightly in our analysis to meet a lower average altitude more consistent with a cruise-climb to 60,000 ft.

SUAVE framework, missions are constructed as a series of segments that are further split into control points. At each control point, conditions (altitude, speed, climb rate, etc.) are specified, and the equations of motion are solved to determine aircraft performance. This is done iteratively, segment by segment, to determine the full mission performance. See Lukaczyk et al. (2015) for further details of the mathematics involved.

MODEL CONSTRUCTION

Parameters for the SST model were determined primarily using publicly available information on Boom's aircraft. In general, Boom's statements of its designed capability were taken as truth; we did not modify estimates for parameters such as maximum takeoff mass or engine bypass ratio based upon our own expert judgement. This may lead to overestimating the real-world performance of the reference SST aircraft. The high-level airframe parameters used in the model are shown in Table 2.

We used a three-view drawing available on Boom's website to develop the geometric representation necessary for aerodynamic calculations. The measurements were made with Digimizer, a digital measurement tool (MedCalc Software, 2018). We used the tool to estimate all airframe geometric parameters except for wing and vertical tail thickness. An OpenVSP (Fredericks, 2010) model based on these estimates is used to determine wetted areas. For the wing and tail thickness, we assumed that Boom would be able to create structures slightly thinner than Concorde, reducing the wing's maximum thickness from 3% to 2.25%. The vertical tail is assumed to be slightly thicker than the wing at 3.5% of the chord length. See Table A1 in the Appendix for the full list of geometric parameters.

Boom's exact engine configuration has yet to be announced. The company aims to develop an aircraft with a medium bypass–ratio turbofan using an existing core and no afterburners. A clean-sheet turbofan engine would provide lower noise, emissions, and fuel burn but with a higher development cost. Currently, no manufacturers are producing commercial turbofan engines that could operate at Mach 2.2. An alternative approach, described in Fehrm (2016), would be to develop a commercial SST using an engine derived from an in-production military turbojet aircraft.

We assume that the new supersonic aircraft will use a variable-geometry nozzle, as Concorde did, that will be capable of keeping the flow nearly perfectly expanded. The result is an idealized engine that provides accurate values when operated near its design point, which means that climb and cruise values are expected to be representative of a well-designed engine with the parameters specified in Table 3. Although doubts have been raised about the capability of constructing an efficient engine with the properties specified (Fehrm, 2016), we provide this analysis assuming that such an engine can be designed. We therefore expect that the calculated emissions will be optimistic.

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Three engine models were developed to span the range of possible performance: most likely (derivative turbofan), best case (clean-sheet turbofan), and worst case (derivative turbojet). For the most likely case, we examined an engine expected to be usable on the Aerion AS2 based on the CFM56 (Fehrm, 2018). In its expected Mach 1.4 flight condition with refanning, the engine would have a lower-pressure compressor (LPC) pressure ratio of 2, a high-pressure compressor (HPC) pressure ratio of 10, and a turbine inlet temperature (T4) of 1650 K. To adapt this for Mach 2.2 flight, we assume that the pressure ratio is limited by the temperature at the compressor outlet as a result of material temperature limits in the compressor (Fehrm, 2016). This provides us with a HPC compression ratio of about 7.5. We also assume a bypass ratio of 3, consistent with Boom's stated engine plan. This may be optimistic given the resulting high ram drag on Mach 2.2 operations.

To represent the best-case scenario, we created an advanced engine aimed at meeting NASA's N+2 goals for supersonic aircraft (Welge et al., 2010). In this case, the assumption of a clean-sheet design allows us to vary T4 to find the maximum efficiency. We assume a compressor outlet temperature limit of 720°C for this design (Welge et al., 2010). This provides a somewhat more efficient engine. As a clean-sheet design, this engine would be more advanced, and therefore more complex and costly, than the derivative turbofan that near-term SST manufacturers are likely to deploy.

Our final engine is a turbojet based on an in-production military engine (EJ200) with constraints suggested in the series of articles on supersonic aircraft by Fehrm (2018). In this case, the compressor outlet temperature is limited to below 700°C. This engine provides a worst-case scenario estimate on engine performance, although it is unlikely to be used for commercial aircraft because of excessive noise. An aircraft based on this existing military engine could be brought to market more easily and more cheaply than one using a turbofan.

Table 3. Engine parameters used for modeling.

Parameter	Configuration		
	Best	Most likely	Worst
Engine type	Clean-sheet turbofan	Derivative turbofan	Derivative turbojet
Bypass ratio	3.0	3.0	—
Overall pressure ratio	15	15	13.8
Turbine inlet temperature (K)	1850	1650	1800
Landing and takeoff thrust available (lbf)	40,000	50,000	30,000
Top of climb thrust available (lbf)	7,600	8,200	9,200

We checked that these engines are capable of producing the required takeoff and cruise thrust. Boom claims a takeoff thrust in the range of 15,000 to 20,000 lbf per engine (Trimble, 2017). We estimate the need for about 7,000 to 8,000 lbf per engine in cruise and somewhat more than that for climb. Our analysis indicates that this performance is possible for all three engines with resizing.[2] All engine models use the same component efficiencies. Table 3 summarizes the engine parameters used in the modeling.

Uncertainty in the aerodynamic performance of the representative SST was captured by varying the level of assumed aerodynamic improvement over the Concorde. Improvements of 20%, 10%, and 0% (no improvement) in the lift-to-drag ratio were assumed for the best-case, most likely, and worst-case configurations, respectively.

FUEL EFFICIENCY DETERMINATION

The fuel efficiency of the reference SST was compared to existing subsonic standards and aircraft using two metrics: the ICAO CO_2 metric value (CO2MV) (ICCT, 2016) and mission fuel burn.

The ICAO CO2MV is based on the maximum specific air range (SAR), which is a measure of cruise fuel efficiency. The MV is expressed as $1/(SAR \times RGF^{0.24})$, where RGF is the reference geometric factor determined by multiplying the pressurized fuselage length by the fuselage width. This approximates the amount of usable space in the aircraft. We estimate the pressurized length of the reference SST to be about 35 m and the width to be about 2.3 m.

Maximum SAR measures the distance (km) traveled per mass (kg) of fuel under optimal flight conditions. To calculate it, the aircraft is simulated at a variety of altitudes and cruise speeds to find the condition that

2 Note that LTO thrust exceeds what is needed because engines must be sized for top-of-climb thrust. Additional uncertainty is also present at takeoff because the design mass flow near zero speed is not available. It is expected that engines for new SSTs will be derated to bring them in line with LTO requirements.

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gives the maximum value. In addition to finding the maximum cruise SAR, we also find the maximum SAR at Mach 2.2 and at subsonic conditions. Those values are important because SSTs will be required to fly over many countries subsonically and will likely not fly at maximum supersonic SAR if the associated speed is too low.

We next analyzed mission fuel burn. This is defined as gate-to-gate fuel burn minus fuel used to taxi the aircraft. To determine this, we use climb and descent segments similar to what Concorde performed, along with a cruise segment at constant altitude. Although we expect that the new supersonic aircraft will perform a cruise-climb to reduce fuel burn slightly, this would reduce mission fuel burn on the order of only 1 to 2%. Modeling an optimal trajectory is therefore not necessary to reach the level of accuracy targeted in this study.

Three different origin-to-destination missions were chosen for the analysis, corresponding to routes highlighted by Boom: San Francisco–Tokyo (SFO-NRT), Los Angeles–Sydney (LAX-SYD), and New York–London (JFK-LHR). Because of the SST's shorter design range, we assume that a refueling stop would be needed in Anchorage (ANC) and Tahiti (PPT) for the first two routes, respectively. These routes and distances are shown in Figure 1.

Mission distances were assumed to be great-circle distances if there is not a substantial land mass under the route. Because the great-circle distance for the ANC-NRT route includes about 1,000 km traveling over Alaska, we estimated a subsonic flight over Alaska at a speed matching optimal subsonic SAR. This created a slightly slower (15 min) but more fuel-efficient flight path relative to a purely supersonic, longer-distance route that requires flying south out of ANC to clear Alaska's southern edge.

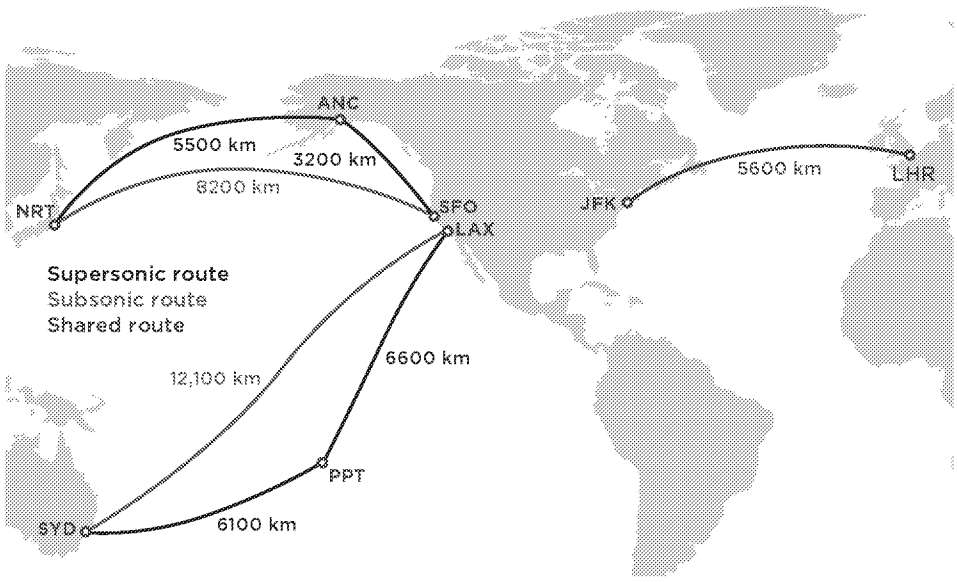

Figure 1. Routes investigated. (Source: GCmap.com)

The analysis distinguishes between premium (both supersonic and subsonic) and economy (subsonic only) service. We assumed a load factor of 80% for economy and 60% for premium passengers based on Bofinger and Strand (2013).[3] To apportion fuel use between premium and economy seats on the subsonic aircraft, we assigned a weighting factor of 2 to 1 to account for the greater floor area of long-haul premium seats (ICAO, 2017b).[4] Freight was assumed to be negligible for narrow-body aircraft and the SST, whereas for wide-body aircraft it was assumed to be 16% of total payload for flights operating between North America and the Pacific or Southeast Asia/Oceania, and 34% of total payload for flights operating between North America and East Asia (ICAO, 2018).

To determine the aircraft takeoff weight for each SST mission, we first used the maximum takeoff weight in a generic full-range mission of 4,500 nautical miles. The landing weight was determined, corresponding to the sum of the payload, reserve fuel, and aircraft empty weight. This landing weight was then reduced to account for the 60% load factor assuming 100 kg per passenger. This provided the expected landing weight for each origin/destination-specific mission. The mission

3 Transparent load factor data for both premium subsonic and supersonic seating is limited. On subsonic operations, Delta reported an estimated first-class load factor of 57% in 2015 (Anderson, 2015). For supersonics, the Concorde's load factors were highest between London and New York and between Paris and New York for British Airways and Air France, respectively. BA's load factors between JFK and LHR were reported to be between 50 and 60% in 2002 (Kingsley-Jones, 2002) and as high as 73% in the first six months of operations in 1978 (Witkin, 1978). Air France achieved load factors above 60% on its Paris–New York and Paris–Rio de Janeiro routes (ibid.). Other routes, including Paris–Caracas and London–Bahrain, experienced load factors well below 60%.

4 Bofinger and Strand (2013) calculated a business-class to economy-class emissions multiplier of 1.86 to 2.71 for flights where the passenger weight share is 12.5% of the total aircraft weight, close to the simple average of subsonic flights in this analysis.

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was then solved iteratively to determine what takeoff weight (and therefore fuel burn) would be needed to land at the specified weight.

In modeling the mission fuel burn of subsonic aircraft, default Piano 5 values for operational parameters such as engine thrust, drag, fuel flow, available flight levels, and speed were used.

Cruise speeds were set to allow 99% maximum specific air range. Flight times were estimated by including 20 min of taxi time (both in and out) for all flights, plus 30 min for refueling for routes longer than the range of the SST (Figure 1).

EMISSIONS AND NOISE

NO_x emissions were estimated for the most likely and best-case scenarios using emissions data for in-production engines in the ICAO engine emissions databank (ICAO, 2018).

An exponential curve of NO_x emission indices versus overall pressure ratio (OPR) for current CFM56 (CFM56-5 and -7) engine data was used to adjust the emissions values.[5] These engines use rich-quench-lean (RQL) combustor technology. For the most likely (derivative turbofan) engine, no further adjustments were made. LTO emissions for the best-case engine (i.e., clean-sheet turbofan) were estimated by correcting for the lower emissions of the LEAP engine family relative to current CFM56 engines.

Building a sophisticated noise model was beyond the scope of this work, so we instead used exit jet velocities to investigate likely noise characteristics. The jet velocity is found by taking a mass-weighted average of the core and fan velocities from SUAVE's engine model. The accuracy of these jet velocities depends on the engine's capability to operate at an ideal nozzle area ratio, which assumes that the engine has a variable nozzle that can reach the necessary outlet area. Boeing has determined that a jet velocity of 1,100 ft/s will be sufficient to meet Chapter 3 minus 10 to 20 EPNdB[6] (Welge et al., 2010). Research suggests that the lateral noise limit is the key determinant of passing noise standards stricter than Chapter 3, so we focused specifically on that value.

RESULTS

Table 4 summarizes the results for LTO NO_x and cruise CO_2 (CO2MV) emissions of the reference SST aircraft relative to existing subsonic standards. Values for the most likely, best-case, and worst-case configurations are summarized, along with their regulatory values and the year each standard takes effect. Regulatory limits for NO_x are set as a function of overall pressure ratio, whereas standards for CO_2 are set as a function of aircraft maximum takeoff mass. NO_x emission estimates were not available for the worst-case configuration because emissions data is not available for military engines.

As Table 4 indicates, the reference SST is unlikely to meet existing commercial aircraft standards. It exceeded allowable LTO NO_x limits by 38% in the most likely configuration, and CO2MV limits by 52% to 115%, with a most likely exceedance of 67%. The best-case, advanced clean-sheet engine was

Table 4. Modeled NO_x and CO_2 performance of SST aircraft by configuration.

Pollutant	Standard[a]	Year	Parameter	Configuration		
				Best	Most likely	Worst
NO_x	CAEP/8	2014	Overall pressure ratio	15	15	13.8
			SST (g/kN)	18	40	—[b]
			Standard (g/kN)	29	29	—[b]
			Exceedance	–37%	+38%	—[b]
CO_2	CAEP/10	2020	Maximum takeoff mass (kg)	77,000		
			SST (kg/km)	1.21	1.33	1.72
			Standard (kg/km)	0.80		
			Exceedance	+52%	+67%	+115%

[a] ICAO's environmental standards are referenced to the meeting at which they were agreed. ICAO's current CAEP/8 (NO_x) and CAEP/10 (CO_2) standards were finalized in 2010 and 2016, respectively.
[b] NO_x emission estimates were unavailable for this configuration.

5 This fit line is generally consistent with typical NO_x correlation equations, such as the one found in the GasTurb manual, which is a widely used program for calculating engine cycle parameters (GasTurb, n.d.). This approach has the added benefit of providing NO_x data for all of the required mode settings, whereas the SUAVE model cannot handle off-design conditions.

6 The ICAO Chapter 3 noise standard, applicable since 1978, is the current operational noise standard in many ICAO member states including the United States and Europe. This means that airplanes that do not comply with the Chapter 3 noise standard are not allowed to fly. The Chapter 4 noise standard, applicable from 2006 to 2017, is 10 EPNdB (cumulative) quieter than Chapter 3. The current applicable noise standard, Chapter 14, is 17 EPNdB (cumulative) more stringent than Chapter 3.

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estimated to comply with the latest subsonic NO_x standards. This finding is consistent with the view that staged lean-burn combustors can considerably reduce NO_x emissions. Note that the CO2MV results are more certain than the NO_x estimates.

A detailed assessment of noise certification levels is beyond the scope of this work. Some simple observations can be made, however. Relative to the jet exit velocity limit of 1,100 ft/s identified in Welge et al. (2010), SUAVE's engine model predicts a jet exit velocity of 1,350 ft/s in the most likely configuration, and 1,550 and 3,400 ft/s for the best- and worst-case configurations, respectively. This implies that the aircraft would not meet existing (Chapter 14/Stage 5) standards. Engine derating, combined with modified landing and takeoff procedures, is believed to be needed to bring new SST aircraft into compliance with the 2006 Chapter 4 noise standards (Welge et al., 2010). Certification to current subsonic noise standards is likely to require additional technological solutions—for example, a clean-sheet advanced variable-cycle engine—that are currently not being considered for near-term SSTs.

Figure 2 summarizes the expected mission fuel performance of the reference SST aircraft relative to new subsonic aircraft on comparable missions. The applicable routes, aircraft types, and fuel use (mass per passenger) are shown for average, premium, and economy passengers. Best- and worst-case SST scenarios are indicated as error bars on the blue SST bars.

As Figure 2 indicates, in its most likely configuration the modeled SST consumed between 5 and 7 times as much fuel per passenger relative to comparable subsonic aircraft. Divided by class, the SST burned between 3 and 4 times as much fuel per passenger for premium (business) service, and between 6 and 8 times as much fuel per economy passenger.[7] The lower multiples were associated with the New York (JFK)–London (Heathrow) and Los Angeles–Sydney routes, which largely followed great-circle distances with relatively little belly freight carriage. The higher multiples were seen for the SFO-NRT route, which had a 6% excess flight distance to enable refueling and a high share of belly freight carriage.

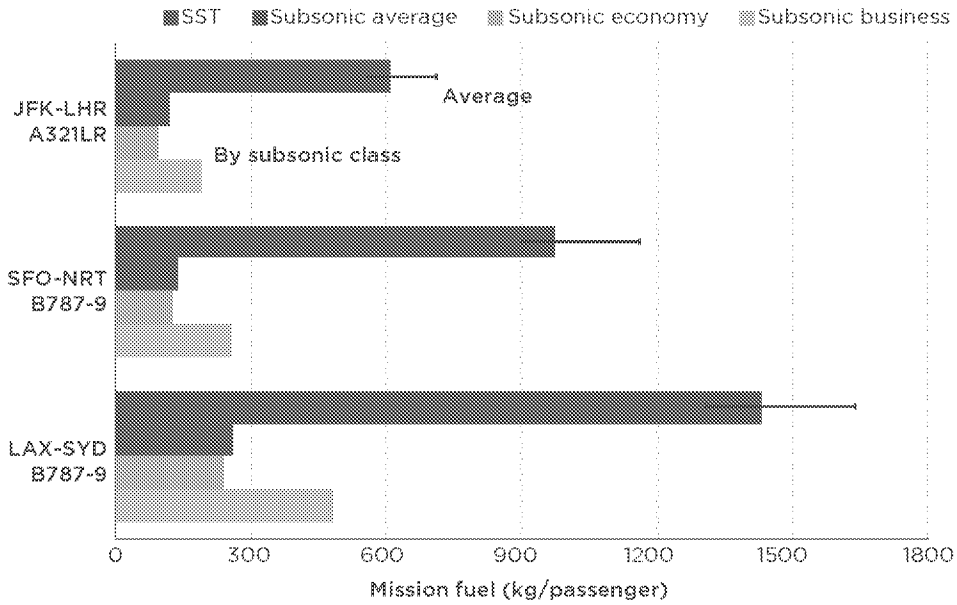

Figure 2. One-way mission fuel consumption per passenger by route and class.

These values are for the most likely SST configuration. Taking into account the full range of uncertainty, the per-passenger fuel intensity of the SST varied from 3 times (best configuration relative to subsonic business class, LAX-SYD) to 9 times (worst configuration relative to subsonic economy class, SFO-NRT) that of its subsonic equivalent. Estimated travel times were 30 to 50% shorter for the Mach 2.2 SST relative to the subsonic aircraft, which typically operate near Mach 0.85.

Aircraft fuel burn, LTO NO_x, and LTO noise are not the only environmental issues facing SSTs. Some of the issues not considered in this paper stem from the high cruise altitudes of SSTs, including cruise NO_x, stratospheric water vapor, and magnified non-CO_2 effects. Sonic boom or en-route noise impacts are also important but beyond the scope of this work.

7 High mission fuel burn is directly related to high CO_2 emissions during cruise. The gap between the SST's smaller (70%) exceedance to the CO_2 standard and its larger (5 to 7 times) overall fuel intensity is due to the way that the CO_2 standard assigns regulatory targets to individual aircraft. Supersonic aircraft, which are disproportionately heavy compared to subsonic aircraft carrying the same number of passengers, would receive less stringent targets if subject to the standard. See ICCT (2016) for further details.

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CONCLUSIONS AND NEXT STEPS

This working paper provides a preliminary assessment of the environmental performance of emerging commercial SST aircraft. Multiple scenarios representing most likely, best-case, and worst-case configurations were developed to bound the range of possible uncertainty. Where provided, manufacturer claims of airframe and engine design parameters were used as modeling inputs. Accordingly, our overall findings are likely optimistic; the actual performance of future supersonic aircraft may be worse.

This analysis suggests that near-term commercial SSTs are unlikely to comply with existing standards for commercial aircraft. The most likely configuration of a representative SST was estimated to exceed limits for NO_x and CO_2 by 40% and 70%, respectively. A qualitative assessment of noise was consistent with the understanding that engine derating and modified LTO procedures would be needed to comply with older (2006) Chapter 4 noise standards. Advanced technologies, including variable-cycle engines and staged combustion, on a clean-sheet engine would likely be needed to meet current LTO noise and NO_x standards.

These findings suggest two pathways for further development of commercial SSTs. First, manufacturers could refocus their development efforts on designs with advanced, clean sheet engines. Those are more likely to meet existing subsonic aircraft standards. Second, policymakers could establish new environmental standards for SSTs based upon designs using poorer performing derivative engines. Such standards would allow for increased pollution and nuisance relative to new commercial aircraft.

Independent of standards, the economic feasibility and social acceptability of new designs remain to be seen. The representative SST is expected to burn 5 to 7 times as much fuel per passenger as comparable subsonic aircraft. The results were sensitive to seating class, route, and the exact configuration of the aircraft. In its best possible configuration and route, the SST burned 3 times as much fuel per business-class passenger relative to subsonic aircraft; in the worst configuration with a refueling stop, the difference would be 9 times as much fuel for an economy-class passenger.

Fuel is typically an airline's single largest operating expense, accounting for 20 to 35% of overall airline operating costs. Current jet fuel prices of about $700 per metric tonne (IATA, 2018) mean that the fuel costs of transporting one passenger round-trip from San Francisco to Tokyo via SST would be around $1400, versus about $180 to $360 for subsonic economy class and business class, respectively. Profitable operation of these aircraft would require revenue and yields high enough to recover these extra fuel costs.

This increased fuel consumption would lead to proportional increases in CO_2 emissions. The share of CO_2 emissions attributable to international aviation is expected to increase from 1.4% today to between 7% and 14% of a Paris-compatible global carbon budget by 2075 (Rutherford, 2018). The introduction of new supersonic aircraft opens up the potential for even larger increases. The social acceptability of this increase, and therefore the public's support for supersonic travel, remains to be determined.

This working paper has provided an initial assessment of one aspect of SST operations, namely their emissions and noise characteristics. Substantial data gaps persist with respect to the characteristics of the engines that may be deployed as well as precise airframe parameters (e.g., maximum takeoff weight, empty weight, range, and payload). Further work is needed in particular to better characterize noise levels, both for LTO and supersonic en-route noise or sonic boom. LTO NO_x emissions estimates could be refined further through the use of analytical models such as GasTurb. Furthermore, little is known about how LTO NO_x relates to cruise NO_x for these aircraft, and work will be needed to establish this relationship.

The viability of new commercial SSTs will depend on more than just pollution and nuisance. Additional work is needed to understand other aspects of commercial SSTs. A route-based analysis of how commercial SSTs may be integrated into current and future airline networks and air traffic management at airports is recommended. Similarly, an economic analysis of likely fares, operating costs, yield, profitability, etc., would help to clarify the business case for commercial supersonics.

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Appendix

Table A1. Detailed geometric parameters.

Parameter	Value	Source
Main wing aspect ratio (span²/reference area)	1.39	Calculated
Main wing thickness/chord ratio	0.0225	Engineering Judgement
Main wing quarter chord sweep (degrees)	55.9	Measured using Digimizer (MedCald Software, 2018).
Main wing span (m)	18.3	Boom website
Main wing root chord (m)	20.8	Measured using Digimizer.
Main wing tip chord (m)	2.8	Measured using Digimizer.
Main wing mean aerodynamic chord (m)	12.0	Calculated
Main wing total length (m)	21.7	Measured using Digimizer.
Main wing reference area (m²)	241	Measured using Digimizer.
Main wing wetted area (m²)	344	Calculated with OpenVSP Model
Tail aspect ratio	0.65	Calculated
Tail thickness/chord ratio	0.035	Engineering Judgment
Tail quarter chord sweep (degrees)	60	Measured using Digimizer.
Tail span (m)	4	Measured using Digimizer.
Tail root chord (m)	11.9	Measured using Digimizer.
Tail tip chord (m)	2.1	Measured using Digimizer.
Tail mean aerodynamic chord (m)	9.4	Measured using Digimizer.
Tail total length (m)	12	Measured using Digimizer.
Tail reference area (m²)	24.6	Measured using Digimizer.
Tail wetted area (m²)	60.4	Calculated with OpenVSP Model
Fuselage length (m)	51.8	Boom website
Fuselage maximum height (m)	2.7	Measured using Digimizer.
Fuselage width (m)	2.4	Measured using Digimizer.
Fuselage wetted area (m²)	332	Calculated with OpenVSP Model
Fuselage front projected area (m²)	5.3	Measured using Digimizer.
Fuselage effective diameter (m)	2.55	Estimated
Propulsor length (m)	10.6 (underwing) 12.6 (fuselage)	Measured using Digimizer.
Propulsor nacelle diameter	1.4	Measured (approximate due to square shape)
Propulsor inlet diameter	1.2	Estimated
Propulsor total wetted area (m²)	45	Estimated (ignored in-fuselage propulsor)

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Message

From: Daniel.Jacob@faa.gov [Daniel.Jacob@faa.gov]
Sent: 8/1/2018 1:45:06 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: Question again on documents
Attachments: EPA NPRM fr037239.pdf; EPANotice fr038136.pdf

John,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Daniel.

federal register

TUESDAY, JULY 17, 1973
WASHINGTON, D.C.

Volume 38 ■ Number 136

PART II

ENVIRONMENTAL PROTECTION AGENCY

■

CONTROL OF AIR POLLUTION FROM AIRCRAFT AND AIRCRAFT ENGINES

Emission Standards and Test Procedures for Aircraft

ED_002134_00001125-00001

Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

PART 87—CONTROL OF AIR POLLUTION FROM AIRCRAFT AND AIRCRAFT ENGINES

Emission Standards and Test Procedures for Aircraft

Section 231 of the Clean Air Act, as amended by Public Law 91-604, directs the Administrator of the Environmental Protection Agency to "establish standards applicable to emissions of any air pollutant from any class or classes of aircraft or aircraft engines which in his judgment cause or contribute to or are likely to cause or contribute to air pollution which endangers the public health or welfare." Regulations ensuring compliance with these standards are required to be issued by the Secretary of Transportation in accordance with section 232 of the Act.

Section 231 also directs the Administrator to conduct a study of the extent to which aircraft emissions affect air quality throughout the United States, and the technological feasibility of controlling such emissions. The report of such a study, "Aircraft Emissions: Impact on Air Quality and Feasibility of Control," has been published and copies of the report are available upon request free of charge from the Office of Public Affairs, Environmental Protection Agency, Washington, D.C. 20460.

On December 12, 1972, a notice of proposed rule making was published in the FEDERAL REGISTER (Volume 37, Number 239) which described standards limiting emissions from aircraft and aircraft engines. As required by section 231 of the Act, the Administrator held public hearings with respect to the proposed aircraft emission standards. One was held in Boston, Massachusetts, on January 29, 1973, and another in Los Angeles, California on February 6, 1973. Testimony was presented at these hearings by twenty-two representatives of domestic and foreign manufacturers and operators of aircraft and aircraft engines and other interested parties. Additional detailed comments were provided subsequent to the hearings by thirty-one organizations.

Consideration has been given to all relevant material presented and a number of amendments have been made to the regulations as proposed.

Changes have been made in the engine classification system. A separate class was created for turboprop engines because, after considering the comments, the proposed equivalency between shaft horsepower and jet thrust was not considered acceptable for all operating conditions over the landing/take off (LTO) cycle. Except for the creation of special classes for the JT3d and JT8D engines, which was done in order to require smoke retrofits on separate schedules, turbine engines over 8,000 lbs. thrust which power subsonic aircraft have been put into one class. This over-8,000 lbs. thrust class represents essentially all turbines used in commercial air transportation, except for the supersonic aircraft to be introduced during the next few years.

Based on testimony and comments during the public hearings, the engines which power supersonic transport aircraft are not technically capable of achieving as low emissions levels as other large turbine engines by using equivalent combustor design technology. The reasons for this include the following:

(1) Some such engines employ afterburners for thrust augmentation during take off and acceleration at cruising speeds. This type of device involves combustion at relatively low pressures in the engine tailpipe and consequent greater loss of hydrocarbons and carbon monoxide to the atmosphere.

(2) All such engines known to EPA operate at compressor ratios much lower than engines designed for subsonic aircraft. This means that at low speed, low altitude conditions, where the "ram" pressure rise is small, these engines burn more fuel, and hence emit greater total quantities of hydrocarbons and carbon monoxide than do the high pressure ratio subsonic engines. Comments demonstrated that this is a necessary design tradeoff to ensure that these engines achieve maximum efficiency (best possible fuel consumption) throughout a complete flight.

(3) In addition, the supersonic engines do not employ the high bypass ratio turbofan principle which contributes to the excellent fuel economy and low pollutant emission capability of the engines which power most large subsonic engines, since the relatively large diameter (or frontal areas) of this type of engine would cause excessive aerodynamic drag in aircraft flying at mach 2-3 flight speeds.

A separate class has been established for engines which power supersonic aircraft. Exhaust emission standards for this class will be based on the best available combustor design technology expected in 1979 and later, but with due consideration for the inherently higher emission characteristics of supersonic aircraft engines under landing/takeoff cycle conditions, as discussed above. These standards will represent the same level of emissions reduction from current supersonic aircraft, through application of the same types of combustor design technology, as will be required of subsonic aircraft, though the absolute hydrocarbon and carbon monoxide levels will be several times higher. Standards will be proposed for this class of engines within 60 days.

Consideration will also be given to development of ground handling procedures specifically applicable to supersonic aircraft which would further reduce their inherently greater pollution characteristics during operations at large metropolitan airports.

It is recognized by the EPA that potential problems have been identified relating to upper atmosphere effects of supersonic aircraft and to a lesser extent subsonic aircraft operations. The work in progress under the Department of Transportation Climatic Impact Assessment Program will be closely monitored by the EPA, in order that the present regulations can be adjusted if necessary. The present regulations are based on the need to control emissions occurring under 3,000 feet, to protect ambient air quality in urban areas.

The effective date for the completion of the JT3D smoke control retrofit has been delayed until 1978 to allow time for the development of the necessary new combustor components. This deferral is based upon the manufacturers' comments that the additional time is necessary to solve problems relating to component durability.

The proposed 1976 standards applicable to carbon monoxide and hydrocarbon emissions from newly manufactured turbine engines have been deleted. Deletion of the 1976 standards is based upon the manufacturers' comments that insufficient lead time is available to allow introduction of changes in all newly manufactured engines to achieve these levels by that date. To relax the standards to levels which could be achieved this quickly would eliminate any useful impact which they might have on ambient air quality. It was concluded that efforts could be more effectively directed toward achieving substantially greater emissions reductions than those proposed at a later point in time, i.e., 1979.

Following a detailed study of the comments plus consultation with the National Aeronautics and Space Administration and the Air Force, the originally proposed 1979 standards applicable to gas turbine engines have been revised to become essentially equivalent to emission levels being used as design goals by these two agencies in planned and current research and development projects. A new set of standards, applicable to newly certified large engines only, has been set for January 1, 1981, to reflect the introduction of the same types of advanced combustor design technology originally expected in 1979. The technology necessary to meet these 1981 standards is in an early development stage. EPA intends to monitor closely the development of this technology through programs sponsored both by other federal agencies and by industry. If it should become evident that the standards as promulgated cannot be achieved by the technology approaches explored in these programs, additional rule making action will be considered to ensure that the best technology available is reflected in the standards. These two changes respond to the many comments received which stated that the emissions reductions originally proposed for 1979 could not be achieved this quickly using currently known technology. It is estimated that approximately 6 years are needed to translate combustion research findings into production engines which are fully certified and flight tested for safe usage in aircraft.

The method for specifying smoke limits has been changed to reflect a sliding scale of values chosen to be proportional to thrust for engines to be produced after 1979. It now represents a more flexible approach than specifying an absolute number for an entire class of engines and is fundamentally sounder for application to future engine designs whose

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thrust characteristics are not known now. This change will better ensure that the actual visibility characteristics of the exhaust plumes from newly designed engines are within limits consistent with protection of the public welfare, i.e., protection of visibility and personal well-being.

The proposed standards controlling crankcase emissions from piston engine aircraft have been deleted because it has been concluded based on comments received that introduction of these systems could induce safety hazards and in any case would provide relatively little reduction in emissions. The exhaust emissions standards applicable to piston engines have been retained as proposed, effective for engines produced after December 31, 1979, to allow needed additional time for development. In addition, comments expressed concern over the safety of the measures expected to be used by the manufacturers of such engines to achieve the standards. Therefore, the EPA will monitor closely the development of the technology necessary to meet these 1980 standards. If it should become evident that the standards as promulgated cannot be achieved at that time by design techniques which are safe and in other respects airworthy, additional rule making action will be considered to ensure that the best technology available is reflected in the standards.

Many comments were received asking that EPA develop suitable correction factors for differences in ambient temperatures, pressures and humidity levels at locations where emissions testing would be carried out. The EPA is in agreement with the need to develop such factors, so as to allow for these influences, as is done in other EPA standards applicable to highway vehicles. Projects are being started to define these relationships so as to allow introduction of suitable correction factors as soon as possible.

In addition, the final rules contain other technical amendments and clarifying modifications to the testing and measurement procedures.

A number of additional basic criticisms of the proposed regulations were considered in the analysis which led to the revised standards, but were rejected for the reasons identified below:

Some commenters pointed out that the timing of the initially proposed standards was too late to be of any value to the states in their implementation plans aimed at meeting ambient air quality standards by 1975. However, consideration of other comments presented at the hearings plus information on the availability of emission reduction technology in the study accompanying the proposal, and consideration of the lead time necessary to introduce such technology into manufactured products and certify them for safety considerations, made it impossible to design standards to achieve meaningful air quality reductions which would be implemented any sooner than the regulations now specify.

Several commenters recommended that the Ringleman visual system for evaluating aircraft gas turbine smoke behavior should be substituted for the indirect filtration system described in the regulations, to facilitate direct correlation of the method used to certify engines with a technique which could be employed for enforcement purposes. Unfortunately, the Ringleman system is not suited to the precise evaluation of engine smoking characteristics. Moreover, during test cell operation, the plume cannot be viewed directly and its appearance is not the same as it would be under the conditions of altitude and visual contrast which exist in flight. Therefore the prescribed filter reflectance method and associated sampling systems have been retained.

Some commenters felt that the simulated landing/take-off cycle used as a basis for the numbers derived in the standards should be altered to make it more representative of an average LTO operation instead of reflecting peak traffic times at metropolitan air terminals. This comment was rejected, since the justification for the aircraft standards is largely based on protecting air quality in and around large metropolitan air terminals during adverse conditions. The short term National Ambient Air Quality Standards (40 CFR Part 50) are not written to be exceeded more than once per year. Thus the LTO cycle is based on typical adverse conditions.

Several commenters recommended that standards not be set at all for the 1979 and later period, pending the development of technology capable of achieving significant known emission reductions. EPA considers that the published standards will have a significant effect on stimulating the rate of progress of technological development and spur its rapid introduction into flight applications. The standards are based on NASA and Air Force-sponsored research already in progress, as well as engineering evaluations sponsored by EPA. The standards reflect reductions from present emission levels resulting from modified designs to existing engine components based on the application of known control technology. It should be emphasized that the standards set by EPA may reflect technology which may reasonably be obtained within a given time frame but which is not yet available. Section 231(b) of the Act expressly contemplates "*development* and application of the requisite technology" (emphasis added).

Commenters representing general aviation interests opposed the introduction of emission standards applicable to piston engine aircraft, on the grounds that compliance would require introductions of exhaust system reactors which would have drastic and costly effects on the configuration of the entire aircraft. The Agency has concluded that sufficient evidence is already available in the form of measured emissions data on current aircraft to indicate that the proposed standards can be met by improved fuel management and will not require exhaust system reactors.

A number of commenters felt that the report cited in the preamble to the proposed regulations had not adequately demonstrated a compelling need for emission standards applicable to aircraft. EPA does not feel that the minimal evidence offered by these commenters in support of their claim represents a valid basis for deciding that aircraft emissions do not contribute to air pollution endangering health or welfare in areas surrounding airports.

A new Part 87 of Title 40, Code of Federal Regulations, is hereby adopted and establishes:

(a) Fuel venting emission standards for new and in-use aircraft gas turbine engines.

(b) Exhaust emission standards for new and in-use aircraft gas turbine engines.

(c) Exhaust emission standards for new aircraft piston engines.

(d) Exhaust emission standards for new aircraft.

(e) Test procedures applicable to aircraft gas turbine engines and aircraft.

(f) A test procedure applicable to aircraft piston engines.

In judging the need for the regulations, the Administrator has determined (1) that the public health and welfare is endangered in several air quality control regions by violation of one or more of the national ambient air quality standards for carbon monoxide, hydrocarbons, nitrogen oxides, and photochemical oxidants, and that the public welfare is likely to be endangered by smoke emissions; (2) that airports and aircraft are now, or are projected to be, significant sources of emissions of carbon monoxide, hydrocarbons, and nitrogen oxides in some of the air quality control regions in which the national ambient air quality standards are being violated, as well as being significant sources of smoke; and therefore (3) that maintenance of the national ambient air quality standards and reduced impact of smoke emissions requires that aircraft and aircraft engines be subject to a program of control compatible with their significance as pollution sources. Accordingly, the Administrator has determined that emissions from aircraft and aircraft engines should be reduced to the extent practicable with present and developing technology. The standards proposed herein are not quantitatively derived from the air quality considerations discussed in the study report cited above but, instead, reflect EPA's judgment as to what reduced emission levels are or will be practicable to achieve for turbine and piston engines.

In general, the influence of the regulations, will be to contribute to the maintenance of the quality of the air in and around major air terminals throughout the post-1975 era in which air traffic is undergoing expansion. The timing of these standards is such that they will not make contributions to achievement of the ambient air pollution levels required by 1975 through the state implementation programs, although they will influence attainment of those levels where extensions until 1977 are granted for the ambient standards.

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The total cost of these requirements to the airline industry is estimated at 141 million dollars over a ten year period. This represents for newly designated commercial engines an increase in cost of at most 3 percent. All equipment costs (including engines) used in commercial air transport account for only 13 percent of the airline ticket dollar. Thus, it is believed that imposition of the schedule of standards set forth in this regulation is too small to have any impact on the continued growth of air transportation in a fashion healthy and beneficial to the economy.

The standards promulgated for piston type aircraft are expected to result in significant fuel savings. (29 million dollars over ten years). The technology expected to be used to achieve 1979 and 1981 standards for turbines is not expected to result in fuel consumption penalties. Similarly, there is no inconsistency or conflict presently envisioned between the imposition of the above standards and the compliance of aircraft with noise control regulations during the same period.

It is intended that the attainment of any standards proposed herein not result in the increased emission of any substance for which a standard is not proposed if such emission could endanger public health or welfare. The Administrator intends to remain informed throughout engine and aircraft development and certification programs to permit him to determine at the earliest possible time if the emissions of a substance are likely to endanger the public health or welfare. Therefore, the Administrator may subsequently publish in the FEDERAL REGISTER a list of those substances whose emissions are liable to increase as a result of the installation or incorporation of any system or component, including fuel additives, designed to enable an aircraft or aircraft engine to conform to any prescribed standard. In the event such a list of substances is so published, appropriate testing and sampling methods and/or analytical techniques will be proposed under the normal rule making procedures after consultation with the Department of Transportation.

The standards contained in this notice are being promulgated after consultation with the Secretary of Transportation in order to assure appropriate consideration of aircraft safety. However, the Department of Transportation has advised that it is impossible to make conclusive judgments as to the effects of an emission standard on aircraft safety until engines designed to meet that standard have been developed, constructed, and tested. Therefore, there will be continuing consultation on this issue between this agency and that Department, both prior to and after promulgation of the standards. Should the Secretary of Transportation determine at any point that an emission standard cannot be met within the specified time without creating a safety hazard, appropriate modifications will be made to that standard or to its effective date.

(Section 231 of the Clean Air Act, as amended (42 U.S.C. 1857f-9))

Dated: July 6, 1973.

ROBERT W. FRI,
Acting Administrator.

In Title 40 of the Code of Federal Regulations, a new part, Part 87, is to be added as follows:

Subpart A—General Provisions

Sec.
87.1 Definitions.
87.2 Abbreviations.
87.3 General requirements.
87.4 Test conditions.
87.5 Special test procedures.
87.6 Aircraft safety.

Subpart B—Engine Fuel Venting Emissions (New and In-Use Aircraft Gas Turbine Engines)

87.10 Applicability.
87.11 Standard for fuel venting emissions.

Subpart C—Exhaust Emissions (New Aircraft Gas Turbine Engines)

87.20 Applicability.
87.21 Standards for exhaust emissions.

Subpart D—Exhaust Emissions (In-Use Aircraft Gas Turbine Engines)

87.30 Applicability.
87.31 Standards for exhaust emissions.

Subpart E—Exhaust Emissions (New and In-Use Aircraft Piston Engines)

87.40 Applicability.
87.41 Standards for exhaust emissions (new aircraft piston engines).
87.42 Standards for exhaust emissions (in-use aircraft piston engines).

Subpart F—Exhaust Emissions (New and In-Use Aircraft)

87.50 Applicability.
87.51 Standards for exhaust emissions (new aircraft).
87.52 Standards for exhaust emissions (in-use aircraft).

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Appendix A—Instrumentation (Aircraft Gas Turbine Engine Measurements).
Appendix B—Instrumentation (Aircraft Piston Engine Measurements).

AUTHORITY: Sec. 231 of the Clean Air Act, as amended (42 U.S.C. 1857f-9).

Subpart A—General Provisions

§ 87.1 Definitions.

(a) As used in this part, all terms not defined herein shall have meaning given them in the Act:

(1) "Act" means the Clean Air Act, as amended by Public Law 91-604.

(2) "Administrator" means the Administrator of the Environmental Protection Agency to whom the authority involved may be delegated.

(3) "Aircraft" means any airplane for which a U.S. standard airworthiness certificate or equivalent foreign airworthiness certificate is issued.

(4) "Aircraft engine" means a propulsion engine which is installed in or which is manufactured for installation in an aircraft.

(5) "Aircraft gas turbine engine" means a turboprop, turbofan, or turbojet aircraft engine.

(6) "New aircraft gas turbine engine" means an aircraft gas turbine engine which has never been in service.

(7) "New aircraft piston engine" means an aircraft piston engine which has never been in service.

(8) "In-use aircraft gas turbine engine" and "in-use aircraft piston engine" mean an aircraft gas turbine engine or aircraft piston engine (as appropriate) which is in service.

(9) "Newly certified aircraft gas turbine engine" means an aircraft gas turbine engine which is originally type certified on or after the effective date of the applicable emission standard.

(10) "Rated power" means the maximum power/thrust available for takeoff at standard day conditions as approved for the engine by the Federal Aviation Administration.

(11) "Standard day conditions" means standard ambient conditions as described in the United States Standard Atmosphere, 1962, (i.e., temperature=59°F, relative humidity=0%, and pressure =29.92 inches Hg).

(12) "Power setting" means the power output of an engine in terms of pounds thrust for turbojet and turbofan engines and shaft horsepower for turboprop and piston engines.

(13) "Pound-thrust/hr." means pounds of thrust for 1 hour.

(14) "Shaft horsepower" means only the measured shaft power output of an auxiliary power unit, turboprop, or piston engine.

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(15) "Auxiliary power unit" means any engine installed in or on an aircraft exclusive of the propulsion engines.

(16) "Class T1" means all aircraft turbofan or turbojet engines except engines of Class T5 of rated power less than 8,000 pounds thrust.

(17) "Class T2" means all turbofan or turbojet aircraft engines except engines of Class T3, T4, and T5 of rated power of 8,000 pounds thrust or greater.

(18) "Class T3" means all aircraft gas turbine engines of the JT3D model family.

(19) "Class T4" means all aircraft gas turbine engines of the JT8D model family.

(20) "Class T5" means all aircraft gas turbine engines employed for propulsion of aircraft designed to operate at supersonic flight speeds.

(21) "Class P1" means all aircraft piston engines, except radial engines.

(22) "Class P2" means all aircraft turboprop engines.

(23) "Taxi/idle (in)" means those aircraft operations involving taxi and idle between the time of landing roll-out and final shutdown of all propulsion engines.

(24) "Taxi/idle (out)" means those aircraft operations involving taxi and idle between the time of initial starting of the propulsion engine(s) used for the taxi and turn onto duty runway.

(25) "Exhaust emissions" means substances emitted to the atmosphere from the exhaust discharge nozzle of an aircraft or aircraft engine.

(26) "Fuel venting emissions" means all raw fuel, exclusive of hydrocarbons in the exhaust emissions, discharged from aircraft gas turbine engines during all normal ground and flight operations.

(27) "Smoke" means the matter in exhaust emissions which obscures the transmission of light.

(28) "Smoke number (SN)" means the dimensionless term quantifying smoke emissions.

(29) "Oxides of nitrogen" means the sum of the amounts of the nitric oxide and nitrogen dioxide contained in a gas sample as if the nitric oxide were in the form of nitrogen dioxide.

(30) "Calibration gas" means a gas of known concentration which is used to establish the response curve of an analyzer.

(31) "Span gas" means a gas of known concentration which is used routinely to set the output level of an analyzer.

§ 87.2 Abbreviations.

The abbreviations used in this part have the following meanings in both upper and lower case:

abs.	Absolute.
APU	Auxiliary power unit.
ASA	American Standards Association.
ASTM	American Society for Testing and Materials.
b.hp.	Brake horsepower.
c.f.h.	Cubic feet per hour.
c.f.m.	Cubic feet per minute.
C.	Centigrade.
cc.	Cubic centimeter.
CO_2	Carbon dioxide.
CO	Carbon monoxide.
EPR	Engine pressure ratio.
F.	Fahrenheit.
FAA	Federal Aviation Administration, Department of Transportation.
FID	Flame ionization detector.
H/C	Hydrogen to carbon atomic ratio.
HC	Hydrocarbon(s).
Hg	Mercury.
hp.	Horsepower.
hp.-hr.	Horsepower-hr.
hr.	Hour(s).
in.HgV.	Inches of mercury, vacuum.
I.D.	Inside diameter.
lb.	Pound(s).
LTO	Landing takeoff.
min.	Minute(s).
mm.	Millimeter(s).
N_1	First-stage rotor speed.
N_2	Second-stage rotor speed or nitrogen (as applicable).
N_3	Third-stage rotor speed.
NO	Nitric oxide.
NO_2	Nitrogen dioxide.
NO_x	Oxides of nitrogen, NO and NO_2.
NDIR	Nondispersive infrared analyzer.
O_2	Oxygen.
O_3	Ozone.
p.p.m	Parts per million by volume.
p.p.m.C	Parts per million carbon.
PT_7	Total pressure at station 7.
R.	Rankine.
r.p.m.	Revolutions per minute.
s.c.f.h.	Standard cubic feet per hour.
s.c.f.m.	Standard cubic feet per minute.
sec.	Second(s).
SHP	Shaft horsepower
SN	Smoke number.
TIM	Time in mode.
TT	Total temperature at station 7.
°	Degree.
%	Percent.

§ 87.3 General requirements.

(a) This part provides for the approval or acceptance by the Administrator or his agents of testing and sampling methods, analytical techniques, and related equipment not identical to those specified in this part. Before he approves or accepts any such alternate, equivalent, or otherwise nonidentical procedures or equipment, the Administrator shall consult with the Secretary of Transportation in determining whether or not the action requires rule making under sections 231 and 232 of the Clean Air Act, as amended, consistent with the Secretary's responsibilities under section 232 of the Act.

(b) Under section 232 of the Act, the Secretary of Transportation issues regulations to insure compliance with this part and all amendments thereof.

(c) With respect to aircraft of foreign registry, these regulations shall apply in a manner consistent with any obligation assumed by the United States in any treaty, convention or agreement between the United States and any foreign country or foreign countries.

§ 87.4 Test conditions.

The complete engine as configured for final acceptance testing, including all accessories which might reasonably be expected to influence emissions to the atmosphere excluding auxiliary gearbox-mounted components required to drive aircraft systems and service air bleed, shall be functional for all testing in this part.

§ 87.5 Special test procedures.

The Administrator may, upon written application by a manufacturer or operator of aircraft or aircraft engines, prescribe test procedures for any aircraft or aircraft engine that is not susceptible to satisfactory testing by the procedures set forth herein. Prior to taking action on any such application, the Administrator shall consult with the Secretary of Transportation.

§ 87.6 Aircraft safety.

The provisions of this part will be revised if at any time the Secretary of Transportation determines that an emission standard cannot be met within the specified time without creating a safety hazard.

Subpart B—Engine Fuel Venting Emissions (New and In-Use Aircraft Gas Turbine Engines)

§ 87.10 Applicability.

The provisions of this subpart are applicable to each new aircraft gas turbine engine of classes T2, T3, T4, and T5 manufactured on or after January 1, 1974, and all in-use aircraft gas turbine engines of classes T2, T3, T4, and T5 beginning January 1, 1974, and each new aircraft gas turbine engine of Classes T1 and P2 manufactured on or after January 1, 1975 and all in-use aircraft gas turbine engines of classes T1 and P2 beginning January 1, 1975.

§ 87.11 Standard for fuel venting emissions.

(a) No fuel venting emissions shall be discharged into the atmosphere from any new or in-use gas turbine engine subject to the subpart.

(b) Conformity with the standard set forth in paragraph (a) shall be determined by inspection of the method designed to eliminate these emissions.

Subpart C—Exhaust Emissions (New Aircraft Gas Turbine Engines)

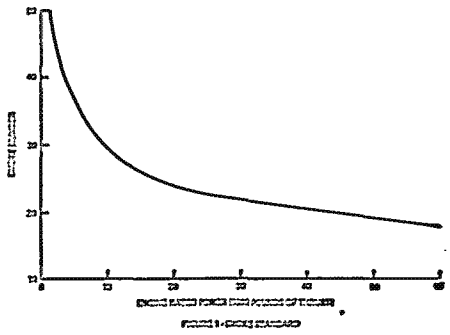
§ 87.20 Applicability.

The provisions of this subpart are applicable to all aircraft gas turbine engines of the classes specified beginning on the dates specified.

§ 87.21 Standards for exhaust emissions.

(a) Exhaust emissions of smoke from each new aircraft gas turbine engine of class T4 manufactured on or after January 1, 1974, shall not exceed: Smoke number of 30.

(b) Exhaust emissions of smoke from each new aircraft gas turbine engine of class T2 and of rated power of 29,000 pounds thrust or greater, manufactured on or after January 1, 1976 shall not exceed: Applicable smoke number from Figure 1.



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(c) Exhaust emissions of smoke from each new aircraft gas turbine engine of class T3 manufactured on or after January 1, 1978 shall not exceed: smoke number of 25.

(d) Exhaust emissions from each aircraft gas turbine engine of the classes specified below manufactured on or after January 1, 1979, shall not exceed:

(1) Class T1:	
(i) Hydrocarbons	1.6 pounds/1,000 pound-thrust hours/cycle
(ii) Carbon monoxide	9.4 pounds/1,000 pound-thrust hours/cycle
(iii) Oxides of nitrogen	3.7 pounds/1,000 pound-thrust-hours cycle
(iv) Smoke	Smoke number from Figure 1.
(2) Class T2, T3, or T4:	
(i) Hydrocarbons	0.8 pound/1,000 pound-thrust hours/cycle
(ii) Carbon monoxide	4.3 pounds/1,000 pound-thrust hours/cycle
(iii) Oxides of nitrogen	3 pounds/1,000 pound-thrust hours/cycle
(iv) Smoke	Smoke number from Figure 1.

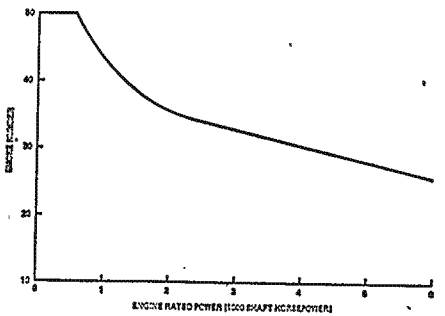

FIGURE 2—SMOKE STANDARD

(3) Class P2:	
(i) Hydrocarbons	4.9 pounds/1,000 horsepower-hours/cycle
(ii) Carbon monoxide	26.8 pounds/1,000 horsepower-hours/cycle
(iii) Oxides of nitrogen	12.9 pounds/1,000 horsepower-hours/cycle
(iv) Smoke	Smoke number from Figure 2.

(4) The smoke number for each engine shall be determined by obtaining the smoke number corresponding to the engine rated power from Figure 1 for turbofan or turbojet engines and Figure 2 for turboprop engines.

(e) Exhaust emissions from each newly certified aircraft gas turbine engine of Classes T2, T3, or T4 manufactured on or after January 1, 1981, shall not exceed:

(i) Hydrocarbons	0.4 pound/1,000 pound-thrust hours/cycle
(ii) Carbon monoxide	3 pounds/1,000 pound-thrust hours/cycle
(iii) Oxides of nitrogen	3 pounds/1,000 pound-thrust hours/cycle
(iv) Smoke	Smoke number from Figure 1.

(f) The standards set forth in paragraphs (a), (b), (c), (d), and (e) of this section refer to a composite gaseous emission sample representing the operating cycles set forth in the applicable sections of Subpart G of this part, and exhaust smoke emissions emitted during operations of the engine as specified in the applicable sections of subpart H of this part, and measured and calculated in accordance with the procedures set forth in those subparts.

Subpart D—Exhaust Emissions (In-Use Aircraft Gas Turbine Engines)

§ 87.30 Applicability.

The provisions of this subpart are applicable to all in-use aircraft gas turbine engines certified for operation within the United States of the classes specified beginning on the dates specified.

§ 87.31 Standards for exhaust emissions.

(a) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class T4, beginning January 1, 1974, shall not exceed: Smoke number of 30.

(b) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of class T2 and of rated power of 29,000 pounds thrust or greater, beginning January 1, 1976, shall not exceed: Applicable Smoke number from Figure 1.

(c) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of class T3, beginning January 1, 1978 shall not exceed: Smoke number of 25.

(d) The standards set forth in paragraphs (a), (b), and (c) of this section refer to exhaust smoke emissions emitted during operations of the engine as specified in the applicable sections of Subpart H of this part, and measured and calculated in accordance with the procedures set forth in this subpart.

(e) In addition to the requirements imposed by paragraphs (a), (b), and (c) of this section, each in-use aircraft gas turbine engine shall not exceed the level of the emissions applicable to such engine when it was new.

Subpart E—Exhaust Emissions (New and In-Use Aircraft Piston Engines)

§ 87.40 Applicability.

The provisions of this subpart are applicable to all aircraft piston engines of class P1 beginning on the date specified.

§ 87.41 Standards for exhaust emissions (new aircraft piston engines).

(a) Exhaust emissions from each new aircraft piston engine manufactured on or after December 31, 1979, shall not exceed:

(i) Hydrocarbons	0.00190 pound/rated power/cycle
(ii) Carbon monoxide	0.042 pound/rated power/cycle
(iii) Oxides of nitrogen	0.0015 pound/rated power/cycle.

(b) The standards set forth in paragraph (a) of this section refer to a composite gaseous exhaust emission sample representing the operating cycle set forth in the application sections of Subpart I of this part and measured and calculated in accordance with the procedures set forth in that subpart.

§ 87.42 Standards for exhaust emissions (in-use aircraft piston engines).

Exhaust emissions from each in-use aircraft piston engine manufactured on or after January 1, 1979, shall not exceed the level applicable to such engine when it was new.

Subpart F—Exhaust Emissions (New and In-Use Aircraft)

§ 87.50 Applicability.

The provisions of this subpart are applicable to all aircraft beginning on the date specified.

§ 87.51 Standards for exhaust emissions (new aircraft).

(a) Exhaust emissions resulting from the generation of onboard power from each new aircraft manufactured on or after January 1, 1979, shall not exceed:

(i) Hydrocarbons	0.4 pound/1,000 hp.-hr. of power output
(ii) Carbon monoxide	5 pounds/1,000 hp.-hr. of power output
(iii) Oxides of nitrogen	3 pounds/1,000 hp.-hr. of power output.

(b) The standards set forth in paragraph (a) of this section refer to exhaust emissions from new aircraft exclusive of the exhaust, crankcase, and fuel venting emissions from the propulsion engines mounted on such aircraft.

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(c) In determining conformity of aircraft with the standards set forth in paragraph (a) of this section, all auxiliary power units shall be operated under the conditions set forth in the applicable sections of Subpart G of this part and emissions measured and calculated in accordance with those procedures.

§ 87.52 Standards for exhaust emissions (in-use aircraft).

Exhaust emissions from each in-use aircraft manufactured on or after January 1, 1979, resulting from generation of onboard power shall not exceed the level of the emission standards applicable to such aircraft when it was new.

Subpart G—Test Procedures for Engine Exhaust Gaseous Emissions (Aircraft and Aircraft Gas Turbine Engines)

§ 87.60 Introduction.

Except as provided under § 87.5, the procedures described in this subpart shall be the test program to determine the conformity of new and in-use aircraft gas turbine engines with the applicable standards set forth in this part. The procedures shall also be used to determine emissions from auxiliary power units in determining conformity of new and in-use aircraft with the applicable standards set forth in this part.

(a) The test consists of operating the engine at prescribed power settings on an engine dynamometer (for engines producing primarily shaft horsepower) or thrust measuring test stand (for engines producing primarily thrust). The exhaust gases generated during engine operation are sampled continuously for specific component analysis through the analytical train.

(b) The exhaust emission test is designed to measure hydrocarbons, carbon monoxide, carbon dioxide, and oxides of nitrogen concentrations and determine mass emissions and engine work output through calculations during a simulated aircraft landing-takeoff cycle (LTO). The LTO cycle is based on time in mode data during high activity periods at major airports. The test for propulsion engines consists of at least the following five modes of engine operation: Taxi/idle (out), takeoff, climbout, approach, and taxi/idle (in). The mass emission and work output for the modes are combined to yield the reported values. The test for auxiliary power units consists of one mode: Full load.

