ADVANCED BURNER TECHNOLOGIES

271 Route 202/206
P.O. Box 410
Pluckemin, NJ 07978
P 908.470.0470
F 908.470.0479
www.advancedburner.com

Mr. Garry Christensen
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

February 28, 2006

Subject: Intermountain Unit 2
Quotation for Parts No. Q05017

Dear Garry,

Following is our quotation for additional pipe brick for the elbows:

Quantity	Description	Price
400	1 inch thick pipe brick, 9 inches long by 2.5 inch nominal width, suitable to repair segmented elbows. Bricks are trimmed to a 6 degree 26 minute side angle to provide a self-supporting key arch attachment. Bricks will need to be fit in the field. A kit of Blome #2 bedding cement, consisting of 5 gallons of liquid and 2 - 50 pound bags of powder, and one 10 inch diameter, continuous rim diamond impregnated masonry blade for cutting the bricks, are included also.	$5,795

Delivery will be approximately 4 weeks after receipt of order. This price includes freight to your plant, and is valid for 30 days. However, the price does not include taxes. Terms of payment are net 30 days.

We look forward to hearing from you.

Very truly yours,

Tom Shults

Tom Shults
Project Manager

xc: Joel Vatsky, Sal Ferrara, Tarkel Larson

IP7020885

ADVANCED BURNER TECHNOLOGIES

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Mr. Garry Christensen
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

February 28, 2006

Subject: Intermountain Unit 2
Quotation for Parts No. Q05017-Revised

Dear Garry,

Following is our revised quotation for additional pipe brick for the elbows, per today's discussion:

Quantity	Description	Price
1 Lot	400 - 1 inch thick pipe brick, 9 inches long by 2.5 inch nominal width, suitable to repair segmented elbows. Bricks are trimmed to a 6 degree 26 minute side angle to provide a self-supporting key arch attachment. Bricks will need to be fit in the field. A kit of Blome #2 bedding cement, consisting of four, 5 gallon containers of liquid and eight, 50 pound bags of powder, and four 10 inch diameter, continuous rim diamond impregnated masonry blade for cutting the bricks, are included also. This quantity of Blome bedding cement and the four saw blades should be adequate for setting approximately 1,500 bricks.	$6,890

Delivery will be approximately 4 weeks after receipt of order. This price includes freight to your plant, and is valid for 30 days. However, the price does not include taxes. Terms of payment are net 30 days.

We look forward to hearing from you.

Tom Shults

Tom Shults
Project Manager

xc: Joel Vatsky, Sal Ferrara, Tarkel Larson

IP7020886

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P 908.470.0470
F 908.470.0479
www.advancedburner.com

Mr. Garry Christensen
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

December 2, 2005

Subject: Intermountain Unit 2
Quotation for Parts No. Q05017

Dear Garry,

Following is our quotation for parts, as you requested:

Quantity	Description	Price
288	Burner tip segment wear liners made of cast stainless steel. Quantity is adequate for 48 burners. Price includes bedding cement.	$107,100
6	Ceramic lined elbows, complete with removable flatback and X-Vane assembly. A rod out hole will be provided but not located on the burner centerline since the vane elements will be centered. X-Vane assembly incorporates 1/8 inch thick brazed sintered tungsten carbide tiles on the heaviest wear areas of the vane edges, with Chrome Carbide weld overlay on areas of lesser wear, and Alumina tiles on the vane wear surfaces except sintered silicon carbide lining will be used on the horizontal face where maximum wear has been observed. A spool piece is included to replace the existing horizontal fuel distributor spool. Included with this package are diffuser elements with downstream erosion protection sleeve for fuel injectors. Diffuser elements are made of Nitride Bonded Silicon Carbide segments attached to a carbon steel shell for simple installation into the existing fuel injector barrel. The erosion protection sleeve is made of two 180 degree segments of AR400 plate two feet long to be welded into the fuel injector barrel to avoid erosion of the barrel.	$146,400

IP7020887

6	X-Vane spool assemblies incorporating protective measures on the vanes as outlined above. No rod out hole will be provided and the vane elements will be centered in the pipe per ABT standard. The diffuser and erosion protection sleeves for the fuel injectors, as described above, are included in this package also.	$103,700

Delivery will be approximately 16 weeks after receipt of order. These prices are valid for 30 days, due to volatility in the metals market, and do not include taxes. Terms of payment are net 30 days.

We look forward to hearing from you.

Very truly yours,

Tom Shults

Tom Shults
Project Manager

xc: Joel Vatsky, Sal Ferrara, Tarkel Larson

IP7020888

ADVANCED BURNER TECHNOLOGIES

271 Route 202/206
P.O. Box 410
Pluckemin, NJ 07978
P 908.470.0470
F 908.470.0479
www.advancedburner.com

Mr. Garry Christensen
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

December 7, 2005

Subject: Intermountain Unit 2
Quotation for Parts No. Q05017
Erosion Liners

Dear Garry,

Following is our quotation for erosion liners, as you requested:

Quantity	Description	Price
48	Fuel injector erosion liners for 48 burners, provided in two 180 degree rolled segments two feet long, made of ¼ inch thick AR400 plate. These will provide erosion protection on the inside of the fuel injector barrel. (These liners do not cover the entire length of the burner barrel.)	$51,850

Delivery will be 8 to 10 weeks after receipt of order. These prices are valid for 30 days, due to volatility in the metals market, and do not include taxes. Terms of payment are net 30 days.

Please let us know if we can help further.

