To: Gude, Karen[Gude.Karen@epa.gov]
From: Campbell, Ann
Sent: Thur 12/29/2016 12:35:12 PM
Subject: Re: Request for meeting with EPA Administrator Gina McCarthy re PAGs

Thanks Karen. Based on Peters email last night I'm thinking we should try to have the meeting Wednesday afternoon. That would be 1/4. I know that's not a date they were looking at but I don't think we're going to want things to fall to the next week.

On Dec 28, 2016, at 8:54 PM, Gude, Karen <Gude.Karen@epa.gov> wrote:

> I'll send her contact info first thing tomorrow.
>
> Thanks,
> Karen
>
> Sent from my iPhone
>
> On Dec 28, 2016, at 6:22 PM, Campbell, Ann <Campbell.Ann@epa.gov> wrote:
>
> > I think we need to start with the 6th and go from there. Do you have Diane's contact information? I think I may need to either contact her myself or have Peter contact her to establish expectations.
> >
> > On Dec 28, 2016, at 4:05 PM, Gude, Karen <Gude.Karen@epa.gov> wrote:
> >
> > > Ann,
> > >
> > > Diane D'Arrigo (NIRS) has asked that we schedule with Joel before the DW PAG is signed. She has indicated that 12/6, 12/9, or 12/11 work best, as this gives her time to organize participants – it could be a dozen participants.
> > >
> > > Obviously, we want to avoid the week of the 9th (I know that Joel is reserving that time, and I believe that Peter has conflicts on 1/10 and 1/11). We likely want to schedule this sooner rather than later anyway. Diane did indicate that she could be flexible and meet sooner, to accommodate a meeting prior to signature.
> > >
> > > Karen

From: Campbell, Ann
Sent: Wednesday, December 28, 2016 8:58 AM
To: Beauvais, Joel <Beauvais.Joel@epa.gov>; Grevatt, Peter <Grevatt.Peter@epa.gov>
Cc: Loop, Travis <Loop.Travis@epa.gov>; Dennis, Allison <Dennis.Allison@epa.gov>; Gude, Karen <Gude.Karen@epa.gov>
Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

Wanted to give you both the heads up on this meeting request coming your way. I haven't heard where we landed with OMB late last week. The OA wants this scheduled for next week so it would be helpful to know where things are at so we can land this appropriately on the calendar. cc'ing Travis and Allison from a comms perspective.

From: Gude, Karen
Sent: Wednesday, December 28, 2016 8:55 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

Ann,

A heads up --- The AO is delegating a meeting with NGOs re: DW PAGs to Joel. Liel is reaching out to the requester and will loop me in, once this is done (given that Crystal is out) so that we can get this scheduled next week.

Karen Gude, Special Assistant

U.S. Environmental Protection Agency

Office of Water

Phone: (202) 564-0831

From: Azoolin, Liel
Sent: Tuesday, December 27, 2016 10:09 AM
To: Gude, Karen <Gude.Karen@epa.gov>
Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

Hi Karen,

In our scheduling meeting last week, Matt Fritz suggested would be the best person to take this meeting. I just wanted to flag for you and make sure it's something he can do when he returns. Please let me know if it will be possible and I will loop Crystal in with their contact.

Thank you,

Liel

From: Azoolin, Liel
Sent: Wednesday, November 30, 2016 4:53 PM
To: scheduling <scheduling@epa.gov>
Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

From: Leavy, Jacqueline
Sent: Wednesday, November 30, 2016 4:45 PM
To: CMS.Sched <CMS.Sched@epa.gov>
Cc: Gaines, Cynthia <Gaines.Cynthia@epa.gov>; Azoolin, Liel <Azoolin.Liel@epa.gov>
Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

From: Diane D'Arrigo [mailto:dianed@nirs.org]
Sent: Wednesday, November 30, 2016 2:36 PM
To: Mccarthy, Gina <McCarthy.Gina@epa.gov>; scheduling <scheduling@epa.gov>
Cc: Diane D'Arrigo <dianed@nirs.org>; Catherine Thomasson <CThomasson@psr.org>; Geoff Fettus <gfettus@nrdc.org>; John Coequyt <John.Coequyt@sierraclub.org>; Damon Moglen <dmoglen@foe.org>; Wenonah Hauter (whauter@fwwatch.org) <whauter@fwwatch.org>; Lynn Thorp CWA <lthorp@cleanwater.org>; Anna Aurilio <asquared@environmentamerica.org>; Allison Fisher <afisher@citizen.org>; Paul Gallay <PGallay@riverkeeper.org>; Catherine Lincoln <catlincoln@aol.com>; Cindy Folkers <cindy@beyondnuclear.org>
Subject: Request for meeting with EPA Administrator Gina McCarthy re PAGs

Physicians for Social Responsibility ◆ Natural Resources Defense Council

Sierra Club ◆ Friends of the Earth ◆ Food and Water Watch

Clean Water Action ◆ Public Citizen ◆ Beyond Nuclear

Nuclear Information and Resource Service

Environment America ◆ Committee to Bridge the Gap ◆ Riverkeeper

November 30, 2016

Gina McCarthy, US EPA Administrator

US EPA Headquarters

William Jefferson Clinton Building

1200 Pennsylvania Avenue, N. W. Mail Code: 1101A

Washington, DC 20460

202-564-4700

McCarthy.gina@Epa.gov

Dear Administrator McCarthy:

We understand that you are close to deciding whether to approve the 2013 Protective Action Guides (PAGs) and the additional Radionuclide Drinking Water PAGs any day now. Please take one more step before making that important decision: meet with us one more time, to clarify critical information.

As you know our groups and many others have been diligently commenting and raising serious concerns for many years about the PAGs. We believe that some of the premises that are being used to justify your final adoption of these PAGs are incorrect and ask that you meet with us one last time before proceeding.

The pending PAG proposal would upend decades of clean water protections. We think it would be appropriate for you to meet with us and consider seriously the information we have to provide before embarking on such a significant step backwards in terms of public protections.

We call your attention to a recent investigative piece on the issue by NBC Bay Area, which can be watched at http://www.nbcbayarea.com/investigations/E-P-AS-NEW-EMERGENCY-PLAN-FOR-DRINKING-WATER-CONCERNS-MANY-401206656.html.

After many environmental victories and successes throughout your tenure, moving the nation forward to a cleaner, safer, more energy efficient environment, we ask that you not depart with an unnecessary action that will justify enormous increases in radioactivity in drinking water.

We appreciate your service and ask you to reconsider how approving the PAGs will affect your legacy. We would be extremely grateful to meet with you at your earliest convenience, before you make this critical decision.

Sincerely,

Diane D'Arrigo*

Director Radioactive Waste Project

Nuclear Information and Resource Service

Catherine Thomasson, M.D.

Executive Director

Physicians for Social Responsibility

Damon Moglen

Senior Strategic Advisor

Friends of the Earth

Lynn Thorp

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Allison Fisher

Outreach Director

Public Citizen

Paul Gallay

President

Hudson Riverkeeper

Catherine Lincoln

Executive Coordinator

Committee to Bridge the Gap

Cindy Folkers

Radiation Specialist

Beyond Nuclear

* *Point of contact*: Diane D'Arrigo 202-841-8588 dianed@nirs.org

To: Gude, Karen[Gude.Karen@epa.gov]
From: Campbell, Ann
Sent: Wed 12/28/2016 11:22:23 PM
Subject: Re: Request for meeting with EPA Administrator Gina McCarthy re PAGs

I think we need to start with the 6th and go from there. Do you have Diane's contact information? I think I may need to either contact her myself or have Peter contact her to establish expectations.

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Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

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Karen Gude, Special Assistant

U.S. Environmental Protection Agency

Office of Water

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Subject: FW: Request for meeting with EPA Administrator Gina McCarthy re PAGs

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Physicians for Social Responsibility • Natural Resources Defense Council

Sierra Club • Friends of the Earth • Food and Water Watch

Clean Water Action • Public Citizen • Beyond Nuclear

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November 30, 2016

Gina McCarthy, US EPA Administrator

US EPA Headquarters

William Jefferson Clinton Building

1200 Pennsylvania Avenue, N. W. Mail Code: 1101A

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202-564-4700

McCarthy.gina@Epa.gov

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We appreciate your service and ask you to reconsider how approving the PAGs will affect your legacy. We would be extremely grateful to meet with you at your earliest convenience, before you make this critical decision.

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Catherine Lincoln

Executive Coordinator

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Cindy Folkers

Radiation Specialist

Beyond Nuclear

* *Point of contact*: Diane D'Arrigo 202-841-8588 dianed@nirs.org

To: Gude, Karen[Gude.Karen@epa.gov]
From: Campbell, Ann
Sent: Fri 10/7/2016 3:21:53 PM
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

Loverly. Thank you.

From: Gude, Karen
Sent: Friday, October 07, 2016 11:21 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

Just FYI -- CGP is close. It's going through OP management review now (through the first of three or so levels of management review), and likely will be ready to send to OMB by Tuesday…which is the date listed in ADP Tracker.

From: Campbell, Ann
Sent: Friday, October 07, 2016 11:17 AM
To: Gude, Karen <Gude.Karen@epa.gov>
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

Great. Thank you.

From: Gude, Karen
Sent: Friday, October 07, 2016 11:15 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

Oregon was sent to OP in advance of OMB on 10/4, so I wouldn't expect it to move to OMB quite yet.

CGP went to OP on 9/29…Per ADP Tracker, it looks like we're expecting it to move to OMB early next week. Sandy's going to give OP a quick call to see if she can get a status update on their review.

From: Campbell, Ann
Sent: Friday, October 07, 2016 11:07 AM
To: Gude, Karen <Gude.Karen@epa.gov>
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

Thanks. Do you know if uploaded Oregon or the CGP yet?

From: Gude, Karen
Sent: Friday, October 07, 2016 11:00 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: FW: Final PAG guidance (SAN 5198) to OP for OMB review
Importance: High

FYI – PAGs has been sent to OP.

From: Evalenko, Sandy
Sent: Friday, October 07, 2016 10:51 AM
To: Muellerleile, Caryn <Muellerleile.Caryn@epa.gov>
Cc: Arrigoni, Holly <Arrigoni.Holly@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Gude, Karen <Gude.Karen@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: Final PAG guidance (SAN 5198) to OP for OMB review
Importance: High

Caryn: Attached is the Office of Water's submission of the Final Protective Action Guide for Drinking Water (PAG) (SAN 5198) for OMB review. I've attached Joel Beauvais' transmittal memo to Laura Vaught. Please let me know if you have any questions.

Thanks,

Sandy

Sandy Evalenko
Water Policy Staff
Office of Water (4101M)
3226K WJC East
(202) 564-0264 telephone

To: Gude, Karen[Gude.Karen@epa.gov]
From: Campbell, Ann
Sent: Fri 10/7/2016 3:16:46 PM
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

Great. Thank you.

From: Gude, Karen
Sent: Friday, October 07, 2016 11:15 AM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Subject: RE: Final PAG guidance (SAN 5198) to OP for OMB review

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Thanks,

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Sandy Evalenko
Water Policy Staff
Office of Water (4101M)
3226K WJC East
(202) 564-0264 telephone

To: Gude, Karen[Gude.Karen@epa.gov]
From: Campbell, Ann
Sent: Wed 5/25/2016 7:07:57 PM
Subject: RE: PAGS and LCR letter dates

Thanks. Ashley's edits to the administrator week matt sends around says a prepub will be released 6/6. Is that accurate? Christina is not as clear in her email.

From: Gude, Karen
Sent: 5/25/2016 3:06 PM
To: Campbell, Ann
Subject: FW: PAGS and LCR letter dates

Just FYI…latest on PAGs release estimates from OGWDW Communications.

From: Wadlington, Christina
Sent: Wednesday, May 25, 2016 2:56 PM
To: Dennis, Allison <Dennis.Allison@epa.gov>
Cc: Loop, Travis <Loop.Travis@epa.gov>; Gude, Karen <Gude.Karen@epa.gov>; Evalenko, Sandy <Evalenko.Sandy@epa.gov>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov>; Greene, Ashley <Greene.Ashley@epa.gov>
Subject: FW: PAGS and LCR letter dates

Alison,

Confirming my understanding for PAGS. We are publically releasing PAGS on 6/6. Therefore, we will work to get signature on 6/6. Not get the FRN published by that date.

Christina Wadlington

Communications Director

Office of Ground Water and Drinking Water

U.S. Environmental Protection Agency

Tel: 202.566.1859

Email: wadlington.christina@epa.gov

To: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Wieder, Jessica
Sent: Tue 5/3/2016 11:26:42 AM
Subject: Fw: SOP#3
PAGs Comm SOP3.pdf

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Wieder, Jessica
Sent: Tuesday, May 3, 2016 7:00:41 AM
To: Nesky, Anthony
Cc: DeCair, Sara; Wieder, Jessica
Subject: Re: SOP#3

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]
From: Amy Doll
Sent: Wed 4/27/2016 8:44:13 PM
Subject: Except with new TOC for PAG Manual
PAG Manual_TOC EXCERPT_04-27-2016ad.docx

Hi Sara

Attached is an excerpt with the new TOC for the draft PAG Manual. PLEASE NOTE: if it gives you "Error! Bookmark Not Defined" when you open it, please just try ignore that and look for the yellow highlights!

The yellow highlights show the changes to the report organization.

As we discussed, the Introduction headings that Miguel inserted were deleted. The 4th level headings from Miguel were also removed.

A few notes, from our earlier discussions:

-- Conservatism built into the PAGs was moved to end of Chapter 1

-- Basis for Early Phase PAGs is now a new section at end of Chapter 2

-- Basis for Intermediate Phase PAGs is now a new section at end of Chapter 4

In a few cases, I created sections to avoid having just one level of heading:

-- I already sent you the new beginning for Chapter 5 to review, with the new 5.1 heading

-- I made the former 3.1.3 heading into 3.2 heading because this improves the organization of that chapter and provides two second-level headings

-- I reorganized the beginning of Section 2.1, and will send shortly for your review. This improves the readability and provides two third-level headings in that section.

Please let me know if you want to discuss,

Thanks,

Amy

Amy Doll

Senior Associate

EnDyna, Inc.
7926 Jones Branch Drive, Suite 620
McLean, VA 22102

adoll@endyna.com
Tel: 703-848-8842 ext. 111

To: Wieder, Jessica[Wieder.Jessica@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Nesky, Anthony
Sent: Mon 4/18/2016 9:03:38 PM
Subject: PAGs Comm Q&A with Cover
PAGs Comm Tool QA 4-18-16+cover.docx

Here's the latest version of the PAG Comm Q&A, with a mock-up cover.

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

From: Wieder, Jessica
Sent: Monday, April 18, 2016 3:12 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>
Cc: White, Rick <White.Rick@epa.gov>
Subject: PAGs Comm Q&A

Here is the document with the updated foreword and formatted Q&A.

Tony- Please add the cover and send it back around. When you add the cover, please make sure that the Q&A starts at the top of page 1.

This has been a very productive process. I am really happy with how the document is coming together. Thank you!

Jess

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

C: Ex. 6 - Personal Privacy

To: DeCair, Sara[DeCair.Sara@epa.gov]; Nesky, Anthony[Nesky.Tony@epa.gov]
Cc: White, Rick[White.Rick@epa.gov]
From: Wieder, Jessica
Sent: Mon 4/18/2016 7:12:14 PM
Subject: PAGs Comm Q&A
PAGs Comm Tool QA 4-18-16.docx

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w: 202-343-9201
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To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]; Amy Doll[adoll@endyna.com]
From: Miguel Tuason
Sent: Tue 4/12/2016 3:27:59 PM
Subject: RE: PAGS - Final Cover and Draft Inside Graphic
EPA_PAGS_Cover_04122016.pdf
MASTER_2016April_DRAFT003.pdf

Hello, Sara –

Here is the new cover and new inside keyhole graphics, with your changes incorporated, for your review.

Please let us know if there are any additional changes.

Best

Miguel

Miguel Tuason
SR. BUSINESS DEVELOPMENT MANAGER
EnDyna, Inc.
7926 Jones Branch Drive
Suite 620
McLean, VA 22102
Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
Fax: 703 848 9001
www.endyna.com

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, April 11, 2016 5:27 PM
To: Miguel Tuason <mtuason@endyna.com>
Cc: Smita Siddhanti <Siddhanti@endyna.com>; Amy Doll <adoll@endyna.com>
Subject: RE: PAGS - Final Cover and Draft Inside Graphic

Hi Miguel,

On the inside graphic for the keyhole, could you change it to yellow being darkest of one color (blue?) then the pink be the next lighter, then the shelter area lightest blue? Then the plume deposition fade out looks good.

Shelter area should read "area in which people are sheltered." Maybe with no periods on any of the key.

And for the front cover, my bosses really liked the 3/16/2016 one you sent, and just asked that the title lines be spread out a little, and PAG Manual can be a bit larger than the rest of it.

Many thanks!

Sara

From: Miguel Tuason [mailto:mtuason@endyna.com]
Sent: Thursday, March 24, 2016 12:23 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Cc: siddhanti@endyna.com; Amy Doll <adoll@endyna.com>
Subject: RE: PAGS - Final Cover and Draft Inside Graphic

Hello Sara –

Here is a modified version with the following changes:

- Colors now include patterns, which are colorblind-friendly.

- Map has been faded and blurred so nothing specific can be identified on it… but still maintains that "map" feel.

- The cloudy trail of contamination has been shrunk, as you noted, to just passed the 10-mile areas.

- Finally, I've added a "two-mile" marker on the graphic to give it scale.

Hope this version gets us closer.

Thanks again for sending over your comments.

Best
Miguel

Miguel Tuason
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Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
Fax: 703 848 9001
www.endyna.com

From: Miguel Tuason
Sent: Thursday, March 24, 2016 9:51 AM
To: 'DeCair, Sara' <DeCair.Sara@epa.gov>
Cc: Smita Siddhanti <Siddhanti@endyna.com>; Amy Doll <adoll@endyna.com>
Subject: RE: PAGS - Final Cover and Draft Inside Graphic

Thanks for the feedback, Sara.

Will get on the "drawing board" and develop a few more options based on this feedback in the next day or so.

Best

Miguel

Miguel Tuason
SR. BUSINESS DEVELOPMENT MANAGER
EnDyna, Inc.
7926 Jones Branch Drive
Suite 620
McLean, VA 22102
Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
Fax: 703 848 9001
www.endyna.com

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, March 24, 2016 9:32 AM
To: Miguel Tuason <mtuason@endyna.com>
Cc: Smita Siddhanti <Siddhanti@endyna.com>; Amy Doll <adoll@endyna.com>
Subject: RE: PAGS - Final Cover and Draft Inside Graphic

Good morning Miguel, and Smita and Amy too!

I love the new cover. It is a great color and I'm going to show it to my Comms colleagues and my Office Director this afternoon to see what he thinks.

On the Keyhole graphic, I like the way it is going. Could you make the following changes?

- Obscure the big city names so it's less identifiable, or maybe fade back the map features
- The length of the Evac, Shelter and Relocate areas all should be less than 10 miles
- Make the cloudy trailing contamination to the right end not far from the end of the Relocation area – it should show that just a little contamination is outside the areas, but not very far.

- Think about ways the color blind can distinguish the key, too.

Thank you so much!

Sara

From: Miguel Tuason [mailto:mtuason@endyna.com]
Sent: Thursday, March 17, 2016 1:29 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Cc: siddhanti@endyna.com; Amy Doll <adoll@endyna.com>
Subject: PAGS - Final Cover and Draft Inside Graphic

Hello, Sara –

Thanks for taking the time to speak with me and Amy yesterday about the PAGS cover and inside "plume" graphic.

Per your feedback, I've attached the "final" cover as a PDF with the updated color you suggested.

Also attached, as discussed, is a re-worked, color version of the "Generalized Protective Action Areas for NPP Incident" graphic that will replace the current b/w version inside the manual. Please review and let us know if this version works better and along the lines of what you described. I've used the map of Colorado/Nebraska/Kansas as the background to give it a bit of depth and context. We can, of course, make the location less obvious (or use a plain background) in the final version, if you'd prefer.

Thanks in advance for providing your feedback.

Best,

Miguel

Miguel Tuason
SR BUSINESS DEVELOPMENT MANAGER
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Suite 620
McLean, VA 22102
Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
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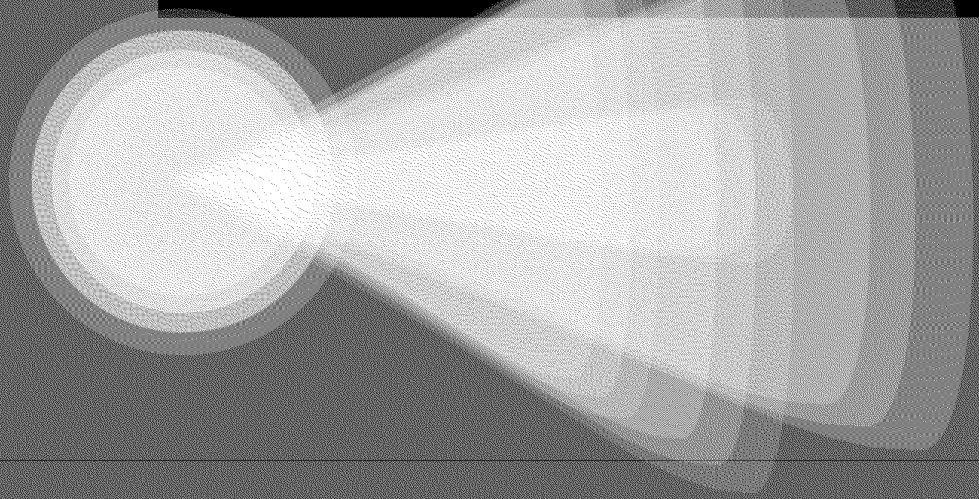
EPA-XXX/X-XX/XXX | Month YYYY | www.epa.gov/xxxxxx

United States
Environmental Protection
Agency

PAG Manual

Protective Action Guides and Planning Guidance for Radiological Incidents



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Manual of Protective Action Guides and Protective Actions for Nuclear Incidents

Prepared for the U.S. Environmental Protection Agency
Office of Air and Radiation (OAR), Radiation Protection Division (RPD)

Month YYYY

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Area from which population is evacuated
Area in which people are sheltered
Area from which population is relocated (relocation area)
Plume travel and deposition area
Approx. 2 miles

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]
From: Amy Doll
Sent: Tue 4/12/2016 3:09:37 PM
Subject: Portrait draft of Reentry Matrix
Table 4-2 PORTRAIT_041216.docx

Hi Sara

Attached is the Portrait draft of the Reentry Matrix that I developed for your review. We discussed this morning that you'd share this with your colleague, and then let us know whether to use this Portrait version in the manual.

For now, I've got this in a separate file – so please feel free to edit the attached file at EPA if you want.

Please let me know if you have any questions, or need anything else as you are reviewing it.

I put in the header and footer, just so you can see how the Portrait version will look after insertion into the manual.

Thanks,

Amy

Amy Doll

Senior Associate

EnDyna, Inc.
7926 Jones Branch Drive, Suite 620
McLean, VA 22102

adoll@endyna.com
Tel: 703-848-8842 ext. 111

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Laiche, Thomas P
Sent: Mon 4/4/2016 7:28:58 PM
Subject: Sanity Check
EPA PAG Manual Update.pptx

Sara,

Would you mind looking at the attached slides and correct if our statements are outdated.

Thanks

Tom

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Nesky, Anthony[Nesky.Tony@epa.gov]
From: Wieder, Jessica
Sent: Wed 2/24/2016 6:11:31 PM
Subject: PAGs - Draft Q&A
PAG Internal Q&A 2-24-2016 (2).docx

For your review.

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

To: DeCair, Sara[DeCair.Sara@epa.gov]; Perrin, Alan[Perrin.Alan@epa.gov]
Cc: Wieder, Jessica[Wieder.Jessica@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Nesky, Anthony
Sent: Wed 2/24/2016 5:57:26 PM
Subject: OPTIONAL edit for PAG FR announcement.
PAG Manual Finalized FR Notice 2-24-2016-tnedits.docx

I just broke up a long sentence under DATES. The announcement was OK as written if you are pressed for time.

From: DeCair, Sara
Sent: Wednesday, February 24, 2016 12:26 PM
To: Perrin, Alan
Cc: Wieder, Jessica; Nesky, Anthony
Subject: PAG Manual FR Notice with 'what we heard'

Here is an updated draft FR Notice, that includes edits from Alan and a version of "What We Heard" from the public comments – just FYI.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-OAR-2008-0268; FRL-9707-2]

Final revision to Protective Action Guides Manual: Protective Action Guides (PAGs) and Planning Guidance for Radiological Incidents

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of document availability.

SUMMARY: As part of its mission to protect human health and the environment, the U.S. Environmental Protection Agency (EPA) publishes protective action guides to help federal, state, local and tribal emergency response officials make radiation protection decisions during emergencies. EPA, in coordination with a multi-agency working group within the Federal Radiological Preparedness Coordinating Committee (FRPCC), has finalized updates to the 1992 Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, referred to as "The 1992 PAG Manual" (EPA 400-R-92-001, May 1992).

The updated guidance in this revised PAG Manual – Protective Action Guides and Planning Guidance for Radiological Incidents ("PAG Manual" hereafter) applies the PAGs to incidents other than just nuclear power plant accidents, updates the radiation dosimetry and dose calculations based on current science and incorporates late phase guidance. The final revisions incorporate input from public comments received in 2013 and include clarifications based on those comments. {{We have to talk about water here, whether it is in or not}} The final revision is available at www.regulations.gov.

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DATES: This guidance may be used immediately. Most organizations that use the PAGs in their emergency management plans will be expected to have incorporated this updated guidance within twelve months of this announcement.

FOR FURTHER INFORMATION CONTACT: Sara DeCair, Radiation Protection Division, Center for Radiological Emergency Management, Mail Code 6608T, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue NW, Washington, DC 20460; telephone number: (202) 343-9108 ; fax number: (202) 343-2304; E-mail: *decair.sara@epa.gov*.

SUPPLEMENTARY INFORMATION:

A. How can I get copies of the PAG Manual and supporting information?

Docket: All documents in the docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. The EPA has established a docket for this action under Docket ID No. [EPA-HQ-OAR-2008-0268; FRL-9707-2]. Publicly available docket materials are available either electronically through www.regulations.gov or in hard copy at the Air and Radiation Docket in the EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC 20004. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744 and the telephone number for the Air and Radiation Docket is (202) 566-1742. In accordance with EPA's regulations at 40 CFR Part 2 and in accordance with normal EPA docket procedures, if copies of any docket materials are requested, a reasonable fee may be charged for photocopying.

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Electronic access: The PAG Manual in electronic form suitable for printing as well as related guidelines and further information can be found on the PAGs web page, at http://www.epa.gov/radiation/protective-action-guides-pags

B. What authority does the EPA have to provide Protective Action Guidance?

The historical and legal basis of EPA's role in the PAG Manual begins with Reorganization Plan No. 3 of 1970, in which the Administrator of the EPA assumed functions of the Federal Radiation Council (FRC), including the charge to "…advise the President with respect to radiation matters, directly or indirectly affecting health, including guidance for all federal agencies in the formulation of radiation standards and in the establishment and execution of programs of cooperation with states." (Reorg. Plan No. 3 of 1970, sec. 2(a) (7), 6(a) (2); § 274.h of the Atomic Energy Act of 1954, as amended (AEA), codified at 42 U.S.C. § 2021(h)). Recognizing this role, FEMA directed the EPA in their Radiological Emergency Planning and Preparedness Regulations to "establish Protective Action Guides (PAGs) for all aspects of radiological emergency planning in coordination with appropriate federal agencies." (44 CFR 351.22(a)). FEMA also tasked the EPA with preparing "guidance for state and local governments on implementing PAGs, including recommendations on protective actions which can be taken to mitigate the potential radiation dose to the population."(44 CFR 351.22(b)). All of this information was to "be presented in the Environmental Protection Agency (EPA) 'Manual of Protective Action Guides and Protective Actions for Nuclear Incidents.'"(44 CFR 351.22(b)).

Additionally, section 2021(h) charged the Administrator with performing "such other functions as the President may assign to him [or her] by Executive order." Executive Order 12656 states that the Administrator shall "[d]evelop, for national security emergencies, guidance

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on acceptable emergency levels of nuclear radiation…." (Executive Order No. 12656, sec.1601(2)). EPA's role in PAGs development was reaffirmed by the *National Response Framework, Nuclear/Radiological Incident Annex* of June 2008.

C. What is the PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents?

The PAG Manual provides federal, state and local emergency management officials with guidance for responding to radiological emergencies. A protective action guide (PAG) is the projected dose to an individual from a release of radioactive material at which a specific protective action to reduce or avoid that dose is recommended. Emergency management officials use PAGs for making decisions regarding actions to protect the public from exposure to radiation during an emergency. Such actions include, but are not limited to, evacuation, shelter-in-place, temporary relocation, and food restrictions.

Development of the PAGs was based on the following essential principles, which also apply to the selection of any protective action during an incident—

- Prevent acute effects.
- Balance protection with other important factors and ensure that actions result in more benefit than harm.
- Reduce risk of chronic effects.

The PAG Manual is not a legally binding regulation or standard and does not supersede any environmental laws; PAGs are not intended to define "safe" or "unsafe" levels of exposure or contamination. This guidance does not address or impact site cleanups occurring under other

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statutory authorities such as the United States Environmental Protection Agency's (EPA) Superfund program, the Nuclear Regulatory Commission's (NRC) decommissioning program, or other federal or state cleanup programs. As indicated by the use of non-mandatory language such as "may," "should" and "can," the PAG Manual only provides recommendations and does not confer any legal rights or impose any legally binding requirements upon any member of the public, states, or any other federal agency. Rather, the PAG Manual recommends projected radiation doses at which specific actions may be warranted in order to reduce or avoid that dose. The PAG Manual is designed to provide flexibility to be more or less restrictive as deemed appropriate by decision makers based on the unique characteristics of the incident and the local situation.

D. What has changed since the 2013 draft revised PAG Manual?

The updates to the 1992 PAG Manual, published for public comment and interim use in 2013, were developed by a multi-agency Subcommittee of the Federal Radiological Preparedness Coordinating Committee (FRPCC) and are published by the EPA with concurrence from the Department of Energy (DOE); the Department of Defense (DoD); the Department of Homeland Security (DHS), including the Federal Emergency Management Agency (FEMA); the Nuclear Regulatory Commission; the Department of Health and Human Services (HHS), including both the Centers for Disease Control (CDC) and the Food and Drug Administration (FDA); the U.S. Department of Agriculture (USDA); and the Department of Labor (DOL).

We received 5,000 comments from members of the public, state and local emergency response and health organizations, industry associations, and from national and international radiation protection organizations. Based on questions raised in comments and issues identified

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about implementing the updated PAG Manual, significant changes we made include:

- Clarifying planning considerations related to the lower FDA KI (supplemental) PAG in combination with deleting the thyroid-based evacuation threshold
- Providing additional language on implementing the FRMAC tables of derived values
- Adding information from the appendices of the 1992 PAG Manual on how the PAG levels were set, in "Basis" sections
- {{placeholder for how we're addressing water}}
- Providing explanation about the removal of the Relocation PAG of 5 rem over 50 years to avoid confusion with long-term cleanup goals

E. What is being done to address concerns raised in the public comments?

The major themes we heard from commenters are grouped under these headings: (1) maintaining the strength of environmental regulations; (2) PAGs are higher than radiation protection standards; (3) concern about the need for PAGs; and (4) concern about the cleanup (remediation) process guidance.

Concern: *Many commenters expressed concern that the PAG Manual is a way to weaken environmental regulations.*

Environmental regulations or standards are legal limits designed to prevent health effects from everyday exposure to low levels of radiation over long periods. The PAG levels are emergency guidance and do not overturn or affect the stringency or enforcement of any standards or laws, or how they apply. The PAG levels are used only in an emergency when

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radiation levels have already exceeded environmental standards and could be high enough to cause health effects unless something is done. The PAG levels trigger public safety measures to minimize or avoid radiation exposure during an emergency.

Concern: The fact that the PAGs are higher than existing radiation protection regulations means that the EPA is allowing the public to get more radiation exposure.

• PAGs are guidance for use only in an emergency. Potential increased risk for cancer from radiation exposure at the PAG levels is approximately 0.12% or 12 additional cancers out of 10,000 people. If used early in an emergency, the PAG guidance could trigger safety actions to prevent the public from getting any additional exposure at all—they could be evacuated before the arrival of a radioactive plume. The PAG safety actions can be triggered by projected doses—officials do not have to wait for radiation measurements to order public safety measures if they have any reason to suspect that the radiation could approach the PAG levels. Actual exposures are likely to be much lower than projected doses, if protective actions are taken and especially if they're taken early. The whole point of protective actions is to avoid risks.

• The PAG Manual provides guidance for emergency situations only. No one is permitting a radiological accident or terrorist event. As long there are nuclear materials in the world, we have the responsibility to plan responses to protect the public from potential releases. The PAG Manual is emergency guidance, not a legal standard, and it does not set cleanup, or remediation, levels.

• The PAG Manual is a non-binding guidance document to help officials plan safety measures in the event of a radiological emergency. Standards are legally enforceable limits on radioactive emissions. The PAG Manual has no bearing on the interpretation, enforcement, or

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setting of standards. The PAG Manual was first issued in 1975, and has no effect on environmental regulations.

Concern: The PAG Manual is not necessary. You should just base your emergency responses on existing environmental standards instead of the higher PAG triggers.

• The PAGs are designed to prevent health effects by triggering public safety measures, such as evacuation. The PAG levels are higher than legal standards because they are based on the risk of health effects from radiation levels high enough to warrant having people evacuate or stay indoors for extended periods. The additional risk from a slight increase over legal limits is not worth the known risks of evacuation or sheltering in place, traffic accidents, trips and falls, anxiety from separation of family members, etc. The PAGs are set at a level where the health risk from radiation exposure outweighs the risk from the safety measures. Although higher than legal standards, the PAG levels are still highly protective, and the guidance in the PAG Manual is designed to minimize unnecessary exposure.

• Emergency preparedness starts with prevention, including radioactive materials regulation, nuclear facility siting and minimizing risks from industry. Preventing accidents by ensuring safety redundancies and by preparing local responders to take quick actions will save people from disasters. PAGs are focused on recommending the best prompt actions when bad things are happening.

Concern: The cleanup guidance in the PAG Manual allows too much radiation.

• The PAG Manual is non-binding guidance for emergency situations and does not set cleanup levels. Chapter 4 of the PAG Manual provides a list of considerations for planning and

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initiating a cleanup (remediation) process after the emergency is brought under control, but does not prescribe end goals. Remediation may take a long time and some safety measures may be necessary for years. For instance, some restrictions on use of certain areas may be in place for a long time.

• Where remediation doesn't achieve background levels, land use might have to be restricted. Superfund, for instance, balances reduced exposure with practical requirements of removing the contamination.

• Remediation levels will be decided by decision makers along with community members to balance the goals with their needs. Jobs, homes, social, practical and technical factors will inform the remediation goals. How long the remediation takes will directly impact people's ability to work and live in an area. This process can be sped up with additional funding, workers, equipment, technology and collaboration with local residents helping out.

F. What is the timeframe for implementation of this PAG Manual?

Emergency management and radiation protection organizations that use the PAGs in their emergency plans will be expected to have incorporated this updated guidance within twelve months of this announcement. During this time, training, plans, and procedures can be updated. By agreement with the Federal Emergency Management Agency, evaluation of offsite response organizations around nuclear power facilities based on the new PAG Manual will begin twelve months after the date of this Notice. Outreach and technical training will be conducted by the EPA, the FRMAC and interagency partners of the PAG Subcommittee.

For further information and related guidelines, see the PAGs web page: http://www.epa.gov/radiation/protective-action-guides-pags

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Dated:

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Stan Meiburg,

Deputy Administrator.

ED_001057_00009000

To: Wieder, Jessica[Wieder.Jessica@epa.gov]
Cc: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Becker, Steven M.
Sent: Wed 2/10/2016 9:30:18 PM
Subject: Suite of Materials
1 - Using the Suite of Materials.docx
2 - PAGs Protect Q&As - Full.docx
3 - PAGs Protect Slide Deck.ppt
4 - PAGs Protect Q&As - Brief.docx
5 - Rad Terrorism Comprehensive Q&As.docx
TF Project 6 Final Report December 2013.pdf

Hi Jess,

Here is the entire Suite of Materials.

The work was federally funded (DHS). But I am not sure what the policy is regarding citation/credit to DHS DNDO, the Task Force, Old Dominion U., etc. Is this something we should ask Rich about?

All the best,

Steve

-----Original Message-----
From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Wednesday, February 10, 2016 12:18 PM
To: Becker, Steven M.
Subject: RE: PAGs Messages

Thank you, Steve!

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Becker, Steven M. [smbecker@odu.edu]
Sent: Wednesday, February 10, 2016 12:00 PM
To: Wieder, Jessica
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Hi Jess,

Yes, absolutely, I would be happy to do so.

I will send the entire folder (suite of materials) later today.

All the best,

Steve

-----Original Message-----
From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Wednesday, February 10, 2016 11:27 AM
To: Becker, Steven M.
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Hi Steve,

I hate to be a pain, but can you send me ALL of the Q&As in a word file. These would include the messages for special populations and the dirty bomb specific questions. I want whatever we put out to include all of the specialized messages that don't exist anywhere else just yet.

Thank you!

Jess

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Becker, Steven M. [smbecker@odu.edu]
Sent: Monday, February 1, 2016 9:21 AM
To: Wieder, Jessica
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Hi Jess,

Good morning! Attached please find the PAGs materials in accessible formats. There are three files:

1. The full PAGs Q&A (WORD file)

2. An abbreviated PAGs Q&A (WORD file)

3. The PAGs slide deck (Powerpoint)

If you need anything else, please don't hesitate to contact me.

All the best,

Steve

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Monday, February 01, 2016 7:23 AM
To: Becker, Steven M.
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Steve - I appreciate the help. As soon as you can get me the materials, we can start working on them.

Jessica

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Becker, Steven M. [mailto:smbecker@odu.edu]
Sent: Friday, January 29, 2016 2:41 PM
To: Wieder, Jessica <Wieder.Jessica@epa.gov<mailto:Wieder.Jessica@epa.gov>>
Subject: RE: PAGs Messages

Sorry it has taken so long... it has just been nutso busy around here.

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Friday, January 29, 2016 2:40 PM
To: Becker, Steven M.
Subject: Re: PAGs Messages

Thank you!
Jessica Wieder
U.S. Environmental Protection Agency
Radiation Protection Program
202-343-9201
m: 202-420-9353

Sent from my iPhone

On Jan 29, 2016, at 2:25 PM, Becker, Steven M. <smbecker@odu.edu<mailto:smbecker@odu.edu>> wrote:
Found the materials... stay tuned.

-----Original Message-----
From: Becker, Steven M.
Sent: Tuesday, January 26, 2016 1:57 PM
To: 'Wieder, Jessica'
Subject: RE: PAGs Messages

Hi Jess,

The snowstorm ended up being fun for us. Norfolk only got 2-3 inches of snow between the two bands that affected the area. So we had enough for snowballs and snowmen but not so much as to be a pain. (It was also merciful for the storm not to be too bad. I was too jet-lagged to deal with more than a little bit of shoveling!)

Yikes, I cannot believe how much snow DC and surrounding areas received! I hope the situation has at least given you some pretty scenes to view and some nice, relaxing family time to enjoy.

Re: the PAGs messages -- That is terrific! I am glad EPA will be able to make use of some of the content. I will go the archive later today, get the original WORD files out, and send them to you.

Stay safe!

All the best,

Steve

-----Original Message-----
From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Tuesday, January 26, 2016 7:20 AM
To: Becker, Steven M.
Subject: PAGs Messages

Hi Steve,

I hope you made it back from your travels before the storm. How did you and your family weather the storm? After not seeing a plow since 7 pm on Friday, my street banded together yesterday and hand shoveled 30 inches of snow from the court to the main street. It was a truly impressive act of a community working together. We will have a problem if two cars are headed in different directions, but at least we have a way out if we need it.

When you get a chance, can you please send me an editable version of the PAGs messages? We briefed our management and EPA is going to take the lead on publishing the Q&As. Some will go on the web as FAQs and some will end up in a PAG Manual Communications Implementation Tool.

Thank you.

Jess

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

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_____

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BEGIN-ANTISPAM-VOTING-LINKS

Teach CanIt if this mail (ID 03QgFilau) is spam:

Spam: https://www.spamtrap.odu.edu/canit/b.php?i=03QgFilau&m=3695f5018be1&t=20160210&c=s

Not spam:
https://www.spamtrap.odu.edu/canit/b.php?i=03QgFilau&m=3695f5018be1&t=20160210&c=n

Forget vote: https://www.spamtrap.odu.edu/canit/b.php?i=03QgFilau&m=3695f5018be1&t=20160210&c=f
---
END-ANTISPAM-VOTING-LINKS

A Note on Using the "Suite of Materials"

The informational materials contained in this folder ("Suite of Materials") are intended to be used in conjunction with the Task Force Project 6 Final Report (also found on this CD).

The informational materials have been designed to be used by local, state, tribal, and federal agencies and non-governmental organizations to help answer the general public's questions about radiological terrorism, protective actions, and Protective Action Guides (PAGs).

The materials are designed to be clear, user friendly, and adaptable for use in a variety of formats and settings (e.g., fact sheets, handouts, web content, presentations, and community meetings).

In addition, the materials are designed to be used either for educational/informational purposes or as the basis for answering questions during an actual incident.

Detailed descriptions and explanations of all of the informational materials are contained in the Task Force Project 6 Final Report.

In addition, to make the materials easy for agencies to adapt and use, the following are included in the "Suite of Materials" folder:

- A copy of the full "Protective Actions/PAGs Questions and Answers" document in WORD format. The file name is *2 – PAGs Protect Q&As – Full*.

- A copy of the Powerpoint slide deck on "Protecting Public Health in a Radiation Emergency: How Do Officials Decide What Steps the Public Should Take after a Radiological Terrorism Incident?" The slide deck has been set up as a template, with space left for easy insertion of agency information, contact information, details about the local situation or incident, photos and graphics, etc. The file name is *3 – PAGs Protect Slide Deck*.

- A copy of the shorter "Protective Actions/PAGs" information sheet in WORD format. The file name is *4 – PAGs Protect Q&As - Brief*.

- A copy of the comprehensive "Radiological Terrorism Q&A Guide" in WORD format. The file name is *5 – Rad Terrorism Comprehensive Q&As*.

Protective Actions and Protective Action Guides (PAGs): Questions and Answers

Q: What is a Protective Action?

A: *Protective actions* are the urgent steps that people can take to protect their health and the health of loved ones in a dirty bomb incident or other radiation emergency.

The main protective actions that the public might be asked to take are evacuation or sheltering (staying inside).

Q. How will people know what to do?

A. Health and emergency management officials will tell the public if protective actions are needed and whether evacuation or staying inside would be more effective for avoiding radiation doses to people.

The officials make these decisions about how to protect public health by using information about local conditions and by using something called the "PAGs."

Q. What does "PAGs" stand for?

A. The abbreviation "PAGs" is short for *Protective Action Guides*.

Q. What are Protective Actions Guides?

A. *Protective Action Guides*, or *PAGs*, are guides that help officials decide when it is necessary for people to evacuate, stay inside or take other urgent steps to safeguard health in a radiation emergency.

Every emergency situation is different, and the best action or set of actions in one situation may not be helpful at another time or in another situation.

Knowing *when* emergency steps need to be taken and *which* steps are warranted is very important for protecting the health of the public.

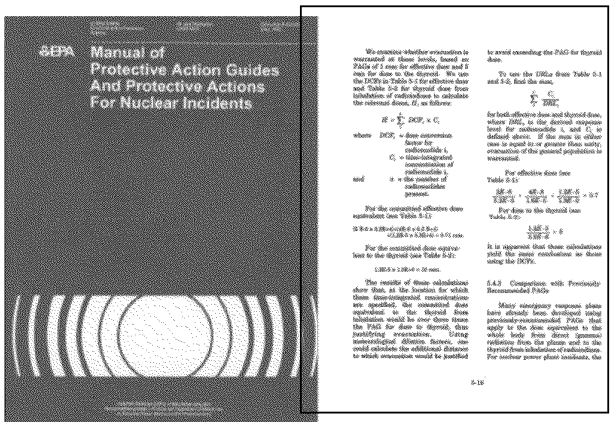
The PAGs provide general guidance to officials, which they can use together with their knowledge of local conditions, to make these important decisions.

Q: What do the PAGs look like?

A: The Manual of Protective Action Guides developed in 1991 was actually a book.

Much of it consists of pages with equations and tables with numbers developed by scientists.

More recent additions to the PAGs are not in book form, but have been published instead in the *Federal Register*.



Q. What kinds of steps are included in the PAGs?

A. The PAGs include actions that government agencies and members of the public can take to protect people's health in a radiation emergency.

In the first hours and days of a radiation emergency, there are two main protective actions that the public might be asked to take to avoid exposure to radiation: evacuation or sheltering (staying inside).

Q. What is evacuation? What is sheltering? What is the difference?

A. *Evacuation* involves quickly moving people from an area expected to be in the path of radioactive releases.

Sheltering, on the other hand, involves having people stay indoors in their homes, offices, schools or other buildings while radioactive materials pass over.

Q. Are there other steps officials might ask people to take?

A. Depending on the circumstances, other actions may also sometimes be helpful for protecting health.

For example, evacuation or sheltering could be supplemented by *limiting access* to (keeping people out of) the location where the emergency has taken place. Another step is *decontaminating people*, which means to remove any radioactive particles that may have fallen onto people's clothes, skin, or hair. Decontamination is done by having people wash, shower, and change their clothes.

Q. What about controls on food?

A. In some situations, officials may determine that it is necessary to take actions to prevent radioactive contamination from entering the food chain.

Steps might involve preventing livestock from grazing in potentially-contaminated pastures or fields and ensuring that animals only eat feed and drink water that has been previously stored.

When necessary, officials may also act to stop certain foods from coming to market or limit consumption of human food if it is suspected of being contaminated.

Q. What about taking Potassium Iodide?

A. Never take potassium iodide (also known as KI) and never give to your children unless you have been specifically advised to do so by the health department, emergency management officials, or your doctor.

Potassium iodide is a non-radioactive form of iodine.

KI can be useful in situations where radioactive iodine has been released into the environment.

It works by filling a person's thyroid gland with safe iodine so that harmful radioactive iodine in the environment is not absorbed.

But KI is only useful in situations involving radioactive iodine, and it only protects the thyroid gland; it does not help in other situations involving radioactive releases.

A dirty bomb situation is very unlikely to involve radioactive iodine.

You should only take potassium iodide if you have been specifically advised to do so by local public health officials, emergency management officials, or your doctor.

Q. How do officials know when it is time to carry out protective actions?

A. When a radiation emergency occurs, officials will use available information and computer models to quickly predict how much radiation people could potentially receive from the incident.

This estimate is then compared with decision levels described in the PAGs.

If the dose that could result from the emergency has the potential to go higher than the decision levels listed in the guidelines, the PAGs list what general actions can be taken to *avoid* the exposure from taking place.

In other words, PAGs are general guidelines for deciding when specific steps are needed to *prevent* people from being exposed to a level of radiation that might be hazardous to health.