(c) When an engine is tested for exhaust emissions on an engine dynamometer or test stand, the complete engine shall be used with all accessories which might reasonably be expected to influence emissions to the atmosphere installed and functioning but excluding auxiliary gearbox-mounted components required to drive aircraft systems and service air bleed.

§ 87.61 Turbine fuel specifications.

For exhaust emission testing, fuel meeting the specifications, ASTM D1655-latest version-Jet A. shall be used. Nonmetallic additives as specified in ASTM D1655-latest version-Jet A. may be present. Additives used for the purpose of smoke suppression (such as organometallic compounds) shall not be present.

§ 87.62 Test procedure (propulsion engines).

(a) (1) The engine shall be tested in each of the following five engine operating modes which simulate aircraft operation to determine its mass emission rates and work output.

Actual power setting, that when corrected to standard day conditions, corresponds to the following percentage of rated power.

Mode	Class T1 or T2	Class T3, T3, or T4
Taxi/idle (out)	See subparagraph (2) of this paragraph.	
Takeoff	100	100
Climbout	90	85
Approach	30	30
Taxi/idle (in)	See subparagraph (2) of this paragraph.	

(2) The taxi/idle operating modes shall be carried out at a power setting in accordance with applicable Federal Aviation Administration regulations, at the manufacturer's recommended power setting for idle.

(b) Emission testing shall be conducted on warmed-up engines which have achieved a steady operating temperature.

§ 87.63 Test procedure (auxiliary power units)

(a) In determining compliance with the aircraft emission standards under Subpart F of this part, each auxiliary power unit shall be tested at its maximum load condition as indicated by its power output, exhaust gas temperature, or turbine inlet temperature to determine its mass emission rate and work output. The work output shall be determined as a combination of shaft energy output and actual bleed air energy content. The bleed air equivalent horsepower for APU's shall be determined as follows:

Work Output $= 0.241W\ (T_{bleed} - T_{in})$, where W = bleed airflow in lbs/sec, T_{bleed} = measured bleed air temperature in °F, and T = compressor inlet temperature in °F.

(b) Emission testing shall be conducted on warmed-up auxiliary power units which have achieved a steady operating temperature.

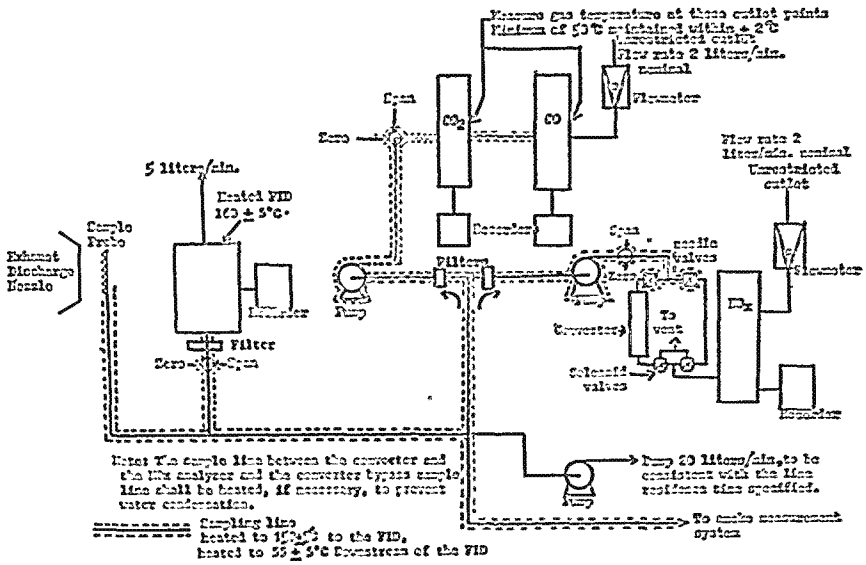

Figure 3. [illegible]

(c) In determining compliance with the aircraft emission standards under Subpart F of this part, auxiliary power units shall be tested prior to installation in aircraft.

§ 87.64 Sampling and analytical system for measuring exhaust emissions.

(a) *Schematic drawing.* Figure 3 is a schematic drawing of the exhaust gas sampling and analytical system which shall be used for testing under the regulations in this subpart. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the component systems. Parallel installation of CO and CO_2 instruments are an acceptable alternate configuration of Figure 3.

(b) *Water removal devices.* No desiccants, dryers, water traps, or related equipment may be used to treat the exhaust sample flowing to the oxides of nitrogen measurement instrumentation. NO_x instrument configuration must be such that condensation is avoided through the instrument. The extent of water vapor and carbon dioxide interference on the carbon monoxide analyzer shall be determined by passing a range of known concentrations of carbon dioxide and water vapor through the instrument and observing the response. If the effect is greater than 2 percent of measured CO levels, all subsequent measurements shall be corrected for these interferences.

(c) *Component description (exhaust gas sampling system).* The following components shall be used in the exhaust

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gas sampling system for testing under the regulations in this subpart.

(1) *Sampling probe.* (i) Probe design concept: The probe shall be made of stainless steel. If a mixing probe is used, all sampling holes shall be of equal diameter. Total probe orifice area shall be such that the principal pressure drop (at least 80 percent) through the probe assembly shall be taken at the orifice (or orifices).

(ii) Probe orientation and sampling location:

(*a*) A minimum of 12 sampling points shall be used. Either mixing or individual probes are acceptable.

(*b*) A minimum of three different radial positions shall be used in each of four sampling quadrants.

(*c*) If the minimum of 12 sampling points are used, the points in circumferentially adjacent sampling areas shall be separated in any direction by a distance less than 0.1 tailpipe radius or 0.1 annular height, as applicable. If the number of sampling points (n) is greater than 12, they shall be equal in number in each quadrant or sector and the minimum separations specified above shall be reduced by a factor = 12/n.

(*d*) The axial sampling plane shall be as close to the plane of the exit nozzle as engine performance parameters permit but in any case, shall be within one exit nozzle diameter of the exit plane.

(*e*) In all cases, the probe shall be designed to obtain a representative sample over the area of the entire exhaust nozzle, on both mixed fan engines and nonmixed fan engines as well as turbojets, turboprops and auxiliary power engines.

(*f*) The multipoint probe shall be designed to minimize the errors due to pollutant stratification, whether the stratification is due to combustor design, mixing or lack of mixing, or engine design such as mixing of fan and core air.

(2) *Sample transfer.* The sample shall be transferred from the probe to the analytical instruments through a heated sample line of either stainless steel or Teflon of 0.18- to 0.32-in. I.D. The sample lines shall be maintained at a temperature of 150°±5° C. Sample flow rate from the engine to the instruments is 2 sec. or less. The sample line length from the probe exit to the instruments shall be of minimum length, but in no case greater than 80 feet.

(d) *Component description (exhaust gas analytical system).* The following components shall be used in the exhaust gas analytical system for testing under the regulations in this subpart. The analytical system provides for the determination of hydrocarbon concentrations by flame ionization detector analysis, the determination of carbon monoxide and carbon dioxide concentrations by nondispersive infrared analysis and the determination of oxides of nitrogen concentrations by chemiluminescence analysis of exhaust samples. The chemiluminescence method of analysis requires that the nitgrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator. See Appendix A of this part.

§ 87.65 Information to be recorded.

The following information, as applicable, shall be recorded with respect to each test.

(a) *General.* (1) Facility performing test.

(2) Description of test equipment including the probe and sampling and analytical train.

(3) Instrument operator.

(4) Test stand operator.

(5) Fuel identification, including H/C ratio and additives, if any.

(b) *Aircraft (in which engine will be installed) description.* (1) Manufacturer.

(2) Model number.

(3) Serial number (if known).

(4) User.

(5) Engine installation position.

(c) *Engine description.* (1) Manufacturer.

(2) Model number.

(3) Serial number.

(4) Time since overhaul and other pertinent maintenance information.

(d) *Test data.* (1) Test number.

(2) Date.

(3) Time.

(4) Ambient temperature and engine inlet temperature.

(5) Barometric pressure.

(6) Relative humidity.

(7) Sample line temperature. Line temperature shall be taken at a minimum of three locations, two of which shall be the probe outlet and instrumentation inlet.

(8) Sample line residence time.

(9) All pertinent instrument information such as tuning, gain, full scale range.

(10) Recorder charts: Identify zero, span, exhaust gas sample traces, and operating mode.

(11) Date of most recent analytical assembly calibration and identification number, if any.

(e) *Operating mode data.* (1) Nominal power setting.

(2) Actual power setting (pounds, thrust, horsepower, etc.).

(3) N_1 speed, revolutions per minute.

(4) N_2 speed and N_3, if applicable, revolutions per minute.

(5) Measured fuel flow, pounds/hour.

(6) Air flow, pounds/second and method of determination.

(7) Bleed air flow, pounds/second and pressure (APU's only).

(8) PT_7.

(9) EPR.

(10) TT_7.

(11) Pollutant concentration, from recorders, in percent or parts per million by volume, and parts per million carbon for hydrocarbons.

§ 87.66 Calibration and instrument checks.

(a) Calibrate the analytical assembly at least once every 30 days. Use the same flow rate as when analyzing samples.

(1) Adjust analyzers to optimize performance.

(2) Zero the hydrocarbon analyzer with zero grade air and the carbon monoxide, carbon dioxide, and oxides of nitrogen analyzers with zero grade nitrogen. The allowable zero gas impurity concentrations should not exceed 0.1 p.p.m. equivalent carbon response, 1 p.p.m. carbon monoxide, 350 p.p.m. carbon dioxide, and 0.1 p.p.m. nitric oxide.

(3) Set the CO and CO_2 analyzer gains to give the desired range. Select desired attenuation scale of the HC analyzer and adjust the electronic gain control to give the desired full scale range. Select the desired scale of the NO_x analyzer and adjust the phototube high voltage supply or amplifier gain to give the desired range.

(4) Calibrate the HC analyzer with propane (air diluent) gases having nominal concentrations equal to 50 and 95 percent of full scale of each range used. Calibrate the CO analyzer with carbon monoxide (nitrogen diluent) gases and the CO_2 analyzer with carbon dioxide (nitrogen diluent) gases having nominal concentrations equal to 30, 60, and 90 percent of full scale of each range used. Calibrate the NO_x analyzer with nitric oxide (nitrogen diluent) gases having nominal concentrations equal to 50 and 95 percent of full scale of each range used. The actual concentrations should be known to within ±2 percent of the true values.

(5) Compare values obtained on the the CO and CO_2 analyzers with previous calibration curves. Any significant change reflects some problem in the system. Locate and correct problem, and recalibrate. Use best judgment in selecting curves for data reduction. Log gain reading.

(6) Check the NO_x to NO converter efficiency by the following procedure. Use the apparatus described and illustrated in Figure 4.

(i) Attach the NO/N_2 supply (150–250 p.p.m.) at C_2, the O_2 supply at C_1 and the analyzer inlet connection to the efficiency detector at C_3. If lower concentrations of NO are used, air may be used in place of O_2 to facilitate better control of the NO_2 generated during step (iv).

(ii) With the efficiency detector variac off, place the NO_x converter in bypass mode and close valve V3. Open valve MV2 until sufficient flow and stable readings are obtained at the analyzer. Zero and span the analyzer output to indicate the value of the NO concentration being used. Record this concentration.

(iii) Open valve V3 (on/off flow control solenoid valve for O_2) and adjust valve MV1 (O_2 supply metering valve) to blend enough O_2 to lower the NO concentration (ii) about 10%. Record this concentration.

(iv) Turn on the ozonator and increase its supply voltage until the NO concentration of (iii) is reduced to about 20% of (ii). NO_2 is now being formed from the $NO+O_3$ reaction. There must always

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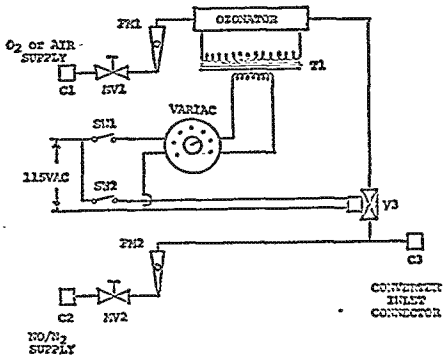
be at least 10% unreacted NO at this point. Record this concentration.

Figure 4 — NO_x CONVERTER EFFICIENCY DETECTOR



(v) When a stable reading has been obtained from (iv), place the NOx converter in the convert mode. The analyzer will now indicate the total NOx concentration. Record this concentration.

(vi) Turn off the ozonator and allow the analyzer reading to stabilize. The mixture NO+02 is still passing through the converter. This reading is the total NOx concentration of the dilute NO span gas used at step (iii). Record this concentration.

(vii) Close valve V3. The NO concentration should be equal to or greater than the reading of (ii) indicating whether the NO contains any NO_2.

Calculate the efficiency of the NOx converter by substituting the concentrations obtained during the test into the following equation.

$$\% \text{ Eff.} = \frac{(v)-(iv)}{(vi)-(iv)} \times 100\%$$

The efficiency of the converter should be greater than 90 percent. Adjusting the converter temperature may be needed to maximize the efficiency. Efficiency checks should be made on each analyzer range using an NO span gas concentration appropriate to the instrument range.

(viii) If the converter efficiency is not greater than 90 percent, the cause of the inefficiency shall be determined and corrected before the instrument is used.

(ix) The converter efficiency shall be checked at least once weekly and preferably once daily.

(b) Verifications and instrument checks shall be performed in accordance with § 87.67 on in-use systems. Verification and instrument checks shall be performed before and after each test, but not less than once per hour.

(c) For the purposes of this section, the term "zero grade air" includes artificial "air" consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18- and 21-mole percent.

§ 87.67 Sampling procedures.

(a) *HC, CO, CO_2, and NOx measurements.* Allow a minimum of 2 hours warmup for the CO, CO_2, HC, and NOx analyzers. (Power is normally left on infrared and chemiluminescence analyzers; but when not in use, the chopper motors of the infrared analyzers are turned off and the phototube high voltage supply of the chemiluminescence analyzer is placed in the standby position.) The following sequence of operations shall be performed in conjunction with each series of measurements:

(1) Check the sampling system for any leaks that could dilute the exhaust gas and replace or clean sample line filters.

(2) Introduce the zero grade gas at the same flow rates used to analyze the test samples and zero the analyzers. Obtain a stable zero on each amplifier meter and recorder. Recheck after tests.

(3) Introduce span gases and set the CO and CO_2 analyzer gains, the HC analyzer sample capillary flow rate and electronic gain control, if provided, and the NOx analyzer high voltage supply or amplifier gain to match the calibration curves. In order to avoid corrections, span and calibrate at the same flow rates used to analyze the test samples. Span gases should have concentrations equal to approximately 80 percent of each range used. If gain has shifted significantly on the CO or CO_2 analyzers, check tuning. If necessary, check calibration. Respan at least at end of test but not less than once per hour. Show actual concentrations on chart. Log gain readings.

(4) Check zeros; repeat the procedure in subparagraphs (1) and (2) of this paragraph, if required.

(5) Check sample line temperature and sample residence time. To check sample residence time:

(i) Introduce HC span gas into sampling system at sample inlet and simultaneously start timer.

(ii) When HC instrument indication is 15 percent of span concentration, stop timer.

(iii) If elapsed time is more than 2.0 seconds, make necessary adjustments.

(iv) Repeat (i) through (iii) with CO, CO_2, and NO instruments and span gases.

(6) Check instrument flow rates and pressures.

(7) The engine shall be operated in each operating mode until emission levels have stabilized as indicated by a constant instrument reading or recorder output. This stabilized reading shall be recorded and used in calculating mass emission rates as called for in Section 87.70.

(8) Measure, HC, CO, CO_2, and NOx concentrations of the exhaust sample at the various modes called for in §§ 87.62 or 87.63, as appropriate.

(9) If individual probes are used, the number to be reported (for each component) shall be the arithmetic average of the values obtained at each sampling point. If mixing probes are used, the number to be reported shall be the average of the values of the several probes, giving each probe a weighting factor equal to the number of sample points in that particular probe.

(10) Recheck zero and span points at the end of the test and also at approximately one hour intervals during the test. If either has changed by ±2 percent of full scale, the test shall be rerun after instrument maintenance: *Provided,* That if it is impractical to repeat the test, a correction based on an interpolation which is linear with time is acceptable for corrections within ±4 percent.

(b) *Sample system contamination.* (1) Care shall be taken to avoid loading of the sampling system with raw fuel discharge during engine starting.

(2) When the sample probe is in the exhaust stream and sampling is not in process, a back purge with air or an inert gas may be necessary to protect the probe and sample line from particulate buildup which could affect smoke and hydrocarbon readings. Check sample line for contamination each time the instrument zero and span points are checked. Use the following procedure to check the sample line:

(i) Immediately after instrument zero and span measurements and necessary adjustments are complete, introduce hydrocarbon zero gas near the sample probe. If the instrument zero reading increases by more than 5 percent of the scale in use, the sample line shall be purged or cleaned as required, to bring the zero within limits.

(ii) When the requirements of (i) have been met, introduce hydrocarbon span gas into the inlet of the sampling system. If the instrument span reading is different by more than ±5 percent from the correct setting for the scale in use, the sample line shall be purged or cleaned, as required, to bring the span within limits.

§ 87.68 Test run.

A test run shall consist of operating the engine in accordance with §§ 87.62 or 87.63, as applicable. During the test run the engine shall not be operate at a power setting above normal idle power before beginning the test sequence of § 87.62. The engine shall be operated in the sequence called for under these sections, unless an alternate procedure is agreed to in writing by the Administrator before such testing is conducted. If repeat runs at full takeoff power are necessary, they may be conducted after the last idle run in the test sequence.

§ 87.69 Chart reading.

Determine the HC, CO, CO_2, and NOx concentrations of the exhaust sample during the various modes from the instrument deflections or recordings, making use of appropriate calibration charts.

§ 87.70 Calculations.

(a) The final reported test results shall be computed by use of the following formulas:

(1) Hydrocarbon:

$$\text{HC pounds/1,000 pound-thrust-hrs. or 1,000 hp.-hr., as appropriate/cycle} = \frac{\text{Sum of the HC mass/mode of ea. mode}}{\text{Sum of the work output of ea. mode}}$$

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(2) Carbon monoxide:

$$\text{CO pounds/1,000 pound-thrust hrs. or 1,000 hp.=hr., as appropriate/cycle} = \frac{\text{Sum of the CO mass/mode of ea. mode}}{\text{Sum of the work output of ea. mode}}$$

(3) Oxides of nitrogen:

$$\text{NO}_x \text{ pounds/1,000 pound-thrust hrs. or 1,000 hp.=hr., as appropriate/cycle} = \frac{\text{Sum of the NO}_x\text{ mass/mode of ea. mode}}{\text{Sum of the work output of ea. mode}}$$

(b) The pollutant mass and work output per mode shall be computed by use of the following formulas:

(1) HC mass/mode=HC emission rate x TIM.
(2) CO mass/mode=CO emission rate x TIM.
(3) NO_x mass/mode=NO_x emission rate x TIM.
(4) Work output of each mode=power (in 1000 pounds thrust of 1000 horsepower) x TIM.

(c) The emission rates for each mode shall be computed by use of the following formulas:

$$\text{(1) HC emission rate} = \frac{M_{HC}\frac{(HC)}{10^4}F}{(M_C + {}_aM_H)\left(\frac{(CO)}{10^4} + (CO_2) + \frac{(HC)}{10^4}\right)}$$

$$\text{(2) CO emission rate} = \frac{M_{CO}\frac{(CO)}{10^4}F}{(M_C + {}_aM_H)\left(\frac{(CO)}{10^4} + (CO_2) + \frac{(HC)}{10^4}\right)}$$

$$\text{(3) NO}_x\text{ emission rate} = \frac{M_{NO_2}\frac{(NO_x)}{10^4}F}{(M_C + {}_aM_H)\left(\frac{(CO)}{10^4} + (CO_2) + \frac{(HC)}{10^4}\right)}$$

(d) The times in mode (TIM) shall be as specified below:

Time in mod (minutes)	Class T1 or P2	Class T2, T3 or T4
(1) Taxi/idle (out)	19	19
(2) Takeoff	0.5	0.7
(3) Climbout	2.5	2.2
(4) Approach	4.5	4.0
(5) Taxi/idle (in)	7.0	7.0

(e) Meaning of symbols:

(1) (i) HC mass/mode=Total mass of hydrocarbon emissions in pounds emitted during an operational mode as specified in Section 87.62 and paragraph (d) of this section.

(ii) CO mass/mode=Total mass carbon monoxide emissions in pounds emitted during an operational mode as specified in Section 87.62 and paragraph (d) of this paragraph.

(iii) NOx mass/mode=Total mass of oxides of nitrogen emissions in pounds emitted during an operational mode as specified in Section 87.62 and paragraph (d) of this section.

(2) (i) HC emission rate=Pounds/hour of exhaust hydrocarbons emitted in an operational mode.

(ii) CO emission rate=Pounds/hour of exhaust carbon monoxide emitted in an operational mode.

(iii) NOx emission rate=Pounds/hour of exhaust oxides of nitrogen emitted in an operational mode.

(3)

(i) M_{HC}=Molecular weight of methane, M_{HC}=16.04.

(ii) M_{CO}=Molecular weight of carbon monoxide.

(iii) M_{NO_2}=Molecular weight of nitrogen dioxide.

(iv) M_C=Atomic weight of carbon.

(v) M_H=Atomic weight of hydrogen, M_H=1.008.

(vi) a=Atomic hydrogen-carbon ratio of fuel.

(4) For each operating mode:

(i) (HC)=Concentration of hydrocarbons in the exhaust sample in parts per million carbon equivalent, i.e., equivalent propane x 3.

(ii) (CO)=Concentration of carbon monoxide in the exhaust sample in parts per million by volume.

(iii) (CO_2)=Concentration of CO in the exhaust sample in volume percent.

(iv) (NO_x)=Concentration of oxides of nitrogen in the exhaust sample in parts per million by volume, NO+NO_2.

(v) F=Mass rate of fuel flow in pounds per hour.

(5) TIM=Time in mode as specified in paragraph (d) of this section, divided by 60 to yield time in mode in hours.

§ 87.71 Compliance with emission standards.

Compliance with each emission standard by any aircraft or aircraft engine shall be determined by comparing the pollutant level in pounds/1,000 pound-thrust hours/cycle or pounds/1,000 hp.-hr./cycle as calculated in § 87.70(a) with the applicable emission standard under this part. The pollutant level for the cycle shall not exceed the standard.

Subpart H—Test Procedures for Engine Smoke Emission (Aircraft Gas Turbine Engines)

§ 87.80 Introduction.

Except as provided under § 87.5, the procedures described in this subpart shall be the test program to determine the conformity of new and in-use gas turbine engines with the applicable standards set forth in this part. The test is essentially the same as that described in §§ 87.60–87.62, except that the test is designed to determine the smoke emission level at various operating points representative of engine usage in aircraft. Other smoke measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator.

§ 87.81 Fuel specifications.

Fuel having specifications as provided in Section 87.61 shall be used in smoke emission testing.

§ 87.82 Sampling and analytical system for measuring smoke exhaust emissions.

(a) *Schematic drawing.* Figure 5 is a schematic drawing of the exhaust smoke sampling and analytical system which shall be used in testing under the regulation in this subpart.

(b) *Component description.* The following components shall be used in the sampling and analytical system for testing under the regulations in this subpart.

(1) *Sample size measurement.* A wet or dry positive displacement meter shall be used to measure sample size to an accuracy of ±0.01 standard cubic foot. Pressure and temperature shall be measured immediately upstream of the meter. Accuracy shall be no less than ±0.10 in. Hg and ±4° F., respectively. If a dry type meter is used, it may be located between the filter holder and the vacuum pump.

(2) *Sample flow rate measurement.* Sample flow rate shall be measured with a rotameter with accuracy of no less than ±0.02 cubic foot per minute.

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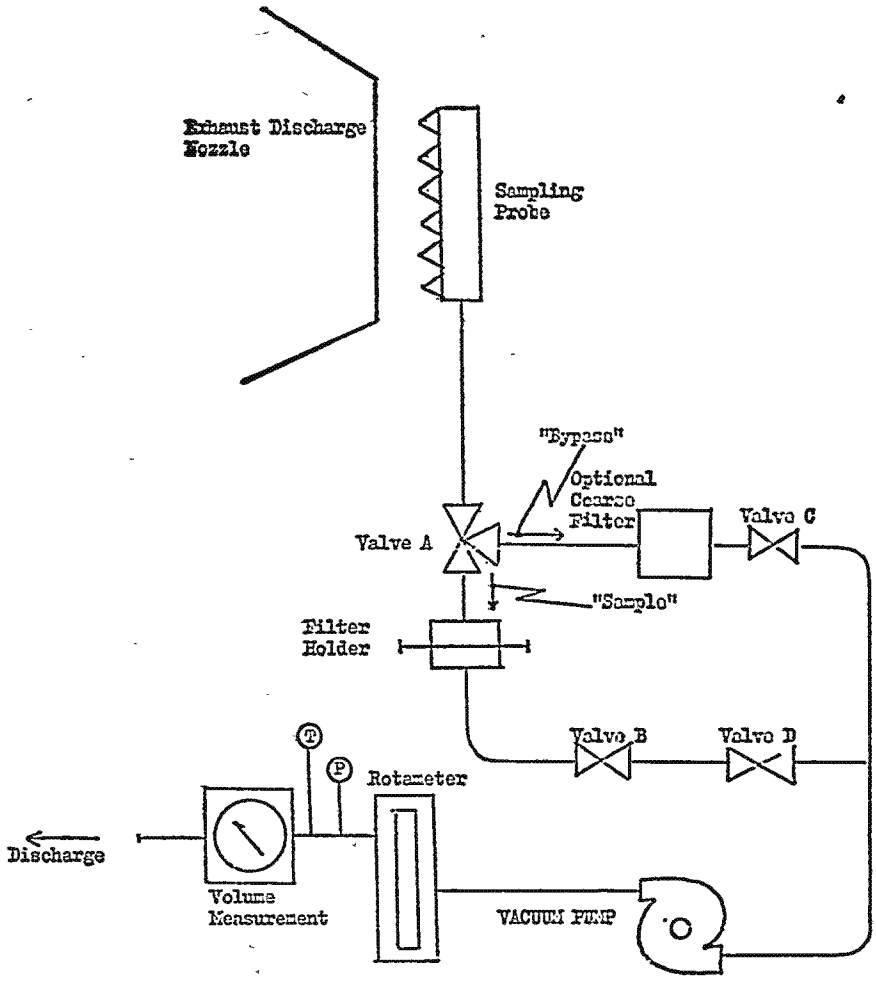

Figure 5 - SAMPLING SYSTEM SCHEMATIC DIAGRAM

(3) *Filter holder.* The filter holder shall firmly clamp the filter material so that overall system leakage does not exceed that provided in § 87.84(c). The holder internal geometry shall be such that the variation of SN over the sample spot surface is not greater than two. Required elements of the filter holder design are given in Figure 6. The filter holder shall be made of corrosion resistant material.

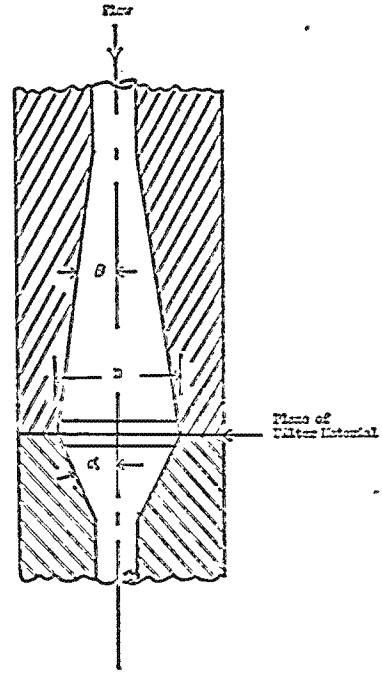

Figure 6 - FILTER HOLDER GEOMETRY DIAGRAM

(4) *Sampling probe.* The sample probe and procedure shall be the same as used to show compliance with § 87.64(c).

(5) *Sampling lines.* The sampling lines shall be straight through with no kinks or loops, and no bends having a radius of less than 10 line diameters. Sampling line inside diameter shall be within 0.18 to 0.32 inch. The sampling line section from the probe exit to valve A entrance shall be of minimum length, not greater than 75 feet, with a minimum of fittings or other breaks. Line material shall be such as to not encourage build-up of either particulate matter or static electric charge, such as stainless steel or copper.

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(6) *Valving.* Four valve elements shall be provided. Valve A shall be a quick acting, full-flow, flow diverter with "closed," "sample," and "bypass" positions. Valve A may consist of two valves, provided that they are interlocked so that one of the pair cannot act independently of the other. Valves B and C shall be throttling valves used to establish a system flow rate. Valve D shall be a shutoff valve used in isolating the filter holder. All valves shall be made of corrosion resistant material.

(7) *Vacuum pump.* The vacuum pump shall have a no-flow vacuum capability of at least 22 in. Hg. V., and full-flow capacity of 1 s.c.f.m. minimum.

(8) *Reflectometer.* A reflectometer conforming to ASA standard for diffuse reflection density, number Ph2.17–1958, shall be used. The diameter of the reflectometer light beam on the filter paper shall be no more than one-half of "D," the diameter of the filter spot. The allowable range of "D" is given in Figure 6.

(9) *Filter material.* The filter material shall be Whatman No. 4 filter paper or equivalent approved by the Administrator.

§ 87.83 Information to be recorded.

The following information shall be recorded with respect to each test in addition to that information called for in § 87.65 (a) through (c).

(a) Sample temperature.

(b) Sample pressure.

(c) Actual sample volume at sampling conditions.

(d) Actual sample flow rate at sampling conditions.

(e) Leak and cleanliness checks substantiation as required by § 87.84 (b) and (c).

§ 87.84 Calibration and instrument checks.

(a) *Reflectometer calibration.* The reflectometer required by § 87.82(b)(8) shall be calibrated in accordance with manufacturer's specifications.

(b) *System maintenance.* The need for cleaning or replacement shall be determined by conducting the following cleanliness check:

(1) Full open valves B, C, and D.

(2) Use the vacuum pump and alternately set valve A to "bypass" and "sample" to purge the entire system with clean air for at least 5 minutes.

(3) Set valve A to "bypass."

(4) Close valve D and clamp clean filter material into the holder. Open valve D.

(5) Set valve A to "sample," reset back to "bypass" after 1 standard cubic foot of air per square inch of filter area has passed through the filter material.

If the filter spot exhibits SN greater than 3, the system lines must be cleaned or replaced. The system shall not be used until this cleanliness requirement has been met.

(c) *Leak check.* The following procedure shall be used to leak check the system.

(1) Clamp clean filter material into the holder.

(2) Close valve A, full open valves B, C, and D.

(3) Run the vacuum pump for 5 minutes.

The system shall be satisfactory if no more than 0.20 standard cubic foot passed through the volume meter during 5 minutes. The system shall not be used until this requirement has been met.

§ 87.85 Test procedures.

(a) The engine shall be operated as provided in § 87.62. The leak check and cleanliness check requirements of § 87.84 shall be confirmed before and after each engine test. The test shall be repeated if the requirements of § 87.84 are not confirmed.

(b) Precautions: The material being measured is composed of low-micron and/or submicron size agglomerated particles. Precautions should be taken to assure that steady state conditions have been achieved prior to taking a sample. To prevent material accumulation, the system shall not be left in a no-flow condition when exhaust gas is contained.

(c) Sampling: Not less than 1 minute shall be allowed to assure that the system is fully charged with a representative gas sample. The sampling flow rate shall be maintained at 0.50±0.02 c.f.m. At least four sample sizes shall be taken within the range of 0.00765 to 0.115 lb. of exhaust gas per square inch of filter. Samples shall be taken both above and below 0.0230 lb. of exhaust gas per square inch of filter.

(d) Temperature control: The gas temperature from the sampling probe entrance to the filter material shall be above the dew point temperature. All lines and valves shall be lagged and/or heated as necessary to meet this requirement.

(e) Preparation for each power setting: The following shall be done to prepare the system at each power setting:

(1) Set valve A to "bypass," close valve D.

(2) Draw exhaust gas for 5 minutes minimum, then use valve C to set flow rate at 0.50±0.02 c.f.m.

(3) Clamp clean filter material into the holder.

(4) Open valve D.

(5) Set valve A to "sample" and use valve B to again set the flow rate to 0.50±0.02 c.f.m. This shall be done quickly before particulate buildup on the filter causes excessive pressure drop.

(6) Set valve A to "bypass" and close valve D.

(7) Clamp clean filter material into the holder.

(f) Sampling procedure: The procedure for smoke sampling at each power setting shall be as follows:

(1) With valve D closed and valve A set at the "bypass" position, charge the lines with exhaust gas for 1 minute minimum. Reestablish flow rate at 0.50±0.02 c.f.m. as required, using valve C.

(2) Open valve D.

(3) Set valve A to "sample," allow the chosen sample volume to pass, then set valve A to "bypass."

(4) Close valve D and clamp clean filter material into the holder.

(5) Repeat subparagraphs (2) through (4) of this paragraph for at least three more sample sizes in accordance with paragraph (c) of this section.

§ 87.86 Test run.

With respect to engine operation, the test run shall be conducted in accordance with § 87.68.

§ 87.87 Determination of SN.

Smoke spot analysis shall be made with a reflectometer as specified in § 87.82(b)(8). The backing material shall be black with a maximum absolute reflectance of 3 percent. The reflectance reading of each spot shall be used to calculate SN by: $SN=100\left(1-\frac{Rs}{Rw}\right)$, where Rs=absolute reflectance of the sample spot. Rw=absolute reflectance of clean filter material.

§ 87.88 Calculations.

(a) *Calculation of W.* The sample weight (W) shall be calculated by: $W\ (\text{lb.})=1.326\frac{PV}{T}$, where P and T are sample pressure and temperature in units of inches of mercury absolute and degrees Rankine, respectively, measured immediately upstream of the volume meter. V is measured sample volume in cubic feet.

(b) *Calculation of W/A.* The sample weight in pounds per square inch of filter spot area (W/A) shall be calculated for each sample size taken.

(c) *Plotting SN versus W/A.* All SN shall be plotted versus W/A on semilog coordinates, with W/A as the logarithmic abscissa. A straight line shall be fitted to these points using the method of least squares. Such a line shall be produced for each power setting specified.

(d) *Plotting reporting values of SN versus power setting.* Values of SN shall be read from the straight line functions of paragraph (c) of this section for W/A=0.0230 lb/sq. in. These SN are the values to be reported and shall be presented by plotting them as ordinate versus power setting as abscissa on rectangular coordinates.

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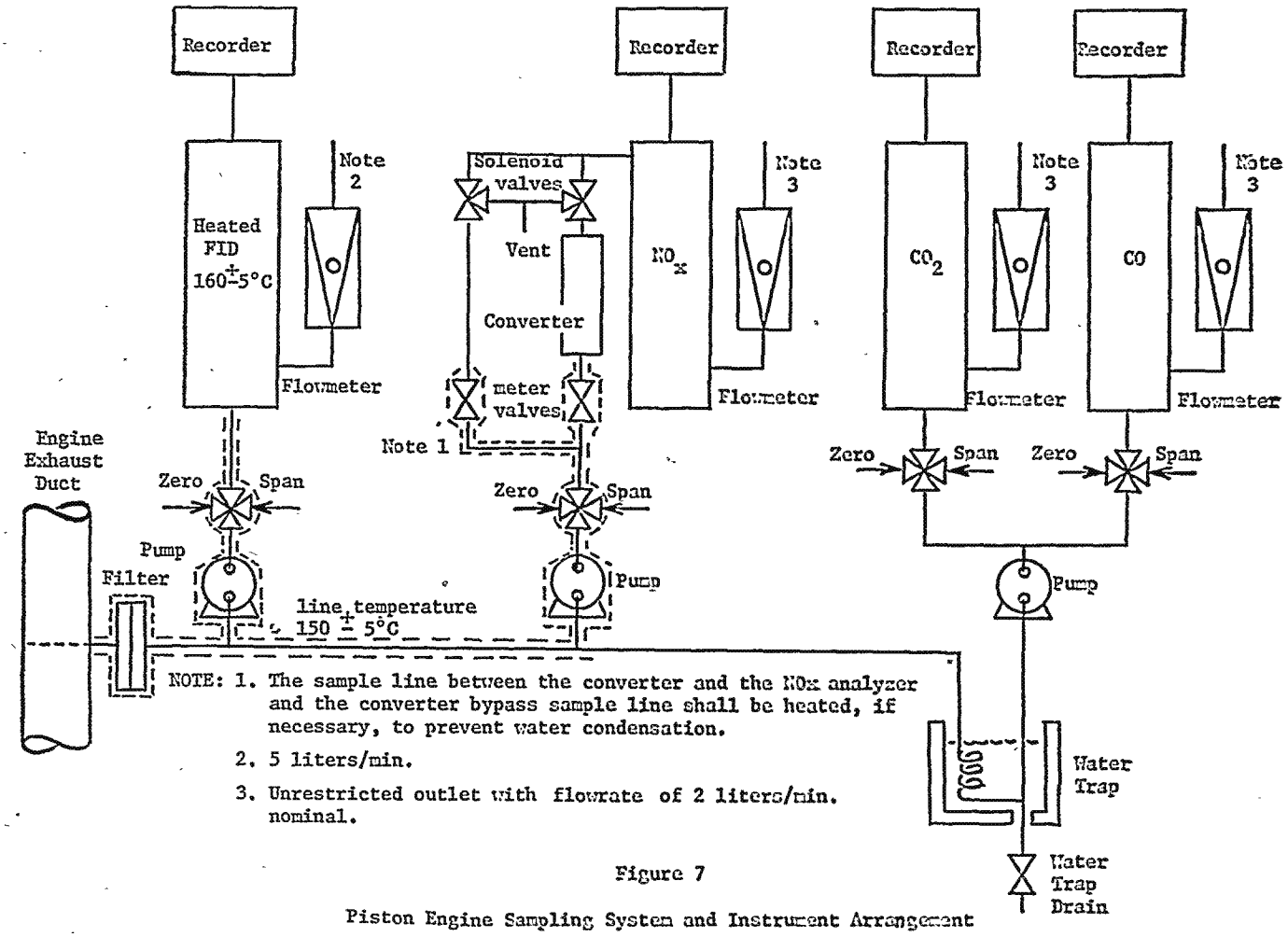

Figure 7

Piston Engine Sampling System and Instrument Arrangement

§ 87.89 Compliance with emission standards.

Compliance with each emission standard shall be determined by comparing the plot of SN versus power setting from § 87.83 with the applicable emission standard under this part. The SN at every power setting shall not exceed the standard.

Subpart I—Test Procedures for Engine Exhaust Gaseous Emissions (Aircraft Piston Engines)

§ 87.90 Introduction.

Except as provided under § 87.5, the procedures described in this subpart shall be the test program to determine the conformity of new and in-use aircraft piston engines with the applicable standards set forth in this part.

(a) The test consists of operating the engine at prescribed power settings on an engine dynamometer or test stand. The exhaust gases generated during engine operation are sampled continuously for specific component analysis through the analytical train.

(b) The exhaust emission test is designed to measure hydrocarbon, carbon monoxide, and oxides of nitrogen concentrations and determine mass emissions through calculations during a simulated aircraft landing-takeoff cycle (LTO). The LTO cycle is based on time in mode data during high activity periods at major airports. The test consists of five modes of engine operation: Taxi/idle (out), takeoff, climbout, approach, and taxi/idle (in). The mass emissions for the modes and engine rated power are combined to yield the reported values.

(c) When an engine is tested for exhaust emissions on an engine dynamometer or test stand, the complete engine shall be used with all accessories, which might reasonably be expected to influence emissions to the atmosphere, installed and functioning.

§ 87.91 Gasoline fuel specifications.

For exhaust emission testing, fuel meeting the specifications of ASTM D910 latest version for grades 80/87 or 100/130 (as applicable) shall be used. The lead content and octane rating of the fuel shall be in the range recommended by the engine manufacturer.

§ 87.92 Test procedure.

(a) (1) The engine shall be tested in each of the following five engine operating modes which simulate aircraft operation to determine its mass emission rates:

Mode	*Power setting (percent of rated power)*
Taxi/idle (out)	See subparagraph (2) of this paragraph
Takeoff	100 percent
Climbout	See subparagraph (3) of this paragraph
Approach	40 percent
Taxi/idle (in)	See subparagraph (2) of this paragraph

(2) The taxi/idle operating modes shall be conducted in accordance with the manufacturer's recommended power setting.

(3) The climbout operating mode shall be conducted in accordance with the manufacturer's recommended power setting: *Provided*, That the power setting shall be between 75 and 100 percent of rated power.

(b) Emission testing shall be conducted on warmed-up engines which have achieved a steady operating temperature.

§ 87.93 Sampling and analytical system for measuring exhaust emissions.

(a) *Schematic drawing.* Figure 7 is a schematic drawing of the exhaust gas sampling and analytical system which shall be used for testing under the regulations in this subpart. Additional com-

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ponents such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordinate the functions of the component systems.

(b) *Water removal devices.* No desiccants, dryers, water traps, or related equipment may be used to treat the exhaust sample flowing to the oxides of nitrogen measurement instrumentation. Temperature control shall be provided for NOx sample lines, hardware and instrument to prevent water condensation.

(c) *Component description (exhaust gas sampling system).* The following components shall be used in the exhaust gas sampling system for testing under the regulations in this subpart:

(1) *Sampling probe.* The probe will be made of stainless steel of at least one-fourth inch outside diameter extending across the diameter of the engine exhaust duct. The gas sample will be drawn through a minimum of 5 holes in the sample probe distributed uniformly across the inside diameter of the engine exhaust duct. Where the engine has two or more exhaust pipes, the pipes shall be combined into a common exhaust pipe of sufficient length to provide for good mixing.

(2) *Sample transfer.* The sample shall be transferred from the probe to the analytical instruments through a stainless steel or Teflon sample line. Sample flow rate from the engine to the instruments shall be such that the transport time from exhaust pipe to instruments is 2 seconds or less.

(d) *Component description (exvhaust gas analytical system).* The analytical system provides for the determination of hydrocarbon concentrations by flame ionization detector analysis, the determination of carbon monoxide and carbon dioxide concentrations by nondispersive infrared analysis and the determination of oxides of nitrogen concentrations by chemiluminescence analysis of exhaust samples. The chemiluminescence method of analysis requires that the nitrogen dioxide present in the sample be converted to nitric oxide before analysis. Other types of analyzers may be used if shown to yield equivalent results and if approved in advance by the Administrator. See appendix B of this part.

§ 87.94 Information to be recorded.

The following information, as applicable, shall be recorded with respect to each test:

(a) *General.* (1) Facility performing test.

(2) Description of test equipment including the probe and sampling and analytical train.

(3) Instrument operator.

(4) Test stand operator.

(5) Fuel identification including H/C ratio and additives, if any.

(b) *Aircraft (in which engine will be installed) description.* (1) Manufacturer.

(2) Model number.

(3) Serial number (if known).

(4) User.

(c) *Engine description.*—(1) Manufacturer.

(2) Model number.

(3) Serial number.

(4) Displacement.

(5) Type, manufacturer, and model of carburetion.

(6) Cylinder configuration.

(7) Turbocharger manufacturer and model, if applicable.

(d) *Test data.*—(1) Test number.

(2) Date.

(3) Time.

(4) Ambient temperature and engine inlet temperature.

(5) Barometric pressure.

(6) Relative humidity.

(7) Sample line temperature.

(8) Sample line residence time.

(9) All pertinent instrument information such as tuning, gain, full scale range.

(10) Recorder charts: Identify zero, span and exhaust gas sample traces.

(e) *Operating mode data.*—(1) Nominal power setting.

(2) Actual power setting, horsepower.

(3) Speed, revolutions per minute.

(4) Absolute manifold pressure, inches mercury.

(5) Measured fuel flow, pounds per minute.

(6) Air flow, pounds per minute and method of determination.

(7) Pollutant concentration, from recorders, in percent or parts per million by volume, and parts per million carbon for hydrocarbons.

§ 87.95 Calibration and instrument checks.

Calibration and instrument checks shall be performed in accordance with § 87.66 except that daily calibration and instrument checks shall be performed in accordance with § 87.96.

§ 87.96 Sampling procedures.

(a) *HC, CO, CO^2, and NOx measurements.* Allow a minimum of 2 hours warmup for the CO, CO_2, HC and NOx analyzers. (Power is normally left on infrared and chemiluminescence analyzers; but when not in use, the chopper motors of the infrared analyzers are turned off and the phototube high voltage supply of the chemiluminescence analyzer is placed in the standby position.) The following sequence of operations shall be performed in conjunction with each series of measurements:

(1) Check the sampling system for any leaks that could dilute the exhaust gas.

(2) Introduce the zero grade gas at the same flow rates used to analyze the test samples and zero the analyzers. Obtain a stable zero on each amplifier meter and recorder. Recheck after tests.

(3) Introduce span gases and set the CO and CO_2 analyzer gains, the HC analyzer sample capillary flow rate and electronic gain control, if provided, and the NO, anaylzer high voltage supply or amplifier gain to match the calibration curves. In order to avoid corrections, span and calibrate at the same flow rates used to analyze the test samples. Span gases should have concentrations equal to approximately 80 percent of each range used. If gain has shifted significantly on the CO or CO_2 analyzers, check tuning. If necessary, check calibration. Respan at least at end of test but not less than once per hour. Show actual concentrations on chart. Log gain readings.

(4) Check zeros; repeat the procedure in subparagraphs (1) and (2) of this paragraph if required.

(5) Check sample line temperature and sample residence time. To check sample residence time:

(i) Introduce HC span gas into sampling system at sample inlet and simultaneously start timer.

(ii) When HC instrument indication is 15 percent of span concentration, stop timer.

(iii) If elapsed time is more than 2.0 seconds, make necessary adjustments.

(iv) Repeat (i) through (iii) with CO, CO_2, and NO instruments and span gases.

(6) Check instrument flow rates and pressures.

(7) The engine shall be operated in each operating mode until emission levels have stabilized as indicated by a constant instrument reading or recorder ouput. This stabilized reading shall be recorded and used in calculating mass emission rates as called for in § 87.99.

(8) Measure HC, CO, CO_2, and NOx concentrations of the exhaust sample at the various modes called for in § 87.92.

(9) Recheck zero and span points at the end of the test and also at approximately one hour intervals during the test. If either has changed by ±2 percent of full scale, the test shall be rerun after instrument maintenance: *Provided,* That if it is impractical to repeat the test, a correction based on interpolation linear with time is acceptable for corrections within ±4 percent.

(b) *Carbon balance.* As a test of representative sample collection, a carbon balance shall be calculated from air and fuel flow data. This balance shall be within ±5 percent of that calculated from exhaust gas constituents or the test will be invalidated. Fuel flow data shall be derived by measurement during the test for which emissions are to be calculated. Air flow data preferably is from direct measurement but if such measurement is impractical, the data shall be taken from air consumption curves generated for the particular model of engine under test.

(c) *Sample system contamination.* (1) Care shall be taken to avoid loading of the sampling system with raw fuel discharge during engine starting.

(2) When the sample probe is in the exhaust stream and sampling is not in process, a back purge with air or an inert gas may be necessary to protect the probe and sample line from hydrocarbon buildup.

Check sample line for contamination each time the instrument zero and span points are checked. Use the following procedure to check the sample line:

(i) Immediately after instrument zero and span measurements and necessary adjustments are complete, introduce hydrocarbon zero gas near the sample probe. If the instrument zero reading increases by more than 5 percent of the

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scale in use the sample line shall be purged or cleaned as required, to bring the zero within limits.

(ii) When the requirements of paragraph (c) (2) (i) of this section have been met, introduce hydrocarbon span gas near the sample probe. If the instrument span reading is different by more than ±5 percent from the correct setting for the scale in use, the sample line shall be purged or cleaned, as required to bring the span within limits.

§ 87.97 Test run.

A test run shall consist of operating the engine in accordance with § 81.92. The engine shall be operated in the sequence called for under that section without intervening operating points unless an alternate procedure is agreed to in writing by the Administrator before such testing is conducted.

§ 87.98 Chart reading.

Determine the HC CO, CO_2, and NOx concentrations of the exhaust sample during the various modes from the instrument deflections or recordings making use of appropriate calibration charts. CO and CO_2 measurements shall be converted to a wet basis by multiplying the recorded concentrations by a conversion factor calculated in accordance with good engineering practices for rich or lean mixtures as appropriate from actual air and fuel flow measurements or from air consumption curves generated for the particular model of engine under test.

§ 87.99 Calculations.

(a) The final reported test results shall be computed by use of the following formulas:

(1) Hydrocarbon:

$$\text{HC pounds/rated power/cycle} = \frac{\text{Sum of the HC mass/mode of ea. of the modes}}{\text{Engine rated power (horsepower)}}$$

(2) Carbon monoxide:

$$\text{CO pounds/rated power/cycle} = \frac{\text{Sum of the CO mass/mode of each of the modes}}{\text{Engine rated power (horsepower)}}$$

(3) Oxides of nitrogen:

$$NO_x \text{ pounds/rated power/cycle} = \frac{\text{Sum of the } NO_x \text{ mass/mode of ea. of the modes}}{\text{Engine rated power (horsepower)}}$$

(b) The pollutant mass per mode shall be computed by use of the following formulas:

(1) HC mass/mode=HC emission rate x TIM.

(2) CO mass/mode=CO emission rate x TIM.

(3) NOx mass/mode=NOx emission rate x TIM.

(c) The emission rates shall be computed by use of the following formulas:

$$(1)\ \text{HC emission rate} = \dot{V}\ \text{exhaust} \times \text{density HC} \times \frac{\text{HC conc}}{1{,}000{,}000}$$

$$(2)\ \text{CO emission rate} = \dot{V}\ \text{exhaust} \times \text{density CO} \times \frac{\text{CO conc}}{1{,}000{,}000}$$

$$(3)\ NO_x \text{ emission rate} = \dot{V}\ \text{exhaust} \times \text{density } NO_x \times \frac{NO_x \text{ conc}}{1{,}000{,}000}$$

(d) The time-in-mode (TIM) shall be as specified below (in minutes):

(1) Taxi/idle (out)	12.0
(2) Takeoff	0.3
(3) Climbout	5.0
(4) Approach	6.0
(5) Taxi/idle (in)	4.0

(e) Meaning of symbols:

(1) (i) HC mass/mode=Total mass of hydrocarbons emissions in pounds emitted during an operational mode as specified in § 87.92 and paragraph (d) of this section.

(ii) CO mass/mode=total mass of carbon monoxide emissions in pounds emitted during an operational mode as specified in § 87.92 and paragraph (d) of this section.

(iii) NOx mass/mode=total mass of oxides of nitrogen emissions in pounds emitted during an operational mode as specified in § 87.92 and paragraph (d) of this section.

(2) (i) HC emission rate=pounds/hour of exhaust hydrocarbons emitted in an operational mode.

(ii) CO emission rate=pounds/hour of exhaust hydrocarbons emitted in an operational mode.

(iii) NOx emission rate=pounds/hour of exhaust oxides of nitrogen emitted in an operational mode.

(3) V exhaust=Total engine exhaust volume flow rate in terms of cubic feet per hour at 68°F. and 760 mm. Hg pressure. V exhaust shall be calculated in accordance with good engineering practices from actual air and fuel flow measurements or from air consumption curves generated for the particular model of engine under test.

(4) (i) Density HC=Density of hydrocarbons in the exhaust gas, assuming an average carbon to hydrogen ratio of 1:1.85, in pounds per cubic foot at 68°F. and 760 mm. Hg pressure (0.0359 lb./cu. ft).

(ii) Density CO=Density of carbon monoxide in the exhaust gas in pounds per cubic foot at 68°F. and 760 mm. Hg pressure (0.0726 lb./cu. ft.).

(iii) Density NOx=Density of oxides of nitrogen in the exhaust gas, assuming they are in the form of nitrogen dioxide, in pounds per cubic foot at 68°F. and 760 mm. Hg pressure (0.119 lb./cu. ft.).

(5) (i) HC conc.=hydrocarbon concentration of the exhaust sample in pounds per minute carbon equivalent, i.e., equivalent propaneX3.

(ii) CO conc.=Carbon monoxide concentration of the exhaust sample in parts per million by volume.

(iii) NOx conc.=Oxides of nitrogen concentration of the exhaust sample in parts per million by volume.

(6) TIM=Time in mode as specified in paragraph (d) of this section divided by 60 to yield time in mode in hours.

§ 87.100 Compliance with emission standards.

Compliance with each emission standard shall be determined by comparing the pollutant level to pounds/rated power/cycle as calculated in accordance with § 87.99, with the applicable emission standard under this part. The pollutant level for the cycle shall not exceed the standard.

APPENDIX A—INSTRUMENTATION (AIRCRAFT GAS TURBINE ENGINE MEASUREMENTS)

(a) *NDIR instruments.* Nondispersive infrared (NDIR) analyzers shall be used for the continuous monitoring of carbon monoxide and carbon dioxide.

The NDIR instruments operate on the principle of differential energy absorption from parallel beams of infrared energy. The energy is transmitted to a differential detector through parallel cells, one containing a reference gas, and the other, sample gas. The detector, changed with the component to be measured, transduces the optical signal to an electrical signal. The electrical signal thus generated is amplified and continuously recorded. The NDIR analyzer used in accordance with Subpart H of this part shall meet the following specifications:

(1) *Response time (electrical).* 90 percent full scale response in 0.5 second or less. Zero drift—Less than ±1 percent of full scale in 2 hours on most sensitive range. Span drift—Less than ±1 percent of full scale in 2 hours on most sensitive range. Repeatability—±1 percent of full scale. Noise—Less than 1 percent of full scale on most sensitive range. Cell temperature—Minimum 59° C. maintained within ±2° C.

(2) *Range and accuracy.*

Range	*Accuracy excluding interferences*
Carbon monoxide:	
0 to 100 p.p.m.	±2 percent of full scale
0 to 500 p.p.m.	±1 percent of full scale
0 to 2500 p.p.m.	±1 percent of full scale
Carbon dioxide:	
0 to 2 percent	±1 percent of full scale
0 to 5 percent	±1 percent of full scale

(3) All NDIR instruments shall be equipped with cells of suitable length to measure exhaust concentrations within the ranges encountered to the indicated accuracy. Range changes shall be accomplished either by the use of stacked sample cells or changes in the electronic circuitry, or both.

(b) *Total hydrocarbon analyzer* (1) General design specifications. The measurement of total hydrocarbon is made by an analyzer using a flame ionization detector (FID). With this type detector an ionization current, proportional to the mass rate of hydrocarbon entering a hydrogen flame, is established between two electrodes; the small current is

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measured by an electrometer amplifier and continuously recorded.

The analyzer shall be fitted with a constant-temperature oven housing the detector and sample-handling components. It shall maintain temperature within ±2°C. of the set point, which shall be within 155° to 165°C.

The detector and sample handling components shall be suitable for continuous operation at temperatures to 200°C.

(2) The FID analyzer used in accordance with Subpart G of this part shall meet the following specifications:

Response time (electrical)—90 percent of full scale in 0.5 seconds or less.

Noise—±1 percent of full scale on most sensitive range.

Repeatability—±1 percent of full scale.

Zero drift—Less than ±1 percent of full scale in 2 hours on all ranges.

Span drift—Less than ±1 percent of full scale in 2 hours.

Linearity—Response with propane in air shall be linear with ±2 percent over the range of 0 to 2,000 p.p.m.C.

Accuracy:

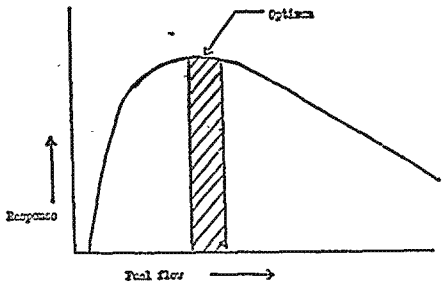
0 to 10 p.p.m.C	±5 percent of full scale with propane calibration gas.
0 to 100 p.p.m.C	±2 percent of full scale with propane calibration gas.
0 to 1,000 p.p.m.C	±1 percent of full scale with propane calibration gas.
0 to 2,000 p.p.m.C	±1 percent of full scale with propane calibration gas.

(3) Total hydrocarbon analyzer shall have an initial alignment as follows:

(i) *Optimization of detector response.* (*a*) Follow manufacturer's instructions for instrument startup and basic operating adjustment. Fuel shall be 60 percent helium, 40 percent hydrogen containing less than 2 p.p.m.C. hydrocarbon. Air shall be "hydrocarbon-free" grade containing less than 2 p.p.m.C.

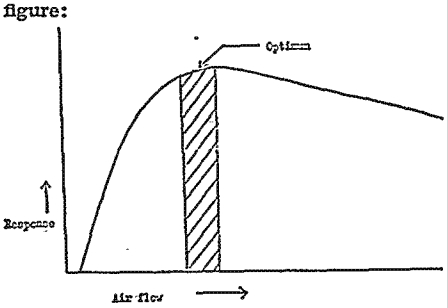
(*b*) Set oven temperature at 160°±5°C. and allow at least one-half hour after oven reaches temperature for the system to equilibrate. The temperature is to be maintained at set point ±2°C.

(*c*) Introduce a mixture of propane in air at a propane concentration of about 500 p.p.m.C. Vary the fuel flow to burner and determine the peak response. A change in zero may result from a change in fuel flow; therefore, the instrument zero should be checked at each fuel-flow rate. Select an operating flow rate that will give near maximum response and least variation in response with minor fuel-flow variations. A typical curve for response versus fuel flow is shown in the following figure.



RESPONSE VS. FUEL FLOW

(*d*) To determine the optimum air flow, use fuel flow setting determined above and vary air flow. A typical curve for response versus air flow is shown in the following figure:



RESPONSE VS. AIR FLOW

After the optimum flow settings have been determined these flows are to be measured and recorded for future reference.

(ii) *Oxygen effect.* Check the response of the detector with varied concentrations of oxygen in the sample following the steps outlined below; this test shall be made with oven temperature at the set point and with gas flow to the detector at optimum conditions, as determined in paragraph (b)(3)(i) of this section.

(*a*) Introduce nitrogen (N_2) zero gas and zero analyzer; check zero using hydrocarbon-free air; the zero should be the same.

(*b*) The following blends of propane shall be used to determine the effect of oxygen (O_2) in the sample.

Propane in N_2.

Propane in 10%±0.5% O_2 and balance N_2.

Propane in zero grade air (refer to 87.66 (c)).

The volume concentration of propane in the mixture reaching the detector should be about 500 p.p.m.C, and the concentration of both the O_2 and hydrocarbon should be known within ±1 percent of the absolute value. The zero shall be checked after each mixture is measured. If the zero has changed then the test shall be repeated.