Very truly yours,

Tom Shults

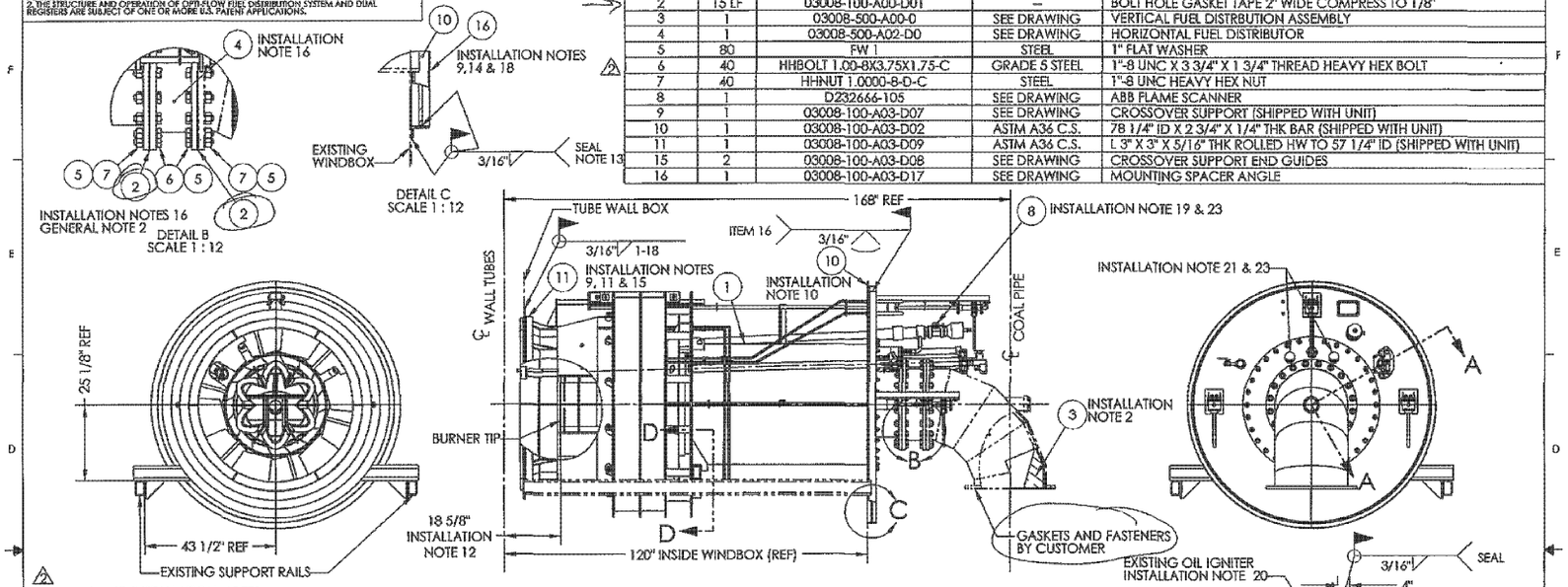
Tom Shults
Project Manager

xc: Joel Vatsky, Sal Ferrara, Tarkel Larson

IP7020889

DISCLOSURE NOTICES:
1. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ADVANCED BURNER TECHNOLOGIES. ANY REPRODUCTION IN PART OR IN WHOLE WITHOUT THE WRITTEN PERMISSION OF ADVANCED BURNER TECHNOLOGIES IS PROHIBITED.
2. THE STRUCTURE AND OPERATION OF OPTI-FLOW FUEL DISTRIBUTION SYSTEM AND DUAL REGISTERS ARE SUBJECT OF ONE OR MORE U.S. PATENT APPLICATIONS.

ITEM NO.	QTY.	PART NUMBER	MATERIAL	DESCRIPTION
1	1	03008-100-A03-D0	SEE DRAWING	BURNER SHOP ASSEMBLY
2	15 LF	03008-100-A00-D01	–	BOLT HOLE GASKET TAPE 2" WIDE COMPRESS TO 1/8"
3	1	03008-500-A00-0	SEE DRAWING	VERTICAL FUEL DISTRBUTION ASSEMBLY
4	1	03008-500-A02-D0	SEE DRAWING	HORIZONTAL FUEL DISTRIBUTOR
5	80	FW 1	STEEL	1" FLAT WASHER
6	40	HHBOLT 1.00-8X3.75X1.75-C	GRADE 5 STEEL	1"-8 UNC X 3 3/4" X 1 3/4" THREAD HEAVY HEX BOLT
7	40	HHNUT 1.0000-8-D-C	STEEL	1"-8 UNC HEAVY HEX NUT
8	1	D232666-105	SEE DRAWING	ABB FLAME SCANNER
9	1	03008-100-A03-D07	SEE DRAWING	CROSSOVER SUPPORT (SHIPPED WITH UNIT)
10	1	03008-100-A03-D02	ASTM A36 C.S.	78 1/4" ID X 2 3/4" X 1/4" THK BAR (SHIPPED WITH UNIT)
11	1	03008-100-A03-D09	ASTM A36 C.S.	L 3" X 3" X 5/16" THK ROLLED HW TO 57 1/4" ID (SHIPPED WITH UNIT)
15	2	03008-100-A03-D08	SEE DRAWING	CROSSOVER SUPPORT END GUIDES
16	1	03008-100-A03-D17	SEE DRAWING	MOUNTING SPACER ANGLE

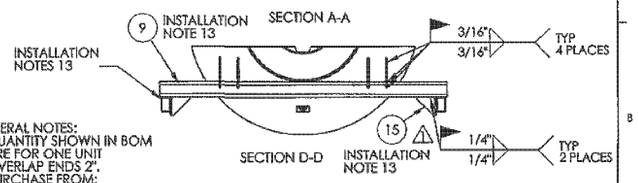


REMOVAL AND INSTALLATION NOTES:

THE FOLLOWING INSTRUCTIONS ARE SUGGESTIONS. THE SEQUENCE MAY BE MODIFIED TO ACCOMIDATE WORK FLOW, EQUIPMENT AVAILABLE, AND SKILL LEVELS OF THE WORKMEN.

UNLESS NOTED OTHERWISE ALL WELDS ARE CARBON STEEL TO CARBON STEEL.