Q. Wouldn't it make more sense to carry out all of the protective actions right away, as soon as a radiation emergency occurs?

A. No. Different safety measures are used for different situations.

Trying to take all of the measures at once would not be possible and could actually cause confusion or even harm.

For example, people cannot take shelter and evacuate at the same time.

Officials need to see what kind of hazard the emergency poses to people so they can provide the best advice on how to protect health.

Q. Why don't officials just automatically advise everyone to evacuate when a radiation emergency occurs?

A. Evacuation is one of the two main protective actions that can be taken in the immediate hours or first few days of a radiation emergency, and sometimes it is necessary for protecting people's health.

But there are also situations when sheltering may be a better choice for preventing or reducing radiation exposure.

For example, if a cloud containing radioactive particles is expected to pass over an area very soon and then leave quickly, evacuation could actually expose people to more radiation than staying indoors.

This is because evacuation takes time, and many people might be caught outside or in their cars when the cloud passed over.

So in such a situation, officials might ask people to stay indoors.

Buildings, such as large offices and structures made from brick, can provide significant protection from radiation.

So people staying indoors while the cloud passed by would be more protected than those caught outside trying to evacuate.

Sheltering also has the advantage of being less disruptive than evacuation and of enabling people to stay in familiar surroundings and have access to food, water, and information sources such as television or radio. So in some circumstances, it may be better than evacuating.

Watch or listen to official announcements to learn what steps you should take.

Q. Are there situations when evacuation might not be appropriate, or might even be harmful?

A. Yes. In some situations, evacuation may not be practical.

Blocked highways, for example, could make evacuation difficult.

Severe weather at the time of the radiation emergency could also make evacuation dangerous.

It is also important to remember that evacuations can themselves create certain risks to people.

With large numbers of people suddenly taking to the highways, automobile accidents occur and people can be killed or injured. Other vehicles may run out of gas and get stuck.

Evacuations can also be very difficult on people who are ill or in medical care. So, evacuations should only take place if they are necessary.

If the risks from a protective action such as a major evacuation are greater than the risks to people from the emergency situation itself, it makes no sense to carry out this protective action.

Officials using the PAGs and information about local conditions will tell the public whether evacuation, sheltering, or other steps (e.g., avoiding certain foods) are needed in a radiation emergency.

Q. What kinds of radiation emergencies are the PAGs used for?

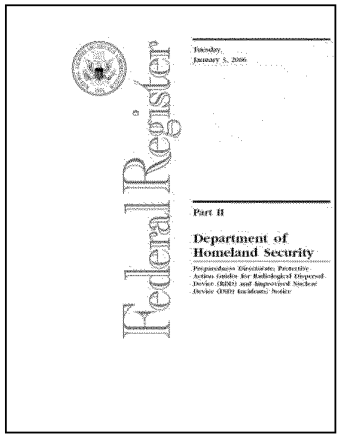
A. When the U.S. Environmental Protection Agency (EPA) was created in 1970, it was given responsibility for developing PAGs. The first Protective Action Manual, which was published in 1975, focused only on accidents at commercial nuclear power plants.

But in 1991 the Protective Action Guides were revised and expanded to cover all types of peacetime radiation emergencies.

The 1991 revisions also included recommendations from the U.S. Food and Drug Administration (FDA) for protective actions if an incident causes contamination of food or animal feed.

In addition, the 1991 Manual added guidance from the FDA and FEMA on the use of KI, potassium iodide, in situations involving the release of radioactive iodine.

Among the many possible situations covered in the 1991 PAGs were accidents involving U.S. nuclear power plants, accidents involving foreign nuclear reactors where the U.S. is affected, incidents involving the transportation of radioactive materials, satellite incidents, and incidents at nuclear research facilities, manufacturing or scrap metal recycling facilities, or hospitals.



More recently, in 2006, the PAGs were revised further to cover terrorism involving radioactive materials.

This includes both radiological dirty bombs (or other radiological dispersal devices, RDDs) and the exploding of a crude nuclear bomb (an IND, or improvised nuclear device).

Today, emergency responders and government officials can use the PAGs for any radiation emergency.

Q. Who uses the PAGs?

In a radiation emergency, federal, state and local emergency response agencies use the PAGs to decide when special actions are needed to avoid radiation exposure and protect people's health.

Under the system of government and the laws we have in the U.S., states and local governments have the main responsibility for deciding upon and taking measures to protect life and health.

The federal government's role in disasters is to provide assistance when it is needed.

This is true for all kinds of disasters, except war and declared national emergencies.

Q: What is the purpose of the PAGs?

A: At the most fundamental level, the purpose of the PAGs is to protect people's health.

By providing guidelines on when it is time to take protective actions, and which protective actions are best, the PAGs help prevent immediate effects and reduce the risk of longer-term effects from a radiation emergency.

The PAGs are also designed to ensure that any protective action taken does more good than harm.

Q: Are the PAGs federal standards?

A: Although the PAGs are not federal standards, they were developed by federal agencies to provide helpful guidance to state and local agencies.

The PAGs recommend precautions that state and local authorities can take during an emergency to keep people from receiving an amount of radiation that might be hazardous to their health.

State and local agencies use the PAGs, along with their knowledge of local conditions, to make decisions on how best to safeguard the population.

Q: What is the difference between a Protective Action and a PAG?

A: Protective actions are the specific steps that can be taken to avoid or reduce radiation dose. Evacuation and sheltering are examples of Protective Actions.

The PAGs are guides that tell officials when it is time to carry out protective actions and which steps are appropriate.

Q. Do the PAGs play a role in protecting people once the immediate emergency is over?

Yes. The steps described earlier are used to protect people in the early hours and days of a radiation emergency. (This is sometimes referred to as the *Early Phase*.)

But once the immediate emergency has passed, officials may recommend other steps to help protect people from longer-term exposure.

These cover what is known as the *Intermediate Phase* (which begins as soon as the emergency has been brought under control and can last days to months) and the Late Phase (which involves cleanup and recovery efforts lasting months to years).

One such measure is *decontamination of land and property*, which involves cleaning radioactive contamination from an area so that people can reoccupy it.

When this is not possible, another measure – *relocation* – may be required. Relocation involves moving people from an area and continuing to keep them from returning.

An additional protective action may involve placing continuing *controls on food and water*.

Q. What is the difference between evacuation and relocation?

Evacuation involves temporarily moving of people out of an area to protect them from short-term, high-level exposure to radiation, with the intention of having them return later.

Relocation involves moving people out of a contaminated area for a much longer time (or in some situations perhaps even permanently), in order to avoid chronic or long-term radiation exposure.

Q. After a terrorist attack that spreads radioactive contamination, how do officials figure out how much to clean up the area?

For Radiological Dispersal Device (RDD) or Improvised Nuclear Device (IND) incidents, the guidance for cleanup and recovery is contained in new guidelines that were issued in 2006.

The document, which is entitled *Application of Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*, describes what is called an optimization process for cleanup and recovery.

Every terrorism situation will be different, with impacts potentially ranging from light contamination of a single street or building to situations involving wider destruction and contamination.

Therefore, it makes little sense to have a “one size fits all” approach to cleanup and recovery.

Keeping this in mind, the guidance does not include a pre-established numeric guideline for cleanup.

Rather, the guidance takes the approach that the process of cleanup and recovery should be developed on an incident-specific basis and should engage stakeholders, be inclusive and be community-based. This is called *optimization*.

Q: What is Optimization? How does it work?

A: The idea is to have all interested parties involved in the process, and to find an approach to cleanup and recovery that is best for that particular community.

In choosing among cleanup alternatives, the decision-making process seeks to consider and balance many factors.

These could include:

- the nature of the incident
- the areas impacted (e.g., size, location relative to population)
- the types of contamination
- human health
- public welfare
- ecological risks
- technical feasibility
- how effective clean-up will be
- costs
- potential adverse effects of clean-up activities
- long-term effectiveness
- potential economic effects (e.g., on residents, tourism, business, and industry) and public acceptability.

Optimization is a process that tries to consider all of the relevant factors and to find a balance that is acceptable to a community.

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PROTECTING PUBLIC HEALTH IN A RADIATION EMERGENCY

How Do Officials Decide What Steps the Public Should Take after a Radiological Terrorism Incident?

Understanding Protective Actions and Protective Action Guides (PAGs)

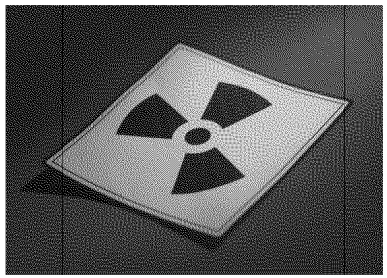
Presented by

Jane Q. Official
Official Title

Name of Radiation, Health or Emergency Management Agency
Location
Date

Why This Presentation?

- Taking the right actions in a radiation emergency is crucial for protecting public health.
- Members of the public often ask how officials decide which steps to advise the public to take.
- Terms such as Protective Actions and Protective Action Guides (PAGs) are unfamiliar to many people.



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Objectives

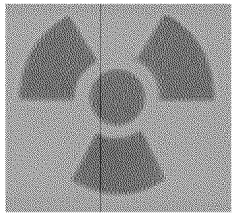
- To discuss the meaning and importance of Protective Actions and Protective Action Guides (PAGs) in a radiation emergency
- To discuss how officials decide what actions the public should take following a radiological terrorism incident
- To invite further questions and requests for information

Introduction

Radiological Dispersal Device (RDD)

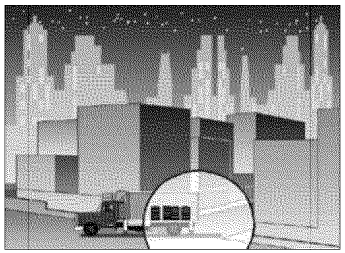
- Combination of radioactive material and some means to disperse it

- Many possibilities
  - Liquid
  - Incendiary
  - Aerosol



"Dirty Bomb"

- Combination of radioactive material and conventional explosive (e.g., dynamite, TNT)
  - Examples: truck bomb, planted device



- Does *not* involve a nuclear explosion
  - Dirty bomb lacks the capacity to cause the kind of massive, area-wide destruction and huge numbers of fatalities
  - Still very serious
  - Potential for tens or hundreds of deaths; major social, psychological, behavioral and economic impacts

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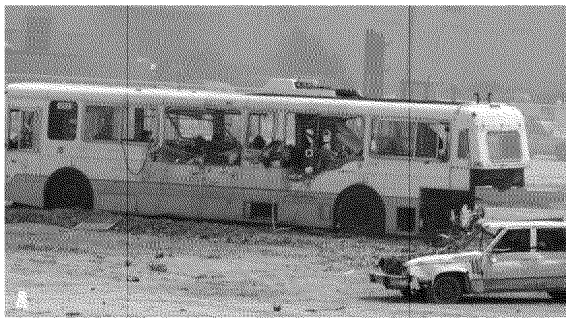
"Dirty Bomb"

- When the conventional explosive goes off, it does what any bomb does -- kills and maims people and causes damage to nearby structures.



Destroyed city bus after mock RDD attack, TOPOFF 2 national level exercise, Seattle. Photo: Seattle Municipal Archives Photograph Collection. Collection Record Series 0207-01 (Fleets & Facilities Imagebank). Item 138618.

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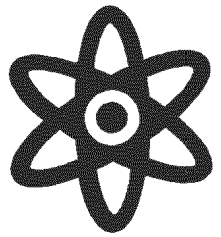
"Dirty Bomb"

- Direct casualties primarily from detonation of the conventional explosives

TOPOFF 2 RDD Exercise, 2003, Photo credit: Erik Stuhaug (Seattle Mayor Greg Nickels' Photo Gallery)

“Dirty Bomb”

- But with a dirty bomb, the explosion also disperses the radioactive material into the surrounding area with the aim of contaminating people, facilities and communities.



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Protective Actions, PAGs and Public Health

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Protecting Public Health

- In a dirty bomb incident – as in any emergency – the toll in terms of deaths, injuries and illnesses can be significantly reduced if people take the right steps to protect themselves and their loved ones.
- This is where Protective Actions and the Protective Action Guides (PAGs) can help.

Protective Actions

- The urgent steps taken to avoid or reduce radiation dose to the public in an emergency are called protective actions.
- The main protective actions that the public might be asked to take right after a radiation emergency occurs are evacuation or sheltering (staying inside).

Protective Actions

- *Evacuation* involves urgently moving people from an area expected to be in the path of radioactive releases.
- *Sheltering* involves having people stay indoors in their homes, offices, schools, or other buildings while radioactive materials pass over.

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How Do Officials Decide Which One to Recommend?

- Officials use something called the PAGs to decide whether people need to take protective actions and which steps will be most effective in avoiding or reducing radiation doses to people.
- The abbreviation “PAGs” is short for *Protective Action Guides.*

What are PAGs?

- *Protective Action Guides*, or *PAGs*, are scientific guides that were created to help officials decide when it is necessary for people to evacuate, shelter, or take other urgent steps to safeguard health after a radiation emergency has occurred.

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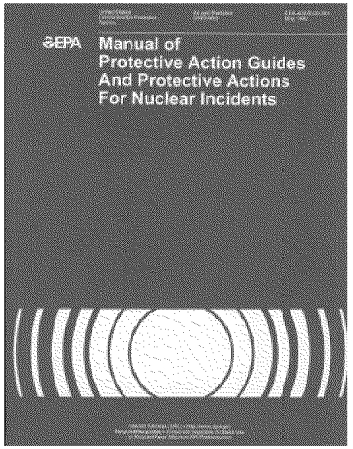
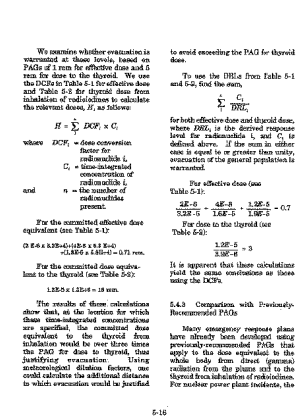
What is in the PAGs? What Do PAGs Look Like?

- The PAGs developed in 1991 were actually in book form; much of it consists of pages with *equations and tables with numbers developed by scientists*.
- More recent additions to the PAGs are not in book form, but have been published instead in the *Federal Register*.





We examine whether evacuation is warranted at these levels, based on PAGs of 1 rem for effective dose and 5 rem for dose to the thyroid. We use the DCFs in Table 5-1 for effective dose and Table 5-2 for thyroid dose from inhalation of radioiodines to calculate the relevant doses, H, as follows:

$$H = \sum_i^n DCF_i \times C_i$$

where DCF_i = dose conversion factor for radionuclide i,
C_i = time-integrated concentration of radionuclide i,
and n = the number of radionuclides present.

For the committed effective dose equivalent (see Table 5-1):

(3.E-6 x 3.2E-5)+(4E-8 x 3.2E-5)
=(1.8E-5 x 5.6E-5) = 0.71 rem.

For the committed dose equivalent to the thyroid (see Table 5-2):

1.2E-5 x 1.2E+6 = 15 rem.

The results of these calculations show that, at the location for which these time-integrated concentrations are specified, the committed dose equivalent to the thyroid from inhalation would be over three times the PAG for dose to thyroid, thus justifying evacuation. Using meteorological dilution factors, one could calculate the additional distance to which evacuation would be justified to avoid exceeding the PAG for thyroid dose.

To use the DRLs from Table 5-1 and 5-2, find the sum,

$$\sum_i^n \frac{C_i}{DRL_i}$$

for both effective dose and thyroid dose, where DRL_i is the derived response level for radionuclide i, and C_i is defined above. If the sum in either case is equal to or greater than unity, evacuation of the general population is warranted.

For effective dose (see Table 5-1):

$$\frac{2E-6}{3.2E-5} + \frac{4E-8}{1.6E-5} + \frac{1.2E-5}{1.9E-5} = 0.7$$

For dose to the thyroid (see Table 5-2):

$$\frac{1.2E-5}{3.9E-6} = 3$$

It is apparent that these calculations yield the same conclusions as those using the DCFs.

5.4.3 Comparison with Previously-Recommended PAGs

Many emergency response plans have already been developed using previously-recommended PAGs that apply to the dose equivalent to the whole body from direct (gamma) radiation from the plume and to the thyroid from inhalation of radioiodines. For nuclear power plant incidents, the

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How are the PAGs Used?

- Every emergency situation is different, and the best action or set of actions in one situation may not be appropriate at another time or in another situation.
- Knowing *when* emergency steps need to be taken, and *which* steps are warranted, is important for protecting the health of the public.

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How are the PAGs Used?

- The scientific information in the PAGs provides general guidance to officials, which they can use in combination with their knowledge of local conditions, to make these important decisions.

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To What Kinds of Emergencies Do the PAGs Apply?

- The first Protective Action Manual, which was published by the EPA in 1975, focused only on accidents at commercial nuclear power plants.

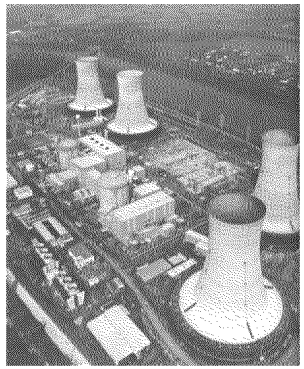

Photo: Three Mile Island: A Report to the Commissioners and the Public. NUREG/CR-1250, Volume 1. U.S. Nuclear Regulatory Commission.

- But in 1991 the PAGs were expanded to cover all types of peacetime radiation emergencies (including those involving transportation, research and hospitals).

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To What Kinds of Emergencies Do the PAGs Apply?

- The 1991 revisions also included recommendations from the U.S. Food and Drug Administration for protective actions if an incident causes contamination of food or animal feed.
- In addition, the 1991 Manual added guidance from the FDA and FEMA on the use of KI, potassium iodide, in situations involving the release of radioactive iodine.

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To What Kinds of Emergencies Do the PAGs Apply?

- More recently, in 2006, the PAGs were revised further to cover terrorism involving radioactive materials.
- This includes both radiological dirty bombs (or other radiological dispersal devices, RDDs) and the exploding of a crude nuclear bomb (an IND, or improvised nuclear device).
- Today, emergency responders and government officials can use the PAGs for any radiation emergency.

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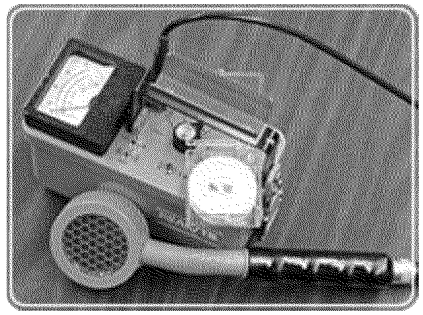
How do Officials Know When it is Time to Act?

- When a radiation emergency (including a dirty bomb incident) occurs, officials will use available information and computer models to quickly predict how much radiation people could potentially receive from the incident.



- This estimate is then compared with decision levels described in the PAGs.

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How do Officials Know When it is Time to Act?

- If the dose that could result from the emergency has the potential to go higher than the decision levels listed in the guidelines, the PAGs indicate what general actions can be taken to *avoid* the exposure from taking place.
- In other words, PAGs are general guidelines for deciding when specific steps are needed to *prevent* people from being exposed to a level of radiation that might be hazardous to health.

Why Not Just Carry Out Every Protective Action as Soon as a Radiation Emergency Occurs?

- Different protective actions are appropriate for different situations.
- Doing “everything at once” is not possible. For example, people cannot take shelter (stay indoors) and evacuate at the same time.

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Why Not Just Carry Out Every Protective Action as Soon as a Radiation Emergency Occurs?

- Officials need to see what kind of threat the emergency poses to people so they can provide the best advice to people on how to protect health.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- Evacuation is one of the two main protective actions that can be taken in the immediate hours or first few days of a radiation emergency, and sometimes it is necessary for protecting people's health.
- But there are also situations when sheltering may be a better choice for preventing or reducing radiation exposure.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- For example, if a cloud containing radioactive particles is expected to pass over an area very soon and then leave quickly, evacuation could actually expose people to more radiation than staying indoors.
- This is because evacuation takes time, and many people might be caught outside or in their cars when the cloud passed over.

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Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- In such a situation, people staying indoors while the cloud passed by would be **more protected** than those caught outside trying to evacuate.
- Sheltering also has the advantage of being less disruptive than evacuation and of enabling people to stay in familiar surroundings and have ready access to communication, food, and water.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- In some situations, evacuation may also not be practical.
- Blocked highways, for example, could make evacuation difficult.
- Severe weather at the time of the radiation emergency could also make evacuation dangerous.

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Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- It is also important to remember that evacuations can themselves create certain risks to people.
  - With large numbers of people suddenly taking to the highways, automobile accidents occur and people can be killed or injured.
  - Likewise, evacuations can be very difficult on people who are ill or in medical care. So, evacuations should only take place if they are necessary.

Photo: Three Mile Island: A Report to the Commissioners and the Public. NUREG/CR-1250, Volume 1. U.S. Nuclear Regulatory Commission.

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Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- If the risks from a protective action such as a major evacuation are greater than the risks to people from the emergency situation itself, it makes no sense to carry out the protective action.

Taking the Right Steps

- Officials using the PAGs and information about local conditions will tell the public whether evacuation, sheltering, or other steps are needed in a radiation emergency.
- Taking the correct steps is important for protecting yourself and your loved ones.

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Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- Sheltering or evacuation may be supplemented by
  - *limiting access* to (keeping people out of) the location where the emergency has taken place
  - *decontaminating people*, which means to remove any radioactive particles that may have fallen onto people's clothes, skin, or hair. Decontamination is done by having people remove their clothes and put them in a plastic bag, take a warm shower with lots of soap, wash their hair with only shampoo (no conditioner) or soap and water, and change clothes. Pets and service animals can also be decontaminated.

Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- Actions might be taken to prevent radioactive contamination from entering the food chain.
- Officials might put special *controls on selected foods* suspected of being contaminated.
- They might also temporarily *put livestock on previously stored feed and water*, rather than allowing them go graze in potentially contaminated areas.

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Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- In situations where radioactive iodine has been released into the environment, officials may distribute something called potassium iodide, or KI, to protect people's thyroid glands.
- KI is a non-radioactive form of iodine. When it is taken, it fills the thyroid with regular (non-radioactive) iodine so that the radioactive iodine is not absorbed.
- KI only protects the thyroid and it is only useful in situations involving radioactive iodine; *it does not help in other situations*. It is *not an antidote to radiation*.

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Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- It is very unlikely that radioactive iodine will be released in a dirty bomb attack. So KI is unlikely to be helpful in a dirty bomb situation.
- In the rare case that radioactive iodine is released, officials will notify the public and provide instructions on what to do.
- Never take KI, and never give it to children, unless local health officials, emergency management officials, or your doctor specifically tell you it is needed.

Taking the Right Steps

- Officials using the PAGs and information about local conditions will tell the public which steps, if any, are needed.
- Taking the correct steps is important for protecting yourself and your family.

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Who Decides Which Protective Actions to Recommend?

- Under the system of government and the laws we have in the U.S., states and local governments have the main responsibility for deciding upon and taking measures to protect life and health.
- This is true for all kinds of disasters, except war and declared national emergencies.

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Who Decides Which Protective Actions to Recommend?

- The federal government's role in disasters is to provide assistance when it is needed.
- In a radiation emergency, state and local emergency response agencies use the PAGs developed by the federal government, along with their knowledge of local conditions, to decide when special actions are needed to avoid radiation exposure and protect people's health.

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What Role Do PAGs Play in Protecting People Once the Immediate Emergency is Over?

- The steps described earlier are used to protect people in the early hours and days of a radiation emergency. (This is sometimes referred to as the *Early Phase*.)
- But once the immediate emergency has passed, officials may recommend other steps to help protect people from longer-term exposure.

What Role Do PAGs Play in Protecting People Once the Immediate Emergency is Over?

- These cover what is known as the *Intermediate Phase* (which begins as soon as the emergency has been brought under control and can last days to months) and the *Late Phase* (which involves cleanup and recovery efforts lasting months to years).

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What Role Do PAGs Play in Protecting People Once the Immediate Emergency is Over?

- One such measure is *decontamination of land and property*, which involves cleaning radioactive contamination from an area so that people can reoccupy it.
- When this is not possible, another measure – *relocation* – may be required. Relocation involves moving people from an area and continuing to keep them from returning.

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After a Radiological Terrorism Attack, How Do Officials Decide What Needs to Be Done to Clean Up the Area?

- For Radiological Dispersal Device (RDD) incidents, including dirty bombs, the guidance for cleanup and recovery is contained in a document issued in 2006.
- The document is entitled *Application of Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*.

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After a Radiological Terrorism Attack, How Do Officials Decide What Needs to Be Done to Clean Up the Area?

- The document notes that every terrorism situation will be different, with impacts potentially ranging from light contamination of a single street or building to situations involving wider destruction and contamination.
- Therefore, it makes little sense to have a “one size fits all” approach to cleanup and recovery.

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After a Radiological Terrorism Attack, How Do Officials Decide What Needs to Be Done to Clean Up the Area?

- Keeping this in mind, the guidance does not include a pre-established numeric guideline for cleanup.
- Rather, the guidance takes the approach that the process of cleanup and recovery should be *community-based* and developed on an *incident-specific basis.* This is called *optimization*.

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What is Optimization?

- The idea is to have all interested parties involved in the process, and to find an approach to cleanup and recovery that is best for that particular community.
- In choosing among cleanup alternatives, the decision-making process seeks to consider and balance many factors.

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What is Optimization? How Does it Work?

- These could include:
  - the nature of the incident
  - the areas impacted (e.g., size, location relative to population)
  - the types of contamination
  - human health
  - public welfare
  - ecological risks
  - technical feasibility
  - how effective clean-up will be
  - costs
  - potential adverse effects of clean-up activities
  - long-term effectiveness
  - potential economic effects (e.g., on residents, tourism, business, and industry) and public acceptability.

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What is Optimization? How Does it Work?

- Optimization is a process that tries to consider all of the relevant factors and to find a balance that is acceptable to a community.

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Finding Out More

On the web: www.agency.etc

Telephone: 1-800-123-4567

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Radiation Incident: Key Questions and Answers

This fact sheet was prepared by [AGENCY] to provide important information to the public regarding radiation emergencies. It is one in a series of fact sheets intended to answer some of people's most frequently asked questions. This particular fact sheet discusses two terms that are often used in relation to radiation emergencies: *Protective Actions* and *Protective Action Guides (PAGs)*. It also explains how agencies decide what steps the public should take in response to a radiation emergency. If you don't see your question here, or you wish additional information, please contact the web address or telephone number listed at the end of the sheet.

Topics covered in this fact sheet:

- ***What are Protective Actions?***
- ***What are Protective Action Guides (PAGs)?***
- ***How do agencies decide whether people should evacuate or stay where they are?***

Q: What is a Protective Action?

A: Protective actions are the urgent steps that people can take to protect their health and the health of loved ones in a dirty bomb incident or other radiation emergency.

The main protective actions that the public might be asked to take are evacuation or sheltering (staying inside).

Q. How do people know which steps to take?

A. Health and emergency management officials will tell the public if protective actions are needed and whether evacuation or staying inside would be more effective for avoiding radiation doses to people.

The officials make these decisions about how to protect public health by using information about local conditions and by using something called the "PAGs."

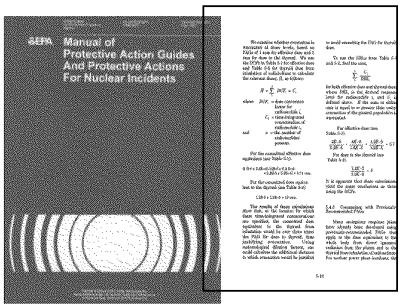
Q. What are the PAGs?

A. *PAGs, or Protective Action Guides*, are guides that were created to help officials decide when it is necessary for people to evacuate or shelter to safeguard health after a radiation emergency has occurred.

Every emergency situation is different, and the best action or set of actions in one situation may not be appropriate at another time or in another situation.

Knowing *when* emergency steps need to be taken, and *which* steps are warranted, is important for protecting the health of the public. The PAGs provide general guidance to officials, which they can use in combination with their knowledge of local conditions, to make these important decisions.

Q: What do the PAGs look like?



A: The PAGs published in 1991 were in book form, with many pages containing equations and tables with numbers developed by scientists. More recent additions to the PAGs are not in book form, but have been published instead in the *Federal Register*.

Q. What kinds of steps are included in the PAGs?

A. The PAGs include measures that government agencies and members of the public can take to protect people's health in a radiation emergency. In the first hours and days of a radiation emergency, there are two main protective actions that can be taken to avoid exposure to radiation: evacuation or sheltering.

Q. What is evacuation? What is sheltering? What is the difference?

A. *Evacuation* involves urgently moving people from an area expected to be in the path of radioactive releases.

Sheltering, on the other hand, involves having people stay indoors in their homes, offices, schools, or other buildings while radioactive materials pass over.

Q. Are there other steps officials might ask people to take?

A. Depending on the situation, evacuation or sheltering may be supplemented by other measures. One step is to limit access to (keep people out of) the affected area. Another step involves decontaminating people, which means to remove any radioactive particles that may have fallen onto people's clothes, skin, or hair. Decontamination is done by having people wash, shower, and change clothes.

Food: Sometimes officials may also take steps to stop certain foods from being consumed if the foods are suspected of being contaminated. Authorities may also act to prevent livestock from grazing in potentially-contaminated areas, and instead have the animals drink water and eat feed that has been previously stored.

Potassium Iodide: Potassium iodide, or KI, is a non-radioactive form of iodine. KI can be useful in situations where radioactive iodine has been released into the environment. It

works by filling a person's thyroid gland with safe iodine so that harmful radioactive iodine is not absorbed.

But a dirty bomb incident is very unlikely to involve radioactive iodine, so taking KI in that situation would not be helpful.

In the unlikely event that authorities do determine that radioactive iodine is involved, they will alert the public, distribute potassium iodide, and provide instructions.

Never take KI and never give to your children unless you have been specifically advised to do so by the health department, emergency management officials, or your doctor.

Q. How do officials know when it is time to carry out protective actions?

A. When a radiation emergency occurs, officials will use available information and computer models to quickly predict how much radiation people could *potentially* receive from the incident.

They then use the PAGs to determine what general actions can be taken to *avoid* that potential exposure from taking place.

In other words, PAGs are general guidelines for deciding when specific steps are needed to *prevent* people from being exposed to a level of radiation that might be hazardous to health.

Q. Wouldn't it make more sense to carry out all of the protective actions right away, as soon as a radiation emergency occurs?

A. No. Different safety measures are used for different situations.

Taking all of the safety measures at once is not possible. For example, people cannot stay inside and evacuate at the same time. Officials need to see what kind of threat the emergency poses to people so they can provide the best advice on how to protect health.

Q. Why don't officials just automatically advise everyone to evacuate when a radiation emergency occurs?

A. There are situations when sheltering may be a better choice for preventing or reducing radiation exposure.

For example, if a cloud containing radioactive particles is expected to pass over an area very soon and then leave quickly, evacuation could actually expose people to more radiation than staying indoors.

This is because evacuation takes time, and many people might be caught outside or in their cars when the cloud passed over. So people staying indoors while the cloud passed by would be more protected than those caught outside trying to evacuate.

Also, in some situations, evacuation may not be practical. Blocked highways, for example, could make evacuation difficult. So, too, could severe weather.

Officials using the PAGs and information about local conditions will tell the public whether evacuation, sheltering or other steps are needed in a radiation emergency. Follow the instructions so that you take the right steps to protect yourself and your loved ones.

Q. Who uses the PAGs?

States and local governments have the main responsibility for taking measures to protect life and health.

In a radiation emergency, state and local emergency response agencies use the PAGs to decide when special actions are needed to avoid radiation exposure and protect people's health.

Q. Do PAGs play a role in protecting people after the immediate emergency is over?

Yes. The steps described earlier are used to protect people in the early hours and days of a radiation emergency. (This is sometimes referred to as the Early Phase.)

But once the immediate emergency has passed, officials may recommend other steps to help protect people from longer-term exposure.

These cover what is known as the Intermediate Phase (which begins as soon as the emergency has been brought under control and can last days to months) and the Late Phase (which involves cleanup and recovery efforts lasting months to years).

One such measure is *decontamination of land and property*, which involves cleaning radioactive contamination from an area so that people can reoccupy it. When this is not possible, another measure – *relocation* – may be required. Relocation involves moving people from an area and continuing to keep them from returning. An additional protective action may involve placing continuing *controls on food and water*.

Q. Where can I find out more about more?

We are strongly committed to keeping the public informed and to answering people's questions. If you want to learn more, or did not see your question here, please contact us on the web at www.agency.etc or by telephone: [INSERT AGENCY CONTACT NUMBER HERE]

Radiological Terrorism Incident: Question and Answer Guide

Impacted Community: Immediate Actions

What has happened?

An explosion has occurred at [Location] in [City].

Police, firefighters, and other emergency responders are now on the scene.

[First reports indicate that there are casualties.]

[Emergency responders have also detected radiation in the area close to the explosion site.]

Law enforcement agencies suspect the explosion was the result of a dirty bomb, which combines regular explosives such as dynamite with radioactive powder, liquid, pellets, or other materials.

Was this an atomic bomb?

No, this was not atomic bomb.

The situation we are facing involves a dirty bomb, which is completely different from an atomic bomb.

A dirty bomb does not cause a nuclear blast (the so-called mushroom cloud) and a dirty bomb affects a much smaller area than an atomic bomb.

A dirty bomb cannot cause the kind of massive, area-wide destruction and huge numbers of fatalities associated with an atomic bomb.

But this is still a very serious situation, especially very close to where the dirty bomb explosion took place.

What are the main dangers from the bombing incident?

The main and most immediate danger from a dirty bomb is from the explosion itself.

When the dynamite or other explosive used in the bomb goes off, it can destroy or damage nearby buildings and vehicles and injure or kill people.

The radioactive materials used in a dirty bomb would probably not create enough radiation exposure to cause immediate serious illness, except to people who are very close to the site of the explosion.

However, the radioactive dust and smoke that are released into the air can be hazardous to people's health if it is breathed in.

Because of this, it is important for you to take the steps listed below to protect yourself and your loved ones.

What steps should I take to protect myself and my loved ones?

There are a few simple steps — recommended by doctors, scientists, and health experts — that will help protect you and your loved ones.

- outside and near the explosion
- inside a building near the explosion
- in a car or other vehicle in the vicinity of the explosion
- farther away

IF YOU ARE OUTSIDE AND CLOSE TO WHERE THE EXPLOSION TOOK PLACE

- **Cover your nose and mouth**. Covering your nose and mouth with a cloth reduces the risk of breathing in radioactive dust or smoke. You may also use a disposable respirator such as an N95 mask if one is immediately available.
- **Don't touch** objects or pieces thrown off by an explosion — they could be radioactive.
- **Go inside and stay inside**. Quickly go into a building where the walls and windows have not been broken. This will help shield you from any radiation that might be outside.
- **Remove your outer clothes**. Once you are inside, carefully take off your outer layer of clothing. This is done in case any radioactive dust has fallen onto your clothes while you were outside.

  Carefully removing outer clothes can get rid of up to 90% of radioactive dust.

- Place the clothes in a plastic bag if one is available. Put the cloth you used to cover your mouth in the bag, too. Seal the bag. Place the bag away from people and pets and keep it until authorities tell you what to do with it.

- **Wash off**. If available, take a warm shower with lots of soap. Do not scald or scratch your skin. Wash your hair only with shampoo or soap and water.

  Don't use conditioner because it can cause the radioactive dust to stick to your hair.

  Children should be given a shower or washed under supervision of a parent or other adult.

- If you cannot shower, use a wipe or clean wet cloth to wipe skin that was not covered by clothing (such as your hands and face).

- Gently blow your nose and gently wipe your eyelids, eyelashes, and ears with a clean wet cloth.

- Put on clean clothes. Clothing stored in a closet or away from radioactive material is clean. If you do not have clean clothes, carefully brush off your outer layer of clothing and get dressed again.

- **Tune in**. Tune to local radio or television news or government emergency management websites for more instructions.

IF YOU ARE IN A BUILDING CLOSE TO WHERE THE EXPLOSION TOOK PLACE

- **Stay inside.** If the walls and windows of the building are not broken, stay in the building and do not leave.

- **Close doors and windows.** To keep radioactive dust or powder from getting inside, shut all windows, outside doors, and fireplace dampers. It is not necessary to put duct tape or plastic sheets around doors or windows.

  Temporarily turn off fans, and heating and air-conditioning systems that bring in air from the outside. In-room fans (for example, ceiling fans) that only recirculate air are okay to use. Air conditioning systems in large buildings can be used if they are set on recirculate.

- If the walls and windows of the building are broken, go to an inside room and do not leave. If the building has been heavily damaged, quickly go into another building where the walls and windows have not been broken.

- **If you have to go outside, be sure to cover your nose and mouth with a cloth**. Once you are inside, take off your outer layer of clothing and seal it in a plastic bag if available. Store the bag where others will not touch it.

- **Shower or wash** with soap and water, removing any remaining dust. Be sure to wash your hair with shampoo or soap, but remember not to use conditioner, since it can cause radioactive dust to stick to your hair.

- **Tune in**. Tune to local radio or television news or government emergency management websites for more instructions.

IF YOU ARE IN A CAR OR TRUCK WHEN THE EXPLOSION TAKES PLACE

- **Shut the windows and vents.** Close the windows and turn off the fan, air conditioner or heater if weather conditions permit. Otherwise, set the fan, air conditioner or heater on recirculate.

- **Cover your nose and mouth.** Cover your nose and mouth with a cloth to avoid breathing radioactive dust or smoke.

- If you are close to your home, office, or a public building, go there immediately and go inside quickly.

- If you cannot get to your home or another building safely, pull over to the side of the road and stop in the safest place possible. Turn off the engine and stay in the car until you are told it is safe to get back on the road.

  If it is a hot or sunny day, try to stop under a bridge or in a shady spot so you and your passenger don't overheat.

- **Tune in**. Listen to the car radio for more instructions.

IF YOU ARE IN A POTENTIALLY-AFFECTED COMMUNITY BUT ARE NOT NEAR THE EXPLOSION

- **Go inside and stay inside**. Go inside your home, office, school or other building.

  The wind can sometimes carry small amounts of radioactive dust from the site of a dirty bomb explosion. As a precaution, people should stay indoors for their personal safety until authorities say it is okay to leave.

- **Tune in.** Tune to the local radio or television station, or check government emergency management websites, for more instructions.

Potassium Iodide (KI): Important Information

Should my family take potassium iodide?

Never take potassium iodide (also known as KI) and never give to your children unless you have been specifically advised to do so by the health department, emergency management officials, or your doctor.

What is potassium iodide? How does it work?

Potassium iodide is a non-radioactive form of iodine.

KI can be useful in situations where hazardous radioactive iodine has been released into the environment.

KI works by filling a person's thyroid gland with safe iodine so that the harmful radioactive iodine in the environment is not absorbed.

But a dirty bomb incident is very unlikely to involve radioactive iodine. So taking KI in that situation would not be helpful.

You should only take potassium iodide if you have been specifically advised to do so by local public health officials, emergency management officials, or your doctor.

Do dirty bombs release radioactive iodine?

For various technical reasons, particularly the short amount of time it stays radioactive, radioactive iodine is not considered something terrorists are likely to use in a dirty bomb.

It is unlikely that a "dirty bomb" will release radioactive iodine.

Do not take KI unless local health officials, emergency management officials, or your doctor specifically tell you it is needed.

Will potassium iodide protect me from radiation?

Potassium iodide only protects the thyroid gland from radioactive iodine. It does not provide protection from any other kind of radiation exposure.

Potassium iodide pills are not "radiation antidotes." Potassium iodide should *only* be taken if there is a specific public health recommendation to do so.

Are over-the-counter medicines that contain iodine, such as disinfectants or throat sprays, a good substitute for potassium iodide?

No. Doing so will not protect your thyroid and could even be dangerous to your health.

It is true that many over-the-counter medicines contain iodine in some form. Examples include iodine liquid for cuts and sores, disinfectants, and throat sprays.

But these should never be taken as a substitute for potassium iodide.

These over-the-counter medicines and products are not intended for internal use. They may contain other ingredients that can be harmful.

Also, the amount of iodine contained in most of these products is small and would have no protective effect against radioactive iodine.

What about taking household disinfectants or antiseptics that contain iodine? Are these a good substitute for potassium iodide?

No. Doing so will not protect your thyroid and could even be dangerous to your health.

It is true that some household products such as disinfectants and sterilizing solutions may contain iodine.

But they are not meant to be taken internally. Drinking or consuming them could poison you.

Is taking large amounts of iodized salt a good substitute for potassium iodide?

No. Doing so will not protect your thyroid. Furthermore, although most people don't realize this, it could even be dangerous.

It is true that iodized salt contains small quantities of iodine. But the iodine content in iodized salt is too low to prevent uptake of radioactive iodine.

Furthermore, it is actually dangerous to consume large amounts of iodized salt.

The main ingredient in salt -- sodium chloride -- can make people very ill if taken in large amounts.

Even tablespoons of salt taken repeatedly over a short period of time can cause poisoning. Eating large amounts of salt can also cause high blood pressure and other medical problems.

Are herbs or herbal products a good substitute for potassium iodide?

No. Doing so will not protect your thyroid and could even be dangerous to your health.

It is true that some herbs and herbal products may contain iodine.

But the amount of iodine is not regulated, so it is not possible to know how much iodine you will be getting.

Taking large amounts of herbs or herbal products could endanger your health.

Do people need a prescription to obtain potassium iodide?

The government stockpiles potassium iodide for emergency uses.

If public health and emergency management officials determine that taking potassium iodide would be helpful, the pills will be provided to people at no charge.

But a dirty bomb situation is very unlikely to involve radioactive iodine.

Should people take potassium iodide because of the dirty bomb?

Do not take potassium iodide unless you have been advised to do so by your public health and emergency management agencies or your doctor.

Potassium iodide is unlikely to be helpful in a dirty bomb situation because a dirty bomb is unlikely to contain radioactive iodine.

Never consume iodine solution, disinfectants, cleaning products, or other over-the-counter medications or products as a substitute for KI; do not take large quantities of salt as a substitute for KI.

Taking such products will not protect your thyroid and could even be very dangerous to your health and the health of your loved ones.

Follow the advice and recommendations of public health and emergency management officials and your doctor.

Additional Information: Situation Specifics

Where should I go for information about the situation?

Tune in your local radio or television station, or check government emergency management websites, for additional information.

Public health and emergency management officials will be providing regular updates.

You can also go to the following website or toll-free hotline for information:

www.agency.etc

1-800-123-4567

I am seeing a lot of information and instructions about what to do on internet blogs. Should I follow it?

Blogs, social media, and the internet more generally can be a useful source of information, but only if the source is known and trustworthy.

Unfortunately, we know from past disasters and emergencies that small numbers of individuals may use the situation to distribute false information. And even well-intentioned individuals can pass on incorrect information or rumors.

Therefore, it is advisable to double-check what you are reading with the information and instructions being provided by the official website listed above, the official toll-free hotline, or local radio and television broadcasts.

In an emergency, get information from reliable sources so that you can protect your health and the health of loved ones.

I received a text message giving me instructions on what to do. How do I tell if it is an official message or a fake?

Unfortunately, we know from past disasters and emergencies that small numbers of individuals may use the situation to send out official-looking false information. And, as noted earlier, even well-intentioned individuals can pass on incorrect information or rumors.

If the government has issued an emergency text message, it will clearly identified as coming from [INSERT INFORMATION]. That is, the sender will read [INSERT INFORMATION].

If you are unsure about a message, double check what you are reading with the information and instructions being provided by the official website or the official toll-free hotline.

www.agency.etc

1-800-123-4567

What has happened?

An explosion has occurred at [Location] in [City].

Law enforcement agencies suspect the explosion was the result of a dirty bomb, which combines regular explosives such as dynamite with radioactive powder, liquid, pellets, or other materials.

[First reports from the scene indicate that there are casualties.]

[Emergency responders have also detected some radiation in the area close to the explosion site.]

Was this an atomic bomb?

No, this was not atomic bomb.

The situation here involves a dirty bomb, which is completely different from an atom bomb.

An atomic bomb, like those bombs dropped on Hiroshima and Nagasaki during World War Two, involves the splitting of atoms and a huge release of energy that produces the atomic mushroom cloud. Atom bombs can create immense destruction over a significant portion of a city.

A dirty bomb is different. A dirty bomb uses dynamite, plastic explosive, fertilizer, or other regular explosives to destroy nearby buildings and to scatter radioactive dust, smoke, or other material into the surrounding area.

A dirty bomb *cannot create an atomic blast*. A dirty bomb is much less destructive and affects a much smaller area than an atomic bomb.

How serious is the situation?

A dirty bomb is far less destructive than an atomic bomb.

But this is still a very serious situation, especially for people very close to where the explosion took place.

Where did the dirty bomb come from?

Early indications are that this was a deliberate [terrorist] attack using a dirty bomb.

Law enforcement and other agencies are using all available means to determine who is responsible for this attack.

How large was the explosion?

It is too early to know the exact size of the explosion. But buildings located near the explosion site have been damaged, and people have been [injured, killed].

This is a very serious situation and authorities are responding with every resource they can.

How many people have been injured or killed?

At this time, we do not yet know the specific number of casualties. An update will be provided as soon as reliable information becomes available.

Right now, we are focused on getting help to people in the affected area as quickly and safely as possible.

How much damage has there been?

First reports from the scene indicate that the explosion has caused serious damage to buildings located very close to [LOCATION].

In addition, there is some damage to nearby [CHOOSE AS APPROPRIATE roads, public transportation, communication, electricity, water pipes, communication systems].

As you would expect, our first priority is on helping people who have been injured and on protecting the health of the community.

As soon as it is possible, steps will be taken to restore damaged systems and services.

What types of radioactive material were spread due to the dirty bomb explosion?

First responders at the scene have detected [radiation / type of radionuclide if known].

[However, it is possible that additional radioactive materials could be involved.]

But regardless of the specific radioactive materials involved, the best way to protect yourself and your loved ones is to follow the instructions issued by health and emergency management officials.

Where is the radioactive material located?

Radiation and environmental health experts are checking air, water, and ground conditions in and around the explosion site to determine the precise locations of hazardous areas.

Where is the radioactive dust and smoke from the dirty bomb going?

According to current weather predictions, the areas [DIRECTION] of [CITY] could be in the path of the cloud containing the radioactive dust and smoke.

Until advised otherwise, people in neighborhoods and communities that could potentially be in this path should stay indoors.

What is a plume?

Officials sometimes call the cloud of smoke and radioactive dust moving away from the explosion a plume.

Could there be more dirty bomb explosions in our area or elsewhere?

At this time, we have no information to indicate that additional attacks are being planned.

[At this time, we do not know whether additional terrorist attacks are being planned.]

But we are taking all possible security precautions to protect the American people.

As a nation, we must continue to be alert. If you see something, say something.

If you see anything suspicious, contact your local police or the FBI right away.

Be sure to stay tuned to local radio or television news, or check government emergency management websites, for updates.

What are emergency responders doing at this time?

Emergency responders, radiation experts, scientists, and representatives from all levels of government are working together to protect the public and save lives.

Law enforcement is working to apprehend those responsible for this despicable act.

How can people learn about the safety of their family members?