The response to propane in air shall not differ by more than 3 percent from the response to propane in the 10 percent-O_2/90 percent-N_2 mixture, nor differ by more than 5 percent from the response to propane in nitrogen.

The difference between the response to propane in nitrogen and response to propane in diluent containing 10 percent O_2 shall not exceed 2 percent. If the 2 percent specification cannot be met by changing the sample flow rate or burner parameters, such as air and/or fuel-flow rate, the detector shall be modified or replaced.

(iii) Linearity and relative response.

(*a*) With analyzer optimized in accordance with paragraph (b)(3)(i) of this section, the instrument linearity shall be checked for the ranges covering the range of analysis using propane in air at nominal concentrations of 30, 60, and 90 percent full scale of each range. The deviation of a best-fit curve from a least-squares best-fit straight line should not exceed 2 percent of the value at any point. If this specification is met, concentration values may be calculated by use of a single calibration factor. If the deviation exceeds 2 percent at any point, concentration values shall be read from a calibration curve prepared during this alignment procedure.

(*b*) A comparison of response to the different classes of compounds shall be made using (individually) propylene, toluene, n-hexane, and propane, each at 20 to 50 p.p.m.C concentration in air. If the response to propylene, toluene or n-hexane differs by more than 5 percent from the response to propane, check instrument operating parameters. Reducing sample flow rate improves uniformity of response.

(*c*) *Oxides of nitrogen analytical system.* The chemiluminescence method utilizes the principle that nitric oxide (NO) reacts with ozone (O_3) to give nitrogen dioxide (NO_2) and oxygen (O_2). Approximately 10 percent of the NO_2 is electronically excited. The transition of excited NO_2 to the ground state yields a light emission (600–2600 nanometer region) at low pressures. The detectable region of this emission depends on the PM-tube/optical filter being used in the detector. The intensity of this emission is proportional to the mass flow rate of NO into the reactor. The light emission can be measured utilizing a photomultiplier tube and associated electronics.

(1) The method also utilizes the principle that the thermal decomposition of NO_2 i.e., ($2NO_2 \rightarrow 2NO + O_2$), is complete at about 600°C. The rate constant for the dissociation of NO_2 at 600°C. is approximately 10^6 (liters/mole-second). A 6-foot length of one-eighth inch outside diameter, 0.028 inch wall thickness, flawless stainless steel tubing resistance heated using a low voltage, high current power supply to a temperature of 650°C. provides sufficient residence time at a sample flow rate of 700 cc. per minute (1.5 c.f.h.) for essentially complete conversion of nitrogen dioxide to nitric oxide. Other converter designs may be used if shown to yield equivalent results.

(2) The method permits continuous monitoring of NOx concentrations over a wide range. Response time (2 to 4 sec. is typical) is primarily dependent on the mechanical pumping rate at the operating pressure of the reactor. The following figure is a flow schematic illustrating one configuration of the major components required for the oxides of nitrogen analytical system.

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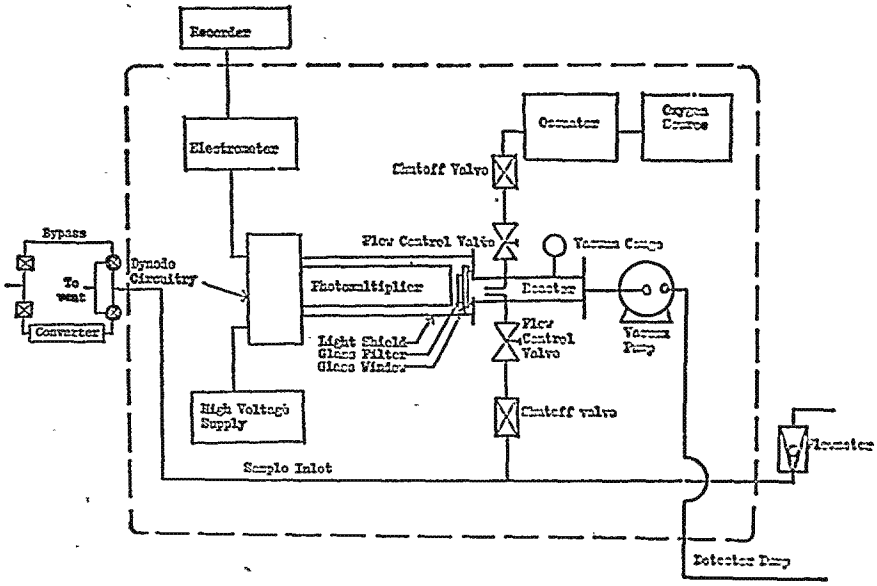

OXIDES OF NITROGEN ANALYTICAL SYSTEM

(3) The oxides of nitrogen analyzer used in accordance with Subpart G of this part shall meet the following specifications:

Response time (electrical)—90 percent of full scale in 0.5 seconds or less.

Noise—Less than 1 percent of full scale.

Repeatability—±1 percent of full scale.

Zero drift—Less than ±1 percent of full scale in 2 hours.

Span drift—Less than ±1 percent of full scale in 2 hours.

Linearity—Linear to within ±2 percent of full scale on all ranges.

Accuracy—±1 percent of full scale on all scales.

(d) The dynamometer test stand and other instruments for measurement of power output and the fuel flow measurement instrumentation in accordance with Subpart G of this part shall be accurate to within ±2 percent at all power settings.

APPENDIX B—INSTRUMENTATION (AIRCRAFT PISTON ENGINE MEASUREMENTS)

(a) The NDIR analyzers used for continuous monitoring of carbon monoxide and carbon dioxide in accordance with Subpart I of this part shall meet the following specifications:

(1) Response time (electrical—90 percent full scale response in 0.5 second or less. Zero drift—Less than ±1 percent full scale in 2 hours on most sensitive range. Span drift—Less than ±1 percent of full scale in 2 hours on most sensitive range. Noise—Less than 1 percent of full scale on most sensitive range.

(2) Range and accuracy:

Range	*Accuracy excluding interferences*
Carbon monoxide, 0–12 percent	±1 percent of full scale.
Carbon dioxide, 0–15 percent	±1 percent of full scale.

(b) The FID analyzer used for measurement of hydrocarbons in accordance with Subpart I of this part shall meet the following specifications:

Response time (electrical)—90 percent of full scale in 0.5 seconds or less.

Noise—±1 percent of full scale on most sensitive range.

Repeatability—±1 percent of full scale.

Zero drift—Less than ±1 percent of full scale in 2 hours on all ranges.

Span drift—Less than plus or minus of full scale in 2 hours.

Linearity—Response with propane in air shall be linear with ±2 percent over the range of 0 to 20,000 p.p.m.C.

Accuracy:

0 to 100 p.p.m.C	±5 percent of full scale with propane calibration gas.
0 to 1,000 p.p.m.C	±2 percent of full scale with propane calibration gas.
0 to 10,000 p.p.m.C	±1 percent of full scale with propane calibration gas.

(c) The oxides of nitrogen analyzer used for measurement of oxides of nitrogen in accordance with Subpart I of this part shall meet the following specifications:

Response time (electrical)—90 percent of full scale in 0.5 second or less.

Noise—Less than 1 percent of full scale.

Repeatability—±1 percent of full scale.

Zero drift—Less than ±1 percent of full scale in 2 hours.

Span drift—Less than ±1 percent of full scale in 2 hours.

Linearity—Linear to within ±2 percent of full scale on all ranges.

Accuracy—±1 percent of full scale on all scales.

(d) The dynamometer, test stand, and other instruments for measurement of power output and air and fuel flow measurement instrumentation in accordance with Subpart I of this part shall be accurate to within ±2 percent at all power settings.

[FR Doc.73-14493 Filed 7-16-73;8:45 am]

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8	1943	53	20	1955	41	32	1967	69
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Subject: ANALYSIS: Aerion releases configuration of supersonic jet engine

ANALYSIS: Aerion releases configuration of supersonic jet engine

- 22 February, 2018
- SOURCE: Flight International
- BY: Kate Sarsfield
- London **FlightGlobal**

Aerion has released a configuration of the first civil supersonic jet engine since the Bristol Siddeley Olympus.

The engine under study by GE Aviation is the final, and perhaps most critical, piece of Aerion's 15-year-old quest to revive supersonic travel from the ashes of the retired BAC/Aérospatiale Concorde, but still introduces a new challenge that the would-be manufacturer's designers must overcome.

Aerion's concept for the AS2 supersonic trijet assumes no changes in the regulations that ban supersonic travel overland, so the challenge is to design a supersonic engine that meets new noise regulations that will take effect before its scheduled entry into service in 2023.

Such performance criteria are naturally in conflict. Supersonic speed demands a lower bypass ratio than found on a modern subsonic civil aircraft, but new Stage 5 noise regulations adopted by the US Federal Aviation Administration on 1 January for aircraft over 54,400kg (120,000lb) require the noise dampening provided by a higher bypass ratio.

Even if Aerion can keep the weight below that threshold, the same regulations begin applying to jet transport aircraft under 54,400kg in 2021.

Aerion

The GE engine cross-section – first displayed publicly on 15 February by Aerion chief executive Brian Barents – takes a systems-level approach to solving that problem, he says.

GE has not officially identified the source of the engine's high-pressure compressor, but Barents confirms that it is derived from the eight-stage compressor and single-stage high-pressure turbine of the subsonic CFM56. GE matches that high-pressure section to a new low-pressure module optimised for supersonic speed.

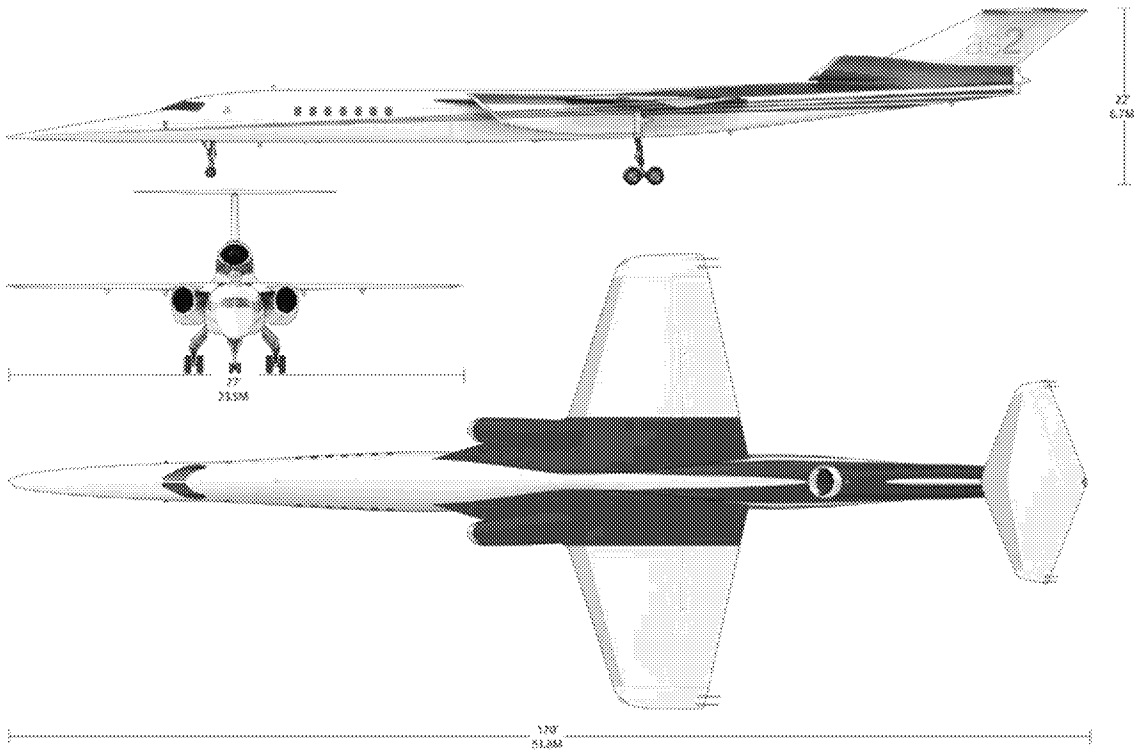
The CFM56 has a 155-173cm (61-68.3in)-diameter inlet fan, allowing a 6:1 ratio of air bypassing the inlet to the engine core. By contrast, each of GE's engines for the AS2 trijet will feature a nearly 1.33m (52in)-diameter fan, Barents says.

Bypass ratio is a metric often associated with fuel economy, but it also has a dampening effect on noise. The cool air stream flowing around the core acts as a natural muffler for the shrieking jet of super-heated air blasted from the aft engine nozzle.

At the same time, a lower bypass ratio makes it possible for a supersonic engine to function at the relatively high altitudes where the AS2 will usually cruise at Mach 1.4, Barents says.

The answer to the noise problem, however, is simple: the pilot will not use the full amount of thrust available from the engines on take-off, Barents says. By avoiding a full-throttle take-off, the AS2 will be able to meet Chapter 5 regulations for community noise, he says.

The solution does not come without trade-offs, however. Using less throttle will require the AS2 to use a longer runway or carry a smaller payload. Barents acknowledges the impact on the AS2's balanced field take-off length, but says the compromise is acceptable.

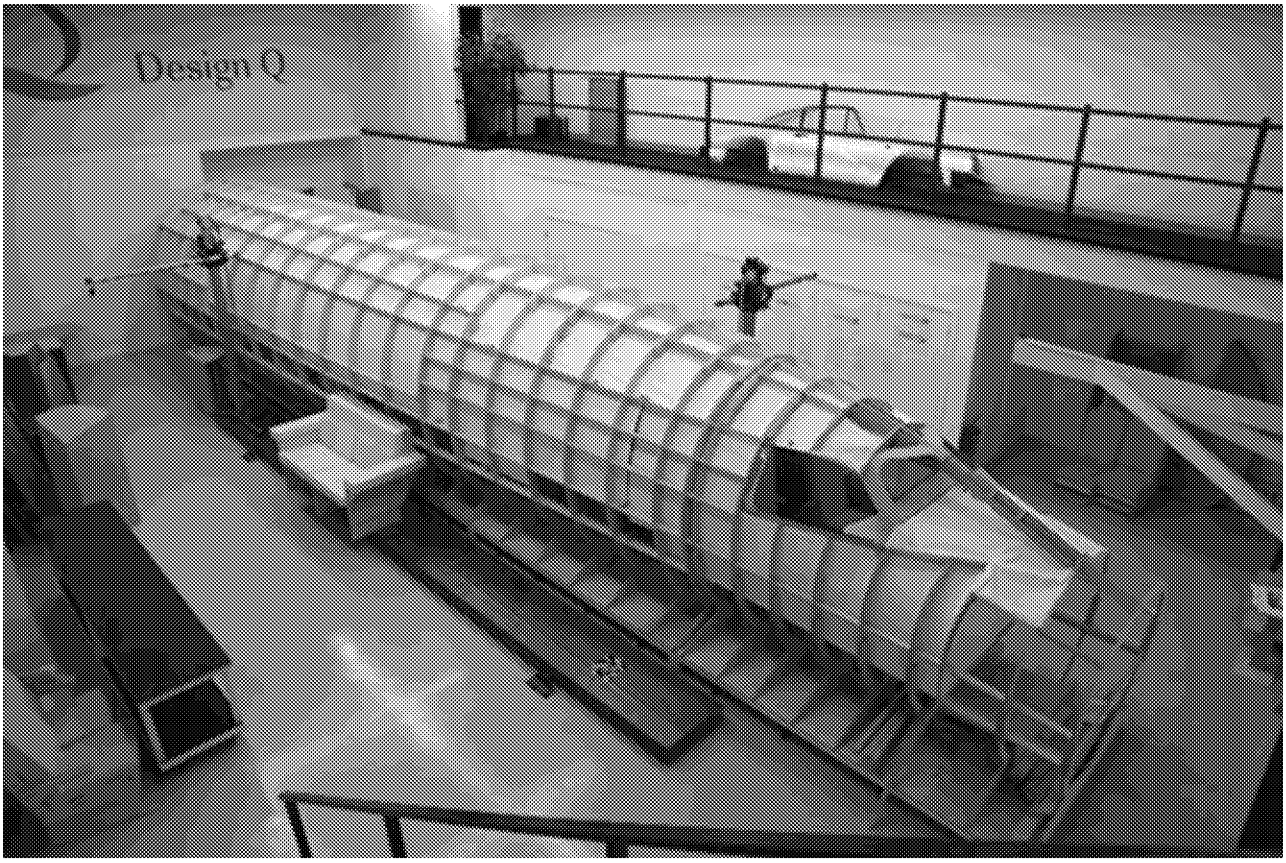


Aerion

With that problem solved, Aerion can move on to finalising plans to formally launch the AS2 with Lockheed Martin and GE as partners by the end of the year.

In December, Lockheed and GE announced they were joining Aerion's evaluation team for the AS2. GE kicked off a year-long configuration study for an engine based on the CFM56. Lockheed's Skunk Works, meanwhile, launched an evaluation of options for producing the AS2 in the USA, with the company's Marietta, Georgia factory on top of the list of candidates for the final assembly site. Those studies remain ongoing, Barents says.

The estimated $120 million AS2 jet is designed to accommodate 8-12 passengers on flights up to 4,200nm (7,400km) at speeds up to M1.4. The AS2 emerged in 2014 after Aerion shelved an earlier concept based on low-bypass Pratt & Whitney JT8D engines, with a commitment from fractional ownership company, Flexjet to order 20 aircraft.



Aerion

The AS2 now faces competition in the civil supersonic field. Colorado-based Boom Technology has received commitments from five airlines, including Virgin and Japan Air Lines, for up to 76 aircraft with 55 seats in an all-business class configuration.

Although the AS2 will emerge as a business jet, Aerion has plans to develop a family of aircraft, including airline-sized, supersonic aircraft, Barents says.

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Subject: Noise And Emissions Are Central Issues For Resurgent Supersonics

Noise And Emissions Are Central Issues For Resurgent Supersonics

Jul 27, 2018 Guy Norris and Graham Warwick | ***Aviation Week & Space Technology***

Engines, noise and emissions are at the center of a growing debate over the reintroduction of supersonic travel. U.S. startup Boom Technology is pressing lawmakers and regulators to set less-stringent environmental standards for supersonic transports (SST) to reflect engine technology, but this is being resisted by European aviation authorities and rival aircraft developers.

Supersonic travel ended in 2003, when Concorde was retired. Now Boom, along with hopefuls Aerion and Spike Aerospace, are convinced advances in technology can enable supersonic aircraft that are more fuel efficient and have less environmental impact than the Anglo-French airliner.

Aerion working with CFM56 derivative for Mach 1.4 AS2

Boom has identified candidate engines for Mach 2.2 SST

But a limited market means these startups targeting near-term opportunities for supersonic business jets and small airliners will be forced to use derivatives of existing engines because of the high cost of developing clean-sheet powerplants meeting their needs.

Aerion is working with General Electric on an engine based on the CFM56 commercial turbofan to power its trijet AS2 business jet. The choice was driven by the need to meet the latest Stage 5 noise standards for new aircraft, but the cost is a reduction in cruise speed to Mach 1.4 from Mach 1.6.

Boom has yet to select an engine for its 55-seat, Mach 2.2 trijet airliner, but CEO Blake Scholl says the candidate powerplants have been narrowed to derivatives of existing high-bypass-ratio turbofans. “There are multiple good options that don’t involve a clean-sheet engine,” he says.

But an analysis by an environmental research group suggests the costs of using available engines—in fuel burn, emissions and noise—could be high. Using a derivative of an existing turbofan, a near-term commercial SST could exceed international limits on carbon dioxide (CO_2) by 70% and nitrogen oxides (NOx) by 40%, while burning 5-7 times as much fuel per passenger as a comparable subsonic aircraft, concludes the nonprofit International Council on Clean Transportation (ICCT).

With an adaptive-cycle, staged-lean-burn turbofan designed for supersonic operation, an SST would comply with NOx limits but exceed International Civil Aviation Organization (ICAO) standards for CO_2 while still burning three times as much fuel relative to subsonic business-class jets, ICCT says.

“There are reasons to be worried about the environmental impact of reintroducing supersonic aircraft,” says Daniel Rutherford, study co-author and ICCT aviation program director. “A modest first step is for manufacturers to commit to meeting existing standards for new aircraft.”

Boom has narrowed the engine choice for its Mach 2.2 trijet to derivatives of existing high-bypass turbofans as it tries to meet conflicting noise, drag and fuel-burn goals. Credit: Boom Technology

The FAA has begun rulemaking activity on noise certification for supersonic aircraft, with establishment of a proposed landing-and-takeoff rule anticipated in 2019. As with existing noise limits, the standard is expected to be set through ICAO, but Reuters reports documents presented to the organization’s Committee on Aviation Environmental Protection reveal disagreement between U.S. and European regulators.

While Europe proposes current subsonic noise limits should be used as guidelines, the U.S. is calling for standards that reflect the fundamental differences between supersonic and subsonic aircraft, Reuters reports. This is similar to the approach taken with the latest Stage 5 noise standard, which sets different limits for smaller and larger aircraft to reflect levels of engine technology available.

“Our analysis shows that travel on Boom’s supersonic airliner is at parity with subsonic business class on fuel-burn per seat-mile,” says Eli Dourado, the startup’s head of global policy. Also, under ICAO’s Corsia carbon-offsetting framework, “if supersonic emissions increase total aviation emissions after 2020, they will be fully offset. Therefore, supersonic operations categorically will not increase net emissions at all.”

Of all the hurdles facing supersonic aircraft developers, the scarcity of viable engines remains the “big one,” says Dave Richardson, director of air vehicle designs and technologies at the Lockheed Martin Skunk Works, which is working with Aerion on the AS2 and NASA on the X-59A QueSTT supersonic low-boom flight demonstrator.

Creating an all-new low-bypass turbofan with the right characteristics is unlikely, he says. “The development costs of these engines are staggering: If you are going to develop a business jet, then it is going to cost you X millions to develop what is essentially a fighter-like airplane. But then you now also have to develop the engine, which in itself is a huge investment,” Richardson told the American Institute of Aeronautics and Astronautics Aviation 2018 forum in Atlanta in late June.

Aerion has selected a CFM56-based engine to enable its trijet AS2 to meet Stage 5 noise limits, but the bigger fan reduces supersonic speed to Mach 1.4. Credit: Aerion

Aerion says it scoured the industry to find a supersonic engine and ended up adapting an existing core. The company was originally targeting Stage 4 noise standards, but the introduction of Stage 5 limits—a reduction of 7 EPNdB—at the end of 2017 forced it to an engine with a higher bypass ratio. This means a larger fan diameter and higher wave drag, which reduces supersonic cruise speed and range.

"You need a big core for power, but a relatively small fan for wave drag, and so we are trying to find that sweet spot," says Mike Hinderberger, Aerion's AS2 program manager. "We'd love to go Mach 2 or 2.5, but the other thing that's important for business jets . . . is range, so you get to the point where Mach 1.4 is where we are today."

Boom also has been searching for a suitable engine. "The key thing is finding something that's sufficiently low-pressure in the core so you can move compression out of the core and into the intake," says Scholl. "There are some low-pressure cores that have been overlooked in the public dialog. Some are new and some are a little bit older, but they can be made to work."

Although he declines to identify the candidate engines, Scholl describes them as turbofans in the 3-4:1 low-bypass range. "That's the sweet spot where it is not too noisy for takeoff and low enough bypass so you don't have too much wave drag. You also get the right fuel efficiency; that's the tension in the design," he says.

Its engine selected, Aerion says it is on track to launch the AS2. "We are finalizing the trades on the aircraft so we can launch this year," says Hinderberger. The plan is for a preliminary design review [PDR] in two years and first flight in 2023. Aerion is targeting a New York-London flight in October 2023 to mark the 20th anniversary of the Concorde retirement.

Boom still is targeting commercial service in 2023, but first flight of its XB-1 "Baby Boom" third-scale demonstrator has slipped to 2019 from late 2017 due to aerodynamic challenges and an engine change. Boom has switched to three 4,300-lb.-thrust GE J85-15s from 3,500-lb. -21s, requiring variable-geometry inlets and nozzles. "First flight is probably later next year," says Scholl. "It turns out this is hard."

Aerion is working toward launch of the AS2 with Lockheed under an exploratory joint development agreement announced in December 2017. "We are working with the Skunk Works on aircraft design and development and program execution, and they are instrumental to the things we are doing to finalize the configuration and get the program launched," says Hinderberger. Discussions on collaboration on industrialization "are continuing," he says.

Following PDR in mid-2020, the program will enter detailed design, leading to a critical design review in early 2022 and first flight around 18 months later. Certification is targeted for late 2025, with service entry in early 2026. Deliveries are planned to ramp up from 12 aircraft in 2026 and 23 in 2027 to full-rate production of 36 a year from 2028.

Describing the search for the right engine as a "huge challenge" for the program, Hinderberger says: "We are finalizing the specifications now. The engine has been very, very difficult." The engine will produce 18,000 lb. of thrust, with GE adding a smaller fan and new booster and low-pressure turbine to the baseline eight-stage high-pressure compressor and single-stage turbine of the CFM56 core.

"We need a relatively big core, and before selecting GE, we worked with all the major engine makers, and there are only so many cores out there you can use," he says. "With regulations for landing and takeoff noise on top of that, and trying to drive to Stage 5 requirements, it is very difficult."

Sonic boom is another area of contention between the U.S. and Europe. The Aerion AS2 and Boom SST are not low-boom, and supersonic flight over land is prohibited, so both are intended to fly supersonically only over water. But an amendment to FAA reauthorization legislation now in Congress would require the agency to set a "reasonable" boom limit for overland flight within three years—ahead of the 2025 date set by ICAO for an international standard. There are concerns a U.S.-only standard could be higher than NASA's 75 PNLdB target, which compares to Concorde's 110 PNLdB, and could jeopardize public acceptance of supersonic travel.

Editor's note: This article has been updated to clarify the type of engines Boom Technology is considering for its Mach 2.2 trijet airliner.

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Subject: CAEP11 WG3-8 Sao Jose dos Campos, Brazil, 26 February 26, 2018

The following WG3-8 papers have been added Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

CTG-8

Deliberative Process / Ex. 5

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CC: ed.ctr.firth@faa.gov; JRooney@Comtechllc.com; victoria.m.williams@faa.gov; ed.ctr.firth@faa.gov
Subject: For Action: IGIA Clearance Required for 72/1.329 - Air Navigation Conference - Proposed U.S. Information Paper "Views of the United States on Civil Supersonic Flight", for the Thirteenth Air Navigation Conference being held in Montreal, October 9 – 19,...
Attachments: 1.329-ANC CONF 13-IP-Supersonics-RESP.doc; 1.329-ANC CONF 13-IP-Supersonics-cover-RESP.doc

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Subject: RE: ESSTsg 17 April Telecon
Attachments: CAEPSG.20183.WP0xx.5.en (WG3 SSEE Update) Draft 2+CL_.xlsx

All,

Deliberative Process / Ex. 5

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Best regards,
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Dear Bethan and all,

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From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 19 April 2018 13:54
To: Laszlo.Windhoffer@faa.gov; Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: Re: ESSTsg 17 April Telecon

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Best wishes,

Bethan

Dr Bethan Owen
Research Fellow
Manchester Metropolitan University
Telephone 01824-709583
Mobile 07920083914
Normal student office hours are Weds 10am-1pm
but please check first as I am often travelling

"Before acting on this email or opening any attachments you should read the Manchester Metropolitan University's email disclaimer available on its website http://www.mmu.ac.uk/emaildisclaimer "

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Wednesday, 18 April 2018 at 16:36
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>,

"joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov" <samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>, "Eric.Upton@gulfstream.com" <eric.upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Dear All,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Laszlo Windhoffer
Federal Aviation Administration
T. +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Tuesday, April 17, 2018 9:17 AM*
Subject: *RE: ESSTsg 17 April Telecon*

Dear All,

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
T. +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Thursday, April 12, 2018 12:39 PM*
Subject: *ESSTsg 17 April Telecon*

Dear ESSTsg Team,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Security Detail / Ex. 6

László Windhoffer
Laszlo Windhoffer
Federal Aviation Administration
T. +1.202.267.4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Dear All,

Deliberative Process / Ex. 5

Finally, please let us know if you have any questions, and we look forward to your input by 6 Apr.

Thank you

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

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Message

From: Herms Erika [erika.herms@easa.europa.eu]
Sent: 3/26/2018 4:36:54 PM
To: Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem [willem.franken@easa.europa.eu]; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; Hoermann Werner [werner.hoermann@easa.europa.eu]; Readman Guy [guy.readman@easa.europa.eu]; SAVVIDIS Charalambos [charalambos.savvidis@easa.europa.eu]; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: RE: ESSTsg 27 March Telecon
Attachments:

Deliberative Process / Ex. 5

Dear ESSTsg,

Deliberative Process / Ex. 5

Regards,
Erika

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: 24 March 2018 04:45
To: Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: ESSTsg 27 March Telecon

Dear All,

Deliberative Process / Ex. 5

4. Any other business?

Thank you,
Eric and Laszlo

Personal Security Detail / Ex. 6

Laszló Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, March 15, 2018 1:52 PM
To: Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; giannelli.bob@epa.gov; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; leggett.cullen@epa.gov; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Liu, Sandy (FAA) <sandy.liu@faa.gov>; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: RE: ESSTsg Schedule & Actions

Dear All,

Deliberative Process / Ex. 5

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: 12 March 2018 21:44
To: jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Herms Erika <erika.herms@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: ESSTsg Schedule & Actions
Importance: High

Dear ESSTsg,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Please let us know if you have any questions.

Thank you,
Eric, Laszlo

László Winkhofer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, S.W.
Washington, DC 20591
T +1-202-267-4741

Message

From: Ralph.Iovinelli@faa.gov [Ralph.Iovinelli@faa.gov]
Sent: 4/25/2018 3:59:34 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Donald.Scata@faa.gov
Subject: RE: Draft US papers for SG3: Future Work on NOx and Public RIA for CAEP11 nvPM standards
Attachments: CAEPSG.20183.WPXX_USViewsNVPM_v3.docx; CAEP11-SG2018-WPxx FAA Views re SST Engine Certification_v1.docx

Hi Bryan et al,

Deliberative Process / Ex. 5

Thanks,
Ralph

From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Tuesday, April 24, 2018 12:02 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Scata, Donald (FAA) <Donald.Scata@faa.gov>
Subject: RE: Draft US papers for SG3: Future Work on NOx and Public RIA for CAEP11 nvPM standards

Deliberative Process / Ex. 5

Thanks again,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Tuesday, April 24, 2018 11:56 AM
To: Manning, Bryan <manning.bryan@epa.gov>; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Donald.Scata@faa.gov
Subject: RE: Draft US papers for SG3: Future Work on NOx and Public RIA for CAEP11 nvPM standards

Deliberative Process / Ex. 5

Thanks,
Ralph

From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Monday, April 23, 2018 5:18 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Scata, Donald (FAA) <Donald.Scata@faa.gov>
Subject: Draft US papers for SG3: Future Work on NOx and Public RIA for CAEP11 nvPM standards

Hi Ralph,

Deliberative Process / Ex. 5

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality

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Ann Arbor, MI 48105
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From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Monday, April 23, 2018 3:28 PM
To: Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Gerring, Holly <gerring.holly@epa.gov>
Subject: RE: Draft Agenda items for 2:00 FAA/EPA call today (April 19); **Personal Security Detail / Ex. 6**

Deliberative Process / Ex. 5

R

From: Mueller, John [mailto:mueller.john@epa.gov]
Sent: Monday, April 23, 2018 3:22 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Gerring, Holly <gerring.holly@epa.gov>
Subject: RE: Draft Agenda items for 2:00 FAA/EPA call today (April 19); **Personal Security Detail / Ex. 6**

Hi Ralph,

Deliberative Process / Ex. 5

-John

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Monday, April 23, 2018 10:03 AM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Gerring, Holly

<gerring.holly@epa.gov>
Subject: RE: Draft Agenda items for 2:00 FAA/EPA call today (April 19); Personal Security Detail / Ex. 6

Deliberative Process / Ex. 5

Thanks,
R

From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: Friday, April 20, 2018 4:47 PM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Yen, David <Yen.David@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Gerring, Holly <gerring.holly@epa.gov>
Subject: RE: Draft Agenda items for 2:00 FAA/EPA call today (April 19); Personal Security Detail / Ex. 6

Ralph,

Deliberative Process / Ex. 5

Best regards,
Cullen Leggett
+1 734-214-4514

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Thursday, April 19, 2018 12:53 PM
To: Manning, Bryan <manning.bryan@epa.gov>; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Gerring, Holly <gerring.holly@epa.gov>
Subject: RE: Draft Agenda items for 2:00 FAA/EPA call today (April 19); Personal Security Detail / Ex. 6

Hi Brian,

Deliberative Process / Ex. 5

Thanks,
Ralph

From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Thursday, April 19, 2018 11:50 AM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Didyk-Wells, Nicole (FAA) <nicole.didyk-wells@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>;

Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Gerring, Holly <gerring.holly@epa.gov>
Subject: Draft Agenda items for 2:00 FAA/EPA call today (April 19); **Personal Security Detail / Ex. 6**

Hi,

Deliberative Process / Ex. 5

Bryan

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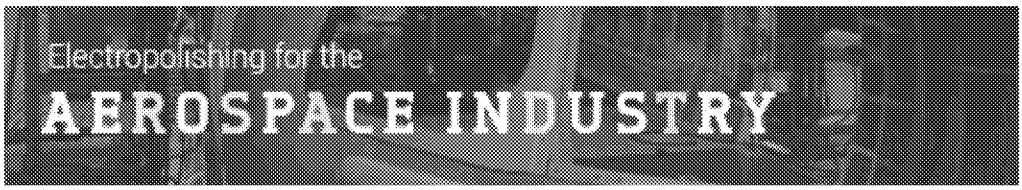
Message

From: SAE International [publisher@sae.org]
Sent: 4/19/2018 1:07:23 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: NASA Plane Quietly Goes Supersonic



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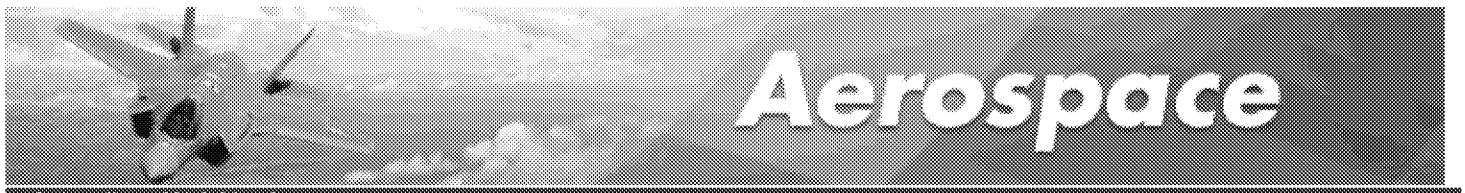

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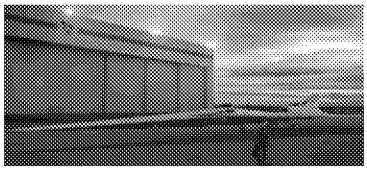

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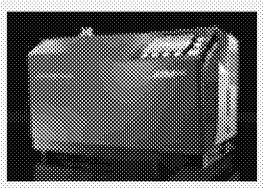

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- Linda L. Bell, Editorial Director

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Message

From: Herms Erika [erika.herms@easa.europa.eu]
Sent: 4/19/2018 1:06:38 PM
To: Bethan Owen [B.Owen@mmu.ac.uk]; Laszlo.Windhoffer@faa.gov; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem [willem.franken@easa.europa.eu]; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; Hoermann Werner [werner.hoermann@easa.europa.eu]; Readman Guy [guy.readman@easa.europa.eu]; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com [eric.upton@gulfstream.com]
Subject: RE: ESSTsg 17 April Telecon

Dear Bethan and all,

Deliberative Process / Ex. 5

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 19 April 2018 13:54
To: Laszlo.Windhoffer@faa.gov; Herms Erika <erika.herms@easa.europa.eu>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: Re: ESSTsg 17 April Telecon

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Best wishes,

Bethan

Dr Bethan Owen
Research Fellow
Manchester Metropolitan University
Telephone 01824-709583
Mobile 07920083914
Normal student office hours are Weds 10am-1pm
but please check first as I am often travelling

"Before acting on this email or opening any attachments you should read the Manchester Metropolitan University's email disclaimer available on its website http://www.mmu.ac.uk/emaildisclaimer "

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Wednesday, 18 April 2018 at 16:36
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com" <keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com"

<charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov" <samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>, "Eric.Upton@gulfstream.com" <eric.upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Dear All,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Tuesday, April 17, 2018 9:17 AM*
Subject: *RE: ESSTsg 17 April Telecon*

Dear All,

Deliberative Process / Ex. 5

Thank you

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Thursday, April 12, 2018 12:39 PM*
Subject: *ESSTsg 17 April Telecon*

Dear ESSTsg Team,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Security Detail / Ex. 6

Laszlo Windhoffer
Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Dear All,

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

"Before acting on this email or opening any attachments you should read the Manchester Metropolitan University email disclaimer available on its website http://www.mmu.ac.uk/emaildisclaimer "

Message

From: Bailey, Wendy [wendy.bailey@tc.gc.ca]
Sent: 6/26/2018 4:12:25 PM
To: Allyn, Dan [daniel.m.allyn@boeing.com]; Bailey, Wendy [wendy.bailey@tc.gc.ca]; Bilcock, David [david.bilcock@tc.gc.ca]; Dudebout, Rudy [rudolph.dudebout@honeywell.com]; Dupont, Ricardo [ricardo.Dupont@anac.gov.br]; Greg Smallwood (Greg.Smallwood@nrc-cnrc.gc.ca) [Greg.Smallwood@nrc-cnrc.gc.ca]; Herms, Erika [erika.herms@easa.europa.eu]; Hoermann, Werner [werner.hoermann@easa.europa.eu]; Jacob, Daniel [Daniel.Jacob@faa.gov]; Johnson, Mark [Mark.Johnson3@Rolls-Royce.com]; Kim, brian [brian.kim@pw.utc.com]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lobo, Prem [Prem.Lobo@nrc-cnrc.gc.ca]; Locke, Maryalice [maryalice.locke@faa.gov]; Madden, Paul [paul.madden@rolls-royce.com]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; McCaldon, Kian [Kian.McCaldon@pwc.ca]; Méry, Yoann [yoann.mery@snecma.fr]; Miaki-Lye, Rick [rick@aerodyne.com]; Moriyama, Mahito [moriyama-m2ff@mlit.go.jp]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Neil Dickson (NDickson@icao.int) [NDickson@icao.int]; Owen, Bethan [B.Owen@mmu.ac.uk]; Penanhoat, Olivier [olivier.penanhoat@snecma.fr]; Ralph Iovinelli (Ralph.Iovinelli@faa.gov) [Ralph.Iovinelli@faa.gov]; Rindlisbacher, Theo [Theo.Rindlisbacher@bazl.admin.ch]; Sarda, Jerome [jerome.sarda@aviation-civile.gouv.fr]; Tobaldini, Luiz [luiz.tobaldini@embraer.com.br]; Yang Xiaojun [xiaojunyoung@hotmail.com]; Zelina, Joseph [Joseph.Zelina@ge.com]
Subject: PRO Call June 27
Attachments: PRO ahg telecon - Draft Minutes 2018-04-18.docx; Doc.9501.Vol.II.2nd.edition.alltext.en - agreed at SG2016.pdf

Dear PRO

Deliberative Process / Ex. 5

Call-in Info

Personal Security Detail / Ex. 6

Wendy and Jerome

Wendy Bailey

Senior Environmental Engineer, Civil Aviation ✈
Transport Canada / Government of Canada
wendy.bailey@tc.gc.ca: / Tel: 613-990-5680 / Cell: 613-291-4590 / TTY: 1-888-675-6863

Ingénieur principale en environnement, Aviation civile ✈
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Government of Canada Gouvernement du Canada

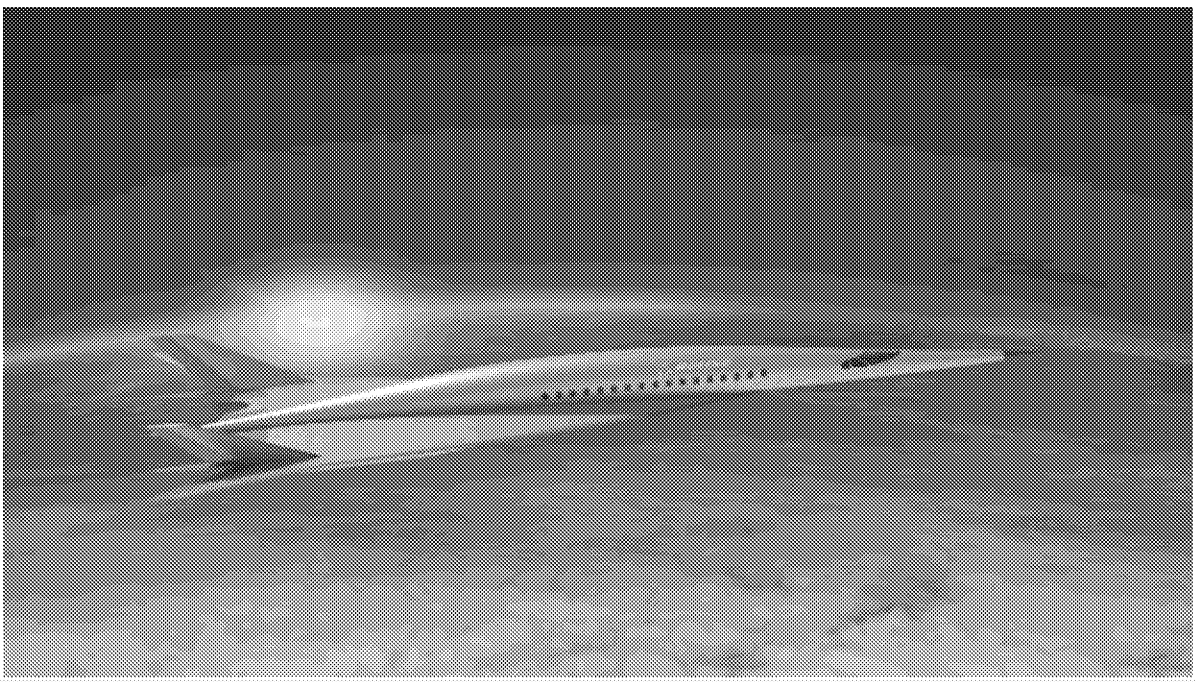
Canada

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 6/26/2018 3:13:52 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: Boeing Unveils Hypersonic Airliner Concept

Boeing Unveils Hypersonic Airliner Concept

Jun 26, 2018 Guy Norris | ***Aviation Week & Space Technology***



Boeing

Boeing Commercial Airplanes (BCA) has joined with hypersonic specialists at the company's Research & Technology unit to study a Mach 5 passenger transport capable of crossing the Atlantic in 2 hr. or the Pacific in 3.

The initial concept vehicle, unveiled at the American Institute of Aeronautics and Astronautics (AIAA) Aviation 2018 conference in Atlanta, is a preliminary step toward a long-range development plan targeted at both commercial and military applications. Although not yet defined, the concept is provisionally aimed at a passenger capacity larger than long-range business jets, but smaller than Boeing's 737, with potential entry into service from the late 2030s onward.

Flying at Mach 5, and with a projected cruise altitude of 95,000 ft., the vehicle would travel at more than 2.5 times the speed and 30,000 ft. higher than the supersonic Anglo-French Concorde, which was retired in 2003. According to Boeing, the additional speed would enable same-day return flights even across the Pacific and provide airlines with increased asset utilization.

Emerging from the same internal high-speed vehicle research studies that produced the hypersonic intelligence, surveillance, reconnaissance (ISR) and strike military concept unveiled early this year at the AIAA SciTech conference in Florida, the civil design forms part of a broader Boeing program that may include the nearer-term development of a reusable hypersonic demonstrator. This vehicle, if sanctioned, would be used to prove a wide range of airframe, systems and propulsion technologies for multiple applications, and could be flown as early as 2023 or 2024, says Boeing chief scientist for hypersonics Kevin Bowcutt.

"You have to do these kinds of studies now to know where we have to push the technology and where we have to advance things," says Bowcutt, whose hypersonic aircraft research studies have usually been related to space access and potential near-term military applications. "Technologically we could have an [operational military] hypersonic aircraft, such as an ISR, flying in 10 years. But there's a lot that goes into a commercial airplane, including the market, regulatory and environmental requirements, so it will happen when there is a convergence of those things."

COMMERCIAL HYPERSONICS

Concept could be tested in demonstrator form by mid-2020s

Targeted at transatlantic/pacific ranges at Mach 5, 95,000-ft. cruise altitude

Would require turboramjet engine development not dependent on scramjets

Leverages Boeing's civil supersonic and military hypersonic 'waverider' design heritage

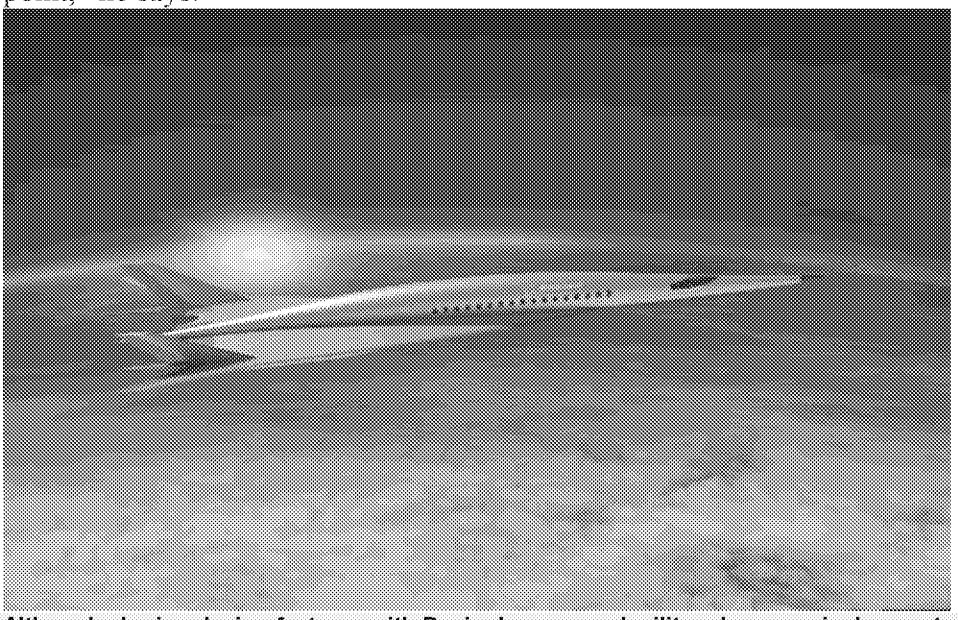
Boeing's studies indicate Mach 5 as the watershed speed between civil and most nontransport military applications. "When you look at the problem of getting from Point A to Point B anywhere in the world, the question is how fast do you want to go and how fast is fast enough?" says Bowcutt. "Supersonic isn't really fast enough to go overseas and back in one day. For the business traveler or the military, where time is really important, that's an interesting point. Mach 5 is where you can do that. You can get across the Atlantic in about 2 hr. and across the Pacific in about 3 hr."

Working with advanced concept designers at BCA, the Boeing Research & Technology (BR&T) hypersonics group has studied the potential advantages of operating at significantly higher cruise speeds on today's networks. "If you look at time differences and schedules, you can conceive of going back and forth in a day. It is also interesting from an airline business perspective, because now you can double the rate of income generation [as] you use the asset twice in a day instead of once or even less," he adds.

Outwardly resembling the hypersonic demonstrator/ISR configuration revealed in January, the commercial concept is a sharply swept delta with twin fins and a prominently humped forward fuselage. The initial configuration also leveraged a raft of earlier Boeing supersonic transport aircraft design work going back five decades to the 2707 SST as well as the High Speed Civil Transport project of the 1990s and the transonic Sonic Cruiser concept of the early 2000s, which ultimately led to the 787. It also includes design lessons from various Boeing low-boom and supersonic business jet studies.

"Several months ago we shared this with BCA and asked if they would be interested in us furthering these studies," says Bowcutt. "They said yes, so from that we've done more studies and the aircraft has evolved quite

a bit from the design we are showing. We are not going to share that evolution—but we are sharing the starting point," he says.



Although sharing design features with Boeing's proposed military hypersonic demonstrator, the commercial concept has an extended forward fuselage for greater cabin volume. Credit: Boeing

"Our commercial airplane team has been working right alongside the BR&T team as this technology has evolved," says Mike Sinnett, vice president of BCA product strategy and future airplane development. "We share our insight into the commercial market and where we see it going, as well as the requirements any commercial airplane would need to meet—ranging from passenger appeal to regulatory mandates."

The combined team has "so far been looking at requirements and flight times," adds Bowcutt. "And we have some of their advanced concept folks working shoulder-to-shoulder with us. We are trying to get to a point where we have a concept in which we are comfortable with the way the design closes, and then we can start looking at the market and at things like sonic boom and takeoff noise."

However, from a technological challenge perspective, it is speed that sets the research agenda. "To get from Mach 0.8 to Mach 5 is a sixfold [600%] increase in speed, but from Mach 5 to 6 is only a 20% increase. After Mach 5 you get diminishing returns and increasing costs, so what I am looking for are technical cliffs, or step changes. If you go much faster, eventually you are going to hit a step change in propulsion or materials," explains Bowcutt. Unlike the Concorde, which achieved a top speed of just over Mach 2 by adopting an aluminum airframe, Boeing believes a Mach 5 cruise speed is achievable using an advanced titanium airframe structure.

The choice of Mach 5 also simplifies the propulsion option, says Bowcutt. "We know we don't need a scramjet because we can do it with a kind of turboramjet: a turbofan that transitions to a ramjet at Mach 5." In contrast, the propulsion system for the higher-speed, Mach 5+ ISR vehicle will require a more sophisticated turbine-based combined cycle (TBCC), which combines conventional turbine engines with dual-mode ramjet/scramjets (DMRJ). The turbine engines operate up to a sufficiently high Mach number to enable transition to the DMRJ. The engines will share a common inlet and nozzle, with the turbine cocooned after transition and then restarted once the hypersonic vehicle slows down for return to a runway landing.

The turboramjet for the commercial variant, on the other hand, is more akin to the Pratt & Whitney J58 engine developed for Lockheed's Mach 3-plus-capable SR-71 Blackbird, but takes the concept further by completely shutting off the turbine element at higher speeds. Boeing envisions an annular turboramjet in which a turbine engine, developed from an existing commercial turbofan core, accelerates the vehicle to a transition speed at which the ramjet element takes over and the turbine section becomes partially or fully cocooned.

Similar to the three-stream adaptive-cycle XA100/101 military engines in early development by General Electric and Pratt, the engine will have a single inlet and nozzle and be integrated, with an axisymmetric annular layout. This would incorporate a bypass duct around the turbine engine that would bypass air into a combination afterburner/ramjet at the back of the engine. "It's not a new idea, but what's different is that the J58 was limited in Mach number because it was always putting some air through the turbomachinery. When you go to Mach 5 you can't really do that. You have to deal with cocooning and perhaps some flow through the engine which would have to be cooled."

Bowcutt says advanced cooling technology will be key, for controlling the thermal environment of the cabin, systems and propulsion system. The heat exchanger technology in development by Reaction Engines for the UK company's SABRE propulsion system could play a part, he adds. Boeing, which along with Rolls-Royce announced in April that it was investing in Reaction, says the British developer is "supporting our study." According to Bowcutt, who first discussed the possibility of a commercial hypersonic derivative at the Wharton Aerospace West Coast conference in early June, the heat exchanger could be a "nice synergy and might have a great application."

For the overall propulsion system, Boeing will also likely need to partner with other industry players beyond the current "big three" commercial engine-makers GE, Pratt and Rolls. Development of the military hypersonic vehicle concept is continuing under DARPA's Advanced Full Range Engine (AFRE) initiative and a TBCC flight demonstration concept study run by the U.S. Air Force Research Laboratory (AFRL). Boeing's engine partner for the concept is Northrop Grumman Innovation Systems (formerly Orbital ATK), which in September 2017 was awarded a $21.4 million contract for the AFRE program. Boeing began work on the AFRL TBCC flight demonstrator concept study, with Orbital ATK as subcontractor, in 2016.

Boeing is also studying using liquid methane as another key component of the cooling system as part of a dual-fuel architecture incorporating conventional Jet A for turbine operations. "The nice thing about methane is you can use it for cooling as well as fuel. Methane has higher energy per pound than Jet A, so you get an ISP [specific impulse] boost out of it, but it is less dense so it takes up more volume. That is why it will be an interesting study to optimize the split between the fuels. It could be 100% methane or a split—we just don't know yet."

Boeing is on firmer ground with the aerodynamics of the concept, which will leverage the company's extensive experience with hypersonic waverider configurations. A waverider rides the shockwave attached to the leading edge, thus benefiting from lower induced drag. "We are doing a lot of that aero work right now, trying to look at what the theoretical limits of the lift/drag ratio are in cruise, and there are some key things we've learned about how to configure waveriders to get the right ratio, and to get high performance with an integrated propulsion system," says Bowcutt.

For slower-speed flight and reducing takeoff noise, Boeing is "looking at technologies like flow control to enhance wing lift, and ways to keep the engine noise quiet enough," he adds. "Do you derate on takeoff? We certainly would not afterburn on takeoff. We have some innovative things we are doing there, and I'm not going to divulge them. We have tons more work to do, but we have some very neat ideas."

Bruce Maeroff
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Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 2/8/2018 3:57:22 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: RE: Latest version of ETM for Annex 16 Vol II??
Attachments: Doc.9501.Vol.II.2nd.edition.alltext.en - with CAEP10 amendments + SG2016....docx

Deliberative Process / Ex. 5

From: Manning, Bryan
Sent: Thursday, February 08, 2018 10:22 AM
To: Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Maeroff, Bruce <Maeroff.Bruce@epa.gov>
Subject: Latest version of ETM for Annex 16 Vol II??