1. REMOVE ELBOW
2. INSTALL VFD ITEM 3 (VERTICAL FUEL DISTRIBUTOR) PER DRAWING 03008-500-A03-0 IN EXISTING ELBOW
3. DISCONNECT SEAL AIR PIPING, OIL, AIR LINES AND ALL ELECTRICAL LEADS
4. REMOVE EXISTING SCANNERS, DISCARD.
5. REMOVE EXISTING OIL IGNITER AND SET ASIDE FOR REUSE
6. REMOVE INSULATION AND LAGGING AROUND EXISTING BURNER FRONT PLATE
7. REMOVE EXISTING BURNER AND DISCARD
8. REFERENCE B&W DRAWING 294359E, REMOVE ITEM E AND GRIND WELDS FLUSH TO THE EXISTING CASING WELD RING.
9. BREAK TACK WELDS OF SUPPORT RING, ITEM 10 AND SEAL RING ITEM 11
10. DISCARD ITEM 10 (ROLLED RING) AND REPLACE WITH NEW ANGLE RING ITEM 16, SHIPPED SEPERATLY.
11. INSTALL NEW BURNER. SEE DRAWING 03008-100-A01-FW AND 03008-100-A01-RW FOR BURNER LOCATION AND SPIN. ITEM 11 SHOULD BE KEPT IN POSITION ON THE TIP.
12. CENTER BURNER IN FURNACE WALL OPENING AND LEVEL AND PLUMB BURNER. LOCATE TIP PER SIDE VIEW.
13. INSTALL BURNER CROSSOVER SUPPORT ITEM 9 (03008-100-A03-D07) AND SUPPORT END GUIDES ITEM 15 (03008-100-A03-D08), CENTER ITEM 15 ON ITEM 9 TUBING, WELD AS SHOWN IN SECTION D-D. SHIM TO FIT TO EXISTING SUPPORT RAILS. COMPETE WELDING PER SECTION D-D.
14. LOCATE MOUNTING SPACER, ITEM 16, AGAINST WINDBOX WALL. TACK WELD TO WINDBOX AND BURNER FRONT PLATE
15. CENTER ITEM 11 ON THE TIP, AND TACK IN PLACE TO THE EXISTING CASING WELD RING
16. INSTALL COAL ELBOW & HORIZONTAL FUEL DISTRIBUTOR ASSEMBLY PER DETAIL B.
17. THE BURNER CAN BE MOVED UP TO 1/4" IN ANY DIRECTION TO FIT UP WITH THE EXISTING COAL PIPE ATTACHMENT.
18. FINISH WELDING FRONT PLATE AND SUPPORT RING IN PLACE SEE DETAIL "C".
19. INSTALL FLAME SCANNER PER ABB DRAWING:
    902-2491-AA
    STNRD-B232666-107
    STNRD-D232665-025
    STNRD-D232677-002
    STNRD-00-D623232-000-001
20. INSTALL OIL IGNITER PER THIS DRAWING AND B&W DRAWING 294359E
21. INSTALL T/C LEADS PER MANUFACTURERS INSTRUCTIONS.
22. MAKE ALL OIL AND AIR CONNECTIONS.
23. MAKE ALL ELECTRICAL CONNECTIONS FOR THERMOCOUPLES, AND MAIN FLAME SCANNER.
24. INSULATE AND LAG BURNER FRONT
25. STROKE ALL OPERATORS TO MAKE SURE THAT THEY FULLY OPEN AND CLOSE WITH NO BINDING.
26. AFTER DRAFT FANS HAVE BEEN STARTED CAREFULLY TIGHTEN ALL PACKING GLANDS TO STOP ANY LEAKS AROUND SHAFTS (DO NOT OVER TIGHTEN). RECHECK ALL OPERATORS FOR MOVEMENT.



GENERAL NOTES:
1. QUANTITY SHOWN IN BOM ARE FOR ONE UNIT
2. OVERLAP ENDS 2".
   PURCHASE FROM:
   HUNTER SALES CORP
   3338 INDUSTRIAL BLVD.
   BETHEL PARK, PA
   412-833-4333
3. REFERENCE DRAWINGS
   000-100-HANDLING

REV.	DATE	DESCRIPTION	BY
2	2/13/2004	REVISED NOTES AND CHANGED BOLT SIZE	RJ
1	1/26/2004	ADDED ITEM 15	RJ

REVISION

	NAME	DATE
DRAWN	RJ	1/15/2004
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

ADVANCED BURNER TECHNOLOGIES

OPTI-FLOW BURNER
IGS UNIT 2
FIELD ASSEMBLY

SIZE C | DWG. NO. 03008-100-A02-D0 | REV 2
SCALE 1:24 | SHEET 1 OF 1

TOLERANCES UNLESS SPECIFIED

	MACHINED PARTS	WELD FABRICATED PARTS
UP TO 6" INCL.	±0.015"	±0.03"
OVER 6" TO 12" INCL.	±0.02"	±0.05"
OVER 12" TO 24" INC.	±0.03"	±0.09"
OVER 24"	±0.06"	±0.125"

ANGLES ±0.50°
SURFACE ROUGHNESS NOT EXCEED 125
BREAK SHARP CORNERS
DO NOT SCALE PRINT

EST. WEIGHT: 8901.61 lb.
MATERIAL:
SIZE:
TYPE:
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