If phone lines or other communication infrastructure has been damaged in the bombing, or if the lines are clogged, you may not be able to complete a phone call. Use text messages instead to try and reach your family members.

If you have access to a computer or a web-enabled device, use e-mail, social media websites like Facebook and Twitter, or online registries such as the Red Cross Safe and Well website.

Emergency responders are gathering and organizing all vital information available. If you are separated from your children or loved ones, search online for registries where people can identify themselves and their location.

Bear in mind that it may take time for registries to put in the latest information.

You can seek additional information and counseling services at [LIST ORGANIZATIONS or LOCATIONS].

What will happen to people in the affected neighborhoods?

While it is too early to know the specific impacts, we know that this is a serious incident. Lives have been lost, people have been injured, and homes and businesses have been destroyed.

All levels of government are coordinating their efforts to do everything possible to help the people affected by this emergency.

As life-saving activities continue, follow the instruction of emergency responders. These instructions are for your safety and the well-being of your loved ones.

These instructions are based on the best information we have right now.

These instructions may be updated as more information is available.

How can the public help?

Your help is vital in this situation.

Here are six important steps you can take to help:

- Do not abandon your car on the road. Instead, park your car without impeding traffic. This will allow responders to help people in need of assistance.

- Do not go near the site of the dirty bomb explosion. It could put you in danger and also stop emergency responders from doing their jobs.

- Use text messaging rather than phone calls to communicate with friends and family. This will help to keep the phone lines from overloading.

- Don't go to the hospital, police stations, or fire stations unless you were injured in the explosion, or have another medical emergency requiring immediate treatment. These facilities need to be available for victims in serious need of assistance.

- Stay alert: If you see anything suspicious, contact your local police or the FBI right away.

- Stay tuned to television, radio, and government emergency management websites for updates.

Additional Information: Health and Safety Issues

What are the immediate dangers to health?

The most immediate danger is close to the site of the explosion. Buildings are damaged, there is a great deal of glass and debris on the ground, and there may be fires burning.

Emergency responders are working to rescue individuals who are trapped and to care for people who have been have been hurt.

Do not approach the area of the explosion.

Follow the safety instructions provided by emergency response officials.

What are the dangers from radiation?

The main and most immediate danger from a dirty bomb is from the explosion, which can cause property damage, serious injuries, and deaths.

The radioactive materials used in a dirty bomb would probably not create enough radiation exposure to cause immediate serious illness, except possibly very close to where the bomb went off.

However, the radioactive dust and smoke spread by the bomb could travel farther away. Breathing them could be hazardous to health.

Because radiation cannot be seen, smelled, or tasted, you should take immediate steps to protect yourself and your loved ones.

How should I protect myself if I am outside in the area where the explosion occurred?

If you are outside and close to the site of the explosion, cover your nose and mouth with a cloth to avoid breathing smoke or other contaminants.

Don’t touch objects or pieces thrown off by an explosion—they could be radioactive.

Go inside a building where the walls and windows have not been broken. This will help shield you from any radiation that might be outside.

Remove your outer clothes and wash off. Take a warm shower with lots of soap. Do not scald or scratch your skin.

Wash your hair with shampoo or soap and water. Do not use conditioner because it can cause radioactive dust to stick to your hair.

If you cannot shower, use a wipe or clean wet cloth to wipe skin that was not covered by clothing (such as your hands and face).

Put on clean clothes and tune to local radio or television for further instructions.

How should I protect myself if I am in a building close to where the explosion took place?

If the walls and windows of the building are intact, stay inside.

If the walls and windows of the building are broken, go to an inside room and do not leave. If the building has been heavily damaged, quickly go into another building where the walls and windows have not been broken.

Close doors and windows to keep radioactive dust or powder from getting inside,

Temporarily turn off fans, and heating and air-conditioning systems that bring in air from the outside. In-room fans (for example, ceiling fans) that only recirculate air are okay to use. Air conditioning systems in large buildings can be used if they are set on recirculate.

Tune in. Tune to local radio or television news, or check government emergency management websites, for more instructions.

What should I do if I come across an object from the explosion that might be radioactive?

Do not approach, pick up, or touch debris or other objects thrown off by the dirty bomb explosion. Especially in the immediate vicinity of the explosion, they could be radioactive.

If people are told by health and emergency management officials to self-decontaminate, what does this mean?

It means that people are being told to take several easy steps to remove any radioactive material that might have fallen onto clothes, skin, or hair.

To self-decontaminate: (1) remove your outer clothes; (2) place the clothes in a plastic bag, seal the bag, and put it someplace away from children and pets; (3) take a warm shower with lots of soap; do not scald or scratch your skin; (4) wash your hair with

shampoo or soap and water. Do not use conditioner because it can cause radioactive dust to stick to your hair; (5) if you cannot shower, use a wipe or clean wet cloth to wipe skin that was not covered by clothing (such as your hands and face); (6) put on clean clothes.

If people have been told to stay inside and self-decontaminate during a radiation emergency, what should be done about pets? How do I decontaminate my pet?

If your pet was outside at the time of the explosion, the pet can be brought inside and decontaminated.

Start by putting on waterproof gloves and a dust mask (or other material to cover your mouth).

Also, keep cuts and scrapes (yours and on your pet) covered to keep radioactive material out of any wounds.

Then wash your pet carefully in a shower or bath using shampoo or soap and water. Rinse the pet completely.

To make sure you have not picked up any contaminants, be sure to shower, and wash your hands and face, after you have washed the pet.

Will people who have been exposed to the radioactive dust and smoke get cancer?

Just because a person is near a radioactive source for a short time or gets a small amount of radioactive dust on himself or herself does not mean he or she will get cancer later in life, especially if it is removed quickly.

Except very close to the site of the incident, the radiation doses are expected to be low.

Exposure at the low radiation doses expected from a dirty bomb could increase the risk of cancer slightly over naturally occurring rates.

Scientists and health experts are working now to gather information on the radiation risks posed by the attack.

Meanwhile, health agencies will be establishing screening centers to check people for radioactive contamination and to arrange for any longer-term follow-up should it be needed.

Further information on this will be provided soon by health and emergency management officials.

Should I take potassium iodide (KI)?

Potassium iodide is unlikely to be helpful in a dirty bomb incident.

You should only take potassium iodide if you have been specifically advised to do so by local public health or emergency management officials.

How do I know if I've been exposed to radiation or contaminated by radioactive materials?

People cannot see, smell, feel, or taste radiation; so you may not know whether you have been exposed.

In addition, low levels of radiation exposure (like those expected from a dirty bomb situation) do not cause any symptoms.

Police or firefighters will quickly check for radiation by using special equipment to determine how much radiation is present and whether it poses any danger in your area.

Is the food safe to eat?

Food in sealed containers and any unspoiled food in your refrigerator or freezer are safe to eat.

Use a damp towel or cloth to wipe off cans, bottles, packaged foods, counters, plates, pots and utensils before using them.

Seal these towels or cleaning cloths in a plastic bag and place them away from people and pets.

However, any unpackaged food that was out in the open and close to the incident may have radioactive dust on it. Therefore, do not consume food that was out in the open.

Food that was outdoors from [*time*] today, within a few miles of [*explosion site*] should be avoided.

Is the water safe to use?

Bottled water and sealed juice or soda containers will be free of radioactive contamination. But wipe or rinse the outside of bottles or cans before opening them.

Water from the tap is probably safe. But until we have drinking water test results, only bottled water is certain to be free of contamination. Tap or well water can be used for cleaning yourself and your food.

Boiling tap water does not get rid of radioactive material.

Is pet food safe for my pet?

As with human food, sealed pet food is safe for animals to consume.

As with human food, rinse or wipe off any debris from a closed can or package with tap water and dispose the washcloth in a plastic bag away from people and animals.

Is radiation contagious?

Unlike some biological agents, radiological effects are not contagious and cannot result in an epidemic.

It is true that people who have radioactive dust on their clothes or their bodies can leave some of that contamination on things or people they come into contact with.

But there is a simple solution: to have them clean up or decontaminate.

People who might have radioactive dust on them can remove their outer layer of clothing, shower, and put on new clothes.

Is it safe for me to let someone who might have been affected by the dirty bomb into my home?

Even if someone has radioactive dust on his or her clothes or body, a few simple steps can clean up or decontaminate the person so that he or she can safely visit your home.

First, ask your visitor to remove his or her outer layer of clothing and place it in a plastic bag. Place the bag away from people and pets.

Second, have your visitor shower with soap and warm water to remove any remaining radioactive material. A warm shower with lots of soap is sufficient. There is no need to use very hot water or to scratch the skin.

Hair may be washed with shampoo or soap and water. But don't use conditioner because it can cause the radioactive dust to stick to your hair.

Gently blow your nose and gently wipe your eyelids, eyelashes, and ears with a clean wet cloth.

Finally, put on clean clothes.

Special Issues and Concerns:

Pregnancy and Breastfeeding

I am pregnant. Do I need to terminate my pregnancy because of the incident?

After any radiation incident, expectant mothers who have concerns should seek advice from their physicians working in consultation with radiation professionals.

Unfortunately, after some radiation accidents in other countries, pregnant women reportedly terminated their pregnancies because they feared that the radiation would harm the developing embryo or fetus. Tragically, these terminations turned out to be totally unnecessary.

It is true that the fetus is extremely sensitive to radiation, with the unborn child at greatest risk during the first trimester of the pregnancy. But as the Centers for Disease Control and Prevention (CDC) has noted, most radiation exposure events will not expose the fetus to levels likely to cause health effects.

In the case of a dirty bomb, the majority of people in the general area of the incident would only be exposed to low levels of radiation. In general, this situation is unlikely to expose the fetus to levels associated with health effects.

However, for any pregnant woman who was very close to the site of the explosion, significantly higher levels of contamination on the body or inside the body could result in higher exposure levels.

Before any potential health risk to the embryo/fetus can be assessed, healthcare professionals and radiation experts would determine what external or internal doses the mother might have received as a result of being very close to the explosion.

Once dose levels to the mother and fetus have been determined, your physician working in conjunction with other medical and radiation professionals can discuss potential risks (if any) and provide appropriate counseling.

Is it safe to breastfeed?

Breastfeeding is very important for the well-being of a baby, providing vital nutrients and a sense of security.

For mothers far from the explosion site, breastfeeding can continue.

However, if a mother was close to the explosion site and was either injured or is believed to have inhaled significant quantities of radioactive dust or smoke, there is a small possibility that some radioactivity could be passed through breast milk.

Public health and medical officials may advise the mother to temporarily stop breastfeeding and switch to either breast milk that was pumped and stored before the incident or baby formula until she is able to contact her doctor or public health and medical officials for further instructions or advice.

Formula containers and feeding supplies should be cleaned with a damp cloth or clean towel before use. Put the used cloth or towel in a plastic bag or other sealable container and place the bag in an out-of-the-way place, away from other people and pets.

If no other source of food is available, continue to breastfeed. Wash the nipple and breast thoroughly with soap and warm water before nursing.

Can pregnant women take potassium iodide pills?

As with the rest of the population, pregnant women should take potassium iodide only when specifically advised to by public health authorities.

Potassium iodide will cross the placenta and protect the thyroid of the growing fetus, as well as the mother.

Can breastfeeding women take potassium iodide?

As with the rest of the population, breastfeeding women should take potassium iodide tablets only when specifically advised by public health authorities.

However, this will not be sufficient to fully protect the breastfed child. The child will also need potassium iodide in special doses adapted for newborns and infants.

I am trying to get pregnant. Should I worry that my future children will be affected?

There is no evidence that your future children will be at a greater risk for birth defects or other problems. Over many years, extensive studies of the children of atomic bomb survivors have been conducted by scientists. There has been no indication of genetic effects in the offspring of people who survived the atomic bombings and later had children.

Special Issues and Concerns: Children

What should I do about my children and family? Should I leave to find my children?

If your children or family are with you, stay together. Take the same actions to protect your whole family.

If your children or family are in another home or building, they should stay there until you are told it is safe to travel.

Schools have emergency plans and shelters. If your children are at school, they should stay there until it is safe to travel.

Do not go to the school until public officials say it is safe to travel.

What is being done to protect children in school?

Children in schools will be cared for by teachers and staff until such time as it is safe for them to leave. Children will not be released to go outside until instructed to do so by health officials and emergency responders.

Schools have emergency plans in place to protect the children. These plans include keeping everyone inside and providing assistance for those with special needs.

If some of the radioactive dust got on my clothes or skin, will I contaminate my child? Is it safe for me to be around my child?

Radioactive dust can be removed by taking off and bagging your outer layer of clothing, showering with soap and warm water, and putting on clean clothes.

People who have cleaned up pose no contamination risk to you, your property, or the members of your household.

If people need to be decontaminated at a reception center or other location, will I be able to stay with my children when they are decontaminated?

Children and their families (parents or caregivers) should not be separated unless there are critical medical issues that need to be addressed.

Parents should be able to stay with their children during decontamination and other processes.

Does my child need to have his/her thyroid scanned?

Thyroid scans are only needed in situations where there is a possibility that radioactive iodine has entered the body.

It is very unlikely that a dirty bomb would involve radioactive iodine, so a thyroid scan would probably not be useful.

In the very unlikely case that radioactive iodine is detected at the dirty bomb site, public health officials will immediately notify doctors and the public and provide information about thyroid protection.

What kind of emotional impact can a radiological terrorism incident have on children? What should I look out for?

Children are among the most vulnerable of those affected by a radiological terrorism incident because they lack the maturity, skills, and experience to fully understand and process what is going on.

Family members and caregivers should gently try to find out what the child thinks and feels about the disaster.

If the child is scared because she/he has misunderstood what has happened, then simple explanations should be provided while avoiding alarming details.

Children who exhibit signs of stress such as difficulty sleeping, loss of appetite, or bedwetting should receive extra time and attention from family members and other caregivers.

It is important to remember that children also need a chance to play and relax.

Encourage older children to be helpful and maintain regular routines.

Are children at higher risk of harm if exposed to radiation?

Children exposed to radiation may be at greater risk than adults.

Children have higher breathing rates, are growing, and have physical proximity to the ground—where agents may be more concentrated—which makes them more vulnerable. Young children are also very sensitive to radioactive iodine.

To protect children, and avoid radiation exposure, follow the instructions issued by health officials and emergency responders.

Will my child and I get cancer from the dirty bomb?

There are many causes of cancer, some genetic and some from the environment.

For some people, it is possible that the low levels of radiation expected from a dirty bomb could slightly increase the risk of cancer over what occurs naturally in a person's lifetime.

But first, it is very important to remember that being at the site where a dirty bomb exploded does not automatically mean that someone came into contact with radioactive material.

Healthcare providers and other specialists are screening people and their belongings with sensitive radiation detection devices to find out if someone came into contact with radioactive materials thrown off by the bomb. The special instruments used to detect radiation are very sensitive, so radioactive contamination is easily detected if it is present.

Second, even if someone was exposed to radiation, it does not necessarily mean that a person will have any negative health effects.

Just because a person is near a radioactive source for short time, inhales a small amount of radioactive dust, or gets a small amount of radioactive material on clothing or skin, it does not automatically mean he or she will get cancer later in life.

Scientists, doctors, and other health experts are working now to check people and gather information on any potential radiation risks posed by the attack. Once exposure information has been gathered, health officials and your doctor will be able to discuss possible risks (if any) and the practical steps you can take to reduce them.

Should my children take potassium iodide?

It is unlikely that radioactive iodine will be released in a dirty bomb situation.

If health authorities do advise that potassium iodide needs to be taken by the public in an affected area, children can do so unless they have known allergies to iodine.

However, the doses and procedures for giving KI to children are not the same as for an adult.

If potassium iodide is needed, health authorities will provide specific guidance on dosages and procedures for giving KI to children.

Special Issues and Concerns:

People with Disabilities or Special Medical Needs

If I go through decontamination at a reception center or other facility, will my eyeglasses have to be taken away?

Eye glasses may be washed in the shower with the person who wears them.

Your glasses should not be taken away.

I have a prosthetic limb. If I have to be decontaminated to remove radioactive dust, will by prosthetic limb have to be taken away?

Most prosthetic limbs can get wet.

So they can be removed, thoroughly cleaned along with the person, and put back on.

There is no reason for a prosthetic limb to be taken away.

Is there a general list of the kinds of devices, adaptive equipment, prostheses, and mobility aids that can be decontaminated?

Unfortunately, there is no single guide currently available that covers all situations.

However, a general list was published in 2006 by the New York Center for Terrorism Planning and Preparedness (NYCTP) in a document on hospital decontamination protocols.

The list identifies the following Items that can be decontaminated: non-electric wheelchairs, prosthetic limbs (w/o leather components), walkers, crutches (w/o foam cushions/parts), canes (w/o foam cushions/parts), eyeglasses, and prosthetic eyes.

Items that cannot be decontaminated, or that pose special challenges, include mechanical ventilators, electric wheelchairs, hearing aids, contact lenses, and any leather attachments/components of items.

For such items, discuss options with emergency responders and health officials.

What if my service animal is found to be contaminated?

Animals that provide critical support to humans (for example, seeing eye dogs) and are known or suspected to be contaminated will be decontaminated.

In 2006, the PETS Act (Pets Evacuation and Transportation Standards Act) was created to ensure that state and local emergency management partners address the specific needs of individuals with service animals. Provisions for decontamination of service animals are included in the law.

How are service animals decontaminated?

Most animals can be decontaminated by simply using a soap and water solution.

For sensitive areas around the animal's eyes, nose, mouth, and in ears, where traditional washing methods may be more difficult, moist towlettes may be utilized.

In some situations, emergency responders may also place a muzzle on the animal to prevent it from licking or drinking contaminated water.

What should people do if they do not have life-sustaining medications?

If you are in the area affected by the dirty bomb and your life is in danger because you are running out of life-sustaining medication such as insulin or heart medicine, take the following steps to get medication and avoid any radioactive contamination that might be outside:

- Call 911 if possible.
- Seek help from a neighbor.
- As a last resort, you can go to the closest medical facility.
- If you must go outside, remember to clean yourself thoroughly when you come back inside.
- Remove the outer layer of clothes, shower and wash with soap and warm water, and put on clean clothes.

I have been having radiation treatments for medical reasons. Should I stop my treatments because I might have been exposed to radiation from the dirty bomb?

Doctors sometimes recommend the use of radiation therapy to treat certain types of cancer. The medical treatment radiation is used in an effort to target the tumor without harming nearby healthy cells.

As a general rule, there is no reason for a dirty bomb situation to cause people to stop or take a break from potentially life-saving medical treatments.

However, it is possible the dislocation or emotional stress from the dirty bomb situation could leave some people very tired and less able to deal with the side effects of medical radiation therapy.

If this is the case, you should discuss this with your doctor to jointly decide the best course of action.

To: Wieder, Jessica[Wieder.Jessica@epa.gov]
Cc: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Becker, Steven M.
Sent: Wed 2/10/2016 5:00:56 PM
Subject: RE: PAGs Messages

Hi Jess,

Yes, absolutely, I would be happy to do so.

I will send the entire folder (suite of materials) later today.

All the best,

Steve

-----Original Message-----
From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Wednesday, February 10, 2016 11:27 AM
To: Becker, Steven M.
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Hi Steve,

I hate to be a pain, but can you send me ALL of the Q&As in a word file. These would include the messages for special populations and the dirty bomb specific questions. I want whatever we put out to include all of the specialized messages that don't exist anywhere else just yet.

Thank you!

Jess

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Becker, Steven M. [smbecker@odu.edu]
Sent: Monday, February 1, 2016 9:21 AM
To: Wieder, Jessica
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Hi Jess,

Good morning! Attached please find the PAGs materials in accessible formats. There are three files:

1. The full PAGs Q&A (WORD file)

2. An abbreviated PAGs Q&A (WORD file)

3. The PAGs slide deck (Powerpoint)

If you need anything else, please don't hesitate to contact me.

All the best,

Steve

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Monday, February 01, 2016 7:23 AM
To: Becker, Steven M.
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Steve - I appreciate the help. As soon as you can get me the materials, we can start working on them.

Jessica

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w: 202-343-9201
c: 202-420-9353

From: Becker, Steven M. [mailto:smbecker@odu.edu]
Sent: Friday, January 29, 2016 2:41 PM
To: Wieder, Jessica <Wieder.Jessica@epa.gov<mailto:Wieder.Jessica@epa.gov>>
Subject: RE: PAGs Messages

Sorry it has taken so long... it has just been nutso busy around here.

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Friday, January 29, 2016 2:40 PM
To: Becker, Steven M.
Subject: Re: PAGs Messages

Thank you!
Jessica Wieder
U.S. Environmental Protection Agency
Radiation Protection Program
202-343-9201
m: 202-420-9353

Sent from my iPhone

On Jan 29, 2016, at 2:25 PM, Becker, Steven M. <smbecker@odu.edu<mailto:smbecker@odu.edu>>
wrote:
Found the materials... stay tuned.

-----Original Message-----
From: Becker, Steven M.
Sent: Tuesday, January 26, 2016 1:57 PM
To: 'Wieder, Jessica'
Subject: RE: PAGs Messages

Hi Jess,

The snowstorm ended up being fun for us. Norfolk only got 2-3 inches of snow between the two bands that affected the area. So we had enough for snowballs and snowmen but not so much as to be a pain. (It was also merciful for the storm not to be too bad. I was too jet-lagged to deal with more than a little bit of shoveling!)

Yikes, I cannot believe how much snow DC and surrounding areas received! I hope the situation has at least given you some pretty scenes to view and some nice, relaxing family time to enjoy.

Re: the PAGs messages -- That is terrific! I am glad EPA will be able to make use of some of the content. I will go the archive later today, get the original WORD files out, and send them to you.

Stay safe!

All the best,

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From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Tuesday, January 26, 2016 7:20 AM
To: Becker, Steven M.
Subject: PAGs Messages

Hi Steve,

I hope you made it back from your travels before the storm. How did you and your family weather the storm? After not seeing a plow since 7 pm on Friday, my street banded together yesterday and hand shoveled 30 inches of snow from the court to the main street. It was a truly impressive act of a community working together. We will have a problem if two cars are headed in different directions, but at least we have a way out if we need it.

When you get a chance, can you please send me an editable version of the PAGs messages? We briefed our management and EPA is going to take the lead on publishing the Q&As. Some will go on the web as FAQs and some will end up in a PAG Manual Communications Implementation Tool.

Thank you.

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BEGIN-ANTISPAM-VOTING-LINKS

Teach CanIt if this mail (ID 03QgErsom) is spam:

Spam: https://www.spamtrap.odu.edu/canit/b.php?i=03QgErsom&m=297fff251916&t=20160210&c=s

Not spam:
https://www.spamtrap.odu.edu/canit/b.php?i=03QgErsom&m=297fff251916&t=20160210&c=n

Forget vote:
https://www.spamtrap.odu.edu/canit/b.php?i=03QgErsom&m=297fff251916&t=20160210&c=f
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END-ANTISPAM-VOTING-LINKS

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Cc: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Wieder, Jessica
Sent: Wed 2/10/2016 4:26:51 PM
Subject: RE: PAGs Messages

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BEGIN-ANTISPAM-VOTING-LINKS

NOTE: This message was trained as non-spam. If this is wrong, please correct the training as soon as possible.
Teach CanIt if this mail (ID 01QaAkHnP) is spam:Spam: about:blankNot spam: about:blankForget vote: about:blank
---
END-ANTISPAM-VOTING-LINKS

Spam<https://www.spamtrap.odu.edu/canit/b.php?i=03Qd0n3m6&m=8ccff4584794&t=20160201&c=s>
Not
spam<https://www.spamtrap.odu.edu/canit/b.php?i=03Qd0n3m6&m=8ccff4584794&t=20160201&c=n>
Forget previous
vote<https://www.spamtrap.odu.edu/canit/b.php?i=03Qd0n3m6&m=8ccff4584794&t=20160201&c=f>

To: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Wieder, Jessica
Sent: Wed 2/10/2016 3:02:46 PM
Subject: RE: FAQs Round 2
WebFAQs-PAGS+jw=SD=RW (2) jw.docx

I few minor edits. Tony, this is excellent. You will see that my comments are just compliments. Nicely done!

I am working on the PAGs Implementation Communication Tool today.

Jess

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Nesky, Anthony
Sent: Monday, February 8, 2016 7:24 PM
To: Wieder, Jessica; DeCair, Sara; White, Rick
Subject: FAQs Round 2

Here are the revised FAQs. Text we added on the phone is in green. New text or edited text is in redline/strikeout. We may need to discuss the question about the basis.

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov<mailto:nesky.tony@epa.gov>

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Favret, Derek
Sent: Tue 2/9/2016 12:36:28 PM
Subject: RE: PAG Manual for FRPCC review - cmts due 2/19

Sara,

Yes, please add me to the list with Ed.

Thanks.

Derek

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, February 08, 2016 3:30 PM
To: Favret, Derek <Derek.Favret@Hq.Doe.Gov>
Subject: Fw: PAG Manual for FRPCC review - cmts due 2/19

Derek, is it safe to assume I should put you on the PAGs Subcommittee of the FRPCC list in place of Carlos?

Sara

From: DeCair, Sara
Sent: Monday, February 8, 2016 3:27 PM
To: Amy Doll; Andrew.Wallo@eh.doe.gov; asa4@cdc.gov; ben.cacioppo@dtra.mil; Carlos.Corredor@Hq.Doe.Gov; Edward.Regnier@hq.doe.gov; John.Jensen@dm.usda.gov; john.mackinney@dhs.gov; john.madrid@dtra.mil; lee.a.nickel1@navy.mil; lodwick.jeffrey@dol.gov; michael.howe@fema.dhs.gov; Michael.Noska@fda.hhs.gov; Patricia.Milligan@nrc.gov; paul.ward@fema.dhs.gov; ricardo.a.reyes@us.army.mil; siddhanti@endyna.com; tdkraus@sandia.gov; Veal, Lee; Wieder, Jessica; william.cunningham@nist.gov
Cc: olin.hale@fema.dhs.gov
Subject: PAG Manual for FRPCC review - cmts due 2/19

FRPCC Colleagues;

Attached you will find (finally!) our proposed public-comments-in version of the PAG Manual. This includes work we've done together on clarifying and explaining what we meant as a PAGs Subcommittee, and you'll see other tweaks and improvements to make the guidance more complete. This version does contain placeholders for the drinking water guidance to drop in, once public review of that is done. You'll also note, with relief I'm sure, that the changes in total are very minor. All changes from the PAG Manual issued for comment in 2013 are highlighted for you.

Since the changes are minor, we're looking for your comments within two weeks (due date: Feb. 19, 2016). Comments in the form of Page Number, Paragraph Number, Suggestion & Rationale are preferred to making a redline strikeout of the Manual document itself, but whatever works for you will work for us. Also know that formatting is still underway on this document, so if you see ways that could improve, do let me know. Please call or email anytime with questions or issues. Our next steps will be to finalize the document and prepare a proposed FR Notice for OMB review.

Thank you for your help,

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]; Amy Doll[adoll@endyna.com]; Andrew.Wallo@eh.doe.gov[Andrew.Wallo@eh.doe.gov]; asa4@cdc.gov[asa4@cdc.gov]; Cacioppo, Ben A Jr CIV DTRA J3-7 (US)[ben.a.cacioppo.civ@mail.mil]; Carlos.Corredor@Hq.Doe.Gov[Carlos.Corredor@Hq.Doe.Gov]; Edward.Regnier@hq.doe.gov[Edward.Regnier@hq.doe.gov]; John.Jensen@dm.usda.gov[John.Jensen@dm.usda.gov]; john.mackinney@dhs.gov[john.mackinney@dhs.gov]; john.madrid@dtra.mil[john.madrid@dtra.mil]; Nickel, Lee A CDR USN (US)[lee.a.nickel1@navy.mil]; lodwick.jeffrey@dol.gov[lodwick.jeffrey@dol.gov]; michael.howe@fema.dhs.gov[michael.howe@fema.dhs.gov]; Michael.Noska@fda.hhs.gov[Michael.Noska@fda.hhs.gov]; Patricia.Milligan@nrc.gov[Patricia.Milligan@nrc.gov]; paul.ward@fema.dhs.gov[paul.ward@fema.dhs.gov]; siddhanti@endyna.com[siddhanti@endyna.com]; tdkraus@sandia.gov[tdkraus@sandia.gov]; Veal, Lee[Veal.Lee@epa.gov]; Wieder, Jessica[Wieder.Jessica@epa.gov]; william.cunningham@nist.gov[william.cunningham@nist.gov]
Cc: olin.hale@fema.dhs.gov[olin.hale@fema.dhs.gov]
From: Reyes, Ricardo A LTC USARMY DHA DHSS (US)
Sent: Mon 2/8/2016 10:15:08 PM
Subject: RE: [Non-DoD Source] PAG Manual for FRPCC review - cmts due 2/19
smime.p7s

We see the light at the end of the tunnel.

Thank you.

Rick

LTC Ricardo Reyes, Ph.D.
Chief Health Physics/DHA Regional Radiation Health Consultant
WRNMMC
8901 Rockville Pike | Bethesda, MD 20889
NIPR: ricardo.a.reyes.mil@mail.mil
O: (301) 400-0892
BB: (202) 468-7431

-----Original Message-----
From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, February 08, 2016 3:27 PM
To: Amy Doll; Andrew.Wallo@eh.doe.gov; asa4@cdc.gov; Cacioppo, Ben A Jr CIV DTRA J3-7 (US); Carlos.Corredor@Hq.Doe.Gov; Edward.Regnier@hq.doe.gov; John.Jensen@dm.usda.gov; john.mackinney@dhs.gov; john.madrid@dtra.mil; Nickel, Lee A CDR USN (US); lodwick.jeffrey@dol.gov; michael.howe@fema.dhs.gov; Michael.Noska@fda.hhs.gov; Patricia.Milligan@nrc.gov; paul.ward@fema.dhs.gov; Reyes, Ricardo A LTC USARMY DHA DHSS (US); siddhanti@endyna.com; tdkraus@sandia.gov; Veal, Lee; Wieder, Jessica; william.cunningham@nist.gov
Cc: olin.hale@fema.dhs.gov
Subject: [Non-DoD Source] PAG Manual for FRPCC review - cmts due 2/19

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

FRPCC Colleagues;

Attached you will find (finally!) our proposed public-comments-in version of the PAG Manual. This includes work we've done together on clarifying and explaining what we meant as a PAGs Subcommittee, and you'll see other tweaks and improvements to make the guidance more complete. This version does contain placeholders for the drinking water guidance to drop in, once public review of that is done. You'll also note, with relief I'm sure, that the changes in total are very minor. All changes from the PAG Manual issued for comment in 2013 are highlighted for you.

Since the changes are minor, we're looking for your comments within two weeks (due date: Feb. 19, 2016). Comments in the form of Page Number, Paragraph Number, Suggestion & Rationale are preferred to making a redline strikeout of the Manual document itself, but whatever works for you will work for us. Also know that formatting is still underway on this document, so if you see ways that could improve, do let me know. Please call or email anytime with questions or issues. Our next steps will be to finalize the document and prepare a proposed FR Notice for OMB review.

Thank you for your help,

Sara
Sara D. DeCair
Caution-http://www.epa.gov/radiation/rert/pags.html <
Caution-http://www.epa.gov/radiation/rert/pags.html >
202-343-9108
Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Hale, Olin
Sent: Mon 2/8/2016 9:14:39 PM
Subject: RE: Distro to FRPCC of PAG Manual, by Olin

You are most welcome and I have both messages firmly in hand while preparing the email.

Very Best,

Olin

Olin Hale

DHS-FEMA-NPD-THD-PSI

Mobile: (202) 341-8643

email: *olin.hale@fema.dhs.gov*

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, February 08, 2016 4:11 PM
To: Hale, Olin
Subject: Re: Distro to FRPCC of PAG Manual, by Olin

You're wise to get clarity. I do want review, and yes, comments too. Please do send on my behalf. Thanks!!

From: Hale, Olin <olin.hale@fema.dhs.gov>
Sent: Monday, February 8, 2016 4:09 PM
To: DeCair, Sara
Subject: RE: Distro to FRPCC of PAG Manual, by Olin

Sara, thank you for the kind words. Between getting Mr. Hoye and some changes we've also made in THD I'm hoping for a good year for FRPCC.

Now I can't leave you without asking a not-too-bright question: we do wish to ask for review and comment? Also, may I send on your behalf (as opposed to being directly on behalf of the generic FRPCC)?

Thanks again,

Olin

Olin Hale

DHS-FEMA-NPD-THD-PSI

Mobile: (202) 341-8643

email: *olin.hale@fema.dhs.gov*

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, February 08, 2016 4:05 PM
To: Hale, Olin
Cc: Veal, Lee

Subject: Re: Distro to FRPCC of PAG Manual, by Olin

Olin, that is great -- all the things you mentioned! A new director for you and a broad distribution for the PAG Manual. Thank you so much,

Sara

From: Hale, Olin <olin.hale@fema.dhs.gov>
Sent: Monday, February 8, 2016 3:43 PM
To: DeCair, Sara
Subject: RE: March FRPCC Meeting Save-the-Date: March 23rd 1000-13000h: 1800 S. Bell Street, 8th floor, Room 803. December 3rd Meeting Minutes Attached

Sara,

Well, looking at your document with changes, I believe it should go to the full membership. The PAGs are quite important and I see some interesting subject-matter, including the ever popular KI section.

I've created two lists for FRPCC, a Member list that includes the agencies required by 44 CFR and a 'Participants' list to include everyone else we invite, including administrative personnel and the like. I don't suppose it would hurt to send to both groups rather than inadvertently leaving out an interested party.

My excuse for the delay is that we have a new THD Director, who will also be our new FRPCC Co-Chair. I am travelling to ORNL tomorrow but hope to brief him up on my return, and begin discussing FRPCC topics, including yours. Our new Director is Jonathan Hoye, former FEMA deputy Administrator.

So I would be glad to send your notes out, the timing is indeed perfect!

Very Best Regards,

Olin

PS: Please let me know how much time you would like on the March agenda.

Olin Hale

DHS-FEMA-NPD-THD-PSI

Mobile: (202) 341-8643

email: olin.hale@fema.dhs.gov

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, February 08, 2016 1:16 PM
To: Hale, Olin
Subject: Re: March FRPCC Meeting Save-the-Date: March 23rd 1000-13000h: 1800 S. Bell Street, 8th floor, Room 803. December 3rd Meeting Minutes Attached

Olin, this note from you is very timely. I'd like to send out the PAG Manual for FRPCC review today, and I wanted to check with you on the best way to do that.

I have a PAG Subcommittee distribution, and I can send it to that list, plus you. Then see if your leadership thinks the Manual should also go to the full list, or not. I could see benefit, but also potential confusion on what's being asked of the reviewers. In fact, the document has holes, or placeholders, in it where the drinking water proposal would drop in after we get it out for public review. In the interest of speeding this to OMB to get it out before the end of the administration, though, we are doing concurrent processes.

Let me know if you or your bosses have strong feelings about how broadly to send this out, and I'll cc you on my note the PAG Subcommittee in just a few minutes.

Thanks!

- Sara

From: Hale, Olin <olin.hale@fema.dhs.gov>
Sent: Monday, February 8, 2016 12:51 PM
To: Hutter, Adam; Remick, Alan; Scott, Andrew; Armin Ansari; Barbara Stunder; Ben Cacioppo; Stevenson, Benjamin; Bernard Bogdan; Webb, Bill; Blizzard, Jeffrey; Blumenthal, Daniel; Bob Stephan (robertbstephan@aol.com); Bruce Young; byw3@cdc.gov; Carla Boyce; Celia, Matthew; Gorman, Chad; Wood, Chad; Christine Martin; Gregg, Chuck; Burnside, Conrad; Crawford, Sean; Cullen, William R; Dean McCauley; Dennis Emmert (dennis.j.emmert.mil@mail.mil); Eberst, William; Elaine Bond; Feighert, Dan; FladeboeJP@state.gov; Foreman, Bruce; Fox, Kathleen (Katie) M; Garcia, Luis; Gardner, Patricia; Gordon Cleveland; Greten, Timothy; Hammond, Lisa; Sherwood, Harry; Heath, Stanley; Hoyes, Jonathan; Jacqueline.mann@nist.gov; James Williams; Kish, James; Jeffery Albanus; Jeffrey Sincek; 'Jensen, John (USDA)'; Patterson, James L; Jim Stahlman (James.e.stahlman.civ@mail.mil); John F. Koerner (John.Koerner@hhs.gov); John Madrid; MacKinney, John A; John.Sokich@noaa.gov; Brinsfield, Kathryn; Kennedy, Beth D CTR OSD OUSD POLICY (US); McDaniel, Kenneth L CIV; Kgeiss@ostp.eop.gov; Veal, Lee; Lee.a.nickel1@navy.mil; lodwick.jeffrey@dol.gov; McCarroll, Janis; michael.collins2@ic.fbi.gov; michael.noska@fda.hhs.gov; Mike.Wangler@em.doe.gov; Monchek, Rafaela; Monchek, Rafaela; Musick, David; OLeary, Sean; Hale, Olin; pxm@nrc.gov; Grundstrom, Richard; Robert Stephan; Robert Whitcomb; Lewis, Robert; Washington, Russell; Sally Billings; DeCair, Sara; Scardino, Thomas; Overby, Stacey; Colman, Steve; steven.fine@noaa.gov; Quinn, Vanessa; Wieder, Jessica; Billado, William; Alvin Morris; Andrew Wallo; Bennett, Gerilee; Blunt, Kenyetta; Bobbitt, Sharon; Schlieger, Brian; Carrington, Jessica; Chacko, Betsie; Chase, Stephen; Coleman-Hansberry, Brenda; Collins, Richard; Coons, Albert; DeFelice, Anthony; Dozor, Joshua; Echevarria, Sharon; Gearing, Alexis; Alexis; Glenn-Graves, Precilla (CTR); Harris III, Timothy; Hart, Hampton; Howe, Michael; Jackson, Liz; Jason.kozal@nrc.gov; Snead, Kathryn; Ken Lauziere; Kenneth Inn; Laurence Broun; Lisa Karam; Nanko, Lisa; Mark Russo; Ward, Paul; Perry, April; Pesapane, Robert; Phillips, Marlene; Ricardo Reyes; Collins, Richard; Robert Prins; Sabata, Andrew; Schafer, John; Stewart-Smith, Mart A (Stewart-SmithMA@state.gov); Tagliento, Marc
Subject: March FRPCC Meeting Save-the-Date: March 23rd 1000-13000h: 1800 S. Bell Street, 8th floor, Room 803. December 3rd Meeting Minutes Attached

Good Afternoon FRPCC Members and Colleagues,

You are cordially invited to participate in the next quarterly meeting of the Federal Radiological Preparedness Coordinating Committee that will be held:

Wednesday, March 23rd 2016 *from 10:00 AM to 1:00 PM.*

Location: we are returning to ***1800 S. Bell Street, 8th floor, Room 803***. Further details and directions will be included with the calendar invitation.

- A draft agenda is being prepared and we welcome your topics and suggestions for consideration. A calendar invitation and a formal call-for-topics will be sent in the near future.

- Attached are the minutes from the December 3rd quarterly meeting: your comments and revisions are welcome.

- Also, as an administrative note, James Purvis and Matt Celia are currently on FEMA details so Mr. Jeff Blizzard and I will continue to be the points of contact for regular FRPCC matters.

Please feel free to contact me and/or Mr. Blizzard at any time for questions, comments, and new FRPCC initiatives.

Very Best Regards,

Olin

Olin T. Hale, PPS

FRPCC Section Chief

Professional Services and Integration
Technological Hazards Division
Federal Emergency Management Agency
U.S. Department of Homeland Security
202.341.8643

email: *olin.hale@fema.dhs.gov*

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Perrin, Alan
Sent: Fri 2/5/2016 10:23:47 PM
Subject: RE: This is just a few of the 999 versions I have...

Nope, this is all the excitement I can handle for the weekend! Thank you, Alan

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
ofc (202) 343-9775 | mbl (202) 279-0376

From: DeCair, Sara
Sent: Friday, February 05, 2016 4:14 PM
To: Perrin, Alan <Perrin.Alan@epa.gov>
Subject: This is just a few of the 999 versions I have...

So – here is the latest Finalization doc I have (meant for other office heads), an interim step that looks like an Action Plan but doesn't have water, and the last full Action Plan that I had from October. The dates have been adjusted each time, most recently for the other offices -- to tighten up all steps but theirs ☺

Let me know if you want the other 996 of them. Thanks!

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Doug Draper[chg5gb@hotmail.com]
From: Doug Draper
Sent: Fri 2/5/2016 9:11:47 PM
Subject: RE: Maybe I need your work email address?

Sara,
This looks great! Thanks so much for the prompt reply. As soon as I figure out who the HPS Program Committee Chair is, I'll get this in.

Have a great weekend!
Doug

From: DeCair.Sara@epa.gov
To: CHG5GB@hotmail.com
Subject: Maybe I need your work email address?
Date: Fri, 5 Feb 2016 20:10:27 +0000

Doug,

So glad we can work together on an HPS session! I can also emphasize the move to ICRP 60-series dosimetry and use of age groups for some of the PAGs, and not others. (Finally, right?) My 3 or 4 lines would look something like this – but I welcome any editorial suggestions or tweaks you'd like to make.

The revised PAG Manual issue for Public Comment and Interim Use in 2013 will be described in detail with emphasis on how the update was informed by the Fukushima experience. Long-awaited drinking water guidance being crafted will be discussed, as well as decisions for implementing the age groups in ICRP 60 series dosimetry that was adopted in the revision. New long term recovery guidance on setting remediation goals with community involvement and planning for unprecedented waste management challenges have been shaped by how Japan is dealing with their long term recovery process.

Here's the long version:

In 2013, the U.S. Environmental Protection Agency (EPA) proposed an update to the 1992 Protective Action Guides (PAG) Manual that provides guidance to state and local officials planning for radiological emergencies. EPA requested public comment on the proposed revisions, while making them available for interim use by officials faced with an emergency situation. Developed with interagency partners, EPA's proposal incorporates newer dosimetric methods, identifies tools and guidelines developed since the current document was issued, and extends the scope of the PAGs to all significant radiological incidents, including radiological dispersal devices or improvised nuclear devices. EPA also requested input on potential protective action guides for drinking water. New in the PAG Manual is planning guidance for the late phase of an incident, after the situation is stabilized and efforts turn toward recovery. Because the late phase can take years to complete, decision makers are faced with managing public exposures in areas not fully remediated. The proposal includes quick reference operational guidelines to inform re-entry to the contaminated zone. Broad guidance on approaches to wide-area cleanup and developing cleanup goals is also provided. EPA adapted the cleanup process from the 2008 Department of Homeland Security (DHS) "Planning Guidance for Protection and Recovery Following Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents" and the final PAG Manual will supersede that DHS guidance. Waste management guidance is also provided. Recognizing that an incident could result in radioactive waste volumes that severely strain or exceed available resources and capacity, officials may consider alternatives for disposal of waste that is relatively lightly contaminated. Waste management, which includes treatment, staging, and interim and long-term storage, must be an integral part of recovery.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Amy Doll[adoll@endyna.com]
From: Miguel Tuason
Sent: Thur 2/4/2016 10:15:05 PM
Subject: RE: Yours for the afternoon: new PAG Manual version
PAG Manual Revised_v050 02052016.docx

Hi Sara –

We've gone ahead and addressed most of your notes below and attached the slightly revised version on this email.

Amy and I would like to have another quick call (any time after 10am Friday) to review these changes to make sure we are on the same page, correctly addressed your notes, and get you the most solid version for your Monday review.

Thanks again.

Best

Miguel

Miguel Tuason
SR. BUSINESS DEVELOPMENT MANAGER
EnDyna, Inc.
7926 Jones Branch Drive
Suite 620
McLean, VA 22102
Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
Fax: 703 848 9001
www.endyna.com

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, February 4, 2016 3:28 PM
To: Miguel Tuason <mtuason@endyna.com>
Cc: Amy Doll <adoll@endyna.com>
Subject: Yours for the afternoon: new PAG Manual version

Miguel,

Thanks for turning around those changes for me! I have made my changes based in internal comments, and stuck with the Gray/Yellow them for word changes (not punctuation or capitalization).

I still want to check:

- FIXED Headers late in the doc, may not be same as earlier in doc

Will you check/fix:

- DONE Check format for my references that I added (FRC, 2 of them) – I used hard returns and guessed at how to cite them properly

- OKAY QA for wording changes that snuck back in:

o "major facility" had become "majority facility" in 1.2

o "nuclear fuel manufacturing" had become "nuclear manufacturing" in the same section

- DONE Basis for Early Phase should be its own section with a section #

- OKAY Let's make Ch. 5's Introduction that first paragraph that used to lead with Cleanup Process – does it look okay the way I did it?

- DONE – but should discuss if we should refrain from fourth-level (1.1.1.1) sections throughout the rest of the manual (for consistency) - We need fewer sections and section #s in the 5.2.4 area – those small outline and list parts can be larger and not so numbered

- DONE For this next review I'll be starting Monday, can you pull out most or all of the blue highlights for a clean version? (But I promise I'll look at them to give feedback during this next review. I'll just need reminders.)

- OKAY, FOR DISCUSSION I think in Ch. 3, the Key Points heading (we don't have any

yet but I'd welcome your ideas for them) got mixed up in order with the last line of text and the table 3-3.

I'll be back at this about 9 am tomorrow, so let me know if any of this is indecipherable. Thank you!!

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Amy Doll[adoll@endyna.com]; siddhanti@endyna.com[siddhanti@endyna.com]
From: Miguel Tuason
Sent: Thur 2/4/2016 4:38:52 PM
Subject: RE: Couple requests on new formatted PAG Manual
PAG Manual Revised_v049 02042016.docx

Hello, Sara –

Thanks for the feedback.

Re-formatted version is attached.

The previously BURGUNDY highlights are now BRIGHT BLUE.

The page breaks for each section have been eliminated.

We look forward to receiving the next round of feedback and edits in about two weeks, and as always, please don't hesitate to give either me or Amy a call with any questions, comments, or concerns.

Best

Miguel

Miguel Tuason
SR. BUSINESS DEVELOPMENT MANAGER
EnDyna, Inc.
7926 Jones Branch Drive
Suite 620
McLean, VA 22102
Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
Fax: 703 848 9001
www.endyna.com

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, February 4, 2016 10:13 AM
To: Amy Doll <adoll@endyna.com>; Miguel Tuason <mtuason@endyna.com>
Subject: Couple requests on new formatted PAG Manual

Amy and Miguel,

I'm at the point of making a few changes based in internal review here (very minor, thank goodness) so we can get out for FRPCC interagency review of the Manual on Monday.

I wonder, can you go through and make the burgundy hilites in the TOC easier to read? And could you cut the many pages breaks that takes the page number count so high? I see it's cleaner to look at but I need it a bit shorter for people to recognize it's not so very much changed.

Let me know your time estimate on those adjustments so I can figure how best to get these changes in – that is, by me, you all, or a combo – thanks tons! I am at my desk if you'd like to discuss.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: Wieder, Jessica[Wieder.Jessica@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Nesky, Anthony
Sent: Mon 2/1/2016 4:36:11 PM
Subject: Draft FAQs for the Web Page
WebFAQs-PAGS.docx

Dear Jess and Sara:

Here are a shortened version of Dr. Becker's FAQs that I would put on the website. Your feedback is most welcome.