Hi again,

Deliberative Process / Ex. 5

Thanks,

Bryan

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Message

From: Bethan Owen [B.Owen@mmu.ac.uk]
Sent: 4/19/2018 11:54:09 AM
To: Laszlo.Windhoffer@faa.gov; erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com [eric.upton@gulfstream.com]
Subject: Re: ESSTsg 17 April Telecon
Attachments: CAEPSG.20183.WP.0xx.5.en [WG3 Supersonic Engine Emissions Updates] Draft...Bethan.docx

Dear Eric and Laszlo,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Bethan

Dr Bethan Owen
Research Fellow
Manchester Metropolitan University
Telephone 01824-709583
Mobile 07920083914
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http://www.mmu.ac.uk/emaildisclaimer "

From: Laszlo Windhoffer <Laszlo.Windhoffer@faa.gov>
Date: Wednesday, 18 April 2018 at 16:36
To: "erika.herms@easa.europa.eu" <erika.herms@easa.europa.eu>, Jérôme SARDA <jerome.sarda@aviation-civile.gouv.fr>, "tpohle@airlines.org" <tpohle@airlines.org>, "jscavuzzi@aci.aero" <jscavuzzi@aci.aero>, "ricardo.dupont@anac.gov.br" <ricardo.dupont@anac.gov.br>, "marcelo.saito@anac.gov.br" <marcelo.saito@anac.gov.br>, "wendy.bailey@tc.gc.ca" <wendy.bailey@tc.gc.ca>, David Bilcock <david.bilcock@tc.gc.ca>, "greg.smallwood@nrc-cnrc.gc.ca" <greg.smallwood@nrc-cnrc.gc.ca>, "xiaojunyoung@hotmail.com" <xiaojunyoung@hotmail.com>, "willem.franken@easa.europa.eu" <willem.franken@easa.europa.eu>, "stephen.arrowsmith@easa.europa.eu" <stephen.arrowsmith@easa.europa.eu>, "werner.hoermann@easa.europa.eu" <werner.hoermann@easa.europa.eu>, "guy.readman@easa.europa.eu" <guy.readman@easa.europa.eu>, "martin.plohr@dlr.de" <martin.plohr@dlr.de>, "frank.wetzel@uba.de" <frank.wetzel@uba.de>, "david.anvid@delta.com" <david.anvid@delta.com>, "daltherr@aerioncorp.com" <daltherr@aerioncorp.com>, "ecotti@nbaa.org" <ecotti@nbaa.org>, "ndickson@icao.int" <ndickson@icao.int>, "denise.ahrens@rolls-royce.com" <denise.ahrens@rolls-royce.com>, "daniel.m.allyn@boeing.com" <daniel.m.allyn@boeing.com>, "andy@boom.aero" <andy@boom.aero>, "arnaud.bonnet@embraer.com.br" <arnaud.bonnet@embraer.com.br>, "robbie.cowart@gulfstream.com" <robbie.cowart@gulfstream.com>, "guillaume.dehestru@dassault-aviation.com" <guillaume.dehestru@dassault-aviation.com>, "wcdolejsi@txtav.com" <wcdolejsi@txtav.com>, "rudolph.dudebout@honeywell.com" <rudolph.dudebout@honeywell.com>, "charles.etter@gulfstream.com" <charles.etter@gulfstream.com>, "mike.garrison@boeing.com" <mike.garrison@boeing.com>, "ddhornbaker@txtav.com" <ddhornbaker@txtav.com>, "mark.johnson3@rolls-royce.com" <mark.johnson3@rolls-royce.com>, "keisuke_nakahama@mitsubishiaircraft.com"

<keisuke_nakahama@mitsubishiaircraft.com>, "brian.kim@pw.utc.com" <brian.kim@pw.utc.com>, "david.lye@aero.bombardier.com" <david.lye@aero.bombardier.com>, "paul.madden@rolls-royce.com" <paul.madden@rolls-royce.com>, "jrmatisheck@aerioncorp.com" <jrmatisheck@aerioncorp.com>, "kian.mccaldon@pwc.ca" <kian.mccaldon@pwc.ca>, "john.morgenstern@lmco.com" <john.morgenstern@lmco.com>, "kevin.morris@adsgroup.org.uk" <kevin.morris@adsgroup.org.uk>, "matthew.r.muehlhausen@boeing.com" <matthew.r.muehlhausen@boeing.com>, "krisha.nobrega@embraer.com.br" <krisha.nobrega@embraer.com.br>, "thierry.percheron@dassault-aviation.com" <thierry.percheron@dassault-aviation.com>, "jean-francois.perelgritz@airbus.com" <jean-francois.perelgritz@airbus.com>, "charles.renard@airbus.com" <charles.renard@airbus.com>, "hans.smit@airbus.com" <hans.smit@airbus.com>, "simon.smith@rolls-royce.com" <simon.smith@rolls-royce.com>, "frederic.soum@airbus.com" <frederic.soum@airbus.com>, "sturdza@aerioncorp.com" <sturdza@aerioncorp.com>, "luiz.tobaldini@embraer.com.br" <luiz.tobaldini@embraer.com.br>, "eric.upton@gulfstream.com" <eric.upton@gulfstream.com>, "joseph.zelina@ge.com" <joseph.zelina@ge.com>, "karin@theicct.org" <karin@theicct.org>, "paul.peeters1000@gmail.com" <paul.peeters1000@gmail.com>, "mirzoyan@ciam.ru" <mirzoyan@ciam.ru>, "jauhari_arsad@caas.gov.sg" <jauhari_arsad@caas.gov.sg>, "arturo.benito@upm.es" <arturo.benito@upm.es>, "marie.hankanen@transportstyrelsen.se" <marie.hankanen@transportstyrelsen.se>, "Theo.Rindlisbacher@bazl.admin.ch" <Theo.Rindlisbacher@bazl.admin.ch>, Bethan Owen <b.owen@mmu.ac.uk>, "jeff.berton@nasa.gov" <jeff.berton@nasa.gov>, "clarence.t.chang@nasa.gov" <clarence.t.chang@nasa.gov>, "Rebecca.Cointin@faa.gov" <Rebecca.Cointin@faa.gov>, "jorge.fernandez@faa.gov" <jorge.fernandez@faa.gov>, "giannelli.bob@epa.gov" <giannelli.bob@epa.gov>, Ralph Iovinelli <Ralph.Iovinelli@faa.gov>, "Daniel.Jacob@faa.gov" <Daniel.Jacob@faa.gov>, "leggett.cullen@epa.gov" <leggett.cullen@epa.gov>, maryalice locke <maryalice.locke@faa.gov>, "sandy.liu@faa.gov" <sandy.liu@faa.gov>, "maeroff.bruce@epa.gov" <maeroff.bruce@epa.gov>, "manning.bryan@epa.gov" <manning.bryan@epa.gov>, "rick@aerodyne.com" <rick@aerodyne.com>, "mueller.john@epa.gov" <mueller.john@epa.gov>, "samulski.michael@epa.gov" <samulski.michael@epa.gov>, "jonathan.a.seidel@nasa.gov" <jonathan.a.seidel@nasa.gov>, "wolfe.philip@epa.gov" <wolfe.philip@epa.gov>, "yen.david@epa.gov" <yen.david@epa.gov>, "yuriy.medved@gmail.com" <yuriy.medved@gmail.com>, "moriyama-m2ff@mlit.go.jp" <moriyama-m2ff@mlit.go.jp>, "yoann.mery@snecma.fr" <yoann.mery@snecma.fr>, Olivier Penanhoat <olivier.penanhoat@snecma.fr>, "stephen.kramer@pw.utc.com" <stephen.kramer@pw.utc.com>, "raymond@boomsupersonic.com" <raymond@boomsupersonic.com>, "eli@boomsupersonic.com" <eli@boomsupersonic.com>, "Eric.Upton@gulfstream.com" <eric.upton@gulfstream.com>
Subject: RE: ESSTsg 17 April Telecon

Dear All,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

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T. +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Tuesday, April 17, 2018 9:17 AM*
Subject: *RE: ESSTsg 17 April Telecon*

Dear All,

Deliberative Process / Ex. 5

Thank you

Laszló Windhoffer
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From: *Windhoffer, Laszlo (FAA)*
Sent: *Thursday, April 12, 2018 12:39 PM*
Subject: *ESSTsg 17 April Telecon*

Dear ESSTsg Team,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Security Detail / Ex. 6

Laszló Windhoffer
László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: *Windhoffer, Laszlo (FAA)*
Sent: *Monday, April 02, 2018 3:30 PM*
Subject: *RE: ESSTsg 27 March Telecon*

Dear All,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration

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Message

From: Daniel.Jacob@faa.gov [Daniel.Jacob@faa.gov]
Sent: 7/26/2018 5:18:32 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Ralph.Iovinelli@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: RE: Draft Agenda items 2:00 FAA/EPA call today (July 26); Personal Security Detail / Ex. 6

Deliberative Process / Ex. 5

From: Manning, Bryan <manning.bryan@epa.gov>
Sent: Thursday, July 26, 2018 8:55 AM
To: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Gillette, Warren (FAA) <warren.gillette@faa.gov>
Cc: Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>
Subject: Draft Agenda items 2:00 FAA/EPA call today (July 26); Personal Security Detail / Ex. 6

Hi,

Deliberative Process / Ex. 5

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
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manning.bryan@epa.gov

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 4/24/2018 10:35:51 AM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-9 Derby, United Kingdom, April 30, 2018 - CTG Papers Have Been Added to the H Drive

The following CTG papers have been added t Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
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Large Marine and Aviation Center
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Cube N130
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Message

From: Ralph.Iovinelli@faa.gov [Ralph.Iovinelli@faa.gov]
Sent: 4/30/2018 9:30:11 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
CC: Daniel.Jacob@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov
Subject: 3 US papers ready.... 1 to go...
Attachments: Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,
Ralph

Message

From: Dickson, Neil [NDickson@icao.int]
Sent: 4/18/2018 10:27:47 PM
To: Bethan Owen [B.Owen@mmu.ac.uk]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Log T [thobias.log@transportstyrelsen.se]; Abdain Z [Zainal.abidin@emirates.com]; Abidin Z [Zainal.abidin@emirates.com]; Agarwal A [aa681@mit.edu]; Ahrens D [denise.ahrens@rolls-royce.com]; Allyn D [daniel.m.allyn@boeing.com]; Altherr D [daltherr@aerioncorp.com]; Anvid [david.anvid@delta.com]; Archilla V [archillapv@inta.es]; Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Arsad J [Jauhari_ARSAD@caas.gov.sg]; Bailey [wendy.bailey@tc.gc.ca]; Balasubramanian S [Sathya.Balasubramanian.CTR@dot.gov]; Baughcum S [steven.l.baughcum@boeing.com]; Beauregard M [MBeauregard@AIAC.ca]; Benito [arturo.benito@upm.es]; Berryann A [andy@boom.aero]; Berton J [Jeff.Berton@nasa.gov]; Bilcock D [david.bilcock@tc.gc.ca]; Boichenko [chemmotology@ukr.net]; Bonnefoy [bonnefoy_philippe@bluesky-d2d.com]; Bonnet A [arnaud.bonnet@embraer.com.br]; Box L [laurent.box@eurocontrol.int]; 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Lye [david.lye@aero.bombardier.com]; Madden [paul.madden@rolls-royce.com]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Majjigi R [muni.majjigi@ge.com]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Marks [julie.marks@faa.gov]; Matischeck J [jrmatisheck@aerioncorp.com]; Maurice L [lourdes@boomsupersonic.com]; McCaldon [kian.mccaldon@pwc.ca]; McConnachie D [McConnachie_Dominic@bah.com]; McKinney [randal.mckinney@pw.utc.com]; Medvedev Y [yuriy.medved@gmail.com]; Mery Y [yoann.mery@snecma.fr]; Miake-Lye [rick@aerodyne.com]; Middel J [jan.middel@nlr.nl]; Mirzoyan A [mirzoyan@ciam.ru]; Morgenstern J [john.morgenstern@lmco.com]; Moriyama M [moriyama-m2ff@mlit.go.jp]; Morris [kevin.morris@adsgroup.org.uk]; Muehlhausen M [matthew.r.muehlhausen@boeing.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John];

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Subject: RE: WG3 Plenary Call - Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

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Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 15-Apr-18 9:57 PM
To: 'Bethan Owen'; 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berryann A';

'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carmody C'; 'Carnelly'; 'Chang C'; 'Simon Christie'; 'Cointin R'; 'Collin D'; 'Cooreman B'; 'Cornier'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Didyk N'; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame Y'; 'David Lee'; 'Leggett'; 'Ling Lim'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Sagues C'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'; 'nagayoshi_hiromitsu@ihi.co.jp'
Subject: WG3 Plenary Call - Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

The dial in details, as usual are:

Personal Security Detail / Ex. 6

Best regards,

Neil

Dr Neil Dickson
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International Civil Aviation Organization (ICAO)
Air Transport Bureau

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Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 11-Apr-18 11:48 AM
To: 'Bethan Owen'; Bristow A; Log T; Abdain Z; Abidin Z; Agarwal A; Ahrens D; Allyn D; Altherr D; Anvid; Archilla V; Arrowsmith; Arsad J; Bailey; Balasubramanian S; Baughcum S; Beauregard M; Benito; Berryann A; Berton J; Bilcock D; Boichenko; Bonnefoy; Bonnet A; Box L; Carmody C; Carnelly; Chang C; Simon Christie; Cointin R; Collin D; Cooreman B; Cornier; Cotti; Cousineau Y; Crayford A; De Lepinay I; Dehestru G; Deniskov V; Denk K; Didyk N; Dolejsi W; Dourado E; Jim Dow; Dudebout; Dupont R; Etter; Eyers; Fajari A; Ferdian Hussein B; Fleming G; Fleuti; Franken; Frenandez J; Fudge, Ted; Fujiwara; Galotti, Vincent; Garrison M; Gerring H; Giannelli B; Gillette; Gowen H; Grandi F; Hankanen M; Hemmings; Herms; Hileman J; Hinderberger M; Hoermann; Hoke J; Holsclaw C; Horie N; Iglesias A; Iovinelli; Jacob D;

Janicke U; Johnson M; Jung J; Kartika D; Kenney M; Kharina A; Kim B; Kittery J; Kozel; Kramer S; Kusukame Y; David Lee; Leggett; Ling Lim; Lindsey L; Lobo P; Locke M; Locke M; Lunter; Lye; Madden; Maeroff; Majjigi R; Manning B; Marks; Matischeck J; Maurice L; McCaldon; McConnachie D; McKinney; Medvedev Y; Mery Y; Miake-Lye; Middel J; Mirzoyan A; Morgenstern J; Moriyama M; Morris; Muehlhausen M; Mueller J; Nobrega K; Oshimizu M; Pagliarello M; Patserin; Peeters P; Penanhoat; Percheron T; Perelgritz J; Peter; Plohr; Pohle T; Renard C; Riegle; Rindlisbacher; Roeler T; Roetger; Russell R; Rutherford; Sabnis J; Sagues C; Saito; Samulski M; Sarda J; Savvidis C; Scata D; Scavuzzi J; Schaefer M; Schaufele R; Seeberg I; Seeliger K; Seidel J; Sipatov; Skillen G; Smallwood G; Smit H; Smith; Soum F; Sow D; Sparrow V; Speth R; Stevens J; Stimson; Sturdza P; Takahashi H; Tobaldini L; Upton E; Vanek A; Volkov; Wetzel; Willford N; Williams P; Windhoffer; Yang X; Yasar G; Yen; Yen; Zelina J; nagayoshi_hiromitsu@ihi.co.jp
Subject: RE: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

Best regards,

Neil

Dr Neil Dickson
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Air Transport Bureau

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Consider the environment before printing this e-mail

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 10-Apr-18 8:07 AM
To: Dickson, Neil; Bristow A; Log T; Abdain Z; Abidin Z; Agarwal A; Ahrens D; Allyn D; Altherr D; Anvid; Archilla V; Arrowsmith; Arsad J; Bailey; Balasubramanian S; Baughcum S; Beauregard M; Benito; Berryann A; Berton J; Bilcock D; Boichenko; Bonnefoy; Bonnet A; Box L; Carmody C; Carnelly; Chang C; Simon Christie; Cointin R; Collin D; Cooreman B; Cornier; Cotti; Cousineau Y; Crayford A; De Lepinay I; Dehestru G; Deniskov V; Denk K; Didyk N; Dolejsi W; Dourado E; Jim Dow; Dudebout; Dupont R; Etter; Eyers; Fajari A; Ferdian Hussein B; Fleming G; Fleuti; Franken; Frenandez J; Fudge, Ted; Fujiwara; Galotti, Vincent; Garrison M; Gerring H; Giannelli B; Gillette; Gowen H; Grandi F; Hankanen M; Hemmings; Herms; Hileman J; Hinderberger M; Hoermann; Hoke J; Holsclaw C; Horie N; Iglesias A; Iovinelli; Jacob D; Janicke U; Johnson M; Jung J; Kartika D; Kenney M; Kharina A; Kim B; Kittery J; Kozel; Kramer S; Kusukame Y; David Lee; Leggett; Ling Lim; Lindsey L; Lobo P; Locke M; Locke M; Lunter; Lye; Madden; Maeroff; Majjigi R; Manning B; Marks; Matischeck J; Maurice L; McCaldon; McConnachie D; McKinney; Medvedev Y; Mery Y; Miake-Lye; Middel J; Mirzoyan A; Morgenstern J; Moriyama M; Morris; Muehlhausen M; Mueller J; Nobrega K; Oshimizu M; Pagliarello M; Patserin; Peeters P; Penanhoat; Percheron T; Perelgritz J; Peter; Plohr; Pohle T; Renard C; Riegle; Rindlisbacher; Roeler T; Roetger; Russell R; Rutherford; Sabnis J; Sagues C; Saito; Samulski M; Sarda J; Savvidis C; Scata D; Scavuzzi J; Schaefer M; Schaufele R; Seeberg I; Seeliger K; Seidel J; Sipatov; Skillen G; Smallwood G; Smit H; Smith; Soum F; Sow D; Sparrow V; Speth R; Stevens J; Stimson; Sturdza P; Takahashi H; Tobaldini L; Upton E; Vanek A; Volkov; Wetzel; Willford N; Williams P; Windhoffer; Yang X; Yasar G; Yen; Yen; Zelina J; nagayoshi_hiromitsu@ihi.co.jp
Subject: Re: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

Best wishes,

Bethan and Ralph
WG3 co-rapporteurs

Dr Bethan Owen
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Manchester Metropolitan University
Telephone 01824-709583
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but please check first as I am often travelling

"Before acting on this email or opening any attachments you
should read the Manchester Metropolitan University's email
disclaimer available on its website
http://www.mmu.ac.uk/emaildisclaimer "

Manchester Metropolitan University

From: "Dickson, Neil" <NDickson@icao.int>
Date: Friday, 6 April 2018 at 22:15
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Subject: RE: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

The dial in details, as usual are:

Personal Security Detail / Ex. 6

www.connectmeeting.att.com

Best regards,

Neil

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Subject: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

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The dial in details for both conference calls will be, as usual:

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Best regards,

Neil

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Sent: 8/29/2018 9:54:18 PM
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CC: Bryan Comer [bryan.comer@theicct.org]; Brandon Graver [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user0e3b7bdb]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: catching up
Attachments: Annex_MEPC_73-INF-X_Probability of achieving 2050_vff.pdf; Environmental_Supersonic_Aircraft_20180717.pdf; US CO2 WoP v4.3 clean.docx

Hi Mike,

Hope you've been well and enjoying some time off this summer.

With MEPC 73 and the pre-CAEP/11 working group meetings coming up next month in Montreal, I thought it would be good to connect again to discuss. I'd be quite interested in your take on where things may go with the EEDI review, HFO ban work, and supersonic engine emission standards in particular. You can find our latest work on these attached to this email.

Separately, we're finalizing a working paper on implementing ICAO's CO2 standard in the US that I thought you should be aware of, also attached.

Would you have any time either this Friday (8/31) or next week (9/5~9/7) for a quick call? Please let me know when would work for you.

Thanks,

Dan

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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Environmental performance of emerging supersonic transport aircraft

Authors: Anastasia Kharina, Tim MacDonald, Dan Rutherford*

Date: July 17, 2018

Keywords: supersonic, aircraft fuel efficiency, NO_x, noise, ICAO

SUMMARY

Three U.S.-based startup companies are working to develop new supersonic transport (SST) aircraft for planned entry into service in the mid-2020s. There are currently no international environmental standards for such aircraft, which last flew in 2003. Policymakers are considering whether to develop new specific SST standards or to apply existing standards for subsonic aircraft to the new designs.

This paper provides a preliminary assessment of the environmental performance of new commercial SSTs. Results suggest that these aircraft are unlikely to comply with existing standards for subsonic aircraft. The most likely configuration of a representative SST was estimated to exceed limits for nitrogen oxides and carbon dioxide (CO_2) by 40% and 70%, respectively. A noise assessment concludes that emerging SSTs are likely to fail current (2018) and perhaps historical (2006) landing and takeoff noise standards.

On average, the modeled SST was estimated to burn 5 to 7 times as much fuel per passenger as subsonic aircraft on representative routes. Results varied by seating class, configuration, and route. In the best-case scenario, the modeled SST burned 3 times as much fuel per business-class passenger relative to recently certificated subsonic aircraft; in the worst case, it burned 9 times as much fuel compared to an economy-class passenger on a subsonic flight.

These findings suggest two pathways for further development of commercial SSTs. First, manufacturers could maximize the likelihood of meeting existing environmental standards by developing new aircraft based upon advanced, clean sheet engines. Second, policymakers could establish new environmental standards specifically for SSTs based upon the performance of poorer performing derivative engines. Such standards would allow for increased air pollution, noise, and CO_2 relative to new commercial aircraft.

INTRODUCTION

Aircraft produce about 3% of global carbon dioxide (CO_2) emissions and 11% of all CO_2 emissions from the transportation sector (EIA, 2018). The aviation sector is one of the fastest-growing sources of greenhouse gas emissions globally. Despite international agreements that call for reductions in CO_2, the International Civil Aviation Organization (ICAO) projects that CO_2 emissions from international aviation will triple from 2018 to 2050, given current trends (ICAO, 2013, 2016).

To mitigate this rise in CO_2 emissions, ICAO established two aspirational goals for international flights: fleet-wide fuel efficiency improvements of 2% annually through 2050, and zero net growth of aviation CO_2 emissions after 2020 (ICAO, 2010). In March 2017, ICAO formally adopted new global aircraft CO_2 emission standards for member states to implement starting in 2020. ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is expected to come into effect around the same time (ICCT, 2017).

Aircraft development is capital-intensive and risky; the vast majority of projects are undertaken by large airframe manufacturers, often with substantial government support. A more recent phenomenon is that of startups, often backed by major companies such as Boeing and Lockheed Martin, developing new aircraft

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designs. Examples include companies developing electric-powered aircraft, such as Zunum Aero and Joby Aviation, and three companies in the United States developing new supersonic transport (SST) aircraft: Boom Supersonic, Spike Aerospace, and Aerion Corporation. Boom is developing a commercial airliner, while Spike and Aerion are focusing on supersonic business jets.

The potential return of supersonic flights could have large environmental and noise pollution consequences. In 2015, aviation was responsible for about 800 million metric tons of CO_2 emissions, or about as much as the German economy. New supersonic aircraft could lead to further emission increases if they are less fuel-efficient than new subsonic aircraft.

The previous generation of civil supersonic aircraft, the Aérospatiale/BAC Concorde and Tupolev Tu-144, took their first flights five decades ago. Currently, there are no environmental standards applicable to new supersonic designs. ICAO's Committee on Aviation Environmental Protection (CAEP) is now developing noise and emission certification standards for supersonic aircraft (FAA, 2018a).

This paper presents a preliminary analysis of a new commercial SST's performance in terms of fuel burn, CO_2 and nitrogen oxide (NO_x) emissions, and landing and takeoff (LTO) noise. Other environmental factors, including sonic boom, particulate matter, and stratospheric water vapor have not been addressed. The analysis uses publicly available data, expert engineering judgment, and an open-source aircraft conceptual aircraft design tool (SUAVE). The analysis addresses a key data gap since manufacturers are currently releasing little information about the environmental performance of their designs. The work is meant to inform policymakers' thinking about future standards for new supersonic designs until such time that higher-fidelity data is made available.

Table 1. SST startup companies.

Company	Aerion	Spike	Boom
Aircraft type	Business jet	Business jet	Airliner
Aircraft name	AS2	S-512 Quiet Supersonic Jet	—
Target entry into service	2025	2023	2023
Target speed	Mach 1.4	Mach 1.6	Mach 2.2
Target maximum range	7,780 km	11,500 km	8,300 km
Low-boom technology?	No	"Quiet supersonic flight technology"[1]	No
Corporate customers	Flexjet	—	Virgin Group Japan Airlines CTrip

[1] Spike Aerospace (2017b).

BACKGROUND

AIRCRAFT

There have been two commercial supersonic vehicles in the past: the Aérospatiale/BAC Concorde and the Tupolev Tu-144. Seventeen Tu-144s were manufactured, including 14 production aircraft that flew commercially 102 times before being decommissioned in 1978 (NASA, 2014). Concorde, while equally limited in production, had a more substantial service life. It flew its first scheduled supersonic passenger service in 1976 and the last in 2003. Both aircraft were powered by turbojet engines with afterburners, which led to high fuel burn and takeoff noise.

Three companies in the United States are currently developing new SSTs: Spike Aerospace, Aerion Corporation, and Boom Supersonic. Spike and Aerion are both focusing on business jet models, whereas Boom is developing a supersonic airliner.

Spike Aerospace (2017a), based in Boston, is collaborating with Siemens, MAYA Simulation, Greenpoint Technologies, BRPH, Aernnova, and Quartus Engineering Inc. Dubbed S-512, Spike's supersonic business jet is targeted to fly at Mach 1.6. Unlike Aerion and Boom, Spike's aircraft design would be powered by two engines, not three. It claims to use a "Quiet Supersonic Flight Technology" in designing its project airplane.

Aerion Corporation, Spike's competitor in delivering the first supersonic business jet, aims to perform the first flight of its AS2 aircraft in 2023 and to bring it into service in 2025. It is the only company to identify its engine manufacturer: General Electric. Aerion collaborated with Airbus in aircraft design and signed an agreement for co-development with Lockheed Martin, the developer of NASA's low-boom flight demonstrator experimental plane (or X-plane). This business jet is targeted to fly at Mach 1.4 using three engines.

Boom Supersonic is developing a 55-seat commercial jet capable of operating at Mach 2.2 with a design range of 4,500 nautical miles (8,300 km). Boom is not developing a specific technology or design to

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suppress sonic boom; instead, it is relying on the use of a newer engine and better aerodynamics than Concorde's to manage sonic boom. It is developing a one-third–scale supersonic airplane that will demonstrate Boom's technology prior to finalizing its airliner design. Boom claims that its aircraft "won't pollute any more than the subsonic business-class travel it replaces" (Dourado, 2018). Table 1 summarizes key elements of these three companies and their products.

Several government agencies are also involved in supersonic development. NASA has been a major player in SST technology development for decades, including building several supersonic X-planes. The agency's next supersonic X-plane, the Low Boom Flight Demonstrator, will be built by Lockheed Martin and delivered in 2021 (NASA, 2018). On the other side of the Atlantic, the European Union (EU) is funding the Regulation and Norm for Low Sonic Boom Levels, or RUMBLE. RUMBLE[1] aims to develop and assess sonic boom prediction tools, study the human response to sonic boom, and validate the findings using wind-tunnel experiments and flight tests. This is part of the effort by the EU to assess the "social acceptability" of new designs to support European regulatory development.

POLICY

The development of new supersonic aircraft designs will be influenced by international aviation standards. Those are decided by ICAO, the specialized UN agency that sets recommended standards and practices for civil aviation worldwide. Currently, international standards to support the certification of new supersonic aircraft and engines are not in place.

1 https://rumble-project.eu/#/.

The ICAO noise standard does not include a regulatory limit for supersonic aircraft (ICAO, 2014a). In 2004, CAEP formed a supersonic task group under its Working Group 1, which focuses on noise pollution. This group has been monitoring the development of supersonic technologies in order to develop eventual en-route (sonic boom) and LTO noise standards.

Although the United States is an active participant in CAEP negotiations, it is moving forward independently to regulate supersonic aircraft noise. Citing concerns about sonic boom, the Federal Aviation Administration (FAA, 1973) banned civilian aircraft from flying faster than Mach 1 over U.S. soil. This contributed to effectively banning Concorde operations over the continental United States and limited its movement to transoceanic routes. Language currently incorporated into the 2018 FAA reauthorization bill would undo that restriction (U.S. Government Publishing Office, 2018).

Separately, the FAA (2018a) is initiating a process to develop U.S.-specific standards for civil supersonic aircraft noise, including a proposed rule for LTO noise certification of supersonic aircraft. This rulemaking process may or may not be in line with ICAO's standard setting. If the United States sets its own standards for SSTs, other countries may adopt operational restrictions on those aircraft. Thus, it is unlikely that the U.S. government will adopt a national standard instead of coordinating internationally through ICAO.

On the emissions side, ICAO has aircraft engine emission certification standards for engines capable of supersonic flight based on the Concorde (ICAO, 2017a). However, in 2007, CAEP agreed that these stringency limits are outdated and should not be applied to new supersonic designs (ICAO, 2014b).

The lack of supporting standards for both noise and engine emissions complicates the development of new supersonic aircraft. Without international standards providing regulatory certainty that their aircraft can be sold and operated worldwide, major manufacturers will be reluctant to invest in new designs. But developing an emission standard within ICAO typically requires primary flight and engine test data for a wide variety of aircraft types. Negotiations among ICAO member states can be slow. For example, the 2016 ICAO CO_2 standard (ICCT, 2016) took seven years, or more than two CAEP cycles of three years each, to develop. Typically, an additional four years of lead time is provided before new standards take effect.

Two general approaches are under consideration: either to develop specific, SST-only standards for new aircraft, or to require that new designs comply with existing LTO NO_X, noise, and CO_2 standards for new subsonic airplanes. Separately, both the economic viability and public acceptability of new supersonics will depend in part on their fuel efficiency. Four metrics—NO_X emissions, noise, cruise CO_2 emissions, and mission fuel burn—are explored in this paper.

METHODOLOGY

SCOPE AND OVERALL APPROACH

According to the FAA (2018b), jet fuel consumption for commercial flights accounts for more than 90% of total U.S. jet fuel consumption for both domestic and international operations. Globally, general aviation is understood to be about 2% of total aviation fuel use (GAMA,

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2009). Because business jets are a small contributor to overall emissions, we decided to focus on commercial supersonics in this analysis.

The first step in the analysis is to identify a representative commercial SST design. Boom Supersonic, the only company currently developing such an aircraft, provided that basis. Boom has received support from a variety of investors and customers. In March 2017, Boom (2017) announced that it had received $41 million in funding including from Y Combinator, Sam Altman, Seraph Group, Eight Partners, and others. Japan Airlines provided $10 million in addition to 20 aircraft preorders, while Virgin Atlantic holds an option on 10 aircraft. All in all, Boom has received 76 aircraft commitments across five airline customers (Etherington, 2017).

Boom is aiming for a 2023 entry into service for its aircraft. Before building its airliner, Boom is building a one-third-scale demonstrator aircraft dubbed XB-1 or "Baby Boom." Subsonic flight tests are planned near Boom's hangar at Centennial, Colorado, followed by supersonic flights at Edwards Air Force Base in Southern California for technology validation purposes.

At the start of this project, Boom was contacted for information about the design and performance characteristics of its aircraft. General confirmation of publicly available data was provided, but no detailed information regarding engine specification was offered.

The following public information was available to support this assessment. A three-view drawing on Boom's website was used to develop the geometric representation necessary for aerodynamic calculations (see below). Boom also provides estimated routes, travel times, ticket prices, and fuel costs on its website. Relative to present-day subsonic service, supersonic travel on Boom airliners is claimed to save more than half the time it takes to fly trans-Atlantic, and a little less than that for trans-Pacific, because the latter would require a refueling stop due to range limitations. Boom estimates one-way ticket prices for three routes: $3,200 between Tokyo and San Francisco, $3,500 between Los Angeles and Sydney, and $2,500 between New York and London. The company also claims a fuel efficiency similar to that of existing premium-class twin-aisle aircraft.

The following sections describe the tools and assumptions used to estimate NO_x and CO_2 emissions, noise, and mission fuel burn of a reference commercial SST based on Boom's design. These values are compared against current ICAO subsonic emission standards and the fuel burn of equivalent commercial aircraft on representative missions.

TOOL SUMMARY

To evaluate new supersonic aircraft, we chose SUAVE (Lukaczyk et al., 2015), an open-source conceptual aircraft design tool with development currently led by Stanford University. It was specifically designed to be able to evaluate the performance of unconventional aircraft, including supersonic configurations.

The aerodynamics model derived from SUAVE was used for both subsonic and supersonic conditions (Lukaczyk et al., 2015). These low-fidelity methods have been validated against Concorde performance numbers. Details are available in the initial SUAVE paper, with minor refinements made over time. Because the reference SST aircraft is largely the same shape as the Concorde, we expect that these methods will hold. However, we also recognize the availability of more advanced design and manufacturing methods, such as using the area rule to design a fuselage with reduced wave drag. As a result, the overall lift/drag ratio of the vehicle was improved by an average of 10% from the value initially calculated under the low-fidelity methods.

The engine model used in this work is a low-fidelity model built into SUAVE. High-level engine cycle parameters—namely bypass ratio, overall pressure ratio, and turbine inlet temperature—are used as inputs into the model. Efficiencies of the engine components are based on technology level estimates from Mattingly (2006). From these parameters, the thermodynamic equations are solved across the engine components to find the temperature and pressure at each combustion stage, along with the final exit jet velocity.

Piano 5 aircraft performance and design software (Lissys Ltd., 2017) was used to compare estimated supersonic aircraft fuel burn with comparable subsonic transport. Two subsonic aircraft were chosen as baseline: Airbus A321LR (long range) and Boeing B787-9. The narrow-body A321LR was chosen because of its similarity in overall weight and range capacity to the Boom aircraft, which makes it suitable for trans-Atlantic flights. The B787-9 was chosen to represent conventional transoceanic travels on a twin-aisle aircraft without a refueling stop. Both aircraft are state-of-the-art subsonic aircraft at the time of writing and will be representative of newer in-service aircraft when new commercial SSTs enter into service.

The mission profile used in modeling is based roughly on the profile flown by Concorde. We used the full mission profile to include the fuel burn used in the climb portion of the mission. In the

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Table 2. Airframe parameters used for modeling.

Parameter	Value	Source
Maximum takeoff mass (kg)	77,000	www.flightglobal.com/news/articles/dubai-boom-to-make-a-big-noise-at-show-about-shorte-442767
Design range (km)	8,300	https://boomsupersonic.com/airliner
Maximum passengers	55	https://boomsupersonic.com/airliner
Design speed (Mach number)	2.2	https://boomsupersonic.com/airliner
Length (ft)	170	https://boomsupersonic.com/airliner
Wingspan (ft)	60	https://boomsupersonic.com/airliner
Reference geometric factor[a] (m^2)	80	Estimated
Balanced field length (ft)	10,000	https://boomsupersonic.com/airliner
Cruise altitude (ft)[b]	60,000	https://techcrunch.com/2017/01/12/boom-shows-off-its-xb-1-supersonic-demonstration-passenger-airliner
Engine	Medium-bypass-ratio turbofan, no afterburner	https://blog.boomsupersonic.com/why-we-dont-need-an-afterburner-a4e05943b101

[a] Reference geometric factor, which approximates an aircraft's pressurized floor area, is used to calculate the CO_2 standard metric value. The metric value is used to demonstrate compliance with ICAO's CO_2 standard (see below).
[b] We reduced the cruise altitude slightly in our analysis to meet a lower average altitude more consistent with a cruise-climb to 60,000 ft.

SUAVE framework, missions are constructed as a series of segments that are further split into control points. At each control point, conditions (altitude, speed, climb rate, etc.) are specified, and the equations of motion are solved to determine aircraft performance. This is done iteratively, segment by segment, to determine the full mission performance. See Lukaczyk et al. (2015) for further details of the mathematics involved.

MODEL CONSTRUCTION

Parameters for the SST model were determined primarily using publicly available information on Boom's aircraft. In general, Boom's statements of its designed capability were taken as truth; we did not modify estimates for parameters such as maximum takeoff mass or engine bypass ratio based upon our own expert judgement. This may lead to overestimating the real-world performance of the reference SST aircraft. The high-level airframe parameters used in the model are shown in Table 2.

We used a three-view drawing available on Boom's website to develop the geometric representation necessary for aerodynamic calculations. The measurements were made with Digimizer, a digital measurement tool (MedCalc Software, 2018). We used the tool to estimate all airframe geometric parameters except for wing and vertical tail thickness. An OpenVSP (Fredericks, 2010) model based on these estimates is used to determine wetted areas. For the wing and tail thickness, we assumed that Boom would be able to create structures slightly thinner than Concorde, reducing the wing's maximum thickness from 3% to 2.25%. The vertical tail is assumed to be slightly thicker than the wing at 3.5% of the chord length. See Table A1 in the Appendix for the full list of geometric parameters.

Boom's exact engine configuration has yet to be announced. The company aims to develop an aircraft with a medium bypass–ratio turbofan using an existing core and no afterburners. A clean-sheet turbofan engine would provide lower noise, emissions, and fuel burn but with a higher development cost. Currently, no manufacturers are producing commercial turbofan engines that could operate at Mach 2.2. An alternative approach, described in Fehrm (2016), would be to develop a commercial SST using an engine derived from an in-production military turbojet aircraft.

We assume that the new supersonic aircraft will use a variable-geometry nozzle, as Concorde did, that will be capable of keeping the flow nearly perfectly expanded. The result is an idealized engine that provides accurate values when operated near its design point, which means that climb and cruise values are expected to be representative of a well-designed engine with the parameters specified in Table 3. Although doubts have been raised about the capability of constructing an efficient engine with the properties specified (Fehrm, 2016), we provide this analysis assuming that such an engine can be designed. We therefore expect that the calculated emissions will be optimistic.

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Three engine models were developed to span the range of possible performance: most likely (derivative turbofan), best case (clean-sheet turbofan), and worst case (derivative turbojet). For the most likely case, we examined an engine expected to be usable on the Aerion AS2 based on the CFM56 (Fehrm, 2018). In its expected Mach 1.4 flight condition with refanning, the engine would have a lower-pressure compressor (LPC) pressure ratio of 2, a high-pressure compressor (HPC) pressure ratio of 10, and a turbine inlet temperature (T4) of 1650 K. To adapt this for Mach 2.2 flight, we assume that the pressure ratio is limited by the temperature at the compressor outlet as a result of material temperature limits in the compressor (Fehrm, 2016). This provides us with a HPC compression ratio of about 7.5. We also assume a bypass ratio of 3, consistent with Boom's stated engine plan. This may be optimistic given the resulting high ram drag on Mach 2.2 operations.

To represent the best-case scenario, we created an advanced engine aimed at meeting NASA's N+2 goals for supersonic aircraft (Welge et al., 2010). In this case, the assumption of a clean-sheet design allows us to vary T4 to find the maximum efficiency. We assume a compressor outlet temperature limit of 720°C for this design (Welge et al., 2010). This provides a somewhat more efficient engine. As a clean-sheet design, this engine would be more advanced, and therefore more complex and costly, than the derivative turbofan that near-term SST manufacturers are likely to deploy.

Our final engine is a turbojet based on an in-production military engine (EJ200) with constraints suggested in the series of articles on supersonic aircraft by Fehrm (2018). In this case, the compressor outlet temperature is limited to below 700°C. This engine provides a worst-case scenario estimate on engine performance, although it is unlikely to be used for commercial aircraft because of excessive noise. An aircraft based on this existing military engine could be brought to market more easily and more cheaply than one using a turbofan.

Table 3. Engine parameters used for modeling.

Parameter	Configuration		
	Best	Most likely	Worst
Engine type	Clean-sheet turbofan	Derivative turbofan	Derivative turbojet
Bypass ratio	3.0	3.0	—
Overall pressure ratio	15	15	13.8
Turbine inlet temperature (K)	1850	1650	1800
Landing and takeoff thrust available (lbf)	40,000	50,000	30,000
Top of climb thrust available (lbf)	7,600	8,200	9,200

We checked that these engines are capable of producing the required takeoff and cruise thrust. Boom claims a takeoff thrust in the range of 15,000 to 20,000 lbf per engine (Trimble, 2017). We estimate the need for about 7,000 to 8,000 lbf per engine in cruise and somewhat more than that for climb. Our analysis indicates that this performance is possible for all three engines with resizing.[2] All engine models use the same component efficiencies. Table 3 summarizes the engine parameters used in the modeling.

Uncertainty in the aerodynamic performance of the representative SST was captured by varying the level of assumed aerodynamic improvement over the Concorde. Improvements of 20%, 10%, and 0% (no improvement) in the lift-to-drag ratio were assumed for the best-case, most likely, and worst-case configurations, respectively.

FUEL EFFICIENCY DETERMINATION

The fuel efficiency of the reference SST was compared to existing subsonic standards and aircraft using two metrics: the ICAO CO_2 metric value (CO2MV) (ICCT, 2016) and mission fuel burn.

The ICAO CO2MV is based on the maximum specific air range (SAR), which is a measure of cruise fuel efficiency. The MV is expressed as $1/(SAR \times RGF^{0.24})$, where RGF is the reference geometric factor determined by multiplying the pressurized fuselage length by the fuselage width. This approximates the amount of usable space in the aircraft. We estimate the pressurized length of the reference SST to be about 35 m and the width to be about 2.3 m.

Maximum SAR measures the distance (km) traveled per mass (kg) of fuel under optimal flight conditions. To calculate it, the aircraft is simulated at a variety of altitudes and cruise speeds to find the condition that

2 Note that LTO thrust exceeds what is needed because engines must be sized for top-of-climb thrust. Additional uncertainty is also present at takeoff because the design mass flow near zero speed is not available. It is expected that engines for new SSTs will be derated to bring them in line with LTO requirements.

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gives the maximum value. In addition to finding the maximum cruise SAR, we also find the maximum SAR at Mach 2.2 and at subsonic conditions. Those values are important because SSTs will be required to fly over many countries subsonically and will likely not fly at maximum supersonic SAR if the associated speed is too low.

We next analyzed mission fuel burn. This is defined as gate-to-gate fuel burn minus fuel used to taxi the aircraft. To determine this, we use climb and descent segments similar to what Concorde performed, along with a cruise segment at constant altitude. Although we expect that the new supersonic aircraft will perform a cruise-climb to reduce fuel burn slightly, this would reduce mission fuel burn on the order of only 1 to 2%. Modeling an optimal trajectory is therefore not necessary to reach the level of accuracy targeted in this study.

Three different origin-to-destination missions were chosen for the analysis, corresponding to routes highlighted by Boom: San Francisco–Tokyo (SFO-NRT), Los Angeles–Sydney (LAX-SYD), and New York–London (JFK-LHR). Because of the SST's shorter design range, we assume that a refueling stop would be needed in Anchorage (ANC) and Tahiti (PPT) for the first two routes, respectively. These routes and distances are shown in Figure 1.

Mission distances were assumed to be great-circle distances if there is not a substantial land mass under the route. Because the great-circle distance for the ANC-NRT route includes about 1,000 km traveling over Alaska, we estimated a subsonic flight over Alaska at a speed matching optimal subsonic SAR. This created a slightly slower (15 min) but more fuel-efficient flight path relative to a purely supersonic, longer-distance route that requires flying south out of ANC to clear Alaska's southern edge.

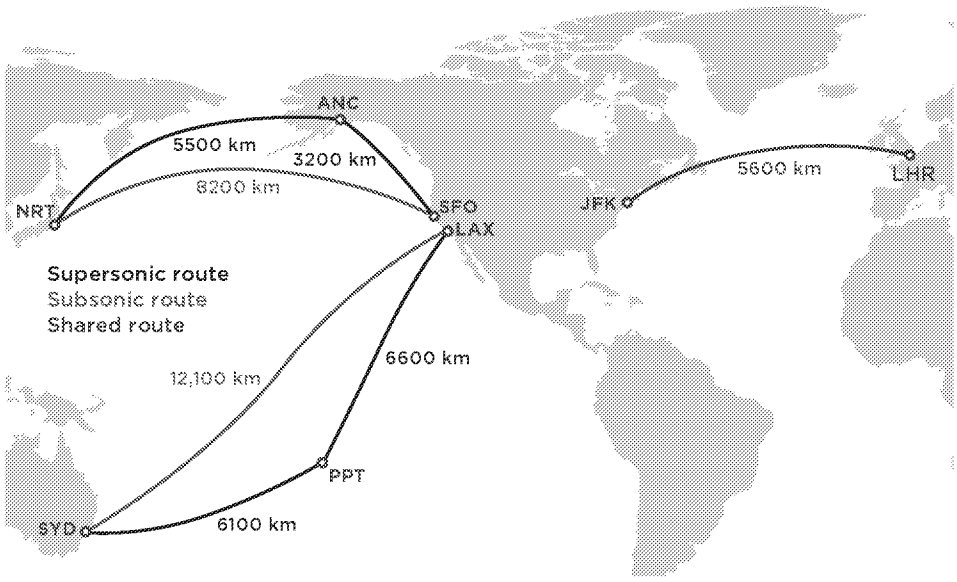

Figure 1. Routes investigated. (Source: GCmap.com)

The analysis distinguishes between premium (both supersonic and subsonic) and economy (subsonic only) service. We assumed a load factor of 80% for economy and 60% for premium passengers based on Bofinger and Strand (2013).[3] To apportion fuel use between premium and economy seats on the subsonic aircraft, we assigned a weighting factor of 2 to 1 to account for the greater floor area of long-haul premium seats (ICAO, 2017b).[4] Freight was assumed to be negligible for narrow-body aircraft and the SST, whereas for wide-body aircraft it was assumed to be 16% of total payload for flights operating between North America and the Pacific or Southeast Asia/Oceania, and 34% of total payload for flights operating between North America and East Asia (ICAO, 2018).

To determine the aircraft takeoff weight for each SST mission, we first used the maximum takeoff weight in a generic full-range mission of 4,500 nautical miles. The landing weight was determined, corresponding to the sum of the payload, reserve fuel, and aircraft empty weight. This landing weight was then reduced to account for the 60% load factor assuming 100 kg per passenger. This provided the expected landing weight for each origin/destination-specific mission. The mission

3 Transparent load factor data for both premium subsonic and supersonic seating is limited. On subsonic operations, Delta reported an estimated first-class load factor of 57% in 2015 (Anderson, 2015). For supersonics, the Concorde's load factors were highest between London and New York and between Paris and New York for British Airways and Air France, respectively. BA's load factors between JFK and LHR were reported to be between 50 and 60% in 2002 (Kingsley-Jones, 2002) and as high as 73% in the first six months of operations in 1978 (Witkin, 1978). Air France achieved load factors above 60% on its Paris–New York and Paris–Rio de Janeiro routes (ibid.). Other routes, including Paris–Caracas and London–Bahrain, experienced load factors well below 60%.

4 Bofinger and Strand (2013) calculated a business-class to economy-class emissions multiplier of 1.86 to 2.71 for flights where the passenger weight share is 12.5% of the total aircraft weight, close to the simple average of subsonic flights in this analysis.

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was then solved iteratively to determine what takeoff weight (and therefore fuel burn) would be needed to land at the specified weight.

In modeling the mission fuel burn of subsonic aircraft, default Piano 5 values for operational parameters such as engine thrust, drag, fuel flow, available flight levels, and speed were used.

Cruise speeds were set to allow 99% maximum specific air range. Flight times were estimated by including 20 min of taxi time (both in and out) for all flights, plus 30 min for refueling for routes longer than the range of the SST (Figure 1).

EMISSIONS AND NOISE

NO_x emissions were estimated for the most likely and best-case scenarios using emissions data for in-production engines in the ICAO engine emissions databank (ICAO, 2018).

An exponential curve of NO_x emission indices versus overall pressure ratio (OPR) for current CFM56 (CFM56-5 and -7) engine data was used to adjust the emissions values.[5] These engines use rich-quench-lean (RQL) combustor technology. For the most likely (derivative turbofan) engine, no further adjustments were made. LTO emissions for the best-case engine (i.e., clean-sheet turbofan) were estimated by correcting for the lower emissions of the LEAP engine family relative to current CFM56 engines.

Building a sophisticated noise model was beyond the scope of this work, so we instead used exit jet velocities to investigate likely noise characteristics. The jet velocity is found by taking a mass-weighted average of the core and fan velocities from SUAVE's engine model. The accuracy of these jet velocities depends on the engine's capability to operate at an ideal nozzle area ratio, which assumes that the engine has a variable nozzle that can reach the necessary outlet area. Boeing has determined that a jet velocity of 1,100 ft/s will be sufficient to meet Chapter 3 minus 10 to 20 EPNdB[6] (Welge et al., 2010). Research suggests that the lateral noise limit is the key determinant of passing noise standards stricter than Chapter 3, so we focused specifically on that value.

RESULTS

Table 4 summarizes the results for LTO NO_x and cruise CO_2 (CO2MV) emissions of the reference SST aircraft relative to existing subsonic standards. Values for the most likely, best-case, and worst-case configurations are summarized, along with their regulatory values and the year each standard takes effect. Regulatory limits for NO_x are set as a function of overall pressure ratio, whereas standards for CO_2 are set as a function of aircraft maximum takeoff mass. NO_x emission estimates were not available for the worst-case configuration because emissions data is not available for military engines.

As Table 4 indicates, the reference SST is unlikely to meet existing commercial aircraft standards. It exceeded allowable LTO NO_x limits by 38% in the most likely configuration, and CO2MV limits by 52% to 115%, with a most likely exceedance of 67%. The best-case, advanced clean-sheet engine was

Table 4. Modeled NO_x and CO_2 performance of SST aircraft by configuration.

Pollutant	Standard[a]	Year	Parameter	Configuration		
				Best	Most likely	Worst
NO_x	CAEP/8	2014	Overall pressure ratio	15	15	13.8
			SST (g/kN)	18	40	—[b]
			Standard (g/kN)	29	29	—[b]
			Exceedance	–37%	+38%	—[b]
CO_2	CAEP/10	2020	Maximum takeoff mass (kg)	77,000		
			SST (kg/km)	1.21	1.33	1.72
			Standard (kg/km)	0.80		
			Exceedance	+52%	+67%	+115%

[a] ICAO's environmental standards are referenced to the meeting at which they were agreed. ICAO's current CAEP/8 (NO_x) and CAEP/10 (CO_2) standards were finalized in 2010 and 2016, respectively.
[b] NO_x emission estimates were unavailable for this configuration.

5 This fit line is generally consistent with typical NO_x correlation equations, such as the one found in the GasTurb manual, which is a widely used program for calculating engine cycle parameters (GasTurb, n.d.). This approach has the added benefit of providing NO_x data for all of the required mode settings, whereas the SUAVE model cannot handle off-design conditions.

6 The ICAO Chapter 3 noise standard, applicable since 1978, is the current operational noise standard in many ICAO member states including the United States and Europe. This means that airplanes that do not comply with the Chapter 3 noise standard are not allowed to fly. The Chapter 4 noise standard, applicable from 2006 to 2017, is 10 EPNdB (cumulative) quieter than Chapter 3. The current applicable noise standard, Chapter 14, is 17 EPNdB (cumulative) more stringent than Chapter 3.

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estimated to comply with the latest subsonic NO_x standards. This finding is consistent with the view that staged lean-burn combustors can considerably reduce NO_x emissions. Note that the CO2MV results are more certain than the NO_x estimates.

A detailed assessment of noise certification levels is beyond the scope of this work. Some simple observations can be made, however. Relative to the jet exit velocity limit of 1,100 ft/s identified in Welge et al. (2010), SUAVE's engine model predicts a jet exit velocity of 1,350 ft/s in the most likely configuration, and 1,550 and 3,400 ft/s for the best- and worst-case configurations, respectively. This implies that the aircraft would not meet existing (Chapter 14/Stage 5) standards. Engine derating, combined with modified landing and takeoff procedures, is believed to be needed to bring new SST aircraft into compliance with the 2006 Chapter 4 noise standards (Welge et al., 2010). Certification to current subsonic noise standards is likely to require additional technological solutions—for example, a clean-sheet advanced variable-cycle engine—that are currently not being considered for near-term SSTs.

Figure 2 summarizes the expected mission fuel performance of the reference SST aircraft relative to new subsonic aircraft on comparable missions. The applicable routes, aircraft types, and fuel use (mass per passenger) are shown for average, premium, and economy passengers. Best- and worst-case SST scenarios are indicated as error bars on the blue SST bars.

As Figure 2 indicates, in its most likely configuration the modeled SST consumed between 5 and 7 times as much fuel per passenger relative to comparable subsonic aircraft. Divided by class, the SST burned between 3 and 4 times as much fuel per passenger for premium (business) service, and between 6 and 8 times as much fuel per economy passenger.[7] The lower multiples were associated with the New York (JFK)–London (Heathrow) and Los Angeles–Sydney routes, which largely followed great-circle distances with relatively little belly freight carriage. The higher multiples were seen for the SFO-NRT route, which had a 6% excess flight distance to enable refueling and a high share of belly freight carriage.

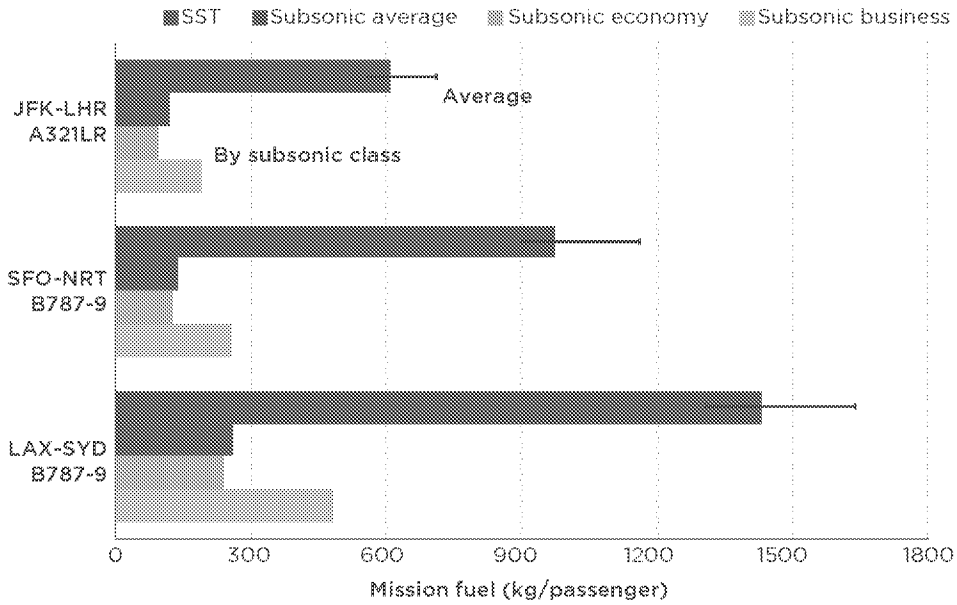

Figure 2. One-way mission fuel consumption per passenger by route and class.

These values are for the most likely SST configuration. Taking into account the full range of uncertainty, the per-passenger fuel intensity of the SST varied from 3 times (best configuration relative to subsonic business class, LAX-SYD) to 9 times (worst configuration relative to subsonic economy class, SFO-NRT) that of its subsonic equivalent. Estimated travel times were 30 to 50% shorter for the Mach 2.2 SST relative to the subsonic aircraft, which typically operate near Mach 0.85.

Aircraft fuel burn, LTO NO_x, and LTO noise are not the only environmental issues facing SSTs. Some of the issues not considered in this paper stem from the high cruise altitudes of SSTs, including cruise NO_x, stratospheric water vapor, and magnified non-CO_2 effects. Sonic boom or en-route noise impacts are also important but beyond the scope of this work.

7 High mission fuel burn is directly related to high CO_2 emissions during cruise. The gap between the SST's smaller (70%) exceedance to the CO_2 standard and its larger (5 to 7 times) overall fuel intensity is due to the way that the CO_2 standard assigns regulatory targets to individual aircraft. Supersonic aircraft, which are disproportionately heavy compared to subsonic aircraft carrying the same number of passengers, would receive less stringent targets if subject to the standard. See ICCT (2016) for further details.

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CONCLUSIONS AND NEXT STEPS

This working paper provides a preliminary assessment of the environmental performance of emerging commercial SST aircraft. Multiple scenarios representing most likely, best-case, and worst-case configurations were developed to bound the range of possible uncertainty. Where provided, manufacturer claims of airframe and engine design parameters were used as modeling inputs. Accordingly, our overall findings are likely optimistic; the actual performance of future supersonic aircraft may be worse.

This analysis suggests that near-term commercial SSTs are unlikely to comply with existing standards for commercial aircraft. The most likely configuration of a representative SST was estimated to exceed limits for NO_x and CO_2 by 40% and 70%, respectively. A qualitative assessment of noise was consistent with the understanding that engine derating and modified LTO procedures would be needed to comply with older (2006) Chapter 4 noise standards. Advanced technologies, including variable-cycle engines and staged combustion, on a clean-sheet engine would likely be needed to meet current LTO noise and NO_x standards.

These findings suggest two pathways for further development of commercial SSTs. First, manufacturers could refocus their development efforts on designs with advanced, clean sheet engines. Those are more likely to meet existing subsonic aircraft standards. Second, policymakers could establish new environmental standards for SSTs based upon designs using poorer performing derivative engines. Such standards would allow for increased pollution and nuisance relative to new commercial aircraft.

Independent of standards, the economic feasibility and social acceptability of new designs remain to be seen. The representative SST is expected to burn 5 to 7 times as much fuel per passenger as comparable subsonic aircraft. The results were sensitive to seating class, route, and the exact configuration of the aircraft. In its best possible configuration and route, the SST burned 3 times as much fuel per business-class passenger relative to subsonic aircraft; in the worst configuration with a refueling stop, the difference would be 9 times as much fuel for an economy-class passenger.

Fuel is typically an airline's single largest operating expense, accounting for 20 to 35% of overall airline operating costs. Current jet fuel prices of about $700 per metric tonne (IATA, 2018) mean that the fuel costs of transporting one passenger round-trip from San Francisco to Tokyo via SST would be around $1400, versus about $180 to $360 for subsonic economy class and business class, respectively. Profitable operation of these aircraft would require revenue and yields high enough to recover these extra fuel costs.

This increased fuel consumption would lead to proportional increases in CO_2 emissions. The share of CO_2 emissions attributable to international aviation is expected to increase from 1.4% today to between 7% and 14% of a Paris-compatible global carbon budget by 2075 (Rutherford, 2018). The introduction of new supersonic aircraft opens up the potential for even larger increases. The social acceptability of this increase, and therefore the public's support for supersonic travel, remains to be determined.

This working paper has provided an initial assessment of one aspect of SST operations, namely their emissions and noise characteristics. Substantial data gaps persist with respect to the characteristics of the engines that may be deployed as well as precise airframe parameters (e.g., maximum takeoff weight, empty weight, range, and payload). Further work is needed in particular to better characterize noise levels, both for LTO and supersonic en-route noise or sonic boom. LTO NO_x emissions estimates could be refined further through the use of analytical models such as GasTurb. Furthermore, little is known about how LTO NO_x relates to cruise NO_x for these aircraft, and work will be needed to establish this relationship.

The viability of new commercial SSTs will depend on more than just pollution and nuisance. Additional work is needed to understand other aspects of commercial SSTs. A route-based analysis of how commercial SSTs may be integrated into current and future airline networks and air traffic management at airports is recommended. Similarly, an economic analysis of likely fares, operating costs, yield, profitability, etc., would help to clarify the business case for commercial supersonics.

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Appendix

Table A1. Detailed geometric parameters.

Parameter	Value	Source
Main wing aspect ratio (span²/reference area)	1.39	Calculated
Main wing thickness/chord ratio	0.0225	Engineering Judgement
Main wing quarter chord sweep (degrees)	55.9	Measured using Digimizer (MedCald Software, 2018).
Main wing span (m)	18.3	Boom website
Main wing root chord (m)	20.8	Measured using Digimizer.
Main wing tip chord (m)	2.8	Measured using Digimizer.
Main wing mean aerodynamic chord (m)	12.0	Calculated
Main wing total length (m)	21.7	Measured using Digimizer.
Main wing reference area (m²)	241	Measured using Digimizer.
Main wing wetted area (m²)	344	Calculated with OpenVSP Model
Tail aspect ratio	0.65	Calculated
Tail thickness/chord ratio	0.035	Engineering Judgment
Tail quarter chord sweep (degrees)	60	Measured using Digimizer.
Tail span (m)	4	Measured using Digimizer.
Tail root chord (m)	11.9	Measured using Digimizer.
Tail tip chord (m)	2.1	Measured using Digimizer.
Tail mean aerodynamic chord (m)	9.4	Measured using Digimizer.
Tail total length (m)	12	Measured using Digimizer.
Tail reference area (m²)	24.6	Measured using Digimizer.
Tail wetted area (m²)	60.4	Calculated with OpenVSP Model
Fuselage length (m)	51.8	Boom website
Fuselage maximum height (m)	2.7	Measured using Digimizer.
Fuselage width (m)	2.4	Measured using Digimizer.
Fuselage wetted area (m²)	332	Calculated with OpenVSP Model
Fuselage front projected area (m²)	5.3	Measured using Digimizer.
Fuselage effective diameter (m)	2.55	Estimated
Propulsor length (m)	10.6 (underwing) 12.6 (fuselage)	Measured using Digimizer.
Propulsor nacelle diameter	1.4	Measured (approximate due to square shape)
Propulsor inlet diameter	1.2	Estimated
Propulsor total wetted area (m²)	45	Estimated (ignored in-fuselage propulsor)

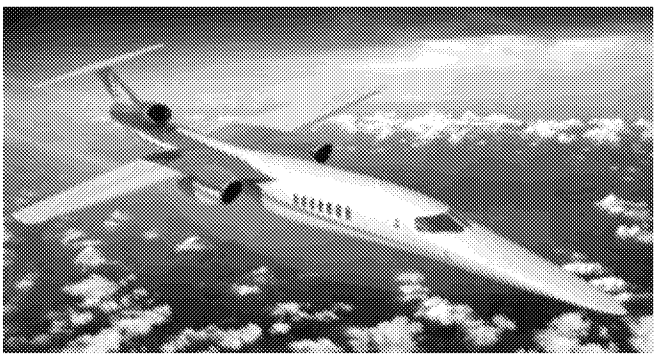
ED_002134_00001242-00013

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/16/2018 3:01:08 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: FAA Considers Changes To Supersonic Ban

FAA Considers Changes To Supersonic Ban

MARY GRADY **AVweb**



The FAA's rules currently prohibit civil aircraft from exceeding speeds in excess of Mach 1 over U.S. land areas, and the FAA says that's not going to change. However, the agency said this week it wants to support the development of civil supersonic aircraft, and will propose two new rules that suggest a move in that direction. The first proposed rule will address the noise certification for supersonic aircraft, and the second aims to make it easier to get the special authorization needed to conduct supersonic flight testing in the U.S. The FAA also said it is "working within the existing statutory and regulatory authority to consider the range of permissible supersonic operations." In addition, the FAA is assessing the current state of supersonic aircraft technology in terms of mitigating the noise impacts associated with supersonic overland flight.

The two proposed rules will be published next year, the agency said. The rules would not rescind the prohibition of flight in excess of Mach 1 over land. Yet the FAA said it is "working within the existing statutory and regulatory authority" to consider the range of permissible supersonic operations. In addition, the FAA is assessing the current state of supersonic aircraft technology in terms of mitigating the noise impacts associated with supersonic overland flight. Several companies, including Aerion and Boom, are working to develop supersonic business jets. Members of Congress have pressured the FAA to revisit its prohibition on supersonic flight.