CONTRACT NO	PART NO.	QTY.
A03008	03008-100-A02-D0 CW	24
A03008	03008-100-A02-D0 CCW	24

CUSTOMER NAME	PLANT NAME	UNIT	
I.P.S.C.	IGS	2	

IP7020890

IP7020891

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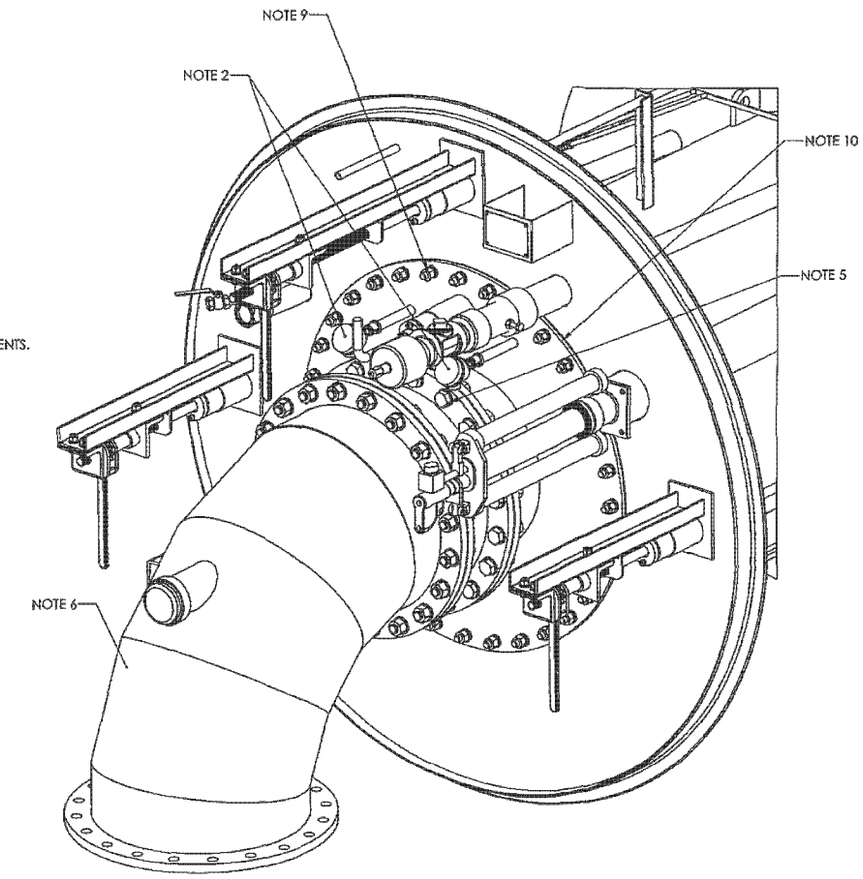
2. THE STRUCTURE AND OPERATION OF OPTI-FLOW FUEL DISTRIBUTION SYSTEM AND DUAL REGISTERS ARE SUBJECT OF ONE OR MORE U.S. PATENT APPLICATIONS.

CONTRACTOR IS TO ENSURE THAT ALL AFFECTED EQUIPMENT IS LOCKED AND TAGGED OUT IN ACCORDANCE WITH CURRENT PLANT PROCEDURES BEFORE ANY WORK COMMENCES.

FOLLOWING IS A SUGGESTED SEQUENCE OF EVENTS FOR THE REMOVAL OF THIS EQUIPMENT. THE SEQUENCE MAY BE VARIED, PROVIDING ALL OF THE REMOVAL CRITERIA ARE MET. FOR REINSTALLATION FOLLOW INSTRUCTIONS IN REVERSE ORDER.

1. MATCH MARK ALL PARTS THAT ARE TO BE REMOVED.
2. DISCONNECT ELECTRICAL CONNECTIONS TO THERMOCOUPLES.
3. SUPPORT COAL PIPE TO PREVENT MOVEMENT UPON DISASSEMBLY.
4. SUPPORT COAL ELBOW PRIOR TO ANY DISASSEMBLY OF COAL PIPING OR ELBOW.
5. REMOVE ALL BOLTS, NUTS AND WASHERS ON INLET AND OUTLET OF COAL ELBOW AND SAVE FOR REUSE. HORIZONTAL FUEL DISTRIBUTOR SHALL REMAIN CONNECTED TO THE ELBOW.
6. REMOVE COAL ELBOW.
7. REMOVE ELBOW GASKETS AND CLEAN GASKET SURFACES.
8. SUPPORT FUEL INJECTOR PRIOR TO ANY DISASSEMBLY FROM THE BURNER.
9. REMOVE ALL NUTS AND WASHERS HOLDING THE FUEL INJECTOR IN PLACE, SAVE FOR REUSE.
10. CAREFULLY REMOVE THE FUEL INJECTOR. SUPPORT THE FUEL INJECTOR AT ALL TIMES. MAKE SURE THAT THE FUEL INJECTOR DOES NOT HANG UP ON ANY BURNER COMPONENTS.
11. PERFORM THE MODIFICATIONS TO THE FUEL INJECTOR.
12. REINSTALL THE FUEL INJECTOR BY REVERSING THE REMOVAL PROCEDURE. USE MATCH MARKS TO ALIGN ALL COMPONENTS BEING REINSTALLED. INSTALL NEW GASKET TAPE ON THE ELBOW AND FUEL INJECTOR FLANGES.



CONTRACT NO.	PART NO.	QTY.

EST. WEIGHT:
MATERIAL:
SIZE:
TYPE:
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
CUSTOMER NAME: I.P.S.C.

TOLERANCES UNLESS SPECIFIED

	MACHINE PARTS	WELD FABRICATED PARTS
UP TO 6" INCL.	±0.016"	±0.06"
OVER 6" TO 12" INCL.	±0.03"	±0.06"
OVER 12" TO 24" INCL.	±0.05"	±0.09"
OVER 24"	±0.06"	±0.125"

ANGLES ±0° 30'
SURFACE ROUGHNESS NOT EXCEED 125
BREAK SHARP CORNERS
DO NOT SCALE PRINT

PLANT NAME: IGS
UNIT: 2

CAD GENERATED DRAWING
DO NOT MANUALLY UPDATE

	NAME	DATE
DRAWN	RJ	3/23/2006
CHECKED	ABP	3/23/2006
ENG APPR.		
MFG APPR.		
Q.A.		

ADVANCED BURNER TECHNOLOGIES

OPTI-FLOW BURNER
FUEL INJECTOR
REMOVAL INSTRUCTIONS

SIZE: C
DWG. NO.: 05013-100-A01-0
REV: 0
SCALE: 1:8
SHEET 1 OF 1

IP7020892

ADVANCED BURNER TECHNOLOGIES TECHNICAL SPECIFICATION	000-100-HANDLING HANDLING REQUIREMENTS

1.0 GENERAL STATEMENT

This Specification defines the procedures and requirements for handling the equipment furnished by Advanced Burner Technologies

2.0 Description of Work

2.1 Following is a brief description of the methods required to handle components furnished and manufactured by Advanced Burner Technologies.

The components supplied by Advanced Burner Technologies are typical of power plant equipment and do not require special care or procedures.

Personnel experienced with this type of equipment should be employed to unload and to move the hardware within the power plant. Large components, such as complete burner modules, will be equipped with lifting lugs, but can be handled with non-metallic slings. Tight hitches should be avoided.

2.1.1 Burner Components
Use lifting lugs when supplied, otherwise use non-metallic straps for handling. Keep slings away from the sliding sleeve damper, linkages, and actuator rods.

2.1.2 Ducts & windboxes
Lifting lugs can be field welded to duct or windbox components. Care should be exercised in handling these components since they are large, unwieldy and can be heavy.