Tony Nesky

Center for Radiation Information and Outreach

Tel: 202-343-9597

nesky.tony@epa.gov

To: Wieder, Jessica[Wieder.Jessica@epa.gov]
Cc: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Becker, Steven M.
Sent: Mon 2/1/2016 2:32:37 PM
Subject: RE: PAGs Messages

My pleasure! I am thrilled that EPA will be able to make use of some of the content.

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Monday, February 01, 2016 9:27 AM
To: Becker, Steven M.
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Thank you, Steve! This is super helpful. We are going to get starting pulling these products together right away.

Jess

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

From: Becker, Steven M. [mailto:smbecker@odu.edu]
Sent: Monday, February 01, 2016 9:22 AM
To: Wieder, Jessica <Wieder.Jessica@epa.gov>
Cc: Nesky, Anthony <Nesky.Tony@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>; White, Rick <White.Rick@epa.gov>
Subject: RE: PAGs Messages

Hi Jess,

Good morning! Attached please find the PAGs materials in accessible formats. There are three files:

1. The full PAGs Q&A (WORD file)
2. An abbreviated PAGs Q&A (WORD file)
3. The PAGs slide deck (Powerpoint)

If you need anything else, please don't hesitate to contact me.

All the best,

Steve

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Monday, February 01, 2016 7:23 AM
To: Becker, Steven M.
Cc: Nesky, Anthony; DeCair, Sara; White, Rick
Subject: RE: PAGs Messages

Steve – I appreciate the help. As soon as you can get me the materials, we can start working on them.

Jessica

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

From: Becker, Steven M. [mailto:smbecker@odu.edu]
Sent: Friday, January 29, 2016 2:41 PM
To: Wieder, Jessica <Wieder.Jessica@epa.gov>
Subject: RE: PAGs Messages

Sorry it has taken so long… it has just been nutso busy around here.

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Friday, January 29, 2016 2:40 PM
To: Becker, Steven M.
Subject: Re: PAGs Messages

Thank you!

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U.S. Environmental Protection Agency

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m: 202-420-9353

Sent from my iPhone

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All the best,

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Cc: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Wieder, Jessica
Sent: Mon 2/1/2016 2:26:36 PM
Subject: RE: PAGs Messages

Thank you, Steve! This is super helpful. We are going to get starting pulling these products together right away.

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To: Wieder, Jessica <Wieder.Jessica@epa.gov>
Cc: Nesky, Anthony <Nesky.Tony@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>; White, Rick <White.Rick@epa.gov>
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2 - PAGs Protect Q&As - Full.docx
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Protective Actions and Protective Action Guides (PAGs): Questions and Answers

Q: What is a Protective Action?

A: *Protective actions* are the urgent steps that people can take to protect their health and the health of loved ones in a dirty bomb incident or other radiation emergency.

The main protective actions that the public might be asked to take are evacuation or sheltering (staying inside).

Q. How will people know what to do?

A. Health and emergency management officials will tell the public if protective actions are needed and whether evacuation or staying inside would be more effective for avoiding radiation doses to people.

The officials make these decisions about how to protect public health by using information about local conditions and by using something called the "PAGs."

Q. What does "PAGs" stand for?

A. The abbreviation "PAGs" is short for *Protective Action Guides*.

Q. What are Protective Actions Guides?

A. *Protective Action Guides*, or *PAGs*, are guides that help officials decide when it is necessary for people to evacuate, stay inside or take other urgent steps to safeguard health in a radiation emergency.

Every emergency situation is different, and the best action or set of actions in one situation may not be helpful at another time or in another situation.

Knowing *when* emergency steps need to be taken and *which* steps are warranted is very important for protecting the health of the public.

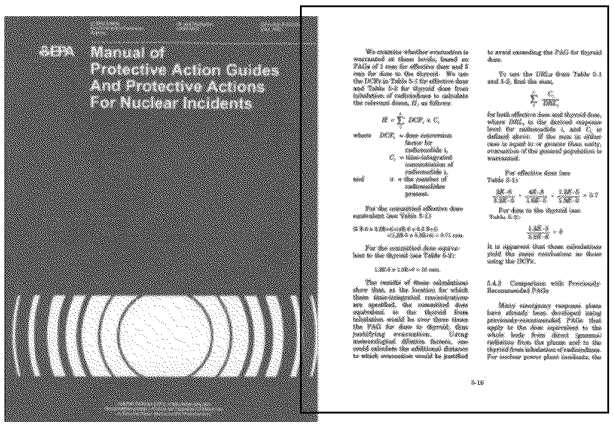
The PAGs provide general guidance to officials, which they can use together with their knowledge of local conditions, to make these important decisions.

Q: What do the PAGs look like?

A: The Manual of Protective Action Guides developed in 1991 was actually a book.

Much of it consists of pages with equations and tables with numbers developed by scientists.

More recent additions to the PAGs are not in book form, but have been published instead in the *Federal Register*.



Q. What kinds of steps are included in the PAGs?

A. The PAGs include actions that government agencies and members of the public can take to protect people's health in a radiation emergency.

In the first hours and days of a radiation emergency, there are two main protective actions that the public might be asked to take to avoid exposure to radiation: evacuation or sheltering (staying inside).

Q. What is evacuation? What is sheltering? What is the difference?

A. *Evacuation* involves quickly moving people from an area expected to be in the path of radioactive releases.

Sheltering, on the other hand, involves having people stay indoors in their homes, offices, schools or other buildings while radioactive materials pass over.

Q. Are there other steps officials might ask people to take?

A. Depending on the circumstances, other actions may also sometimes be helpful for protecting health.

For example, evacuation or sheltering could be supplemented by *limiting access* to (keeping people out of) the location where the emergency has taken place. Another step is *decontaminating people*, which means to remove any radioactive particles that may have fallen onto people's clothes, skin, or hair. Decontamination is done by having people wash, shower, and change their clothes.

Q. What about controls on food?

A. In some situations, officials may determine that it is necessary to take actions to prevent radioactive contamination from entering the food chain.

Steps might involve preventing livestock from grazing in potentially-contaminated pastures or fields and ensuring that animals only eat feed and drink water that has been previously stored.

When necessary, officials may also act to stop certain foods from coming to market or limit consumption of human food if it is suspected of being contaminated.

Q. What about taking Potassium Iodide?

A. Never take potassium iodide (also known as KI) and never give to your children unless you have been specifically advised to do so by the health department, emergency management officials, or your doctor.

Potassium iodide is a non-radioactive form of iodine.

KI can be useful in situations where radioactive iodine has been released into the environment.

It works by filling a person's thyroid gland with safe iodine so that harmful radioactive iodine in the environment is not absorbed.

But KI is only useful in situations involving radioactive iodine, and it only protects the thyroid gland; it does not help in other situations involving radioactive releases.

A dirty bomb situation is very unlikely to involve radioactive iodine.

You should only take potassium iodide if you have been specifically advised to do so by local public health officials, emergency management officials, or your doctor.

Q. How do officials know when it is time to carry out protective actions?

A. When a radiation emergency occurs, officials will use available information and computer models to quickly predict how much radiation people could potentially receive from the incident.

This estimate is then compared with decision levels described in the PAGs.

If the dose that could result from the emergency has the potential to go higher than the decision levels listed in the guidelines, the PAGs list what general actions can be taken to *avoid* the exposure from taking place.

In other words, PAGs are general guidelines for deciding when specific steps are needed to *prevent* people from being exposed to a level of radiation that might be hazardous to health.

Q. Wouldn't it make more sense to carry out all of the protective actions right away, as soon as a radiation emergency occurs?

A. No. Different safety measures are used for different situations.

Trying to take all of the measures at once would not be possible and could actually cause confusion or even harm.

For example, people cannot take shelter and evacuate at the same time.

Officials need to see what kind of hazard the emergency poses to people so they can provide the best advice on how to protect health.

Q. Why don't officials just automatically advise everyone to evacuate when a radiation emergency occurs?

A. Evacuation is one of the two main protective actions that can be taken in the immediate hours or first few days of a radiation emergency, and sometimes it is necessary for protecting people's health.

But there are also situations when sheltering may be a better choice for preventing or reducing radiation exposure.

For example, if a cloud containing radioactive particles is expected to pass over an area very soon and then leave quickly, evacuation could actually expose people to more radiation than staying indoors.

This is because evacuation takes time, and many people might be caught outside or in their cars when the cloud passed over.

So in such a situation, officials might ask people to stay indoors.

Buildings, such as large offices and structures made from brick, can provide significant protection from radiation.

So people staying indoors while the cloud passed by would be more protected than those caught outside trying to evacuate.

Sheltering also has the advantage of being less disruptive than evacuation and of enabling people to stay in familiar surroundings and have access to food, water, and information sources such as television or radio. So in some circumstances, it may be better than evacuating.

Watch or listen to official announcements to learn what steps you should take.

Q. Are there situations when evacuation might not be appropriate, or might even be harmful?

A. Yes. In some situations, evacuation may not be practical.

Blocked highways, for example, could make evacuation difficult.

Severe weather at the time of the radiation emergency could also make evacuation dangerous.

It is also important to remember that evacuations can themselves create certain risks to people.

With large numbers of people suddenly taking to the highways, automobile accidents occur and people can be killed or injured. Other vehicles may run out of gas and get stuck.

Evacuations can also be very difficult on people who are ill or in medical care. So, evacuations should only take place if they are necessary.

If the risks from a protective action such as a major evacuation are greater than the risks to people from the emergency situation itself, it makes no sense to carry out this protective action.

Officials using the PAGs and information about local conditions will tell the public whether evacuation, sheltering, or other steps (e.g., avoiding certain foods) are needed in a radiation emergency.

Q. What kinds of radiation emergencies are the PAGs used for?

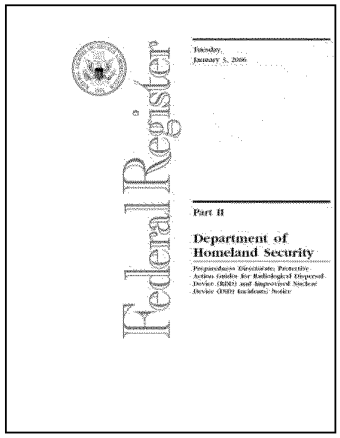
A. When the U.S. Environmental Protection Agency (EPA) was created in 1970, it was given responsibility for developing PAGs. The first Protective Action Manual, which was published in 1975, focused only on accidents at commercial nuclear power plants.

But in 1991 the Protective Action Guides were revised and expanded to cover all types of peacetime radiation emergencies.

The 1991 revisions also included recommendations from the U.S. Food and Drug Administration (FDA) for protective actions if an incident causes contamination of food or animal feed.

In addition, the 1991 Manual added guidance from the FDA and FEMA on the use of KI, potassium iodide, in situations involving the release of radioactive iodine.

Among the many possible situations covered in the 1991 PAGs were accidents involving U.S. nuclear power plants, accidents involving foreign nuclear reactors where the U.S. is affected, incidents involving the transportation of radioactive materials, satellite incidents, and incidents at nuclear research facilities, manufacturing or scrap metal recycling facilities, or hospitals.



More recently, in 2006, the PAGs were revised further to cover terrorism involving radioactive materials.

This includes both radiological dirty bombs (or other radiological dispersal devices, RDDs) and the exploding of a crude nuclear bomb (an IND, or improvised nuclear device).

Today, emergency responders and government officials can use the PAGs for any radiation emergency.

Q. Who uses the PAGs?

In a radiation emergency, federal, state and local emergency response agencies use the PAGs to decide when special actions are needed to avoid radiation exposure and protect people's health.

Under the system of government and the laws we have in the U.S., states and local governments have the main responsibility for deciding upon and taking measures to protect life and health.

The federal government's role in disasters is to provide assistance when it is needed.

This is true for all kinds of disasters, except war and declared national emergencies.

Q: What is the purpose of the PAGs?

A: At the most fundamental level, the purpose of the PAGs is to protect people's health.

By providing guidelines on when it is time to take protective actions, and which protective actions are best, the PAGs help prevent immediate effects and reduce the risk of longer-term effects from a radiation emergency.

The PAGs are also designed to ensure that any protective action taken does more good than harm.

Q: Are the PAGs federal standards?

A: Although the PAGs are not federal standards, they were developed by federal agencies to provide helpful guidance to state and local agencies.

The PAGs recommend precautions that state and local authorities can take during an emergency to keep people from receiving an amount of radiation that might be hazardous to their health.

State and local agencies use the PAGs, along with their knowledge of local conditions, to make decisions on how best to safeguard the population.

Q: What is the difference between a Protective Action and a PAG?

A: Protective actions are the specific steps that can be taken to avoid or reduce radiation dose. Evacuation and sheltering are examples of Protective Actions.

The PAGs are guides that tell officials when it is time to carry out protective actions and which steps are appropriate.

Q. Do the PAGs play a role in protecting people once the immediate emergency is over?

Yes. The steps described earlier are used to protect people in the early hours and days of a radiation emergency. (This is sometimes referred to as the *Early Phase*.)

But once the immediate emergency has passed, officials may recommend other steps to help protect people from longer-term exposure.

These cover what is known as the *Intermediate Phase* (which begins as soon as the emergency has been brought under control and can last days to months) and the Late Phase (which involves cleanup and recovery efforts lasting months to years).

One such measure is *decontamination of land and property*, which involves cleaning radioactive contamination from an area so that people can reoccupy it.

When this is not possible, another measure – *relocation* – may be required. Relocation involves moving people from an area and continuing to keep them from returning.

An additional protective action may involve placing continuing *controls on food and water*.

Q. What is the difference between evacuation and relocation?

Evacuation involves temporarily moving of people out of an area to protect them from short-term, high-level exposure to radiation, with the intention of having them return later.

Relocation involves moving people out of a contaminated area for a much longer time (or in some situations perhaps even permanently), in order to avoid chronic or long-term radiation exposure.

Q. After a terrorist attack that spreads radioactive contamination, how do officials figure out how much to clean up the area?

For Radiological Dispersal Device (RDD) or Improvised Nuclear Device (IND) incidents, the guidance for cleanup and recovery is contained in new guidelines that were issued in 2006.

The document, which is entitled *Application of Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*, describes what is called an optimization process for cleanup and recovery.

Every terrorism situation will be different, with impacts potentially ranging from light contamination of a single street or building to situations involving wider destruction and contamination.

Therefore, it makes little sense to have a “one size fits all” approach to cleanup and recovery.

Keeping this in mind, the guidance does not include a pre-established numeric guideline for cleanup.

Rather, the guidance takes the approach that the process of cleanup and recovery should be developed on an incident-specific basis and should engage stakeholders, be inclusive and be community-based. This is called *optimization*.

Q: What is Optimization? How does it work?

A: The idea is to have all interested parties involved in the process, and to find an approach to cleanup and recovery that is best for that particular community.

In choosing among cleanup alternatives, the decision-making process seeks to consider and balance many factors.

These could include:

- the nature of the incident
- the areas impacted (e.g., size, location relative to population)
- the types of contamination
- human health
- public welfare
- ecological risks
- technical feasibility
- how effective clean-up will be
- costs
- potential adverse effects of clean-up activities
- long-term effectiveness
- potential economic effects (e.g., on residents, tourism, business, and industry) and public acceptability.

Optimization is a process that tries to consider all of the relevant factors and to find a balance that is acceptable to a community.

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PROTECTING PUBLIC HEALTH IN A RADIATION EMERGENCY

How Do Officials Decide What Steps the Public Should Take after a Radiological Terrorism Incident?

Understanding Protective Actions and Protective Action Guides (PAGs)

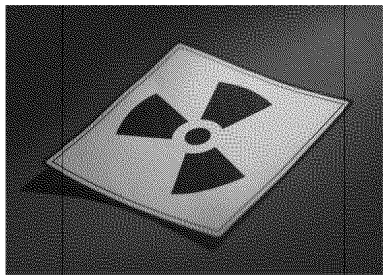
Presented by

Jane Q. Official
Official Title

Name of Radiation, Health or Emergency Management Agency
Location
Date

Why This Presentation?

- Taking the right actions in a radiation emergency is crucial for protecting public health.
- Members of the public often ask how officials decide which steps to advise the public to take.
- Terms such as Protective Actions and Protective Action Guides (PAGs) are unfamiliar to many people.



Objectives

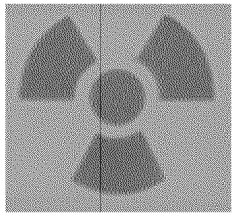
- To discuss the meaning and importance of Protective Actions and Protective Action Guides (PAGs) in a radiation emergency
- To discuss how officials decide what actions the public should take following a radiological terrorism incident
- To invite further questions and requests for information

Introduction

Radiological Dispersal Device (RDD)

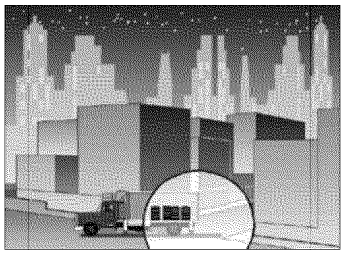
- Combination of radioactive material and some means to disperse it

- Many possibilities
  - Liquid
  - Incendiary
  - Aerosol



"Dirty Bomb"

- Combination of radioactive material and conventional explosive (e.g., dynamite, TNT)
  - Examples: truck bomb, planted device



- Does *not* involve a nuclear explosion
  - Dirty bomb lacks the capacity to cause the kind of massive, area-wide destruction and huge numbers of fatalities
  - Still very serious
  - Potential for tens or hundreds of deaths; major social, psychological, behavioral and economic impacts

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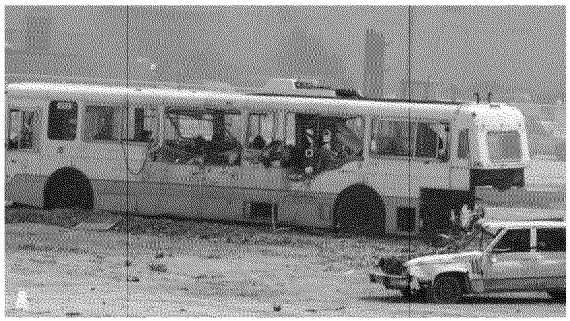
"Dirty Bomb"

- When the conventional explosive goes off, it does what any bomb does -- kills and maims people and causes damage to nearby structures.



Destroyed city bus after mock RDD attack, TOPOFF 2 national level exercise, Seattle. Photo: Seattle Municipal Archives Photograph Collection. Collection Record Series 0207-01 (Fleets & Facilities Imagebank). Item 138618.

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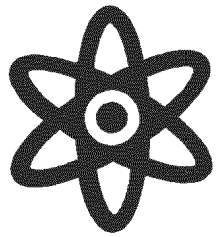
"Dirty Bomb"

- Direct casualties primarily from detonation of the conventional explosives

TOPOFF 2 RDD Exercise, 2003, Photo credit: Erik Stuhaug (Seattle Mayor Greg Nickels' Photo Gallery)

“Dirty Bomb”

- But with a dirty bomb, the explosion also disperses the radioactive material into the surrounding area with the aim of contaminating people, facilities and communities.



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Protective Actions, PAGs and Public Health

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Protecting Public Health

- In a dirty bomb incident – as in any emergency – the toll in terms of deaths, injuries and illnesses can be significantly reduced if people take the right steps to protect themselves and their loved ones.
- This is where Protective Actions and the Protective Action Guides (PAGs) can help.

Protective Actions

- The urgent steps taken to avoid or reduce radiation dose to the public in an emergency are called protective actions.
- The main protective actions that the public might be asked to take right after a radiation emergency occurs are evacuation or sheltering (staying inside).

Protective Actions

- *Evacuation* involves urgently moving people from an area expected to be in the path of radioactive releases.
- *Sheltering* involves having people stay indoors in their homes, offices, schools, or other buildings while radioactive materials pass over.

How Do Officials Decide Which One to Recommend?

- Officials use something called the PAGs to decide whether people need to take protective actions and which steps will be most effective in avoiding or reducing radiation doses to people.
- The abbreviation “PAGs” is short for *Protective Action Guides.*

What are PAGs?

- *Protective Action Guides*, or *PAGs*, are scientific guides that were created to help officials decide when it is necessary for people to evacuate, shelter, or take other urgent steps to safeguard health after a radiation emergency has occurred.

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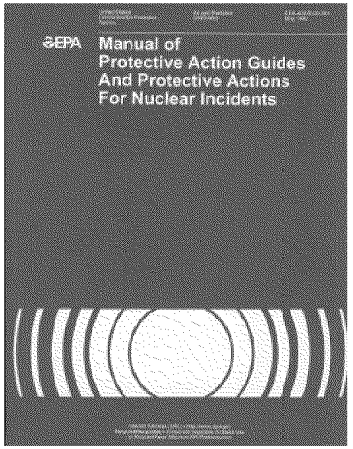
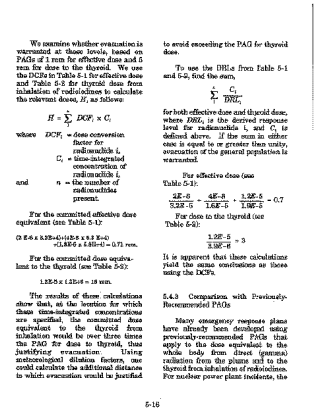
What is in the PAGs? What Do PAGs Look Like?

- The PAGs developed in 1991 were actually in book form; much of it consists of pages with *equations and tables with numbers developed by scientists*.
- More recent additions to the PAGs are not in book form, but have been published instead in the *Federal Register*.





We examine whether evacuation is warranted at these levels, based on PAGs of 1 rem for effective dose and 5 rem for dose to the thyroid. We use the DCFs in Table 5-1 for effective dose and Table 5-2 for thyroid dose from inhalation of radioiodines to calculate the relevant doses, H, as follows:

$$H = \sum_i^n DCF_i \times C_i$$

where DCF_i = dose conversion factor for radionuclide i,
C_i = time-integrated concentration of radionuclide i,
and n = the number of radionuclides present.

For the committed effective dose equivalent (see Table 5-1):

(3.E-6 x 3.2E-5)+(4E-8 x 8.2 E-4)
=(1.8E-9 x 4.8E+4) = 0.71 rem.

For the committed dose equivalent to the thyroid (see Table 5-2):

1.2E-5 x 1.2E+6 = 18 rem.

The results of these calculations show that, at the location for which these time-integrated concentrations are specified, the committed dose equivalent to the thyroid from inhalation would be over three times the PAG for dose to thyroid, thus justifying evacuation. Using meteorological dilution factors, one could calculate the additional distance to which evacuation would be justified to avoid exceeding the PAG for thyroid dose.

To use the DRLs from Table 5-1 and 5-2, find the sum,

$$\sum_i^n \frac{C_i}{DRL_i}$$

for both effective dose and thyroid dose, where DRL_i is the derived response level for radionuclide i, and C_i is defined above. If the sum in either case is equal to or greater than unity, evacuation of the general population is warranted.

For effective dose (see Table 5-1):

$$\frac{2E-6}{3.2E-5} + \frac{4E-8}{1.6E-5} + \frac{1.2E-5}{1.9E-5} = 0.7$$

For dose to the thyroid (see Table 5-2):

$$\frac{1.2E-5}{3.9E-6} = 3$$

It is apparent that these calculations yield the same conclusions as those using the DCFs.

5.4.3 Comparison with Previously-Recommended PAGs

Many emergency response plans have already been developed using previously-recommended PAGs that apply to the dose equivalent to the whole body from direct (gamma) radiation from the plume and to the thyroid from inhalation of radioiodines. For nuclear power plant incidents, the

5-16

How are the PAGs Used?

- Every emergency situation is different, and the best action or set of actions in one situation may not be appropriate at another time or in another situation.
- Knowing *when* emergency steps need to be taken, and *which* steps are warranted, is important for protecting the health of the public.

How are the PAGs Used?

- The scientific information in the PAGs provides general guidance to officials, which they can use in combination with their knowledge of local conditions, to make these important decisions.

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To What Kinds of Emergencies Do the PAGs Apply?

- The first Protective Action Manual, which was published by the EPA in 1975, focused only on accidents at commercial nuclear power plants.

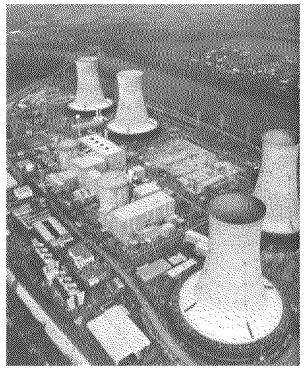

Photo: Three Mile Island: A Report to the Commissioners and the Public. NUREG/CR-1250, Volume 1. U.S. Nuclear Regulatory Commission.

- But in 1991 the PAGs were expanded to cover all types of peacetime radiation emergencies (including those involving transportation, research and hospitals).

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To What Kinds of Emergencies Do the PAGs Apply?

- The 1991 revisions also included recommendations from the U.S. Food and Drug Administration for protective actions if an incident causes contamination of food or animal feed.
- In addition, the 1991 Manual added guidance from the FDA and FEMA on the use of KI, potassium iodide, in situations involving the release of radioactive iodine.

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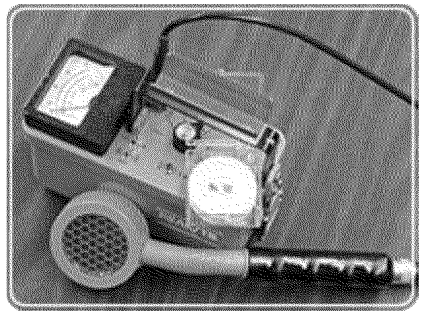
To What Kinds of Emergencies Do the PAGs Apply?

- More recently, in 2006, the PAGs were revised further to cover terrorism involving radioactive materials.
- This includes both radiological dirty bombs (or other radiological dispersal devices, RDDs) and the exploding of a crude nuclear bomb (an IND, or improvised nuclear device).
- Today, emergency responders and government officials can use the PAGs for any radiation emergency.

How do Officials Know When it is Time to Act?

- When a radiation emergency (including a dirty bomb incident) occurs, officials will use available information and computer models to quickly predict how much radiation people could potentially receive from the incident.



- This estimate is then compared with decision levels described in the PAGs.

How do Officials Know When it is Time to Act?

- If the dose that could result from the emergency has the potential to go higher than the decision levels listed in the guidelines, the PAGs indicate what general actions can be taken to *avoid* the exposure from taking place.
- In other words, PAGs are general guidelines for deciding when specific steps are needed to *prevent* people from being exposed to a level of radiation that might be hazardous to health.

Why Not Just Carry Out Every Protective Action as Soon as a Radiation Emergency Occurs?

- Different protective actions are appropriate for different situations.
- Doing “everything at once” is not possible. For example, people cannot take shelter (stay indoors) and evacuate at the same time.

Why Not Just Carry Out Every Protective Action as Soon as a Radiation Emergency Occurs?

- Officials need to see what kind of threat the emergency poses to people so they can provide the best advice to people on how to protect health.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- Evacuation is one of the two main protective actions that can be taken in the immediate hours or first few days of a radiation emergency, and sometimes it is necessary for protecting people's health.
- But there are also situations when sheltering may be a better choice for preventing or reducing radiation exposure.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- For example, if a cloud containing radioactive particles is expected to pass over an area very soon and then leave quickly, evacuation could actually expose people to more radiation than staying indoors.
- This is because evacuation takes time, and many people might be caught outside or in their cars when the cloud passed over.

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Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- In such a situation, people staying indoors while the cloud passed by would be **more protected** than those caught outside trying to evacuate.
- Sheltering also has the advantage of being less disruptive than evacuation and of enabling people to stay in familiar surroundings and have ready access to communication, food, and water.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- In some situations, evacuation may also not be practical.
- Blocked highways, for example, could make evacuation difficult.
- Severe weather at the time of the radiation emergency could also make evacuation dangerous.

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Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- It is also important to remember that evacuations can themselves create certain risks to people.
  - With large numbers of people suddenly taking to the highways, automobile accidents occur and people can be killed or injured.
  - Likewise, evacuations can be very difficult on people who are ill or in medical care. So, evacuations should only take place if they are necessary.

Photo: Three Mile Island: A Report to the Commissioners and the Public. NUREG/CR-1250, Volume 1. U.S. Nuclear Regulatory Commission.

Why Don't Officials Just Automatically Tell Everyone to Evacuate?

- If the risks from a protective action such as a major evacuation are greater than the risks to people from the emergency situation itself, it makes no sense to carry out the protective action.

Taking the Right Steps

- Officials using the PAGs and information about local conditions will tell the public whether evacuation, sheltering, or other steps are needed in a radiation emergency.
- Taking the correct steps is important for protecting yourself and your loved ones.

Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- Sheltering or evacuation may be supplemented by
  - *limiting access* to (keeping people out of) the location where the emergency has taken place
  - *decontaminating people*, which means to remove any radioactive particles that may have fallen onto people's clothes, skin, or hair. Decontamination is done by having people remove their clothes and put them in a plastic bag, take a warm shower with lots of soap, wash their hair with only shampoo (no conditioner) or soap and water, and change clothes. Pets and service animals can also be decontaminated.

Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- Actions might be taken to prevent radioactive contamination from entering the food chain.
- Officials might put special *controls on selected foods* suspected of being contaminated.
- They might also temporarily *put livestock on previously stored feed and water*, rather than allowing them go graze in potentially contaminated areas.

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Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- In situations where radioactive iodine has been released into the environment, officials may distribute something called potassium iodide, or KI, to protect people's thyroid glands.
- KI is a non-radioactive form of iodine. When it is taken, it fills the thyroid with regular (non-radioactive) iodine so that the radioactive iodine is not absorbed.
- KI only protects the thyroid and it is only useful in situations involving radioactive iodine; *it does not help in other situations*. It is *not an antidote to radiation*.

Beyond Evacuation or Sheltering, Are There Other Steps Officials Might Recommend?

- It is very unlikely that radioactive iodine will be released in a dirty bomb attack. So KI is unlikely to be helpful in a dirty bomb situation.
- In the rare case that radioactive iodine is released, officials will notify the public and provide instructions on what to do.
- Never take KI, and never give it to children, unless local health officials, emergency management officials, or your doctor specifically tell you it is needed.

Taking the Right Steps

- Officials using the PAGs and information about local conditions will tell the public which steps, if any, are needed.
- Taking the correct steps is important for protecting yourself and your family.

Who Decides Which Protective Actions to Recommend?

- Under the system of government and the laws we have in the U.S., states and local governments have the main responsibility for deciding upon and taking measures to protect life and health.
- This is true for all kinds of disasters, except war and declared national emergencies.

Who Decides Which Protective Actions to Recommend?

- The federal government's role in disasters is to provide assistance when it is needed.
- In a radiation emergency, state and local emergency response agencies use the PAGs developed by the federal government, along with their knowledge of local conditions, to decide when special actions are needed to avoid radiation exposure and protect people's health.

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What Role Do PAGs Play in Protecting People Once the Immediate Emergency is Over?

- The steps described earlier are used to protect people in the early hours and days of a radiation emergency. (This is sometimes referred to as the *Early Phase*.)
- But once the immediate emergency has passed, officials may recommend other steps to help protect people from longer-term exposure.

What Role Do PAGs Play in Protecting People Once the Immediate Emergency is Over?

- These cover what is known as the *Intermediate Phase* (which begins as soon as the emergency has been brought under control and can last days to months) and the *Late Phase* (which involves cleanup and recovery efforts lasting months to years).

What Role Do PAGs Play in Protecting People Once the Immediate Emergency is Over?

- One such measure is *decontamination of land and property*, which involves cleaning radioactive contamination from an area so that people can reoccupy it.
- When this is not possible, another measure – *relocation* – may be required. Relocation involves moving people from an area and continuing to keep them from returning.

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After a Radiological Terrorism Attack, How Do Officials Decide What Needs to Be Done to Clean Up the Area?

- For Radiological Dispersal Device (RDD) incidents, including dirty bombs, the guidance for cleanup and recovery is contained in a document issued in 2006.
- The document is entitled *Application of Protective Action Guides for Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*.

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After a Radiological Terrorism Attack, How Do Officials Decide What Needs to Be Done to Clean Up the Area?

- The document notes that every terrorism situation will be different, with impacts potentially ranging from light contamination of a single street or building to situations involving wider destruction and contamination.
- Therefore, it makes little sense to have a “one size fits all” approach to cleanup and recovery.

After a Radiological Terrorism Attack, How Do Officials Decide What Needs to Be Done to Clean Up the Area?

- Keeping this in mind, the guidance does not include a pre-established numeric guideline for cleanup.
- Rather, the guidance takes the approach that the process of cleanup and recovery should be *community-based* and developed on an *incident-specific basis.* This is called *optimization*.

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What is Optimization?

- The idea is to have all interested parties involved in the process, and to find an approach to cleanup and recovery that is best for that particular community.
- In choosing among cleanup alternatives, the decision-making process seeks to consider and balance many factors.

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What is Optimization? How Does it Work?

- These could include:
  - the nature of the incident
  - the areas impacted (e.g., size, location relative to population)
  - the types of contamination
  - human health
  - public welfare
  - ecological risks
  - technical feasibility
  - how effective clean-up will be
  - costs
  - potential adverse effects of clean-up activities
  - long-term effectiveness
  - potential economic effects (e.g., on residents, tourism, business, and industry) and public acceptability.

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What is Optimization? How Does it Work?

- Optimization is a process that tries to consider all of the relevant factors and to find a balance that is acceptable to a community.

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Finding Out More

On the web: www.agency.etc

Telephone: 1-800-123-4567

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Radiation Incident: Key Questions and Answers

This fact sheet was prepared by [AGENCY] to provide important information to the public regarding radiation emergencies. It is one in a series of fact sheets intended to answer some of people's most frequently asked questions. This particular fact sheet discusses two terms that are often used in relation to radiation emergencies: *Protective Actions* and *Protective Action Guides (PAGs)*. It also explains how agencies decide what steps the public should take in response to a radiation emergency. If you don't see your question here, or you wish additional information, please contact the web address or telephone number listed at the end of the sheet.

Topics covered in this fact sheet:

- ***What are Protective Actions?***
- ***What are Protective Action Guides (PAGs)?***
- ***How do agencies decide whether people should evacuate or stay where they are?***

Q: What is a Protective Action?

A: Protective actions are the urgent steps that people can take to protect their health and the health of loved ones in a dirty bomb incident or other radiation emergency.

The main protective actions that the public might be asked to take are evacuation or sheltering (staying inside).

Q. How do people know which steps to take?

A. Health and emergency management officials will tell the public if protective actions are needed and whether evacuation or staying inside would be more effective for avoiding radiation doses to people.

The officials make these decisions about how to protect public health by using information about local conditions and by using something called the "PAGs."

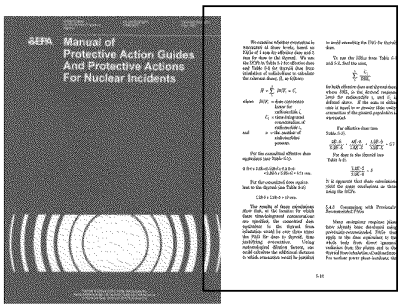
Q. What are the PAGs?

A. *PAGs, or Protective Action Guides*, are guides that were created to help officials decide when it is necessary for people to evacuate or shelter to safeguard health after a radiation emergency has occurred.

Every emergency situation is different, and the best action or set of actions in one situation may not be appropriate at another time or in another situation.

Knowing *when* emergency steps need to be taken, and *which* steps are warranted, is important for protecting the health of the public. The PAGs provide general guidance to officials, which they can use in combination with their knowledge of local conditions, to make these important decisions.

Q: What do the PAGs look like?



A: The PAGs published in 1991 were in book form, with many pages containing equations and tables with numbers developed by scientists. More recent additions to the PAGs are not in book form, but have been published instead in the *Federal Register*.

Q. What kinds of steps are included in the PAGs?

A. The PAGs include measures that government agencies and members of the public can take to protect people's health in a radiation emergency. In the first hours and days of a radiation emergency, there are two main protective actions that can be taken to avoid exposure to radiation: evacuation or sheltering.

Q. What is evacuation? What is sheltering? What is the difference?

A. *Evacuation* involves urgently moving people from an area expected to be in the path of radioactive releases.

Sheltering, on the other hand, involves having people stay indoors in their homes, offices, schools, or other buildings while radioactive materials pass over.

Q. Are there other steps officials might ask people to take?

A. Depending on the situation, evacuation or sheltering may be supplemented by other measures. One step is to limit access to (keep people out of) the affected area. Another step involves decontaminating people, which means to remove any radioactive particles that may have fallen onto people's clothes, skin, or hair. Decontamination is done by having people wash, shower, and change clothes.

Food: Sometimes officials may also take steps to stop certain foods from being consumed if the foods are suspected of being contaminated. Authorities may also act to prevent livestock from grazing in potentially-contaminated areas, and instead have the animals drink water and eat feed that has been previously stored.

Potassium Iodide: Potassium iodide, or KI, is a non-radioactive form of iodine. KI can be useful in situations where radioactive iodine has been released into the environment. It

works by filling a person's thyroid gland with safe iodine so that harmful radioactive iodine is not absorbed.

But a dirty bomb incident is very unlikely to involve radioactive iodine, so taking KI in that situation would not be helpful.

In the unlikely event that authorities do determine that radioactive iodine is involved, they will alert the public, distribute potassium iodide, and provide instructions.

Never take KI and never give to your children unless you have been specifically advised to do so by the health department, emergency management officials, or your doctor.

Q. How do officials know when it is time to carry out protective actions?

A. When a radiation emergency occurs, officials will use available information and computer models to quickly predict how much radiation people could *potentially* receive from the incident.

They then use the PAGs to determine what general actions can be taken to *avoid* that potential exposure from taking place.

In other words, PAGs are general guidelines for deciding when specific steps are needed to *prevent* people from being exposed to a level of radiation that might be hazardous to health.

Q. Wouldn't it make more sense to carry out all of the protective actions right away, as soon as a radiation emergency occurs?

A. No. Different safety measures are used for different situations.

Taking all of the safety measures at once is not possible. For example, people cannot stay inside and evacuate at the same time. Officials need to see what kind of threat the emergency poses to people so they can provide the best advice on how to protect health.

Q. Why don't officials just automatically advise everyone to evacuate when a radiation emergency occurs?

A. There are situations when sheltering may be a better choice for preventing or reducing radiation exposure.

For example, if a cloud containing radioactive particles is expected to pass over an area very soon and then leave quickly, evacuation could actually expose people to more radiation than staying indoors.

This is because evacuation takes time, and many people might be caught outside or in their cars when the cloud passed over. So people staying indoors while the cloud passed by would be more protected than those caught outside trying to evacuate.

Also, in some situations, evacuation may not be practical. Blocked highways, for example, could make evacuation difficult. So, too, could severe weather.

Officials using the PAGs and information about local conditions will tell the public whether evacuation, sheltering or other steps are needed in a radiation emergency. Follow the instructions so that you take the right steps to protect yourself and your loved ones.

Q. Who uses the PAGs?

States and local governments have the main responsibility for taking measures to protect life and health.

In a radiation emergency, state and local emergency response agencies use the PAGs to decide when special actions are needed to avoid radiation exposure and protect people's health.

Q. Do PAGs play a role in protecting people after the immediate emergency is over?

Yes. The steps described earlier are used to protect people in the early hours and days of a radiation emergency. (This is sometimes referred to as the Early Phase.)

But once the immediate emergency has passed, officials may recommend other steps to help protect people from longer-term exposure.

These cover what is known as the Intermediate Phase (which begins as soon as the emergency has been brought under control and can last days to months) and the Late Phase (which involves cleanup and recovery efforts lasting months to years).

One such measure is *decontamination of land and property*, which involves cleaning radioactive contamination from an area so that people can reoccupy it. When this is not possible, another measure – *relocation* – may be required. Relocation involves moving people from an area and continuing to keep them from returning. An additional protective action may involve placing continuing *controls on food and water*.

Q. Where can I find out more about more?

We are strongly committed to keeping the public informed and to answering people's questions. If you want to learn more, or did not see your question here, please contact us on the web at www.agency.etc or by telephone: [INSERT AGENCY CONTACT NUMBER HERE]

To: Becker, Steven M.[smbecker@odu.edu]
Cc: Nesky, Anthony[Nesky.Tony@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Wieder, Jessica
Sent: Mon 2/1/2016 12:22:44 PM
Subject: RE: PAGs Messages

Steve – I appreciate the help. As soon as you can get me the materials, we can start working on them.

Jessica

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

From: Becker, Steven M. [mailto:smbecker@odu.edu]
Sent: Friday, January 29, 2016 2:41 PM
To: Wieder, Jessica <Wieder.Jessica@epa.gov>
Subject: RE: PAGs Messages

Sorry it has taken so long… it has just been nutso busy around here.

From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
Sent: Friday, January 29, 2016 2:40 PM
To: Becker, Steven M.
Subject: Re: PAGs Messages

Thank you!

Jessica Wieder

U.S. Environmental Protection Agency

Radiation Protection Program

202-343-9201

m: 202-420-9353

Sent from my iPhone

On Jan 29, 2016, at 2:25 PM, Becker, Steven M. <smbecker@odu.edu> wrote:

> Found the materials... stay tuned.
>
> -----Original Message-----
> From: Becker, Steven M.
> Sent: Tuesday, January 26, 2016 1:57 PM
> To: 'Wieder, Jessica'
> Subject: RE: PAGs Messages
>
> Hi Jess,
>
> The snowstorm ended up being fun for us. Norfolk only got 2-3 inches of snow between the two bands that affected the area. So we had enough for snowballs and snowmen but not so much as to be a pain. (It was also merciful for the storm not to be too bad. I was too jet-lagged to deal with more than a little bit of shoveling!)
>
> Yikes, I cannot believe how much snow DC and surrounding areas received! I hope the situation has at least given you some pretty scenes to view and some nice, relaxing family time to enjoy.
>
> Re: the PAGs messages -- That is terrific! I am glad EPA will be able to make use of some of the content. I will go the archive later today, get the original WORD files out, and send them to you.
>
> Stay safe!
>
> All the best,
>
> Steve
>
> -----Original Message-----
> From: Wieder, Jessica [mailto:Wieder.Jessica@epa.gov]
> Sent: Tuesday, January 26, 2016 7:20 AM

To: Becker, Steven M.
Subject: PAGs Messages

Hi Steve,

I hope you made it back from your travels before the storm. How did you and your family weather the storm? After not seeing a plow since 7 pm on Friday, my street banded together yesterday and hand shoveled 30 inches of snow from the court to the main street. It was a truly impressive act of a community working together. We will have a problem if two cars are headed in different directions, but at least we have a way out if we need it.

When you get a chance, can you please send me an editable version of the PAGs messages? We briefed our management and EPA is going to take the lead on publishing the Q&As. Some will go on the web as FAQs and some will end up in a PAG Manual Communications Implementation Tool.

Thank you.

Jess

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

--
BEGIN-ANTISPAM-VOTING-LINKS

NOTE: This message was trained as non-spam. If this is wrong, please correct the training as soon as possible.
Teach CanIt if this mail (ID 01QaAkHnP) is spam:Spam: about:blankNot spam: about:blankForget vote: about:blank
---
END-ANTISPAM-VOTING-LINKS

Spam
Not spam
Forget previous vote

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Hallam, Christopher
Sent: Tue 1/26/2016 1:24:26 PM
Subject: RE: Sorry to push our PAGs so far...

No worries on the PAGs; I had wanted to get through the draft updated PAGs before I give you full comments on the slides, but I will cut that short and get you comments this afternoon.

Let me know if you need someone to carry your luggage in Austin…. ;-P

Chris Hallam

Office: 202-343-9308

Center for Radiological Emergency Management

Radiation Protection Division

Office of Radiation and Indoor Air

www.epa.gov/radiation

From: DeCair, Sara
Sent: Tuesday, January 26, 2016 8:18 AM
To: Hallam, Christopher
Subject: Sorry to push our PAGs so far...

But this week does have some busy times and I figure we should take our time. I'm in Austin Mon-Wed next week... the far preferable climate to the Minnesota trip Ray is taking!!

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Amy Doll[adoll@endyna.com]; siddhanti@endyna.com[siddhanti@endyna.com]
From: Miguel Tuason
Sent: Thur 1/21/2016 8:07:33 PM
Subject: CURRENT FORMATTED/CLEANED UP VERSION - PAGS / v048 01212016
PAG Manual Revised_v048 01212016.docx

Hello, Sara –

As promised, here is the formatted version of PAGS, which is also reflective of the version we last received from you (November 2015).

Some notes about this version:

- **COLOR CODE** remains the same: ~~**YELLOW**~~ = Deleted, **GRAY** = Added… However, we also included = notes or questions from EnDyna.

- There is no designed COVER on this version, pending approval of new COVER DESIGN. Options currently being reviewed by EPA.

- The **TABLE OF CONTENTS** (TOC) has been updated and reflect the current contents of PAGS. Headings and heading numbers have been updated for document consistency, which is also now accurate on the TOC.

- A new **CHAPTER THREE** has been added for "EMERGENCY WORKER PROTECTION," as requested. This additional chapter was not included in the November review (where this material was included within Chapter 2), so this version includes an additional chapter not reflected in the November version of PAGS.

- A placeholder is included in this version (See note after "*Key Points in Chapter 3*"), as you requested, for a future "Water and Food" chapter.

- For ease of review, each section has been separated by page breaks. Once all reviews are completed, the finalized version can easily be tightened.

- Page numbers will be included for **TABLES** and **FIGURES** on the final version.

- Footnotes from ~~DELETED~~ sections have been removed, but archived in the pages where they had originally appeared. Doing so leaves all remaining footnotes intact and numbering accurate.

Based on the notes above, the attached version (***v048 01212016***) should be the most up-to-date version of PAGS, and can be the basis of any additional feedback - including those which you'll be addressing from Amy's emails sent to you earlier this week – from this point on.

We look forward to working with you in the coming weeks and months to implement any future revisions as we move towards a final version of this manual.

Please don't hesitate to contact us with any comments, questions, and concerns.

Thank you.

Best

Miguel

Miguel Tuason
DIRECTOR OF BUSINESS DEVELOPMENT
EnDyna, Inc.
7926 Jones Branch Drive
Suite 620
McLean, VA 22102
Tel: 703 848 8842 ext. 120
Cell: 571 218 7505
Fax: 703 848 9001

www.endyna.com

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copying or forwarding it, and notify the sender of the error by email reply.

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]; Miguel Tuason[mtuason@endyna.com]
From: Amy Doll
Sent: Tue 1/19/2016 5:38:00 PM
Subject: FW: REVISED Combined sections and revised tables for Surface Contamination
PAG_Surface Contam Control Section Revised_071015.docx
Understand Target Levels for Decontamination of People - Radiation Emergency.pdf

Hi Sara

Second of two emails regarding PAGs materials that were waiting for review. This revision was prepared after your webinar with CDC, and I believe you sent this revised version to CDC for review.

Thanks,

Amy

Amy Doll

Senior Associate

EnDyna, Inc.
7926 Jones Branch Drive, Suite 620
McLean, VA 22102

adoll@endyna.com
Tel: 703-848-8842 ext. 111 **NEW EXTENSION**

Fax: 703-848-9001

From: Amy Doll
Sent: Friday, July 10, 2015 5:10 PM
To: DeCair, Sara (DeCair.Sara@epa.gov) (DeCair.Sara@epa.gov)
Cc: 'Smita Siddhanti (siddhanti@endyna.com)'
Subject: REVISED Combined sections and revised tables for Surface Contamination

Hi Sara

Attached is the revision to the excerpt on surface contamination that was reviewed and discussed at the webinar today. I wanted to wrap up a revised draft today, while it was all still fresh! Green highlight shows the revisions today subsequent to the webinar.