Bruce Maeroff
Senior Service America, Inc.
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Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 4/18/2018 3:36:02 PM
To: erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com; Eric.Upton@gulfstream.com
Subject: RE: ESSTsg 17 April Telecon
Attachments: ESSTsg 20180417 Telecon Minutes.docx; ESSTsg 20180327 Telecon Minutes.docx

Dear All,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Windhoffer, Laszlo (FAA)
Sent: Tuesday, April 17, 2018 9:17 AM
Subject: RE: ESSTsg 17 April Telecon

Dear All,

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Windhoffer, Laszlo (FAA)
Sent: Thursday, April 12, 2018 12:39 PM
Subject: ESSTsg 17 April Telecon

Dear ESSTsg Team,

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Security Detail / Ex. 6

László Windhoffer
Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Windhoffer, Laszlo (FAA)
Sent: Monday, April 02, 2018 3:30 PM
Subject: RE: ESSTsg 27 March Telecon

Dear All,

Please find our 27 Mar ESSTsg telecon minutes attached to this email.

Deliberative Process / Ex. 5

Finally, please let us know if you have any questions, and we look forward to your input by 6 Apr.

Thank you

Laszlo Windheffer
Federal Aviation Administration
T: +1-202-267-4741

CAEP/11-WG3 -CTG ESSTsg 27 Mar 2018 9:30 Eastern / 15:30 CET	Personal Security Detail / Ex. 6

1. ***Attendees***: See attendance record at the end of this document.

2. ***Agenda Items***

Deliberative Process / Ex. 5

3.

Deliberative Process / Ex. 5

Attendance Records

Nominated By	Contact Name	27/03/2018
ICCAIA	Ahrens, Denise	X
ICCAIA	Allyn, Dan	X
IBAC	Altherr, David	
IATA	Anvid, David	
EU	Arrowsmith, Steve	
Singapore	Arsad, Jauhari	
Canada	Bailey, Wendy	
Spain	Benito, Arturo (Dr)	
Canada	Bilcock, David	X
ICCAIA	Bonnet, Arnaud	X
IBAC	Cotti, Eli	X
ICCAIA	Dehestru, Guillaume	
ICAO	Dickson, Neil	
ICCAIA	Dolejsi, William (Bill)	
Brazil	Dupont, Ricardo	
United States	Fernandez, Jorge	X
ICCAIA	Garrison, Mike	
United States	Gillette, Warren	
EU	Herms, Erika	X
EU	Hoermann, Werner	
ICCAIA	Hornbaker, Darrel	
United States	Iovinelli, Ralph	
United States	Jacob, Daniel	X
ICCT	Kharina, Anastasia	X
ICCAIA	Keisuke, Nakahama	
ICCAIA	Kim, Brian	X
United States	Leggett, Cullen	
United States	Locke, Maryalice	X
ICCAIA	Lye, David	
ICCAIA	Madden, Paul	X
United States	Maeroff, Bruce	
United States	Manning, Bryan	
ICCAIA	Matisheck, Jason	X
Russian Federation	Medvedev, Yuriy	X
Japan	Moriyama, Mahito	X
Russian Federation	Mirzoyan, Artur	X
United States	Miyake-Lye, Rick	X
ICCAIA	Muehlhausen, Matt	
United States	Mueller, John	X
ICCAIA	Nobrega de Lima, Krisha	X
United Kingdom	Owen, Bethan	X
ICCAIA	Percheron, Thierry	
Germany	Plohr, Martin	X
ICCAIA	Russell, Raymond	X
Switzerland	Rindlisbacher, Theo	
Brazil	Saito, Marcelo	
France	Sarda, Jerome	
EU	Savvidis, Charalambos	
United States	Seidel, Jonathan	X
EU	Skillen, Graham	
ICCAIA	Smit, Hans	
ICCAIA	Smith, Simon	

ICCAIA	Soum, Frederic	
United States	Stimson, Don	
ICCAIA	Tobaldini, Luiz	X
ICCAIA	Upton, Eric	X
United States	Windhoffer, Laszlo	X
China	Yang, Xiaojun	X
ICCAIA	Zelina, Joseph	X

CAEP/11-WG3 -CTG ESSTsg 17 Apr 2018 9:30 Eastern / 15:30 CET	**Personal Security Detail / Ex. 6**

1. ***Attendees***: See attendance records at the end of this document.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

3.

4.

Attendance Records

Nominated By	Contact Name	27/03/2018	17/04/2018
ICCAIA	Ahrens, Denise	X	
ICCAIA	Allyn, Dan	X	X
IBAC	Altherr, David		
IATA	Anvid, David		
EU	Arrowsmith, Steve		
Singapore	Arsad, Jauhari		
Canada	Bailey, Wendy		X
Spain	Benito, Arturo (Dr)		
Canada	Bilcock, David	X	
ICCAIA	Bonnet, Arnaud	X	X
IBAC	Cotti, Eli	X	X
ICCAIA	Dehestru, Guillaume		
ICAO	Dickson, Neil		
ICCAIA	Dolejsi, William (Bill)		
Brazil	Dupont, Ricardo		X
United States	Fernandez, Jorge	X	X
ICCAIA	Garrison, Mike		
United States	Gillette, Warren		
EU	Herms, Erika	X	X
EU	Hoermann, Werner		
ICCAIA	Hornbaker, Darrel		
United States	Iovinelli, Ralph		X
United States	Jacob, Daniel	X	X
ICCT	Kharina, Anastasia	X	X
ICCAIA	Keisuke, Nakahama		
ICCAIA	Kim, Brian	X	X
United States	Leggett, Cullen		X
United States	Locke, Maryalice	X	X
ICCAIA	Lye, David		
ICCAIA	Madden, Paul	X	X
United States	Maeroff, Bruce		
United States	Manning, Bryan		
ICCAIA	Matisheck, Jason	X	X
Russian Federation	Medvedev, Yuriy	X	
Japan	Moriyama, Mahito	X	X
Russian Federation	Mirzoyan, Artur	X	
United States	Miyake-Lye, Rick	X	X
ICCAIA	Muehlhausen, Matt		
United States	Mueller, John	X	X
ICCAIA	Nobrega de Lima, Krisha	X	
United Kingdom	Owen, Bethan	X	X
ICCAIA	Percheron, Thierry		
Germany	Plohr, Martin	X	X
ICCAIA	Russell, Raymond	X	X
Switzerland	Rindlisbacher, Theo		
Brazil	Saito, Marcelo		
France	Sarda, Jerome		X
EU	Savvidis, Charalambos		
United States	Seidel, Jonathan	X	
EU	Skillen, Graham		
ICCAIA	Smit, Hans		
ICCAIA	Smith, Simon		

ICCAIA	Soum, Frederic		
United States	Stimson, Don		
ICCAIA	Tobaldini, Luiz	X	X
ICCAIA	Upton, Eric	X	X
United States	Windhoffer, Laszlo	X	X
China	Yang, Xiaojun	X	X
ICCAIA	Zelina, Joseph	X	X

Message

From: Bloomberg Environment - Environment & Energy Report [bloomberg@bna.com]
Sent: 7/26/2018 9:47:44 AM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: First Move: Superfund Sites' Hurricane Prep • Chemical Price-Fixing's Costs • Colorado River Cooperation

What you need to know to start your day.

Bloomberg Environment

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Superfund Sites' Hurricane Prep • Chemical Price-Fixing's Costs • Colorado River Cooperation

By Chuck McCutcheon

Hurricane Harvey caused considerable destruction across Texas last year, including unleashing contamination at hazardous waste sites.

Now some of those Superfund sites are readying for future disasters—but not all of them have the work done yet. Two companies, International Paper Co. and McGinnes Industrial Maintenance Corp., estimate it will take them two years to figure out how to adapt their site's waste-removal plan for potential severe weather.

That delay is making some environmentalists nervous.

"We are crossing our fingers that we don't get a direct hurricane strike" until the waste can be removed, says Scott Jones, director of advocacy for Houston's Galveston Bay Foundation.

For updates, follow Sylvia Carignan on Twitter and look for her story later this morning.

CHEMICAL PRICE-FIXING MONEY: The Justice Department is winding down an investigation of illegal price fixing among distributors of widely used water treatment chemicals. General Chemical Corp. and its rivals could get hit with criminal fines—and even bigger amounts in civil damages.

Civil suits following criminal cartel charges or guilty pleas can dwarf the original case, a Bloomberg Law analysis finds. GEO Specialty Chemicals Inc., another company involved in the water treatment cartel, was given a criminal fine of $5 million but its civil settlement—finalized last week—is almost three times that much.

Watch for a story from Bloomberg Law's Eleanor Tyler later this morning.

COLORADO RIVER COOPERATION: The Colorado River's overuse and drought is bringing people together in Arizona.

Farmers, home builders, and mining giant Freeport-McMoRan are among the interests that Arizona water agencies have enlisted to develop a plan. The river runs through a handful of Western states and part of Mexico, but the Grand Canyon State has the most to lose from shortages.

"If we don't listen to each other, we're not going to get anywhere," says Arizona state Rep. Rosanna Gabaldon.

Follow Brenna Goth on Twitter for updates and watch for her story later this morning.

OTHER STORIES WE'RE COVERING

- The Senate is hoping to wrap up work on the "minibus" that includes funding the EPA and Interior Department by week's end, but it has been slow going so far. Dean Scott is covering.
- Numerous oil companies including Conoco, Valero, Marathon Petroleum, National Oilwell, and Cenovus are releasing quarterly earnings reports. Bloomberg News is watching.

- Six Eletrobras power distributors in north and northeast Brazil are holding an auction. Together, they provide electricity to 13 million people in six states. Bloomberg News is monitoring.

QUOTE OF THE DAY

"This is a critical moment to be playing political games."
—Eduardo Bhatia, Puerto Rico's Senate minority leader, criticizing Gov. Ricardo Rossello for skipping a House hearing yesterday on the island's electricity situation.

AROUND THE WEB

Inmate firefighters battle the Ferguson fire near Yosemite National Park on July 22.
Photographer: Noah Berger/AFP/Getty Images

- Wildfires are shutting down Yosemite National Park's most popular visitor destination.
- Duke Energy plans to cap a popular solar program in South Carolina, which will mean customers adding new systems will receive less favorable rates.
- A nonprofit has launched a searchable website enabling homeowners in Florida, Georgia, North Carolina, South Carolina, and Virginia to determine their risks from hurricane-related flooding and sea level rise.
- New supersonic jets are expected to boost greenhouse gas emissions.

TODAY'S EVENTS

- **10 a.m. • Natural Gas** • U.S. Energy Association sponsors talk on NET Power's commercialization of a novel power system that produces emissions-free electricity from natural gas for the same cost as conventional power plants.
- **11 a.m. • Climate** • MSCI Inc. holds webinar on California's upcoming Global Climate Action Summit.

- **2 p.m.** • **China** • Wilson Center hosts forum on new innovations for green financing in urban China.

For all of today's Bloomberg Environment headlines, visit Environment & Energy Report

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Subject: Re: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Dear WG3 members,

Deliberative Process / Ex. 5

Personal Security Detail / Ex. 6

Best wishes,

Bethan and Ralph
WG3 co-rapporteurs

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Subject: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Dear members of WG3,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Best wishes

Neil on behalf of Bethan and Ralph, WG3 co-rapporteurs

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From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 3/24/2018 3:45:25 AM
To: erika.herms@easa.europa.eu; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; willem.franken@easa.europa.eu; Stephen.Arrowsmith@easa.europa.eu; werner.hoermann@easa.europa.eu; guy.readman@easa.europa.eu; charalambos.savvidis@easa.europa.eu; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; maryalice.locke@faa.gov; sandy.liu@faa.gov; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; rick@aerodyne.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; jonathan.a.seidel@nasa.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr; stephen.kramer@pw.utc.com; raymond@boomsupersonic.com; eli@boomsupersonic.com
Subject: ESSTsg 27 March Telecon
Attachments:

Deliberative Process / Ex. 5

Dear All,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thank you,
Eric and Laszlo

Personal Security Detail / Ex. 6

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Herms Erika [mailto:erika.herms@easa.europa.eu]
Sent: Thursday, March 15, 2018 1:52 PM
To: Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>; jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; giannelli.bob@epa.gov; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; leggett.cullen@epa.gov; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; Liu, Sandy (FAA) <sandy.liu@faa.gov>; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: RE: ESSTsg Schedule & Actions

Dear All,

Deliberative Process / Ex. 5

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

EASA

Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: 12 March 2018 21:44
To: jerome.sarda@aviation-civile.gouv.fr; tpohle@airlines.org; jscavuzzi@aci.aero; ricardo.dupont@anac.gov.br; marcelo.saito@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; greg.smallwood@nrc-cnrc.gc.ca; xiaojunyoung@hotmail.com; FRANKEN Willem <willem.franken@easa.europa.eu>; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; Herms Erika <erika.herms@easa.europa.eu>; Hoermann Werner <werner.hoermann@easa.europa.eu>; Readman Guy <guy.readman@easa.europa.eu>; SAVVIDIS Charalambos <charalambos.savvidis@easa.europa.eu>; martin.plohr@dlr.de; frank.wetzel@uba.de; david.anvid@delta.com; daltherr@aerioncorp.com; ecotti@nbaa.org; ndickson@icao.int; denise.ahrens@rolls-royce.com; daniel.m.allyn@boeing.com; andy@boom.aero; arnaud.bonnet@embraer.com.br; robbie.cowart@gulfstream.com; guillaume.dehestru@dassault-aviation.com; wcdolejsi@txtav.com; rudolph.dudebout@honeywell.com; charles.etter@gulfstream.com; mike.garrison@boeing.com; ddhornbaker@txtav.com; mark.johnson3@rolls-royce.com; keisuke_nakahama@mitsubishiaircraft.com; brian.kim@pw.utc.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; jrmatisheck@aerioncorp.com; kian.mccaldon@pwc.ca; john.morgenstern@lmco.com; kevin.morris@adsgroup.org.uk; matthew.r.muehlhausen@boeing.com; krisha.nobrega@embraer.com.br; thierry.percheron@dassault-aviation.com; jean-francois.perelgritz@airbus.com; charles.renard@airbus.com; hans.smit@airbus.com; simon.smith@rolls-royce.com; frederic.soum@airbus.com; sturdza@aerioncorp.com; luiz.tobaldini@embraer.com.br; eric.upton@gulfstream.com; joseph.zelina@ge.com; karin@theicct.org; paul.peeters1000@gmail.com; mirzoyan@ciam.ru; jauhari_arsad@caas.gov.sg; arturo.benito@upm.es; marie.hankanen@transportstyrelsen.se; theo.rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; jeff.berton@nasa.gov; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; jorge.fernandez@faa.gov; giannelli.bob@epa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; leggett.cullen@epa.gov; maryalice.locke@faa.gov; sandy.liu@faa.gov; maeroff.bruce@epa.gov; manning.bryan@epa.gov; rick@aerodyne.com; mueller.john@epa.gov; samulski.michael@epa.gov; jonathan.a.seidel@nasa.gov; wolfe.philip@epa.gov; yen.david@epa.gov; yuriy.medved@gmail.com; moriyama-m2ff@mlit.go.jp; yoann.mery@snecma.fr; olivier.penanhoat@snecma.fr
Subject: ESSTsg Schedule & Actions
Importance: High

Dear ESSTsg,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Please let us know if you have any questions.

Thank you,
Eric, Laszlo

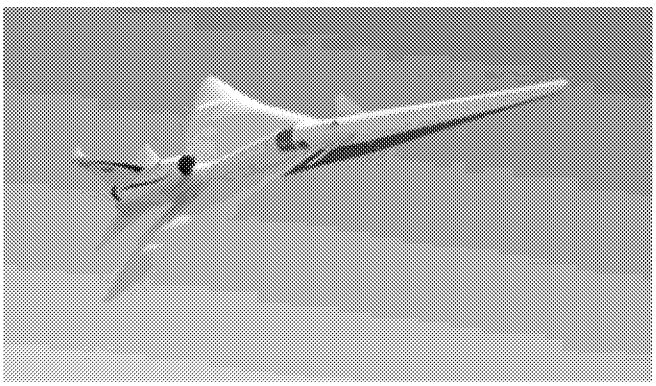
Laszlo Windhaffer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, S.W.
Washington, DC 20591
T. +1.202.267-4741

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/29/2018 2:06:22 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: Eco-Groups Lobby Against Supersonic Flight

Eco-Groups Lobby Against Supersonic Flight

MARY GRADY AVwebflash



With a measure to lift the ban on supersonic flight above the U.S. in play in the Senate, a coalition of 38 environmental and health advocacy groups issued a news release this week urging lawmakers to uphold the current restrictions. The new jet designs would burn up to "seven times more fuel per passenger" compared to today's airliners, according to the coalition's news release. "Resurrecting these flying gas-guzzlers would cause the aviation industry's already massive climate damage to skyrocket," said Bill Snape, senior counsel at the Center for Biological Diversity. "Supersonic planes are a gratuitous luxury for the super-rich and a dirty burden for everyone else." Spike Aerospace, Aerion and Boom all are working to bring supersonic aircraft to market in the next decade. NASA is testing new technology that would "soften" the boom so it would be less disruptive to people on the ground.

A recent analysis (PDF) by the nonprofit International Council on Clean Transportation concluded that new supersonic airliners would likely exceed international subsonic limits for nitrogen oxides by 40 percent, according to the coalition letter. Exposure to nitrogen oxides is linked to respiratory disease, heart attacks and strokes. "At a time when we need to reduce carbon dioxide emissions from aviation, not increase them, incentivizing commercial use of supersonic aircraft is a huge step in the wrong direction," said Sarah Burt, a lawyer at Earthjustice.

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/6/2018 1:31:31 AM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: RE: Boilerplate and E.O. 13045

Thanks Bryan. Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

From: Manning, Bryan
Sent: Wednesday, June 06, 2018 12:04 AM
To: Mueller, John <mueller.john@epa.gov>
Subject: RE: Boilerplate and E.O. 13045

Hi John,

Deliberative Process / Ex. 5

Thanks again,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: Mueller, John
Sent: Monday, June 04, 2018 9:39 PM
To: Manning, Bryan <manning.bryan@epa.gov>
Subject: RE: Boilerplate and E.O. 13045

Deliberative Process / Ex. 5

From: Manning, Bryan
Sent: Tuesday, June 05, 2018 4:32 AM
To: Mueller, John <mueller.john@epa.gov>
Subject: RE: Boilerplate and E.O. 13045

Deliberative Process / Ex. 5

Thanks again,

Bryan

From: Mueller, John
Sent: Monday, June 04, 2018 4:31 AM
To: Manning, Bryan <manning.bryan@epa.gov>
Subject: Boilerplate and E.O. 13045

Hi Bryan,

Deliberative Process / Ex. 5

-John

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/17/2018 4:23:40 PM
To: Laszlo.Windhoffer@faa.gov
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Ralph.Iovinelli@faa.gov
Subject: RE: Annex 16 applicability question

Laszlo,

Deliberative Process / Ex. 5

Best regards,
Cullen Leggett
+1 734-214-4514

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Tuesday, April 17, 2018 12:14 PM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>; Mueller, John <mueller.john@epa.gov>; Ralph.Iovinelli@faa.gov
Subject: RE: Annex 16 applicability question

Hi Cullen,

Deliberative Process / Ex. 5

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Leggett, Cullen [mailto:Leggett.Cullen@epa.gov]
Sent: Tuesday, April 17, 2018 11:50 AM
To: Windhoffer, Laszlo (FAA) <Laszlo.Windhoffer@faa.gov>

Cc: Manning, Bryan <manning.bryan@epa.gov>; Mueller, John <mueller.john@epa.gov>
Subject: Annex 16 applicability question

Laszlo,

Deliberative Process / Ex. 5

Best regards,

Cullen Leggett

U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) +1 734-214-4514
(fax) +1 734-214-4816
Leggett.Cullen@EPA.gov

Message

From: Ricardo Antonio Binotto Dupont [ricardo.Dupont@anac.gov.br]
Sent: 7/16/2018 4:42:19 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: RES: CTG VIII - 03 July 2018 telecon minutes

No problems, Bruce.

Deliberative Process / Ex. 5

Regards,
Ricardo.

De: Maeroff, Bruce [mailto:Maeroff.Bruce@epa.gov]
Enviada em: segunda-feira, 16 de julho de 2018 12:58
Para: Ricardo Antonio Binotto Dupont
Cc: manning.bryan@epa.gov
Assunto: RE: CTG VIII - 03 July 2018 telecon minutes

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

From: Ricardo Antonio Binotto Dupont [mailto:ricardo.Dupont@anac.gov.br]
Sent: Monday, July 16, 2018 10:10 AM
To: Maeroff, Bruce <Maeroff.Bruce@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>
Subject: RES: CTG VIII - 03 July 2018 telecon minutes

Deliberative Process / Ex. 5

Ricardo.

De: Maeroff, Bruce [mailto:Maeroff.Bruce@epa.gov]
Enviada em: segunda-feira, 16 de julho de 2018 11:00
Para: Ricardo Antonio Binotto Dupont

Cc: manning.bryan@epa.gov
Assunto: RE: CTG VIII - 03 July 2018 telecon minutes

Ricardo,

Deliberative Process / Ex. 5

Thank You,

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
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Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

From: Ricardo Antonio Binotto Dupont [mailto:ricardo.Dupont@anac.gov.br]
Sent: Wednesday, July 11, 2018 2:40 PM
To: LD.CAEP_WG3_CTG_V3 <LD.CAEP_WG3_CTG_V3@anac.gov.br>
Cc: Laszlo.Windhoffer@faa.gov
Subject: CTG VIII - 03 July 2018 telecon minutes

Deliberative Process / Ex. 5

Regards,
Laszlo and Ricardo.

Message

From: Herms Erika [erika.herms@easa.europa.eu]
Sent: 4/17/2018 11:43:33 AM
To: Upton, Eric [Eric.Upton@gulfstream.com]; andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; SAVVIDIS Charalambos [OA.Closed.OA.Closed.charalambos.savvidis@easa.local]; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie [robbie.cowart@gulfstream.com]; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; denise.ahrens@rolls-royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; Etter, Charles [charles.etter@gulfstream.com]; frank.wetzel@uba.de; frederic.soum@airbus.com; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; Readman Guy [guy.readman@easa.europa.eu]; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Laszlo.Windhoffer@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; mark.johnson3@rolls-royce.com; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; sandy.liu@faa.gov; simon.smith@rolls-royce.com; Arrowsmith Stephen [Stephen.Arrowsmith@easa.europa.eu]; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; Hoermann Werner [werner.hoermann@easa.europa.eu]; FRANKEN Willem [willem.franken@easa.europa.eu]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; xiaojunyoung@hotmail.com; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yoann.mery@snecma.fr; yuriy.medved@gmail.com
Subject: RE: Additional paper for tomorrow's call
Attachments: **Deliberative Process / Ex. 5**

Dear all,

Please find my feedback.
Regards,
erika

Erika Herms
Regulation Officer – Environmental Protection
European Aviation Safety Agency

EASA
Tel.: +49 221 89990-5062
Postal: Postfach 10 12 53, 50452 Cologne, Germany
An agency of the European Union

From: Upton, Eric [mailto:Eric.Upton@gulfstream.com]
Sent: 16 April 2018 21:56
To: andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; SAVVIDIS Charalambos <OA.Closed.OA.Closed.charalambos.savvidis@easa.local>; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie <robbie.cowart@gulfstream.com>; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; denise.ahrens@rolls-royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; Herms Erika <erika.herms@easa.europa.eu>; Etter, Charles <charles.etter@gulfstream.com>; frank.wetzel@uba.de; frederic.soum@airbus.com; giannelli.bob@epa.gov; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; Readman Guy <guy.readman@easa.europa.eu>; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Laszlo.Windhoffer@faa.gov; leggett.cullen@epa.gov; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; manning.bryan@epa.gov; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; mark.johnson3@rolls-royce.com; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; samulski.michael@epa.gov; sandy.liu@faa.gov; simon.smith@rolls-royce.com; Arrowsmith Stephen <Stephen.Arrowsmith@easa.europa.eu>; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; Upton, Eric <Eric.Upton@gulfstream.com>; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; Hoermann Werner <werner.hoermann@easa.europa.eu>; FRANKEN Willem <willem.franken@easa.europa.eu>; wolfe.philip@epa.gov; xiaojunyoung@hotmail.com; yen.david@epa.gov; yoann.mery@snecma.fr; yuriy.medved@gmail.com
Subject: Additional paper for tomorrow's call

Hello Colleagues,

Deliberative Process / Ex. 5

Eric and Laszlo
ESSTsg Co-Leads

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 7/16/2018 3:58:29 PM
To: Ricardo Antonio Binotto Dupont [ricardo.Dupont@anac.gov.br]
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: RE: CTG VIII - 03 July 2018 telecon minutes

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

From: Ricardo Antonio Binotto Dupont [mailto:ricardo.Dupont@anac.gov.br]
Sent: Monday, July 16, 2018 10:10 AM
To: Maeroff, Bruce <Maeroff.Bruce@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>
Subject: RES: CTG VIII - 03 July 2018 telecon minutes

Hi, Bruce!
Yes, it is official. Sorry for the confusion.
Ricardo.

De: Maeroff, Bruce [mailto:Maeroff.Bruce@epa.gov]
Enviada em: segunda-feira, 16 de julho de 2018 11:00
Para: Ricardo Antonio Binotto Dupont
Cc: manning.bryan@epa.gov
Assunto: RE: CTG VIII - 03 July 2018 telecon minutes

Ricardo,

Deliberative Process / Ex. 5

Thank You,

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,

Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

From: Ricardo Antonio Binotto Dupont [mailto:ricardo.Dupont@anac.gov.br]
Sent: Wednesday, July 11, 2018 2:40 PM
To: LD.CAEP_WG3_CTG_V3 <LD.CAEP_WG3_CTG_V3@anac.gov.br>
Cc: Laszlo.Windhoffer@faa.gov
Subject: CTG VIII - 03 July 2018 telecon minutes

Dear CTG VIII,

Deliberative Process / Ex. 5

Regards,
Laszlo and Ricardo.

Message

From: Yen, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=865CA449DD0F405A949A635615E68827-YEN, DAVID]
Sent: 4/16/2018 8:11:31 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
CC: Storhok, Ines [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2adfcd6cfa10433eb6f2618e4b21bbdc-Storhok, Ines]; Salazar-Greene, Natalie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=90e6598b81bf4603a74cf349e8fb2e98-Salazar-Gre]
Subject: Report for MDG-FESG07 Meeting
Attachments: Trip Report for MDG-FESG07.docx

Hello team,

Deliberative Process / Ex. 5

Best regards,
David

Message

From: Upton, Eric [Eric.Upton@gulfstream.com]
Sent: 4/16/2018 7:56:11 PM
To: andy@boom.aero; arnaud.bonnet@embraer.com.br; arturo.benito@upm.es; b.owen@mmu.ac.uk; brian.kim@pw.utc.com; charalambos.savvidis@easa.europa.eu; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cowart, Robbie [robbie.cowart@gulfstream.com]; daltherr@aerioncorp.com; Daniel.Jacob@faa.gov; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; david.lye@aero.bombardier.com; ddhornbaker@txtav.com; denise.ahrens@rolls-royce.com; ecotti@nbaa.org; eli@boomsupersonic.com; erika.herms@easa.europa.eu; Etter, Charles [charles.etter@gulfstream.com]; frank.wetzel@uba.de; frederic.soum@airbus.com; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; greg.smallwood@nrc-cnrc.gc.ca; guillaume.dehestru@dassault-aviation.com; guy.readman@easa.europa.eu; hans.smit@airbus.com; jauhari_arsad@caas.gov.sg; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; jorge.fernandez@faa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; jscavuzzi@aci.aero; karin@theicct.org; keisuke_nakahama@mitsubishiaircraft.com; kevin.morris@adsgroup.org.uk; kian.mccaldon@pwc.ca; krisha.nobrega@embraer.com.br; Laszlo.Windhoffer@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; marcelo.saito@anac.gov.br; marie.hankanen@transportstyrelsen.se; mark.johnson3@rolls-royce.com; martin.plohr@dlr.de; maryalice.locke@faa.gov; matthew.r.muehlhausen@boeing.com; mike.garrison@boeing.com; mirzoyan@ciam.ru; moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; Ralph.Iovinelli@faa.gov; raymond@boomsupersonic.com; Rebecca.Cointin@faa.gov; ricardo.dupont@anac.gov.br; rick@aerodyne.com; rudolph.dudebout@honeywell.com; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; sandy.liu@faa.gov; simon.smith@rolls-royce.com; Stephen.Arrowsmith@easa.europa.eu; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; theo.rindlisbacher@bazl.admin.ch; thierry.percheron@dassault-aviation.com; tpohle@airlines.org; Upton, Eric [Eric.Upton@gulfstream.com]; wcdolejsi@txtav.com; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; xiaojunyoung@hotmail.com; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; yoann.mery@snecma.fr; yuriy.medved@gmail.com
Subject: Additional paper for tomorrow's call
Attachments: Deliberative Process / Ex. 5

Hello Colleagues,

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Eric and Laszlo
ESSTsg Co-Leads

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 3/5/2018 12:04:06 PM
To: Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: CAEP11 WG3-8 Sao Jose dos Campos, Brazil, February 26, 2018

The following WG3-8 papers have been added to the H Drive at: Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

WG3-08 Plenary
Flimys

Deliberative Process / Ex. 5

PMTG-08

Deliberative Process / Ex. 5

Bruce Maeroff
Senior Service America, Inc.

Supporting the U.S. EPA through a Cooperative
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maeroff.bruce@epa.gov

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 4/16/2018 1:36:33 PM
To: Dickson, Neil [NDickson@icao.int]; Ralph Iovinelli [Ralph.Iovinelli@faa.gov]
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: RE: WG3 Plenary Call - Monday, 16 April, 09h30 EDT - EPA, We Are Here

The following EPA personnel are in attendance today 4/16/2018:

Mike Samulski
Bryan Manning
John Mueller
David Yen
Bruce Maeroff

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
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2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
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maeroff.bruce@epa.gov

From: Dickson, Neil [mailto:NDickson@icao.int]
Sent: Sunday, April 15, 2018 9:57 PM
To: Bethan Owen <B.Owen@mmu.ac.uk>; Wolfe, Philip <wolfe.philip@epa.gov>; Log T <thobias.log@transportstyrelsen.se>; Abdain Z <Zainal.abidin@emirates.com>; Abidin Z <Zainal.abidin@emirates.com>; Agarwal A <aa681@mit.edu>; Ahrens D <denise.ahrens@rolls-royce.com>; Allyn D <daniel.m.allyn@boeing.com>; Altherr D <daltherr@aerioncorp.com>; Anvid <david.anvid@delta.com>; Archilla V <archillapv@inta.es>; Arrowsmith <stephen.arrowsmith@easa.europa.eu>; Arsad J <Jauhari_ARSAD@caas.gov.sg>; Bailey <wendy.bailey@tc.gc.ca>; Balasubramanian S <Sathya.Balasubramanian.CTR@dot.gov>; Baughcum S <steven.l.baughcum@boeing.com>; Beauregard M <MBeauregard@AIAC.ca>; Benito <arturo.benito@upm.es>; Berryann A <andy@boom.aero>; Berton J <Jeff.Berton@nasa.gov>; Bilcock D <david.bilcock@tc.gc.ca>; Boichenko <chemmotology@ukr.net>; Bonnefoy <bonnefoy_philippe@bluesky-d2d.com>; Bonnet A <arnaud.bonnet@embraer.com.br>; Box L <laurent.box@eurocontrol.int>; Carmody C <colleen.carmody@tc.gc.ca>; Carnelly <daniel.carnelly@airbus.com>; Chang C <clarence.t.chang@nasa.gov>; Simon Christie <S.Christie@mmu.ac.uk>; Cointin R <rebecca.cointin@faa.gov>; Collin D <dominique.collin@snecma.fr>; Cooreman B <barbara.cooreman@asd-europe.org>; Cornier <isabelle.cornier@adp.fr>; Cotti <Ecotti@NBAA.org>; Cousineau Y <yves.cousineau@tc.gc.ca>; Crayford A <crayfordap1@cardiff.ac.uk>; De Lepinay I <ivan.de-lepinay@easa.europa.eu>; Dehestru G <guillaume.dehestru@dassault-aviation.com>; Deniskov V <V.Deniskov@antonov.kiev.ua>; Denk K <keremdenk@gmail.com>; Didyk N <nicole.didyk@faa.gov>; Dolejsi W <WCDolejsi@cessna.textron.com>; Dourado E <eli@boomsupersonic.com>; Jim Dow <Jdow@iccaia.org>; Dudebout <rudolph.dudebout@honeywell.com>; Dupont R <ricardo.dupont@anac.gov.br>; Etter <charles.etter@gulfstream.com>; Eyers <chris@limitedskies.com>; Fajari A <ajaria96@yahoo.co.id>; Ferdian Hussein B <baronferdianhussein@airasia.com>; Fleming G <Gregg.Fleming@dot.gov>; Fleuti <emanuel.fleuti@zurich-airport.com>; Franken <willem.franken@easa.europa.eu>; Frenandez J <jorge.fernandez@faa.gov>; Fudge, Ted

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Subject: WG3 Plenary Call - Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

The dial in details, as usual are:

Personal Security Detail / Ex. 6

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

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mobile: +1 514-812-0737
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Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 11-Apr-18 11:48 AM
To: 'Bethan Owen'; Bristow A; Log T; Abdain Z; Abidin Z; Agarwal A; Ahrens D; Allyn D; Altherr D; Anvid; Archilla V; Arrowsmith; Arsad J; Bailey; Balasubramanian S; Baughcum S; Beauregard M; Benito; Berryann A; Berton J; Bilcock D; Boichenko; Bonnefoy; Bonnet A; Box L; Carmody C; Carnelly; Chang C; Simon Christie; Cointin R; Collin D; Cooreman B; Cornier; Cotti; Cousineau Y; Crayford A; De Lepinay I; Dehestru G; Deniskov V; Denk K; Didyk N; Dolejsi W; Dourado E; Jim Dow; Dudebout; Dupont R; Etter; Eyers; Fajari A; Ferdian Hussein B; Fleming G; Fleuti; Franken; Frenandez J; Fudge, Ted; Fujiwara; Galotti, Vincent; Garrison M; Gerring H; Giannelli B; Gillette; Gowen H; Grandi F; Hankanen M; Hemmings; Herms; Hileman J; Hinderberger M; Hoermann; Hoke J; Holsclaw C; Horie N; Iglesias A; Iovinelli; Jacob D; Janicke U; Johnson M; Jung J; Kartika D; Kenney M; Kharina A; Kim B; Kittery J; Kozel; Kramer S; Kusukame Y; David Lee; Leggett; Ling Lim; Lindsey L; Lobo P; Locke M; Locke M; Lunter; Lye; Madden; Maeroff; Majjigi R; Manning B; Marks; Matischeck J; Maurice L; McCaldon; McConnachie D; McKinney; Medvedev Y; Mery Y; Miake-Lye; Middel J; Mirzoyan A; Morgenstern J; Moriyama M; Morris; Muehlhausen M; Mueller J; Nobrega K; Oshimizu M; Pagliarello M; Patserin; Peeters P; Penanhoat; Percheron T; Perelgritz J; Peter; Plohr; Pohle T; Renard C; Riegle; Rindlisbacher; Roeler T; Roetger; Russell R; Rutherford; Sabnis J; Sagues C; Saito; Samulski M; Sarda J; Savvidis C; Scata D; Scavuzzi J; Schaefer M; Schaufele R; Seeberg I; Seeliger K; Seidel J; Sipatov; Skillen G; Smallwood G; Smit H; Smith; Soum F; Sow D; Sparrow V; Speth R; Stevens J; Stimson; Sturdza P; Takahashi H; Tobaldini L; Upton E; Vanek A; Volkov; Wetzel; Willford N; Williams P; Windhoffer; Yang X; Yasar G; Yen; Yen; Zelina J; nagayoshi_hiromitsu@ihi.co.jp
Subject: RE: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section

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Consider the environment before printing this e-mail

From: Bethan Owen [mailto:B.Owen@mmu.ac.uk]
Sent: 10-Apr-18 8:07 AM
To: Dickson, Neil; Bristow A; Log T; Abdain Z; Abidin Z; Agarwal A; Ahrens D; Allyn D; Altherr D; Anvid; Archilla V; Arrowsmith; Arsad J; Bailey; Balasubramanian S; Baughcum S; Beauregard M; Benito; Berryann A; Berton J; Bilcock D; Boichenko; Bonnefoy; Bonnet A; Box L; Carmody C; Carnelly; Chang C; Simon Christie; Cointin R; Collin D; Cooreman B; Cornier; Cotti; Cousineau Y; Crayford A; De Lepinay I; Dehestru G; Deniskov V; Denk K; Didyk N; Dolejsi W; Dourado E; Jim Dow; Dudebout; Dupont R; Etter; Eyers; Fajari A; Ferdian Hussein B; Fleming G; Fleuti; Franken; Frenandez J; Fudge, Ted; Fujiwara; Galotti, Vincent; Garrison M; Gerring H; Giannelli B; Gillette; Gowen H; Grandi F; Hankanen M; Hemmings; Herms; Hileman J; Hinderberger M; Hoermann; Hoke J; Holsclaw C; Horie N; Iglesias A; Iovinelli; Jacob D; Janicke U; Johnson M; Jung J; Kartika D; Kenney M; Kharina A; Kim B; Kittery J; Kozel; Kramer S; Kusukame Y; David Lee; Leggett; Ling Lim; Lindsey L; Lobo P; Locke M; Locke M; Lunter; Lye; Madden; Maeroff; Majjigi R; Manning B; Marks; Matischeck J; Maurice L; McCaldon; McConnachie D; McKinney; Medvedev Y; Mery Y; Miake-Lye; Middel J; Mirzoyan A; Morgenstern J; Moriyama M; Morris; Muehlhausen M; Mueller J; Nobrega K; Oshimizu M; Pagliarello M; Patserin; Peeters P; Penanhoat; Percheron T; Perelgritz J; Peter; Plohr; Pohle T; Renard C; Riegle; Rindlisbacher; Roeler T; Roetger; Russell R; Rutherford; Sabnis J; Sagues C; Saito; Samulski M; Sarda J; Savvidis C; Scata D; Scavuzzi J; Schaefer M; Schaufele R; Seeberg I; Seeliger K; Seidel J; Sipatov; Skillen G; Smallwood G; Smit H; Smith; Soum F; Sow D; Sparrow V; Speth R; Stevens J; Stimson; Sturdza P; Takahashi H; Tobaldini L; Upton E; Vanek A; Volkov; Wetzel; Willford N; Williams P; Windhoffer; Yang X; Yasar G; Yen; Yen; Zelina J; nagayoshi_hiromitsu@ihi.co.jp
Subject: Re: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

Best wishes,

Bethan and Ralph
WG3 co-rapporteurs

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but please check first as I am often travelling

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From: "Dickson, Neil" <NDickson@icao.int>
Date: Friday, 6 April 2018 at 22:15
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Subject: RE: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

The dial in details, as usual are:

Personal Security Detail / Ex. 6

www.connectmeeting.att.com

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
mobile: +1 514-812-0737
email: NDickson@icao.int

Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 4-Apr-18 7:45 PM
To: 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berryann A'; 'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carmody C'; 'Carnelly'; 'Chang C'; 'Christie S'; 'Cointin R'; 'Collin D'; 'Cooreman B'; 'Cornier'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Didyk N'; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame Y'; 'Lee'; 'Leggett'; 'Lim L'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Owen'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Sagues C'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'; 'nagayoshi_hiromitsu@ihi.co.jp'
Subject: WG3 Plenary Calls - Monday, 9 April, 09h30 EDT and Monday, 16 April, 09h30 EDT

Dear WG3,

Deliberative Process / Ex. 5

The dial in details for both conference calls will be, as usual:

Personal Security Detail / Ex. 6

Best regards,

Neil

Dr Neil Dickson
Chief, Environmental Standards Section
International Civil Aviation Organization (ICAO)
Air Transport Bureau

tel: +1 514-954-8219 (x6042)
mobile: +1 514-812-0737
email: NDickson@icao.int

Consider the environment before printing this e-mail

"Before acting on this email or opening any attachments you should read the Manchester Metropolitan University email disclaimer available on its website http://www.mmu.ac.uk/emaildisclaimer "

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/23/2018 6:32:45 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: FW: SST Qs...
Attachments: **Deliberative Process / Ex. 5**

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Thursday, August 23, 2018 1:19 PM
To: Mueller, John <mueller.john@epa.gov>
Subject: SST Qs...

See attached…

Message

From: victoria.m.williams@faa.gov [victoria.m.williams@faa.gov]
Sent: 8/23/2018 6:00:20 PM
To: Carmen.Breiding@faa.gov; Brandon.LeBlanc@faa.gov; judi.m.citrenbaum@faa.gov; leah.moebius@faa.gov; stacey.herishen-smith@faa.gov; Walklet-TigheM@state.gov; Ed.CTR.Firth@faa.gov; Ed.CTR.Firth@faa.gov; cassandra.jordan@faa.gov; Michael.Givens@faa.gov; usaf.pentagon.af-a3-5.mbx.af-igia-workflow@mail.mil; jcasey@airlines.org; Alexis.Haakensen@trade.gov; keh@asri.aero; pdoell@naca.cc; craig.spence@aopa.org; pmcgraw@airlines.org; rmarchi@aci-na.org; Richard.a.kahne.civ@mail.mil; scot.stone@fcc.gov; salterman@cargoair.org; sydney.e.tutein@us.army.mil; wdesrosier@gama.aero; dcarr@nbaa.org; eas@alpa.org; leslie.riegle@aia-aerospace.org; cortney.robinson@aia-aerospace.org; ha.nguyen@dhs.gov; Danielle.Swaim@faa.gov; bonnie.ahumada@faa.gov; tricia.stacey@faa.gov; Caitlin.Locke@faa.gov; george.s.wilson@delta.com; david.Semanchik@alpa.org; cbethke@airlines.org; chris.walker@delta.com; denise.a.fountain2.civ@mail.mil; angela.harris-clark@faa.gov; michelle.westover@faa.gov; krista.berquist@faa.gov; cindy.nordlie@faa.gov; hilldrf@ntsb.gov; michael.graf@noaa.gov; Yadira.Lacot@faa.gov; Beth.Weir@faa.gov; della.davis@dot.gov; Esta.Rosenberg@dot.gov; katie.logisz@tsa.dhs.gov; David.L.Edwards@uscg.mil; Lillian.Miller@faa.gov; briedler@icao.int; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; coswald@aci-na.org; Mark.Reeves@faa.gov; michael.w.brown@faa.gov; MiBrown@icao.int; Lalesh.CTR.Nagy@faa.gov; Janet.McLaughlin@faa.gov; jennifer.arquilla@faa.gov; Christopher.Loring@faa.gov; nancy.rivera@faa.gov; rich.swayze@delta.com; Minh.Favila@faa.gov; John.Dermody@faa.gov; Barbara.Cassidy@faa.gov; Tim.Maguire@fcc.gov; Kathi.Hurst@alpa.org; Jennifer.Kileo@faa.gov; Raleigh.Griffith@faa.gov; IMCEAINVALID-john+2Esloan+2Efaa+2Egov@MGD.DOT.GOV; rachel.manis@tsa.dhs.gov; nicole.mikel-brumfield@faa.gov; chad.balentine@alpa.org; Natalie.Randolph@faa.gov; mcornelius@aci-na.org; mara.jenkins@faa.gov; elizabeth.thomas@faa.gov; MaryJo.Marzinzik@faa.gov; rebecca.barthel@faa.gov; Donald.Ward@faa.gov; allan.d.storm.civ@mail.mil; david.hyde@aia-aerospace.org; paula.martinez@faa.gov; luke.schiada@ntsb.gov; irma.cortes@nasa.gov; Iyi-EwekaAO@state.gov; louis.bell@fcc.gov; laurie.sussman@rockwellcollins.com; Linda.Ubokudom@faa.gov; gpaul@naca.cc; ecotti@nbaa.org; Sharon.Yun@faa.gov; mreeves@icao.int; Giles.D.Strickler@faa.gov; Kevin.Partowazam@faa.gov; Donald.Scata@faa.gov; briedler@icao.int; mreeves@icao.int
Subject: RE: For Information - Final Action for IGIA 72/1.329A - Air Navigation Conference - U.S. Information Paper "Views of the United States on Civil Supersonic Flight", for the Thirteenth Air Navigation Conference being held in Montreal, October 9 – 19, 2018
Attachments: **Deliberative Process / Ex. 5**

Please replace cover page with one attached. Thanks

Victoria M. Williams
Management & Program Analyst
Office of International Aviation (API)
Federal Aviation Administration
Tel: (202) 267-0928
Email: victoria.m.williams@faa.gov

From: 9-AWA-API-IGIA (FAA)
Sent: Thursday, August 23, 2018 1:48 PM
To: Breiding, Carmen (FAA) <Carmen.Breiding@faa.gov>; LeBlanc, Brandon (FAA) <Brandon.LeBlanc@faa.gov>; Citrenbaum, Judi M (FAA) <judi.m.citrenbaum@faa.gov>; Moebius, Leah (FAA) <leah.moebius@faa.gov>; Herishen-Smith, Stacey (FAA) <stacey.herishen-smith@faa.gov>; Walklet-TigheM@state.gov; Firth, Ed CTR (FAA) <Ed.CTR.Firth@faa.gov>; Firth, Ed CTR (FAA) <Ed.CTR.Firth@faa.gov>; Jordan, Cassandra (FAA) <cassandra.jordan@faa.gov>; Williams, Victoria M (FAA) <victoria.m.williams@faa.gov>; Firth, Ed CTR (FAA) <Ed.CTR.Firth@faa.gov>; Raymond.Swider@osd.mil; sydney.e.tutein@us.army.mil; Givens, Michael (FAA) <Michael.Givens@faa.gov>; usaf.pentagon.af-a3-5.mbx.af-igia-workflow@mail.mil; jcasey@airlines.org; Alexis.Haakensen@trade.gov; keh@asri.aero; pdoell@naca.cc; craig.spence@aopa.org; pmcgraw@airlines.org;

rmarchi@aci-na.org; Richard.a.kahne.civ@mail.mil; scot.stone@fcc.gov; salterman@cargoair.org; sydney.e.tutein@us.army.mil; wdesrosier@gama.aero; dcarr@nbaa.org; eas@alpa.org; leslie.riegle@aia-aerospace.org; cortney.robinson@aia-aerospace.org; ha.nguyen@dhs.gov; Swaim, Danielle (FAA) <Danielle.Swaim@faa.gov>; Ahumada, Bonnie (FAA) <bonnie.ahumada@faa.gov>; Stacey, Tricia (FAA) <tricia.stacey@faa.gov>; Locke, Caitlin (FAA) <Caitlin.Locke@faa.gov>; george.s.wilson@delta.com; david.Semanchik@alpa.org; cbethke@airlines.org; chris.walker@delta.com; denise.a.fountain2.civ@mail.mil; Harris-Clark, Angela (FAA) <angela.harris-clark@faa.gov>; Westover, Michelle (FAA) <michelle.westover@faa.gov>; Berquist, Krista (FAA) <krista.berquist@faa.gov>; Nordlie, Cindy (FAA) <cindy.nordlie@faa.gov>; hilldrf@ntsb.gov; michael.graf@noaa.gov; Lacot, Yadira (FAA) <Yadira.Lacot@faa.gov>; Weir, Beth (FAA) <Beth.Weir@faa.gov>; Davis, Della (OST) <della.davis@dot.gov>; Rosenberg, Esta (OST) <Esta.Rosenberg@dot.gov>; katie.logisz@tsa.dhs.gov; David.L.Edwards@uscg.mil; Miller, Lillian (FAA) <Lillian.Miller@faa.gov>; briedler@icao.int; samulski.michael@epa.gov; manning.bryan@epa.gov; coswald@aci-na.org; Reeves, Mark (FAA) <Mark.Reeves@faa.gov>; Brown, Michael W (FAA) <michael.w.brown@faa.gov>; MiBrown@icao.int; Nagy, Lalesh CTR (FAA) <Lalesh.CTR.Nagy@faa.gov>; McLaughlin, Janet (FAA) <Janet.McLaughlin@faa.gov>; Arquilla, Jennifer (FAA) <jennifer.arquilla@faa.gov>; Loring, Christopher (FAA) <Christopher.Loring@faa.gov>; Rivera, Nancy (FAA) <nancy.rivera@faa.gov>; rich.swayze@delta.com; Favila, Minh (FAA) <Minh.Favila@faa.gov>; Dermody, John (FAA) <John.Dermody@faa.gov>; Cassidy, Barbara (FAA) <Barbara.Cassidy@faa.gov>; Tim.Maguire@fcc.gov; Kathi.Hurst@alpa.org; Kileo, Jennifer (FAA) <Jennifer.Kileo@faa.gov>; Griffith, Raleigh (FAA) <Raleigh.Griffith@faa.gov>; john.sloan.faa.gov; rachel.manis@tsa.dhs.gov; Mikel-Brumfield, Nicole (FAA) <nicole.mikel-brumfield@faa.gov>; chad.balentine@alpa.org; Randolph, Natalie (FAA) <Natalie.Randolph@faa.gov>; mcornelius@aci-na.org; Jenkins, Mara (FAA) <mara.jenkins@faa.gov>; Thomas, Elizabeth (FAA) <elizabeth.thomas@faa.gov>; Marzinzik, MaryJo (FAA) <MaryJo.Marzinzik@faa.gov>; Barthel, Rebecca (FAA) <rebecca.barthel@faa.gov>; Ward, Donald (FAA) <Donald.Ward@faa.gov>; allan.d.storm.civ@mail.mil; david.hyde@aia-aerospace.org; Martinez, Paula (FAA) <paula.martinez@faa.gov>; luke.schiada@ntsb.gov; irma.cortes@nasa.gov; Iyi-EwekaAO@state.gov; louis.bell@fcc.gov; laurie.sussman@rockwellcollins.com; Ubokudom, Linda (FAA) <Linda.Ubokudom@faa.gov>; gpaul@naca.cc; ecotti@nbaa.org; Yun, Sharon (FAA) <Sharon.Yun@faa.gov>; mreeves@icao.int; Strickler, Giles D (FAA) <Giles.D.Strickler@faa.gov>; Partowazam, Kevin (FAA) <Kevin.Partowazam@faa.gov>; Scata, Donald (FAA) <Donald.Scata@faa.gov>; Williams, Victoria M (FAA) <victoria.m.williams@faa.gov>; Williams, Victoria M (FAA) <victoria.m.williams@faa.gov>; briedler@icao.int; mreeves@icao.int
Cc: Firth, Ed CTR (FAA) <Ed.CTR.Firth@faa.gov>; JRooney@Comtechllc.com; Williams, Victoria M (FAA) <victoria.m.williams@faa.gov>; Firth, Ed CTR (FAA) <Ed.CTR.Firth@faa.gov>
Subject: For Information - Final Action for IGIA 72/1.329A - Air Navigation Conference - U.S. Information Paper "Views of the United States on Civil Supersonic Flight", for the Thirteenth Air Navigation Conference being held in Montreal, October 9 – 19, 2018

Deliberative Process / Ex. 5

For more information, contact us:

Federal Aviation Administration
Interagency Group on International Aviation (IGIA)
9-AWA-API-IGIA@faa.gov
Fax: (202) 267-5499

Victoria M. Williams
Principal Staff Officer
victoria.m.williams@faa.gov
Phone: (202) 267-0928

Message

From: 9-AWA-API-IGIA@faa.gov [9-AWA-API-IGIA@faa.gov]
Sent: 8/23/2018 5:48:10 PM
To: Carmen.Breiding@faa.gov; brandon.leblanc@faa.gov; Judi.M.Citrenbaum@faa.gov; Leah.Moebius@faa.gov; stacey.herishen-smith@faa.gov; Walklet-TigheM@state.gov; ed.ctr.firth@faa.gov; ed.ctr.firth@faa.gov; cassandra.jordan@faa.gov; victoria.m.williams@faa.gov; ed.ctr.firth@faa.gov; raymond.swider@osd.mil; sydney.e.tutein@us.army.mil; michael.givens@faa.gov; usaf.pentagon.af-a3-5.mbx.af-igia-workflow@mail.mil; jcasey@airlines.org; Alexis.Haakensen@trade.gov; keh@asri.aero; pdoell@naca.cc; craig.spence@aopa.org; pmcgraw@airlines.org; rmarchi@aci-na.org; Richard.a.kahne.civ@mail.mil; scot.stone@fcc.gov; salterman@cargoair.org; sydney.e.tutein@us.army.mil; wdesrosier@gama.aero; dcarr@nbaa.org; eas@alpa.org; leslie.riegle@aia-aerospace.org; cortney.robinson@aia-aerospace.org; ha.nguyen@dhs.gov; danielle.fontaine@faa.gov; bonnie.ahumada@faa.gov; tricia.stacey@faa.gov; caitlin.locke@faa.gov; george.s.wilson@delta.com; david.Semanchik@alpa.org; cbethke@airlines.org; chris.walker@delta.com; denise.a.fountain2.civ@mail.mil; angela.harris-clark@faa.gov; michelle.westover@faa.gov; krista.berquist@faa.gov; cindy.nordlie@faa.gov; hilldrf@ntsb.gov; michael.graf@noaa.gov; Yadira.Lacot@faa.gov; beth.weir@faa.gov; della.davis@dot.gov; esta.rosenberg@dot.gov; katie.logisz@tsa.dhs.gov; david.l.edwards@uscg.mil; lillian.miller@faa.gov; briedler@icao.int; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; coswald@aci-na.org; mark.reeves@faa.gov; michael.w.brown@faa.gov; MiBrown@icao.int; Lalesh.CTR.Nagy@faa.gov; janet.mclaughlin@faa.gov; jennifer.arquilla@faa.gov; christopher.loring@faa.gov; nancy.rivera@faa.gov; rich.swayze@delta.com; minh.favila@faa.gov; John.Dermody@faa.gov; barbara.cassidy@faa.gov; Tim.Maguire@fcc.gov; Kathi.Hurst@alpa.org; Jennifer.Kileo@faa.gov; raleigh.griffith@faa.gov; john.sloan.faa.gov@domain.invalid; rachel.manis@tsa.dhs.gov; nicole.mikel-brumfield@faa.gov; chad.balentine@alpa.org; natalie.randolph@faa.gov; mcornelius@aci-na.org; mara.jenkins@faa.gov; elizabeth.thomas@faa.gov; Maryjo.Marzinzik@faa.gov; rebecca.barthel@faa.gov; Donald.Ward@faa.gov; allan.d.storm.civ@mail.mil; david.hyde@aia-aerospace.org; paula.martinez@faa.gov; luke.schiada@ntsb.gov; irma.cortes@nasa.gov; Iyi-EwekaAO@state.gov; louis.bell@fcc.gov; laurie.sussman@rockwellcollins.com; linda.ubokudom@faa.gov; gpaul@naca.cc; ecotti@nbaa.org; sharon.yun@faa.gov; mreeves@icao.int; giles.d.strickler@faa.gov; kevin.partowazam@faa.gov; donald.scata@faa.gov; victoria.m.williams@faa.gov; victoria.m.williams@faa.gov; briedler@icao.int; mreeves@icao.int
CC: ed.ctr.firth@faa.gov; JRooney@Comtechllc.com; victoria.m.williams@faa.gov; ed.ctr.firth@faa.gov
Subject: For Information - Final Action for IGIA 72/1.329A - Air Navigation Conference - U.S. Information Paper "Views of the United States on Civil Supersonic Flight", for the Thirteenth Air Navigation Conference being held in Montreal, October 9 – 19, 2018
Attachments: Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

For more information, contact us:

Federal Aviation Administration
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Message

From: Donald.Scata@faa.gov [Donald.Scata@faa.gov]
Sent: 8/23/2018 1:18:27 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: Deliberative Process / Ex. 5

Thank you! ☺

Don

Donald S. Scata Jr.
Senior International Advisor
Office of Environment & Energy
Federal Aviation Administration
202.267.3281 (w)
202.441.5568 (c)

From: Manning, Bryan [mailto:manning.bryan@epa.gov]
Sent: Thursday, August 23, 2018 9:18 AM
To: Williams, Victoria M (FAA) <victoria.m.williams@faa.gov>; Scata, Donald (FAA) <Donald.Scata@faa.gov>
Cc: Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: RE: Overdue - ANC CONF 13-IP-Supersonic

Hi,

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: 9-AWA-API-IGIA@faa.gov [mailto:9-AWA-API-IGIA@faa.gov]
Sent: Thursday, August 23, 2018 9:04 AM
To: victoria.m.williams@faa.gov; Samulski, Michael <samulski.michael@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>
Subject: Overdue - ANC CONF 13-IP-Supersonic

This is a notice that a IGIA Response.CR for the following correspondence is overdue by 2 days. Please take action as soon as possible

For Information/Handling

Deliberative Process / Ex. 5

For more information, contact us:
Federal Aviation Administration
Interagency Group on International Aviation (IGIA)
9-AWA-API-IGIA@faa.gov
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Victoria M. Williams
Principal Staff Officer
victoria.m.williams@faa.gov
Phone: (202) 267-0928

Appointment

From: Jerome SARDA [jerome.sarda@aviation-civile.gouv.fr]
Sent: 3/20/2018 3:03:19 PM
To: Timothy Pohle [tpohle@airlines.org]; Juliana Scavuzzi [jscavuzzi@aci.aero]; Ricardo Dupont [ricardo.dupont@anac.gov.br]; Marcelo Saito [marcelo.saito@anac.gov.br]; Wendy Bailey [wendy.bailey@tc.gc.ca]; David Bilcock [david.bilcock@tc.gc.ca]; Greg Smallwood [greg.smallwood@nrc-cnrc.gc.ca]; Xiaojun Yang [xiaojunyoung@hotmail.com]; Willem Franken [willem.franken@easa.europa.eu]; Steve Arrowsmith [stephen.arrowsmith@easa.europa.eu]; Erika Herms [erika.herms@easa.europa.eu]; Werner Hoermann [werner.hoermann@easa.europa.eu]; Martin Plohr [martin.plohr@dlr.de]; Frank Wetzel [frank.wetzel@uba.de]; David Anvid [david.anvid@delta.com]; David Altherr [daltherr@aerioncorp.com]; Eli Cotti [ecotti@nbaa.org]; Neil Dickson [ndickson@icao.int]; Denise Ahrens [denise.ahrens@rolls-royce.com]; Dan Allyn [daniel.m.allyn@boeing.com]; Andy Berryann [andy@boom.aero]; Arnaud Bonnet [arnaud.bonnet@embraer.com.br]; Robbie Cowart [robbie.cowart@gulfstream.com]; Guillaume Dehestru [guillaume.dehestru@dassault-aviation.com]; William Dolejsi [wcdolejsi@txtav.com]; Rudy Dudebout [rudolph.dudebout@honeywell.com]; Charles Etter [charles.etter@gulfstream.com]; Mike Garrison [mike.garrison@boeing.com]; Darrel Hornbaker [ddhornbaker@txtav.com]; Mark Johnson [mark.johnson3@rolls-royce.com]; Nakahama Keisuke [keisuke_nakahama@mitsubishiaircraft.com]; Brian Kim [brian.kim@pw.utc.com]; David Lye [david.lye@aero.bombardier.com]; Paul Madden [paul.madden@rolls-royce.com]; Jason Matisheck [jrmatisheck@aerioncorp.com]; Kian McCaldon [kian.mccaldon@pwc.ca]; John Morgenstern [john.morgenstern@lmco.com]; Kevin Morris [kevin.morris@adsgroup.org.uk]; Matt Muehlhausen [matthew.r.muehlhausen@boeing.com]; Krisha Nobrega [krisha.nobrega@embraer.com.br]; Thierry Percheron [thierry.percheron@dassault-aviation.com]; Jean-François Perelgritz [jean-francois.perelgritz@airbus.com]; Charles Renard [charles.renard@airbus.com]; Hans Smit [hans.smit@airbus.com]; Simon Smith [simon.smith@rolls-royce.com]; Frédéric Soum [frederic.soum@airbus.com]; Peter Sturdza [sturdza@aerioncorp.com]; Luiz Tobaldini [luiz.tobaldini@embraer.com.br]; Eric Upton [eric.upton@gulfstream.com]; Joseph Zelina [joseph.zelina@ge.com]; Anastasia Kharina [karin@theicct.org]; Paul Peeters [paul.peeters1000@gmail.com]; Artur Mirzoyan [mirzoyan@ciam.ru]; Jauhari Arsad [jauhari_arsad@caas.gov.sg]; Arturo Benito [arturo.benito@upm.es]; Marie Hankanen [marie.hankanen@transportstyrelsen.se]; Theo Rindlisbacher [theo.rindlisbacher@bazl.admin.ch]; Bethan Owen [b.owen@mmu.ac.uk]; Jeff Berton [jeff.berton@nasa.gov]; Clarence Chang [clarence.t.chang@nasa.gov]; Rebecca Cointin [rebecca.cointin@faa.gov]; Jorge Fernandez [jorge.fernandez@faa.gov]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Ralph Iovinelli [ralph.iovinelli@faa.gov]; Daniel Jacob [daniel.jacob@faa.gov]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maryalice Locke [maryalice.locke@faa.gov]; Sandy Liu [sandy.liu@faa.gov]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Rick Miake-Lye [rick@aerodyne.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Jon Seidel [jonathan.a.seidel@nasa.gov]; Laszlo Windhoffer [laszlo.windhoffer@faa.gov]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Yuriy Medvedev [yuriy.medved@gmail.com]; Mahito Moriyama [moriyama-m2ff@mlit.go.jp]; Yoann Méry [yoann.mery@snecma.fr]; Olivier Penanhoat [olivier.penanhoat@snecma.fr]; Graham Skillen [gskillen7@gmail.com]; Don Stimson [dkstimson@hotmail.com]

Subject: Event Request Notification: CTG ESSTsg

Start: 4/17/2018 1:30:00 PM
End: 4/17/2018 3:00:00 PM
Show Time As: Tentative

Recurrence: (none)

```
     Summary: CTG ESSTsg
   Organizer: jerome.sarda@aviation-civile.gouv.fr
   Attendees: tpohle@airlines.org jscavuzzi@aci.aero ricardo.dupont@anac.gov.br
marcelo.saito@anac.gov.br wendy.bailey@tc.gc.ca david.bilcock@tc.gc.ca
greg.smallwood@nrc-cnrc.gc.ca xiaojunyoung@hotmail.com willem.franken@easa.europa.eu
stephen.arrowsmith@easa.europa.eu erika.herms@easa.europa.eu
werner.hoermann@easa.europa.eu jerome.sarda@aviation-civile.gouv.fr martin.plohr@dlr.de
frank.wetzel@uba.de david.anvid@delta.com daltherr@aerioncorp.com ecotti@nbaa.org
ndickson@icao.int denise.ahrens@rolls-royce.com daniel.m.allyn@boeing.com andy@boom.aero
arnaud.bonnet@embraer.com.br robbie.cowart@gulfstream.com guillaume.dehestru@dassault-
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charles.etter@gulfstream.com mike.garrison@boeing.com ddhornbaker@txtav.com
mark.johnson3@rolls-royce.com keisuke_nakahama@mitsubishiaircraft.com
brian.kim@pw.utc.com david.lye@aero.bombardier.com paul.madden@rolls-royce.com
jrmatisheck@aerioncorp.com kian.mccaldon@pwc.ca john.morgen
 stern@lm
       Start: mar. avril 17, 2018 03:30:00 PM Z
         End: mar. avril 17, 2018 05:00:00 PM Z
    Location:

 Description:
```

Personal Security Detail / Ex. 6

Message

From: Aviation eBrief [aopa@smartbrief.com]
Sent: 5/24/2018 6:14:33 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: May 24, 2018 - House transportation bill includes $17.7B for FAA

Created for **manning.bryan@epa.gov** | Web Version

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NEWS OF THE DAY

PILOT INSURANCE CENTER

House transportation bill includes $17.7B for FAA

The House's fiscal year 2019 transportation budget includes $17.7 billion for the Federal Aviation Administration, $310 million less than the year before. The agency's Air Traffic Organization is slated to receive $147 million more than last year, including funding for 14,500 air traffic controllers, 7,400 safety inspectors and operational support personnel.