2.1.3 Water wall panels
Water wall panels will be equipped with lifting lugs.

Prevent damage to the tube caps during handling in the storage yard.

2.2 Equipment supplied by Advanced Burner Technologies, but designed and manufactured by others.

This includes such items as igniters, flow elements, transmitters, control panels, fuel trains, and blower skids. These items should be handled with care. Instructions will be provided by the specific equipment designer.

IP7020893

ABT Time line

Nov 30, 2006

Sep 16, 2003

Contract Awarded to ABT	Burners	$2,237,415.00
	Installation	$1,616,800.00

Nov 12, 2003

Addendum to existing contract	253 MA material upgrade	$ 40,800.00
	Coal flow divider, X-vane spool	$ 40,800.00
	Air flow measurement components	$ 35,220.00

March 2004
Installation of new ABT burners

April-May 2004
Startup and testing of ABT burners

Feb 16,2005
Unit 2 short outage fireside burner inspection - minor cracking observed

June 5, 2005
Burner F4 fire - burner isolated

July 2005
New replacement burner purchase from ABT $107,150.00

Sept 6, 2005
IPSC letter to ABT - Dissatisfaction with ABT Opti-flow Burners

Sep 26, 2005
ABT letter to IPSC - response to letter of Sept 6, 2005.

October 15, 2005
F row elbows pulled - erosion issues on burner tips and coal pipes observed

October 18, 2005
F row inspection pictures and report sent to ABT email Dean Wood to Sal Ferrara

Nov 1, 2005
Conference call with ABT and IPSC personnel over burner issues

Nov 1, 2005
IPSC letter to ABT, Invitation to Visit IGS to Inspect Failing Burners

Nov 5, 2005
Unit off for repairs, G2 and D2 elbows pulled.

Nov 7, 2005
New replacement burner for F4 arrived on-site

Dec 2005 - Jan 2006
Purchase from ABT - burner tip segment liners/diffuser/liner assembly in lieu of erosion liners $199,100.00

Feb 22, 2006
Email from Tom Shults (ABT) to Garry Christensen (IPSC)
IPSC pressure drop concerns - ABT agreement to remove kicker in elbow

Feb 28, 2006
Purchase from ABT - lot of ceramic brick $ 7,050.00

March 31, 2006 to April 29, 2006
Unit 2 extended outage - AP&F burner repair work release plus IPSC I&C work $282,219.64

April 4, 2006
Purchase from ABT - 6 cast SS throat segments $ 3,660.00

April 10, 2006
ABT Letter to IPSC - response to outage photos

April 12, 2006
Purchase from Power Industrial - Two 309 SS burner tips $ 4,570.00

April 17, 2006
ABT representative site visit - Tarkel Larsen

April 19, 2006
ABT Letter - Recommended Test Program regarding Burner Overheating

April 24, 2006
IPSC Letter to ABT - Request for Repair of Intermountain Generating Station Unit 2 Burners

May 6, 2006
ABT Letter to IPSC - Subject: Intermountain Generating Station Unit 2 Low Nox Burners, Contract 04-45606 IPSC April 24, 2006 Letter

July 31, 2006

IPSC Letter to ABT - Intermountain Generating Station Unit 2 Low NOx Burners Contract 04-45606: Response to ABT Letter Dated May 9, 2006

Aug 16, 2006

ABT Letter to IPSC - Intermountain Generating Station Unit 2 Low NOx Burners, Ref: Response to IPSC Letter Dated July 31, 2006

Nov 9, 2006

Site visit meeting ABT with IPSC - ABT Proposed Settlement

BLOME CEMENTS COMPANY

1450 Hoff Industrial Drive
O'Fallon, MO 63366
(314)379-9119 Fax (314)379-0366
www.blome.com E-Mail: blome@att.net

BLOME CEMENTS COMPANY
1450 Hoff Industrial Drive
O'Fallon, MO 63366
(314) 379-9119

For emergencies involving a spill, leak, fire, exposure or accident call CHEMTREC 1-800-424-9300

PRODUCT NAME: BLOME NUMBER 2 POWDER
DATE PREPARED: July 1998
Page 1 of 2

**********Section I - Product Identification**********

Ingredient	OSHA PEL	ACGIH TLV
Silicon Dioxide (CAS# 14808-60-7)	0.1 mg/m3	0.1 mg/m3 (respirable dust)
Sodium Silicofluoride* (CAS#016893-85-9)	PEL TWA 8 hours 2.5 mg/m3 Fluoride as F OSHA TLV TWA 8 hours 2.5 mg/m3 Fluoride as F ACGIH	
Sodium Bentonite (CAS#1302-78-9)	OSHA permissable exposure Limit 4 mg/m3(total dust) 1.5 mg/m3 (respirable dust)	

*Contains 60% Fluorine (F) equivalent by weight, NIOSH
Recommendation is 2.5 mg/m3 TWA 10 hours Fluorides as F

**********Section II - Physical Data**********

Boiling Point:	Silica 4046 degrees F	Specific Gravity:	2.65
Vapor Pressure:	not applicable	Melting Point:	not applicable
Vapor Density:	not applicable	Evaporation rate:	not applicable
Solubility in water:	Sodium Silicofluoride 0.75% @ 75 degrees F		
Appearance & Odor:	Off white powder with an earthen odor.		

**********Section III - Fire & Explosion Hazard Data**********

Flash Point: none	Flammable Limits: not applicable
Extinguishing media:	None required; sand may be used as extinguishing media.
Special Firefighting Procedures:	not applicable
Unusual fire & explosion hazards:	Sodium Silicofluoride forms highly toxic Na20, HF and F fumes in a fire.

**********Section IV - Reactivity Data**********

Stability: stable Conditions to Avoid: none
Incompatibility: Contact with powerful oxidizing agents such as fluorine, chlorine, trifluoride and oxygen fluoride.

IP7020897

BLOME CEMENTS COMPANY

1450 Hoff Industrial Drive
O'Fallon, MO 63366
(314)379-9119 Fax (314)379 0388
www.blome.com E-Mail: blome@att.net

PRODUCT NAME: BLOME NUMBER 2 POWDER
DATE PREPARED: July 1998

Hazardous Decomposition: Silica will dissolve in hydrofluoric acid and produce tetrafluoride - a corrosive gas.