I sent you a definition of gross contamination used by CDC, but I saw different interpretations of "simple decontamination" (CDC 2014 referred to "showering with mild soap and warm water" as "simple" decontamination, but this current draft appears to use "full" decontamination for something similar). We might need more thought/discussion about this "simple" decontamination definition.

ADDENDUM: I've found a few additional resources, as mentioned in a separate email earlier this afternoon (also copied in below so keep with this email chain, for future reference):

I checked, and in the CDC publication, Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners, April 2014 . . . Appendix D: Radiological Screening Criteria - External Contamination, appears relevant to the discussion we had today . . . LATER I'll give Appendix D some review to see if the CDC 2014 publication helps and whether/how it should be referenced or not in that section . . .

Also found this attached PDF of an "Understand Target Levels for Decontamination of People" HHS website, which might be useful as a "reality check" . . . since I noted it references "2 or 3 times background" and provides a comprehensive list of related references (might be worth a look).

GROSS DECONTAMINATION (from another separate email earlier this afternoon):

CDC (2014) refers to gross decontamination (in their appendix on community reception center specifications) as:

"If a patient is contaminated with radioactive material, First Aid staff can perform a gross decontamination by carefully removing the patient's outer layer of clothing before transport."

See page F-7 in CDC (2014)

Thanks,

Amy

Amy Doll

Senior Associate

EnDyna, Inc.
7926 Jones Branch Drive, Suite 620
McLean, VA 22102

adoll@endyna.com
Tel: 703-848-8842 ext. 121

Fax: 703-848-9001

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Scott, Andrew
Sent: Thur 1/14/2016 9:03:37 PM
Subject: RE: This afternoon's OMB briefing call

Nothing earth shattering, but it was good to get some background…..

Have a good weekend!

Andy Scott

202-254-8629

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, January 14, 2016 9:02 AM
To: Scott, Andrew <andrew.scott@hq.dhs.gov>
Subject: RE: This afternoon's OMB briefing call

Not to be cagey, but if you are a silent listener that'd be ideal. I probably wasn't supposed to go beyond the invite list! (heh)

3 pm today: Call-in Number: Ex. 6 - Personal Privacy Passcode: Ex. 6 - Personal Privacy

From: Scott, Andrew [mailto:andrew.scott@hq.dhs.gov]
Sent: Thursday, January 14, 2016 8:39 AM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Subject: RE: This afternoon's OMB briefing call

Sara,

No, I was not aware of this meeting. Please send details, I would like to sit in, if possible.

Thanks for the heads-up.

Cheers,

Andy

Andy Scott

202-254-8629

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, January 14, 2016 8:35 AM
To: Scott, Andrew <andrew.scott@hq.dhs.gov>; Hunt, Brian <bhunt@sandia.gov>
Subject: FW: This afternoon's OMB briefing call

I'm guessing you might be attending today's OMB briefing. Let me know if this sounds totally unfamiliar and I'll fwd you the details. Thanks!

From: DeCair, Sara
Sent: Thursday, January 14, 2016 8:31 AM
Subject: This afternoon's OMB briefing call

Subcommittee friends –

Just a heads up that I won't be able to join this afternoon's drinking water PAG briefing with OMB. To accommodate schedules for our leadership, I had to pick a time that I am already

committed. Though it seems odd to miss a meeting on my very favorite topic, I'm sure it will be a good discussion. Please don't hesitate to pipe up if there are points where you can provide clarity on the bigger PAGs picture – you all know the issues well. And do call or write later if you want to discuss anything -- I am here today but booked from 2 to 3:30 pm.

Cheers,

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Alai, Maureen[alai1@llnl.gov]; Blizzard, Jeffrey (jeffrey.blizzard@fema.dhs.gov[jeffrey.blizzard@fema.dhs.gov]
From: Buddemeier, Brooke2
Sent: Wed 1/13/2016 9:04:02 PM
Subject: RE: Key Planning Factor Reports

Sorry, the link went stale on me… I refreshed it, please try again.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Brooke Buddemeier, Certified Health Physicist

Phone (510) 972-3682, e-mail: brooke2@llnl.gov

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Wednesday, January 13, 2016 1:01 PM
To: Buddemeier, Brooke2
Cc: Alai, Maureen; Blizzard, Jeffrey (jeffrey.blizzard@fema.dhs.gov
Subject: RE: Key Planning Factor Reports

Brooke,

I keep getting an error on the first link (not getting to enter pw, even) in Firefox and IE. Retry?

Reviewed the pages in the second link and it looks awesome! The only future thing that we might have to go back and incorporate is a very-possible drinking water PAG that EPA should be issuing for public comment "soon." All the nods to PAGs you have in here so far are right on. Thanks for showing me!

Sara

From: Sara DeCair [mailto:saradianedecair@gmail.com]
Sent: Tuesday, January 12, 2016 4:32 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Subject: Fwd: Key Planning Factor Reports
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

---------- Forwarded message ----------
From: **Buddemeier, Brooke2** <buddemeier1@llnl.gov>
Date: Tue, Jan 12, 2016 at 2:49 PM
Subject: Key Planning Factor Reports
To: "Sara DeCair (saradianedecair@gmail.com)" <saradianedecair@gmail.com>
Cc: "Alai, Maureen" <alai1@llnl.gov>, "Blizzard, Jeffrey (jeffrey.blizzard@fema.dhs.gov)" <jeffrey.blizzard@fema.dhs.gov>

Hi Sara,

Here is one of our last full "Key Planning Factor" reports that we did. This was for NYC, and there are several focused detailed reports on specific technical areas like Prompt Effects, Fallout, Infrastructure, etc..

The links below provide the reports that mention the PAGs, the links will only be active for a few days and I will send the PDF password separately. I called out the PAG reference pages below, but you will find PAG related contours throughout the document.

Main Document:
ftp://anonymous@ftp.llnl.gov/outgoing/buddemeier1/(Animated)%20FEMA%20IND%20Key%20Response%2(
NYC%20Edition-v1.0C-pw.pdf

Specifically, look at pages 57-58, & 69

Fallout Supplement:
ftp://anonymous@ftp.llnl.gov/outgoing/buddemeier1/(Animated)%20FEMA%20R2%20Fallout%20Report-28Sept2014-pw.pdf

Specifically, look at Page 20-25,

~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Brooke Buddemeier, Certified Health Physicist
Global Security Directorate
Lawrence Livermore National Laboratory
~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Phone (510) 972-3682

brooke2@llnl.gov

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Milligan, Patricia
Sent: Wed 1/13/2016 5:01:13 PM
Subject: Fyi

Hi. Here are Nrc staff comments that will be sent to OMB. I don't think these are problematic.

· The NRC Staff recommends that the terms "drinking water supplies" and "drinking water source" be defined and clarified, and a "point of measurement" be specified, in the draft EPA PAG. Specifically, the NRC Staff recommends the measurement point be defined at the "point of consumption" (i.e., at the tap in accordance with EPA safe drinking water regulations). The measurement point should not be at the groundwater resource/aquifer, nor in a surface water body (lake or river), or at the intake to the water cleaning and chlorination plant since the plant may obtain drinking water from other water sources.

· The description of what type of "dose quantities" and the dose "values" proposed in the draft EPA PAG for drinking water are not consistent with dose quantities and values used in the FDA PAGs for food. In the NRC Staff's view, the dose quantities and values defined in the draft EPA PAG should be consistent and complementary with the FDA PAGs. In addition, the draft EPA PAG for drinking water is written in units of "committed effective dose" (~ sometimes called the whole body dose), whereas the FDA PAGs for food are provided in dual units of "committed effective dose" (~ whole body dose) and "committed dose" (organ dose).

· The draft EPA PAG is unclear regarding the derived response levels (DRLs) drinking water concentrations for Sr-90, Cs-137, and I-131, in three aspects. First, it is unclear if these concentration levels correspond to filtered or unfiltered samples as these concentrations could be different substantially due to the presence of suspended radioactive matters that could be eliminated through routine filtration. Second, it is unclear as to the water sample source (e.g., from the aquifer, from surface water, or at the point of intake by the public). Third, it is unclear as to the analytical uncertainties that can be tolerated due to sampling, source, or analytical errors.

· The NRC Staff also noted that the DRLs for drinking water were calculated by using a simplifying and conservative assumption that radionuclide levels will remain constant over the course of one year. Instead, the NRC Staff recommends that the radionuclide levels be radionuclide decay corrected, which is particularly important for the short-lived radionuclides such as I-131. For I-131, this change would make a significant difference over a one-year period (i.e., several orders of magnitude), especially given that these PAGs are applicable during the intermediate phase of an emergency (typically several days or months after a nuclear accident, and up to one year thereafter).

· The NRC Staff had another concern about the assumption used in the DRLs calculation.

Ex. 5 - Deliberative Process

· Section 4.1, "Other Standards," Second Paragraph—The NRC Staff recommends that the draft EPA PAG be revised to include a comparison of the I-131 DRLs from Section 7.0 to the Fukushima values for reference, as this revision would help provide context for readers. The use of concentration terms when the rest of the paragraphs use dose increases the chance for confusion.

· Section 6.3.1, "Treating Contaminated Water," Second Paragraph—While the EPA reference does provide traditional disposal considerations for residuals, depending on the extent of the radiological event, residual disposal considerations, including liquid and solid treatment residuals, may receive alternate options based on regional decisions. The NRC Staff recommends that the draft EPA PAG be revised to reflect that the regional decisions may be made on waste disposition consistent with the national response framework.

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Snead, Kathryn
Sent: Tue 1/5/2016 4:03:07 PM
Subject: FW: RE: PAGs for drinking water?

Sara,

Mark is on my MARSSIM Workgroup, and he's a really great guy. He's from the research side, with a dry sense of humor, and a sharp mind. When he says, "Good luck" – he's chuckling and smiling. He's seen his share of hard-fought science published, and he's on your side.

Just in case it wasn't clear from the text. I know you've gotten your fair share of detractors on the PAGs, and I wanted to make sure you knew Mark wasn't one of them. Thanks.

Kathryn Snead

Center for Radiological Emergency Management

Office of Radiation and Indoor Air

Environmental Protection Agency

1200 Pennsylvania Ave., NW

Washington, DC 20460

202-343-9228 (W)

202-536-7896 (C)

From: Fuhrmann, Mark [mailto:Mark.Fuhrmann@nrc.gov]
Sent: Tuesday, January 05, 2016 9:58 AM
To: DeCair, Sara <DeCair.Sara@epa.gov>; Snead, Kathryn <Snead.Kathryn@epa.gov>
Cc: Yabusaki, Steve B (yabusaki@pnnl.gov) <yabusaki@pnnl.gov>
Subject: RE: RE: PAGs for drinking water?

Hi Sara

Thanks for the information. I will talk to Trish.

My interest comes from a study we did on a fukushima -like aqueous release to freshwater bodies, since most US plants are on freshwater systems. Modeled water concentrations during the long-term, post-accident phase are around MCL (+/- an order of magnitude) depending on river size, Kd, and source term. So doses from drinking water are not high, even if concentrations are greater than MCL. Being able to discuss these concentrations relative to a PAG would be useful.

But it is pretty clear that it will take time to get the final PAGs….i can only imagine the comments you will get….good luck.

Thanks

Mark

Mark Fuhrmann, Ph.D.

Geochemist

Office of Nuclear Regulatory Research

U.S. Nuclear Regulatory Commission

Mail Stop TWF 10 A-12

11555 Rockville Pike

Rockville, MD 20852-2738

mark.fuhrmann@nrc.gov

Phone: 301-415-0879

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Tuesday, January 05, 2016 9:21 AM
To: Snead, Kathryn <Snead.Kathryn@epa.gov>; Fuhrmann, Mark <Mark.Fuhrmann@nrc.gov>
Subject: [External_Sender] RE: PAGs for drinking water?

Good morning Mark and Kathryn,

How timely! The proposal EPA has crafted for a drinking water PAG is under OMB review right now, and I believe Trish Milligan is preparing to brief the NRC leadership on it. We hope to get that proposal out for public comment to get input on it, then drop it into a finalized full PAG Manual but as you know, these things don't necessarily go quickly at the end of an administration.

Sara

202-343-9108

From: Snead, Kathryn
Sent: Wednesday, December 23, 2015 10:07 AM
To: Fuhrmann, Mark <Mark.Fuhrmann@nrc.gov>
Cc: DeCair, Sara <DeCair.Sara@epa.gov>
Subject: FW: PAGs for drinking water?

Mark,

Let me defer to my colleague, Sara DeCair, who can provide the best context on the status of the Drinking Water PAG, and provide information on who are the NRC POCs working with her on this project. Let me know if I can help with anything else.

Kathryn Snead

Center for Radiological Emergency Management

Office of Radiation and Indoor Air

Environmental Protection Agency

1200 Pennsylvania Ave., NW

Washington, DC 20460

202-343-9228 (W)

202-536-7896 (C)

From: Fuhrmann, Mark [mailto:Mark.Fuhrmann@nrc.gov]
Sent: Tuesday, December 22, 2015 10:26 AM
To: Snead, Kathryn <Snead.Kathryn@epa.gov>
Subject: PAGs for drinking water?

Hi Kathryn

I see you did a presentation on the 2013 draft revisions to the PAGs. Is there any decision to include drinking water in new PAGs?

Thanks

Mark

Mark Fuhrmann, Ph.D.

Geochemist

Office of Nuclear Regulatory Research

U.S. Nuclear Regulatory Commission

Mail Stop TWF 10 A-12

11555 Rockville Pike

Rockville, MD 20852-2738

mark.fuhrmann@nrc.gov

Phone: 301-415-0879

To: Fuhrmann, Mark[Mark.Fuhrmann@nrc.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]
From: Snead, Kathryn
Sent: Wed 12/23/2015 3:07:08 PM
Subject: FW: PAGs for drinking water?

Mark,

Let me defer to my colleague, Sara DeCair, who can provide the best context on the status of the Drinking Water PAG, and provide information on who are the NRC POCs working with her on this project. Let me know if I can help with anything else.

Kathryn Snead

Center for Radiological Emergency Management

Office of Radiation and Indoor Air

Environmental Protection Agency

1200 Pennsylvania Ave., NW

Washington, DC 20460

202-343-9228 (W)

202-536-7896 (C)

From: Fuhrmann, Mark [mailto:Mark.Fuhrmann@nrc.gov]
Sent: Tuesday, December 22, 2015 10:26 AM
To: Snead, Kathryn <Snead.Kathryn@epa.gov>
Subject: PAGs for drinking water?

Hi Kathryn

I see you did a presentation on the 2013 draft revisions to the PAGs. Is there any decision to include drinking water in new PAGs?

Thanks

Mark

Mark Fuhrmann, Ph.D.

Geochemist

Office of Nuclear Regulatory Research

U.S. Nuclear Regulatory Commission

Mail Stop TWF 10 A-12

11555 Rockville Pike

Rockville, MD 20852-2738

mark.fuhrmann@nrc.gov

Phone: 301-415-0879

To: Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Edwards, Jonathan[Edwards.Jonathan@epa.gov]
From: Nanko, Lisa
Sent: Mon 12/14/2015 8:57:21 PM
Subject: RE: Review of PAG Material - Comments, Adjudication and Draft Text

I'll come over for the 9 am meeting. I need to see my ORIA women. And Jon. He must be feeling pretty good with the Navy win over Army. We can sense Jon's grin all the way over here in North.

Lisa

From: Veal, Lee
Sent: Monday, December 14, 2015 1:10 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>; Kudarauskas, Paul <Kudarauskas.Paul@epa.gov>; Scozzafava, MichaelE <Scozzafava.MichaelE@epa.gov>; Stahle, Susan <Stahle.Susan@epa.gov>; Nanko, Lisa <Nanko.Lisa@epa.gov>; Hill, Glynis <Hill.Glynis@epa.gov>
Cc: Christ, Lisa <Christ.Lisa@epa.gov>; Doster, Brian <Doster.Brian@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Hudson, Scott <Hudson.Scott@epa.gov>
Subject: RE: Review of PAG Material - Comments, Adjudication and Draft Text

Good afternoon,

Attached are the promised meeting materials for tomorrow. These include:
1--Two pages on the schedule for finalizing the PAG Manual. This will be shared with ODs on Thursday.
2--Redline/strikeout version of the 2013 PAG Manual, with changes made to address public comments. We will definitely cover this tomorrow.
3--Table of public comments with our notes on how we addressed these. We won't go through these in detail, that would be unreasonable given the volume, but they are there for the curious. EPA is not publishing a response to comments as might be done with a rule, but we are using these as a method for tracking the changes made in the document draft.

<< File: Redline PAG Manual 12-14-2015.docx >> << File: Cmt Resolution 12-14-2015.xlsx >> << File: Finalization proposal for EPA Internal Team 12-10-2015.docx >>
Lee

Lee Ann B. Veal
Director, Center for Radiological Emergency Management
Radiation Protection Division
Office of Radiation and Indoor Air
Office: 202-343-9448
Cell: 202-617-4322
www.epa.gov/radiation

-----Original Appointment-----
From: Veal, Lee
Sent: Wednesday, December 09, 2015 5:40 PM
To: Veal, Lee; DeCair, Sara; Paul Kudarauskas; Scozzafava, MichaelE; Stahle, Susan; Nanko, Lisa; Hill, Glynis
Cc: Christ, Lisa; Doster, Brian; Hernandez-Quinones, Samuel; Scott Hudson
Subject: Review of PAG Material - Comments, Adjudication and Draft Text
When: Tuesday, December 15, 2015 9:00 AM-10:00 AM (UTC-05:00) Eastern Time (US & Canada).
Where: DCRoomWest1424/OPEI

Our Office Directors/designees are meeting on Thursday, December 17 to discuss the schedule for finalizing the PAG Manual (full manual, not just the drinking water portion).

I suggest we spend some time before then to share the comments received and our draft changes to the full manual from the 2013 published version. I'll send a separate email with the comments received and the redline of the full manual. IF you'd like to see what was published in 2013 and the comments, here is the link: http://www.epa.gov/radiation/protective-action-guides-pags

We have a conference room in EPA West, 1st floor, room 1424. We will also have a webinar set up if you'd like to take this conference call from your location. Here is that link:

http://epawebconferencing.acms.com/r4ur9l13ifi/

Audio: Ex. 6 - Personal Privacy

To: Perrin, Alan[Perrin.Alan@epa.gov]; Cherepy, Andrea[Cherepy.Andrea@epa.gov]
Cc: Edwards, Jonathan[Edwards.Jonathan@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Flynn, Mike
Sent: Mon 12/14/2015 8:57:17 PM
Subject: RE: PAGs - schedule

Thanks Alan – I will try to get out to ODs later today

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

From: Perrin, Alan
Sent: Monday, December 14, 2015 1:10 PM
To: Flynn, Mike <Flynn.Mike@epa.gov>; Cherepy, Andrea <Cherepy.Andrea@epa.gov>
Cc: Edwards, Jonathan <Edwards.Jonathan@epa.gov>; Veal, Lee <Veal.Lee@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>
Subject: PAGs - schedule
Importance: High

Mike,

Attached is the proposed schedule for finalizing the full PAG Manual. The timeline begins with a webinar for the EPA internal review team on 12/15, and goes on from there. This is suitable for advance 12/17 OD-level meeting distribution, if you would like to do that.

Lee will be sending out the full (draft) PAG Manual in redline, the response to comments spreadsheet and the attached timeline to the EPA internal review team today in advance of tomorrow's webinar.

Let me know if you would like to discuss any of this before tomorrow's general. -Alan

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
ofc (202) 343-9775 | mbl (202) 279-0376

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Wieder, Jessica
Sent: Mon 12/7/2015 7:29:24 PM
Subject: RE: Call me? Ex. 6 - Personal Privacy PAGs public Q&As

Will do

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: Ex. 6 - Personal Privacy

From: DeCair, Sara
Sent: Monday, December 07, 2015 2:29 PM
To: Wieder, Jessica <Wieder.Jessica@epa.gov>; Nesky, Anthony <Nesky.Tony@epa.gov>
Subject: Call me? Ex. 6 - Personal Privacy PAGs public Q&As

From: Wieder, Jessica
Sent: Thursday, December 3, 2015 8:13 AM
To: Wieder, Jessica; DeCair, Sara; Nesky, Anthony
Subject: PAGs public Q&As
When: Monday, December 7, 2015 2:30 PM-3:00 PM.
Where: DCRoomWest1424/OPEI

Attached is a document created by Dr. Stephen Becker as part of a contact with DNDO, which included messages about PAGs. The PAG Q&A section is really quite good. Should we add these to our PAG FAQ section of the web or make them into a document on the web?
Check out pages 34-42 of the attached pdf.

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Wallo, Andrew
Sent: Fri 12/4/2015 2:29:05 PM
Subject: RE: Good news! Drinking water PAG proposal went to OMB

Congratulations – Any chance you can share it with us before we get it from OMB? No problem if not, we can wait, but any significant changes since we last saw it?

Thanks

Andy

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, December 03, 2015 4:50 PM
To: Amy Doll <adoll@endyna.com>; Wallo, Andrew <Andrew.Wallo@hq.doe.gov>; asa4@cdc.gov; ben.cacioppo@dtra.mil; Carlos.Corredor@Hq.Doe.Gov; Regnier, Edward <Edward.Regnier@hq.doe.gov>; John.Jensen@dm.usda.gov; john.mackinney@dhs.gov; john.madrid@dtra.mil; lee.a.nickel1@navy.mil; lodwick.jeffrey@dol.gov; michael.howe@fema.dhs.gov; Michael.Noska@fda.hhs.gov; Patricia.Milligan@nrc.gov; paul.ward@fema.dhs.gov; ricardo.a.reyes@us.army.mil; siddhanti@endyna.com; tdkraus@sandia.gov; Veal, Lee <Veal.Lee@epa.gov>; Wieder, Jessica <Wieder.Jessica@epa.gov>; william.cunningham@nist.gov
Subject: Good news! Drinking water PAG proposal went to OMB

PAGs Subcommittee;

We just learned that the drinking water PAG proposal we briefed you on a while back went over to OMB for their review. Per the OMB process, you should expect to hear about it through your Regulatory Process Officers sometime in the next days to weeks. I have no idea how quickly to expect that review to start, but if I learn anything new I will give you a heads up.

So now is a great time to remind your leadership that this will be coming around, and make time to answer their technical and policy questions. I am willing at any time to meet with you or hold a conference call to discuss the proposal, or prepare for the full PAG Manual finalization process that'll be next. Let me know if you need anything, and also let me know if you hear anything from OMB.

Onward!

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Hunt, Brian[bhunt@sandia.gov]
From: Kraus, Terrence D
Sent: Fri 12/4/2015 1:40:46 PM
Subject: RE: [EXTERNAL] Happy Hour Friday! Celebrate water PAG going to OMB

Sara,

Congratulations! I am very happy that you were able get the water PAGs approved. Let's hope the OMB review moves quickly.

I'd love to join you tonight at 14th and F NW but my private jet is in the shop because it apparently needs more ball bearings (reference to Fletch the mechanic).

Cheers!

Terry Kraus, CHP

Nuclear Incident Response Programs

Sandia National Laboratories

(505) 284-9708

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, December 03, 2015 2:55 PM
Subject: [EXTERNAL] Happy Hour Friday! Celebrate water PAG going to OMB

Marvelous news! The drinking water Protective Action Guide (PAG) proposal was approved by EPA and is now to the Office of Mgmt and Budget for their review process. We consider this quite an accomplishment after years of hard work, and it is time to celebrate.

Join us for a happy hour at the Hamilton DC (14th and F NW) around 4 pm tomorrow, Friday, December 4th. Please invite others who'd be interested, and I hope to see you there –

CHEERS!!

To: Amy Doll[adoll@endyna.com]; Andrew.Wallo@eh.doe.gov[Andrew.Wallo@eh.doe.gov]; asa4@cdc.gov[asa4@cdc.gov]; ben.cacioppo@dtra.mil[ben.cacioppo@dtra.mil]; Carlos.Corredor@Hq.Doe.Gov[Carlos.Corredor@Hq.Doe.Gov]; Edward.Regnier@hq.doe.gov[Edward.Regnier@hq.doe.gov]; John.Jensen@dm.usda.gov[John.Jensen@dm.usda.gov]; john.mackinney@dhs.gov[john.mackinney@dhs.gov]; john.madrid@dtra.mil[john.madrid@dtra.mil]; lee.a.nickel1@navy.mil[lee.a.nickel1@navy.mil]; lodwick.jeffrey@dol.gov[lodwick.jeffrey@dol.gov]; michael.howe@fema.dhs.gov[michael.howe@fema.dhs.gov]; Michael.Noska@fda.hhs.gov[Michael.Noska@fda.hhs.gov]; Patricia.Milligan@nrc.gov[Patricia.Milligan@nrc.gov]; paul.ward@fema.dhs.gov[paul.ward@fema.dhs.gov]; ricardo.a.reyes@us.army.mil[ricardo.a.reyes@us.army.mil]; siddhanti@endyna.com[siddhanti@endyna.com]; tdkraus@sandia.gov[tdkraus@sandia.gov]; Veal, Lee[Veal.Lee@epa.gov]; Wieder, Jessica[Wieder.Jessica@epa.gov]; william.cunningham@nist.gov[william.cunningham@nist.gov]
From: DeCair, Sara
Sent: Thur 12/3/2015 9:49:32 PM
Subject: Good news! Drinking water PAG proposal went to OMB

PAGs Subcommittee;

We just learned that the drinking water PAG proposal we briefed you on a while back went over to OMB for their review. Per the OMB process, you should expect to hear about it through your Regulatory Process Officers sometime in the next days to weeks. I have no idea how quickly to expect that review to start, but if I learn anything new I will give you a heads up.

So now is a great time to remind your leadership that this will be coming around, and make time to answer their technical and policy questions. I am willing at any time to meet with you or hold a conference call to discuss the proposal, or prepare for the full PAG Manual finalization process that'll be next. Let me know if you need anything, and also let me know if you hear anything from OMB.

Onward!

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]; Nesky, Anthony[Nesky.Tony@epa.gov]
From: Wieder, Jessica
Sent: Thur 12/3/2015 1:11:06 PM
Subject: PAG Messages for the General Public
TF Project 6 Final Report December 2013.pdf

Sara and Tony,

Attached is a document created by Dr. Stephen Becker as part of a contact with DNDO, which included messages about PAGs. The PAG Q&A section is really quite good. Should we add these to our PAG FAQ section of the web or make them into a document on the web?

Check out pages 34-42 of the attached pdf.

I am going set up a meeting to discuss further next week.

Jess

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Jablonowski, Eugene[jablonowski.eugene@epa.gov]
From: Sincek, Jeffrey
Sent: Tue 11/24/2015 1:19:39 PM
Subject: RE: Lingo from PAGs, subset of which for A Team SOP

Thanks Sara, I added your suggested language to the SOP.

Jeff

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Wednesday, November 18, 2015 4:35 PM
To: Sincek, Jeffrey; ATeam-JABLONOWSKI, EUGENE
Subject: Lingo from PAGs, subset of which for A Team SOP

Jeff, Gene,

So the PAG Manual describes the TWG as this -- from the DHS RDD/IND doc originally, actually. The PAG Manual strives to stay out of the response roles/responsibilities space where possible, but this process is given as an example, and it's echoed in the new draft NRIA.

Technical Working Group

A technical working group should be convened as soon as practicable, ideally within days or weeks of the incident. The technical working group would be managed by the Planning Section Unit that is assigned responsibility for the cleanup options analysis. The technical working group may or may not be physically located at the ICP. The group may review data and documents, provide input electronically and meet with incident management officials. The group may also be asked to participate in meetings with the JFO Unified Coordination Group if needed.

Function: The technical working group provides multi-agency, multi-disciplinary expert input on the cleanup options analysis, including advice on technical issues, analysis of relevant regulatory requirements and guidelines, risk analyses and development of cleanup options. The technical working group would provide expert technical input to the IC/UC; it would not be a decision-making body.

Makeup: The technical working group should include selected federal, state, local and

private sector subject matter experts in such fields as environmental fate and transport modeling, risk analysis, technical remediation options analysis, cost, risk and benefit analysis, health physics and radiation protection, construction remediation practices and relevant regulatory requirements. The exact selection and balance of subject matter experts is incident-specific. The Advisory Team for Environment, Food and Health is comprised of federal radiological experts in various fields that may warrant representation on the technical working group, therefore, the Team or some of its members may be incorporated into this group as appropriate.

So what I'd suggest for the SOP is something short and sweet like this (since we might be in a position to provide advice on using the PAG Manual and its handy example cleanup process in there...):

EPA/Recovery Phase

During the Intermediate Phase, the FRMAC will transfer to EPA leadership and the IC/UC will plan the transition from response to recovery efforts. The Advisory Team may advise on long term cleanup planning and some Team members will likely serve as part of a Technical Working Group or similar advice body to the stakeholder involvement process to set cleanup goals. (References: FRMAC Operations Manual and associated FRMAC Transfer Guidance; PAG Manual; National Disaster Recovery Framework).

To: Muellerleile, Caryn[Muellerleile.Caryn@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]; Pritchard, Eileen[Pritchard.Eileen@epa.gov]
From: Hill, Glynis
Sent: Thur 11/19/2015 8:07:26 PM
Subject: FW: PAG proposal with units spelled out on first page
EO12866_PAG for DW_Draft Guidance_20151119.docx

Attached is a clean updated version see note below. I will be finish with my Policy review b4 COB today.

Glynis Hill – Environmental Scientist | Office of the Administrator | Office of Policy | Office of Regulatory Policy & Management

(202) 564-1139 | 3512V WJC North | Mail Code 1803 | 1200 Pennsylvania Avenue, NW | Washington, DC 20460

From: DeCair, Sara
Sent: Thursday, November 19, 2015 3:03 PM
To: Hill, Glynis <Hill.Glynis@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Christ, Lisa <Christ.Lisa@epa.gov>
Subject: PAG proposal with units spelled out on first page

Glynis,

Thanks for suggesting that we spell out the radiation units in the opening of the drinking water PAG proposal. A clean updated version is attached. We understand you are finishing up your policy analysis review now and are hopeful that the package can get over to OMB soon! Your help is much appreciated, and of course contact us if you need anything at all. We are glad to brief on the project at any time.

Thank you,

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; Perrin, Alan[Perrin.Alan@epa.gov]; Cherepy, Andrea[Cherepy.Andrea@epa.gov]
From: Lee, Raymond
Sent: Mon 11/16/2015 7:26:56 PM
Subject: RE: Protective Action Guide for Drinking Water Pkg. for OMB Review [SAN 5198]

Hi Sara,

Big difference indeed! I forwarded this on to OAR and the special assistants as well.

Thanks,

Ray

Sent by EPA Wireless E-mail Services

From: DeCair, Sara
Sent: Monday, November 16, 2015 9:43 AM
To: Veal, Lee; Perrin, Alan; Cherepy, Andrea; Lee, Raymond
Subject: Fw: Protective Action Guide for Drinking Water Pkg. for OMB Review [SAN 5198]

Oh. Big difference. See below, PAGs to OP today.

From: Flaharty, Stephanie
Sent: Monday, November 16, 2015 9:42 AM
To: Hernandez-Quinones, Samuel; Evalenko, Sandy
Cc: Lee, Raymond; DeCair, Sara; Balserak, Paul
Subject: RE: Protective Action Guide for Drinking Water Pkg. for OMB Review [SAN 5198]

Correction, the document is being submitted electronically to OP today.

From: Flaharty, Stephanie
Sent: Monday, November 16, 2015 7:14 AM
To: Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov>; Evalenko, Sandy <Evalenko.Sandy@epa.gov>
Cc: Lee, Raymond <Lee.Raymond@epa.gov>; DeCair, Sara <DeCair.Sara@epa.gov>; Balserak, Paul <Balserak.Paul@epa.gov>
Subject: RE: Protective Action Guide for Drinking Water Pkg. for OMB Review [SAN 5198]

Hi Sam,

OW sent the package to OP on November 2nd.

Steph

From: Hernandez-Quinones, Samuel
Sent: Thursday, November 12, 2015 4:24 PM
To: Evalenko, Sandy <Evalenko.Sandy@epa.gov<mailto:Evalenko.Sandy@epa.gov>>
Cc: Lee, Raymond <Lee.Raymond@epa.gov<mailto:Lee.Raymond@epa.gov>>; DeCair, Sara <DeCair.Sara@epa.gov<mailto:DeCair.Sara@epa.gov>>; Balserak, Paul <Balserak.Paul@epa.gov<mailto:Balserak.Paul@epa.gov>>; Flaharty, Stephanie <Flaharty.Stephanie@epa.gov<mailto:Flaharty.Stephanie@epa.gov>>
Subject: FW: Protective Action Guide for Drinking Water Pkg. for OMB Review [SAN 5198]

Hi Ms. Evalenko,

I was wondering if you could let me know the status of this Package [SAN 5198]. Has it already been transmitted to OP?

Our colleagues at the office of Air were inquiring about this information.

Thank You for any help you can provide.

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Environmental Protection Agency
Office of Water
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

From: Flaharty, Stephanie
Sent: Tuesday, November 03, 2015 1:11 PM

To: Evalenko, Sandy <Evalenko.Sandy@epa.gov<mailto:Evalenko.Sandy@epa.gov>>; Gude, Karen <Gude.Karen@epa.gov<mailto:Gude.Karen@epa.gov>>
Cc: Greene, Ashley <Greene.Ashley@epa.gov<mailto:Greene.Ashley@epa.gov>>; Galada, Heather <Galada.Heather@epa.gov<mailto:Galada.Heather@epa.gov>>; Christ, Lisa <Christ.Lisa@epa.gov<mailto:Christ.Lisa@epa.gov>>; Hernandez-Quinones, Samuel <Hernandez.Samuel@epa.gov<mailto:Hernandez.Samuel@epa.gov>>
Subject: Protective Action Guide for Drinking Water Pkg. for OMB Review [SAN 5198]

Hello,

Please find attached our draft PAG in Drinking Water submittal to OMB for review. This draft document will be posted for public comment after OMB review is completed.

Steph Flaharty

Sr. Reg. Mgr./FOIA Public Liaison

Office of Ground Water and Drinking Water

(202) 564-5072

ORIA Weekly–November 6, 2015

ORIA EVENTS that recently took place

- **Drinking Water Protective Action Guide (PAG) Proposal Approved for Office of Policy Review**: A draft drinking water PAG proposal was approved by the Assistant Administrator for the Office of Water on Monday for submission to Office of Policy for possible Office of Management and Budget Executive Order 12866 review. The proposal is an addition to the revised draft 2013 PAG Manual – Protective Action Guides and Planning Guidance for Radiological Incidents. The proposed drinking water PAG will help federal, state, local and public water system officials make decisions about use of drinking water during radiological emergencies. When finalized, the drinking water guidance will be integrated into EPA's Protective Action Guides and Planning Guidance for Radiological Incidents
- **RPD's Edwards Attended Deputies-Level Senior Official Exercise 2-15:** On November 3, 2015, RPD Director Jonathan Edwards attended the Deputies-Level Senior Official Exercise 2-15 led by the White House with EPA representative Nitin Natarajan, the Deputy Assistant Administrator for OSWER. The exercise asked the interagency to address several important questions regarding the offsite response to a release from a nuclear power plant incident within the U.S.

- **IED's Mitchell Attended Cookstove Events in Ghana**
- **IED's Burton Participated in APHA Annual Conference and Exposition**
- **RPD's Wieder Attended Global Initiative to Combat Nuclear Terrorism Quarterly Meeting**

RadNet Report for the Week of October 26, 2015

Overall monitor operational percentage was 93.3%. This is above the operational goal of 80%.

The overall operational percentage for October was 92.3%.

Radiation Protection and Emergency Response

- **NAREL's Telofski, RPD's Veal and NCREO's Fraass to Attend International Commission on Radiation Units and Measurements (ICRU) Meeting:** During the week of November 16th, in Bethesda, Md, Scott Telofski, Lee Veal and Ron Fraass will attend the ICRU Report Committee 28 meeting to review and edit the future ICRU report titled, "Radiation Monitoring for Protection of the Public after Major Radioactive Releases to the Environment. Scott is writing a large portion of a chapter that covers monitoring programs, pre- and post-accident monitoring, use of computer models in conjunction with measurements, and exposure pathway analyses over time following a major radioactive materials release. Lee is the lead for the Chapter review.
- **RPD's Puskin, Boyd and Pawel to Attend National Academies of Science (NAS) Meeting:** On November 12, 2015 in Washington, DC, RPD staff Jerry Puskin, Mike Boyd and David Pawel will

attend a public meeting of the Nuclear and Radiation Studies Board of the National Academy of Sciences. The meeting will take place at the NAS Keck Center in Washington.

- **RPD's Littleton to Present Briefing to Science Advisory Board:** On November 10, 2015, in Washington, DC, RPD's Brian Littleton will present a briefing to the Science Advisory Board's Radiation Advisory Committee (RAC) on the Agency's efforts to review and potentially revise our Environmental Radiation Protection Standards for Nuclear Power Operations (40 CFR part 190). The briefing will provide the RAC with a summary of our standards and our Advance Notice of Proposed Rulemaking (ANPRM), and cover feedback from the public comment period. This standard sets limits on radiation exposure from all uranium fuel cycle facilities including 100 nuclear power plants and the supply facilities.

Indoor Air Quality

- **IED's Mitchell to Give Presentations at Cookstoves Forum in Ghana:** On November 7-13 in Accra, Ghana , IED's John Mitchell will attend the 7th Biennial Clean Cooking Forum 2015. The forum will be held to "Accelerate Markets, Scale Solutions." John will chair a session and participate on a panel in the closing plenary session. The Forum will convene more than 400 delegates from 40 countries. The stakeholders will share best practices and project lessons, forge partnerships, network, and embark on site visits and clean cooking demonstrations. Participants represent entrepreneurial cookstove designers, manufacturers and retailers, fuel producers and suppliers, non-governmental organizations, multilateral institutions, investors, governments, and researchers.
- **IED's Enger to facilitate the 2015 Asthma Coalition Summit:** On November 6 in San Antonio, Texas, Tracy Enger from IED will join the Allergy & Asthma Network and the American College of Allergy, Asthma and Immunology to facilitate the 2015 Asthma Coalition Summit. Asthma coalitions from across the country will learn about the latest clinical breakthroughs, innovations, and best practices in allergy and asthma care. Coalitions will also discover that through the EPA website (asthmacommunitynetwork.org), they will be able to continue learning and connect with other asthma coalitions, state asthma programs, stakeholders and partners to advance the adoption of home-based environmental interventions and sustainable financing.
- **EPA To Issue National Radon Action Plan Press Release:** On November 10, the new National Radon Action Plan will be announced to the general public. Developed in partnership with 12 federal agencies and nongovernment organizations, the plan's goal is to prevent 3,200 radon-related lung cancer deaths annually by 2020 by requiring radon testing and reduction systems as a standard practice in housing finance and insurance programs, and institutionalizing health risk reduction through building code requirements and adoption. The partnership is led by the American Lung Association. Other members include the American Association of Radon Scientists and Technologists, American Society of Home Inspectors, Cancer Survivors Against Radon (CanSAR), Children's Environmental Health Network, Citizens for Radioactive Radon Reduction, Conference of Radiation Control Program Directors, Environmental Law Institute, and the National Center for Healthy Housing. Federal members are EPA, HHS and HUD.

To see past archived versions of the ORIA weekly, click on this link:
https://javaintranet.epa.gov/ORIA/pageview.do?page_id=2242

Rick White
Office of Radiation and Indoor Air
Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington DC, 20460
Mail Code: 6609T
202-343-9335

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Stahle, Susan
Sent: Wed 11/4/2015 6:29:53 PM
Subject: RE: OP needs your "no comment" in writing on PAG

Thanks Sara. I gave this a quick read and have no comments on it. I confirmed with Brian Doster that he does not plan to review it. As such, ARLO gives you the go ahead to move this forward as we have no comments on it.

Susan Stahle

Attorney-Advisor

Air and Radiation Law Office

Office of General Counsel

U.S. Environmental Protection Agency

202-564-1272 (ph)

202-564-5603 (fax)

stahle.susan@epa.gov

From: DeCair, Sara
Sent: Wednesday, November 04, 2015 9:33 AM
To: Stahle, Susan <Stahle.Susan@epa.gov>
Subject: RE: OP needs your "no comment" in writing on PAG

Sue, here is the version of the proposal that went to OP the other day. You'll see only minor wording changes based on OSWER input. Thank you for your help!

Sara

From: Stahle, Susan

Sent: Tuesday, November 03, 2015 5:49 PM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Subject: RE: OP needs your "no comment" in writing on PAG

Hi –

Can we talk briefly in the morning about this? I feel like I need to make sure my colleagues in WLO were able to review and comment on this. I forwarded it to them on 5/5/15 but haven't heard a thing since (e.g. not sure if there was a revised version that was circulated).

Susan Stahle

Attorney-Advisor

Air and Radiation Law Office

Office of General Counsel

U.S. Environmental Protection Agency

202-564-1272 (ph)

202-564-5603 (fax)

stahle.susan@epa.gov

From: DeCair, Sara
Sent: Tuesday, November 03, 2015 3:34 PM
To: Stahle, Susan <Stahle.Susan@epa.gov>
Subject: OP needs your "no comment" in writing on PAG

Sue,

I wrote down that I got a VM from you in July with no comments on the drinking water PAG proposal and now I'm learning from the OW submission of the FR package to OP that they want that in writing. Would it work for you to reply to this message, do you think? I hope that will be okay. Do call or write if you have questions, thank you!

Sara

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Shogren, Angela
Sent: Wed 10/28/2015 8:25:43 PM
Subject: Re: Get rid of this document?

This is a good question. Part of me feels like we should keep the old one for reference, but the other part of me thinks...why?!

I'll ask my contact as NSCEP what they typically do in a case like this and see if there is any sort of precedent...Stay tuned!

Angela Shogren
Public Affairs Specialist
Radiation Protection Division
U.S. Environmental Protection Agency Tel (202) 343-9761
Shogren.Angela@epa.gov

On Oct 28, 2015, at 4:12 PM, DeCair, Sara <DeCair.Sara@epa.gov> wrote:

> I wonder if we can request that this document be taken down from NEPIS? It has been superceded, and the second edition is something we point to the REMM website for now that we aren't hosting PDFs of other people's docs anymore. Here is a screen shot of the one that should be deleted, and the link to the new one in case someone wonders… I can contact NEPIS if you say that's appropriate. We did co-author this document so it makes sense to have a copy, but also could just delete … Thank you!!
>
> (new document: http://www.remm.nlm.gov/PlanningGuidanceNuclearDetonation.pdf)
>
> <image001.png>
>
> Sara D. DeCair
>
> http://www.epa.gov/radiation/rert/pags.html
>
> 202-343-9108
>
> Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Runge, Roberta
Sent: Mon 10/26/2015 1:24:05 PM
Subject: IMH Clean Copy - Still Draft
EPA IMH Dec 2015 clean copy.docx

Some day I hope to get this finalized!!!

Roberta Runge
Office of Emergency Management
Environmental Protection Agency
Washington, DC
(202) 564-1973

>
>

To: DeCair, Sara[DeCair.Sara@epa.gov]; Dempsey, Gregg D.[Dempsey.Gregg@epa.gov]
From: Brozowski, George
Sent: Sun 10/25/2015 7:00:49 PM
Subject: Comments On Attached Presentation
2014-0214 NC LEPC Presentation.pptx

Good afternoon and I need to give a presentation at the local FBI office this coming Wednesday. Can you two take a look at the attached presentation and tell me what you think? Thanks!

George P. Brozowski

Regional Health Physicist/Radon Coordinator

US EPA – R6

1445 Ross Avenue – MS 6PDT

Dallas, TX 75202

214-665-8541 o

214-755-1530 c

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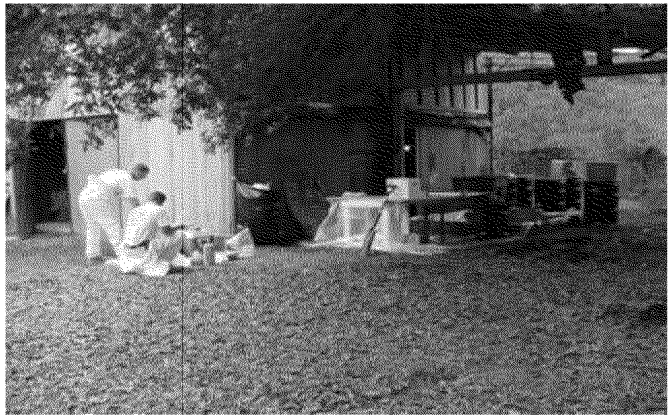
EPA's Radiological Emergency Response Program

George P. Brozowski
Regional Health Physicist
Region 6

Introduction

- Overview
- EPA Response Roles
- EPA Response Assets
- Protective Action Guides



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Mission Statement

Protect human health and to safeguard the natural environment - air, water, and land - upon which life depends on both national and global levels

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EPA's Radiological Emergency Preparedness and Response Authorities

EPA's radiological emergency response program was created to fulfill responsibilities under:

- Statutes such as:
  - Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund)
  - Atomic Energy Act
- Federal plans such as:
  - National Response Framework Nuclear/Radiological Incident Annex

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Building Capacity

EPA is the only Federal agency focused on ensuring protection of the environment, along with public health, from avoidable exposure to radiation

We provide a system of checks and balances ensuring appropriate independence and adequacy of radiation protection

- Yucca Mountain Standard
- WIPP Regulation
- Federal Guidance for General Public

This role continues into our ER role, especially as we coordinate with other agencies

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Preparedness

Building Capacity and Coordinating with:

- DHS/FEMA
  - Federal Radiological Preparedness Coordinating Committee (FRPCC)
  - Radiological Emergency Preparedness (REP)
  - Nuclear Incident Response Team (NIRT)
- Dept. of Energy
- Homeland Security Council
- National Response Team
- Dept. of Defense

EPA Response Roles - Plans

National Response Framework (NRF)

- All Hazards
- Nationally significant incidents
- Nuclear/Radiological Incident Annex
- ESF #10

National Oil & Hazardous Substance Pollution Contingency Plan (NCP)

- All Oil, Hazardous Substances, & Pollutants or Contaminants
  - Includes any imminent and substantial threat to the public health or welfare of the United States or the environment of the United States including radiological materials
- Nationally significant incidents

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EPA's Role in Terrorist Incidents

Pre-release

- Support the DHS and the FBI in threat credibility assessment
- May pre-deploy or assist at Nationally Significant Special Events or on Domestic Emergency Support Team

Post-release

- Forensic assets assist in evidence collection
- Emergency response assets respond to consequences of incident at the tactical ICS level
- Clean-up efforts

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Consequences Response Role

- Provide overall response coordination (NCP/ESF#10)
  Perform and coordinate radiological monitoring and assessment
  - Assist DOE (in the emergency and intermediate phase) and lead the Federal Radiological Monitoring and Assessment Center (FRMAC) in the long-term phase
- Develop Protective Action Guides (PAGs)
  Provide “Special Teams” emergency response expertise and support
- Serve as Coordinating Agency under the NRF’s Nuclear/Radiological Incident Annex if unknown/unlicensed sources, foreign incidents with impacts on the U.S.