AIN Online (5/22)

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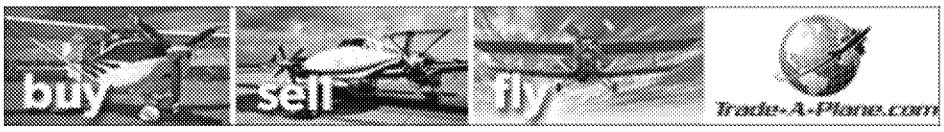
Boeing's Ampofo offers insight into the aviation job market

William Ampofo, Boeing's vice president of business aviation and general aviation, shares his perspective on the future of aviation job opportunities. "The need for jobs and aviation skills in Boeing's 20-year outlook are at a shortage, worldwide. Aviation maintenance technicians, airline pilots, aviation safety inspectors -- all of these specializations need talent," he says.

AOPA Online (5/22)



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W.Va. airport considers working with university on new flight school

Yeager Airport in Charleston, W.Va., plans to study the feasibility of joining with Marshall University on a new aviation school. The school would offer certificates and degrees in such fields as piloting, aeronautical science, aviation maintenance, air traffic control and drone operation.

Charleston Gazette-Mail (W.Va.) (tiered subscription model) (5/23)

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Dart emergency float system receives STC approval

The Federal Aviation Administration has granted supplemental type certificate approval for Dart Aerospace's emergency flotation system for the Bell 505 Jet Ranger X light helicopter. The system has also been approved by Transport Canada and the Japan Civil Aviation Bureau.

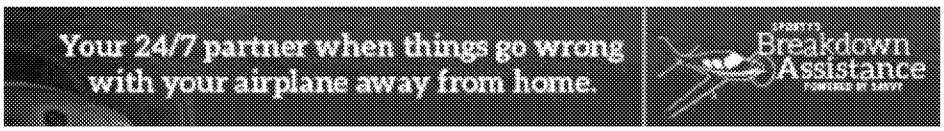
AIN Online (5/22)

POLICY WATCH

Startups look to develop supersonic jets for commercial use

Startup companies including Boom Supersonic, Aerion Supersonic and Spike Aerospace are developing supersonic aircraft for commercial use. The Federal Aviation Administration is easing the way with new regulations that create noise certification standards and make it easier to obtain approval to test supersonic aircraft.

Business Insider (5/23)



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AOPA NEWS

SFRA, Leesburg airspace deviations mount

Spring is here, flying is enjoying a seasonal uptick and so are pilot violations of the Washington, D.C., Special Flight Rules Area and Flight Restricted Zone, along with failures to follow correct operating procedures in the Leesburg Maneuvering Area, according to the Federal Aviation Administration.

AOPA Online (5/15)

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AOPA Online (5/8)

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You never really understand a person until you consider things from his point of view -- until you climb into his skin and walk around in it.

Harper Lee,
writer

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Mailing Address:
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Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 1/29/2018 9:12:38 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]

Subject: NAA SST call - optional
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:00:00 PM
Show Time As: Tentative

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 7/11/2018 12:44:31 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: RE: Can't make FAA call this week

Deliberative Process / Ex. 5

From: Manning, Bryan
Sent: Tuesday, July 10, 2018 4:00 PM
To: Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: RE: Can't make FAA call this week

Deliberative Process / Ex. 5

Thanks again,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: Mueller, John
Sent: Tuesday, July 10, 2018 3:52 PM
To: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: Can't make FAA call this week

FYI – I have to be at a marine call this Thursday at 2:00 for the contract I'm managing. Thus, can't make the FAA call. I hope that's not a problem.

-John

Message

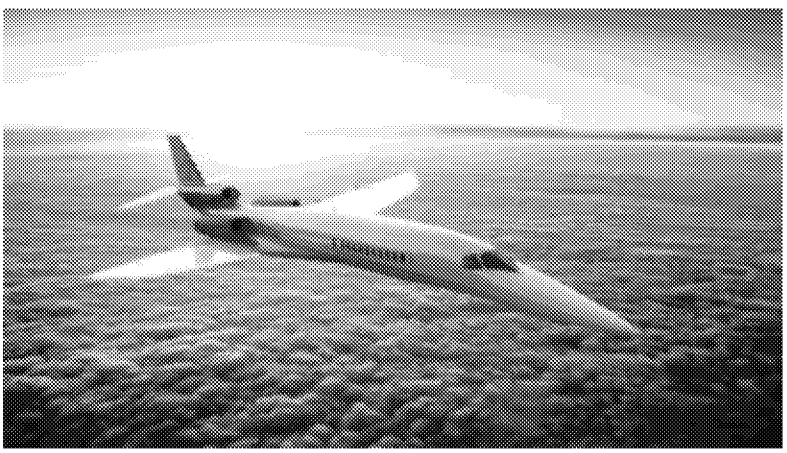
From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 7/10/2018 8:26:18 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Kinsey, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e44ad4b91f44e90af0842d6303605ef-Kinsey, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Subject: RE: Aerion Closes In On Supersonic AS2 Program Launch

Deliberative Process / Ex. 5

From: Maeroff, Bruce
Sent: Tuesday, July 10, 2018 3:26 PM
To: Gerring, Holly <gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Kinsey, John <Kinsey.John@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Yen, David <Yen.David@epa.gov>
Subject: Aerion Closes In On Supersonic AS2 Program Launch

Aerion Closes In On Supersonic AS2 Program Launch

Jul 3, 2018 Guy Norris | *The Weekly Of Business Aviation* **Aviation Week**



LOS ANGELES—Supersonic business jet developer Aerion says it remains on track to launch the Mach 1.4 AS2 within the next few months.

Aerion also said it is targeting a transatlantic flight from New York to London in October 2023 to mark the 20th anniversary of the retirement of the Anglo-French Concorde.

"We are finalizing the trades on the aircraft so we can launch this year," Aerion AS2 program manager Mike Hinderberger says. "The plan is two years from now to have preliminary design review (PDR) and first flight in 2023." Updating progress on the long-running development effort at the American Institute of Aeronautics and Astronautics Aviation 2018 forum in Atlanta, he adds that the return to supersonic travel has "been a long time coming and it is about time."

Aerion is working toward launch of the AS2 together with Lockheed Martin under an exploratory joint development agreement announced in December 2017. "Right now, we are working with Lockheed Martin Skunk Works on aircraft design and development and program execution, and they are very instrumental to the things we are doing to finalize the configuration and get the program launched. We are in further discussions on collaboration on industrialization and those talks are continuing," Hinderberger says.

Following PDR in mid-2020 the program will enter a detailed design and build phase, culminating in a critical design review in early 2022 and first flight around 18 months later. Certification is targeted for late 2025 with entry-into-service in early 2026. Production will ramp up over the next three years with 12 aircraft due to be assembled in 2026, 23 in 2027 and 36 in 2028. Full-rate production will stabilize at 36 per year for 2029 to 2035, although plans include rate increases of up to four per month if sufficient demand emerges.

The 12-passenger AS2 is designed to super-cruise at Mach 1.4 over water, but under appropriate conditions could fly over land at Mach 1.2 without the sonic boom reaching the ground. This exploits the Mach cutoff phenomenon in which the thicker air at lower altitude refracts the boom away from the ground. Design range is 4,200 nm at Mach 1.4 and 5,400 nm at Mach 0.95.

"We recognize the regulations in the U.S. that some are trying to work through low boom entry, but until such time (as these change) we accept the fact we will have to stay subsonic/transonic over the U.S. and other places," he adds.

Although the Skunk Works will build the X-59 QueSST supersonic low boom flight demonstrator for NASA, the AS2 will not incorporate any Lockheed reduced sonic-boom design technology. "You have got to design for low boom from the get go, and maybe that's what the 'AS3' will be," says Hinderberger referring to a possible follow-on program in years to come.

The AS2 will be powered by three 18,000-lb. thrust General Electric engines based on the core of the CFM56 turbofan. Describing the search for the right engine as a "huge challenge" for the program, Hinderberger says "we are finalizing the specifications right now. The engine has been very, very difficult. We scoured the industry but are now adapting an existing core."

For the AS2, GE is adding a smaller fan, thought to be 52 in. in diameter, and a new booster and low-pressure turbine to the baseline eight-stage, high-pressure compressor and single-stage turbine of the CFM56 core. "We need a relatively big core, and before selecting GE we worked with all the major engine makers, and there are only so many cores out there you can use," Hinderberger says. "On top of that, with regulations for landing and takeoff noise and trying to drive Stage 5 requirements, it is very difficult, and that's what we have been focused on."

Ultimately the selection of the Mach 1.4 cruise speed "comes down a lot to the engine," he adds. "You need a big core for power, but a relatively small fan for wave drag and so we are trying to find that

sweet spot. We'd love to go Mach 2 or 2.5, but the other thing that's important for business jets and air travel in general is range, so you really get to the point where Mach 1.4 is where we are today."

As Aerion pushes toward program launch, the company is "busy engaging other strategic partners, and we are going through a lot of that activity now," he adds. These are partners and suppliers primarily for systems and detailed structures.

Bruce Maeroff
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/30/2018 2:31:09 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Clean nvPM & SST US papers for SG3
Attachments: CAEPSG.20183.WPXX_USViewsNVPM_v5.docx; CAEP11-SG2018-WPxx US Views re SST Engine Certification_v3.docx

Hi,

Deliberative Process / Ex. 5

Thanks,

Bryan

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From: Samulski, Michael
Sent: Monday, April 30, 2018 9:12 AM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>
Subject: SG3 papers

Deliberative Process / Ex. 5

Mike

****

Michael Samulski
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/7/2018 5:49:22 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (May 7) in C35 at 2:00
Attachments: Agenda team mtg 5-7-18.docx

Hello,

Attached please find the agenda for today's (May 7) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
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2000 Traverwood Drive
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/23/2018 1:16:30 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (May 21)
Attachments: Agenda team mtg 5-21-18_take away tasks.docx

Hello,

Below/attached please find the take away tasks from today's (May 21) aviation team meeting. Let me know if you have anything to add.

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/19/2018 4:12:40 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: US CAEP6 NOx Production Cut-Off SD from 2008 CAEP SG Meeting
Attachments: CAEPSG.20082.SD4.Rev1.en.pdf

Hi,

Attached please find SD4 from the 2008 CAEP Steering Group meeting. See section 3 on page 3 of this SD.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/28/2018 5:01:19 PM
To: Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; Nicole.Didyk@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Draft Agenda items for 2:00 FAA/EPA call today (June 28); Call 202-991-0477, code 7552253

Hi,

Below are suggested draft agenda items for the 2:00 FAA/EPA call today (June 28). Let us know if you have anything to add to the agenda.

AGENDA:
(A) CAEP/WG3 SST

Deliberative Process / Ex. 5

(F) AOB

Thank you,

Bryan

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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/21/2018 5:27:16 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (May 21) in N66 at 2:00
Attachments: Agenda team mtg 5-21-18.docx

Hello,

Attached please find the agenda for today's (May 21) aviation team meeting at 2:00 in N66. Let me know if you have anything to add.

Thank you,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/26/2018 3:53:03 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Feb 26) in C35 at 2:00
Attachments: Agenda team mtg 2-26-18.docx

Hello,

Attached please find the agenda for today's (Feb 26) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/20/2018 5:06:59 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: RE: Draft email to Ralph re:SST paper attached

I have looked over the paper, John. You can go ahead and send the email.

Thanks,

Bryan

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manning.bryan@epa.gov

From: Mueller, John
Sent: Friday, April 20, 2018 12:58 PM
To: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: RE: Draft email to Ralph re:SST paper attached

Good point Bryan – thanks. Want me to go ahead and send it or do you want to look over the paper first?

From: Manning, Bryan
Sent: Friday, April 20, 2018 11:42 AM
To: Mueller, John <mueller.john@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: RE: Draft email to Ralph re:SST paper attached

Hi John,

Good email.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center

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Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: Mueller, John
Sent: Friday, April 20, 2018 11:17 AM
To: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: Draft email to Ralph re:SST paper attached

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/27/2018 8:02:29 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: RE: SST paper
Attachments: CAEP11-SG2018-WPxx US Views re SST Engine Certification_v1+epa.docx

Attached is the latest paper we agreed to. It is ready to go to Ralph.

Thanks,

Bryan

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manning.bryan@epa.gov

From: Leggett, Cullen
Sent: Friday, April 27, 2018 12:58 PM
To: Mueller, John <mueller.john@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: SST paper

I have finished my edits of the SST paper. It is up on SharePoint. Take a look and see what you think. I may recommend reading through it as a Clean document the first time. It has a lot of markups.

I'm going to lunch now. I'll be back about 1:30.

Best regards,

Cullen Leggett

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(fax) +1 734-214-4816
Leggett.Cullen@EPA.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 9/20/2018 4:09:46 PM
To: Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Draft Agenda items for 2:00 FAA/EPA call today (Sept 20); Call 202-991-0477, code 7552253

Hi,

Below are suggested draft agenda items for the 2:00 FAA/EPA call today (Sept 20). Let us know if you have anything to add to the agenda.

AGENDA:
(A) Losses ARP ballot approved
(B) WG3-10 (CAEP11 nvPM standards, replacement of SN standard, CAEP11 RIA, SST, NOx, etc.)

Deliberative Process / Ex. 5

(G) AOB

Thank you,

Bryan

Bryan Manning
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2000 Traverwood Drive
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 3/13/2018 9:40:42 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (March 12)
Attachments: Agenda team mtg 3-12-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from Monday's (March 12) aviation team meeting. Let me know if you have anything to add.

3/12/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/13/2018 9:35:58 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Feb 13)
Attachments: Agenda team mtg 2-13-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from today's (Feb 13) aviation team meeting. Let me know if you have anything to add.

2/13/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/20/2018 3:41:55 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: RE: Draft email to Ralph re:SST paper attached
Attachments: Email to Ralph on SST April 20 2018+BM.docx

Hi John,

Good email.

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Bryan

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From: Mueller, John
Sent: Friday, April 20, 2018 11:17 AM
To: Manning, Bryan <manning.bryan@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>
Subject: Draft email to Ralph re:SST paper attached

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/27/2018 6:20:23 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: RE: SST paper
Attachments: CAEP11-SG2018-WPxx US Views re SST Engine Certification_v1-LZ2756DBMANNING.docx

Nice job on revising the SST paper, Cullen. On SharePoint and attached please find my comments. For some reason, SharePoint saved two files, and the attached file includes my comments (and all of our comments, as far as I know).

Thanks,

Bryan

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From: Mueller, John
Sent: Friday, April 27, 2018 1:25 PM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: RE: SST paper

That looks pretty good to me. I made a few editorial fixes and responded to a couple of your comment bubble questions.

From: Leggett, Cullen
Sent: Friday, April 27, 2018 12:58 PM
To: Mueller, John <mueller.john@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>
Subject: SST paper

I have finished my edits of the SST paper. It is up on SharePoint. Take a look and see what you think. I may recommend reading through it as a Clean document the first time. It has a lot of markups.

I'm going to lunch now. I'll be back about 1:30.

Best regards,

Cullen Leggett

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Leggett.Cullen@EPA.gov

Appointment

From: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Sent: 8/2/2018 5:57:38 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Declined: Call with GE/FAA on SST 2:30PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Busy

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/13/2018 5:11:03 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Feb 13) in N66 at 2:00
Attachments: Agenda team mtg 2-13-18.docx

Hello,

Attached please find the agenda for today's (Feb 13) aviation team meeting at 2:00 in N66. Let me know if you have anything to add.

Thank you,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/11/2018 9:27:05 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (June 11)
Attachments: Agenda team mtg 6-11-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from today's (June 11) aviation team meeting. Let me know if you have anything to add.

6/11/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 9/20/2018 12:15:02 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Subject: FW: CAEP/11 WG3-10 - Montreal, ICAO HQ, 24 to 28 September 2018 - WG3 Plenary

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From: Dickson, Neil [mailto:NDickson@icao.int]
Sent: Wednesday, September 19, 2018 11:44 PM
To: Bristow A <wolfe.philip@epa.gov>; Log T <thobias.log@transportstyrelsen.se>; Abdain Z <Zainal.abidin@emirates.com>; Abidin Z <Zainal.abidin@emirates.com>; Agarwal A <aa681@mit.edu>; Ahrens D <denise.ahrens@rolls-royce.com>; Allyn D <daniel.m.allyn@boeing.com>; Altherr D <daltherr@aerioncorp.com>; Anglade A <a.anglade@enac.gov.it>; Anvid <david.anvid@delta.com>; Archilla V <archillapv@inta.es>; Arrowsmith <stephen.arrowsmith@easa.europa.eu>; Arsad J <Jauhari_ARSAD@caas.gov.sg>; Bailey <wendy.bailey@tc.gc.ca>; Balasubramanian S <Sathya.Balasubramanian.CTR@dot.gov>; Baughcum S <steven.l.baughcum@boeing.com>; Beauregard M <MBeauregard@AIAC.ca>; Benito <arturo.benito@upm.es>; Berroth S <sberroth@aerioncorp.com>; Berryann A <andy@boom.aero>; Berton J <Jeff.Berton@nasa.gov>; Bilcock D <david.bilcock@tc.gc.ca>; Boichenko <chemmotology@ukr.net>; Bonnefoy <bonnefoy_philippe@bluesky-d2d.com>; Bonnet A <arnaud.bonnet@embraer.com.br>; Box L <laurent.box@eurocontrol.int>; Carnelly <daniel.carnelly@airbus.com>; Chang C <clarence.t.chang@nasa.gov>; Christie S <s.christie@mmu.ac.uk>; Cointin R <rebecca.cointin@faa.gov>; Collin D <dominique.collin@snecma.fr>; Cotti <Ecotti@NBAA.org>; Cousineau Y <yves.cousineau@tc.gc.ca>; Crayford A <crayfordap1@cardiff.ac.uk>; De Lepinay I <ivan.de-lepinay@easa.europa.eu>; Dehestru G <guillaume.dehestru@dassault-aviation.com>; Deniskov V <V.Deniskov@antonov.kiev.ua>; Denk K <keremdenk@gmail.com>; Detragiache M <mariachiara.detragiache@asd-europe.org>; Dolejsi W <WCDolejsi@cessna.textron.com>; Dourado E <eli@boomsupersonic.com>; Jim Dow <Jdow@iccaia.org>; Dudebout <rudolph.dudebout@honeywell.com>; Dupont R <ricardo.dupont@anac.gov.br>; Etter <charles.etter@gulfstream.com>; Eyers <chris@limitedskies.com>; Fajari A <ajaria96@yahoo.co.id>; Ferdian Hussein B <baronferdianhussein@airasia.com>; Fleming G <Gregg.Fleming@dot.gov>; Fleuti <emanuel.fleuti@zurich-airport.com>; Franken <willem.franken@easa.europa.eu>; Frenandez J <jorge.fernandez@faa.gov>; Fudge, Ted <Ted.Fudge@CANSO.org>; Fujiwara <fuji@chofu.jaxa.jp>; Galotti, Vincent <Vgalotti.iccaia@gmail.com>; Garrison M <Mike.garrison@boeing.com>; Garzon A <agarzon@aerioncorp.com>; Gerring, Holly <gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Gillette <warren.gillette@faa.gov>; Gowen H <hayley.gowen@bis.gsi.gov.uk>; Grandi F <fabio.grandi@faa.gov>; Hankanen M <marie.hankanen@transportstyrelsen.se>; Hemmings <bill.hemmings@transportenvironment.org>; Herms <Erika.herms@easa.europa.eu>; Hileman J <James.Hileman@faa.gov>; Hinderberger M <mhinderberger@aerioncorp.com>; Hiromitsu N <nagayoshi_hiromitsu@ihi.co.jp>; Hoermann <werner.hoermann@easa.europa.eu>; Hoke J <james.hoke@pw.utc.com>; Holsclaw C <curtis.holsclaw@faa.gov>; Horie N <naohiro_horie@mhiahq.com>; Huttenhower H <Hillary.Huttenhower@pw.utc.com>; Hyde D <david.hyde@aia-aerospace.org>; Iglesias A <aiglesias@mfom.es>; Iovinelli <Ralph.Iovinelli@faa.gov>; Jacob D <daniel.jacob@faa.gov>; Janicke U <uj@janicke.de>; Johnson M <mark.johnson3@rolls-royce.com>; Jung J <jjung@aci.aero>; Kartika D <kartikadinakartika@gmail.com>; Kenney M <mkenney@kbenv.com>; Kharina A <karin@theicct.org>; Kim B <Brian.Kim@pw.utc.com>; Kittery J <jean-luc.kittery@aviation-civile.gouv.fr>; Kozel <progress@ivchenko-progress.com>; Kramer S

<stephen.kramer@pw.utc.com>; Kusukame T <takuya_kusukame@mitsubishiaircraft.com>; Lee <d.s.lee@mmu.ac.uk>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lim L <L.Lim@mmu.ac.uk>; Lindsey, Leah <lindsey.leah@epa.gov>; Lobo P <Prem.Lobo@nrc-cnrc.gc.ca>; Locke M <maryalice.locke@faa.gov>; Locke M <maryalice.locke@faa.gov>; Lunter <michael.lunter@minienm.nl>; Lye <david.lye@aero.bombardier.com>; Madden <paul.madden@rolls-royce.com>; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Majjigi R <muni.majjigi@ge.com>; Manning, Bryan <manning.bryan@epa.gov>; Marks <julie.marks@faa.gov>; Matischeck J <jrmatisheck@aerioncorp.com>; Maurice L <lourdes@boomsupersonic.com>; McCaldon <kian.mccaldon@pwc.ca>; McConnachie D <McConnachie_Dominic@bah.com>; McKinney <randal.mckinney@pw.utc.com>; Medvedev Y <yuriy.medved@gmail.com>; Mery Y <yoann.mery@snecma.fr>; Miake-Lye <rick@aerodyne.com>; Middel J <jan.middel@nlr.nl>; Mirzoyan A <mirzoyan@ciam.ru>; Morgenstern J <john.morgenstern@lmco.com>; Moriyama M <moriyama-m2ff@mlit.go.jp>; Morris <kevin.morris@adsgroup.org.uk>; Muehlhausen M <matthew.r.muehlhausen@boeing.com>; Mueller, John <mueller.john@epa.gov>; Nobrega K <krisha.nobrega@embraer.com.br>; Oshimizu M <masaya_oshimizu@mitsubishiaircraft.com>; Owen <b.owen@mmu.ac.uk>; Pagliarello M <MPagliarello@aci-na.org>; Patserin <03503@ivchenko-progress.com>; Peeters P <paul.peeters1000@gmail.com>; Penanhoat <olivier.penanhoat@snecma.fr>; Percheron T <Thierry.Percheron@dassault-aviation.com>; Perelgritz J <jean-francois.perelgritz@airbus.com>; Peter <Peter.Zimm@icfi.com>; Plohr <Martin.Plohr@dlr.de>; Pohle T <tpohle@airlines.org>; Renard C <charles.renard@airbus.com>; Riegle <leslie.riegle@aia-aerospace.org>; Rindlisbacher <Theo.Rindlisbacher@bazl.admin.ch>; Roeler T <tim.roesler@liberty.rolls-royce.com>; Roetger <RoetgerT@iata.org>; Russell R <raymond@boom.aero>; Rutherford <Dan@theicct.org>; Sabnis J <sabnis@mit.edu>; Saito <Marcelo.saito@anac.gov.br>; Samulski, Michael <samulski.michael@epa.gov>; Sarda J <jerome.sarda@aviation-civile.gouv.fr>; Savvidis C <Charalambos.Savvidis@uba.de>; Scata D <donald.scata@faa.gov>; Scavuzzi J <jscavuzzi@aci.aero>; Schaefer M <martin.schaefer@bmvi.bund.de>; Schaufele R <roger.schaufele@faa.gov>; Seeberg I <inger.seeberg@cph.dk>; Seeliger K <katharina.seeliger@airbus.com>; Seidel J <jonathan.a.seidel@nasa.gov>; Sipatov <sipatov@avid.ru>; Skillen G <gskillen7@gmail.com>; Smallwood G <Greg.Smallwood@nrc-cnrc.gc.ca>; Smit H <hans.smit@airbus.com>; Smith <simon.smith@rolls-royce.com>; Soum F <frederic.soum@airbus.com>; Sow D <cheikhdjiby.sow@snecma.fr>; Sparrow V <vws1@psu.edu>; Speth R <speth@mit.edu>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Stimson <dkstimson@hotmail.com>; Sturdza P <sturdza@aerioncorp.com>; Takahashi H <h-hashimoto@aeif.or.jp>; Tobaldini L <luiz.tobaldini@embraer.com.br>; Upton E <Eric.Upton@gulfstream.com>; Vanek A <Adrienne.Vanek@faa.gov>; Verlhac S <stephane.verlhac@adp.fr>; Volkov <Volkov@ciam.ru>; Wetzel <Frank.Wetzel@uba.de>; Willford N <NWillford@txtav.com>; Williams P <paul.i.williams@manchester.ac.uk>; Windhoffer <laszlo.windhoffer@faa.gov>; Yang X <xiaojunyoung@hotmail.com>; Yasar G <gursu.tasar@tai.com.tr>; Yen, David <Yen.David@epa.gov>; Yen, David <Yen.David@epa.gov>; Zelina J <joseph.zelina@ge.com>
Cc: Bettega Michielin, Monique <MMichielin@icao.int>
Subject: RE: CAEP/11 WG3-10 - Montreal, ICAO HQ, 24 to 28 September 2018 - WG3 Plenary

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 19-Sep-18 3:14 PM
To: 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anglade A'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berroth S'; 'Berryann A'; 'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carnelly'; 'Chang C'; 'Christie S'; 'Cointin R'; 'Collin D'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Detragiache M'; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Garzon A'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hiromitsu N'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Huttenhower H'; 'Hyde D'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame T'; 'Lee'; 'Leggett'; 'Lim L'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Owen'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Verlhac S'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'
Cc: Bettega Michielin, Monique
Subject: RE: CAEP/11 WG3-10 - Montreal, ICAO HQ, 24 to 28 September 2018 - WG3 Plenary

Deliberative Process / Ex. 5

Consider the environment before printing this e-mail

From: Dickson, Neil
Sent: 26-Aug-18 11:20 PM
To: 'Bristow A'; 'Log T'; 'Abdain Z'; 'Abidin Z'; 'Agarwal A'; 'Ahrens D'; 'Allyn D'; 'Altherr D'; 'Anglade A'; 'Anvid'; 'Archilla V'; 'Arrowsmith'; 'Arsad J'; 'Bailey'; 'Balasubramanian S'; 'Baughcum S'; 'Beauregard M'; 'Benito'; 'Berroth S'; 'Berryann A';

'Berton J'; 'Bilcock D'; 'Boichenko'; 'Bonnefoy'; 'Bonnet A'; 'Box L'; 'Carnelly'; 'Chang C'; 'Christie S'; 'Cointin R'; 'Collin D'; 'Cotti'; 'Cousineau Y'; 'Crayford A'; 'De Lepinay I'; 'Dehestru G'; 'Deniskov V'; 'Denk K'; 'Detragiache M'; Dickson, Neil; 'Dolejsi W'; 'Dourado E'; Jim Dow; 'Dudebout'; 'Dupont R'; 'Etter'; 'Eyers'; 'Fajari A'; 'Ferdian Hussein B'; 'Fleming G'; 'Fleuti'; 'Franken'; 'Frenandez J'; Fudge, Ted; 'Fujiwara'; Galotti, Vincent; 'Garrison M'; 'Garzon A'; 'Gerring H'; 'Giannelli B'; 'Gillette'; 'Gowen H'; 'Grandi F'; 'Hankanen M'; 'Hemmings'; 'Herms'; 'Hileman J'; 'Hinderberger M'; 'Hiromitsu N'; 'Hoermann'; 'Hoke J'; 'Holsclaw C'; 'Horie N'; 'Huttenhower H'; 'Hyde D'; 'Iglesias A'; 'Iovinelli'; 'Jacob D'; 'Janicke U'; 'Johnson M'; 'Jung J'; 'Kartika D'; 'Kenney M'; 'Kharina A'; 'Kim B'; 'Kittery J'; 'Kozel'; 'Kramer S'; 'Kusukame T'; 'Lee'; 'Leggett'; 'Lim L'; 'Lindsey L'; 'Lobo P'; 'Locke M'; 'Locke M'; 'Lunter'; 'Lye'; 'Madden'; 'Maeroff'; 'Majjigi R'; 'Manning B'; 'Marks'; 'Matischeck J'; 'Maurice L'; 'McCaldon'; 'McConnachie D'; 'McKinney'; 'Medvedev Y'; 'Mery Y'; 'Miake-Lye'; 'Middel J'; 'Mirzoyan A'; 'Morgenstern J'; 'Moriyama M'; 'Morris'; 'Muehlhausen M'; 'Mueller J'; 'Nobrega K'; 'Oshimizu M'; 'Owen'; 'Pagliarello M'; 'Patserin'; 'Peeters P'; 'Penanhoat'; 'Percheron T'; 'Perelgritz J'; 'Peter'; 'Plohr'; 'Pohle T'; 'Renard C'; 'Riegle'; 'Rindlisbacher'; 'Roeler T'; 'Roetger'; 'Russell R'; 'Rutherford'; 'Sabnis J'; 'Saito'; 'Samulski M'; 'Sarda J'; 'Savvidis C'; 'Scata D'; 'Scavuzzi J'; 'Schaefer M'; 'Schaufele R'; 'Seeberg I'; 'Seeliger K'; 'Seidel J'; 'Sipatov'; 'Skillen G'; 'Smallwood G'; 'Smit H'; 'Smith'; 'Soum F'; 'Sow D'; 'Sparrow V'; 'Speth R'; 'Stevens J'; 'Stimson'; 'Sturdza P'; 'Takahashi H'; 'Tobaldini L'; 'Upton E'; 'Vanek A'; 'Verlhac S'; 'Volkov'; 'Wetzel'; 'Willford N'; 'Williams P'; 'Windhoffer'; 'Yang X'; 'Yasar G'; 'Yen'; 'Yen'; 'Zelina J'
Cc: Bettega Michielin, Monique
Subject: CAEP/11 WG3-10 - Montreal, ICAO HQ, 24 to 28 September 2018

Deliberative Process / Ex. 5

Consider the environment before printing this e-mail

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/11/2018 5:07:20 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (June 11) in N66 at 2:00
Attachments: Agenda team mtg 6-11-18.docx

Hello,

Attached please find the agenda for today's (June 11) aviation team meeting at 2:00 in N66. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
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manning.bryan@epa.gov

Appointment

From: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
Sent: 8/2/2018 5:51:08 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Declined: Call with GE/FAA on SST 3:00PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Busy

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 9/6/2018 9:13:59 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: Draft agenda: FAA meeting (Sept 7) - PLEASE REVIEW
Attachments: FAA-EPA Meeting Agenda Sept 7 2018.docx

Hi Mike,

Attached is a draft agenda for tomorrow's meeting with FAA. Let me know if you have any comments. We plan to print copies and hand it out at the meeting (for everyone's convenience).

Thanks,

Bryan

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(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 3/12/2018 2:56:35 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (March 12) in C35 at 2:00
Attachments: Agenda team mtg 3-12-18.docx

Hello,

Attached please find the agenda for today's (March 12) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 9/6/2018 4:43:16 PM
To: Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Draft Agenda items for 2:00 FAA/EPA call today (Sept 6); Call 202-991-0477, code 7552253

Hi,

Below are suggested draft agenda items for the 2:00 FAA/EPA call today (Sept 6). Let us know if you have anything to add to the agenda.

AGENDA:
(A) FAA/EPA Meeting tomorrow in Ann Arbor (CO2 NPRM, nvPM, & NOx)
(B) nvPM Losses ARP balloting status
(C) nvPM ICR
(D) Upcoming WG3 meeting in Montreal (nvPM standards analysis, etc., SST)
(E) CAEP12 Future Work
(F) AOB

Thank you,

Bryan

Bryan Manning
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Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/2/2018 9:38:41 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (April 2)
Attachments: Agenda team mtg 4-2-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from today's (April 2) aviation team meeting. Also, see the agenda items for this week's FAA call, which we added to after today's meeting. Let me know if you have anything to add.

4/2/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

(F) SST: Provide feedback to CTG ESSTsg by COB April 6 on draft SG papers; John/Cullen/Bryan

FAA/EPA Bi-Weekly Calls – Agenda Items

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality

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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/2/2018 5:21:58 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (April 2) in C35 at 2:00
Attachments: Agenda team mtg 4-2-18.docx

Hello,

Attached please find the agenda for today's (April 2) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/18/2018 8:45:20 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (June 18)
Attachments: Agenda team mtg 6-18-18_take away tasks.docx

Hello,

Below/attached please find the take away tasks from today's (June 18) aviation team meeting. Let me know if you have anything to add.

6/18/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 9/17/2018 5:13:26 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Agenda: Aviation Team Mtg (Sept 17) in C35 at 2:00
Attachments: Agenda team mtg 9-17-18.docx

Hello,

Attached please find the agenda for today's (Sept 17) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/30/2018 4:29:45 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (May 30) in N125 at 1:00
Attachments: Agenda team mtg 5-30-18.docx

Hello,

Attached please find the agenda for today's (May 30) aviation team meeting at 1:00 in N125. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
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manning.bryan@epa.gov

Appointment

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/26/2018 4:33:18 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]

Subject: Accepted: Call with FAA on nvPM and SST papers
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 4/26/2018 6:30:00 PM
End: 4/26/2018 7:30:00 PM
Show Time As: Busy

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/18/2018 7:32:33 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: FW: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

From: Dickson, Neil [mailto:NDickson@icao.int]
Sent: Friday, June 15, 2018 11:48 AM
To: Bristow A <wolfe.philip@epa.gov>; Log T <thobias.log@transportstyrelsen.se>; Abdain Z <Zainal.abidin@emirates.com>; Abidin Z <Zainal.abidin@emirates.com>; Agarwal A <aa681@mit.edu>; Ahrens D <denise.ahrens@rolls-royce.com>; Allyn D <daniel.m.allyn@boeing.com>; Altherr D <daltherr@aerioncorp.com>; Anglade A <a.anglade@enac.gov.it>; Anvid <david.anvid@delta.com>; Archilla V <archillapv@inta.es>; Arrowsmith <stephen.arrowsmith@easa.europa.eu>; Arsad J <Jauhari_ARSAD@caas.gov.sg>; Bailey <wendy.bailey@tc.gc.ca>; Balasubramanian S <Sathya.Balasubramanian.CTR@dot.gov>; Baughcum S <steven.l.baughcum@boeing.com>; Beauregard M <MBeauregard@AIAC.ca>; Benito <arturo.benito@upm.es>; Berryann A <andy@boom.aero>; Berton J <Jeff.Berton@nasa.gov>; Bilcock D <david.bilcock@tc.gc.ca>; Boichenko <chemmotology@ukr.net>; Bonnefoy <bonnefoy_philippe@bluesky-d2d.com>; Bonnet A <arnaud.bonnet@embraer.com.br>; Box L <laurent.box@eurocontrol.int>; Carmody C <colleen.carmody@tc.gc.ca>; Carnelly <daniel.carnelly@airbus.com>; Chang C <clarence.t.chang@nasa.gov>; Christie S <s.christie@mmu.ac.uk>; Cointin R <rebecca.cointin@faa.gov>; Collin D <dominique.collin@snecma.fr>; Cotti <Ecotti@NBAA.org>; Cousineau Y <yves.cousineau@tc.gc.ca>; Crayford A <crayfordap1@cardiff.ac.uk>; De Lepinay I <ivan.de-lepinay@easa.europa.eu>; Dehestru G <guillaume.dehestru@dassault-aviation.com>; Deniskov V <V.Deniskov@antonov.kiev.ua>; Denk K <keremdenk@gmail.com>; Detragiache M <mariachiara.detragiache@asd-europe.org>; Dickson, Neil <NDickson@icao.int>; Dolejsi W <WCDolejsi@cessna.textron.com>; Dourado E <eli@boomsupersonic.com>; Jim Dow <Jdow@iccaia.org>; Dudebout <rudolph.dudebout@honeywell.com>; Dupont R <ricardo.dupont@anac.gov.br>; Etter <charles.etter@gulfstream.com>; Eyers <chris@limitedskies.com>; Fajari A <ajaria96@yahoo.co.id>; Ferdian Hussein B <baronferdianhussein@airasia.com>; Fleming G <Gregg.Fleming@dot.gov>; Fleuti <emanuel.fleuti@zurich-airport.com>; Franken <willem.franken@easa.europa.eu>; Frenandez J <jorge.fernandez@faa.gov>; Fudge, Ted <Ted.Fudge@CANSO.org>; Fujiwara <fuji@chofu.jaxa.jp>; Galotti, Vincent <Vgalotti.iccaia@gmail.com>; Garrison M <Mike.garrison@boeing.com>; Gerring, Holly <gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Gillette <warren.gillette@faa.gov>; Gowen H <hayley.gowen@bis.gsi.gov.uk>; Grandi F <fabio.grandi@faa.gov>; Hankanen M <marie.hankanen@transportstyrelsen.se>; Hemmings <bill.hemmings@transportenvironment.org>; Herms <Erika.herms@easa.europa.eu>; Hileman J <James.Hileman@faa.gov>; Hinderberger M <mhinderberger@aerioncorp.com>; Hiromitsu N <nagayoshi_hiromitsu@ihi.co.jp>; Hoermann <werner.hoermann@easa.europa.eu>; Hoke J <james.hoke@pw.utc.com>; Holsclaw C <curtis.holsclaw@faa.gov>; Horie N <naohiro_horie@mhiahq.com>; Huttenhower H <Hillary.Huttenhower@pw.utc.com>; Iglesias A <aiglesias@mfom.es>; Iovinelli <Ralph.Iovinelli@faa.gov>; Jacob D <daniel.jacob@faa.gov>; Janicke U <uj@janicke.de>; Johnson M <mark.johnson3@rolls-royce.com>; Jung J <jjung@aci.aero>; Kartika D <kartikadinakartika@gmail.com>; Kenney M <mkenney@kbenv.com>; Kharina A <karin@theicct.org>; Kim B <Brian.Kim@pw.utc.com>; Kittery J <jean-luc.kittery@aviation-civile.gouv.fr>; Kozel <progress@ivchenko-progress.com>; Kramer S <stephen.kramer@pw.utc.com>; Kusukame T <takuya_kusukame@mitsubishiaircraft.com>; Lee <d.s.lee@mmu.ac.uk>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lim L <L.Lim@mmu.ac.uk>; Lindsey, Leah <lindsey.leah@epa.gov>; Lobo P <Prem.Lobo@nrc-cnrc.gc.ca>; Locke M <maryalice.locke@faa.gov>; Locke M <maryalice.locke@faa.gov>; Lunter <michael.lunter@minienm.nl>; Lye <david.lye@aero.bombardier.com>; Madden <paul.madden@rolls-royce.com>; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Majjigi R <muni.majjigi@ge.com>; Manning, Bryan <manning.bryan@epa.gov>; Marks <julie.marks@faa.gov>; Matischeck J <jrmatisheck@aerioncorp.com>; Maurice L <lourdes@boomsupersonic.com>; McCaldon <kian.mccaldon@pwc.ca>; McConnachie D <McConnachie_Dominic@bah.com>; McKinney <randal.mckinney@pw.utc.com>; Medvedev Y

<yuriy.medved@gmail.com>; Mery Y <yoann.mery@snecma.fr>; Miake-Lye <rick@aerodyne.com>; Middel J <jan.middel@nlr.nl>; Mirzoyan A <mirzoyan@ciam.ru>; Morgenstern J <john.morgenstern@lmco.com>; Moriyama M <moriyama-m2ff@mlit.go.jp>; Morris <kevin.morris@adsgroup.org.uk>; Muehlhausen M <matthew.r.muehlhausen@boeing.com>; Mueller, John <mueller.john@epa.gov>; Nobrega K <krisha.nobrega@embraer.com.br>; Oshimizu M <masaya_oshimizu@mitsubishiaircraft.com>; Owen <b.owen@mmu.ac.uk>; Pagliarello M <MPagliarello@aci-na.org>; Patserin <03503@ivchenko-progress.com>; Peeters P <paul.peeters1000@gmail.com>; Penanhoat <olivier.penanhoat@snecma.fr>; Percheron T <Thierry.Percheron@dassault-aviation.com>; Perelgritz J <jean-francois.perelgritz@airbus.com>; Peter <Peter.Zimm@icfi.com>; Plohr <Martin.Plohr@dlr.de>; Pohle T <tpohle@airlines.org>; Renard C <charles.renard@airbus.com>; Riegle <leslie.riegle@aia-aerospace.org>; Rindlisbacher <Theo.Rindlisbacher@bazl.admin.ch>; Roeler T <tim.roesler@liberty.rolls-royce.com>; Roetger <RoetgerT@iata.org>; Russell R <raymond@boom.aero>; Rutherford <Dan@theicct.org>; Sabnis J <sabnis@mit.edu>; Saito <Marcelo.saito@anac.gov.br>; Samulski, Michael <samulski.michael@epa.gov>; Sarda J <jerome.sarda@aviation-civile.gouv.fr>; Savvidis C <Charalambos.Savvidis@uba.de>; Scata D <donald.scata@faa.gov>; Scavuzzi J <jscavuzzi@aci.aero>; Schaefer M <martin.schaefer@bmvi.bund.de>; Schaufele R <roger.schaufele@faa.gov>; Seeberg I <inger.seeberg@cph.dk>; Seeliger K <katharina.seeliger@airbus.com>; Seidel J <jonathan.a.seidel@nasa.gov>; Sipatov <sipatov@avid.ru>; Skillen G <gskillen7@gmail.com>; Smallwood G <Greg.Smallwood@nrc-cnrc.gc.ca>; Smit H <hans.smit@airbus.com>; Smith <simon.smith@rolls-royce.com>; Soum F <frederic.soum@airbus.com>; Sow D <cheikhdjiby.sow@snecma.fr>; Sparrow V <vws1@psu.edu>; Speth R <speth@mit.edu>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Stimson <dkstimson@hotmail.com>; Sturdza P <sturdza@aerioncorp.com>; Takahashi H <h-hashimoto@aeif.or.jp>; Tobaldini L <luiz.tobaldini@embraer.com.br>; Upton E <Eric.Upton@gulfstream.com>; Vanek A <Adrienne.Vanek@faa.gov>; Verlhac S <stephane.verlhac@adp.fr>; Volkov <Volkov@ciam.ru>; Wetzel <Frank.Wetzel@uba.de>; Willford N <NWillford@txtav.com>; Williams P <paul.i.williams@manchester.ac.uk>; Windhoffer <laszlo.windhoffer@faa.gov>; Yang X <xiaojunyoung@hotmail.com>; Yasar G <gursu.tasar@tai.com.tr>; Yen, David <Yen.David@epa.gov>; Yen, David <Yen.David@epa.gov>; Zelina J <joseph.zelina@ge.com>
Cc: Bettega Michielin, Monique <MMichielin@icao.int>
Subject: SG2018 Outcomes and WG3 Plenary call - 26 June 2018 - 09h30 Eastern

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Consider the environment before printing this e-mail

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/21/2018 9:55:55 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Feb 20)
Attachments: Agenda team mtg 2-20-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from yesterday's (Feb 20) aviation team meeting. Let me know if you have anything to add.

2/20/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
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Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/8/2018 4:52:33 PM
To: Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; Nicole.Didyk@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Draft Agenda items for 2:00 FAA/EPA call today (Feb 8); Call 202-991-0477, code 7552253

Hi,

Below are suggested draft agenda items for the 2:00 FAA/EPA call today (Feb 8). Let us know if you have anything to add to the agenda.

AGENDA:

Deliberative Process / Ex. 5

(G) AOB

Thank you,

Bryan

Bryan Manning
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Large Marine and Aviation Center
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 7/9/2018 5:38:46 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (July 9) in C35 at 2:00
Attachments: Agenda team mtg 7-9-18.docx

Hello,

Attached please find the agenda for today's (July 9) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
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(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/26/2018 12:09:19 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
CC: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: I'm going to call in from my desk for the 9:30 WG3 Plenary call on SST

Thanks, Bruce.

Bryan

Bryan Manning
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/18/2018 4:28:29 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (June 18) in C35 at 2:00
Attachments: Agenda team mtg 6-18-18.docx

Hello,

Attached please find the agenda for today's (June 18) aviation team meeting at 2:00 in C35. Let me know if you have anything to add. Note, PM was been switched to the latter part of the meeting today.

Thank you,

Bryan

Bryan Manning
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/18/2018 3:50:19 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: CAEP SG3 (day 4 SD)
Attachments: CAEPSG.20183.SD.Day 4.en.pdf

Hi,

Attached please find the day 4 SD from CAEP SG3. This SD has also been saved at H:\ASD\Aircraft-Documents\CAEP11\CAEP11 Steering Group 3-Singapore, June 4, 2018\SD . I will continue to monitor the SG3 website for the day 5 SD.

Thanks,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/30/2018 3:35:05 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: Never mind - Clean nvPM & SST US papers for SG3
Attachments: CAEPSG.20183.WPXX_USViewsNVPM_v5.docx; CAEP11-SG2018-WPxx US Views re SST Engine Certification_v3.docx

Hi John and Cullen,

Mike figured it would be best to just let Ralph know we are okay with the nvPM and SST WPs for SG3 (as he has already). Thus, we will not be sending Ralph clean versions of these papers. Sorry for the confusion or inconvenience.

Thanks,

Bryan

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From: Manning, Bryan
Sent: Monday, April 30, 2018 10:31 AM
To: Samulski, Michael <samulski.michael@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>
Subject: Clean nvPM & SST US papers for SG3

Hi,

Attached please find clean versions of the latest nvPM and SST US papers for SG3. If you are okay with these clean versions, Mike can send them to Ralph (at the same time he indicates to Ralph that we are okay with these papers). Note, I thought I would take a moment to create clean versions to save Ralph a step.

Thanks,

Bryan

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From: Samulski, Michael
Sent: Monday, April 30, 2018 9:12 AM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Mueller, John <mueller.john@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>
Subject: SG3 papers

Glad you made it to Derby okay.

Deliberative Process / Ex. 5

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 8/6/2018 5:16:58 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Agenda: Aviation Team Mtg (August 6) in C35 at 2:00
Attachments: Agenda team mtg 8-6-18.docx

Hello,

Attached please find the agenda for today's (Aug 6) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

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U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/22/2018 10:32:29 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Jan 22)
Attachments: Agenda team mtg 1-22-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from Monday's (Jan 22) aviation team meeting. Let me know if you have anything to add.

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/6/2018 5:08:34 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Feb 5)
Attachments: Agenda team mtg 2-5-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from Monday's (Feb 5) aviation team meeting. Let me know if you have anything to add.

2/5/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/25/2018 4:05:05 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (June 25) in C35 at 2:00
Attachments: Agenda team mtg 6-25-18.docx

Hello,

Attached please find the agenda for today's (June 25) aviation team meeting at 2:00 in C35. Let me know if you have anything to add. Note, PM was been switched back to the first part of the meeting today.

Thank you,

Bryan

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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/22/2018 5:09:42 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Jan 22) in C35 at 2:00
Attachments: Agenda team mtg 1-22-18.docx

Hello,

Attached please find the agenda for today's (Jan 22) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
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2000 Traverwood Drive
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/20/2018 5:08:13 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Feb 20) in C35 at 2:00
Attachments: Agenda team mtg 2-20-18.docx

Hello,

Attached please find the agenda for today's (Feb 20) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
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Large Marine and Aviation Center
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 8/27/2018 5:54:18 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Agenda: Aviation Team Mtg (August 27) in C35 at 2:00
Attachments: Agenda team mtg 8-27-18.docx

Hello,

Attached please find the agenda for today's (Aug 27) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 4/16/2018 5:47:48 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (April 16) in C35 at 2:00
Attachments: Agenda team mtg 4-16-18.docx

Hello,

Attached please find the agenda for today's (April 16) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/29/2018 4:30:37 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: New CAEP SG3 Paper (US SST Noise WP)
Attachments: CAEPSG.20183.WP.046.8.en.pdf

Hi,

I just downloaded the attached, new SG3 paper. It has also been saved at H:\ASD\Aircraft-Documents\CAEP11\CAEP11 Steering Group 3-Singapore, June 4, 2018\Working Papers . I will continue to monitor the SG3 website for more papers.

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/29/2018 4:11:11 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: New CAEP SG3 Paper (Europe SST Emissions WP)
Attachments: CAEPSG.20183.WP.050.5.en.pdf

Hi,

I just downloaded the attached, new SG3 paper. It has also been saved at H:\ASD\Aircraft-Documents\CAEP11\CAEP11 Steering Group 3-Singapore, June 4, 2018\Working Papers . I will continue to monitor the SG3 website for more papers.

Thanks,

Bryan

Bryan Manning
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2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/25/2018 3:21:07 PM
To: Galperin, Diana [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fa0a6708066b4b7a8db0d3a51c05469e-Galperin, D]; Sherry, Christopher [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=29afce7721dc40db9ab56cff4fbad18c-Sherry, Christopher]
CC: Levy, Aaron [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=48c391c59fc14639b9322d788c8ffb7b-Levy, Aaron]
Subject: SDs (minutes) from CAEP Steering Group meeting week of June 4
Attachments: CAEPSG.20183.SD.Day 1-1.en.pdf; CAEPSG.20183.SD.Day 1-2.en.pdf; CAEPSG.20183.SD.Day 1-3.en.pdf; CAEPSG.20183.SD.Day 2.en.pdf; CAEPSG.20183.SD.Day 3.en.pdf; CAEPSG.20183.SD.Day 4.en.pdf; CAEPSG.20183.SD.Day 5.en.pdf

Hi,

In case you have not already seen them, attached please find the SDs (or minutes) from each day of the recent CAEP Steering Group meeting, which occurred the week of June 4 (in Singapore). Note, day 1 is three different files/documents. In SD5 (the last attachment), the last 3 pages are about Future Work.

Thanks,

Bryan

Bryan Manning
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 6/25/2018 3:16:03 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: CAEP SG3 (day 5 SD)
Attachments: CAEPSG.20183.SD.Day 5.en.pdf

Hi,

Attached please find the day 5 SD from CAEP SG3. The last 3 pages are about future work. This SD has also been saved at H:\ASD\Aircraft-Documents\CAEP11\CAEP11 Steering Group 3-Singapore, June 4, 2018\SD .

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
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Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 7/16/2018 5:51:02 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (July 16) in C35 at 2:00
Attachments: Agenda team mtg 7-16-18.docx

Hello,

Attached please find the agenda for today's (July 16) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 7/16/2018 3:54:48 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]
Subject: FW: CTG VIII - 03 July 2018 telecon minutes

Hi Bruce,

Does Ricardo know that the July 24 CTG Vol III call is the same time as a ESSTsg call?

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: Ricardo Antonio Binotto Dupont [mailto:ricardo.Dupont@anac.gov.br]
Sent: Monday, July 16, 2018 10:10 AM
To: Maeroff, Bruce <Maeroff.Bruce@epa.gov>
Cc: Manning, Bryan <manning.bryan@epa.gov>
Subject: RES: CTG VIII - 03 July 2018 telecon minutes

Hi, Bruce!
Yes, it is official. Sorry for the confusion.
Ricardo.

De: Maeroff, Bruce [mailto:Maeroff.Bruce@epa.gov]
Enviada em: segunda-feira, 16 de julho de 2018 11:00
Para: Ricardo Antonio Binotto Dupont
Cc: manning.bryan@epa.gov
Assunto: RE: CTG VIII - 03 July 2018 telecon minutes

Ricardo,
Is this official (no longer "proposed") that the next meeting will be on July 24th? And, that the July 17th and July 31 meetings are officially canceled?

Thank You,

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,

Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

From: Ricardo Antonio Binotto Dupont [mailto:ricardo.Dupont@anac.gov.br]
Sent: Wednesday, July 11, 2018 2:40 PM
To: LD.CAEP_WG3_CTG_V3 <LD.CAEP_WG3_CTG_V3@anac.gov.br>
Cc: Laszlo.Windhoffer@faa.gov
Subject: CTG VIII - 03 July 2018 telecon minutes

Deliberative Process / Ex. 5

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 7/12/2018 2:09:47 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: RE: Draft Agenda items 2:00 FAA/EPA call today (July 12); Call 202-991-0477, code 7552253

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

From: Leggett, Cullen
Sent: Thursday, July 12, 2018 10:08 AM
To: Manning, Bryan <manning.bryan@epa.gov>
Subject: RE: Draft Agenda items 2:00 FAA/EPA call today (July 12); Call 202-991-0477, code 7552253

Deliberative Process / Ex. 5

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Thursday, July 12, 2018 9:49 AM
To: Manning, Bryan <manning.bryan@epa.gov>
Cc: Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov; Maeroff, Bruce <Maeroff.Bruce@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Yen, David <Yen.David@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>
Subject: Re: Draft Agenda items 2:00 FAA/EPA call today (July 12); Call 202-991-0477, code 7552253

Thank you for the draft agenda, Bryan. There is a possibility I may have a conflict with our call at 2pm, but I am not suggesting cancelling the call. I

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks
Ralph

On Jul 12, 2018, at 9:21 AM, Manning, Bryan <manning.bryan@epa.gov> wrote:

> Hi,
>
> Below are suggested draft agenda items for the 2:00 FAA/EPA call today (July 12). Let us know if you have anything to add to the agenda.

AGENDA:

Deliberative Process / Ex. 5

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 7/12/2018 1:21:09 PM
To: Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; Laszlo.Windhoffer@faa.gov; maryalice.locke@faa.gov; warren.gillette@faa.gov
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: Draft Agenda items 2:00 FAA/EPA call today (July 12); Call 202-991-0477, code 7552253

Hi,

Below are suggested draft agenda items for the 2:00 FAA/EPA call today (July 12). Let us know if you have anything to add to the agenda.

AGENDA:

Deliberative Process / Ex. 5

(C) Losses ARP balloting status
(D) SST -- individual meetings with OEMs

Deliberative Process / Ex. 5

(F) AOB

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 7/12/2018 1:06:21 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
CC: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Minutes from SST WG3 Plenary Call
Attachments: CAEP11-WG3-Plenary Telecon_ 26 July 2018 DRAFTv2.docx

Cullen,

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
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Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/14/2018 7:28:22 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (May 14)
Attachments: Agenda team mtg 5-14-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from today's (May 14) aviation team meeting. Let me know if you have anything to add.