Hazardous Polymerization: Will not occur Conditions to Avoid: none

**********Section V - Reactivity Data**********

Health Hazards: Excessive inhalation of dust may result in respiratory disease, including silicosis, *pneumoconiosis & pulmonary fibrosis*. The IARC has evaluated in Volume 42, Monographs on the Evaluation of the Carcinogenicity Risk of Chemicals to Humans, Silica and Some Silicates (1987), that there is "sufficient evidence for the carcinogenicity of crystalline silica to experimental animals" and "limited evidence" with respect to humans.

Carcinogenicity: NTP? Yes (respirable Crystalline Silica)
IARC Monographs? Yes Level 2A Grouping
OSHA Regulated? No

Signs & Symptoms of exposure: Symptoms of excessive exposure include shortness of breath & reduced pulmonary function. This inert material gives no potential acute toxic hazard.

Medical Conditions Generally Aggravated By Exposure: Individuals with pulmonary and/or respiratory disease, including, but not limited to, asthma & bronchitis, or subject to eye irritation, should be precluded from exposure.

Emergency & First Aid Procedures: Eyes - flush with running water. Gross Inhalation - remove to fresh air. Give oxygen with artificial respiration as needed. Seek medical attention for treatment, observation and support as needed.

**********Section VI - Precautions for Safe Handling and Use**********

Steps to be Taken in Case Material is Released or Spilled: Use dustless methods and place into closable container for disposal or flush with water. Do not dry sweep. Wear protective equipment as specified.

Waste Disposal Method: Dispose of in accordance with federal, state and local regulations.

Precautions to Be Taken in Handling and Storing: Avoid breakage of bagged material or spills of bulk material.

Other Precautions: Use adequate ventilation and dust collection

**********Section VII - Control Measures**********

Respiratory Protection: see attached chart
Ventilation: see attached chart
Protective Gloves: Impervious
Eye Protection: Safety Glasses
Other Protective Clothing or Equipment: Standard work clothes & have safety shower available
Work/Hygenic Practices: Wash with soap & water before eating, drinking or smoking

INFORMATION HEREIN IS GIVEN IN GOOD FAITH AS VALID, HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, CAN BE MADE.

BLOME CEMENTS COMPANY

1450 Hoff Industrial Drive
O'Fallon, MO 63366
(314)379-9119 Fax (314)379-0388
www.blome.com E-Mail: blome@att.net

BLOME CEMENTS COMPANY
1450 Hoff Industrial Drive
O'Fallon, MO 63366
(636) 379-9119

For emergencies involving a spill, leak, fire, exposure or accident call CHEMTREC 1-800-424-9300

PRODUCT NAME: BLOME NUMBER 2 LIQUID
DATE PREPARED: July 1996

**********Section I - Product Identification**********

Ingredient (CAS#)	OSHA PEL	ACGIH TLV
Sodium Silicate Solution (1344-09-8, 7732-18-5)	no data available	TLV not established

**********Section II - Physical Data**********

Boiling Point:	not applicable	Specific Gravity:	1.3 - 1.5
Vapor Pressure:	not applicable	Melting Point:	not applicable
Vapor Density:	not applicable	Evaporation rate:	not applicable
Solubility in water:	Complete		
Appearance & Odor:	Viscous liquid, colorless to hazy, odorless.		

**********Section III - Fire & Explosion Hazard Data**********

Flash Point: none — Flammable Limits: not applicable
Extinguishing media: not applicable
Special Firefighting Procedures: not applicable
Unusual fire & explosion hazards: not applicable

**********Section IV - Reactivity Data**********

Stability: stable — Conditions to Avoid: Flammable hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead and zinc.
Incompatibility: Gels when mixed with acids.
Hazardous Decomposition: Hydrogen
Hazardous Polymerization: Will not occur — Conditions to Avoid: none

**********Section V - Health Hazard Data**********

Health Hazards: Spray mist may damage respiratory tract. Also causes irritation to the skin and if it is ingested
Carcinogenicity: NTP? NO
IARC Monographs? NO
OSHA Regulated? No
Signs & Symptoms of exposure: Irritating to eyes and skin and also if ingested.
Medical Conditions Generally Aggravated By Exposure: none known
Emergency & First Aid Procedures: Eyes - flush with running water for at least 15 minutes. Call a physician. Skin - wash with soap and warm water.

BLOME CEMENTS COMPANY

1450 Hoff Industrial Drive
O'Fallon, MO 63366
(314)379-9119 Fax (314)379-0388
www.blome.com E-Mail: blome@att.net

PRODUCT NAME: BLOME NUMBER 2 LIQUID
DATE PREPARED: July 1996

**********Section VI - Precautions for Safe Handling and Use**********

Steps to be Taken In Case Material is Released or Spilled: High ph if undiluted or unneutralized. Small quantities: mop up and flush to sewer with plenty of water. Large quantities: isolate, dike and store discharged material if possible. Otherwise, disperse & flush with water. Observe environmental protection regulations.

Waste Disposal Method: Neutralize with dilute acid & use approved disposal & use approved disposal facility for solids. Flush neutral liquid to sewer with water.
Precautions to Be Taken in Handling and Storing. Avoid contact with eyes, skin and clothing.
Other Precautions: none

**********Section VII - Control Measures**********

Respiratory Protection: use NIOSH approved mist respirator where spray occurs.
Ventilation: not applicable
Protective Gloves: Rubber
Eye Protection: Chemical goggles and face shieldOther
Protective Clothing or Equipment. Standard work clothes & have safety shower available
Work/Hygenic Practices: Wash with soap & water before eating, drinking or smoking

INFORMATION HEREIN IS GIVEN IN GOOD FAITH AS VALID, HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, CAN BE MADE.

CP-2
Silicate Brick Mortar

PRODUCT DESCRIPTION
Blome CP-2 is a two component silicate based mortar used for the installation of abrasion and chemical resistant brick and tile linings. Blome CP-2 exhibits the required handling and curing characteristics for successful installation of dense alumina ceramic and basalt tile linings in coal piping and other abrasive dry service systems. Blome CP-2 withstands temperatures up to 1,800°F and is resistant to dilute acids found in sulfur bearing coals and other abrasive media.