Annex Coordinating Agency Roles & Responsibilites

TYPE OF INCIDENT	COORDINATING AGENCY
a. Radiological terrorism incidents (e.g., RDD/IND or radiological exposure device):	
1) Material or facilities owned or operated by DOD or DOE	1) DOD or DOE
2) Material or facilities licensed by NRC or Agreement State	2) NRC
3) All others *Note: lead transitions to EPA for cleanup*	**3) DOE** ***(to EPA for cleanup)***
b. Nuclear Facilities:	
1) Owned or operated by DOD or DOE	1) DOD or DOE
2) Licensed by NRC or Agreement Stat	2) NRC
3) Not licensed, owned, or operated by a Federal agency or an Agreement State, or currently or formerly licensed facilities for which the owner/operator is not financially viable or is otherwise unable to respond	**3) EPA**
c. Transportation of radioactive materials:	
1) Materials shipped by or for DOD or DOE	1) DOD or DOE
2) Shipment of NRC or Agreement State-licensed materials	2) NRC
3) Shipment of materials in certain areas of the coastal zone that are not licensed or owned by a Federal agency or Agreement State (see USCG list of responsibilities for further explanation of "certain areas")	3) DHS/USCG
4) All others	**4) EPA**
d. Space vehicles containing radioactive materials:	
1) Managed by NASA or DOD	1) NASA or DOD
2) Not managed by DOD or NASA impacting certain areas of the coastal zone	2) DHS/USCG
3) All others	**3) EPA**
e. Foreign, unknown or unlicensed material:	
1) Incidents involving foreign or unknown sources of radioactive material in certain areas of the coastal zone	1) DHS/USCG
2) All others	**2) EPA**
f. Nuclear weapon accident/incident (based on custody at time of event)	DOD or DOE
Other types of incidents not otherwise addressed above	DHS designates

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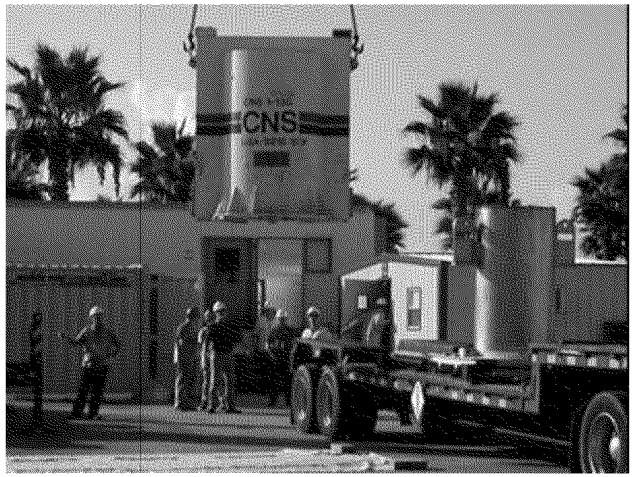
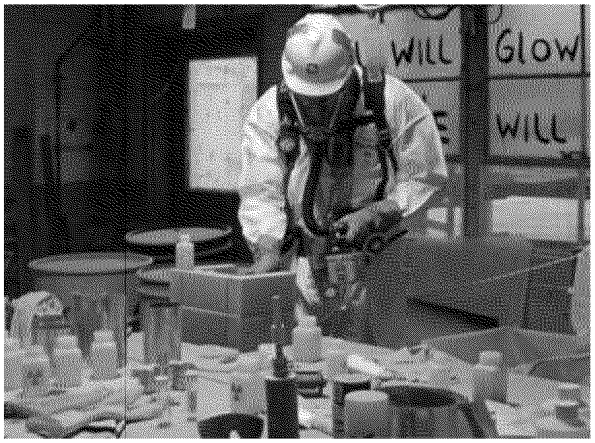
EPA Experience

- Large-scale Incidents
  - Three Mile Island
  - Chernobyl
  - DOE Site Fires
- Small-scale Incidents
  - Lost Sources
  - Removal Sites
  - DOE Site Investigations





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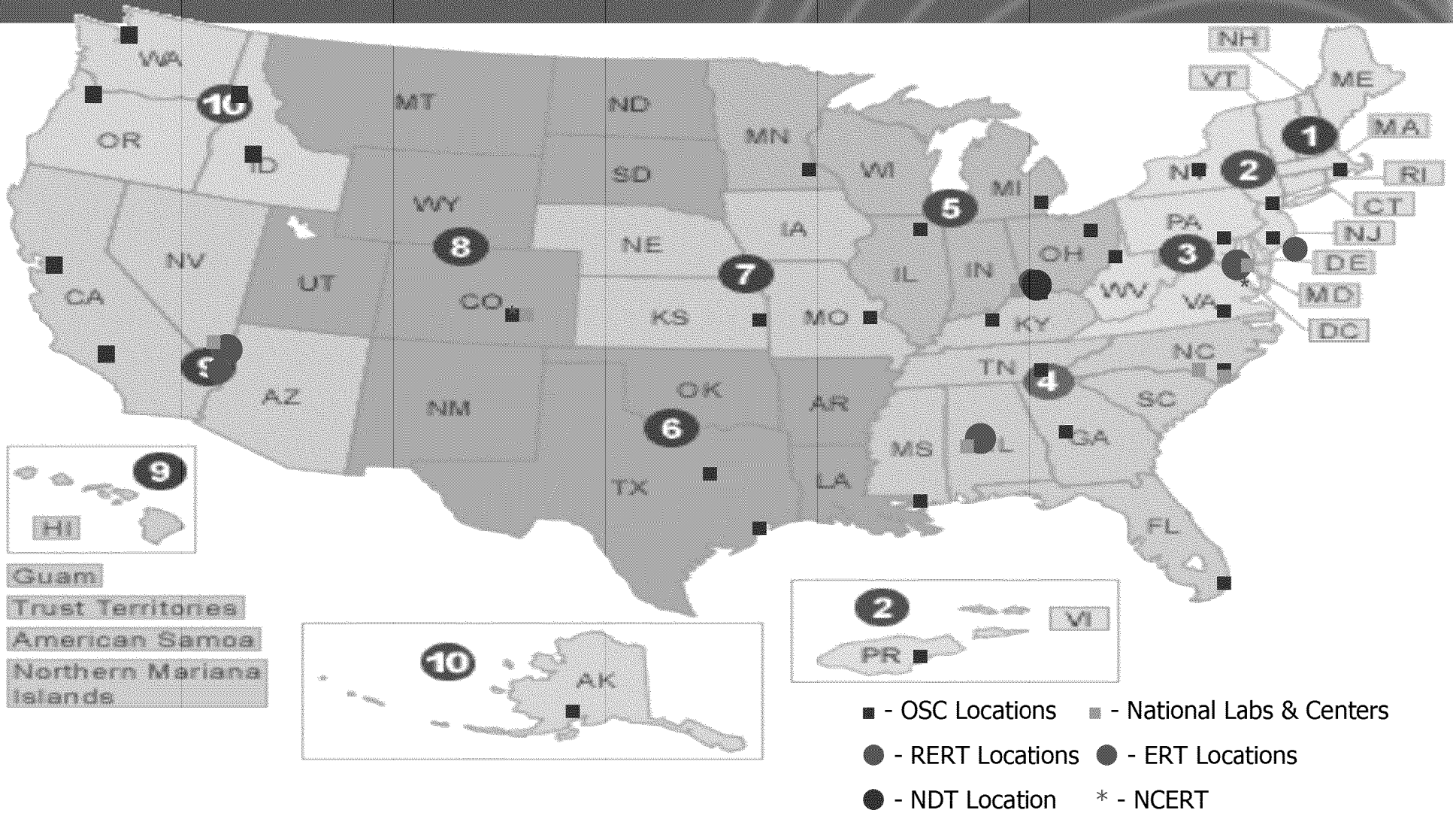
EPA Response Assets



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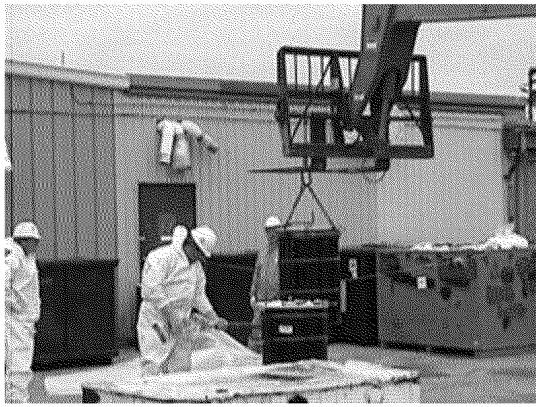
EPA On-Scene Coordinators (OSCs)

- Coordinate all Federal HAZMAT response efforts & resources
- Direct, coordinate, and provide technical assistance to all response efforts at an incident or site
- Bring full authority of the NCP
- Can call upon EPA's Special Teams:
  - NCERT
  - ERT
  - NDT
  - RERT



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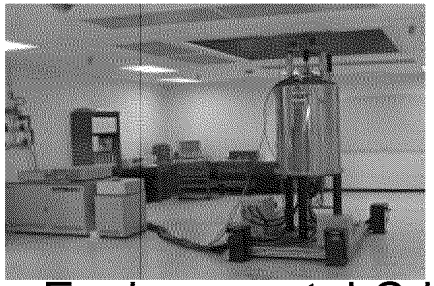
EPA's Role in Threat Response and Incident Assessment

Law Enforcement/Forensic Support



Criminal Investigation Division

- Fully authorized law enforcement officers
- 235 special agents
- Memorandum of Understanding (MOU) with FBI for Environmental Crimes; WMD MOU in Draft

National Enforcement Investigations Center (NEIC)

- Chemical analytical capabilities
- Forensic and rapid public health assessments
- Accredited and nationally recognized in forensic environmental analysis

National Counter-terrorism Evidence Response Team

- High Hazard Evidence Recovery for Chemical, Biological, and Radiological Incidents
- Nationwide team of EPA Special Agents integrated with criminal investigative and science/field expertise and fixed lab support from NEIC

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Environmental Response Team (ERT)

- Provides experienced technical and logistical assistance in responding to environmental emergencies
  - Emergency response, site characterization and assessment, verification, cleanup, and disposal of radiologically contaminated wastes or release events
- Response capabilities include:
  - Air Monitoring
  - Alpha, Beta, Gamma, Neutron Detection and Quantification
  - Clean-Up Verification or Final Status Surveys (MARSSIM)
  - Contamination Containment
  - Disposal Option Determination
  - Environmental Monitoring and Sampling Design and Implementation
  - Isotopic Characterization
  - Decontamination

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National Decontamination Team (NDT)

- Technical resource for decontamination science to provide support for actions that contribute to the protection of human health, the environment, and national security
- Provides unique, immediate response capabilities to safely and effectively support decon activities related to chemical, biological, and radiological events
- Provides expertise in radiological, chemical, and biological decontamination (for buildings, transportation, agriculture, food, open space, etc.)
- Airborne Spectral Photometric Collection Technology (ASPECT) provides 24/7 emergency response chemical/radiological plume mapping capability

ASPECT

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Radiological Emergency Response Team (RERT)

- Provide guidance & on-scene assistance at Superfund and ER sites to OSCs and in the FRMAC
- Field-Deployable RERT:
  - Focus is on identifying and assessing potential impacts of low-level contamination
  - Field monitoring instruments and sample collection equipment
  - Mobile laboratories and capabilities
- Two “fixed” laboratories capable of providing comprehensive environmental analytical services

Improvise, Adapt, And Carry On!

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A New Name

RADNET

Tracking Environmental Radiation Nationwide

ED_001057_00009285

Detection and Monitoring

EPA is upgrading its air monitoring because air the most likely pathway of exposure following a terrorist incident

- Previously known as the Environmental Radiation Ambient Monitoring System (ERAMS)
- Nationwide, continuously operating environmental radiation monitoring system
  - Currently upgrading system to include both fixed and deployable components
  - Air monitoring will provide near real-time gamma spectroscopy & beta detection
  - Milk, precipitation, and drinking water also routinely monitored
- Helps decision-makers estimate the effects of radioactive releases on human health and the environment
- Developing system to meet data quality objectives based on response timeline

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RadNet Provides:

- Baseline for comparison in the event of an emergency
- Data on plume size and direction, degree and extent of contamination
- Basis of determining ongoing health and safety guidelines

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RadNet Will Not Provide:

- Monitor nuclear facilities
- Provide an early warning system for nuclear accidents
- Provide a means to monitor in the immediate locality of the incident

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Expansion of Air Monitoring

Up to 180 new fixed monitors

40 new “deployables”

More detailed and timely data

- Track national/regional ambient radiation levels
- Identify the degree and extent of contamination in the event of an emergency

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Enhanced Fixed Air Monitoring

Near real-time capability to send data automatically to the National Air & Radiation Environmental Lab (NAREL)

Improved instrumentation for operators to monitor quickly for alpha and beta radiation

Increase in number of fixed monitors will provide

- 70% population coverage (about 180 cities/sites)
- Approximately 100% geographic coverage

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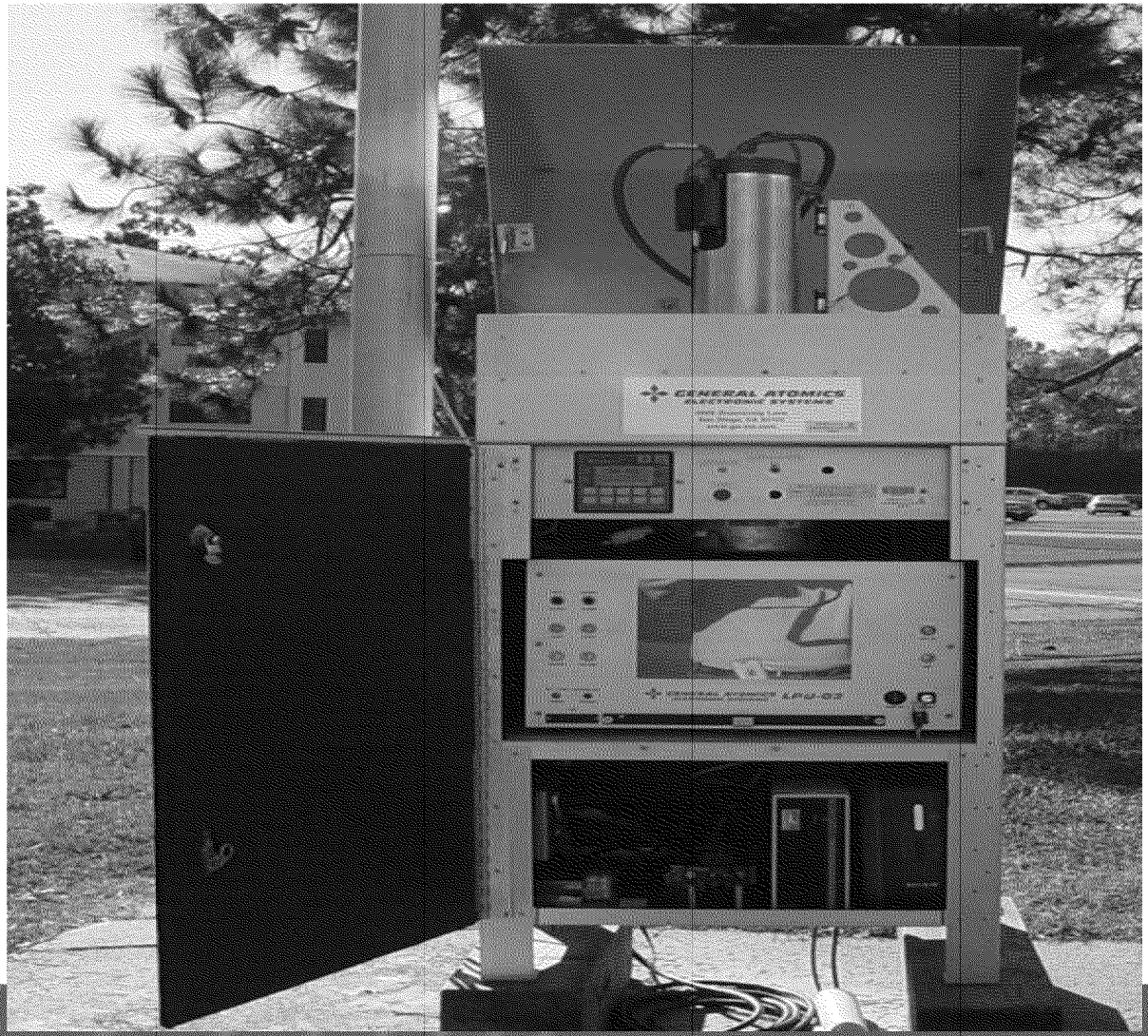
Fixed Monitor



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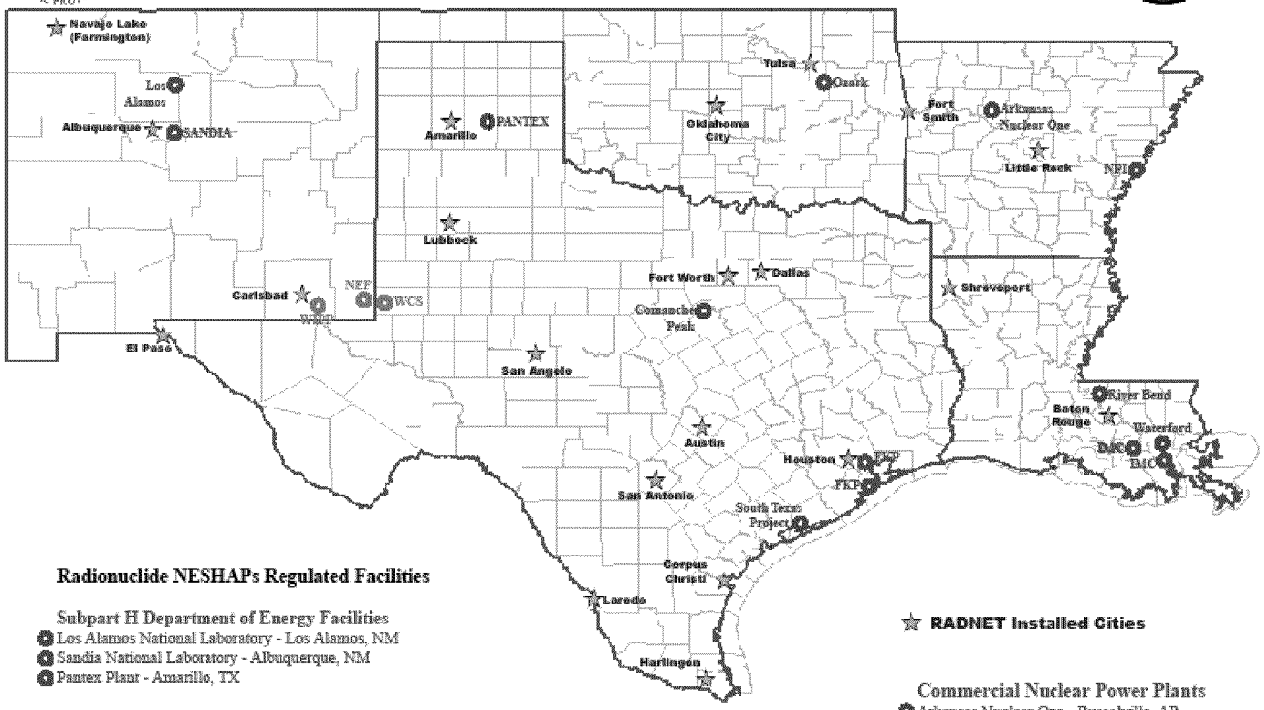
Region 6 Radiation Sites and Facilities

With RADNET Installed Cities



Radionuclide NESHAPs Regulated Facilities

Subpart H Department of Energy Facilities

- Los Alamos National Laboratory - Los Alamos, NM
- Sandia National Laboratory - Albuquerque, NM
- Pantex Plant - Amarillo, TX

Subpart R Phosphogypsum Facilities

- FKP Facility - Pasadena, TX
- IMC-Agrico Facilities - Uncle Sam, LA
- NPI Facility - West Helena, AR
- Ozark Manhoning - Tulsa, OK

- Waste Control Specialists
- Waste Isolation Pilot Plant
- National Enrichment Facility

☆ **RADNET Installed Cities**

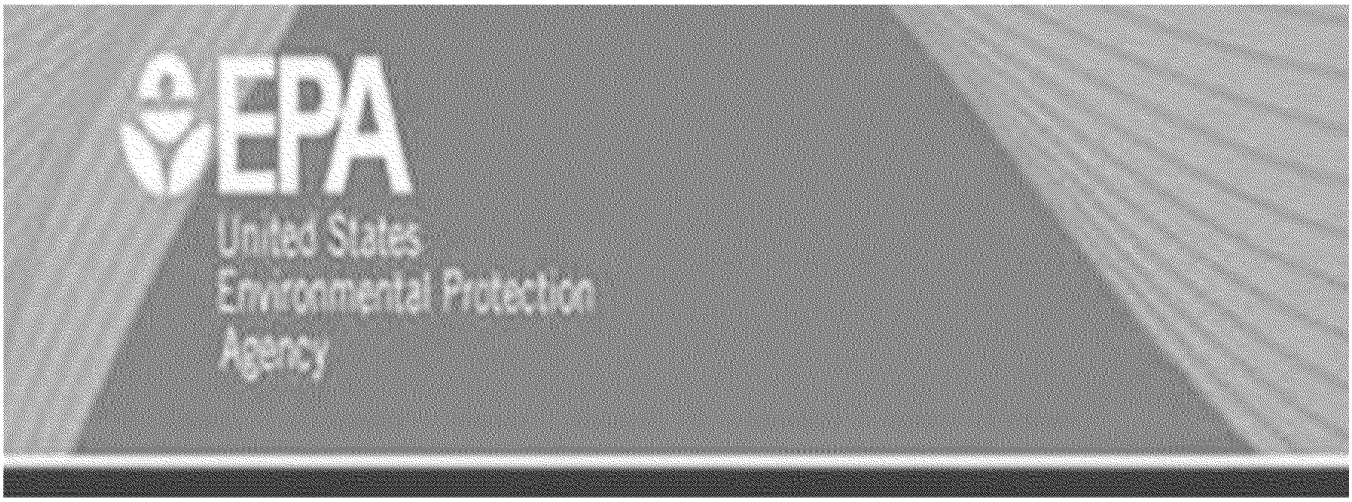
Commercial Nuclear Power Plants

- Arkansas Nuclear One - Russelville, AR
- Comanche Peak - Glenburne, TX
- South Texas Project - Bay City, TX
- River Bend - West Feliciana, LA
- Waterford - St Charles, LA

Questions?

ED_001057_00009285

To: Giardina, Paul[Giardina.Paul@epa.gov]; Jackson, Scott[Jackson.Scott@epa.gov]; Esher, Diana[Esher.Diana@epa.gov]; Ferguson, Rafaela[Ferguson.Rafaela@epa.gov]; Stewart, Gretchen[Stewart.Gretchen@epa.gov]; McCabe, Janet[McCabe.Janet@epa.gov]; Millett, John[Millett.John@epa.gov]; Goffman, Joseph[Goffman.Joseph@epa.gov]; Flynn, Mike[Flynn.Mike@epa.gov]; Shaw, Betsy[Shaw.Betsy@epa.gov]; Dye, Robert[Dye.Robert@epa.gov]; Febbo, carol[febbo.carol@epa.gov]; BANDROWSKI, MIKE[Bandrowski.Mike@epa.gov]; Zhen, Davis[Zhen.Davis@epa.gov]; Tyson, MaryPat[tyson.marypat@epa.gov]; Perry, Stuart[Perry.Stuart@epa.gov]; McDonnell, Ida[McDonnell.Ida@epa.gov]; Snowbarger, Robert[Snowbarger.Robert@epa.gov]; Jencius, Michele[jencius.michele@epa.gov]
Cc: Murphy, Stacy[Murphy.Stacy@epa.gov]; Szabo, Stephen[Szabo.Stephen@epa.gov]; Schiller, Ron[Schiller.Ron@epa.gov]; Rosenblum, Shelly (Separated 9/30/15)[Rosenblum.Shelly@epa.gov]; Moyer, Michelle[moyer.michelle@epa.gov]; LeSane, Heidi[Lesane.Heidi@epa.gov]; Berry, Mark[Berry.Mark@epa.gov]; Mollsen, Helen[mollsen.helen@epa.gov]; Barnette, Jack[Barnette.Jack@epa.gov]; Grier, Gina[Grier.Gina@epa.gov]; Paguia, Monica[paguia.monica@epa.gov]; Mitchell, Ken[Mitchell.Ken@epa.gov]; Banister, Beverly[Banister.Beverly@epa.gov]; Arnold, David[arnold.david@epa.gov]; McTigue, Erin[McTigue.Erin@epa.gov]; Eagles, Tom[Eagles.Tom@epa.gov]; Childers, Pat[Childers.Pat@epa.gov]; Huang, Cindy[Huang.Cindy@epa.gov]; Melanson, Kate[Melanson.Kate@epa.gov]; Jablonowski, Eugene[jablonowski.eugene@epa.gov]; Burke, Dan[Burke.Dan@epa.gov]; Benoit, Eugene[benoit.eugene@epa.gov]; Smuts, MaryBeth[Smuts.Marybeth@epa.gov]; Julien, Rhona[julien.rhona@epa.gov]; Debonis, Michael[Debonis.Michael@epa.gov]; Koehler, Larainne[Koehler.Larainne@epa.gov]; Mehta-Sampath, Ameesha[Mehta-Sampath.Ameesha@epa.gov]; Schulingkamp, Cristina[schulingkamp.cristina@epa.gov]; Bolden, Janice[Bolden.Janice@epa.gov]; Slack, Henry[Slack.Henry@epa.gov]; Blakely, Lashon[Blakely.Lashon@epa.gov]; Batka, Sheila[Batka.Sheila@epa.gov]; Marrero, Jeanette[Marrero.Jeanette@epa.gov]; Bright, Fayette[Bright.Fayette@epa.gov]; Aquino, Marcos[Aquino.Marcos@epa.gov]; Barry, Michael[Barry.Michael@epa.gov]; Brozowski, George[brozowski.george@epa.gov]; Button, Rich[Button.Rick@epa.gov]; Generette, Lloyd[Generette.Lloyd@epa.gov]; Giardina, Paul[Giardina.Paul@epa.gov]; Honnellio, Anthony[Honnellio.Anthony@epa.gov]; Hooper, Charles A.[Hooper.CharlesA@epa.gov]; Knutson, Lingard[Knutson.Lingard@epa.gov]; Povetko, Oleg[Povetko.Oleg@epa.gov]; Richards, Jon M.[Richards.Jon@epa.gov]; Schulingkamp, Cristina[schulingkamp.cristina@epa.gov]; Terry, Robert[Terry.Robert@epa.gov]; Mahler, Tom[mahler.tom@epa.gov]; Wagner, Christine[Wagner.Christine@epa.gov]; Waldon, MARGARET[Waldon.Margaret@epa.gov]; Wood, Periann (Separated)[Wood.Periann@epa.gov]; Wilson, Wenona[Wilson.Wenona@epa.gov]; Knapp, Kristien[Knapp.Kristien@epa.gov]; Wortman, Eric[Wortman.Eric@epa.gov]; Pathak, Priyanka[Pathak.Priyanka@epa.gov]; Stewart, Lori[Stewart.Lori@epa.gov]; Murphy, Michael[murphy.michael@epa.gov]; Hulting, Melissa[hulting.melissa@epa.gov]; Jones, Marlene[Jones.Marlene@epa.gov]; Fuoco, Marta[fuoco.marta@epa.gov]; Paguia, Monica[paguia.monica@epa.gov]; Worley, Gregg[Worley.Gregg@epa.gov]; Davis, Amber[Davis.Amber@epa.gov]; Cooper, Artra[Cooper.Artra@epa.gov]; Woodruff, Kevin[Woodruff.KevinL@epa.gov]; Jay, Michael[Jay.Michael@epa.gov]; Algoe-Eakin, Amy[Algoe-Eakin.Amy@epa.gov]
From: White, Rick
Sent: Thur 10/22/2015 9:02:12 PM
Subject: ORIA Weekly - The Week ending October 23, 2015
ORIA Weekly October 23, 2015.docx



ORIA Weekly–October 23, 2015

ORIA Events that recently took place

•□□□□□□ OAR Acting Asst. Administrator, Janet McCabe along with Dave Rowson and Sheila Brown from IED gave presentations to indoor air program directors during the recent Environmental Law Institute (ELI) Indoor Air Quality Workshop for (IAQ) Officials in Washington, DC. (above)

•□□□□□□ ORIA participated in the National Radon Action Plan Leadership Committee Meeting

•□□□□□□ IED's Curreri and Enger participated in Council of Educational Facility Planners International Conference

•□□□□□□ IED's Curreri presented at the Assn. of School Business Officials

International Conference

- **RPD's Schultheisz Presented to the Nuclear Waste Technical Review Board**

- **Schultheisz from RPD Participated in Low-Level Radioactive Waste Forum**

- **Tribal Air Monitoring Support Center (TAMS) Hosted Training Course**

RadNet Report for the Week of October 12, 2015

Overall monitor operational percentage was 90.5%. This is above the operational goal of 80%.

ORIA Upcoming Events (as of October 23rd)

Radiation Protection and Emergency Response

-

- **RPD's Schultheisz Teams With ORD at Association of State and Territorial Solid Waste Officials (ASTSWMO) Meeting**: On October 29, 2015 in Bethesda, MD, Dan Schultheisz of RPD and Paul Lemieux of ORD's National Homeland Security Research Center will present a session on managing waste from radiological incidents on October 29 at the annual meeting of the Association of State and Territorial Solid Waste Management Officials (ASTSWMO. Dan will discuss policy and planning issues involved in identifying appropriate management options. Paul will describe and demonstrate two decision support tools, the Waste Estimation Support Tool (WEST) and the Incident Waste Assessment and Tonnage Estimator (I-WASTE).

•□□□□□□ **RPD's DeCair to Present at US. Nuclear Regulatory Commission (NRC) State Liaison Officers Meeting:** On Oct. 28th, Sara DeCair from RPD will give an update on the 2013 Interim Use Protective Action Guides (PAGs) Manual and progress to date on finalizing the PAGs for the NRC's State Liaison Officers annual meeting.

•□□□□□□ **DeCair from RPD to represent EPA at Operational Guidelines Manual Webinar**: On Oct. 29th, RPD's DeCair will represent EPA on a steering group webinar focusing on updates made to the software that implements DOE's Operational Guidelines Manual. (That software is referred to as RESRAD-RDD). Nuclides have been added for use in an Improvised Nuclear Device (IND) scenario, and the Manual has been revised and updated since its issuance in 2009. Operational Guidelines are used for Reentry and Return decisions after a radiation incident.

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-

Indoor Air Quality

•□□□□□□ **IED's Scanlon to Participate in ASTM Committee Meeting:** On October 28-

30 in Tampa, Florida, Kelly Scanlon from the Indoor Environments Division (IED) will participate in the American Society for Testing and Materials (ASTM) International Committee E60 on Sustainability during the upcoming Committee Week meetings. The E60 Committee develops standards related to sustainability of buildings and construction. The consensus-based organization members will review and discuss working documents and proposed revisions resulting from balloting processes. Topics to be discussed include product transparency and whole building life cycle assessment. Kelly is an American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellow.

To see past archived versions of the ORIA weekly, click on this link:

https://javaintranet.epa.gov/ORIA/pageview.do?page_id=2242

Rick White

Office of Radiation and Indoor Air

Environmental Protection Agency

1200 Pennsylvania Ave., NW

Washington DC, 20460

Mail Code: 6609T

202-343-9335

ORIA UPCOMING EVENTS (as of October 23rd)

14th)

Office of Radiation and Indoor Air (ORIA)

ORIA Weekly–October 23, 2015

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Rick White
Office of Radiation and Indoor Air
Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington DC, 20460
Mail Code: 6609T
202-343-9335

To: DeCair, Sara[DeCair.Sara@epa.gov]; Martin, Jeffrey[Martin.Jeffrey@epa.gov]
From: Miller, Beth
Sent: Thur 10/22/2015 1:43:15 PM
Subject: RE: PAGs work with Endyna: Option Exercise

Hi Sara,

Yes a PR was done and has been released. It was assigned to Jeffrey Martin as of 6/10.

Rayna Brown	Jeffrey Martin	EAS Inbox/Martin.Jeffrey@epa.gov	06/10/2015 05:09 PM

Please consider the environment before printing this e-mail.

Beth Miller

202-343-9223

From: DeCair, Sara
Sent: Thursday, October 22, 2015 9:30 AM
To: Martin, Jeffrey <Martin.Jeffrey@epa.gov>
Cc: Miller, Beth <Miller.Beth@epa.gov>
Subject: PAGs work with Endyna: Option Exercise

Jeff, thanks for making this easy for me.

(1) Funds are indeed available. We put a PR for $32,000 in EAS in June. Beth can confirm whether that still sits there, or if we need to re-do it.

(2) The needed work is described here, and meets up with the SOW:

Continued contract support to move our drinking water portion of this guidance toward public review is a top priority in the Office of Radiation and Indoor Air, with the longer term goal of issuing a complete, finalized PAG Manual in 2016. It is important that we fund the next option period (3) as soon as possible to continue our progress.

The purpose of this project is to support completion of a new addition to the EPA PAG Manual on drinking water, assist with the interagency and public comment processes, and management of the public comment docket. In preparation for the public comment period, the drinking water proposal must be formatted, reviewed and edited, and interagency comments must be incorporated. The Manual must meet EPA publication and style standards. Contractor will support the public comment process by managing the www.regulations.gov docket and facilitate meetings during the comment adjudication process. Finalization of the Manual will include several rounds of technical review and revisions, completion of a response to comments and final formatting to publish a quality Manual.

(3) Exercising the Option best meets the Government need and is the most effective and efficient use of funds because of these factors:

Endyna, Inc. has unique experience over several years working on controversial technical policy issues within the PAG Manual such that the learning curve necessary for a new contractor to properly support this work would cause unacceptable delays during this period of heightened urgency (Jan. 2016 to Dec. 2017).

There is heightened urgency regarding this project now. Agency leadership, including Gina McCarthy, have made it a priority to publish this new drinking water guidance prior to the

impending change in Administration, requiring prompt action between Jan. 2016 and Dec. 2017.

(4) The contractor, Endyna Inc., has always provided excellent service on this project. Their past performance has all been very highly rated. Additionally, their work on other projects in my office and in OSWER has been highly praised and a good value for the Agency.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

From: Martin, Jeffrey
Sent: Wednesday, October 21, 2015 10:29 AM
To: DeCair, Sara <DeCair.Sara@epa.gov>
Subject: Option Exercise

Hi Sara,

Can you address the following points in your memorandum:

(1) Funds are available;

(2) The requirement covered by the option fulfills an existing Government need;

(3) The exercise of the option is the most advantageous method of fulfilling the Government's need, price and other factors (see paragraphs (d) and (e) of this section) considered; [do your best here!]

(6) The contractor's performance evaluations have been considered; and the contractor's performance on this contract has been acceptable, e.g., received satisfactory ratings.

Thanks,

Jeff Martin

Contract Specialist

EPA/OAM/HPOD/OAR Team

martin.jeffrey@epa.gov

202-564-3268

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Cherepy, Andrea
Sent: Wed 10/21/2015 9:07:17 PM
Subject: RE: FR Notice and Drinking Water PAG proposal for Janet

Thank you, Sara. Debbie handed me the hardcopies, too.

Andrea

From: DeCair, Sara
Sent: Wednesday, October 21, 2015 4:36 PM
To: Cherepy, Andrea <Cherepy.Andrea@epa.gov>
Cc: Veal, Lee <Veal.Lee@epa.gov>; Perrin, Alan <Perrin.Alan@epa.gov>
Subject: FR Notice and Drinking Water PAG proposal for Janet

Andrea;

Sam Hernandez incorporated most of our suggestions on the FR Notice and Drinking Water PAG proposal, and clean versions are attached. He is also updating all the transmitting memos and accompanying documents per Phil's input and they are moving the FR package up through their management now. Updated files are on our OneDrive folder.

In response to Debbie's question about whether we have a mechanism for ensuring drinking water systems get back into compliance in a year, OW says yes, the regulations are always 'on' but they didn't feel an additional statement about the regs was needed. These are ready for Janet's review and I'm bringing you a hard copy of both items. Thank you!

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Perrin, Alan
Sent: Tue 10/20/2015 3:35:59 PM
Subject: FW: PAGs Manual
PAGs FR Notice drinking water PAG 10-2-2015 dj.docx
PAGS Redline proposal with 4 changes 10-2-2015 dj.docx

All looks fairly straightforward? Note on page 6 of FR there is another "…Protective Actions Guides…" – should change to …Protective Action Guides….

~~~~~~~~~~~~~~~

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
ofc (202) 343-9775 | mbl (202) 279-0376

From: Cherepy, Andrea
Sent: Monday, October 19, 2015 9:52 AM
To: Edwards, Jonathan; Perrin, Alan; Veal, Lee; DeCair, Sara
Cc: Flynn, Mike
Subject: FW: PAGs Manual

All,

Please see attached comments from Debbie on the FR notice and draft DW PAG.

Andrea

From: Jordan, Deborah
Sent: Sunday, October 18, 2015 9:49 PM
To: Cherepy, Andrea
Cc: Flynn, Mike
Subject: RE: PAGs Manual

Please find a few minor comments on the FR and the PAG manual. Thanks for the opportunity to review.
~~~~~~~~~~~~~~~

Debbie

From: Cherepy, Andrea
Sent: Tuesday, October 13, 2015 9:05 AM
To: Jordan, Deborah <Jordan.Deborah@epa.gov>
Cc: Flynn, Mike <Flynn.Mike@epa.gov>
Subject: RE: PAGs Manual

Debbie,

The attached files are meant to supplement the PAGS notebook that you received this morning. These files show the progression of edits (in redline) from our interactions with OSWER, plus their comment sets for us. Please let us know if you have any questions.

Andrea

Andrea Cherepy | Chief of Staff | Office of Radiation & Indoor Air | U.S. Environmental Protection Agency | Tel 202 343 9317 | cherepy.andrea@epa.gov

To: Veal, Lee[Veal.Lee@epa.gov]
Cc: Edwards, Jonathan[Edwards.Jonathan@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]; Perrin, Alan[Perrin.Alan@epa.gov]
From: Flynn, Mike
Sent: Wed 10/7/2015 8:03:52 PM
Subject: Re: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA

One final thought - I don't expect she'll have concerns but we just need to loop her in

Sent from my iPhone

On Oct 7, 2015, at 2:53 PM, Veal, Lee <Veal.Lee@epa.gov> wrote:

I'm chatting with Lisa at 4pm about process and the few tweaks. I think that we'll have agreement on those---pretty easy to do.

OW will sign, but perhaps we send concurrently and check in between ODs before anything is finalized? Would Janet mind that?

Lee Ann B. Veal

Director, Center for Radiological Emergency Management

Radiation Protection Division

Office of Radiation and Indoor Air

Office: 202-343-9448

Cell: 202-617-4322

www.epa.gov/radiation

From: Flynn, Mike
Sent: Wednesday, October 07, 2015 3:40 PM
To: Edwards, Jonathan
Cc: Veal, Lee; DeCair, Sara; Perrin, Alan
Subject: Fwd: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA

Keep in mind we will need to send up via OAR to get Janet's sign off on way to OP

Sent from my iPhone

Begin forwarded message:

From: "Christ, Lisa" <Christ.Lisa@epa.gov>
Date: October 7, 2015 at 12:36:03 PM CDT
To: "Grevatt, Peter" <Grevatt.Peter@epa.gov>, "Flynn, Mike" <Flynn.Mike@epa.gov>, "DeCair, Sara" <DeCair.Sara@epa.gov>
Cc: "Oshida, Phil" <Oshida.Phil@epa.gov>, "Edwards, Jonathan" <Edwards.Jonathan@epa.gov>
Subject: RE: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA

Peter and Mike –

We are coordinating to get the revisions made and the proposal to OP.

Lisa

From: Grevatt, Peter
Sent: Wednesday, October 07, 2015 12:57 PM
To: Flynn, Mike; DeCair, Sara; Christ, Lisa
Cc: Oshida, Phil; Edwards, Jonathan
Subject: RE: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA

Thanks Mike. Lisa and Sara, I wonder whether you can take a quick look at the suggestions that Mike and I have provided below. If there are minor additional changes we can make that would be helpful, I recommend that we do so, but none of the issues identified prevent us from going forward to the next step in our process and I recommend that we do so asap. Thanks again for all of your great work on this!

From: Flynn, Mike
Sent: Wednesday, October 07, 2015 12:49 PM
To: Grevatt, Peter
Subject: Re: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR

NODA

On travel....here's quick reaction -

1. Think our folks might be able to add a little language that might help here as you suggest but agree we are mostly there. Also, the sentence we didn't include that points out food and DW PAGs both factor in water from consumption and diet might help

2. Agree, easy thing to do

3. Not sure, but assume could soften language as you suggest

Suggest we have our folks quickly look at.

Mike

Sent from my iPhone

On Oct 7, 2015, at 11:26 AM, Grevatt, Peter <Grevatt.Peter@epa.gov> wrote:

> Regarding OSWER's 3 bullets:
>
> 1) I think we address this already in our discussion. Is there a way that we can be even more specific about the need to consider the use of each of the individual PAG sections depending on the specific conditions facing a community?
>
> 2) Not a big deal to me either way
>
> 3) Can we revise the language to say that the Agency has determined (or recognizes) that it may not be appropriate

Please let me know what you think.

From: Hostage, Barbara
Sent: Wednesday, October 07, 2015 11:00 AM
To: Grevatt, Peter; Flynn, Mike
Cc: Woolford, James; Cheatham, Reggie; Tulis, Dana
Subject: OSWER Comments on 10-02-2015 Revisions to DW PAG and FR NODA
Importance: High

Good morning, Peter & Mike.

The Office of Solid Waste and Emergency Response (OSWER) thanks both OW and ORIA for the opportunity to review the October 2, 2015 revision to the Drinking Water (DW) Protective Action Guide (PAG) and the October 2, 2015 Draft FR Notice of Document Availability (NODA). We have no show-stopper comments. As you know, one of OSWER's key concerns is the two-tiered approach, and we appreciate the request for comments on that proposed approach in the draft FR NODA. We also appreciate the footnote that you added to the revised DW PAG regarding the non-applicability of the guidance to actions under the Superfund program, as well as the revised title of the section discussing other agency standards. Finally, we appreciate that the revised DW PAG further explains how the Water PAG and Food PAG are complementary standards, and emergency managers should consider all routes of exposure during an emergency.

While we don't have any showstopper comments, we do offer the following observations for consideration by OW and ORIA:

- As noted, the additional text on the Food PAG is helpful. That said, we are still concerned that our fundamental questions have not been answered: Does the Water PAG consider cumulative risk? Is it safe for a person to be exposed to 500 mrem from food AND 500 mrem from water

at the same time during the intermediate phase? We believe that this question could be raised during the public comment period.

- As noted, we appreciate the title of the section discussing other standards was changed to NOT say "Rationale for the PAG." That said, we note that the standards discussed in the section are not "related" to the PAG. For example, the NRC regs are for normal operating licensed facilities. Perhaps a more appropriate titled would simply be "Other Standards."

- We have concerns that the following statement (page 5) might be used to challenge cost recovery for CERCLA removal actions because MCLs have been used in removals for many years: "*The Agency determined that it is not appropriate to base protective actions during short-term emergency incidents on lifetime exposure criteria. While the SDWA framework is appropriate for day-to-day normal operations, it does not provide the necessary tools to assist emergency responders with determining the need for an immediate protective action.*"

Lastly, we request continued OSWER involvement in both the proposed DW PAG and the final PAG Manual, as well as any implementation guidance that is developed in the future. OSWER Branch Chief representatives should be Paul Kudarauskas (OEM) and Mike Scozzafava (OSRTI).

Thank you again for the opportunity to participate in the development of these important Significant Guidance Documents. We look forward to continue a close working relationship with you as you move forward.

Barbara Hostage, Director

Policy Analysis and Regulatory Management Staff (PARMS)
Office of Program Management (OPM)
Office of Solid Waste and Emergency Response (OSWER)

EPA West Room 4130A
Phone Number: 202-566-1933

Fax Number: 202-566-1934
Mail Code: 5103T

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Romero, Carmen[Romero.Carmen@epa.gov]; Thornton, Marisa[Thornton.Marisa@epa.gov]
From: Shogren, Angela
Sent: Wed 10/7/2015 2:45:07 PM
Subject: Re: Odd name at top of my PAGs web page

I'll notify webcms for support. This is not normal behavior!

Angela Shogren
Public Affairs Specialist
Radiation Protection Division
U.S. Environmental Protection Agency Tel (202) 343-9761
Shogren.Angela@epa.gov

On Oct 7, 2015, at 10:40 AM, DeCair, Sara <DeCair.Sara@epa.gov> wrote:

> I just tried in IE, and it doesn't do it there. Only in Firefox! Weird… and only when I go to the PAG Manual… I asked EZ Tech for Chrome, but they gave me Firefox instead.
>
> Thanks for checking on it!
>
> **From:** Romero, Carmen
> **Sent:** Wednesday, October 07, 2015 10:34 AM
> **To:** DeCair, Sara; Thornton, Marisa; Shogren, Angela
> **Subject:** RE: Odd name at top of my PAGs web page
>
> Hi Sara,
>
> Please help us find the problem you found. I am not able to recreate it. I started out from this page - http://www2.epa.gov/radiation/pag-manuals-and-resources and then I clicked on the first bullet to get to the PAG manual.
>
> <image001.jpg>
>
> Below are 2 screenshots in different browsers of the PAG manual and I didn't get " AG Manua ".

IE Browser **Chrome Browser**

<image002.jpg> <image003.jpg>

From: DeCair, Sara
Sent: Tuesday, October 06, 2015 4:44 PM
To: Romero, Carmen; Thornton, Marisa
Subject: Odd name at top of my PAGs web page

See the top next to the EPA logo, where it says " AG Manua " ? It just seems odd, but maybe is just a truncated version of what the page name is. The other pages seem to at least start with the first letter. Am I being picky? ☺

<image004.png>

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

AG Manua - pag-manual-i... | Near-Real-Time and Labor... | Radiation Protection | US E... | About the National Center ...
www2.epa.gov/sites/production/files/2014-11/documents/pag-manual-interim-public-comment-4-2-2013.pdf
epa pags
Most Visited | Getting Started | A-Team - Members-In... | Web Slice Gallery
Page: 66 of 86 | Automatic Zoom

Function: The function of the stakeholder working group is to provide input to the IC/UC concerning local needs and desires for site recovery, proposed cleanup options and other recommendations. The group should present local goals for the use of the site, prioritizing current and future potential land uses and functions, such as utilities and infrastructure, light industrial, downtown business and residential land uses. The stakeholder working group would not be a decision-making body.