5/14/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/14/2018 5:45:47 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (May 14) in C35 at 2:00
Attachments: Agenda team mtg 5-14-18.docx

Hello,

Attached please find the agenda for today's (May 14) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
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Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/16/2018 5:13:53 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Jan 16) in C35 at 2:00
Attachments: Agenda team mtg 1-16-18.docx

Hello,

Attached please find the agenda for today's (Jan 16) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

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Large Marine and Aviation Center
2000 Traverwood Drive
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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/28/2018 3:17:08 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Feb 26)
Attachments: Agenda team mtg 2-26-18_take away tasks.docx

Hello,

Below/attached please find the take away tasks from Monday's (Feb 26) aviation team meeting. Let me know if you have anything to add.

2/26/18 Weekly Take Away Tasks:

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 3/19/2018 5:48:45 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (March 19) in C35 at 2:00
Attachments: Agenda team mtg 3-19-18.docx

Hello,

Attached please find the agenda for today's (March 19) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

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U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 2/5/2018 6:03:19 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Feb 5) in C35 at 2:00
Attachments: Agenda team mtg 2-5-18.docx

Hello,

Attached please find the agenda for today's (Feb 5) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

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Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/25/2018 1:16:04 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: Updated IE Tech Review Report - CAEP SG3 Paper (WP28)
Attachments: Deliberative Process / Ex. 5

Hi,

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
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Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/25/2018 12:25:45 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: New CAEP SG3 Papers (4 more working papers; 2 of these are ICCAIA papers on future work and SST)
Attachments: Deliberative Process / Ex. 5

Hi,

Deliberative Process / Ex. 5

Thanks,

Bryan

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manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/24/2018 4:37:24 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: New CAEP SG3 Papers (especially WP54 - European Views on Future Work)
Attachments: **Deliberative Process / Ex. 5**

Hi,

Deliberative Process / Ex. 5

I will continue to monitor the SG3 website for member state papers as they trickle in.

Thanks,

Bryan

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(ph) 734-214-4832 (fax) 734-214-4816
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Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/11/2018 3:10:26 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Jan 8)
Attachments: Agenda team mtg 1-8-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from Monday's (Jan 8) aviation team meeting. Let me know if you have anything to add.

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
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(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/30/2018 5:10:41 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Take away tasks: Aviation Team Mtg (Jan 29)
Attachments: Agenda team mtg 1-29-18 take away tasks.docx

Hello,

Below/attached please find the take away tasks from Monday's (Jan 29) aviation team meeting. Let me know if you have anything to add.

Deliberative Process / Ex. 5

****DRAFT-DELIBERATIVE MATERIAL- INTERNAL-DO NOT CITE OR QUOTE****

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
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Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/30/2018 2:29:03 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: RE: NAA-Only ESSTsg Telecon

Deliberative Process / Ex. 5 Thanks. Bryan

Bryan Manning
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Ann Arbor, MI 48105
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manning.bryan@epa.gov

From: Leggett, Cullen
Sent: Tuesday, January 30, 2018 9:06 AM
To: Mueller, John <mueller.john@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>
Subject: RE: NAA-Only ESSTsg Telecon

John,

Deliberative Process / Ex. 5

Best regards,
Cullen Leggett
+1 734-214-4514

From: Mueller, John
Sent: Monday, January 29, 2018 16:05 PM
To: Leggett, Cullen <Leggett.Cullen@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>
Subject: FW: NAA-Only ESSTsg Telecon

Deliberative Process / Ex. 5

I will set up a room for tomorrow's call. Optional for either of you.

From: Bilcock, David [mailto:david.bilcock@tc.gc.ca]
Sent: Friday, January 26, 2018 4:53 PM

To: 'Laszlo.Windhoffer@faa.gov' <Laszlo.Windhoffer@faa.gov>; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy <wendy.bailey@tc.gc.ca>; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.lovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John <mueller.john@epa.gov>; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: RE: NAA-Only ESSTsg Telecon

All,

Deliberative Process / Ex. 5

David Bilcock
Senior Engineer, Powerplants & Emissions / Ingénieur principal, Groupe moteurs et émissions
National Aircraft Certification / Certification nationale des aéronefs
Ph. / tél.: (613) 617-6821
facsimile / télécopieur: (613) 996-9178
e-mail: David.Bilcock@tc.gc.ca
Transport Canada / Transports Canada,
159, Cleopatra Dr, Nepean (AARD)
Ontario, K1A 0N5
Government of Canada / Gouvernement du Canada

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Friday, January 26, 2018 4:25 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy <wendy.bailey@tc.gc.ca>; Bilcock, David <david.bilcock@tc.gc.ca>; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.lovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: NAA-Only ESSTsg Telecon

Dear NAAs,

Deliberative Process / Ex. 5

Thank you

Laszlo Windhoffer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, SW.
Washington, DC 20591
T +1-202-267-4741

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/8/2018 5:41:18 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Jan 8) in C35 at 2:00
Attachments: Agenda team mtg 1-8-18.docx

Hello,

Happy New Year! Attached please find the agenda for today's (Jan 8) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 1/29/2018 6:33:20 PM
To: Giannelli, Bob [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7fb7b092ff064a509252056dcaaad9c0-Giannelli, Bob]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: Agenda: Aviation Team Mtg (Jan 29) in C35 at 2:00
Attachments: Agenda team mtg 1-29-18.docx

Hello,

Attached please find the agenda for today's (Jan 29) aviation team meeting at 2:00 in C35. Let me know if you have anything to add.

Thank you,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 1/29/2018 9:12:36 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
BCC: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user75988d5f]

Subject: NAA SST call - optional
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:00:00 PM
Show Time As: Busy

Appointment

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 1/26/2018 9:28:40 PM
To: Laszlo.Windhoffer@faa.gov; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov

Subject: NAA-Only ESSTsg
Attachments: NAA-Only ESSTsg Telecon; CTG ESSTsg: TCCA input for NAA discussion; RE: CTG ESSTsg T8-4
Location: See telecon/Webex info below

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:30:00 PM
Show Time As: Busy

Recurrence: (none)

Attached are relevant emails for our NAA supersonic discussion today (fyi, as you probably have all of these).

Deliberative Process / Ex. 5

Please let me know if anyone appears to be missing from this invitation. Thanks and talk to you soon.

Personal Security Detail / Ex. 6

Appointment

From: KRAMER, STEPHEN K PW [stephen.kramer@pw.utc.com]
Sent: 8/10/2018 8:36:03 PM
To: KRAMER, STEPHEN K PW [stephen.kramer@pw.utc.com]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Ralph.Iovinelli@faa.gov; Kim, Brian PW [Brian.Kim@pw.utc.com]

Subject: Call w/ EPA/FAA on SST
Location: Webex

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Recurrence: (none)

Deliberative Process / Ex. 5

Please forward as appropriate to other members of your organizations.

Call w/ EPA/FAA on SST
Thursday, August 23, 2018
1:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 2 hrs

Personal Security Detail / Ex. 6

When it's time, join the meeting.

Join from a video system or application

Personal Security Detail / Ex. 6

When dialing into AT&T before joining WebEx, link your integrated audio by dialing #91, followed by your Attendee ID, then #

Join by phone

Personal Security Detail / Ex. 6

Personal Security Detail / Ex. 6

Can't join the meeting?

IMPORTANT NOTICE: Please note that this Webex service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session

Appointment

From: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Sent: 8/10/2018 6:23:42 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
BCC: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user75988d5f]

Subject: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Deliberative Process / Ex. 5

Please forward as appropriate to other members of your organizations.

Call w/ EPA/FAA on SST
Thursday, August 23, 2018
1:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 2 hrs

Personal Security Detail / Ex. 6

When it's time, join the meeting.

Join from a video system or application

Personal Security Detail / Ex. 6

When dialing into AT&T before joining WebEx, link your integrated audio by dialing #91, followed by your Attendee ID, then #

Join by phone

Personal Security Detail / Ex. 6

Can't join the meeting?

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Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/2/2018 1:04:16 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Leggett, Cullen [Leggett.Cullen@epa.gov]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [samulski.michael@epa.gov]; Yen, David [Yen.David@epa.gov]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]

Subject: Call with GE/FAA on SST 2:30PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Tentative

-----Original Appointment-----
From: Zelina, Joseph (GE Aviation, US) [mailto:Joseph.Zelina@ge.com]
Sent: Wednesday, August 01, 2018 5:59 PM
To: Zelina, Joseph (GE Aviation, US); Mueller, John; Ralph.Iovinelli@faa.gov
Subject: Supersonics Discussions
When: Tuesday, August 07, 2018 2:30 PM-3:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Skype Meeting

→ Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Personal Security Detail / Ex. 6

Find a local number

Personal Security Detail / Ex. 6

Forgot your dial-in PIN? | Help | Legal

HAVING TROUBLE WITH SKYPE?

GE Employees and Contractors are encouraged to try the following:

- Use a Bluetooth or plug-in headset
- **Don't have a headset?** When joining from your computer, select 'Call me at' and enter your landline or mobile device number
- When joining from mobile, use 'call back' within the Skype for Business mobile app - click the ellipses button and choose 'call me back'
- If entering the meeting though SpeedTCON, choose the 'phone' option to call directly into the meeting using the conference line

---

Message

From: Fleming, Gregg G (Volpe) [Gregg.Fleming@dot.gov]
Sent: 9/6/2018 12:19:55 PM
To: Silva, Bruno [BSilva@icao.int]; emanuel.fleuti@zurich-airport.com; RMarchi@aci-na.org; jscavuzzi@aci.aero; istimac@zagreb-airport.hr; david.hyde@aia-aerospace.org; jonalbert.obnamia@mail.utoronto.ca; inger.seeberg@cph.dk; MPagliarello@aci-na.org; vivek.sindhamani@naco.rhdhv.com; rodrigo.padilha@anac.gov.br; sylvie.mallet@tc.gc.ca; scott.mckibbon@canada.ca; Fudge, Ted [Ted.Fudge@CANSO.org]; xnma@cauc.edu.cn; amiraa.elsayed@gmail.com; stephen.arrowsmith@easa.europa.eu; laurent.box@eurocontrol.int; David.BRAIN@eurocontrol.int; laurent.cavadini@eurocontrol.int; ivan.de-lepinay@easa.europa.eu; robin.deransy@eurocontrol.int; chris@limitedskies.com; willem.franken@easa.europa.eu; gareth.Horton@ricardo-aea.com; david.marsh@eurocontrol.int; Marco.PAVIOTTI@ec.europa.eu; stavros.stromatas@env-isa.com; thierry.delort@aviation-civile.gouv.fr; kevin.guittet@aviation-civile.gouv.fr; julien.lepoutre@aviation-civile.gouv.fr; didier.martin@aviation-civile.gouv.fr; nadia.meddour@aviation-civile.gouv.fr; david.smagghe@aviation-civile.gouv.fr; uj@janicke.de; Martin.Schaefer@bmvi.bund.de; adamm@iata.org; perovicj@iata.org; tpohle@airlines.org; nauckhoffj@iata.org; Ecotti@NBAA.org; bparry@ebaa.org; Andrianiaina.Rajaobelina@aero.bombardier.com; daniel.m.allyn@boeing.com; jean-michel.boiteux@snecma.fr; arnaud.bonnet@embraer.com.br; daniel.brown@honeywell.com; andrew.chuang@boeing.com; dominique.collin@snecma.fr; barbara.cooreman@asd-europe.org; lionel.cousseins@airbus.com; thomas.crabtree@boeing.com; Jim Dow [Jdow@iccaia.org]; rudolph.dudebout@honeywell.com; Galotti, Vincent [Vgalotti.iccaia@gmail.com]; Andrew.Gordon@airbus.com; laurence.gray@pw.utc.com; mark.huising@aero.bombardier.com; Brian.Kim@pw.utc.com; Mikael.LABY@airbus.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; muni.majjigi@ge.com; yoann.mery@snecma.fr; krisha.nobrega@embraer.com.br; olivier.penanhoat@snecma.fr; Thierry.Percheron@dassault-aviation.com; leslie.riegle@aia-aerospace.org; domingo.Sepulveda@pw.utc.com; robert.b.solaimani@boeing.com; cheikhdjiby.sow@snecma.fr; Eric.Upton@gulfstream.com; joseph.zelina@ge.com; Brandon Graver [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user0e3b7bdb]; karin@theicct.org; paul.peeters1000@gmail.com; pedro.piriscabezas@gmail.com; ahyani@dephub.go.id; nandi_wardhana@dephub.go.id; r.rizzi@enac.gov.it; t-nakazawa@aeif.or.jp; merlijn.den.boer@nlr.nl; oa_kartyshev@mail.ru; aviamarket@gosniiga.ru; yuriy.medved@gmail.com; mirzoyan@ciam.ru; catherine.marthe@bazl.admin.ch; Theo.Rindlisbacher@bazl.admin.ch; urs.ziegler@bazl.admin.ch; kazhank@gmail.com; synyka@googlemail.com; zap@nau.edu.ua; s.christie@mmu.ac.uk; d.s.lee@mmu.ac.uk; L.Lim@mmu.ac.uk; b.owen@mmu.ac.uk; darren.rhodes@caa.co.uk; Jonathan.Saks@dft.gsi.gov.uk; edward.weston@caa.co.uk; Gia.Kroeff@caa.co.uk; Balasubramanian, Sathya CTR (Volpe) [S.Balasubramania.CTR@dot.gov]; Barlett, Anna <AWA> [anna.barlett@faa.gov]; Boeker, Eric (Volpe) [Eric.Boeker@dot.gov]; bonnefoy_philippe@bluesky-d2d.com; Cointin, Rebecca <AWA> [rebecca.cointin@faa.gov]; Ding, Li <AWA> [li.ding@faa.gov]; Grandi, Fabio <AWA> [fabio.grandi@faa.gov]; Hileman, James <AWA> [james.hileman@faa.gov]; Holsclaw, Curtis <AWA> [curtis.holsclaw@faa.gov]; Iovinelli, Ralph <AWA> [ralph.iovinelli@faa.gov]; Jacob, Daniel <AWA> [daniel.jacob@faa.gov]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; K L [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user8190c13c]; Locke, Maryalice <AWA> [maryalice.locke@faa.gov]; Marks, Julie <AWA> [julie.marks@faa.gov]; amy.j.bann@boeing.com; McConnachie_Dominic@bah.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Pace, David (Volpe) [David.Pace@dot.gov]; Raiffa_Gregory@bah.com; Scata, Donald <AWA> [donald.scata@faa.gov]; Schaufele, Roger <AWA> [roger.schaufele@faa.gov]; vws1 [vws1@psu.edu]; Vanek, Adrienne <AWA> [adrienne.vanek@faa.gov]; Wharff, Jeffrey <AWA> [jeffrey.wharff@faa.gov]; Wishart, Jacob (Volpe) [Jacob.Wishart@dot.gov]; wolfe.philip@epa.gov; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; robert.mauri@aviation-civile.gouv.fr; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; lourdes@boom.aero; Raymond Russell [raymond@boomsupersonic.com]; Matt Sattler [matt@boomsupersonic.com]; Ralf.Berghof@dlr.de; dale.l.smith@boeing.com
CC: Mittelman, Anjuliee (Volpe) [Anjuliee.Mittelman@dot.gov]; Fleming, Gregg G (Volpe) [Gregg.Fleming@dot.gov]
Subject: RE: MDG/FESG Conference Call for August 1st

Attachments: MDG_FESG Call Notes_090518t.docx

Folks – Attached are the notes from yesterday's call. In addition, below you will find the current list of papers for the Montreal meeting. Please review and let Ivan, Roger and myself (with CC's to Bruno and Maryalice) know if there are any missing. Cheers, Gregg

Deliberative Process / Ex. 5

From: Fleming, Gregg G (Volpe)
Sent: Tuesday, September 04, 2018 8:52 AM
To: 'Silva, Bruno' <BSilva@icao.int>; 'emanuel.fleuti@zurich-airport.com' <emanuel.fleuti@zurich-airport.com>; 'RMarchi@aci-na.org' <RMarchi@aci-na.org>; 'jscavuzzi@aci.aero' <jscavuzzi@aci.aero>; 'istimac@zagreb-airport.hr' <istimac@zagreb-airport.hr>; 'david.hyde@aia-aerospace.org' <david.hyde@aia-aerospace.org>; 'jonalbert.obnamia@mail.utoronto.ca' <jonalbert.obnamia@mail.utoronto.ca>; 'inger.seeberg@cph.dk' <inger.seeberg@cph.dk>; 'MPagliarello@aci-na.org' <MPagliarello@aci-na.org>; 'vivek.sindhamani@naco.rhdhv.com' <vivek.sindhamani@naco.rhdhv.com>; 'rodrigo.padilha@anac.gov.br' <rodrigo.padilha@anac.gov.br>; 'sylvie.mallet@tc.gc.ca' <sylvie.mallet@tc.gc.ca>; 'scott.mckibbon@canada.ca' <scott.mckibbon@canada.ca>; 'Fudge, Ted' <Ted.Fudge@CANSO.org>; 'xnma@cauc.edu.cn' <xnma@cauc.edu.cn>; 'amiraa.elsayed@gmail.com' <amiraa.elsayed@gmail.com>; 'stephen.arrowsmith@easa.europa.eu' <stephen.arrowsmith@easa.europa.eu>; 'laurent.box@eurocontrol.int' <laurent.box@eurocontrol.int>; 'David.BRAIN@eurocontrol.int' <David.BRAIN@eurocontrol.int>; 'laurent.cavadini@eurocontrol.int' <laurent.cavadini@eurocontrol.int>; 'ivan.de-lepinay@easa.europa.eu' <ivan.de-lepinay@easa.europa.eu>; 'robin.deransy@eurocontrol.int' <robin.deransy@eurocontrol.int>; 'chris@limitedskies.com' <chris@limitedskies.com>; 'willem.franken@easa.europa.eu' <willem.franken@easa.europa.eu>; 'gareth.Horton@ricardo-aea.com' <gareth.Horton@ricardo-aea.com>; 'david.marsh@eurocontrol.int' <david.marsh@eurocontrol.int>; 'Marco.PAVIOTTI@ec.europa.eu' <Marco.PAVIOTTI@ec.europa.eu>; 'stavros.stromatas@env-isa.com' <stavros.stromatas@env-isa.com>; 'emilia.suomalainen@env-isa.com' <emilia.suomalainen@env-isa.com>; 'thierry.delort@aviation-civile.gouv.fr' <thierry.delort@aviation-civile.gouv.fr>; 'kevin.guittet@aviation-civile.gouv.fr'

<kevin.guittet@aviation-civile.gouv.fr>; 'julien.lepoutre@aviation-civile.gouv.fr' <julien.lepoutre@aviation-civile.gouv.fr>; 'didier.martin@aviation-civile.gouv.fr' <didier.martin@aviation-civile.gouv.fr>; 'nadia.meddour@aviation-civile.gouv.fr' <nadia.meddour@aviation-civile.gouv.fr>; 'david.smagghe@aviation-civile.gouv.fr' <david.smagghe@aviation-civile.gouv.fr>; 'uj@janicke.de' <uj@janicke.de>; 'Martin.Schaefer@bmvi.bund.de' <Martin.Schaefer@bmvi.bund.de>; 'adamm@iata.org' <adamm@iata.org>; 'perovicj@iata.org' <perovicj@iata.org>; 'tpohle@airlines.org' <tpohle@airlines.org>; 'nauckhoffj@iata.org' <nauckhoffj@iata.org>; 'Ecotti@NBAA.org' <Ecotti@NBAA.org>; 'bparry@ebaa.org' <bparry@ebaa.org>; 'Andrianiaina.Rajaobelina@aero.bombardier.com' <Andrianiaina.Rajaobelina@aero.bombardier.com>; 'daniel.m.allyn@boeing.com' <daniel.m.allyn@boeing.com>; 'jean-michel.boiteux@snecma.fr' <jean-michel.boiteux@snecma.fr>; 'arnaud.bonnet@embraer.com.br' <arnaud.bonnet@embraer.com.br>; 'daniel.brown@honeywell.com' <daniel.brown@honeywell.com>; 'andrew.chuang@boeing.com' <andrew.chuang@boeing.com>; 'dominique.collin@snecma.fr' <dominique.collin@snecma.fr>; 'barbara.cooreman@asd-europe.org' <barbara.cooreman@asd-europe.org>; 'lionel.cousseins@airbus.com' <lionel.cousseins@airbus.com>; 'thomas.crabtree@boeing.com' <thomas.crabtree@boeing.com>; 'Jim Dow' <Jdow@iccaia.org>; 'rudolph.dudebout@honeywell.com' <rudolph.dudebout@honeywell.com>; 'Galotti, Vincent' <Vgalotti.iccaia@gmail.com>; 'Andrew.Gordon@airbus.com' <Andrew.Gordon@airbus.com>; 'laurence.gray@pw.utc.com' <laurence.gray@pw.utc.com>; 'mark.huising@aero.bombardier.com' <mark.huising@aero.bombardier.com>; 'Brian.Kim@pw.utc.com' <Brian.Kim@pw.utc.com>; 'Mikael.LABY@airbus.com' <Mikael.LABY@airbus.com>; 'david.lye@aero.bombardier.com' <david.lye@aero.bombardier.com>; 'paul.madden@rolls-royce.com' <paul.madden@rolls-royce.com>; 'muni.majjigi@ge.com' <muni.majjigi@ge.com>; 'yoann.mery@snecma.fr' <yoann.mery@snecma.fr>; 'krisha.nobrega@embraer.com.br' <krisha.nobrega@embraer.com.br>; 'olivier.penanhoat@snecma.fr' <olivier.penanhoat@snecma.fr>; 'Thierry.Percheron@dassault-aviation.com' <Thierry.Percheron@dassault-aviation.com>; 'leslie.riegle@aia-aerospace.org' <leslie.riegle@aia-aerospace.org>; 'CAMILLE.SAGUES@airbus.com' <CAMILLE.SAGUES@airbus.com>; 'domingo.Sepulveda@pw.utc.com' <domingo.Sepulveda@pw.utc.com>; 'robert.b.solaimani@boeing.com' <robert.b.solaimani@boeing.com>; 'cheikhdjiby.sow@snecma.fr' <cheikhdjiby.sow@snecma.fr>; 'Eric.Upton@gulfstream.com' <Eric.Upton@gulfstream.com>; 'joseph.zelina@ge.com' <joseph.zelina@ge.com>; 'b.graver@theicct.org' <b.graver@theicct.org>; 'karin@theicct.org' <karin@theicct.org>; 'paul.peeters1000@gmail.com' <paul.peeters1000@gmail.com>; 'pedro.piriscabezas@gmail.com' <pedro.piriscabezas@gmail.com>; 'ahyani@dephub.go.id' <ahyani@dephub.go.id>; 'nandi_wardhana@dephub.go.id' <nandi_wardhana@dephub.go.id>; 'r.rizzi@enac.gov.it' <r.rizzi@enac.gov.it>; 't-nakazawa@aeif.or.jp' <t-nakazawa@aeif.or.jp>; 'merlijn.den.boer@nlr.nl' <merlijn.den.boer@nlr.nl>; 'oa_kartyshev@mail.ru' <oa_kartyshev@mail.ru>; 'aviamarket@gosniiga.ru' <aviamarket@gosniiga.ru>; 'yuriy.medved@gmail.com' <yuriy.medved@gmail.com>; 'mirzoyan@ciam.ru' <mirzoyan@ciam.ru>; 'catherine.marthe@bazl.admin.ch' <catherine.marthe@bazl.admin.ch>; 'Theo.Rindlisbacher@bazl.admin.ch' <Theo.Rindlisbacher@bazl.admin.ch>; 'urs.ziegler@bazl.admin.ch' <urs.ziegler@bazl.admin.ch>; 'kazhank@gmail.com' <kazhank@gmail.com>; 'synyka@googlemail.com' <synyka@googlemail.com>; 'zap@nau.edu.ua' <zap@nau.edu.ua>; 's.christie@mmu.ac.uk' <s.christie@mmu.ac.uk>; 'd.s.lee@mmu.ac.uk' <d.s.lee@mmu.ac.uk>; 'L.Lim@mmu.ac.uk' <L.Lim@mmu.ac.uk>; 'b.owen@mmu.ac.uk' <b.owen@mmu.ac.uk>; 'darren.rhodes@caa.co.uk' <darren.rhodes@caa.co.uk>; 'Jonathan.Saks@dft.gsi.gov.uk' <Jonathan.Saks@dft.gsi.gov.uk>; 'edward.weston@caa.co.uk' <edward.weston@caa.co.uk>; 'Gia.Kroeff@caa.co.uk' <Gia.Kroeff@caa.co.uk>; Balasubramanian, Sathya CTR (Volpe) <S.Balasubramania.CTR@dot.gov>; Barlett, Anna <AWA> <anna.barlett@faa.gov>; Boeker, Eric (Volpe) <Eric.Boeker@dot.gov>; 'bonnefoy_philippe@bluesky-d2d.com' <bonnefoy_philippe@bluesky-d2d.com>; Cointin, Rebecca <AWA> <rebecca.cointin@faa.gov>; Ding, Li <AWA> <li.ding@faa.gov>; Grandi, Fabio <AWA> <fabio.grandi@faa.gov>; Hileman, James <AWA> <james.hileman@faa.gov>; Holsclaw, Curtis <AWA> <curtis.holsclaw@faa.gov>; Iovinelli, Ralph <AWA> <ralph.iovinelli@faa.gov>; Jacob, Daniel <AWA> <daniel.jacob@faa.gov>; 'leggett.cullen@epa.gov' <leggett.cullen@epa.gov>; Lewis, Kristin (Volpe) <Kristin.Lewis@dot.gov>; Locke, Maryalice <AWA> <maryalice.locke@faa.gov>; Marks, Julie <AWA> <julie.marks@faa.gov>; 'amy.j.bann@boeing.com' <amy.j.bann@boeing.com>; 'McConnachie_Dominic@bah.com' <McConnachie_Dominic@bah.com>; 'mueller.john@epa.gov' <mueller.john@epa.gov>; Pace, David (Volpe) <David.Pace@dot.gov>; 'Raiffa_Gregory@bah.com' <Raiffa_Gregory@bah.com>; Scata, Donald <AWA> <donald.scata@faa.gov>; Schaufele, Roger <AWA> <roger.schaufele@faa.gov>; vws1 <vws1@psu.edu>; Vanek, Adrienne <AWA> <adrienne.vanek@faa.gov>; Wharff, Jeffrey <AWA> <jeffrey.wharff@faa.gov>; Wishart, Jacob (Volpe) <Jacob.Wishart@dot.gov>; 'wolfe.philip@epa.gov' <wolfe.philip@epa.gov>; 'yen.david@epa.gov'

<yen.david@epa.gov>; 'robert.mauri@aviation-civile.gouv.fr' <robert.mauri@aviation-civile.gouv.fr>; 'lindsey.leah@epa.gov' <lindsey.leah@epa.gov>; 'gerring.holly@epa.gov' <gerring.holly@epa.gov>; 'lourdes@boom.aero' <lourdes@boom.aero>; 'Raymond Russell' <raymond@boomsupersonic.com>; 'Matt Sattler' <matt@boomsupersonic.com>; 'Ralf.Berghof@dlr.de' <Ralf.Berghof@dlr.de>
Cc: Mittelman, Anjuliee (Volpe) <Anjuliee.Mittelman@dot.gov>
Subject: MDG/FESG Conference Call for August 1st

Folks –

We'll be having an MDG/FESG coordination/update call Wednesday (5 September) at 10:30 Eastern (4:30 CET).

We'll be using the following call-in information:

Personal Security Detail / Ex. 6

The agenda will be as follows:

Deliberative Process / Ex. 5

5. AOB

Let us know if you have any questions or need additional information before the call,

Cheers,

Roger, Ivan and Gregg
FESG Rapporteur and MDG Co-Rapporteurs

Message

From: Kim, Brian PW [Brian.Kim@pw.utc.com]
Sent: 8/23/2018 6:44:03 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: RE: SST call attendanceKRAMER, STEPHEN K PW <stephen.kramer@pw.utc.com>

Thanks John

From: Mueller, John [mailto:mueller.john@epa.gov]
Sent: Thursday, August 23, 2018 2:43 PM
To: KRAMER, STEPHEN K PW; Kim, Brian PW
Subject: [External] SST call attendance

Thanks again for your time and effort – much appreciated!

In attendance for EPA were:

Bryan Manning
John Mueller
Mike Samulski
David Yen

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 8/13/2018 12:15:06 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]

Subject: Tentative: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Appointment

From: Yen, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=865CA449DD0F405A949A635615E68827-YEN, DAVID]
Sent: 8/13/2018 12:07:34 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]

Subject: Accepted: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Appointment

From: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=USER75988D5F]
Sent: 8/11/2018 1:43:52 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]

Subject: Accepted: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM

Recurrence: (none)

Your request was accepted.

Sent by Microsoft Exchange Server 2016

Appointment

From: KRAMER, STEPHEN K PW [stephen.kramer@pw.utc.com]
Sent: 8/10/2018 8:33:55 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Ralph.Iovinelli@faa.gov; Kim, Brian PW [Brian.Kim@pw.utc.com]

Subject: Call w/ EPA/FAA on SST
Location: Webex

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Tentative

Recurrence: (none)

Discussion with FAA/EPA on P&W studies and perspective on SST.

Please forward as appropriate to other members of your organizations.

Call w/ EPA/FAA on SST
Thursday, August 23, 2018
1:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 2 hrs

Personal Security Detail / Ex. 6

When it's time, join the meeting.

Join from a video system or application

Personal Security Detail / Ex. 6

When dialing into AT&T before joining WebEx, link your integrated audio by dialing #91, followed by your Attendee ID, then #

Join by phone

Personal Security Detail / Ex. 6

Personal Security Detail / Ex. 6

Can't join the meeting?

IMPORTANT NOTICE: Please note that this Webex service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 8/10/2018 7:04:16 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]

Subject: Accepted: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Appointment

From: Yen, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=865CA449DD0F405A949A635615E68827-YEN, DAVID]
Sent: 8/1/2018 8:37:58 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]

Subject: Accepted: Call w/P&W on SST - tentative

Start: 8/9/2018 6:00:00 PM
End: 8/9/2018 7:00:00 PM
Show Time As: Busy

Message

From: Kinsey, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E44AD4B91F44E90AF0842D6303605EF-KINSEY, JOHN]
Sent: 7/10/2018 8:26:20 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Automatic reply: Aerion Closes In On Supersonic AS2 Program Launch

I am out of the office until July 23, 2018. If this is an urgent matter, Personal Security Detail / Ex. 6

Personal Security Detail / Ex. 6

Message

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 7/10/2018 8:26:19 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Automatic reply: Aerion Closes In On Supersonic AS2 Program Launch

I am currently on travel, returning July 6.

Message

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/19/2018 3:34:46 PM
To: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: SST table comments
Attachments: Copy of CAEPSG.20183.WP0xx.5.en (WG3 SSEE Update) Draft 2+CL_.xlsx

Message

From: Silva, Bruno [BSilva@icao.int]
Sent: 4/16/2018 4:07:32 PM
To: emanuel.fleuti@zurich-airport.com; RMarchi@aci-na.org; jscavuzzi@aci.aero; istimac@zagreb-airport.hr; inger.seeberg@cph.dk; MPagliarello@aci-na.org; vivek.sindhamani@naco.rhdhv.com; rodrigo.padilha@anac.gov.br; sylvie.mallet@tc.gc.ca; scott.mckibbon@canada.ca; Fudge, Ted [Ted.Fudge@CANSO.org]; xnma@cauc.edu.cn; amiraa.elsayed@gmail.com; stephen.arrowsmith@easa.europa.eu; laurent.box@eurocontrol.int; David.BRAIN@eurocontrol.int; laurent.cavadini@eurocontrol.int; ivan.de-lepinay@easa.europa.eu; robin.deransy@eurocontrol.int; chris@limitedskies.com; willem.franken@easa.europa.eu; gareth.Horton@ricardo-aea.com; david.marsh@eurocontrol.int; Marco.PAVIOTTI@ec.europa.eu; stavros.stromatas@env-isa.com; emilia.suomalainen@env-isa.com; a.van.velzen@vital-link.nl; robert.mauri@aviation-civile.gouv.fr; thierry.delort@aviation-civile.gouv.fr; kevin.guittet@aviation-civile.gouv.fr; julien.lepoutre@aviation-civile.gouv.fr; didier.martin@aviation-civile.gouv.fr; nadia.meddour@aviation-civile.gouv.fr; david.smagghe@aviation-civile.gouv.fr; uj@janicke.de; Martin.Schaefer@bmvi.bund.de; adamm@iata.org; perovicj@iata.org; tpohle@airlines.org; nauckhoffj@iata.org; Ecotti@NBAA.org; bparry@ebaa.org; daniel.m.allyn@boeing.com; mark.a.augustyniewicz@boeing.com; jean-michel.boiteux@snecma.fr; arnaud.bonnet@embraer.com.br; daniel.brown@honeywell.com; andrew.chuang@boeing.com; dominique.collin@snecma.fr; lionel.cousseins@airbus.com; thomas.crabtree@boeing.com; Jim Dow [Jdow@iccaia.org]; rudolph.dudebout@honeywell.com; Galotti, Vincent [Vgalotti.iccaia@gmail.com]; Andrew.Gordon@airbus.com; laurence.gray@pw.utc.com; mark.huising@aero.bombardier.com; Brian.Kim@pw.utc.com; Mikael.LABY@airbus.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; muni.majjigi@ge.com; yoann.mery@snecma.fr; krisha.nobrega@embraer.com.br; olivier.penanhoat@snecma.fr; Thierry.Percheron@dassault-aviation.com; leslie.riegle@aia-aerospace.org; domingo.Sepulveda@pw.utc.com; robert.b.solaimani@boeing.com; cheikhdjiby.sow@snecma.fr; Eric.Upton@gulfstream.com; joseph.zelina@ge.com; daniel.carnelly@airbus.com; danielle.patton@airbus.com; Brandon Graver [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user0e3b7bdb]; karin@theicct.org; paul.peeters1000@gmail.com; pedro.piriscabezas@gmail.com; ahyani@dephub.go.id; nandi_wardhana@dephub.go.id; r.rizzi@enac.gov.it; t-nakazawa@aeif.or.jp; merlijn.den.boer@nlr.nl; oa_kartyshev@mail.ru; aviamarket@gosniiga.ru; yuriy.medved@gmail.com; mirzoyan@ciam.ru; catherine.marthe@bazl.admin.ch; Theo.Rindlisbacher@bazl.admin.ch; urs.ziegler@bazl.admin.ch; V3V@yandex.ru; kazhank@gmail.com; synyka@googlemail.com; zap@nau.edu.ua; s.christie@mmu.ac.uk; d.s.lee@mmu.ac.uk; L.Lim@mmu.ac.uk; b.owen@mmu.ac.uk; darren.rhodes@caa.co.uk; Jonathan.Saks@dft.gsi.gov.uk; edward.weston@caa.co.uk; Gia.Kroeff@caa.co.uk; Sathya.Balasubramanian.CTR@dot.gov; Anna.Barlett@faa.gov; Eric.Boeker@dot.gov; bonnefoy_philippe@bluesky-d2d.com; rebecca.cointin@faa.gov; Li.Ding@faa.gov; Gregg.Fleming@dot.gov; fabio.grandi@faa.gov; James.Hileman@faa.gov; curtis.holsclaw@faa.gov; Ralph.Iovinelli@faa.gov; daniel.jacob@faa.gov; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; K L [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user8190c13c]; maryalice.locke@faa.gov; julie.marks@faa.gov; McConnachie_Dominic@bah.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; david.pace@dot.gov; Raiffa_Gregory@bah.com; donald.scata@faa.gov; roger.schaufele@faa.gov; vws1@psu.edu; Adrienne.Vanek@faa.gov; jeffrey.wharff@faa.gov; Jacob.wishart@dot.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
Subject: FESG-MDG/7 Action Items
Attachments: CAEP11_FESG-MDG07 Action items.docx; CAEP11_FESG-MDG07 Action items.xlsx

Dear MDG/FESG,

Thanks for the very productive meeting last week. Find attached the list of Action items from the meeting.

final

Deliberative Process / Ex. 5

Best regards,

Dr. Bruno Silva
Environment Officer
Air Transport Bureau
International Civil Aviation Organization
Phone: +1-514-954-8219 Ext. 6822
Mobile +1 514 629 9023
E-mail: bsilva@icao.int

From: Silva, Bruno
Sent: 10-Apr-18 11:24 AM
To: emanuel.fleuti@zurich-airport.com; RMarchi@aci-na.org; jscavuzzi@aci.aero; istimac@zagreb-airport.hr; inger.seeberg@cph.dk; MPagliarello@aci-na.org; vivek.sindhamani@naco.rhdhv.com; rodrigo.padilha@anac.gov.br; sylvie.mallet@tc.gc.ca; scott.mckibbon@canada.ca; Fudge, Ted; xnma@cauc.edu.cn; amiraa.elsayed@gmail.com; stephen.arrowsmith@easa.europa.eu; laurent.box@eurocontrol.int; David.BRAIN@eurocontrol.int; laurent.cavadini@eurocontrol.int; ivan.de-lepinay@easa.europa.eu; robin.deransy@eurocontrol.int; chris@limitedskies.com; willem.franken@easa.europa.eu; gareth.Horton@ricardo-aea.com; david.marsh@eurocontrol.int; Marco.PAVIOTTI@ec.europa.eu; stavros.stromatas@env-isa.com; emilia.suomalainen@env-isa.com; a.van.velzen@vital-link.nl; robert.mauri@aviation-civile.gouv.fr; thierry.delort@aviation-civile.gouv.fr; kevin.guittet@aviation-civile.gouv.fr; julien.lepoutre@aviation-civile.gouv.fr; didier.martin@aviation-civile.gouv.fr; nadia.meddour@aviation-civile.gouv.fr; david.smagghe@aviation-civile.gouv.fr; uj@janicke.de; Martin.Schaefer@bmvi.bund.de; adamm@iata.org; perovicj@iata.org; tpohle@airlines.org; nauckhoffj@iata.org; Ecotti@NBAA.org; bparry@ebaa.org; Silva, Bruno; daniel.m.allyn@boeing.com; mark.a.augustyniewicz@boeing.com; jean-michel.boiteux@snecma.fr; arnaud.bonnet@embraer.com.br; daniel.brown@honeywell.com; andrew.chuang@boeing.com; dominique.collin@snecma.fr; lionel.cousseins@airbus.com; thomas.crabtree@boeing.com; Jim Dow; rudolph.dudebout@honeywell.com; Galotti, Vincent; Andrew.Gordon@airbus.com; laurence.gray@pw.utc.com; mark.huising@aero.bombardier.com; Brian.Kim@pw.utc.com; Mikael.LABY@airbus.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; muni.majjigi@ge.com; yoann.mery@snecma.fr; krisha.nobrega@embraer.com.br; olivier.penanhoat@snecma.fr; Thierry.Percheron@dassault-aviation.com; leslie.riegle@aia-aerospace.org; domingo.Sepulveda@pw.utc.com; robert.b.solaimani@boeing.com; cheikhdjiby.sow@snecma.fr; Eric.Upton@gulfstream.com; joseph.zelina@ge.com; daniel.carnelly@airbus.com; danielle.patton@airbus.com; b.graver@theicct.org; karin@theicct.org; paul.peeters1000@gmail.com; pedro.piriscabezas@gmail.com; ahyani@dephub.go.id; nandi_wardhana@dephub.go.id; r.rizzi@enac.gov.it; t-nakazawa@aeif.or.jp; merlijn.den.boer@nlr.nl; oa_kartyshev@mail.ru; aviamarket@gosniiga.ru; yuriy.medved@gmail.com; mirzoyan@ciam.ru; catherine.marthe@bazl.admin.ch; Theo.Rindlisbacher@bazl.admin.ch; urs.ziegler@bazl.admin.ch; V3V@yandex.ru; kazhank@gmail.com; synyka@googlemail.com; zap@nau.edu.ua; s.christie@mmu.ac.uk; d.s.lee@mmu.ac.uk; L.Lim@mmu.ac.uk; b.owen@mmu.ac.uk; darren.rhodes@caa.co.uk; Jonathan.Saks@dft.gsi.gov.uk; edward.weston@caa.co.uk; Gia.Kroeff@caa.co.uk; Sathya.Balasubramanian.CTR@dot.gov; Anna.Barlett@faa.gov; Eric.Boeker@dot.gov; bonnefoy_philippe@bluesky-d2d.com; rebecca.cointin@faa.gov; Li.Ding@faa.gov; Gregg.Fleming@dot.gov; fabio.grandi@faa.gov; James.Hileman@faa.gov; curtis.holsclaw@faa.gov; Ralph.Iovinelli@faa.gov; daniel.jacob@faa.gov; leggett.cullen@epa.gov; kristin.lewis@dot.gov; maryalice.locke@faa.gov; julie.marks@faa.gov; McConnachie_Dominic@bah.com; mueller.john@epa.gov; david.pace@dot.gov; Raiffa_Gregory@bah.com; donald.scata@faa.gov; roger.schaufele@faa.gov; vws1@psu.edu; Adrienne.Vanek@faa.gov; jeffrey.wharff@faa.gov; Jacob.wishart@dot.gov; wolfe.philip@epa.gov; yen.david@epa.gov; lindsey.leah@epa.gov; gerring.holly@epa.gov
Subject: RE: FESG-MDG/7 late papers and revisions

Dear all,

Deliberative Process / Ex. 5

Dr. Bruno Silva
Environment Officer
Air Transport Bureau
International Civil Aviation Organization
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Mobile +1 514 629 9023
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From: maryalice.locke@faa.gov [mailto:maryalice.locke@faa.gov]
Sent: 9-Apr-18 5:54 AM
To: aiglesias@seguridadaerea.es; Andrew.Gordon@airbus.com; b.graver@theicct.org; Brian.Kim@pw.utc.com; Silva, Bruno; catherine.marthe@bazl.admin.ch; david.marsh@eurocontrol.int; david.smagghe@aviation-civile.gouv.fr; David.Pace@dot.gov; yen.david@epa.gov; didier.martin@aviation-civile.gouv.fr; emilia.suomalainen@env-isa.com; Fabio.Grandi@faa.gov; gareth.Horton@ricardo-aea.com; Gia.Kroeff@caa.co.uk; Gregg.Fleming@dot.gov; ivan.de-lepinay@easa.europa.eu; nauckhoffj@iata.org; jhermira@senasa.es; perovicj@iata.org; synyka@googlemail.com; kevin.guittet@aviation-civile.gouv.fr; krisha.nobrega@embraer.com.br; laurence.gray@pw.utc.com; laurent.box@eurocontrol.int; lindsey.leah@epa.gov; L.Lim@mmu.ac.uk; mark.a.augustyniewicz@boeing.com; merlijn.den.boer@nlr.nl; Mikael.LABY@airbus.com; oa_kartyshev@mail.ru; oa_kartyshev@mail.ru; zap@nau.edu.ua; olivier.penanhoat@snecma.fr; paul.madden@rolls-royce.com; r.rizzi@enac.gov.it; rodrigo.padilha@anac.gov.br; roger.schaufele@faa.gov; Romain.ROLLET@adp.fr; S.Balasubramania.CTR@dot.gov; thierry.delort@aviation-civile.gouv.fr; tpohle@airlines.org; uj@janicke.de; V3V@yandex.ru; bonnefoy_philippe@bluesky-d2d.com; McConnachie_Dominic@bah.com; Jacob.Wishart@dot.gov; Eric.Upton@gulfstream.com; daniel.m.allyn@boeing.com; Daniel.Jacob@faa.gov; Theo.Rindlisbacher@bazl.admin.ch; b.owen@mmu.ac.uk; yuriy.medved@gmail.com
Subject: FESG-MDG/7 Agenda Revisions & conferencing details
Importance: High

Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Personal Security Detail / Ex. 6

Regards,
Maryalice Locke
Aviation Emissions Division, AEE-300
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U.S. Federal Aviation Administration
800 Independence Avenue SW, Washington DC 20591
Phone: 202-267-3495 Office
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laurent.box@eurocontrol.int; lindsey.leah@epa.gov; L.Lim@mmu.ac.uk; mark.a.augustyniewicz@boeing.com; merlijn.den.boer
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Daniel.Jacob@faa.gov;
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b.owen@mmu.ac.uk;

Message

From: Bilcock, David [david.bilcock@tc.gc.ca]
Sent: 1/26/2018 9:53:06 PM
To: 'Laszlo.Windhoffer@faa.gov' [Laszlo.Windhoffer@faa.gov]; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy [wendy.bailey@tc.gc.ca]; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: RE: NAA-Only ESSTsg Telecon
Attachments: CTG ESSTsg: TCCA input for NAA discussion

All,

To get the ball rolling, the attached email is TCCA's thoughts on the various actions from the last ESSTsg call.

David Bilcock
Senior Engineer, Powerplants & Emissions / Ingénieur principal, Groupe moteurs et émissions
National Aircraft Certification / Certification nationale des aéronefs
Ph. / tél.: (613) 617-6821
facsimile / télécopieur: (613) 996-9178
e-mail: David.Bilcock@tc.gc.ca
Transport Canada / Transports Canada,
159, Cleopatra Dr, Nepean (AARD)
Ontario, K1A 0N5
Government of Canada / Gouvernement du Canada

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Friday, January 26, 2018 4:25 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy <wendy.bailey@tc.gc.ca>; Bilcock, David <david.bilcock@tc.gc.ca>; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: NAA-Only ESSTsg Telecon

Dear NAAs,

Since the full ESSTsg telecon was cancelled, this should be a good opportunity to hold an NAA-only telecon at the same date/time (30 Jan @ 09:30 Eastern).

Deliberative Process / Ex. 5

Hope the date/time works for everyone since the other call was cancelled, I'll send out a calendar invitation shortly.

Thank you

László Windhoffer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, S.W.
Washington, DC 20591
T: +1-202-267-4741

Message

From: Madden, Paul C [Paul.Madden@Rolls-Royce.com]
Sent: 1/26/2018 9:51:21 PM
To: Laszlo.Windhoffer@faa.gov; nicole.didyk-wells@faa.gov; andy@boom.aero; arnaud.bonnet@embraer.com.br; Bake, Sebastian [Sebastian.Bake@Rolls-Royce.com]; Brian.Kim@pw.utc.com; bruno.hamon@aviation-civile.gouv.fr; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Ahrens, Denise [Denise.Ahrens@Rolls-Royce.com]; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; jorge.fernandez@faa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; sandy.liu@faa.gov; maryalice.locke@faa.gov; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; b.owen@mmu.ac.uk; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: RE: CTG ESSTsg T8-4

Deliberative Process / Ex. 5

We can discuss this all in Brazil, cheers, Paul

Sent with BlackBerry Work
(www.blackberry.com)

From: Laszlo.Windhoffer@faa.gov <Laszlo.Windhoffer@faa.gov>
Date: Friday, 26 Jan 2018, 1:25 pm
To: nicole.didyk-wells@faa.gov <nicole.didyk-wells@faa.gov>, andy@boom.aero <andy@boom.aero>, arnaud.bonnet@embraer.com.br <arnaud.bonnet@embraer.com.br>, Bake, Sebastian <Sebastian.Bake@Rolls-Royce.com>, Brian.Kim@pw.utc.com <Brian.Kim@pw.utc.com>, bruno.hamon@aviation-civile.gouv.fr <bruno.hamon@aviation-civile.gouv.fr>, charles.etter@gulfstream.com <charles.etter@gulfstream.com>, charles.renard@airbus.com <charles.renard@airbus.com>, clarence.t.chang@nasa.gov <clarence.t.chang@nasa.gov>, Rebecca.Cointin@faa.gov <Rebecca.Cointin@faa.gov>, daltherr@aerioncorp.com <daltherr@aerioncorp.com>, daniel.m.allyn@boeing.com <daniel.m.allyn@boeing.com>, david.anvid@delta.com <david.anvid@delta.com>, david.bilcock@tc.gc.ca <david.bilcock@tc.gc.ca>, Ahrens, Denise <Denise.Ahrens@Rolls-Royce.com>, domingo.Sepulveda@pw.utc.com <domingo.Sepulveda@pw.utc.com>, ecotti@nbaa.org <ecotti@nbaa.org>, eli@boom.aero <eli@boom.aero>,

Eric.Upton@gulfstream.com <Eric.Upton@gulfstream.com>, Erika.herms@easa.europa.eu <Erika.herms@easa.europa.eu>, jorge.fernandez@faa.gov <jorge.fernandez@faa.gov>, Ralph.Iovinelli@faa.gov <Ralph.Iovinelli@faa.gov>, Daniel.Jacob@faa.gov <Daniel.Jacob@faa.gov>, jean-francois.perelgritz@airbus.com <jean-francois.perelgritz@airbus.com>, jeff.berton@nasa.gov <jeff.berton@nasa.gov>, jerome.sarda@aviation-civile.gouv.fr <jerome.sarda@aviation-civile.gouv.fr>, john.morgenstern@lmco.com <john.morgenstern@lmco.com>, jonathan.a.seidel@nasa.gov <jonathan.a.seidel@nasa.gov>, joseph.zelina@ge.com <joseph.zelina@ge.com>, jrmatisheck@aerioncorp.com <jrmatisheck@aerioncorp.com>, JScavuzzi@aci.aero <JScavuzzi@aci.aero>, karin@theicct.org <karin@theicct.org>, sandy.liu@faa.gov <sandy.liu@faa.gov>, maryalice.locke@faa.gov <maryalice.locke@faa.gov>, luiz.tobaldini@embraer.com.br <luiz.tobaldini@embraer.com.br>, maeroff.bruce@epa.gov <maeroff.bruce@epa.gov>, marie.hankanen@transportstyrelsen.se <marie.hankanen@transportstyrelsen.se>, Martin.Plohr@dlr.de <Martin.Plohr@dlr.de>, Mike.garrison@boeing.com <Mike.garrison@boeing.com>, mirzoyan@ciam.ru <mirzoyan@ciam.ru>, Moriyama-m2ff@mlit.go.jp <Moriyama-m2ff@mlit.go.jp>, mueller.john@epa.gov <mueller.john@epa.gov>, ndickson@icao.int <ndickson@icao.int>, b.owen@mmu.ac.uk <b.owen@mmu.ac.uk>, Madden, Paul C <Paul.Madden@Rolls-Royce.com>, paul.peeters1000@gmail.com <paul.peeters1000@gmail.com>, raymond@boom.aero <raymond@boom.aero>, ricardo.dupont@anac.gov.br <ricardo.dupont@anac.gov.br>, rick@aerodyne.com <rick@aerodyne.com>, robbie.cowart@gulfstream.com <robbie.cowart@gulfstream.com>, rudolph.dudebout@honeywell.com <rudolph.dudebout@honeywell.com>, Stephane.Lemaire@dassault-aviation.com <Stephane.Lemaire@dassault-aviation.com>, stephen.kramer@pw.utc.com <stephen.kramer@pw.utc.com>, sturdza@aerioncorp.com <sturdza@aerioncorp.com>, Thierry.Percheron@dassault-aviation.com <Thierry.Percheron@dassault-aviation.com>, TPohle@airlines.org <TPohle@airlines.org>, wendy.bailey@tc.gc.ca <wendy.bailey@tc.gc.ca>, werner.hoermann@easa.europa.eu <werner.hoermann@easa.europa.eu>, willem.franken@easa.europa.eu <willem.franken@easa.europa.eu>, xiaojunyoung@hotmail.com <xiaojunyoung@hotmail.com>, yuriy.medved@gmail.com <yuriy.medved@gmail.com>
Subject: RE: CTG ESSTsg T8-4

Dear All,

This is to confirm that we will not hold the ESSTsg telecon scheduled for 30 Jan. As such, the calendar invitation was cancelled by Nicole.

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
T. +1-202-267-4741

From: Windhoffer, Laszlo (FAA)
Sent: Monday, January 22, 2018 4:01 PM
To: Didyk-Wells, Nicole (FAA) <nicole.didyk-wells@faa.gov>; andy@boom.aero; arnaud.bonnet@embraer.com.br; Bake, Sebastian <Sebastian.Bake@Rolls-Royce.com>; Brian.Kim@pw.utc.com; Bruno HAMON <bruno.hamon@aviation-civile.gouv.fr>; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; Liu, Sandy (FAA) <sandy.liu@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; Owen <b.owen@mmu.ac.uk>; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com;

Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: RE: CTG ESSTsg T8-4

Dear All,

Deliberative Process / Ex. 5

Thanks and please let us know.

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

-----Original Appointment-----
From: Didyk-Wells, Nicole (FAA)
To: Didyk-Wells, Nicole (FAA); andy@boom.aero; arnaud.bonnet@embraer.com.br; Bake, Sebastian; Brian.Kim@pw.utc.com; Bruno HAMON; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA); daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; Fernandez, Jorge (FAA); Iovinelli, Ralph (FAA); Jacob, Daniel (FAA); jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; Liu, Sandy (FAA); Locke, Maryalice (FAA); luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; Owen; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Windhoffer, Laszlo (FAA); xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: CTG ESSTsg T8-4
When: Tuesday, January 30, 2018 9:30 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).
Where: Telecon

Personal Security Detail / Ex. 6

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Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 1/26/2018 9:25:25 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; wendy.bailey@tc.gc.ca; david.bilcock@tc.gc.ca; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov
Subject: NAA-Only ESSTsg Telecon
Attachments: ESSTG Telecon T8-1a Meeting Minutes 20180109.doc

Dear NAAs,

Since the full ESSTsg telecon was cancelled, this should be a good opportunity to hold an NAA-only telecon at the same date/time (30 Jan @ 09:30 Eastern).

Deliberative Process / Ex. 5

Hope the date/time works for everyone since the other call was cancelled, I'll send out a calendar invitation shortly.

Thank you

Laszlo Windhoffer
Federal Aviation Administration
Office of Environment & Energy
800 Independence Avenue, S.W.
Washington, DC 20591
T: +1-202-267-4741

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 1/26/2018 9:24:14 PM
To: nicole.didyk-wells@faa.gov; andy@boom.aero; arnaud.bonnet@embraer.com.br; Sebastian.Bake@Rolls-Royce.com; Brian.Kim@pw.utc.com; bruno.hamon@aviation-civile.gouv.fr; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; jorge.fernandez@faa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; sandy.liu@faa.gov; maryalice.locke@faa.gov; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; b.owen@mmu.ac.uk; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: RE: CTG ESSTsg T8-4
Attachments: ESSTG Telecon T8-1a Meeting Minutes 20180109.doc

Dear All,

This is to confirm that we will not hold the ESSTsg telecon scheduled for 30 Jan. As such, the calendar invitation was cancelled by Nicole.

Deliberative Process / Ex. 5

Thank you

László Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

From: Windhoffer, Laszlo (FAA)
Sent: Monday, January 22, 2018 4:01 PM
To: Didyk-Wells, Nicole (FAA) <nicole.didyk-wells@faa.gov>; andy@boom.aero; arnaud.bonnet@embraer.com.br; Bake, Sebastian <Sebastian.Bake@Rolls-Royce.com>; Brian.Kim@pw.utc.com; Bruno HAMON <bruno.hamon@aviation-civile.gouv.fr>; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA) <Rebecca.Cointin@faa.gov>; daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; Fernandez, Jorge (FAA) <jorge.fernandez@faa.gov>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Jacob, Daniel (FAA) <Daniel.Jacob@faa.gov>; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; Liu, Sandy (FAA) <sandy.liu@faa.gov>; Locke, Maryalice (FAA) <maryalice.locke@faa.gov>; luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru;

Moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; Owen <b.owen@mmu.ac.uk>; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: RE: CTG ESSTsg T8-4

Dear All,

Deliberative Process / Ex. 5

Thanks and please let us know.