TYPICAL USES
Blome CP-2 is suitable for bonding abrasion resistant alumina ceramic and basalt tile in a variety of applications including:
Pulverized Coal Piping Systems
High Temperature Abrasion Resistant Tile Linings
Hot exhaust gas applications

HANDLING CHARACTERISTICS
Blome CP-2 offers superior trowelling and handling characteristics, with sufficient body and thixotropy to bed tile in place and secure them from slipping or sliding while the mortar cures. The material utilizes a unique chemical hardening system that cures behind dense abrasion resistant tile installations and provides an adequate bond for the installation of these linings. This combination of handling, curing and performance properties has made Blome CP-2 the worldwide standard for installation of ceramic and basalt linings in high temperature service.

TYPICAL PROPERTIES
WET
Components: Two (2) - powder & liquid
Wet mortar density: 112 lbs./ft^3
Mixed consistency: Creamy mortar
Pot life: 50°F 60 minutes
77°F 45 minutes
Initial set: 50°F 12 hours
77°F 6 hours
Final cure 50°F 5 days minimum
77°F 3 days minimum

IP7020901

CURED
Blome CP-2 Complies with ASTM C-466
Bond Strength to brick (ASTM C-321) 190 psi
Coefficient of Thermal Expansion (ASTM C-531) 7.0 x 10_{-6} in/in/$_{o}$F
Color Off white/gray
Compressive Strength (ASTM C-579) 2,200 – 3,000 psi
Flexural Strength (ASTM C-580) 1,400 – 1,600 psi
Recommended pH for use 0.0 – 6.0
Temperature limit 1,800°F
Tensile Strength (ASTM C-307) 300 psi

PACKAGING & STORAGE
Blome CP-2 is supplied as a two component product, with a filler powder and a liquid binder solution. CP-2 Powder (Part A) is packaged in 50 lb. bags and CP-2 Liquid is packaged in 50 lb. pails or 600 lb. drums. The use ratio of Powder to Liquid is 2.5 pbw to 1.0 pbw.

Unit Size 350 lbs.
Powder (Part A) 250 lbs. (5 x 50 lb. bags)
Liquid (Part B) 100 lbs. (2 x 50 lb. pail)

Shelf life for CP-2 components is one (1) year. Keep CP-2 Powder and Liquid tightly sealed in original containers until ready for use. Store Powder and Liquid in a cool, dry place, on pallets at temperatures between 50°F – 90°F. Protect CP-2 Liquid from freezing. If Liquid does freeze, thaw frozen material back to a liquid solution and then thoroughly remix prior to use, as settling will occur during the thawing procedure. It is important to completely remix thawed liquid to achieve a uniform solution for use.

ESTIMATED COVERAGE
Typical coverage when using Blome CP-2 for the installation of abrasion resistant tile linings is approximately two (2) pounds of mixed mortar per square foot of tile installation. This includes sufficient material for bed joint and vertical joints between the tile or brick. This is an estimated coverage rate and does not allow for waste, bed joint variation or other job site contingencies.

BID SPECIFICATION GUIDE
Use Blome CP-2 Silicate Brick Mortar as manufactured by Blome International, O'Fallon, MO.

IP7020902

JOB SITE ENVIRONMENTAL CONDITIONS

Blome CP-2 must be applied while ambient temperatures are between 50°F and 90°F. CP-2 components, brick, tile and substrate temperatures must also be maintained in this range. It is critical that installations of CP-2 be protected from water and weather during installation and curing. Once cured, Blome CP-2 offers little or no resistance to neutral water solutions. Therefore, completed linings installed with CP-2 must be protected from water and weather, even after curing. Lined fabrications using CP-2 as the bedding mortar must be kept dry during fab shop storage, during shipment and while in storage at the end user facility, until the fabrications are put into service.

SURFACE PREPARATION

Brick and tile linings installed with Blome CP-2 should be installed over clean, blasted and oil free steel substrates. Steel substrates should be abrasive blasted to achieve a commercial blast profile. Brick and tile to be installed with Blome CP-2 must be clean, dry and oil free. If brick or tile has been frozen, they must be thawed completely and allowed to dry prior to installation with Blome CP-2.

SAFETY PRECAUTIONS

Blome CP-2 Powder, Liquid and mixes of them present various health hazards if handled improperly. CP-2 Powder contains silica dust and CP-2 Liquid is an alkaline solution that will severely burn eyes and irritate skin. Wear respirator suitable for silica dust, safety glasses with side shields, gloves and long sleeve shirts to prevent all contact with skin and eyes. After working with Blome CP-2, wash thoroughly before eating, drinking, smoking or other activities.

APPLICATION EQUIPMENT

Blome CP-2 is best mixed with a KOL, pail type mixer or in a pail using a drill motor driven paddle blade. This mixing equipment must be clean, dry and free of any contaminants including Portland Cement, other mortars, resins, etc. When mixed, CP-2 is applied to brick, tile & substrate with a pointing or margin trowel.

MIXING AND APPLICATION

Add approximately 2.5 parts by weight CP-2 Powder to 1.0 part by weight CP-2 Liquid. Mix components using a clean, dry mechanical mixer or trowel for a minimum of 2-3 minutes, making sure there are no lumps or dry pockets of powder. Using a clean, dry pointing or margin trowel, butter brick or tile evenly on 4 or 5 sides. Slide buttered brick or tile into place squeezing excess mortar from joints and striking off. Maximum mortar joint thickness should be 1/8".

CLEANUP

All tools, mixing equipment, gloves and application equipment should be cleaned up immediately using hot, soapy water. Any material that is allowed to cure prior to clean up should be chiseled or chipped off, then dirty items should be soaked in hot, soapy water overnight and then cleaned and dried.

IP7020903

WARRANTY

We warrant that our goods will conform to the description contained in the order and that we have good title to all goods sold. Our material data sheets and other literature are to be considered accurate and reliable, but are used as guides only. WE GIVE NO WARRANTY OR GUARANTEE, WHETHER OF MERCHANT ABILITY OR FITNESS OF PURPOSE OR OTHERWISE, AND WE ASSUME NO LIABILITY IN CONNECTION THEREWITH. We are happy to give suggestions for applications; however, the user assumes all risks and liabilities in connection therewith regardless of any suggestion, we may give. We assume no liability for consequential or incidental damages. Our liability, in law and equity, shall be expressly limited to the replacement of non-conforming goods at our factory, or at our sole option, to repayment of the purchase price of the non-conforming goods.