Makeup: The stakeholder working group should include selected federal, state and local representatives, local non-governmental representatives as well as local and regional business stakeholders. The exact selection and balance of stakeholders is incident specific.

f) Activities: Cleanup Planning and Recommendations

The IC/UC directs the management of the cleanup options analysis through the Planning Section. Technical and stakeholder working groups assist in performing analyses and developing cleanup options and provide input to the IC/UC and may be asked to participate in meetings with the JFO Unified Coordination Group. The IC/UC reviews cleanup options analysis and selects a proposed approach for site cleanup in close coordination with federal, state and local officials. Again, depending on the incident size, it may be necessary to conduct the cleanup in phases. Thus, decisions on cleanup approaches may also be made in phases. As appropriate for the magnitude of the cleanup task, the IC/UC would brief relevant federal, state and local government officials on proposed cleanup plans for approval. This may involve the office of the affected mayor and governor. At the federal level, it may involve the JFO Unified Coordination Group and higher-level officials.

g) Public Review of Decision

The IC/UC should work with the PIO and JIC to publish a summary of the process, the options analyzed and the recommendations for public comments. Public meetings should also be convened at appropriate times. Public comments should be considered and incorporated as appropriate. A reconvening of the stakeholder or technical working group may be useful for resolving particular issues.

h) Execution of Cleanup and Peer Review

Assuming a Presidential declaration of a major disaster or emergency, FEMA may issue mission

ED_001057_00009310

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Shogren, Angela
Sent: Mon 10/5/2015 4:34:28 PM
Subject: RE: Radiation Protection: Emergency Response Plans Email Subscriber List

Sara,

What about this list? If there is a way to email me this list, I will go ahead and add them. What format do you have it in?

Angela Shogren | Public Affairs Specialist | U.S. Environmental Protection Agency | Tel 202 343 9761 | shogren.angela@epa.gov

From: DeCair, Sara
Sent: Tuesday, September 22, 2015 10:52 AM
To: Shogren, Angela; Thornton, Marisa
Cc: Nesky, Anthony
Subject: Re: Radiation Protection: Emergency Response Plans Email Subscriber List

Yep, and combine lists for the Plans and ER subscribers. Thank you!

From: Shogren, Angela
Sent: Tuesday, September 22, 2015 10:51 AM
To: DeCair, Sara; Thornton, Marisa
Cc: Nesky, Anthony
Subject: RE: Radiation Protection: Emergency Response Plans Email Subscriber List

Great, sounds like a plan. Just to be clear, you would like the signup graphic (below) on this page: http://www2.epa.gov/radiation/radiological-emergency-response for the Radiological Emergency Response list?

And for PAGs, this page: http://www2.epa.gov/radiation/protective-action-guides-pags?

Get email updates when this information changes.

Enter email address sign up

Angela Shogren | Public Affairs Specialist | U.S. Environmental Protection Agency | Tel 202 343 9761 | shogren.angela@epa.gov

From: DeCair, Sara
Sent: Tuesday, September 22, 2015 10:43 AM
To: Shogren, Angela; Thornton, Marisa
Cc: Nesky, Anthony
Subject: Re: Radiation Protection: Emergency Response Plans Email Subscriber List

That's a good point -- I bet they are very much the same email addresses, so let's do that - tell them they're being added due to related content and keep only the PAGs one separate.

I'll get you the Lotus Notes email list next Wednesday. Thank you!

From: Shogren, Angela
Sent: Tuesday, September 22, 2015 10:40 AM
To: DeCair, Sara; Thornton, Marisa
Cc: Nesky, Anthony
Subject: RE: Radiation Protection: Emergency Response Plans Email Subscriber List

One more thing, Sara…

You currently have three lists (stats below):

1 Radiological Emergency Response (25,303 subscribers) – from http://www.epa.gov/radiation/rert/index.html

2 Protective Action Guides (28,088 subscribers) – from http://www.epa.gov/radiation/rert/pags.html

3 Emergency Response Plans (28,622 subscribers) – from http://www.epa.gov/radiation/rert/plans.html

Do you want to keep all of them? Or just a PAGs list and a Radiological Emergency Response list? If you'd like we can email the subscribers of list #3 (Emergency Response Plans) and tell them that they have been added list #2 (Radiological Emergency Response)? Or, we can just redirect them to the homepage – or any other page – on the new radiation website. What are your thoughts?

Thanks,

Angela Shogren | Public Affairs Specialist | U.S. Environmental Protection Agency | Tel 202 343 9761 | shogren.angela@epa.gov

From: DeCair, Sara
Sent: Tuesday, September 22, 2015 9:17 AM
To: Thornton, Marisa
Cc: Shogren, Angela; Nesky, Anthony
Subject: Re: Radiation Protection: Emergency Response Plans Email Subscriber List

This is great and I'm glad we can continue it! I would love for the new link to be established with the old list, too.

I told Tony I have an old email list I generated with Lotus Notes years ago, so when I'm in the office can we merge it in with this one? Not sure how that works -- but they were about 400 email addresses I collected when I was out giving presentations and people asked me to keep them updated. In fact, I may have provided that old list to your system a few years ago but I honestly can't remember.

Thank you!

Sara

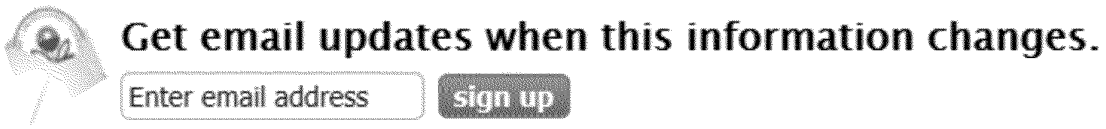
From: Thornton, Marisa
Sent: Tuesday, September 22, 2015 9:02 AM
To: DeCair, Sara
Cc: Shogren, Angela; Nesky, Anthony
Subject: Radiation Protection: Emergency Response Plans Email Subscriber List

Sara,

As part of our new website launch, we are looking to update our GovDelivery email subscription lists. You have been identified as the owner of a mailing list that was previously linked to http://www.epa.gov/radiation/rert/plans.html, which no longer exists. This mailing list has 28,622 subscribers.

Would you like to add a subscriber link (see image below) to this page http://www2.epa.gov/radiation/radiological-emergency-response-planning-and-past-responses, or another page on the new website? Or, would you like to retire this subscription list altogether?

Sample Subscriber Link



Please feel free to contact Angela or myself if you have any questions.

Marisa

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Perrin, Alan[Perrin.Alan@epa.gov]; Edwards, Jonathan[Edwards.Jonathan@epa.gov]
From: Flynn, Mike
Sent: Sat 10/3/2015 2:17:26 PM
Subject: Re: Edited drinking water PAG documents

I had wanted to include this sentence because I think this is a key point of confusion, but I gather Peter decided not to include.

Sent from my iPhone

On Oct 2, 2015, at 4:14 PM, DeCair, Sara <DeCair.Sara@epa.gov> wrote:

> Mike and Peter,
>
> We took out the sentence below that we heard maybe should be cut -- or maybe should be kept. We think it'd be easier to cut it but if not, it should have a few edits for better clarity. If you want it back in, just let me know. See what you think of the four attachments for sending to OSWER. Thank you!
>
> The FDA food PAG includes the mass of water consumed and EPA's proposed ~~drinking water~~ PAG accounts for drinking water, including ~~water consumed and from~~ water added to foods during preparation.
>
> Sara D. DeCair
>
> http://www.epa.gov/radiation/rert/pags.html
>
> 202-343-9108
>
> Room 1416 B in WJC West
>
> <OGWDW-ORIA response to OSWER comments 10-2-2015.docx>
>
> <Redline proposal with 4 changes 10-2-2015.docx>
>
> <FR Notice drinking water PAG 10-2-2015.docx>

<Timeline for PAG Manual 10-2-2015.docx>

To: Perrin, Alan[Perrin.Alan@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Flynn, Mike
Sent: Fri 10/2/2015 2:23:22 PM
Subject: please look at attached
food and DW pag.docx

Revised language on the food/DW relationship. I still find the language in the draft unclear. I may this all wrong so please revise/markup as needed.

Mike Flynn, Director

Office of Radiation & Indoor Air

U.S. EPA

202-343-9356

Taken together, the FDA food PAG and proposed EPA drinking water PAGs complement each other, and both account for doses from eating and drinking. The food ingestion and drinking water pathways are inherently related because water may be used in the preparation of some food products and radionuclides in water may affect crops and ultimately enter the food supply. As a result, the FDA food PAG includes the mass of water consumed and EPA's proposed drinking water PAG accounts for water consumed and from water added to foods during preparation. PAGs for food and drinking watering are needed because a radiological incident may affect the entire food supply or only target drinking water and, while FDA and EPA work closely together in a radiological response, FDA and EPA's authorities are separate and different strategies may be needed to protect drinking water supplies versus the food supply. While there are some technical differences in how FDA and EPA PAGs are derived (e.g., EPA's drinking water PAG is based on newer definitions of dosimetry), both PAGs assure that individuals will have no significant health risk from ingesting radioactive contamination.

Should a major radiological event occur, emergency response officials must consider potential doses from all affected pathways (e.g., drinking water, food, airborne plume) when making protective action decisions. In this case, response officials would conduct detailed risk assessments to account for all pathways, and make appropriate adjustments to the ……

To: Nesky, Anthony[Nesky.Tony@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Wieder, Jessica
Sent: Thur 8/6/2015 4:42:19 PM
Subject: Re: Need you to check a response to a public inquiry on the PAGs

Tony, I don't see the draft.
Jess

Jessica Wieder
U.S. Environmental Protection Agency
Radiation Protection Program
202-343-9201
m: 202-420-9353

Sent from my iPhone

On Aug 6, 2015, at 11:36 AM, Nesky, Anthony <Nesky.Tony@epa.gov> wrote:

> Dear Jess and Sara:
>
> We got a public inquiry on the PAGs. Could you please check my draft response. Today is my last day in the office until August 17, so if you could get back to me today, I'd appreciate it.
>
> Tony Nesky
>
> Center for Radiation Information and Outreach
>
> Tel: 202-343-9597
>
> nesky.tony@epa.gov

To: Perrin, Alan[Perrin.Alan@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Edwards, Jonathan
Sent: Sat 7/25/2015 4:12:55 PM
Subject: Fwd: Peter?

FYI

Sent from my iPhone

Begin forwarded message:

From: "Flynn, Mike" <Flynn.Mike@epa.gov>
Date: July 25, 2015 at 8:49:11 AM EDT
To: "Edwards, Jonathan" <Edwards.Jonathan@epa.gov>
Subject: Re: Peter?

Didn't connect with Peter yet but got a good sense of where things stand in OSWER from Dana - the OSWER IO is preparing consolidated comments. Will get to Peter early next week.

Sent from my iPhone

On Jul 24, 2015, at 5:26 PM, Edwards, Jonathan <Edwards.Jonathan@epa.gov> wrote:

Hey Mike -- I know you've been incredibly busy and traveling to boot but I was wondering if you ever connected in with Peter Gravatt on the OSWER drinking water PAGs review delays? --Jon

To: DeCair, Sara[DeCair.Sara@epa.gov]; EOC Air[EOC_Air@epa.gov]
From: Tingley, Kevin
Sent: Wed 7/22/2015 5:32:49 PM
Subject: Fw: Southern Exposure Exercise - EPA HQ EOC Water Desk Activated

EXERCISE EXERCISE EXERCISE

Hi Sara,

Kathryn recommended I check with you on something...

What do you think we should use for recommended action levels (for raw and finished drinking water) for the radionuclines of interest (Cs-134, Cs-137, Sr-90, and I-131)?

We are trying to determine if there are any issues at drinking water treatment plants.

I know the Water PAGs are not final - but we would need to use something if this were to happen today - what would we do?

Please let me know if you would like to discuss.

Thanks,

-Kevin Tingley

EPA HQ EOC Water Desk

From: Berry, Chuck
Sent: Wednesday, July 22, 2015 1:21 PM
To: EOC Water
Subject: Re: Southern Exposure Exercise - EPA HQ EOC Water Desk Activated

what kind of analyses do you recommend?

Chuck Berry

On-Scene Coordinator

US Environmental Protection Agency

61 Forsyth Street, 11th Floor

Atlanta, GA 30303

404.562.8278 (Office)

404.859.0970 (Cell)

berry.chuck@epa.gov

From: Tingley, Kevin on behalf of EOC Water
Sent: Wednesday, July 22, 2015 11:41
To: Berry, Chuck; Stilman, Terry
Cc: EOC Planning
Subject: Re: Southern Exposure Exercise - EPA HQ EOC Water Desk Activated

EXERCISE EXERCISE EXERCISE

Chuck,

I will pull together recommendations for you within the timeframe you requested.

In the mean time, we have a few questions regarding the situation in South Carolina:

1. **Which DW/WW facilities are impacted? Do you have information on operating status and population served?**
2. **Worker safety – is water safe to sample; if not what are PPE requirements? Who will sample – plant staff, OSCs, others?**
3. **Sampling procedures – what RAD contaminants ae being analyzed for?**
4. **Laboratory support – are there laboratories available to analyze all samples?**
5. **Results – what is the turn-around time for RAD samples?**

It would be very helpful to have whatever information you have by 1400 today so that the information can be added to the EOC Management Report.

Please let me know if you would like to discuss.

Thanks,

-Kevin Tingley

EPA HQ EOC Water Desk

202-250-8920

From: Berry, Chuck
Sent: Wednesday, July 22, 2015 10:45 AM
To: Stilman, Terry; EOC Water
Subject: Re: Southern Exposure Exercise - EPA HQ EOC Water Desk Activated

Kevin:

thanks for helping out.

What we need is a bulleted list of recommendations for drinking water and WWTP plants.

specifically:

- Assessment methodology (pre-post processing, I assume)
- management/action levels to use
- consequences for values above those level to include suggested remediation methodology (flushing?)

can this be ready by 1400 or earlier?

Thanks for the help.

Chuck Berry

On-Scene Coordinator

US Environmental Protection Agency

61 Forsyth Street, 11th Floor

Atlanta, GA 30303

404.562.8278 (Office)

404.859.0970 (Cell)

berry.chuck@epa.gov

From: Stilman, Terry
Sent: Wednesday, July 22, 2015 09:36
To: EOC Water
Cc: Berry, Chuck
Subject: Re: Southern Exposure Exercise - EPA HQ EOC Water Desk Activated

For the exercise, chuck berry is your POC. He will work water issues with you.

Terry Stilman
Federal On-Scene Coordinator
U. S. Environmental Protection Agency
Sent from my iPhone

On Jul 22, 2015, at 09:30, EOC Water <EOC_Water@epa.gov> wrote:

> EXERCISE EXERCSISE EXERCISE
>
> Terry,
>
> This is to inform you that the EPA HQ EOC Water Desk has been activated. If you have any information on the Radiological Spill incident in South Carolina related to water or wastewater infrastructure, please send it to me.
>
> If another individual in R4 has been tasked with water issues, please let me know who that is.
>
> My desk number is 202-250-8920.

Please confirm receipt of this e-mail.

Thanks,

-Kevin Tingley

EPA HQ EOC Water Desk

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Wieder, Jessica
Sent: Mon 7/13/2015 8:05:04 PM
Subject: NCRP Edits
Decair NCRP 2015 jw.docx

I am so sorry that this took me so long. Attached are my suggestions and a few, minor clarifying questions.

Jess

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

Good morning!
The following are the questions submitted after the your session at the 2015 NCRP Annual Meeting. Because of time restrictions the questions highlighted in yellow were not presented during the meeting. Please review all the questions/answers and respond to the unanswered questions by June 26.
Thank you

Q: Are there any initiatives to educate the public so that the civilian population will not respond with hysteria, fear and uncontrolled panic at the mention of the word "radiation"?
DeCair: With so much information publically available, it is incredibly difficult to get the public to learn about radiation before they become concerned. To reach to children, we have developed EPA's RadTown website and associated radiation education activities for middle and high school students. You can find that information at www.epa.gov/radtown. For the rest of the population, we need to focus on "teachable moments." We are in the process of redesigning EPA's radiation website with a focus on our stakeholders, their questions and presenting the material in plain language to best address their concerns.

Q: Why is it necessary to implement ICRP guidance according to the sequence of ICRP publications if the PAGs [Protective Action Guides] are already more than one iteration behind? Can't you skip to the latest version?
DeCair: It may seem more efficient to jump directly to implementing ICRP 103 recommendations, but there are already so many inter-related radiation protection programs hard at work incorporating age-specific dose coefficients from ICRP 60. We see that as a step in the right direction because age specificity will be here to stay when we evaluate how to implement ICRP 103 recommendations in the near future.

Q: How are the PAGs [Protective Action Guides] applied to nonfood crops?
DeCair: That's a great question that's being discussed currently by a Federal Radiological Monitoring and Assessment Center Assessment working group. The Advisory Team for Environment, Food and Health has been considering this question in preparation for the upcoming South Carolina nuclear power plant exercise, Southern Exposure. Tobacco use, for example, puts a crimp in the usual dose assessment methods that we have for food PAGs. Is it a food? Well, I guess if you chew it. The Advisory Team for Environment, Food and Health is made up of expertise from USDA, FDA, CDC and EPA. Together we will provide some guidance on those special questions that are outside of the 'norm' and we will undoubtedly work on this issue more in the future.

Q: FRMAC [Federal Radiological Monitoring and Assessment Center] assumes a 24 h / 7 d outside exposure — that does not seem realistic. Wouldn't making realistic assumptions about the population have more impact than any age specific dose calculations?
DeCair: I can defer this one to Ed Tupin who's in the audience too. Assuming people are continually outdoors is a worse case assumption. I think we stick with it partly because at some point people may be evacuating. Also, making a conservative assumption can help provide a safety factor for the fact that early dose assessments can be very crude, before much measurement data is available. Many other countries assume a large percentage of people will be indoors much of the time. Even the four day time frame is just an assumption;It's just a time

frame that is set for convenience wherein you probably get most of the early phase dose, but not necessarily. So it's just a default assumption that can be changed, especially if we know something incident-specific about the locals, the types of homes they have or the behaviors of people. We can definitely adjust it, but it is a default at least for the beginning of an incident response.

Q: If you do separate calculations for different age groups, how can different actions be taken? Evacuate kids, but leave parents behind?
DeCair: Protective action guidelines that lend themselves to different actions for different subpopulations are the PAGs for potassium iodide, food and water. These guidelines provide age-specific recommendations because of the radiosensitivity of the thyroid and young children with respect to ingestion and inhalation doses in particular. Taking protective actions—like use of KI, avoiding certain foods or using alternative sources of drinking water—can be relatively simple to implement by the parents of younger children. Clear public messages can convey which age groups should take which action. Evacuation or relocation orders should apply to entire households or neighborhoods.

Q: More magazine produced a feature titled "Women of Chernobyl" that indicates that people who refused to evacuate have fared better than those forced to move. Has ICRP / NCRP [International Commission on Radiological Protection / National Council on Radiation Protection and Measurements] done anything to learn lessons from this experience?
DeCair: The radiation protection community is certainly interested in better quantifying detriment that is not physical or easily quantified. Psychological wellbeing and a sense of home are not specifically considered in how the PAG levels are set. Even with the large conservatism built into the PAG projections, we often see decision makers add large buffer areas that may not be warranted. Discussing psychosocial detriment in more detail in the PAG Manual may help decision makers carefully balance protecting the public from radiation risks while not unnecessarily disrupting lives outside the area impactedby the PAG levels..

Q: There have been about 1,600 early deaths attributed to the Fukushima evacuation. How do we avoid those kinds of deaths in the future?
DeCair: It's important to note that most of those premature deaths were attributed to infrastructure damage from the tsunami and earthquakes. Critically ill, often elderly, people had to be moved from facilities that lost power or were damaged. These moves were hampered by the combined disasters. Fear of radiation exposure and adherence to protective evacuation zone mandates and required radiation screening did purportedly add to time delays in getting people to safe facilities. Perhaps adding more planning guidance to our PAGs materials about avoiding undue stress for fragile medical or elderly members of the public when radiation risk doesn't warrant it would be helpful. This topic is mentioned, but not given much detail, in the 2013 PAG Manual.

Q: Numerous members of a community are sensitive enough to peanuts or seafood to cause risk of immediate death if exposed. Why would we base radiation Protective Action Guides on most sensitive groups?

DeCair: I would suggest that we don't. Certainly KI, potassium iodide, is a special case where there are lower PAG levels for the most sensitive population (young people). Negative health effects from that are actually very rare. It is important to remember that emergency response guidelines are set based on minimizing increased risk along with the detriment associated with the protective action. If there is a sensitive subpopulation and there is a safe way safe to limit their dose—for example by limiting contaminated drinking water to infants—then it should be considered. After the Fukushima releases in Japan, drinking water used to mix infant formula was given a more stringent limit than the drinking water for the rest of the population. That's the type of action that may make sense in an emergency, but by no means does it make sense to make PAG projections that only look at the most sensitive.

Q: Are EPA PAGs [U.S. Environmental Protection Agency Protective Action Guides] based on radiological risk? Should they be?

DeCair: Risk levels were evaluated to set the PAG levels back in the 1980s, and the PAGs have been reevaluated several times since then. The PAG levels have remained essentially unchanged. PAG levels are expressed in terms of dose, because of how field radiation measurements are made and compared to derived response levels provided in the FRMAC Manuals.

Q: Can you briefly explain the challenges to follow ICRP 103 [International Commission on Radiological Protection Publication 103] in the Protective Action Guide?

DeCair: We haven't yet fully studied it for application to emergency response in the U.S., but I surmise that using the new metric of residual dose would have to be approached quite differently than focusing on avoidable dose, which we use now. Newly crafted PAG levels may eventually be warranted for that new metric, but I'm not sure.

Q: Which version of PAGs [Protective Action Guides] is to be used? 1992 EPA [U.S. Environmental Protection Agency] Manual, 2008 DHS [U.S. Department of Homeland Security] Guide, or 1013 EPA Manual?

DeCair: All of the above are able to be used. The good old green PAG manual is still in use and most state and local organizations that use PAGs are sticking with that for now. In 2008, DHS helped us out with RDD/IND guidance reiterating the PAGs for those terrorism scenarios. The DHS guidance is still able to be used and is still good. The 2013 PAG Manual is updated, but not many of the PAGs changed. It is available for interim use. What I've heard from states and locals, in particular South Carolina getting ready for the Southern Exposure 2015 exercise, is that they'd like to use the new manual. They wouldn't necessarily like FEMA to evaluate based on the 2013 PAG Manual yet because

plans and procedures are in flux right now. When we issue a final PAG manual with all the revisions in it, hopefully in 2015, we'll also say in the Federal Register what agreement we have with NRC and FEMA about when the expectation is to start evaluating on it, probably a 12 month time frame to update plans, procedures and training.

Q: Instead of setting PAG [Protective Action Guide] exceptions for sensitive groups, why not set exceptions for robust groups?

DeCair: We're trying to keep emergency management as simple as possible, by having as few different PAG levels for different groups as possible. There are a few examples mentioned in the PAG Manual where higher PAGs might make sense for special populations. For instance it might make sense to delay evacuation in a nursing home where cancer incidence is less of a concern than the fragile physical state of the clientsOr a prison, where no children are present, might shelter in place while others evacuate. These would be incident-specific decisions and not prescribed in the PAGs.

Q: With proliferating international, national, state, local, professional, industrial and stakeholder organizations — the word "standard" has a questionable meaning. How can you simplify and communicate with such a trend?

DeCair: We refer to the PAGs as guidelines. They echo and refine international recommendations to meet our country's needs. PAGs are not regulatory standards, but instead are planning guidelines for emergency managers to use in incident response plans and protocols.

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Spradlin, Michael J.
Sent: Thur 7/9/2015 5:17:55 PM
Subject: Re: Dose Limits
EPA Dose limits and Correction Factor.docx

Thanks for the reply. In the midst of our Southern Exposure craziness, NC was considering their EW limits and was asking for the basis as to how other states came up with their factors to reduce the EW PAG. Our best answer to having the SC administrative limit reduced to 20% of the EPA PAGs was that it was essentially a dosimeter correction factor when iodines were involved and no respiratory protection was used. It accounts for respiratory uptake. We received a good explanation from someone else about this that I will pass along.

-Michael

Michael Spradlin
Division of Emergency Response
SC Dept. of Health and Environmental Control
803-896-4100

From: DeCair, Sara <DeCair.Sara@epa.gov>
Sent: Wednesday, July 8, 2015 11:25 AM
To: Spradlin, Michael J.
Subject: RE: Dose Limits

Hm. I think administratively, some orgs choose a safety margin to ensure they don't exceed hard limits, but of course the EPA worker guidelines are that, guidelines, and meant to be flexible.

I have some lingo written up about turnback levels, since they should vary by who is doing what work, and why, and how well trained and equipped they are. See if the info below is helpful.

If you need something to justify lowering the guides even further for your state, I think there are precedents out there in occupational settings for using 50% or even 10% of a limit as a trigger, depending on the work.

EPA developed guidance for Agency personnel on radiation turnback levels. Turnback

levels help incident responders know how far they can go into a radiation area. Our turnback levels may not be appropriate for your organization. The levels we developed are specific to EPA's mission and capabilities.

For example, the National Capital Region (DC, Maryland, and Virginia) fire departments developed a radiation guide for their Haz Mat and Rescue teams -- their mission often involves lifesaving, so their levels are much higher than EPA's (200 R/hour maximum).

You could develop turnback levels for your organization, too. Think about these questions:

□□□□□□□□ How well equipped are your responders?

□□□□□□□□ How much radiation training do they have?

□□□□□□□□ What is their mission? (Life saving? Monitoring and sampling? Protecting critical infrastructure?)

□□□□□□□□ How long will typical entries take?

The more your responders know, the safer they will be. Remembering a turnback or trigger level is part of a safe entry.

For more information:

Contact your state radiation protection program for assistance.

"Manual for First Responders to a Radiological Emergency"

International Atomic Energy Agency. Oct 2006.

http://www-pub.iaea.org/MTCD/publications/PDF/EPR_FirstResponder_web.pdf

“Manual of Protective Action Guides and Protective Actions for Nuclear Incidents”

Environmental Protection Agency. May 1992. *Note this guidance provides emergency worker total dose guides for various activities, but not levels or rates.*

http://www.epa.gov/radiation/rert/pags.htm

From: Spradlin, Michael J. [mailto:spradlmj@dhec.sc.gov]
Sent: Wednesday, July 08, 2015 10:48 AM
To: DeCair, Sara
Subject: Fw: Dose Limits

SC reduces the emergency worker dose limit by a factor of 5 (20% of the EPA limit). I know Minnesota uses 20% as a "turnback value". Do you know of any further explanations/justification/scientific basis to support reduction of the EPA limits?

-Michael

Michael Spradlin
Division of Emergency Response
SC Dept. of Health and Environmental Control
803-896-4100

From: STANLEY, Derrick
Sent: Wednesday, July 8, 2015 10:37 AM
To: Spradlin, Michael J.
Subject: Fw: Dose Limits

From: Nienhius, Nathan <NNienhius@emd.sc.gov>
Sent: Wednesday, July 8, 2015 9:36 AM
To: STANLEY, Derrick
Cc: Threatt, Sandra; Reed, David
Subject: RE: Dose Limits

Is there specific guidance you (DHEC) used to settle on the "factor of 5"? Is it recommended by EPA or someone else? I know that the FEMA REP manual uses 5 as an example but it doesn't get into the science behind why 5. Is there a scientific reason? According to James, he found that states within FEMA Region IV use 2, 4, or 5. He is trying to convince his people why one is appropriate but lacks the science to back it up.

Nathan J. Nienhius

Manager, Fixed Nuclear Facilities

South Carolina Emergency Management Division

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nnienhius@emd.sc.gov

From: STANLEY, Derrick [mailto:stanled@dhec.sc.gov]
Sent: Wednesday, July 08, 2015 9:24 AM
To: Nienhius, Nathan
Cc: Threat, Sandra; Reed, David
Subject: Dose Limits

In South Carolina, most of our Emergency Workers for Radiological Events will be Volunteer Firemen. With that being said, the likelihood o any of these EW wearing any SCBA or respirators during a response is slim to none. We reduce the EPA Dose Limits of 5R,10 R, 25 R are reduced by a factor of 5 to take into account the inhalation.

Why 5 instead of 2? Mathematically speaking, 5 is the Greatest Common Factor of the three(3) limits. Also, if Alpha radiation emitters are present (i.e. Plutonium,Uranium, Americium,etc) , a reduction of 5 may not be large enough.

Derrick P. Stanley, Health Physicist

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US EPA-Recommended Dose Limits for Emergency Responders

In 1992, Dose Limits for Emergency Responders were modified by the EPA Protective Guide Manual (PAG Manual) EPA-400-R-92-001, May 1992. Table 2-2 identified recommended dose limits for the Emergency Phase of a radiological incident. Doses accrued during the incident were to be treated as once-in-a-lifetime to non-pregnant adults.

Table 2-2 Guidance on Dose Limits for Workers Performing Emergency Services

Dose limit[a] (rem)	Activity	Condition
5	all	
10	protecting valuable property	lower dose not practicable
25	life saving or protection of large populations	lower dose not practicable
>25	lifesaving or protection of large populations	only on a voluntary basis to persons fully aware of the risks involved (See Tables 2-3 and 2-4)

[a]Sum of external effective dose equivalent and committed effective dose equivalent to nonpregnant adults from exposure and intake during an emergency situation. Workers performing services during emergencies should limit dose to the lens of the eye to three times the listed value and doses to any other organ (including skin and body extremities) to ten times the listed value. These limits apply to all doses from an incident, except those received in unrestricted areas as members of the public during the intermediate phase of the incident (see Chapters 3 and 4).

The complication concerning these dose limits are that they are Total Effective Dose Equivalent (TEDE) and not just external exposure measureable by a dosimeter. (See footnote to table above). TEDE is the sum of the external dose - Effective Dose Equivalent (EDE), and the internal dose - Committed Effective Dose Equivalent (CEDE). CEDE is the product of the organ dose – Committed Dose Equivalent (CDE), committed over a 50-year period, and a weighting factor (WF) for that organ.

For example, using EPA-400-R-92-001 Tables 5-3 and 5-4 in Chapter 5:

If an emergency worker without respiratory protection or potassium iodide were immersed in an I-131 airborne contaminated environment working for a period of 1 hour, and if the airborne concentration for that 1 hour averaged only 0.023 µCi per cubic centimeter, the external dose (the EDE component), as measured by a dosimeter, would be 5 rem. However, the internal dose (the CEDE component) would be 897 rem. This person with 5 R on the dosimeter would really have a TEDE over-exposure of 902 rem.

It is considerably worse for alpha emitters, such as Pu-238. For example, 1 hour without respiratory protection immersed in a 100 µCi per cubic centimeter Pu-238 airborne environment would deliver a 5 rem EDE dose (as read from a dosimeter). However, the CEDE would have been 47 billion rem (4.7E+10 rem).

US EPA-Recommended Dose Limits for Emergency Responders

The Federal Radiological Protection Coordinating Committee (FRPCC) in 1993 recommended using a correction factor to be applied to dosimeters so that the TEDE dose limits would not be exceeded. It assumed no respiratory protection, administration of potassium iodide, and a release of beta/gamma emitters from the more likely, less severe, nuclear power plant accident (fission products). The recommended correction factor was 5 for this scenario.

Therefore, the EPA dose limit of 5 rem TEDE becomes 1 R on a dosimeter, 10 rem TEDE equals 2 R, and 25 rem equals 5 R. The FEMA document from 1994 is attached. Option 2 is the preferred option.

Below is an excerpt from the current FEMA Radiological Emergency Preparedness Program Manual (REPP Manual), January 2015:

EPA 400-R-92-001 calculates dose to both the emergency workers and the general public. The dose that is compared to emergency worker dose limits or early-phase PAGs is the sum of the external dose from gamma radiation and the committed effective dose equivalent from internal exposure caused by inhalation of radioactive material. This combined total measurement is referred to as the TEDE.

Dosimeters measure external exposure to gamma radiation, but not the dose from airborne radioactive material that is inhaled and that may contribute a major portion of the TEDE. Dose to the thyroid from uptake of radioiodine is mitigated by the correct and timely administration of KI. Although dose from inhalation of particulate materials could be controlled by properly fitted respirators, respirators are not generally practical for radiological emergency response. DRDs are commonly used, along with appropriate adjustment factors to account for the inhalation portion of the dose, to estimate the TEDE during the emergency phase. Assessment of the actual TEDE received by individual emergency workers is conducted after the emergency is over.

Issuing the Right Dosimetry

A mathematical conversion factor is used to translate DRD readings in units of R into applicable dose limits in units of rem.

For example, if the state uses a conversion factor of 5, emergency workers multiply the reading on their DRD by 5 and compare the result to the administrative limits in the plans/procedures.

Therefore, if the applicable dose limit is 5 rem, **the minimum acceptable dosimetry issued to emergency workers must be capable of reading 1 R to provide the information needed to accurately monitor their exposure.**

Since the dose that emergency workers read on their DRDs in units of R is not directly comparable to the TEDE administrative dose limits they are given in units of rem, any discussion of a recommended system or a minimum acceptable system for dosimetry needs to be coupled with the methodology adopted by the State for the conversion of DRD readings into estimated TEDE. The dosimetry OROs issue to emergency workers must be capable of measuring dose in the appropriate range to allow emergency workers to determine whether they have reached the administrative limits. The EPA-400-R-92-001 guidance is to use a factor of 5 for this conversion (see dose control discussion in the next section); however States may be more conservative. If the State adopts administrative dose limits or turn-back values that are more restrictive than EPA dose limits, the DRDs provided to emergency workers must be able to read R in the range that will correspond to the administrative limit when the selected factor is applied.

During training scenarios at CDP, we have adopted a dosimeter correction factor of 5 and administration of KI when airborne radioiodine is present. If particulates were released from the nuclear power plant accident in the scenario or another incident were encounter, especially for alpha-emitters, respiratory protection is recommended. If the incident involved no possibility of respiratory uptake, (e.g. a chunk of radioactive metal sitting on a table), there would be no CEDE component, and therefore, no correction factor would be necessary – 5 rem TEDE = 5 R on a dosimeter.

Any questions, please don't hesitate to call or email.

John Wills, 440.477.3053, radiationguy@windstream.net

To: DeCair, Sara[DeCair.Sara@epa.gov]; Rosencrantz, Ingrid[Rosencrantz.Ingrid@epa.gov]; Rosnick, Reid[Rosnick.Reid@epa.gov]
Cc: Perrin, Alan[Perrin.Alan@epa.gov]; Cherepy, Andrea[Cherepy.Andrea@epa.gov]; White, Rick[White.Rick@epa.gov]
From: Lee, Raymond
Sent: Wed 7/8/2015 8:08:43 PM
Subject: ADP Tracker Dates
OAR Reg Tracker June 25 2015_ORIA.docx

Hi all,

Here is the draft tracker document I put together, based on what I've seen from the latest action plans and info gathered from you all. I made some creative estimates based on how things are looking right now (and built in some extra time to be conservative). Please let me know if you'd like me to edit anything. Remember, these are only ballpark figures for now and we can change them in two weeks for the next exercise, so no need to fret too much about them being super specific. ☺

This is due back to OAR by 3 PM tomorrow, so if you could get me any changes by noon or so that would be great.

Thanks!

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@

ED_001057_00009445

ORIA – June 25, 2015

1st QTR 2016			
Rule, Guidance, Other	**Schedule**		**Description of Action**
B			
Proposal: Protective Action Guides for Radiological Incidents; Drinking Water Guidance (SAN 5198) *Tier 4 Guidance* **COMMENTS:** Package materials under development.	To OAR AA (Advance Draft)		**Background:** EPA will propose a drinking water Protective Action Guide to aid emergency managers in radiological disaster decision making. The proposal, once comments are adjudicated, will be incorporated in a final PAG Manual slated for 2016. The manual provides radiological protection criteria for application to all incidents that would require consideration of protective actions, with the exception of nuclear war. This revision updates EPA's 1992 Protective Action Guides, applying the PAGs to incidents other than just nuclear power plant accidents. The proposed updates confine the PAGs Manual scope to the early and intermediate phases, focusing on emergency response.
	To OAR (for formal review)	8/14/15	
	To OP	8/28/15	
	To OMB	9/11/15	
	Signature Date (Delegated AA)	**6/14/2016**	
Final Rule: NESHAP Amendments for Operating Uranium Mill Tailings (Supbart W) (SAN 5281) *Tier 2 – Significant* **COMMENTS:** NPRM signed on 4/17/14, FR publication on 5/2/14. Comment period extended an additional 60-days, which ended on 10/29/14. Currently preparing response to comments/early draft package materials.	Early Guidance	8/5/15	**Background:** Proposes emissions standards for new and existing sources based on what constitutes the generally available control [illegible] the existing rule also applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method. [illegible] required EPA to review and revise requirements that were in existence prior to the enactment of the Act. The original NESHAP was promulgated in 1989. This action will satisfy a requirement of a settlement agreement between EPA and two environmental groups over EPA's alleged failure to review and revise this standard within 10 years of enactment of the CAA.
	Option Selection	9/2/15	
	FAR	10/16/15	
	To OAR (for formal review)	11/20/15	
	To OP	12/4/15	
	To OMB	12/18/15	
	Signature Date	**4/22/2016**	

ED_001057_00009445

4th QTR 2016			
Rule, Guidance, Other	**Schedule**		**Description of Action**
A			
Final Rule: Revisions to Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings (40 CFR 192) (SAN 5319) *Tier 2 – Significant* **COMMENTS:** Extension of formal comment period closed on 5/27/15; currently evaluating comments.	Early Guidance	4/1/16	(Please note: All milestone dates are only current long-term projections that are subject to change.) **Background:** The cross-media standards found in 40 CFR Part 192 – which apply to pollutant emissions and site restoration associated with uranium ore processing and disposal of waste materials – must be adopted by the Nuclear Regulatory Commission, their Agreement States, and the Department of Energy. The Agency is revising the existing rule to take into particular account the significant changes in 5633 industry extraction technologies and their potential impacts to groundwater. New facilities proposed in states from Virginia to Alaska add to the importance of this effort.
	Option Selection	5/1/16	
	FAR	6/3/16	
	To OAR (for formal review)	7/11/16	
	To OP	7/25/16	
	To OMB	8/8/16	
	Signature Date	**12/15/2016**	

To: Littleton, Brian[Littleton.Brian@epa.gov]; Boyd, Mike[Boyd.Mike@epa.gov]; Peake, Tom[Peake.Tom@epa.gov]; Egidi, Philip[Egidi.Philip@epa.gov]; Rosnick, Reid[Rosnick.Reid@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Perrin, Alan[Perrin.Alan@epa.gov]
From: Rosencrantz, Ingrid
Sent: Wed 7/8/2015 6:52:42 PM
Subject: FW: Update on RPD Action Plans by Wednesday, July 15.
RP_AP-BR1-1_40-CFR-190_(Littleton).docx
RP_AP-BR1-2_FGR 16_(Boyd).docx
RP_AP-BR1-3_40-CFR-192_(Rosencrantz).docx
RP_AP-BR1-4_TENORM_(Peake).docx
RP_AP-BR1-6_FGGP_(Egidi).docx
RP_AP-BR1-7_Subpart-W_(Rosnick).docx
RP_AP-BR1-8_PAG-Manual_(DeCair).docx

Hello, I am continuing to help out with RPD action plans. The next step is to ensure all RPD action plans are up to date and accurate. Please review your attached plan and let me know if the milestones are up to date or, if not, change the milestones accordingly and email an updated version by next Wednesday, July 15.

These versions are essentially the same as the versions Alan submitted on March 27, with the following exceptions:

- **Mike Boyd's Action Plan:** updated the "Due Date" from September 30, 2016 to March 31, 2017 reflecting the date of the last action item on the plan.

- **Sara DeCair's Action Plan:** updated the "Due Date" from March, 2016 to August, 31 2016 reflecting the date of the last action item on the plan.

Thanks,

Ingrid

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: siddhanti@endyna.com[siddhanti@endyna.com]
From: Amy Doll
Sent: Tue 7/7/2015 1:00:02 PM
Subject: RE: Urgent request
EPA PAG Comments 3.4.2014_EXCERPT OF WATER TAB with resolution text deleted.xlsx

Sara

Per your request, attached is just the Water Tab from the latest version (3.4.2014) of Danielle's spreadsheet for the PAG comments -- I have deleted all response text from the resolution column

(please note: actually only the last two rows of the Water Tab had any response text in the resolution column, and there's a note that those two rows had been moved from Miscellaneous)

Thanks,

Amy

Amy Doll
Senior Associate
EnDyna, Inc.
7926 Jones Branch Drive, Suite 620
McLean, VA 22102
adoll@endyna.com
Tel: 703-848-8842 ext. 121
Fax: 703-848-9001

-----Original Message-----
From: Amy Doll
Sent: Tuesday, July 07, 2015 8:36 AM
To: 'DeCair, Sara'
Subject: RE: Urgent request

I'll look for it in Danielle's directory, and get back with you

Amy Doll
Senior Associate
EnDyna, Inc.
7926 Jones Branch Drive, Suite 620
McLean, VA 22102
adoll@endyna.com
Tel: 703-848-8842 ext. 121
Fax: 703-848-9001

-----Original Message-----
From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Tuesday, July 07, 2015 8:34 AM
To: Amy Doll
Subject: Urgent request

Amy, I am in quick need of a clean copy of just the drinking water tab of our public comments without responses. I think that is a tab in an excel spreadsheet from late 2013 or 2014. I'm at home waiting for an Internet service tech, how unhandy!

Sent from my iPhone

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Wieder, Jessica
Sent: Mon 7/6/2015 3:29:46 PM
Subject: RE: NCRP Annual Mtg Q&As for publication in HP Journal

So I printed this last Tuesday and clearly didn't get around to it. Am I too late? If not, when do you need my comments and I will make it a priority.

Thank.

Jess

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

From: DeCair, Sara
Sent: Monday, June 29, 2015 5:00 PM
To: Wieder, Jessica
Subject: NCRP Annual Mtg Q&As for publication in HP Journal

Jess, as I mentioned, here are those questions, some of which I answered in person at the meeting in March, and some of which I worked on last week and today. (Hence the formatting switching, ignore that, I will smooth it out before I send!) and yes I did explain we needed at least another week for internal reviews since I'm already behind their deadline. The good news is, the papers that they're putting in the publication are just now coming back from peer review so they are not waiting on us, thank goodness!

I always appreciate your input -- thank you --

S.

From: Sara DeCair [mailto:saradianedecair@gmail.com]
Sent: Tuesday, June 23, 2015 2:23 PM
To: DeCair, Sara
Subject: Fwd: NCRP Annual Mtg Q&A

Good morning!

The following are the questions submitted after the your session at the 2015 NCRP Annual Meeting. Because of time restrictions the questions highlighted in yellow were not presented during the meeting. Please review all the questions/answers and respond to the unanswered questions by June 26.

Thank you

Q: Are there any initiatives to educate the public so that the civilian population will not respond with hysteria, fear and uncontrolled panic at the mention of the word "radiation"?

DeCair: Yes. Public education initiatives on radiation include (here's where CRIO comes in!)

Q: Why is it necessary to implement ICRP guidance according to the sequence of ICRP publications if the PAGs [Protective Action Guides] are already more than one iteration behind? Can't you skip to the latest version?

DeCair: It may seem more efficient to jump directly to implementing ICRP 103 recommendations, but since there are already so many inter-related radiation protection programs hard at work on incorporating age-specific dose coefficients from ICRP 60 recommendations, we see that as a good step in the right direction. Age specificity will be here to stay when we evaluate how to implement ICRP 103 recommendations in the near future.

Q: How are the PAGs [Protective Action Guides] applied to nonfood crops?

DeCair: That's a great question that's being discussed currently by a Federal Radiological

Monitoring and Assessment Center Assessment working group. In preparation for the Southern Exposure exercise in South Carolina in July 2015, considerations for tobacco that might be contaminated and how tobacco is used puts a crimp in the usual dose assessment methods that we have for food PAGs. Is it a food? Well, I guess if you chew it, but we've had some interesting conversations regarding that. The Advisory Team for Environment, Food and Health is the body of expertise that would provide some of the answers to those special questions that are outside of the 'norm' and will undoubtedly work on this issue more in the future.

Q: FRMAC [Federal Radiological Monitoring and Assessment Center] assumes a 24 h / 7 d outside exposure — that does not seem realistic. Wouldn't making realistic assumptions about the population have more impact than any age specific dose calculations?

DeCair: I can defer this one to Ed Tupin who's in the audience too. Assuming people are continually outdoors is a worse case assumption and I think we stick with it partly because at some point during that time, the people may be evacuating. And too, making a conservative assumption can help provide a safety factor for the fact that early dose assessments can be very crude, before much measurement data is available. Many other countries assume a large percentage credit for people being indoors much of the time. Even the four day time frame is one of those that's just an assumption, it's just a time frame that's set for convenience wherein you probably get most of the early phase dose, but not necessarily. So it's just a default assumption that can be changed, especially if we know something incident-specific about the locals, the types of homes they have or the behaviors of people, we can definitely adjust it, but it is a default at least for the beginning of an incident response.

Q: If you do separate calculations for different age groups, how can different actions be taken? Evacuate kids, but leave parents behind?

DeCair: Protective action guidelines that lend themselves to different actions for different subpopulations are the PAGs for potassium iodide, food and water. These guidelines provide age-specific recommendations because of the radiosensitivity of the thyroid and young children with respect to ingestion and inhalation doses in particular. Taking protective actions like use of KI, avoiding certain foods or using alternative sources of drinking water can be relatively simple to implement by the parents of younger children. Clear public messages can convey which age groups should take which action, unlike how an evacuation or relocation order should apply to entire households or neighborhoods.

Q: More magazine produced a feature titled "Women of Chernobyl" that indicates that people who refused to evacuate have fared better than those forced to move. Has ICRP / NCRP [International Commission on Radiological Protection / National Council on Radiation Protection and Measurements] done anything to learn lessons from this experience?

DeCair: The radiation protection community is certainly interested in better quantifying detriment that is not physical or easily quantified. Psychological wellbeing and a sense of home are not specifically considered in how the PAG levels are set, but more studies are now available. Discussing psychosocial detriment in more detail in the PAG Manual may help decision makers carefully balance protecting the public from radiation risks while not unnecessarily disrupting lives outside the area impacted to PAG levels. We often see decision makers add large buffer areas that may not be warranted, knowing how much conservatism is built into the PAG projections. Undue stress could be avoided for those in the buffer zones, perhaps.

Q: There have been about 1,600 early deaths attributed to the Fukushima evacuation. How do we avoid those kinds of deaths in the future?

DeCair: It's important to note that most of those premature deaths were attributed to infrastructure damage from the tsunami and earthquakes, where transport of critically ill, often elderly, people away from facilities that lost power or were damaged was hampered by the combined disasters. Fear of radiation exposure and adherence to protective evacuation zone mandates and required radiation screening did purportedly add to time delays in getting people to safe facilities. Perhaps adding more planning guidance to our PAGs materials about avoiding undue stress for fragile medical or elderly members of the public when radiation risk doesn't warrant it would be helpful. This topic is mentioned, but not given much detail, in the 2013 PAG Manual.

Q: Numerous members of a community are sensitive enough to peanuts or seafood to cause risk of immediate death if exposed. Why would we base radiation Protective Action Guides on most sensitive groups?