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

-----Original Appointment-----
From: Didyk-Wells, Nicole (FAA)
To: Didyk-Wells, Nicole (FAA); andy@boom.aero; arnaud.bonnet@embraer.com.br; Bake, Sebastian; Brian.Kim@pw.utc.com; Bruno HAMON; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA); daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; Fernandez, Jorge (FAA); Iovinelli, Ralph (FAA); Jacob, Daniel (FAA); jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; Liu, Sandy (FAA); Locke, Maryalice (FAA); luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; Owen; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Windhoffer, Laszlo (FAA); xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: CTG ESSTsg T8-4
When: Tuesday, January 30, 2018 9:30 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).
Where: Telecon

Personal Security Detail / Ex. 6

Message

From: Fleming, Gregg G (Volpe) [Gregg.Fleming@dot.gov]
Sent: 4/24/2018 6:02:04 PM
To: Silva, Bruno [BSilva@icao.int]; emanuel.fleuti@zurich-airport.com; RMarchi@aci-na.org; jscavuzzi@aci.aero; istimac@zagreb-airport.hr; inger.seeberg@cph.dk; MPagliarello@aci-na.org; vivek.sindhamani@naco.rhdhv.com; rodrigo.padilha@anac.gov.br; sylvie.mallet@tc.gc.ca; scott.mckibbon@canada.ca; Fudge, Ted [Ted.Fudge@CANSO.org]; xnma@cauc.edu.cn; amiraa.elsayed@gmail.com; stephen.arrowsmith@easa.europa.eu; laurent.box@eurocontrol.int; David.BRAIN@eurocontrol.int; laurent.cavadini@eurocontrol.int; ivan.de-lepinay@easa.europa.eu; robin.deransy@eurocontrol.int; chris@limitedskies.com; willem.franken@easa.europa.eu; gareth.Horton@ricardo-aea.com; david.marsh@eurocontrol.int; Marco.PAVIOTTI@ec.europa.eu; stavros.stromatas@env-isa.com; emilia.suomalainen@env-isa.com; thierry.delort@aviation-civile.gouv.fr; kevin.guittet@aviation-civile.gouv.fr; julien.lepoutre@aviation-civile.gouv.fr; didier.martin@aviation-civile.gouv.fr; nadia.meddour@aviation-civile.gouv.fr; david.smagghe@aviation-civile.gouv.fr; uj@janicke.de; Martin.Schaefer@bmvi.bund.de; adamm@iata.org; perovicj@iata.org; tpohle@airlines.org; nauckhoffj@iata.org; Ecotti@NBAA.org; bparry@ebaa.org; Andrianiaina.Rajaobelina@aero.bombardier.com; daniel.m.allyn@boeing.com; mark.a.augustyniewicz@boeing.com; jean-michel.boiteux@snecma.fr; arnaud.bonnet@embraer.com.br; daniel.brown@honeywell.com; andrew.chuang@boeing.com; dominique.collin@snecma.fr; barbara.cooreman@asd-europe.org; lionel.cousseins@airbus.com; thomas.crabtree@boeing.com; Jim Dow [Jdow@iccaia.org]; rudolph.dudebout@honeywell.com; Galotti, Vincent [Vgalotti.iccaia@gmail.com]; Andrew.Gordon@airbus.com; laurence.gray@pw.utc.com; mark.huising@aero.bombardier.com; Brian.Kim@pw.utc.com; Mikael.LABY@airbus.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; muni.majjigi@ge.com; yoann.mery@snecma.fr; krisha.nobrega@embraer.com.br; olivier.penanhoat@snecma.fr; Thierry.Percheron@dassault-aviation.com; leslie.riegle@aia-aerospace.org; CAMILLE.SAGUES@airbus.com; domingo.Sepulveda@pw.utc.com; robert.b.solaimani@boeing.com; cheikhdjiby.sow@snecma.fr; Eric.Upton@gulfstream.com; joseph.zelina@ge.com; Brandon Graver [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user0e3b7bdb]; karin@theicct.org; paul.peeters1000@gmail.com; pedro.piriscabezas@gmail.com; ahyani@dephub.go.id; nandi_wardhana@dephub.go.id; r.rizzi@enac.gov.it; t-nakazawa@aeif.or.jp; merlijn.den.boer@nlr.nl; oa_kartyshev@mail.ru; aviamarket@gosniiga.ru; yuriy.medved@gmail.com; mirzoyan@ciam.ru; catherine.marthe@bazl.admin.ch; Theo.Rindlisbacher@bazl.admin.ch; urs.ziegler@bazl.admin.ch; kazhank@gmail.com; synyka@googlemail.com; zap@nau.edu.ua; s.christie@mmu.ac.uk; d.s.lee@mmu.ac.uk; L.Lim@mmu.ac.uk; b.owen@mmu.ac.uk; darren.rhodes@caa.co.uk; Jonathan.Saks@dft.gsi.gov.uk; edward.weston@caa.co.uk; Gia.Kroeff@caa.co.uk; Balasubramanian, Sathya CTR (Volpe) [S.Balasubramania.CTR@dot.gov]; Barlett, Anna <AWA> [anna.barlett@faa.gov]; Boeker, Eric (Volpe) [Eric.Boeker@dot.gov]; bonnefoy_philippe@bluesky-d2d.com; Cointin, Rebecca <AWA> [rebecca.cointin@faa.gov]; Ding, Li <AWA> [li.ding@faa.gov]; Grandi, Fabio <AWA> [fabio.grandi@faa.gov]; Hileman, James <AWA> [james.hileman@faa.gov]; Holsclaw, Curtis <AWA> [curtis.holsclaw@faa.gov]; Iovinelli, Ralph <AWA> [ralph.iovinelli@faa.gov]; Jacob, Daniel <AWA> [daniel.jacob@faa.gov]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; K L [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user8190c13c]; Locke, Maryalice <AWA> [maryalice.locke@faa.gov]; Marks, Julie <AWA> [julie.marks@faa.gov]; McConnachie_Dominic@bah.com; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Pace, David (Volpe) [David.Pace@dot.gov]; Raiffa_Gregory@bah.com; Scata, Donald <AWA> [donald.scata@faa.gov]; Schaufele, Roger <AWA> [roger.schaufele@faa.gov]; vws1 [vws1@psu.edu]; Vanek, Adrienne <AWA> [adrienne.vanek@faa.gov]; Wharff, Jeffrey <AWA> [jeffrey.wharff@faa.gov]; Wishart, Jacob (Volpe) [Jacob.Wishart@dot.gov]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; robert.mauri@aviation-civile.gouv.fr; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]
CC: Mittelman, Anjuliee (Volpe) [Anjuliee.Mittelman@dot.gov]; Fleming, Gregg G (Volpe) [Gregg.Fleming@dot.gov]
Subject: RE: MDG Progress Report WP
Attachments: CAEPSG 20183 WPXX_Coordination_Items_Draft_042418.docx

Deliberative Process / Ex. 5

From: Fleming, Gregg G (Volpe)
Sent: Sunday, April 22, 2018 5:42 PM
To: Silva, Bruno <BSilva@icao.int>; emanuel.fleuti@zurich-airport.com; RMarchi@aci-na.org; jscavuzzi@aci.aero; istimac@zagreb-airport.hr; inger.seeberg@cph.dk; MPagliarello@aci-na.org; vivek.sindhamani@naco.rhdhv.com; rodrigo.padilha@anac.gov.br; sylvie.mallet@tc.gc.ca; scott.mckibbon@canada.ca; Fudge, Ted <Ted.Fudge@CANSO.org>; xnma@cauc.edu.cn; amiraa.elsayed@gmail.com; stephen.arrowsmith@easa.europa.eu; laurent.box@eurocontrol.int; David.BRAIN@eurocontrol.int; laurent.cavadini@eurocontrol.int; ivan.de-lepinay@easa.europa.eu; robin.deransy@eurocontrol.int; chris@limitedskies.com; willem.franken@easa.europa.eu; gareth.Horton@ricardo-aea.com; david.marsh@eurocontrol.int; Marco.PAVIOTTI@ec.europa.eu; stavros.stromatas@env-isa.com; emilia.suomalainen@env-isa.com; thierry.delort@aviation-civile.gouv.fr; kevin.guittet@aviation-civile.gouv.fr; julien.lepoutre@aviation-civile.gouv.fr; didier.martin@aviation-civile.gouv.fr; nadia.meddour@aviation-civile.gouv.fr; david.smagghe@aviation-civile.gouv.fr; uj@janicke.de; Martin.Schaefer@bmvi.bund.de; adamm@iata.org; perovicj@iata.org; tpohle@airlines.org; nauckhoffj@iata.org; Ecotti@NBAA.org; bparry@ebaa.org; Andrianiaina.Rajaobelina@aero.bombardier.com; daniel.m.allyn@boeing.com; mark.a.augustyniewicz@boeing.com; jean-michel.boiteux@snecma.fr; arnaud.bonnet@embraer.com.br; daniel.brown@honeywell.com; andrew.chuang@boeing.com; dominique.collin@snecma.fr; barbara.cooreman@asd-europe.org; lionel.cousseins@airbus.com; thomas.crabtree@boeing.com; Jim Dow <Jdow@iccaia.org>; rudolph.dudebout@honeywell.com; Galotti, Vincent <Vgalotti.iccaia@gmail.com>; Andrew.Gordon@airbus.com; laurence.gray@pw.utc.com; mark.huising@aero.bombardier.com; Brian.Kim@pw.utc.com; Mikael.LABY@airbus.com; david.lye@aero.bombardier.com; paul.madden@rolls-royce.com; muni.majjigi@ge.com; yoann.mery@snecma.fr; krisha.nobrega@embraer.com.br; olivier.penanhoat@snecma.fr; Thierry.Percheron@dassault-aviation.com; leslie.riegle@aia-aerospace.org; CAMILLE.SAGUES@airbus.com; domingo.Sepulveda@pw.utc.com; robert.b.solaimani@boeing.com; cheikhdjiby.sow@snecma.fr; Eric.Upton@gulfstream.com; joseph.zelina@ge.com; b.graver@theicct.org; karin@theicct.org; paul.peeters1000@gmail.com; pedro.piriscabezas@gmail.com; ahyani@dephub.go.id; nandi_wardhana@dephub.go.id; r.rizzi@enac.gov.it; t-nakazawa@aeif.or.jp; merlijn.den.boer@nlr.nl; oa_kartyshev@mail.ru; aviamarket@gosniiga.ru; yuriy.medved@gmail.com; mirzoyan@ciam.ru; catherine.marthe@bazl.admin.ch; Theo.Rindlisbacher@bazl.admin.ch; urs.ziegler@bazl.admin.ch; kazhank@gmail.com; synyka@googlemail.com; zap@nau.edu.ua; s.christie@mmu.ac.uk; d.s.lee@mmu.ac.uk; L.Lim@mmu.ac.uk; b.owen@mmu.ac.uk; darren.rhodes@caa.co.uk; Jonathan.Saks@dft.gsi.gov.uk; edward.weston@caa.co.uk; Gia.Kroeff@caa.co.uk; Balasubramanian, Sathya CTR (Volpe) <S.Balasubramania.CTR@dot.gov>; Barlett, Anna <AWA> <anna.barlett@faa.gov>; Boeker, Eric (Volpe) <Eric.Boeker@dot.gov>; bonnefoy_philippe@bluesky-d2d.com; Cointin, Rebecca <AWA> <rebecca.cointin@faa.gov>; Ding, Li <AWA> <li.ding@faa.gov>; Grandi, Fabio <AWA> <fabio.grandi@faa.gov>; Hileman, James <AWA> <james.hileman@faa.gov>; Holsclaw, Curtis <AWA> <curtis.holsclaw@faa.gov>; Iovinelli, Ralph <AWA> <ralph.iovinelli@faa.gov>; Jacob, Daniel <AWA> <daniel.jacob@faa.gov>; leggett.cullen@epa.gov; Lewis, Kristin (Volpe) <Kristin.Lewis@dot.gov>; Locke, Maryalice <AWA> <maryalice.locke@faa.gov>; Marks, Julie <AWA> <julie.marks@faa.gov>; McConnachie_Dominic@bah.com; mueller.john@epa.gov; Pace, David (Volpe) <David.Pace@dot.gov>; Raiffa_Gregory@bah.com; Scata, Donald <AWA> <donald.scata@faa.gov>; Schaufele, Roger <AWA> <roger.schaufele@faa.gov>; vws1 <vws1@psu.edu>; Vanek, Adrienne <AWA> <adrienne.vanek@faa.gov>; Wharff, Jeffrey <AWA> <jeffrey.wharff@faa.gov>; Wishart, Jacob (Volpe) <Jacob.Wishart@dot.gov>; wolfe.philip@epa.gov; yen.david@epa.gov; robert.mauri@aviation-civile.gouv.fr; lindsey.leah@epa.gov; gerring.holly@epa.gov
Cc: Mittelman, Anjuliee (Volpe) <Anjuliee.Mittelman@dot.gov>
Subject: MDG Progress Report WP

Deliberative Process / Ex. 5

Message

From: Laszlo.Windhoffer@faa.gov [Laszlo.Windhoffer@faa.gov]
Sent: 1/22/2018 9:00:58 PM
To: nicole.didyk-wells@faa.gov; andy@boom.aero; arnaud.bonnet@embraer.com.br; Sebastian.Bake@Rolls-Royce.com; Brian.Kim@pw.utc.com; bruno.hamon@aviation-civile.gouv.fr; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Rebecca.Cointin@faa.gov; daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; jorge.fernandez@faa.gov; Ralph.Iovinelli@faa.gov; Daniel.Jacob@faa.gov; jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; sandy.liu@faa.gov; maryalice.locke@faa.gov; luiz.tobaldini@embraer.com.br; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; marie.hankanen@transportstyrelsen.se; Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; ndickson@icao.int; b.owen@mmu.ac.uk; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: RE: CTG ESSTsg T8-4
Attachments: ESSTG Telecon T8-1a Meeting Minutes 20180109.doc

Dear All,

Deliberative Process / Ex. 5

Thanks and please let us know.

László Windhoffer
Federal Aviation Administration
T +1-202-267-4741

-----Original Appointment-----
From: Didyk-Wells, Nicole (FAA)
To: Didyk-Wells, Nicole (FAA); andy@boom.aero; arnaud.bonnet@embraer.com.br; Bake, Sebastian; Brian.Kim@pw.utc.com; Bruno HAMON; charles.etter@gulfstream.com; charles.renard@airbus.com; clarence.t.chang@nasa.gov; Cointin, Rebecca (FAA); daltherr@aerioncorp.com; daniel.m.allyn@boeing.com; david.anvid@delta.com; david.bilcock@tc.gc.ca; Denise.Ahrens@Rolls-Royce.com; domingo.Sepulveda@pw.utc.com; ecotti@nbaa.org; eli@boom.aero; Eric.Upton@gulfstream.com; Erika.herms@easa.europa.eu; Fernandez, Jorge (FAA); Iovinelli, Ralph (FAA); Jacob, Daniel (FAA); jean-francois.perelgritz@airbus.com; jeff.berton@nasa.gov; jerome.sarda@aviation-civile.gouv.fr; john.morgenstern@lmco.com; jonathan.a.seidel@nasa.gov; joseph.zelina@ge.com; jrmatisheck@aerioncorp.com; JScavuzzi@aci.aero; karin@theicct.org; Liu, Sandy (FAA); Locke, Maryalice (FAA); luiz.tobaldini@embraer.com.br; maeroff.bruce@epa.gov; marie.hankanen@transportstyrelsen.se;

Martin.Plohr@dlr.de; Mike.garrison@boeing.com; mirzoyan@ciam.ru; Moriyama-m2ff@mlit.go.jp; mueller.john@epa.gov; ndickson@icao.int; Owen; paul.madden@rolls-royce.com; paul.peeters1000@gmail.com; raymond@boom.aero; ricardo.dupont@anac.gov.br; rick@aerodyne.com; robbie.cowart@gulfstream.com; rudolph.dudebout@honeywell.com; Stephane.Lemaire@dassault-aviation.com; stephen.kramer@pw.utc.com; sturdza@aerioncorp.com; Thierry.Percheron@dassault-aviation.com; TPohle@airlines.org; wendy.bailey@tc.gc.ca; werner.hoermann@easa.europa.eu; willem.franken@easa.europa.eu; Windhoffer, Laszlo (FAA); xiaojunyoung@hotmail.com; yuriy.medved@gmail.com
Subject: CTG ESSTsg T8-4
When: Tuesday, January 30, 2018 9:30 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).
Where: Telecon

Personal Security Detail / Ex. 6

Message

From: Bilcock, David [david.bilcock@tc.gc.ca]
Sent: 2/8/2018 9:36:25 PM
To: 'Laszlo.Windhoffer@faa.gov' [Laszlo.Windhoffer@faa.gov]; Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy [wendy.bailey@tc.gc.ca]; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]
Subject: RE: NAA-Only ESSTsg

Laszlo, all,

The meeting notes look complete.

Deliberative Process / Ex. 5

Kind regards,
Dave

From: Laszlo.Windhoffer@faa.gov [mailto:Laszlo.Windhoffer@faa.gov]
Sent: Thursday, February 08, 2018 3:11 PM
To: Theo.Rindlisbacher@bazl.admin.ch; jerome.sarda@aviation-civile.gouv.fr; ricardo.Dupont@anac.gov.br; Bailey, Wendy <wendy.bailey@tc.gc.ca>; Bilcock, David <david.bilcock@tc.gc.ca>; werner.hoermann@easa.europa.eu; jorge.fernandez@faa.gov; Daniel.Jacob@faa.gov; martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; michael.lunter@minienm.nl; thobias.log@transportstyrelsen.se; Ralph.Iovinelli@faa.gov; erika.herms@easa.europa.eu; sandy.liu@faa.gov; B.Owen@mmu.ac.uk; Rebecca.Cointin@faa.gov; James.Hileman@faa.gov; maryalice.locke@faa.gov; Laszlo.Windhoffer@faa.gov; marie.hankanen@transportstyrelsen.se; willem.franken@easa.europa.eu; mueller.john@epa.gov; jonathan.gilad@aviation-civile.gouv.fr; xiaojunyoung@hotmail.com; nicole.didyk-wells@faa.gov; jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; NDickson@icao.int; Leggett.Cullen@epa.gov
Subject: RE: NAA-Only ESSTsg

Dear All,

Deliberative Process / Ex. 5

Also, below is a summary of notes from our 30 Jan 2018 telecon. Please let us know if anything is missing.

Thank you

Attendees: DaveB, ErikaH, BethanO, CullenL, JauhariA, RicardoD, XiaojunY, MaryaliceL, RalphI, NicoleD, LaszloW

Deliberative Process / Ex. 5

Laszlo Windhoffer
Federal Aviation Administration
T: +1-202-267-4741

-----Original Appointment-----
From: Windhoffer, Laszlo (FAA)
Sent: Friday, January 26, 2018 4:27 PM
To: Windhoffer, Laszlo (FAA); FOCA - Theo.Rindlisbacher@bazl.admin.ch (Theo.Rindlisbacher@bazl.admin.ch); jerome.sarda@aviation-civile.gouv.fr; Ricardo Antonio Binotto Dupont (ricardo.Dupont@anac.gov.br); Bailey, Wendy; Transport Canada - David Bilcock (david.bilcock@tc.gc.ca); werner.hoermann@easa.europa.eu; Fernandez, Jorge (FAA); Jacob, Daniel (FAA); martin.schaefer@bmvi.bund.de; matsukawa-h2fg@mlit.go.jp; arif_fajari@dephub.go.id; Jauhari_ARSAD@caas.gov.sg; Netherlands MINIENM - Michael Lunter (michael.lunter@minienm.nl) (michael.lunter@minienm.nl); thobias.log@transportstyrelsen.se; Iovinelli, Ralph (FAA); erika.herms@easa.europa.eu; Liu, Sandy (FAA); Bethan Owen; Cointin, Rebecca (FAA); Hileman, James (FAA); Locke, Maryalice (FAA); Windhoffer, Laszlo (FAA) (Laszlo.Windhoffer@faa.gov); marie.hankanen@transportstyrelsen.se; FRANKEN Willem (willem.franken@easa.europa.eu); Mueller, John (mueller.john@epa.gov); jonathan.gilad@aviation-civile.gouv.fr; University of Civil Aviation China - Yang Xiaojun (xiaojunyoung@hotmail.com); Didyk-Wells, Nicole (FAA); jonathan.a.seidel@nasa.gov; clarence.t.chang@nasa.gov; Dickson, Neil
Subject: NAA-Only ESSTsg

When: Tuesday, January 30, 2018 9:30 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: See telecon/Webex info below

Deliberative Process / Ex. 5

Please let me know if anyone appears to be missing from this invitation. Thanks and talk to you soon.

Personal Security Detail / Ex. 6

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/5/2018 9:43:49 AM
To: Rutherford [Dan@theicct.org]
Subject: ICCAIA paper on SST emissions
Attachments: CAEP11_WG3-09_CTG-09_WP10 [Update on Progress to a Supersonic Emissions Standard Rev1].pdf

Dan,

Here is the latest paper on your question about whether subsonic HC, CO, and smoke are feasible for SST.

-John

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 3/27/2018 1:33:50 PM
To: Laszlo Windhoffer [laszlo.windhoffer@faa.gov]; Eric Upton [eric.upton@gulfstream.com]
Subject: Just me from EPA on the ESST call today

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 5/8/2018 8:26:51 PM
To: Salazar-Greene, Natalie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=90e6598b81bf4603a74cf349e8fb2e98-Salazar-Gre]; MacAllister, Julia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d72e3dbea2843018007b53de3670d90-MacAllister, Julia]
Subject: Trip report for CAEP WG3-9 meeting in Derby, UK last week
Attachments: Trip Report for John Mueller - Derby UK April May 2018.docx

Julia/Natalie,

Attached is my trip report for the trip to Derby, UK last week. Let me know if this suffices or if you need anything else.

Thanks,
John

Trip Report for John Mueller – Derby, UK, April 30-May 4, 2018
(ICAO/CAEP Working Group 3 Meeting)

Working Group 3 (WG3) is an emissions technical group within the International Civil Aviation Organization's (ICAO) Committee of Aviation Environmental Protection (CAEP). This meeting in Derby, UK was the ninth of ten meetings this three-year cycle of the group. The group is currently concentrating on developing the first real non-volatile Particulate Matter (nvPM) standards for aircraft engines. This project is at a critical point in its development, with a transition standard being agreed to at CAEP/10 and work on an initial stringency underway this CAEP cycle. In addition to the nvPM work, the group is currently addressing a variety of certification-related issues within the Certification Task Group (CTG) as well as work on technology review efforts within the Technology Goals Task Group (TGTG).

John participated in the all of the meetings. Significant discussions within PMTG centered on resolving issues associated with the technology response framework so that benefits and cost modeling can proceed, a path forward on mandatory loss correction reporting, a final decision on characteristic level factors for the CAEP11 nvPM mass and number standards, and initial discussions on a potential path to sunsetting the existing smoke standards in favor of nvPM standards. Within CTG, the primary discussion involved the development of papers to Steering Group 2018 laying out options for and seeking guidance on a path forward for updating the emissions regulations for supersonic engines, as well as a variety of implementation issues associated with the CAEP10 aircraft CO2 standards.

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 4/17/2018 1:34:19 PM
To: laszlo.windhoffer@faa.gov; Eric.Upton@gulfstream.com
Subject: NNTO: John Mueller is on the ESST call

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 1/29/2018 12:59:52 PM
To: Laszlo.Windhoffer@faa.gov

Subject: Accepted: NAA-Only ESSTsg
Location: See telecon/Webex info below

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:30:00 PM
Show Time As: Busy

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 7/27/2018 7:05:15 PM
To: Kim, Brian PW [Brian.Kim@pw.utc.com]
CC: KRAMER, STEPHEN K PW [stephen.kramer@pw.utc.com]; Ralph.Iovinelli@faa.gov
Subject: RE: Possible call with EPA/FAA on SST

Brian,

Thanks for your willingness to do this. As I mentioned when we talked the other day, FAA would also like to be involved so I've cc'd Ralph on this reply.

August 7 probably won't work for us, but Aug 9 would be good. I will have to check on the Aug 13-17 dates and get back to you next Tuesday – have to find out what the plan is at home for moving our son back to college.

Thanks,
John

From: Kim, Brian PW [mailto:Brian.Kim@pw.utc.com]
Sent: Thursday, July 26, 2018 3:07 PM
To: Mueller, John <mueller.john@epa.gov>
Cc: KRAMER, STEPHEN K PW <stephen.kramer@pw.utc.com>
Subject: RE: Possible call with EPA/FAA on SST

John,

As we discussed yesterday, this should be fine....and Stephen Kramer who is leading P&W's efforts on this has confirmed.

I think it makes sense to discuss with EPA after the meeting with FAA/EASA, and so, some suggested days/times that would work for us are:

Aug 7: 2-3pm (the FAA/EASA discussion is at 11-1pm)
Aug 9: 1-2pm
Aug 13: 11-2pm
Aug 14: 11-12pm, 2-5pm
Aug 16: 1-4pm
Aug 17: 1-2pm

All of these times are in EDT and include 1 hour segments in case we cannot make any of the longer segments work.

-Brian

From: Mueller, John [mailto:mueller.john@epa.gov]
Sent: Thursday, July 26, 2018 1:56 PM
To: Kim, Brian PW
Subject: [External] Possible call with EPA/FAA on SST

Brian,

Following up on our phone conversation yesterday, I want to request that P&W consider having a call with EPA and FAA with the purpose of relaying information P&W has regarding the status of technology development for engines to be used on supersonic aircraft. We understand that the formal process for WG3 to develop the next steps on SST engine emissions is for the OEMs individually to meet collectively with EASA and FAA, who will then distill what they learn to a form suitable for presentation to WG3 in September. However, as the agency in the U.S. with the authority over setting of aircraft engine emissions standards, it would be most helpful to EPA if you'd be willing to share with us the information you plan to share with EASA/FAA. Be assured we would be most respectful and protective of any CBI you would share.

Thanks in advance for your consideration of this request. Let me know if you have any questions or would like to discuss this further.

Best Regards,
John Mueller

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 1/30/2018 2:07:40 PM
To: Laszlo.Windhoffer@faa.gov

Subject: Meeting Forward Notification: NAA-Only ESSTsg

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 3:00:00 PM
Show Time As: Busy

Your meeting was forwarded

Mueller, John has forwarded your meeting request to additional people.

Meeting

NAA-Only ESSTsg

Meeting Time

Tuesday, January 30, 2018 9:30 AM - Tuesday, January 30, 2018 11:30 AM

Recipients

Leggett, Cullen,Manning, Bryan

All times listed are in the following time zone: (UTC-05:00) Eastern Time (US & Canada)

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 7/26/2018 5:56:06 PM
To: Brian Kim - P&W [brian.kim@pw.utc.com]
Subject: Possible call with EPA/FAA on SST

Brian,

Following up on our phone conversation yesterday, I want to request that P&W consider having a call with EPA and FAA with the purpose of relaying information P&W has regarding the status of technology development for engines to be used on supersonic aircraft. We understand that the formal process for WG3 to develop the next steps on SST engine emissions is for the OEMs individually to meet collectively with EASA and FAA, who will then distill what they learn to a form suitable for presentation to WG3 in September. However, as the agency in the U.S. with the authority over setting of aircraft engine emissions standards, it would be most helpful to EPA if you'd be willing to share with us the information you plan to share with EASA/FAA. Be assured we would be most respectful and protective of any CBI you would share.

Thanks in advance for your consideration of this request. Let me know if you have any questions or would like to discuss this further.

Best Regards,
John Mueller

Appointment

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 1/29/2018 9:12:38 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]
BCC: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user75988d5f]

Subject: NAA SST call - optional
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:00:00 PM
Show Time As: Tentative

Appointment

From: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Sent: 8/11/2018 1:44:03 PM
To: KRAMER, STEPHEN K PW [stephen.kramer@pw.utc.com]

Subject: Accepted: Call w/ EPA/FAA on SST
Location: Webex

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Busy

Appointment

From: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Sent: 8/11/2018 1:43:49 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
BCC: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user75988d5f]

Subject: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Tentative

Discussion with FAA/EPA on P&W studies and perspective on SST.

Please forward as appropriate to other members of your organizations.

Call w/ EPA/FAA on SST
Thursday, August 23, 2018
1:00 pm | Eastern Daylight Time (New York, GMT-04:00) | 2 hrs

Meeting number: Personal Phone / Ex. 6
Personal Phone / Ex. 6

When it's time, join the meeting.

Join from a video system or application

Dial **Personal Phone / Ex. 6**

When dialing into AT&T before joining WebEx, link your integrated audio by dialing ---, followed by your Attendee ID, then #

Join by phone

Call-in toll-free number (ATT Audio Conference): Personal Phone / Ex. 6 US)

Call-in number (ATT Audio Conference): Personal Phone / Ex. 6 US)

Show global numbers

Access Code: Personal Phone / Ex. 6

Can't join the meeting?

IMPORTANT NOTICE: Please note that this Webex service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session

Appointment

From: Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Sent: 8/10/2018 6:23:47 PM
To: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
BCC: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user75988d5f]

Subject: SST call w/P&W
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 8/23/2018 5:00:00 PM
End: 8/23/2018 7:00:00 PM
Show Time As: Tentative

Call-in/webex to be sorted out

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 8/1/2018 8:32:05 PM
To: Kim, Brian PW [Brian.Kim@pw.utc.com]
CC: Ralph.Iovinelli@faa.gov; KRAMER, STEPHEN K PW [stephen.kramer@pw.utc.com]
Subject: RE: Possible call with EPA/FAA on SST

The 16th between 2-4 is much preferred at EPA. Like I said, the 17th might work, but can't confirm that now.

From: Kim, Brian PW [mailto:Brian.Kim@pw.utc.com]
Sent: Wednesday, August 01, 2018 4:30 PM
To: Mueller, John <mueller.john@epa.gov>
Cc: Ralph.Iovinelli@faa.gov; KRAMER, STEPHEN K PW <stephen.kramer@pw.utc.com>
Subject: RE: Possible call with EPA/FAA on SST

John, Ralph,

Unfortunately, the 9th is no longer good for us.

But the 16th and 17th would still work. Feel free to set up a calendar invite for either one.

Thanks,
Brian

From: Ralph.Iovinelli@faa.gov [mailto:Ralph.Iovinelli@faa.gov]
Sent: Wednesday, August 01, 2018 3:58 PM
To: mueller.john@epa.gov; Kim, Brian PW
Cc: KRAMER, STEPHEN K PW
Subject: [External] RE: Possible call with EPA/FAA on SST

John -- Thursday, Aug 9 from 2-3pm works for FAA --- this is our biweekly call time anyway...

Thanks,
Ralph

From: Mueller, John [mailto:mueller.john@epa.gov]
Sent: Wednesday, August 01, 2018 3:56 PM
To: Kim, Brian PW <Brian.Kim@pw.utc.com>
Cc: KRAMER, STEPHEN K PW <stephen.kramer@pw.utc.com>; Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>
Subject: RE: Possible call with EPA/FAA on SST

Hi Brian,

Just getting back to you on more possible dates. As I previously mentioned, the Aug 9 time would work for us. We could also do Aug 16 between 2-4. Possibly Aug 17 if neither of those will work for FAA.

Thanks,

John

From: Kim, Brian PW [mailto:Brian.Kim@pw.utc.com]
Sent: Thursday, July 26, 2018 3:07 PM
To: Mueller, John <mueller.john@epa.gov>
Cc: KRAMER, STEPHEN K PW <stephen.kramer@pw.utc.com>
Subject: RE: Possible call with EPA/FAA on SST

John,

As we discussed yesterday, this should be fine....and Stephen Kramer who is leading P&W's efforts on this has confirmed.

I think it makes sense to discuss with EPA after the meeting with FAA/EASA, and so, some suggested days/times that would work for us are:

Aug 7: 2-3pm (the FAA/EASA discussion is at 11-1pm)
Aug 9: 1-2pm
Aug 13: 11-2pm
Aug 14: 11-12pm, 2-5pm
Aug 16: 1-4pm
Aug 17: 1-2pm

All of these times are in EDT and include 1 hour segments in case we cannot make any of the longer segments work.

-Brian

From: Mueller, John [mailto:mueller.john@epa.gov]
Sent: Thursday, July 26, 2018 1:56 PM
To: Kim, Brian PW
Subject: [External] Possible call with EPA/FAA on SST

Brian,

Following up on our phone conversation yesterday, I want to request that P&W consider having a call with EPA and FAA with the purpose of relaying information P&W has regarding the status of technology development for engines to be used on supersonic aircraft. We understand that the formal process for WG3 to develop the next steps on SST engine emissions is for the OEMs individually to meet collectively with EASA and FAA, who will then distill what they learn to a form suitable for presentation to WG3 in September. However, as the agency in the U.S. with the authority over setting of aircraft engine emissions standards, it would be most helpful to EPA if you'd be willing to share with us the information you plan to share with EASA/FAA. Be assured we would be most respectful and protective of any CBI you would share.

Thanks in advance for your consideration of this request. Let me know if you have any questions or would like to discuss this further.

Best Regards,
John Mueller

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 7/16/2018 1:30:02 PM
To: Zelina, Joseph (GE Aviation, US) [Joseph.Zelina@ge.com]
Subject: Questions on SST

Hi Joe,

Wondering if you could give me a call when you get a chance. I was not at the recent WG3 plenary call on SST, but understand there are concerns from ICCAIA regarding EPA's participation. Just wondering if you could help me understand what (if any) those concerns might be from GE's perspective. I'm kind of hearing things third hand here, and the minutes from the plenary call weren't very illuminating.

Today I'm around from 9:30-10:30, 1-2 and 3-5. Tomorrow I should be available except for during the CTG Vol III call.

Thanks,
John

734-214-4275

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/11/2018 2:12:58 PM
To: Salazar-Greene, Natalie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=90e6598b81bf4603a74cf349e8fb2e98-Salazar-Gre]; MacAllister, Julia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d72e3dbea2843018007b53de3670d90-MacAllister, Julia]
Subject: Singapore trip report, take 2 - sorry
Attachments: Trip Report for John Mueller - Singapore June 2018.docx

Trip Report for John Mueller – Singapore June 1-9, 2018
(ICAO/CAEP Steering Group 2018 Meeting)

Steering Group (SG) is an annual meeting of the members and observers of the International Civil Aviation Organization's (ICAO) Committee of Aviation Environmental Protection (CAEP). This meeting in Singapore was the third and last SG meeting of this three-year CAEP/11 cycle. The SG heard updates, made decisions and offered guidance on all aspects of CAEP work, including engine emissions, emissions and cost modeling, noise, GHG and alternative fuels programs, airport operations, and basic science as it relates to the environmental impact of aviation. Finally, the group began consideration of possible future work items for the next CAEP cycle (which will begin in February 2019).

John attended as part of the U.S. delegation in the role of advisor to the U.S. CAEP member (Kevin Welsh of FAA). In this role, John provided input and guidance to Mr. Welsh regarding the U.S. positions in areas of primary interest to the EPA. John participated in the all the U.S. delegation and U.S. stakeholder meetings before the SG meeting each day. John also attended all SG meetings throughout the week, except as discussed in the next paragraph.

John was selected to participate in a small breakout group (along with one member from the U.S. FAA, two members from Europe and one member from Canada). The purpose of this group of governmental representatives was to develop an initial path forward to update the outdated engine emissions regulations for supersonic aircraft engines and to work with representatives of the engine manufacturers to further this goal. This group met before and after the SG meetings on some days, as well as in parallel to the SG meeting at some points. Progress was reported back to SG in Friday.

Message

From: Mueller, John [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=246E50F4FF824777BC2944CBE96D8307-MUELLER, JOHN]
Sent: 6/11/2018 1:56:20 PM
To: Salazar-Greene, Natalie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=90e6598b81bf4603a74cf349e8fb2e98-Salazar-Gre]; MacAllister, Julia [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8d72e3dbea2843018007b53de3670d90-MacAllister, Julia]
Subject: Singapore trip report attached
Attachments: Mueller CAEP SG 2018 Singapore June 2018 FIAT.docx

Let me know if you need anything else.

Thanks,
John

Appointment

From: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Sent: 8/30/2018 4:58:00 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; revelt.jean-marie@epa.gov

Subject: Call with ICCT
Attachments: US CO2 WoP v4.3 clean.pdf; Environmental_Supersonic_Aircraft_20180717.pdf; Annex_MEPC_73-INF-X_Probability of achieving 2050_vff.pdf
Location: N143

Start: 8/31/2018 4:30:00 PM
End: 8/31/2018 5:30:00 PM
Show Time As: Busy

US CO2 WoP v4.3 clean.pdf | Environmental_S... | Annex_MEPC_7... of achieving 205...

From: Dan Rutherford <dan@theicct.org>
Sent: Thursday, August 30, 2018 12:56 PM
To: Samulski, Michael
Cc: Bryan Comer; Manning, Bryan; Brandon Graver; Revelt, Jean-Marie
Subject: Re: catch up?

That's fine. Looks like 12:30 ET also works on this end.

Dan

On Aug 30, 2018, at 9:52 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Sorry, I put 12:30 Pacific in my email, but meant 12:30 Eastern (9:30 Pacific). Will that time work for you? 3:30 won't work for us.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Thursday, August 30, 2018 12:32 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>; Revelt, Jean-Marie <revelt.jean-marie@epa.gov>
Subject: Re: catch up?

Mike,

12:30 PT/3:30 ET tomorrow sounds good. Looking forward to it.

I should have included this on the first email, but attached is the draft paper on implementing ICAO's CO2 standard in the US. The key finding is 7 of the 10 largest US carriers are already expected to meet the INP standard fleetwide in 2028, with another two carriers able to comply with small (< 2%) improvements. This opens up the option of applying the standard to in-use aircraft/airlines from 2028 since no additional improvements will be required if the standard is applied only to OEMs.

Happy to talk you through the details tomorrow if you'd like.

Dan

On Aug 30, 2018, at 4:57 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Dan,

Good to hear from you. I think it would be a good idea for us to catch up too.

In addition to the items you listed below, I would like to talk about aircraft PM and NOx. Also, there are a couple of technical issues related to marine that I would like to discuss.

How does 12:30 Pacific tomorrow sound for a call? I am also copying Jean Marie Revelt, who I would like to have join us.

Bryan is out today and tomorrow. So, if there are still open questions related to aircraft, we can schedule a follow-up call that includes him next week.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Wednesday, August 29, 2018 5:59 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>
Subject: catch up?

Hi Mike,

Hope you've been well and enjoying some time off this summer.

With MEPC 73 and the pre-CAEP/11 working group meetings coming up next month in Montreal, I thought it would be good to connect again. I'd be quite interested in your take on where things may go with the EEDI review, HFO ban work, and supersonic engine emission standards in particular. You can find our latest work on these attached to this email.

Separately, we're finalizing a working paper on implementing ICAO's CO2 standard in the US that I thought you should be aware of.

Would you have any time either this Friday (8/31) or next week (9/5~9/7) for a quick call? Please let me know when would work for you.

Thanks,

Dan

Message

From: Manning, Bryan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9507F60B9C47448A88DD5D270BFC2DD4-MANNING, BRYAN]
Sent: 5/29/2018 4:11:11 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]
Subject: New CAEP SG3 Paper (Europe SST Emissions WP)
Attachments: Deliberative Process / Ex. 5

Hi,

I just downloaded the attached, new SG3 paper. Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

Thanks,

Bryan

Bryan Manning
U.S. EPA Office of Transportation and Air Quality
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105
(ph) 734-214-4832 (fax) 734-214-4816
manning.bryan@epa.gov

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 1/26/2018 8:09:27 PM
To: Audette, Lucie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e2e4c9a6f94540a3ac2cb8ef952bc4d9-Audette, Lucie]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG - ESSTsg Call 9:30AM - 11:00AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 1/30/2018 2:30:00 PM
End: 1/30/2018 4:30:00 PM
Show Time As: Free

Importance: High

Canceled by Nicole Didyk-Wells on 1/26/18 at 3:11pm

Appointment

From: Leggett, Cullen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8DBC6E558E2342BE994D56FD13F48765-LEGGETT, CULLEN]
Sent: 4/26/2018 4:09:46 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]

Subject: Accepted: Call with FAA on nvPM and SST papers
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 4/26/2018 6:30:00 PM
End: 4/26/2018 7:30:00 PM
Show Time As: Busy

Appointment

From: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=USER75988D5F]
Sent: 4/26/2018 4:08:30 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]

Subject: Accepted: Call with FAA on nvPM and SST papers
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 4/26/2018 6:30:00 PM
End: 4/26/2018 7:30:00 PM

Recurrence: (none)

Your request was accepted.

Sent by Microsoft Exchange Server 2016

Message

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 5/2/2018 4:54:49 PM
To: Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Stevens, JeffreyA [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=75ada6180e0c4d61a9477ea2f4799205-Stevens, Je]
Subject: RE: WG3-9 Derby, United Kingdom, April 30, 2018 WG3-09 Plenary papers have been added to the H Drive

Original message not sent due to Outlook issues. See below.

Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
Agreement under the SEE Program,
Assessment and Standards Division,
Large Marine and Aviation Center
2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
Cube N130
ph (734) 214-4404 fax (734) 214-4816
maeroff.bruce@epa.gov

From: Maeroff, Bruce
Sent: Wednesday, May 02, 2018 7:42 AM
To: Gerring, Holly <gerring.holly@epa.gov>; Giannelli, Bob <Giannelli.Bob@epa.gov>; Kinsey, John <Kinsey.John@epa.gov>; Leggett, Cullen <Leggett.Cullen@epa.gov>; Lindsey, Leah <lindsey.leah@epa.gov>; Manning, Bryan <manning.bryan@epa.gov>; Mueller, John <mueller.john@epa.gov>; Samulski, Michael <samulski.michael@epa.gov>; Stevens, JeffreyA <Stevens.JeffreyA@epa.gov>; Yen, David <Yen.David@epa.gov>
Subject: WG3-9 Derby, United Kingdom, April 30, 2018 WG3-09 Plenary papers have been added to the H Drive

The following WG3-9 Derby, United Kingdom, April 30, 2018 PMTG Deliberative Process / Ex. 5

Deliberative Process / Ex. 5

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Bruce Maeroff
Senior Service America, Inc.
Supporting the U.S. EPA through a Cooperative
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Assessment and Standards Division,
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2000 Traverwood Drive
Ann Arbor, MI 48105 U.S.A.
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maeroff.bruce@epa.gov

Message

From: Donald.Scata@faa.gov [Donald.Scata@faa.gov]
Sent: 4/26/2018 2:10:03 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: Automatic reply: Draft US papers for SG3: nvPM and SST

Greetings,

I am out of the country on official travel through April 27. Responses will likely be delayed during this time.

In an emergency, I can be reached at: **Personal Security Detail / Ex. 6**

Best regards,

Don

Message

From: Dan Rutherford [dan@theicct.org]
Sent: 8/31/2018 6:43:00 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Revelt, Jean-Marie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e9a49fd1df8e4ea59fad579c16cc1fe0-Revelt, Jean-Marie]
CC: Bryan Comer [bryan.comer@theicct.org]; Xiaoli Mao [xiaoli.mao@theicct.org]
Subject: Re: catch up?
Attachments: China Rerouting White Paper v4.pdf

Mike, Jean-Marie:

Nice to talk to you just now. As discussed, attached are the final proofs of our upcoming study on potential OGV rerouting under a narrow Chinese ECA. We'll release this next week and the lead author, Xiaoli Mao, is in copy.

The key finding is that ECAs of 50 nm width or less appear to be vulnerable to potential rerouting, redistributing rather than controlling air pollution. See the key graphic below. The 100 nm ECA scenario, in contrast, was robust to rerouting under almost all fuel price scenarios. Overall fuel use and emissions increased modestly (~2%) due to longer routes and higher speeds on the new routes, so the main effect appears to be about the distribution, not magnitude, of emissions.

Also, Section 1.1 and Figure 2 present the evidence of ship rerouting due to fuel quality regulations off the California coast I mentioned on the call.

I hope this is useful to your work on a potential waiver under the NA ECA system.

Best,

Dan

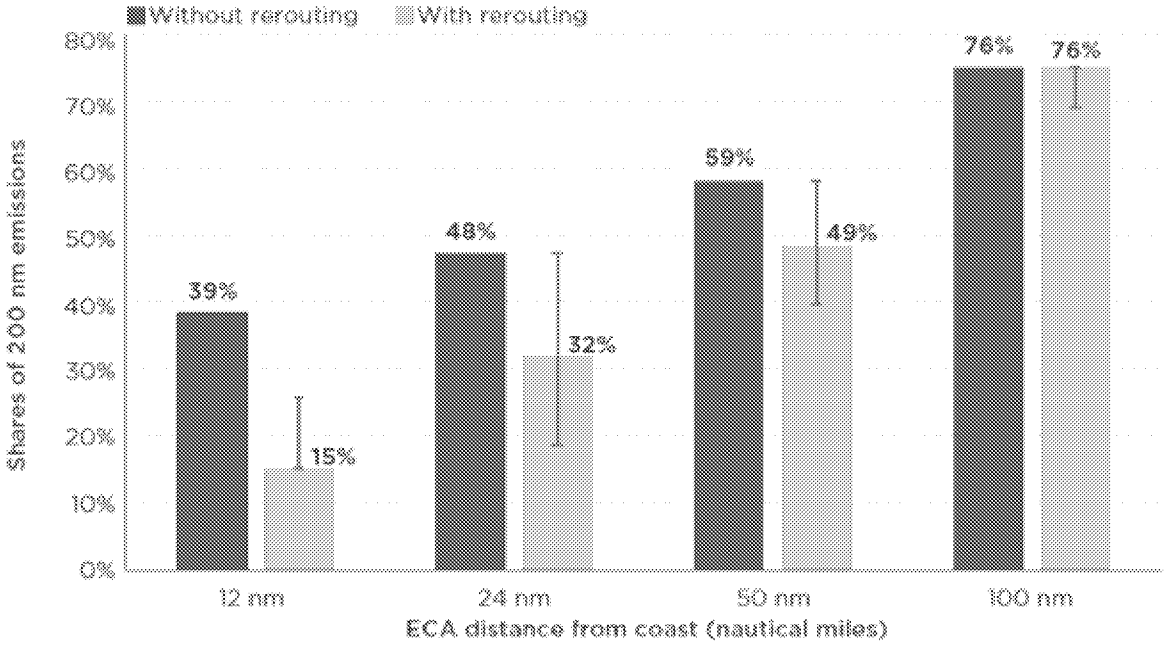

Figure 10. The share of sulfur oxides that ships emit within 200 nautical miles covered by an Emission Control Area.

On Aug 31, 2018, at 8:58 AM, Dan Rutherford <dan@theicct.org> wrote:

Mike,

A quick list below about things we were hoping to exchange notes on today at 12:30 ET/9:30 PT. Feel free to add from your side. Lots of little things so I'm thinking we should start with marine and have a follow-up call on aviation with Bryan M. if we're going long.

We'll be dialing in from a couple of locations. Do you have a conference line to use, or should I send around ours?

Thanks,

Dan

Topics

- Marine: IMO
  - MEPC 73/GHG-4: EEDI review, intel on the GHG strategy implementation plan, other short-term measures e.g. speed reduction
  - PPR 6: Black carbon, HFO ban, Tier III NOx dual engine mapping
- Marine US: Coastal shipping ECA review
- Aviation US: Aircraft CO2 standard proposal
- Aviation: ICAO: CAEP/11 nvPM, supersonic emissions; CAEP/12 NOx future work
- AOB

On Aug 30, 2018, at 9:52 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Sorry, I put 12:30 Pacific in my email, but meant 12:30 Eastern (9:30 Pacific). Will that time work for you? 3:30 won't work for us.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Thursday, August 30, 2018 12:32 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>; Revelt, Jean-Marie <revelt.jean-marie@epa.gov>
Subject: Re: catch up?

Mike,

12:30 PT/3:30 ET tomorrow sounds good. Looking forward to it.

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Happy to talk you through the details tomorrow if you'd like.

Dan

> On Aug 30, 2018, at 4:57 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:
>
> Dan,
>
> Good to hear from you. I think it would be a good idea for us to catch up too.

In addition to the items you listed below, I would like to talk about aircraft PM and NOx. Also, there are a couple of technical issues related to marine that I would like to discuss.

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****
Michael Samulski
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1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Wednesday, August 29, 2018 5:59 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>
Subject: catch up?

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With MEPC 73 and the pre-CAEP/11 working group meetings coming up next month in Montreal, I thought it would be good to connect again. I'd be quite interested in your take on where things may go with the EEDI review, HFO ban work, and supersonic engine emission standards in particular. You can find our latest work on these attached to this email.

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Message

From: Dan Rutherford [dan@theicct.org]
Sent: 8/31/2018 4:19:12 PM
To: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Subject: Re: catch up?

Got it, thanks.

Dan

On Aug 31, 2018, at 9:17 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

We can use the following conference number

Personal Phone / Ex. 6

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Friday, August 31, 2018 11:58 AM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>; Revelt, Jean-Marie <revelt.jean-marie@epa.gov>; Anastasia Kharina <karin@theicct.org>
Subject: Re: catch up?

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1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Thursday, August 30, 2018 12:32 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>; Revelt, Jean-Marie <revelt.jean-marie@epa.gov>
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Michael Samulski
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Dan

Message

From: Gonca.Birkan@faa.gov [Gonca.Birkan@faa.gov]
Sent: 8/13/2018 7:11:38 PM
To: James.Hileman@faa.gov; nyoung@airlines.org; MPagliarello@aci-na.org; leslie.riegle@aia-aerospace.org; darcy@rovolus.com; salterman@cargoair.org; esmith@GAMA.aero; slancaster@dfwairport.com; FLeo@massport.com; ian_redhead@kcmo.org; shamburg@edf.org; jay.e.dryer@nasa.gov; melvin.kosanchick@boeing.com; joseph.zelina@ge.com; charles.etter@gulfstream.com; rudolph.dudebout@honeywell.com; jennifer.duke@pw.utc.com; dimitri.mavris@ae.gatech.edu; jjalonso@stanford.edu; cavalieri@wsu.edu; Jason.Schwartz@portofportland.com; sabnis@mit.edu; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; kpreston@hmmh.com; wuebbles@atmos.uiuc.edu; spresti@cox.net; william.voorhees@navy.mil
CC: Gregg.Fleming@dot.gov; chinita.roundtree-coleman@faa.gov; kevin.welsh@faa.gov; curtis.holsclaw@faa.gov; Fabio.Grandi@faa.gov; joseph.dipardo@faa.gov; sean.doyle@faa.gov; Hua.He@faa.gov; Rebecca.Cointin@faa.gov; Daniel.Jacob@faa.gov; Mohammed.Majeed@faa.gov; Laszlo.Windhoffer@faa.gov; Ralph.Iovinelli@faa.gov; Nathan.Brown@faa.gov; james.skalecky@faa.gov; Christopher.Dorbian@faa.gov; Levent.Ileri@faa.gov; Daniel.Williams@faa.gov; Katherine.Andrus@faa.gov; Donald.Scata@faa.gov; eric.elmore@faa.gov; Mike.Gallivan@faa.gov; jaime.figueroa@faa.gov; shelley.yak@faa.gov; chinita.roundtree-coleman@faa.gov; James.Hileman@faa.gov; Kent.Duffy@faa.gov; lauren.collins@faa.gov; Michel.Hovan@faa.gov; Peggy_Frey@kcmo.org; john.a.cavolowsky@nasa.gov; barbara.m.esker@nasa.gov; Fabio.Grandi@faa.gov; Daniel.Williams@faa.gov
Subject: REDAC E&E Subcommittee Meeting 11-12 September 2018
Attachments: FAA REDAC EE Subcommittee Agenda 201809-v03.pdf; Hotels near GAMA.pdf

Dear REDAC E&E Subcommittee Members and Meeting Attendees,

We are going to have the September 11-12 REDAC E&E Subcommittee meeting at GAMA's facility at 1400 K St. NW Suite 801 Washington DC, 20005. The agenda for the meeting is attached.

Please RSVP to me to confirm your attendance by August 31 (Gonca.Birkan@faa.gov).

Please find nearby Hotels in the attachment.

We will be ordering variety of sandwiches from Corner Bakery Café. The cost for the sandwich basket with variety of sandwiches (with chips, salad, and a can soda) including tax and delivery fee is $15 for each day. Will collect money at the beginning of the meeting.

For the next Spring 2019 REDAC E&E Subcommittee Meeting, please mark your calendars for March 19-20, 2019. A4A will host the meeting.

Sincerely,
Gonca Birkan
R&D Management and Program Analyst
Office of Environment and Energy (AEE-3B)
Federal Aviation Administration
800 Independence Avenue, S.W. 900W
Washington, D.C. 20591
Phone: (202) 267-3654

Message

From: Samulski, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=7ECF1AF23A134D2995FD354D03632D6C-SAMULSKI, MICHAEL]
Sent: 4/27/2018 3:54:00 PM
To: ralph.iovinelli@faa.gov
CC: Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Cullen Leggett (leggett.cullen@epa.gov) [leggett.cullen@epa.gov]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]
Subject: Draft nvPM and NOx Paper
Attachments: SG2018 potential future work items on NOx v8.docx; CAEPSG.20183.WPXX_USViewsNVPM_v3.docx

Ralph,

Deliberative Process / Ex. 5

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
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Director, Large Marine and Aircraft Center
1 (734) 214-4532
samulski.michael@epa.gov
****

Appointment

From: Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]
Sent: 8/30/2018 4:58:22 PM
To: revelt.jean-marie@epa.gov

Subject: Call with ICCT
Attachments: US CO2 WoP v4.3 clean.pdf; Environmental_Supersonic_Aircraft_20180717.pdf; Annex_MEPC_73-INF-X_Probability of achieving 2050_vff.pdf
Location: N143

Start: 8/31/2018 4:30:00 PM
End: 8/31/2018 5:30:00 PM
Show Time As: Tentative

US CO2 WoP v4.3 clean.pdf Environmental_S... Annex_MEPC_7... of achieving 205...

From: Dan Rutherford <dan@theicct.org>
Sent: Thursday, August 30, 2018 12:56 PM
To: Samulski, Michael
Cc: Bryan Comer; Manning, Bryan; Brandon Graver; Revelt, Jean-Marie
Subject: Re: catch up?

That's fine. Looks like 12:30 ET also works on this end.

Dan

On Aug 30, 2018, at 9:52 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Sorry, I put 12:30 Pacific in my email, but meant 12:30 Eastern (9:30 Pacific). Will that time work for you? 3:30 won't work for us.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Thursday, August 30, 2018 12:32 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>; Revelt, Jean-Marie <revelt.jean-marie@epa.gov>
Subject: Re: catch up?

Mike,

12:30 PT/3:30 ET tomorrow sounds good. Looking forward to it.

I should have included this on the first email, but attached is the draft paper on implementing ICAO's CO2 standard in the US. The key finding is 7 of the 10 largest US carriers are already expected to meet the INP standard fleetwide in 2028, with another two carriers able to comply with small (< 2%) improvements. This opens up the option of applying the standard to in-use aircraft/airlines from 2028 since no additional improvements will be required if the standard is applied only to OEMs.

Happy to talk you through the details tomorrow if you'd like.

Dan

On Aug 30, 2018, at 4:57 AM, Samulski, Michael <samulski.michael@epa.gov> wrote:

Dan,

Good to hear from you. I think it would be a good idea for us to catch up too.

In addition to the items you listed below, I would like to talk about aircraft PM and NOx. Also, there are a couple of technical issues related to marine that I would like to discuss.

How does 12:30 Pacific tomorrow sound for a call? I am also copying Jean Marie Revelt, who I would like to have join us.

Bryan is out today and tomorrow. So, if there are still open questions related to aircraft, we can schedule a follow-up call that includes him next week.

Mike

****
Michael Samulski
U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Director, Large Marine and Aviation Center
1 (734) 214-4532
samulski.michael@epa.gov
****

From: Dan Rutherford [mailto:dan@theicct.org]
Sent: Wednesday, August 29, 2018 5:59 PM
To: Samulski, Michael <samulski.michael@epa.gov>
Cc: Bryan Comer <bryan.comer@theicct.org>; Manning, Bryan <manning.bryan@epa.gov>; Brandon Graver <b.graver@theicct.org>
Subject: catch up?

Hi Mike,

Hope you've been well and enjoying some time off this summer.

With MEPC 73 and the pre-CAEP/11 working group meetings coming up next month in Montreal, I thought it would be good to connect again. I'd be quite interested in your take on where things may go with the EEDI review, HFO ban work, and supersonic engine emission standards in particular. You can find our latest work on these attached to this email.

Separately, we're finalizing a working paper on implementing ICAO's CO2 standard in the US that I thought you should be aware of.

Would you have any time either this Friday (8/31) or next week (9/5~9/7) for a quick call? Please let me know when would work for you.

Thanks,

Dan

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 3/7/2018 6:07:16 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG ESSTsg Call 9:30AM - 11:30AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 4/17/2018 1:30:00 PM
End: 4/17/2018 3:30:00 PM
Show Time As: Free

Importance: High

Appointment

From: Maeroff, Bruce [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=2E697AE33F0848CC856449E9AED61CBA-MAEROFF, BRUCE]
Sent: 3/7/2018 6:02:41 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]; Gerring, Holly [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=71f857eda2914f1c964c831d123599f3-Gerring, Ho]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; Lindsey, Leah [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d94c5fa71a54075bc3c44a92788fd98-Lindsey, Le]; Manning, Bryan [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=9507f60b9c47448a88dd5d270bfc2dd4-Manning, Bryan]; Mueller, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=246e50f4ff824777bc2944cbe96d8307-Mueller, John]; Samulski, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7ecf1af23a134d2995fd354d03632d6c-Samulski, Michael]; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]

Subject: Canceled: CTG-ESSTsg Call 9:30AM - 11:00AM RM N125
Location: AA-Room-Office-N125-ConfRoom/AA-OTAQ-OFFICE

Start: 3/27/2018 1:30:00 PM
End: 3/27/2018 3:30:00 PM
Show Time As: Free

Importance: High

John will be calling in from his desk.

Appointment

From: maryalice.locke@faa.gov [maryalice.locke@faa.gov]
Sent: 5/29/2018 12:32:21 PM
To: maryalice.locke@faa.gov; roger.schaufele@faa.gov; Andrew.Gordon@airbus.com; andrew.chuang@boeing.com; BSilva@icao.int; S.Balasubramania.CTR@dot.gov; catherine.marthe@bazl.admin.ch; David.Pace@dot.gov; david.marsh@eurocontrol.int; Fabio.Grandi@faa.gov; gareth.horton@ricardo.com; ivan.de-lepinay@easa.europa.eu; krisha.nobrega@embraer.com.br; laurence.gray@pw.utc.com; mark.a.augustyniewicz@boeing.com; McConnachie_Dominic@bah.com; paul.madden@rolls-royce.com; perovicj@iata.org; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; lionel.cousseins@airbus.com; bonnefoy_philippe@bluesky-d2d.com; kevin.guittet@aviation-civile.gouv.fr; Jacob.Wishart@dot.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; zap@nau.edu.ua; rodrigo.padilha@anac.gov.br; brian.kim@pw.utc.com; Eric.Upton@gulfstream.com; Ralf.Berghof@dlr.de; raymond@boom.aero

Subject: FESG Supersonic Call
Location: 18778738017,,,1185549,,,#

Start: 5/31/2018 3:00:00 PM
End: 5/31/2018 4:00:00 PM
Show Time As: Busy

Recurrence: (none)

Teleconference Line
North America Toll-Free: Personal Phone / Ex. 6
International: Personal Phone / Ex. 6
ACCESS CODE:
Mobile clickable: Personal Phone / Ex. 6

Webinar
Web Conference URL:
Meeting Number(s):
Access Code:

Personal Phone / Ex. 6

Appointment

From: maryalice.locke@faa.gov [maryalice.locke@faa.gov]
Sent: 4/20/2018 1:36:15 PM
To: maryalice.locke@faa.gov; roger.schaufele@faa.gov; andrew.gordon@airbus.com; andrew.chuang@boeing.com; BSilva@icao.int; S.Balasubramania.CTR@dot.gov; catherine.marthe@bazl.admin.ch; David.Pace@dot.gov; David.MARSH@eurocontrol.int; Fabio.Grandi@faa.gov; gareth.horton@ricardo.com; ivan.de-lepinay@easa.europa.eu; krisha.nobrega@embraer.com.br; laurence.gray@pw.utc.com; mark.a.augustyniewicz@boeing.com; mcconnachie_dominic@bah.com; paul.madden@rolls-royce.com; perovicj@iata.org; Ralf.Berghof@dlr.de; Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]; Leggett, Cullen [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=8dbc6e558e2342be994d56fd13f48765-Leggett, Cullen]; lionel.cousseins@airbus.com; bonnefoy_philippe@bluesky-d2d.com; kevin.guittet@aviation-civile.gouv.fr; Jacob.Wishart@dot.gov; Wolfe, Philip [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=Wolfe, Philip]; zap@nau.edu.ua; Rodrigo.Padilha@anac.gov.br; brian.kim@pw.utc.com; Eric.Upton@gulfstream.com

Subject: FESG-FTG call on supersonic forecasts
Location: Personal Phone / Ex. 6

Start: 4/26/2018 2:00:00 PM
End: 4/26/2018 3:30:00 PM
Show Time As: Busy

Recurrence: (none)

Teleconference Line
North America Toll-Free: Personal Phone / Ex. 6
International: 6 Personal Phone / Ex. 6
ACCESS CODE:
Mobile clickable: Personal Phone / Ex. 6
*6 mute

Webinar
Web Conference URL: Personal Phone / Ex. 6
Meeting Number(s): Personal Phone / Ex. 6
Access Code Personal Phone / Ex. 6

Appointment

From: Yen, David [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=865ca449dd0f405a949a635615e68827-Yen, David]
Sent: 8/2/2018 5:59:13 PM
To: Maeroff, Bruce [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2e697ae33f0848cc856449e9aed61cba-Maeroff, Bruce]

Subject: Accepted: Call with GE/FAA on SST 2:30PM - 3:30PM RM C35
Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Start: 8/7/2018 6:30:00 PM
End: 8/7/2018 7:30:00 PM
Show Time As: Busy