DeCair: Well, I would suggest that we don't. Certainly KI, potassium iodide, is a special case where there are lower PAG levels for the most sensitive (young people). Negative health effects from that are actually very rare. But emergency response guidelines are set based on minimizing increased risk along with the detriment associated with the protective action. If there is a sensitive subpopulation and there is a safe way safe to limit their dose, for example by limiting contaminated drinking water to infants, then it should be considered. After the Fukushima releases in Japan, drinking water used to mix infant formula was given a more stringent limit than the drinking water for the rest of the population. That's the type of action that can make sense in an emergency, but by no means does it make sense to make PAG projections that only look at the most sensitive.

Q: Are EPA PAGs [U.S. Environmental Protection Agency Protective Action Guides] based on radiological risk? Should they be?

DeCair: Risk levels were evaluated to set the PAG levels back in the 1980s, and the PAGs have been reevaluated several times since then by experts updating them. The PAG levels have remained essentially unchanged. They are expressed in terms of dose, because of how field radiation measurements are made and compared to derived response levels provided in the FRMAC Manuals.

Q: Can you briefly explain the challenges to follow ICRP 103 [International Commission on Radiological Protection Publication 103] in the Protective Action Guide?

DeCair: We haven't yet fully studied it for application to emergency response in the US, but I surmise that using the new metric of residual dose would have to be approached quite differently than focusing on avoidable dose, which we use now. Newly crafted PAG levels may have to be developed for that new metric, but I'm not sure.

Q: Which version of PAGs [Protective Action Guides] is to be used? 1992 EPA [U.S. Environmental Protection Agency] Manual, 2008 DHS [U.S. Department of Homeland Security] Guide, or 1013 EPA Manual?

DeCair: All of the above are able to be used. The good old green PAG manual is still in use and most state and local organizations that use PAGs are sticking with that for now. In 2008 DHS helped us out with RDD/IND guidance reiterating the PAGs for those terrorism scenarios that is able to be used and is still good. The 2013 PAG Manual is updated, but not many of the PAGs changed in it. It is available for interim use just in case. What I've heard from states and locals, in particular South Carolina getting ready for the Southern Exposure 2015 exercise, is that they'd like to use the new manual. They wouldn't necessarily like FEMA to evaluating on that yet because plans and procedures are in flux right now. When we issue a final PAG manual with all the revisions in it, hopefully in 2015, we'll also say in the Federal Register what agreement we have with NRC and FEMA about when the expectation is to start evaluating on it, probably a 12 month time frame to update plans, procedures and training.

Q: Instead of setting PAG [Protective Action Guide] exceptions for sensitive groups, why not set exceptions for robust groups?

DeCair: We're trying to keep emergency management simplest, by having as few different PAG levels for different groups as possible. There are a few examples mentioned in the PAG Manual where higher PAGs might make sense for special populations, for instance a nursing home where cancer incidence is less of a concern than the fragile physical state of the clients, so special consideration of delaying evacuation might make sense. Or a prison, where no children are present, might shelter in place while others evacuate. But these would be incident-specific decisions and not prescribed in the PAGs.

Q: With proliferating international, national, state, local, professional, industrial and stakeholder organizations — the word “standard” has a questionable meaning. How can you simplify and communicate with such a trend?

DeCair: We refer to the PAGs as guidelines, and they echo and refine international recommendations to meet our country's needs. PAGs are not regulatory standards, but instead are planning guidelines for emergency managers to use in incident response plans and protocols.

Cindy

Cindy L. O’Brien

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http:NCRPonline.org

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Ansari, Armin (CDC/ONDIEH/NCEH)
Sent: Thur 7/2/2015 4:15:36 PM
Subject: RE: For your review: revised tables for Surface Contamination
PAG_Surface Contam Control Section Revised_041615.docx

Hi Sara,

I like how the revised text incorporates info from the two tables and their important footnotes. Also like the change from "limit" to "level" – good call!

I have a just a few observations and suggestions to share with you and I think it would be easier to do on the phone (or webinar if you prefer). I am available after 2 PM today and next week, I can be available anytime on Wednesday, Thursday, or Friday (July 8 through 10). Just let me know.

Have a great 4th of July weekend.

Armin

From: Ansari, Armin (CDC/ONDIEH/NCEH)
Sent: Sunday, June 28, 2015 3:28 PM
To: 'DeCair, Sara'
Subject: RE: For your review: revised tables for Surface Contamination

Hi Sara,

Sorry I was away last week. I will definitely do this and get back to you soon before the end of the week.

Best,

Armin

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, June 22, 2015 3:36 PM
To: Ansari, Armin (CDC/ONDIEH/NCEH)
Subject: For your review: revised tables for Surface Contamination

Armin,

You are our key reviewer for this updated screening guidance in the PAG Manual. The full Subcommittee will have a chance to review when we're done with edits and closer to going back to OMB, which I hope will be in the next month or so!

Let me know if it would be easier for me to set up a conference call/webinar with you to go through this together and discuss any edits needed. I know it's hard to find time to do a focused review on things when we are so crazy busy!

Thank you,

Sara

From: Amy Doll <adoll@endyna.com>
Sent: Thursday, April 16, 2015 10:48 AM
To: DeCair, Sara
Cc: siddhanti@endyna.com
Subject: Combined sections and revised tables for Surface Contamination

Hi Sara

I've created an excerpt of revisions to former Sections 2.7 and 2.8 of the PAG Manual, for your review, when convenient for you. These revisions were done per Item #4 in the January 20, 2015 Memo and also per subsequent discussions about converting two tables into text. These tables were discussed at the PAG subcommittee call and the CDC representative agreed with the suggestion to convert them into text, so if you feel appropriate, the CDC representative could take a look too.

The attached includes:

Excerpt with former Table 2-5 and Table 2-6 now revised into text:

- Former Table 2-5 is now in the text and bullets for new sub-section 2.3.3
- Former Table 2-6 is now in the text and bullets for new sub-section 2.3.4

Also shows how former Section 2.7 (Contamination limits and monitoring of the environment and populations) and former Section 2.8 (Surface contamination control) were combined

As reminder, you had decided we should use "level" instead of "limit"

Please let us know if you have any comments or suggestions.

Thanks,

Amy

Amy Doll

Senior Associate

EnDyna, Inc.
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McLean, VA 22102

adoll@endyna.com

Tel: 703-848-8842 ext. 121

Fax: 703-848-9001

EXCERPT WITH FORMER TABLE 2-5 and TABLE 2-6 NOW REVISED INTO TEXT:

- **Former Table 2-5 is now in the text and bullets for new sub-section 2.3.3 below**
- **Former Table 2-6 is now in the text and bullets for new sub-section 2.3.4 below**

ALSO SHOWS HOW FORMER SECTION 2.7 (Contamination limits and monitoring of the environment and populations) and FORMER SECTION 2.8 (Surface contamination control) WERE COMBINED (#4 in 1/20/15 Memo)

As reminder, Sara's decision was to use "level" instead of "limit"

2.3. CONTAMINATION LEVELS ~~LIMITS~~ AND MONITORING OF THE ENVIRONMENT AND POPULATIONS

Areas under the plume can be expected to contain deposited radioactive materials if aerosols or particulate materials were released during the incident. In extreme cases, individuals and equipment may be highly contaminated and monitoring stations will be required for emergency monitoring, decontamination of individuals and medical evaluations. Equipment should be checked and decontaminated as necessary to avoid the spread of contamination to other locations. This monitoring service would be required for only a few days following plume passage until all such people have been evacuated or relocated. Guidance on surface contamination levels for use at such monitoring stations is provided below.

~~People working in the parts of the restricted areas in which their dose from the residual radioactivity would exceed 2 mrem (20 μSv) in any hour or 100 mrem (1 mSv) in a year should operate under the controlled conditions established for occupational exposure.~~

Adults may reenter restricted areas under controlled conditions in accordance with occupational exposure standards. The need for monitoring stations should be evaluated along highways, which serve as the major evacuation or transportation routes, to control surface contamination at exits from the more highly contaminated areas. Decontamination and other measures should be implemented to maintain low-exposure rates at monitoring stations.

A contaminated item should not be released to an unrestricted area. Based on incident and locality specific considerations, it may be acceptable to release contaminated materials if the level of surface contamination is below acceptable release criteria ~~less than two times (2x) the existing background levels~~. As an alternative to decontamination, contaminated items (i.e., not people or animals) may be retained in the restricted area while the radiological contamination decays.

In some extreme cases, decontamination may be impractical. Evacuating a large area requires resources, and decontamination may conflict with priority use of those resources. Screening and decontamination can slow egress, which could result in increased dose to the evacuees. Emergency managers should refer to CDC's "Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners" (CDC 2014)[1] for more information. These simple initial screening guides from CDC are more general than FEMA REP-21 and REP-22 on use of handheld instruments and portal monitors for screening the public.

2.3.1. Surface Contamination Control

Surface contamination must be controlled both before and after evacuation protective actions are implemented. The principal exposure pathways for loose surface contamination on people, clothing and equipment are:

- Internal doses from ingestion by direct transfer;
- Internal doses from inhalation of resuspended materials;

[1] ADD REFERENCE/LINK

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- Beta dose to skin from contaminated skin or clothing or from nearby surfaces;
- Dose to the whole body from external gamma radiation; and
- Internal doses from absorption of contamination into wounds.

The contamination level ~~limit~~ for screening people, animals and objects for surface contamination at monitoring stations should be influenced by the potential for the contamination to be ingested, inhaled or transferred to other locations. Therefore, it is reasonable to establish lower levels ~~limits~~ for surfaces where contamination is loose than for surfaces where the contamination is fixed (except for skin). The expected period of exposure from fixed contamination on skin would be longer so a lower level ~~limit~~ would be justified.

It is not practical to set surface contamination screening levels ~~limits~~ significantly lower than residual contamination levels in uncontrolled areas. Although the contamination levels recommended in this manual are accordingly set high, consideration should be given as the incident ~~event~~ progresses to using lower contamination screening ~~control~~ levels (and more sensitive monitoring instruments) once people are removed from areas causing high external doses. Such efforts will minimize cross-contamination of people located outside of the affected areas. For incidents ~~events~~ involving fixed nuclear facilities, some evacuation reception centers or shelters will have walk-through portal monitors.

The recommended "2x background" level for screening for surface contamination at monitoring stations is merely a simplified basis for responders to set their own instrument trigger levels based on practical circumstances at the time and location of each screening center. NCRP 161, "Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident" (NCRP Report No. 166), National Council on Radiation Protection and Measurements, Bethesda, MD, 2011,[2] and Koenig paper [cite properly] provide the basis for these simplified initial screening levels.

2.3.2. Priorities for Control of Contaminated Areas

The following priorities are recommended—

- Do not delay urgent medical care for decontamination efforts or for time-consuming protection of attendants, such as donning of additional anti-contamination clothing.
- In early phase scenarios where it might not be practical or would interfere with other lifesaving and public health protection priorities, do not waste effort trying to contain contaminated wash water and be sure to notify sewage treatment plants.
- Do not allow monitoring and decontamination to delay an ordered evacuation.
- *When early screening is needed after a major incident* — After plume passage, it may be necessary to establish emergency contamination monitoring stations in areas not qualifying as low background areas. Gamma exposure rates in such areas should be less than 5 millirem (50 μSv) per hour. These monitoring stations should be used only during the early phase after major atmospheric releases to monitor people emerging from possible high exposure areas. The stations should be set up to provide simple (rapid) decontamination if needed and to evaluate whether affected people should undergo more extensive decontamination or other special care. Section 2.3.3 ~~Table 2-5~~ provides guidance on surface contamination levels for use if such emergency contamination monitoring stations ~~centers~~ are needed.
- *Establish screening to control surface contamination* — Establish monitoring and personnel decontamination (e.g., bathing) facilities at evacuation centers or other locations in low background areas (less than 0.1 millirem (1 μSv) per hour). Section 2.3.4 ~~Table 2-6~~ provides surface contamination guidance for monitoring stations in low background areas. These surface contamination screening levels are examples derived primarily on the basis of easily measurable

[2] See: Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident (NCRP Report No. 166), National Council on Radiation Protection and Measurements, Bethesda, MD, 2011.

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radiation levels using portable instruments. For more specific considerations on control of contaminated areas refer to "Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners" (CDC ~~2007~~2014).[3]

- *Encourage self-decontamination* — Encourage evacuated people who were exposed in areas where release of particulate materials would have warranted evacuation to change and bag the clothes they were wearing and store them in an area away from people and pets until authorities provide further instructions on their disposition, to wash other exposed surfaces such as cars and trucks and their contents and then report to ~~these~~ evacuation centers or other established locations for monitoring.
- After the evacuation area has been established, consider the need to set up monitoring and decontamination stations at exits from the more highly contaminated parts of the area. Low levels of contamination may be undetectable because of high background radiation levels at these locations. Monitoring should be done at lowest practical background levels. Nevertheless, these individuals should be advised to bathe and change clothes at their first opportunity—no later than within the next 24 hours. If, after decontamination, people still exceed the surface contamination screening levels ~~limits~~ for the station, they should be sent for further decontamination or for medical or other special attention.

2.3.3. Recommendations for Emergency Screening in Areas Not Qualifying as Low Background Areas

This section provides the recommended surface contamination screening levels for emergency screening of people and objects at monitoring stations ~~in high background radiation areas~~ in areas with elevated background radiation (0.1 mR/h to 1 mR/h or 1 to 10 µSv/h gamma exposure rate). Monitoring stations in such high exposure rate areas are for use only during the early phase of an incident involving major atmospheric releases of particulates (otherwise see Section 2.3.4 ~~Table 2-6~~). For such emergency screening at monitoring stations, recommended actions for a detection instrument reading at either less than or greater than 2x existing background are outlined below.

- **Before Decontamination:**
  - If <2x existing background — *Recommended action*: ~~Unconditional release~~ Release for further screening outside affected area.
  - If >2x existing background — *Recommended action:* Decontaminate. Equipment may be stored or disposed of as appropriate.
- **After Decontamination:**
  - If <2x existing background — *Recommended action:* ~~Unconditional release~~ Release for further screening outside affected area.
  - If >2x existing background — *Recommended action:* Continue to decontaminate or refer to low background monitoring and decontamination station. Equipment may be stored for decay or disposed of as appropriate.

2.3.4. Recommendations for Screening in Low Background Areas

This section provides the recommended surface contamination screening levels for people and objects at monitoring stations in ~~low~~ background radiation areas (<0.1 mR/h gamma exposure rate). People reporting to monitoring stations in low background radiation areas have been previously instructed to change and bag clothes, wash other exposed surfaces such as cars and their contents and then report to these centers for monitoring. Levels higher than 2x existing background (not to exceed the meter reading corresponding to 0.1 mR/h) may be used to speed the monitoring of evacuees in very low background areas. For

[3] ADD REFERENCE/LINK

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screening at monitoring stations in low background areas, recommended actions for a detection instrument reading at either less than or greater than 2x existing background are outlined below.

- **Before Decontamination:**
  - If <2x existing background — *Recommended action*: Unconditional release.
  - If >2x existing background — *Recommended action:* ~~Decontaminate.~~ Partial decontamination.
- **After Simple Decontamination Effort** (Washing hands and face and localized wiping are examples of a partial decontamination effort): ~~Flushing with water and wiping is an example of a simple decontamination effort.~~
  - If <2x existing background — *Recommended action:* Unconditional release.
  - If >2x existing background — *Recommended action:* Full decontamination.
- **After Full Decontamination Effort** (Changing clothes and/or showering are examples of a full decontamination effort. Washing or gentle scrubbing with soap or other mild detergent followed by flushing is another example of a full decontamination effort.):
  - If <2x existing background — *Recommended action:* Unconditional release.
  - If >2x existing background — *Recommended action:* Continue to decontaminate people. Release animals and equipment.
- **After Additional Full Decontamination Effort:**
  - If <2x existing background — *Recommended action:* Unconditional full release.
  - If >2x existing background — *Recommended action:* Send people for further ~~special~~ evaluation. ~~Release animals and equipment~~

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To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Miguel Tuason[mtuason@endyna.com]; siddhanti@endyna.com[siddhanti@endyna.com]
From: Amy Doll
Sent: Thur 7/2/2015 2:45:03 PM
Subject: RE: Update on reference checking for PAG Manual
PAG Manual Reference Checking Notes.pdf
Literature Review_2.28.2014_formatted to print 031715ad.xlsx

Hi Sara

We're starting on the work to make revisions and update/improve the citations in the PAG Manual. Miguel will be working on this, and if you like, we could discuss this some next Tuesday during our already scheduled call for the graphics.

I've attached a scanned copy of my notes from my earlier reference checking process, so if needed, you have a copy of these notes too. Also I've attached a re-formatted (printable) version of Danielle's spreadsheet from the previous task you gave her. In my reference checking, I did some initial spot checking on Danielle's spreadsheet and there are a few initial notes about that in my PDF.

Hope you enjoy the holiday weekend,

Thanks,

Amy

Amy Doll

Senior Associate

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Fax: 703-848-9001

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, June 22, 2015 2:53 PM
To: Amy Doll
Subject: Re: Update on reference checking for PAG Manual

Amy,

It is definitely good to start making the revisions, and updating/improving the citations. The only risk with citing more recent versions of references is if the new version no longer contains the thing we were pointing to, but that is pretty unlikely. If we run into something that doesn't seem to point the reader to a good piece of additional information, then I'd suggest deleting the citation. Let me know if you run into questions. Thank you!

Sara

From: Amy Doll <adoll@endyna.com>
Sent: Tuesday, April 28, 2015 12:53 PM
To: DeCair, Sara
Cc: siddhanti@endyna.com
Subject: Update on reference checking for PAG Manual

Hi Sara

I've gone through the document checking the references, as we discussed. I've found 14 references that are cited/used within the text that are not in Appendix A-References. Also there are five references in Appendix A that are not cited/used anywhere within the text. I saw that some of the references in Appendix A had errors, which I'll correct if I find them.

The next step will be going through the spreadsheet you sent that Danielle had prepared, and checking what needs to be done regarding the references from those notes in that spreadsheet.

Upon initial review of that spreadsheet, it seems that most of that effort will involve updating/replacing outdated references with new editions and/or updated publications, etc.

Once I get it all reconciled, I'll get back with you with more information and any questions. Also I'll look into how the article below might be cited/used and will plan to add that as well.

I won't make any revisions to the document yet, until it is all reconciled, to avoid spending time on revising revisions.

When I get to the point that I start revising the document, I will need to make revisions to Appendix A as well as revisions within the document. These revisions within the document would involve correcting citations in text or correcting footnotes and adding appropriate citations where a reference was used within the text but no citation was included. As before, all citations within the text will match info in the first column in Appendix A.

Thanks,

Amy

Amy Doll

Senior Associate

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Fax: 703-848-9001

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Thursday, April 23, 2015 2:13 PM
To: Amy Doll
Subject: Reference to add to shelter/evacuation section

Amy,

I'm not sure how best to point readers to this good article since it's behind a subscription, but it definitely did inform the shelter/evacuation section when we updated the Manual and I think the reference gives both it and the Manual credibility.

http://journals.lww.com/health-physics/Abstract/2013/07000/Updated_Emergency_Response_Guidance_for_the_First.8.aspx

Thank you for any ideas!

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: Amy Doll[adoll@endyna.com]
From: Miguel Tuason
Sent: Tue 6/30/2015 12:58:17 PM
Subject: RE: Plume Products

Hello, Sara –

Next week sounds good.

I will send an OUTLOOK invitation shortly to place it on all our schedules.

Enjoy the upcoming holiday and looking forward to our discussion next week.

Best

Miguel

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Monday, June 29, 2015 5:38 PM
To: Miguel Tuason
Cc: Amy Doll
Subject: Re: Plume Products

Miguel, glad to reconnect!

How about we look at times a week from tomorrow? This short week already has a full day meeting Wednesday and my tomorrow looks awful.

Tuesday the 7th? 1 pm? Other times are also open that week. I will look back at my prior notes so we can make a plan of attack. Thank you!

Sara

From: Miguel Tuason <mtuason@endyna.com>
Sent: Thursday, June 25, 2015 4:39 PM
To: DeCair, Sara
Cc: Amy Doll
Subject: RE: Plume Products

Hello, Sara –

Hope you're having a good summer.

I'm emailing to re-connect over the PAGS cover work we were doing earlier this year.

I'll be out of the office for the rest of this week, but I look forward to getting back on this project next week.

Please let me know if you'd like to have a conference call – together with Amy Doll – next week to discuss the current status of the cover, and talk next steps.

Thank you.

Best

Miguel

From: Miguel Tuason
Sent: Monday, January 12, 2015 12:35 PM
To: 'DeCair, Sara'
Subject: RE: Plume Products

Hi Sara –

A couple more options for "PREPARE/RESPOND" (I prefer "EPA" on a gray-scale like version 005b).

I've also included one option for the back cover, with the space for mailing, as requested.

Looking forward to speaking about the keyhole graphic/s.

Best,

Miguel

From: DeCair, Sara [mailto:DeCair.Sara@epa.gov]
Sent: Friday, January 09, 2015 5:29 PM
To: Miguel Tuason
Subject: FW: Plume Products

Jessica said she'd love to see a time progression, with three or four same-scale pics, but I think that may be getting a little far into this! The keyhole serves to explain the transition between Evacuation stuff and Relocation stuff. It might be a hoot to talk through it via webinar as long as we can scribble on each other's pictures with the mouse. ?

Cheers, talk to you next week,

Sara

From: Wieder, Jessica
Sent: Thursday, January 08, 2015 2:42 PM
To: DeCair, Sara
Subject: Plume Products

See slides 2 and 5 – NPP Scenario

Slide 10 – RDD Scenario

Slides 19 and 20- IND Scenario

It may be a good idea to use a single release example and show the different PAG levels (each

on a different map, all using the same scale – including one or two for FDA DILs) to show the different areas potentially covered.

Jessica Wieder

U.S. EPA

Radiation Protection Program

Acting Director, Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Wieder, Jessica
Sent: Tue 6/30/2015 11:35:03 AM
Subject: Re: NCRP Annual Mtg Q&As for publication in HP Journal

I am printing them out for review now.

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: DeCair, Sara
Sent: Monday, June 29, 2015 5:00 PM
To: Wieder, Jessica
Subject: NCRP Annual Mtg Q&As for publication in HP Journal

Jess, as I mentioned, here are those questions, some of which I answered in person at the meeting in March, and some of which I worked on last week and today. (Hence the formatting switching, ignore that, I will smooth it out before I send!) and yes I did explain we needed at least another week for internal reviews since I'm already behind their deadline. The good news is, the papers that they're putting in the publication are just now coming back from peer review so they are not waiting on us, thank goodness!

I always appreciate your input -- thank you --

S.

From: Sara DeCair [mailto:saradianedecair@gmail.com]
Sent: Tuesday, June 23, 2015 2:23 PM
To: DeCair, Sara
Subject: Fwd: NCRP Annual Mtg Q&A

Good morning!

The following are the questions submitted after the your session at the 2015 NCRP

Annual Meeting. Because of time restrictions the questions highlighted in yellow were not presented during the meeting. Please review all the questions/answers and respond to the unanswered questions by June 26.

Thank you

Q: Are there any initiatives to educate the public so that the civilian population will not respond with hysteria, fear and uncontrolled panic at the mention of the word "radiation"?

DeCair: Yes. Public education initiatives on radiation include (here's where CRIO comes in!)

Q: Why is it necessary to implement ICRP guidance according to the sequence of ICRP publications if the PAGs [Protective Action Guides] are already more than one iteration behind? Can't you skip to the latest version?

DeCair: It may seem more efficient to jump directly to implementing ICRP 103 recommendations, but since there are already so many inter-related radiation protection programs hard at work on incorporating age-specific dose coefficients from ICRP 60 recommendations, we see that as a good step in the right direction. Age specificity will be here to stay when we evaluate how to implement ICRP 103 recommendations in the near future.

Q: How are the PAGs [Protective Action Guides] applied to nonfood crops?

DeCair: That's a great question that's being discussed currently by a Federal Radiological Monitoring and Assessment Center Assessment working group. In preparation for the Southern Exposure exercise in South Carolina in July 2015, considerations for tobacco that might be contaminated and how tobacco is used puts a crimp in the usual dose assessment methods that we have for food PAGs. Is it a food? Well, I guess if you chew it, but we've had some interesting conversations regarding that. The Advisory Team for Environment, Food and Health is the body of expertise that would provide some of the answers to those special questions that are outside of the 'norm' and will undoubtedly work on this issue more in the future.

Q: FRMAC [Federal Radiological Monitoring and Assessment Center] assumes a 24 h / 7 d outside exposure — that does not seem realistic. Wouldn't making realistic assumptions about the population have more impact than any age specific dose calculations?

DeCair: I can defer this one to Ed Tupin who's in the audience too. Assuming people are continually outdoors is a worse case assumption and I think we stick with it partly because at some point during that time, the people may be evacuating. And too, making a conservative assumption can help provide a safety factor for the fact that early dose assessments can be very crude, before much measurement data is available. Many other countries assume a large percentage credit for people being indoors much of the time. Even the four day time frame is one of those that's just an assumption, it's just a time frame that's set for convenience wherein you probably get most of the early phase dose, but not necessarily. So it's just a default assumption that can be changed, especially if we know something incident-specific about the locals, the types of homes they have or the behaviors of people, we can definitely adjust it, but it is a default at least for the beginning of an incident response.

Q: If you do separate calculations for different age groups, how can different actions be taken? Evacuate kids, but leave parents behind?

DeCair: Protective action guidelines that lend themselves to different actions for different subpopulations are the PAGs for potassium iodide, food and water. These guidelines provide age-specific recommendations because of the radiosensitivity of the thyroid and young children with respect to ingestion and inhalation doses in particular. Taking protective actions like use of KI, avoiding certain foods or using alternative sources of drinking water can be relatively simple to implement by the parents of younger children. Clear public messages can convey which age groups should take which action, unlike how an evacuation or relocation order should apply to entire households or neighborhoods.

Q: More magazine produced a feature titled “Women of Chernobyl” that indicates that people who refused to evacuate have fared better than those forced to move. Has ICRP / NCRP [International Commission on Radiological Protection / National Council on Radiation Protection and Measurements] done anything to learn lessons from this experience?

DeCair: The radiation protection community is certainly interested in better quantifying detriment that is not physical or easily quantified. Psychological wellbeing and a sense of home are not specifically considered in how the PAG levels are set, but more studies are now available. Discussing psychosocial detriment in more detail in the PAG Manual may help decision makers carefully balance protecting the public from radiation risks while not unnecessarily disrupting lives outside the area impacted to PAG levels. We often see decision makers add large buffer areas that may not be warranted, knowing how much conservatism is built into the PAG projections. Undue stress could be avoided for those in the buffer zones, perhaps.

Q: There have been about 1,600 early deaths attributed to the Fukushima evacuation. How do we avoid those kinds of deaths in the future?

DeCair: It's important to note that most of those premature deaths were attributed to infrastructure damage from the tsunami and earthquakes, where transport of critically ill, often elderly, people away from facilities that lost power or were damaged was hampered by the combined disasters. Fear of radiation exposure and adherence to protective evacuation zone mandates and required radiation screening did purportedly add to time delays in getting people to safe facilities. Perhaps adding more planning guidance to our PAGs materials about avoiding undue stress for fragile medical or elderly members of the public when radiation risk doesn't warrant it would be helpful. This topic is mentioned, but not given much detail, in the 2013 PAG Manual.

Q: Numerous members of a community are sensitive enough to peanuts or seafood to cause risk of immediate death if exposed. Why would we base radiation Protective Action Guides on most sensitive groups?

DeCair: Well, I would suggest that we don't. Certainly KI, potassium iodide, is a special case where there are lower PAG levels for the most sensitive (young people). Negative health effects from that are actually very rare. But emergency response guidelines are set based on minimizing increased risk along with the detriment associated with the protective action. If there is a sensitive subpopulation and there is a safe way safe to limit their dose, for example by limiting contaminated drinking water to infants, then it should be considered. After the Fukushima releases in Japan, drinking water used to mix infant formula was given a more stringent limit than the drinking water for the rest of the population. That's the type of action that can make sense in an emergency, but by no means does it make sense to make PAG projections that only look at the most sensitive.

Q: Are EPA PAGs [U.S. Environmental Protection Agency Protective Action Guides] based on radiological risk? Should they be?

DeCair: Risk levels were evaluated to set the PAG levels back in the 1980s, and the PAGs have been reevaluated several times since then by experts updating them. The PAG levels have remained essentially unchanged. They are expressed in terms of dose, because of how field radiation measurements are made and compared to derived response levels provided in the FRMAC Manuals.

Q: Can you briefly explain the challenges to follow ICRP 103 [International Commission on Radiological Protection Publication 103] in the Protective Action Guide?

DeCair: We haven't yet fully studied it for application to emergency response in the US, but I surmise that using the new metric of residual dose would have to be approached quite differently than focusing on avoidable dose, which we use now. Newly crafted PAG levels may have to be developed for that new metric, but I'm not sure.

Q: Which version of PAGs [Protective Action Guides] is to be used? 1992 EPA [U.S. Environmental Protection Agency] Manual, 2008 DHS [U.S. Department of Homeland Security] Guide, or 1013 EPA Manual?

DeCair: All of the above are able to be used. The good old green PAG manual is still in use and most state and local organizations that use PAGs are sticking with that for now. In 2008 DHS helped us out with RDD/IND guidance reiterating the PAGs for those terrorism scenarios that is able to be used and is still good. The 2013 PAG Manual is updated, but not many of the PAGs changed in it. It is available for interim use just in case. What I've heard from states and locals, in particular South Carolina getting ready for the Southern Exposure 2015 exercise, is that they'd like to use the new manual. They wouldn't necessarily like FEMA to evaluating on that yet because plans and procedures are in flux right now. When we issue a final PAG manual with all the revisions in it, hopefully in 2015, we'll also say in the Federal Register what agreement we have with NRC and FEMA about when the expectation is to start evaluating on it, probably a 12 month time frame to update plans, procedures and training.

Q: Instead of setting PAG [Protective Action Guide] exceptions for sensitive groups, why not set exceptions for robust groups?

DeCair: We're trying to keep emergency management simplest, by having as few different PAG levels for different groups as possible. There are a few examples mentioned in the PAG Manual where higher PAGs might make sense for special populations, for instance a nursing home where cancer incidence is less of a concern than the fragile physical state of the clients, so special consideration of delaying evacuation might make sense. Or a prison, where no children are present, might shelter in place while others evacuate. But these would be incident-specific decisions and not prescribed in the PAGs.

Q: With proliferating international, national, state, local, professional, industrial and stakeholder organizations — the word “standard” has a questionable meaning. How can you simplify and communicate with such a trend?

DeCair: We refer to the PAGs as guidelines, and they echo and refine international recommendations to meet our country's needs. PAGs are not regulatory standards, but instead are planning guidelines for emergency managers to use in incident response plans and protocols.

Cindy

Cindy L. O'Brien

NCRP Managing Editor

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Bethesda, MD 20814-3095

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http:NCRPonline.org

To: Flynn, Mike[Flynn.Mike@epa.gov]; Cherepy, Andrea[Cherepy.Andrea@epa.gov]; Edwards, Jonathan[Edwards.Jonathan@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]
From: Perrin, Alan
Sent: Wed 6/17/2015 6:11:41 PM
Subject: Fwd: Clean Version of PAG Document (6/16/15)
Draft Protective Action Guide 6-16-15 OGWDW.docx
ATT00001.htm

FYI -- OW is making good progress on their senior review.

~~~~~~~~~~~~~~~

Alan Perrin
dsk 202-343-9775
mbl 202-279-0376

Begin forwarded message:

From: "Christ, Lisa" <Christ.Lisa@epa.gov>
Date: June 17, 2015 at 1:52:17 PM EDT
To: "DeCair, Sara" <DeCair.Sara@epa.gov>, "Veal, Lee" <Veal.Lee@epa.gov>, "Perrin, Alan" <Perrin.Alan@epa.gov>
Cc: "Hernandez-Quinones, Samuel" <Hernandez.Samuel@epa.gov>, "Ellis, Jerry" <Ellis.Jerry@epa.gov>
Subject: FW: Clean Version of PAG Document (6/16/15)

All-

Attached is the revised proposal which incorporates Ken's comments. At this point we've obtained review by the AA for OW and OGC.

Thanks-

Lisa

From: Hernandez-Quinones, Samuel
Sent: Tuesday, June 16, 2015 1:19 PM
To: Christ, Lisa
Subject: Clean Version of PAG Document (6/16/15)
~~~~~~~~~~~~~~~

Attached

Sam

==========

Samuel Hernández Quiñones, P.E.
Environmental Engineer
Environmental Protection Agency
Office of Water
1200 Pennsylvania Ave. NW
Washington, DC 20460
202-564-1735

"USEPA Protecting Human Health and the Environment"

To: DeCair, Sara[DeCair.Sara@epa.gov]; Nesky, Anthony[Nesky.Tony@epa.gov]
From: Wieder, Jessica
Sent: Tue 6/9/2015 3:42:54 PM
Subject: Re: Q&A for your quick look, esp. #12
Q&A Document 6-8-2015 Jessica edits.docx

Trying this one more time... I think it bounced:

I don't know if this is helpful or not, but here is my two cents... feel free to give me a call to discuss. I tried to cut or explain jargon, move the key point right up front and remove content that didn't answer the question.

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Wieder, Jessica
Sent: Tuesday, June 9, 2015 11:41 AM
To: Sara DeCair; nesky.anthony@epa.gov
Subject: Re: Q&A for your quick look, esp. #12

I don't know if this is helpful or not, but here is my two cents... feel free to give me a call to discuss. I tried to cut or explain jargon, move the key point right up front and remove content that didn't answer the question.

Jessica Wieder
U.S. EPA
Radiation Protection Program
Center for Radiation Information and Outreach
w: 202-343-9201
c: 202-420-9353

From: Sara DeCair <Personal Email
Sent: Monday, June 8, 2015 5:49 PM
To: Wieder, Jessica; nesky.anthony@epa.gov
Subject: Q&A for your quick look, esp. #12

I've got to close this out Tuesday, for a briefing on Friday when we'll get feedback from ODs. Look at #12 in particular if you would?
I changed just a couple things after Tony's edits, and I think we're very, very close. Thank you so much! (PS I'm writing from Gmail so please respond to decair.sara@epa.gov instead.)

Sara

Internal questions and answers for the Draft Drinking Water PAG Announcement
EPA Internal Deliberative Document—Do Note Quote, Cite, or Release

Internal Q&A's

Question 1: Why is there a need for a drinking water PAG when EPA already has regulations for radionuclides in drinking water?

Answer

Under the Safe Drinking Water Act (SDWA), the Agency established a dose-based Maximum Contaminant Level (MCL) for beta particle and photon (gamma) radioactivity of 4 mrem/yr; based on lifetime exposure criteria, which assume 70 years of continued exposure to contaminants in drinking water.

During the development of the drinking water PAG the Agency determined that it is not appropriate to base response measures during short-term emergency incidents on lifetime exposure criteria.

While the SDWA framework is appropriate for normal operations, it does not provide the necessary tools to assist emergency responders with determining the need for an immediate protective action (do not drink orders) when a MCL is exceeded. The goal is to prioritize potentially scarce water resources for those most at risk in a disaster response.

Regardless of the cause of an incident, EPA expects that any drinking water system impacted during a radiation incident will take action to return to compliance with the Safe Drinking Water Act levels as soon as practical.

Question 2: Will the drinking water PAG weaken EPA's regulations for radionuclides in drinking water?

Answer: No. The drinking water PAG is non-regulatory guidance for emergency situations only. Public water systems must comply with EPA's SDWA regulations.

Question 3: Why is there a different guidance for pregnant women and children versus adults?

Answer: EPA proposes a lower dose threshold for sensitive ages because fetuses, infants, and children are at greater risk from radiological exposures than adults. This is due to two reasons. First, their cells in their growing bodies develop at such a rapid pace, making them more sensitive to the potential harmful effects of radiation. Second, they have more time to be affected by longer-lived radionuclides that clear slowly from the body; a newborn that ingests radioactive material in water might be subject to the effects of that radiation for a longer period of time than an adult.

Question 4: Did EPA consider any information from other countries when developing the drinking water PAG?

ED_001057_00009499

Answer: Yes. Japan used a very similar set of guides for infants on formula (near 100 mrem) and near 400 mrem for everyone else. This helped them prioritize the use of bottled water for the most sensitive population.

Question 5: FDA already has a PAG for food of 500 mrem. Why did EPA just publish a drinking water PAG of 500 mrem?

Answer: EPA's drinking water PAG is designed to limit risk due to radiological contamination of the drinking water supply. The FDA food PAG accounts for food ingestion and considers how water may be used in the preparation of some types of food products or how radionuclides transported through water might end up deposited in crops and ultimately enter the food supply (like milk or vegetables).

Because a radiological event may result in contamination of food, water, or both, a strict delineation between the two ingestion routes may not be straightforward. FDA and EPA PAGs and procedures are complementary and can be adapted to apply to the specifics of a given situation. Due to inherent differences in how the food and water supplies are protected, the intervention/response levels for food and water differ.

Question 6: What is the difference between the FDA Derived Intervention Levels (DILs) versus EPA's Derived Response Levels (DRLs)?

Answer: There are two things to understand about the relationship between the FDA DILs and EPA drinking water PAG; 1) They take water into account in different ways (food preparation vs. drinking water consumption) and 2) Decision makers can use both sets of guidance as appropriate for the specifics of the emergency at hand.

The FDA DILs were developed with a primary focus on responding to contamination events affecting the food supply. The EPA DRLs were developed with a primary focus on responding to contamination events affecting the drinking water supply. The FDA DILs include a water component in the calculations (as part of the total diet mass) even though it is not regulated by FDA. Correspondingly, the EPA DRL calculations used survey data about tap water usage which includes drinking water intake as well as water added to beverages, and water added to foods during preparation, but not water intrinsic in food as purchased. This allows the DIL and DRL calculations to account for the possibility that some ingestion contamination could come from the other ingestion route.

Question 7: Why is there a big difference in guidance for 15-year olds compared to 16-year olds? If my child just turned 16, I can't understand why he would be different from a 15-year old.

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Answer: EPA made projections about risks to adults and risks to the most sensitive populations resulting from exposure to radiation from drinking water. EPA evaluated six different age groups, including infants, 1, 5, 10, 15-year olds and adults. The adult age group is representative of organ size and intake rates for people from age 16 up, and conservative assumptions provide additional assurance that radiation doses will be kept low.

The PAGs provide guidance best on the best science available but the PAGs also give local responders the flexibility to decide whether protective actions should be extended to age groups other than those prescribed in the proposed drinking water PAG. Decisions to extend the protective actions to anyone under age 18 or apply a single number to an entire population, would be based on the particular conditions of each incident and would also have consider how such actions are implemented by local responders.

Question 8: I am pregnant and I don't feel like my unborn baby should be placed in the same category as a child at age 15. Did EPA consider a separate guidance for pregnant women?

Answer: Yes. EPA evaluated the different age groups for the radionuclides most likely to be released in a radiation incident and selected the most limiting concentration that would result in a 100 mrem annual dose. We found that this lower tier PAG applies to pregnant women to protect the fetus. This approach is conservative and protective of all sensitive populations (i.e., infants, 1, 5, and 10 year olds).

Question 9: Why wouldn't my water department give me bottled water immediately following a radiation event?

Answer: The EPA drinking water PAG is non-regulatory guidance to assist emergency management officials when making response plans. Options available to your water department for providing an alternate source of drinking water could include: bottled water, altering the source water (such as switching to ground water), interconnection between systems, or a combination of these actions.

Question 10: How does the EPA drinking water PAG for adults and infants compare to the drinking water emergency standards for adults and infants established by the Japanese government?

Answer: The Japanese adult drinking water emergency standard of 300 Bq/L corresponds to a dose of about 1 mrem/day, or 365 mrem over the course of a year (on the same order of magnitude as EPA's proposed PAG for the adult population), assuming a high-end default water ingestion rate of 2 L/day. Using the Japanese infant drinking water emergency standard of 100 Bq/L, an infant is exposed to an average of 100 Bq/L of I-131 in drinking water from birth until the age of 1, and consumes an average of 0.2 L/day over the course of the year, the dose is 134

mrem/yr.

Question 11: Did EPA consider only one option when developing the drinking water PAG?

Answer: No. EPA considered the following options:

> ***Option #1 Do nothing:*** local governments or states may develop individual PAG levels, or EPA will need to create one after an incident occurs. Experience has shown that local governments often rely on EPA advice when making decisions regarding the safe use of drinking water after contamination incidents. Radiation protection decisions are almost always based on federal guidance in some form. Affected federal entities (e.g., effected military personnel) would need federal guidance.
>
> ***Option #2 Use the SDWA MCL (4 mrem) as the level to provide an alternate source of drinking water:*** MCLs are not intended to inform 'do not drink' levels, in addition MCLs are based on the assumption of a 70 year exposure timeframe.
>
> **Option #3 Adopt DHS & FDA benchmarks**: 500 mrem from water for the first year after an incident (DHS covers water after a terrorist attack and FDA guide applies to food). This allows for consistency with guidance that is already in use and publicly available.
>
> **Option #4 Adapt benchmarks that have long-standing acceptance, and add additional protection for pregnant women and children:** 500 mrem for the general population and a lower dose level for children and pregnant women.

Question 12: What about the total dose I might incur if this water PAG is established?

Answer: EPA's PAGs are doses to be avoided, but, assuming a person receives all the doses we recommend to be avoided, that individual would still receive a dose in a range where no observable negative health effects exist.

- 1rem if not evacuated
- (5 rem thyroid dose if not given KI – but this is not a whole body dose)
- 2 rem first year + 0.5 rem second year if not relocated
- 0.5 rem from food if no local embargoes are warranted
- 0.5 rem from water if no alternative water source is warranted
- additional residual dose on the way to cleanup goals.
- All of which adds up to less than 5 rem, which is in a range where no observable negative health effects exist. It also happens to be the routine annual radiation dose limit for radiation workers and is assumed to be a once (or never!) in a lifetime event for any of us.

ED_001057_00009499

To: DeCair, Sara[DeCair.Sara@epa.gov]
Cc: White, Rick[White.Rick@epa.gov]
From: Nesky, Anthony
Sent: Mon 6/8/2015 8:08:15 PM
Subject: Comments/edits on PAG Q&As
Q&A Document 5-27-2015 Sara cmts-tnedits.docx

See attached.

To: Nesky, Anthony[Nesky.Tony@epa.gov]
Cc: DeCair, Sara[DeCair.Sara@epa.gov]
From: Wieder, Jessica
Sent: Wed 6/3/2015 5:39:18 PM
Subject: Water PAG Talking Point

Going through Helen's old material and I liked how she word this:

The PAGs in no way impact or affect regulatory drinking water standards, which exist to protect public health on a day-to-day basis.

Jessica Wieder

U.S. EPA

Radiation Protection Program

Center for Radiation Information and Outreach

w: 202-343-9201

c: 202-420-9353

To: Perrin, Alan[Perrin.Alan@epa.gov]; Schultheisz, Daniel[Schultheisz.Daniel@epa.gov]; Peake, Tom[Peake.Tom@epa.gov]; Veal, Lee[Veal.Lee@epa.gov]; Boyd, Mike[Boyd.Mike@epa.gov]; Littleton, Brian[Littleton.Brian@epa.gov]; Wieder, Jessica[Wieder.Jessica@epa.gov]; DeCair, Sara[DeCair.Sara@epa.gov]
From: Edwards, Jonathan
Sent: Mon 6/1/2015 9:55:49 PM
Subject: RE: Possible meeting with NEI?

Connie Anders retirement party is supposed to be that day so scheduling something early afternoon is probably better than late afternoon. --Jon

From: Perrin, Alan
Sent: Monday, June 01, 2015 9:52 AM
To: Schultheisz, Daniel; Edwards, Jonathan; Peake, Tom; Veal, Lee; Boyd, Mike; Littleton, Brian; Wieder, Jessica; DeCair, Sara
Subject: RE: Possible meeting with NEI?

Right now, afternoon of the 24th looks good for Jon and me. MF is currently open from 2-3 that day.

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
ofc (202) 343-9775 | mbl (202) 279-0376

From: Schultheisz, Daniel
Sent: Monday, June 01, 2015 9:10 AM
To: Edwards, Jonathan; Perrin, Alan; Peake, Tom; Veal, Lee; Boyd, Mike; Littleton, Brian; Wieder, Jessica; DeCair, Sara
Subject: Possible meeting with NEI?

Some of you may know that Ralph Andersen from NEI will be retiring this summer. RPD has worked with Ralph on a number of issues over the years, and I think you all have interacted with him to some extent. He is interested in meeting with us to go over status on some of our and their efforts, as well as to bring some colleagues who will be taking on some of those responsibilities. He's suggested June 24 as a possible date, so I'm starting from there. Topics might include, but not be limited to, revision of part 190, PAGs, dosimetry issues (e.g., Federal Guidance and/or

NRC's part 20 revision), and ER exercises/communications.

It would be nice if Mike were available for at least a short time, but I don't think we should try to make that a priority.

Please let me know if that date seems workable, if there are other dates that will work better, and other topics/people who will need to be involved. Thanks.

To: DeCair, Sara[DeCair.Sara@epa.gov]
From: Lee, Raymond
Sent: Wed 5/27/2015 4:25:06 PM
Subject: RE: FR std lingo and docket question
nonrulefrtemp-comm12-20-06 (1).doc
proposedruletemplate_03-25-15.docx

Hi Sara,

So I'm attaching two FR templates for you, directly from the intranet site/ADP library. The first (which I believe is the one you're going for) is a non-rulemaking notice that is soliciting comment. That one is still the same from when you issued your proposed guidance.

However, if you/OW are treating this like a proposed rule, then you would go with the second attachment, which is brand new template language from March 2015.

Let me know if you have any questions!

Thanks,

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@

From: DeCair, Sara
Sent: Wednesday, May 27, 2015 11:27 AM
To: Lee, Raymond
Subject: RE: FR std lingo and docket question

Hi Ray,

Just checking – is there new boilerplate lingo I should be using on this FR Notice of Availability? I'm just at ODs and then AAs level review now, so I want to show them the entire package as I imagine it getting approved and signed! It's a lofty dream, I know…

Sara

From: Lee, Raymond
Sent: Wednesday, May 13, 2015 10:34 AM
To: DeCair, Sara
Subject: Re: FR std lingo and docket question

Hi Sara,

If we're going to keep this under the same reg. entry (which I believe we discussed and you told me we were), then I believe we should keep that same docket #. :)

I'll look into the new FR template language. I don't remember seeing it but the my reg. contacts should know.

Thanks!

Ray

Sent by EPA Wireless E-mail Services

From: DeCair, Sara
Sent: Wednesday, May 13, 2015 8:55 AM
To: Lee, Raymond
Subject: FR std lingo and docket question

Ray,

I've attached an FR notice us and OW are working on, to issue a drinking water PAG proposal (to later be dropped into a finalized PAG Manual, one day far far off……..) Anyway, even though this is coming out with an OW AA signature, should it have the same OAR docket number? It is related, so I think so.

They also said OP just said there is new boilerplate lingo for FR notices. Do you have that?

Thanks tons!

S.

Sara D. DeCair

http://www.epa.gov/radiation/rert/pags.html

202-343-9108

Room 1416 B in WJC West