IP7020904

Advanced Wear Resistant Equipment, Inc.

4004 Forest Glen Dr. ~ Greensburg, Pennsylvania ~ 15601 ~ Phone: (724) 834-3345 ~ Fax: (815) 327-1387
Internet: www.advancedwear.com ~ e-mail: info@advancedwear.com

Fuel Distribution Deflector Installation Details

Reference Drawing 3008-500-A03-D0

The fuel distribution deflector is supplied as an assembly consisting of a silicon carbide wear resistant component attached to a steel deflector retainer. The following sequence should be used to install the deflector assembly

1. The existing ceramic in the mitered coal elbow should be removed in the area shown on ABT drawing 3008-500-A03-D0. Complete ceramic tile can be removed on the back bend (extrados) of the elbow. It is not necessary to remove the tiles on the inside of the bend (intrados)
    a. We assume that tiles have been installed with high temperature refractory cement like Blome #2. A chisel and hammer can be used to remove the tiles from the extrados of the elbow.
    b. Due to the original tile installation method, it may be necessary to remove a larger area than the size of the deflector.

2. Clean the area where the tile has been removed. A wire brush, wire wheel, and/or chisel are appropriate for this process. Clean to base metal to prevent any obstructions between the deflector retainer and tiles and the coal elbow

3. Use the deflector retainer as a template in the coal elbow. Make note of where the ceramic will need to be replaced around the retainer. Tiles will need to be installed to fill the gaps around retainer. The tiles provided have an appropriate side angle for the diameter of the coal elbow. The length of the tiles will need to be diamond cut to fit the area to be filled around the retainer. Cut tiles to measured lengths using a wet masonry saw and a 10" diameter continuous rim diamond blade. It is suggested that the cut tiles be match marked to the coal elbow used for measurement.

4. Mix the Blome #2 per the attached instructions. Butter the back and sides of the tiles. The back of the tiles are wider than the width of tile exposed to the ID of the coal elbow. Install the buttered tiles in the elbow. Each tile should be squeezed in as close as possible to the adjacent tile to provide the key-arch mechanical attachment. The tiles should also be squeezed against the ID of the coal elbow.

5. The last tile to be installed may need to be diamond cut along the length of the tile to complete the key-arch. Measure the width of the opening and cut the tile to fit. If the width measured is less than ½ the width of the uncut tile, cut two tiles to fit the opening in order to avoid one thin key tile.

6. Install the deflector assembly per ABT instructions on 03008-500-A01-0.

7. Repeat for each coal elbow.

From: Dean Wood
To: Garry Christensen
Date: 5/22/2006 12:41:43 PM
Subject: Fwd: RE: The remaining pictures

>>> "Sal Ferrara" <sal@advancedburner.com> 10/28 8:25 AM >>>
Thanks Garry.
The entire fuel injector assembly can be unbolted from the burner cover plate and removed as one piece (with inner zone damper and fixed vane spinner attached. We will provide our recommendations and an arrangement drawing for discussion on design for upgrading fuel injector & elbow design to a longer wear life. The pictures and descriptions you provided are very helpful in that respect.

In response to Dean's phone question yesterday morning, the fuel injector was designed based on the OEM Mill "Present Curve" (see email attachment) for full load, with one mill out of service. Based on the curve the burner design point is 62 MCFM PA flow @ 102 MLB/hr coal flow. Operating at higher flow rates than designed will result both in degrading performance as well as increase wear.
Sal

-----Original Message-----
From: Garry Christensen [mailto:Garry-C@ipsc.com]
Sent: Thursday, October 27, 2005 5:33 PM
To: sal@advancedburner.com
Subject: The remaining pictures

Sorry about that, the remaining pictures are attached. Are the nozzles replaceable and if so can they be removed with the tip attached? Also, what other components need to be unattached?

We do want you to look into a ceramic lined coal barrell/nozzle with a different engineered tip. ie less angle and modification of the X-vane. I hope you will be able to come out soon and sit down and discuss the issues so we can come up with a game plan and get needed parts/new equipment in time for April's outage.

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From: "Tom Shults" <Tom@advancedburner.com>
To: "Garry Christensen" <Garry-C@ipsc.com>
Date: 1/31/2006 7:53:00 AM
Subject: Intermountain - Diffuser Field Installation Drg

Hello Garry. Attached is the field installation drg, 05013-240-A06-0 Rev 0, and the corresponding transmittal, for your use. Pls advise if there are any questions.

Best regards.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

From: "Tom Shults" <Tom@advancedburner.com>
To: "Garry Christensen" <Garry-C@ipsc.com>, <Alan-D@ipsc.com>
Date: 2/28/2006 3:05:03 PM
Subject: Intermountain - Revised Quotation for Pipe Brick per our Telecon Today

Garry and Alan, attached is a revised quotation reflecting the increased amount of CP-2 bedding cement and saw blades necessary for all 1500 pipe bricks (those you have on hand already and those we propose to supply). We have attached some information on the Blome CP-2 bedding cement for your information, as well.

Let me know asap how you would like to proceed.

Thanks.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

From: "Tom Shults" <Tom@advancedburner.com>
To: "Garry Christensen" <Garry-C@ipsc.com>
Date: 2/27/2006 8:41:33 AM
Subject: Intermountain - Vertical Fuel Distributor

Good morning Garry. Attached are the vertical fuel distributor drawing and the associated transmittal. Let me know if you have any questions.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

From: "Tom Shults" <Tom@advancedburner.com>
To: <Garry-C@ipsc.com>, <Dean-W@ipsc.com>
Date: 12/5/2005 9:01:35 AM
Subject: Intermountain Burner Nozzle Liner Installation Drg

Good morning. The attached drg will provide some input on the liner installation. Call if questions.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

From: "Tom Shults" <Tom@advancedburner.com>
To: <Garry-C@ipsc.com>
Date: 1/27/2006 2:44:45 PM
Subject: Intermountain Gaskets on Burners

Hi Garry. On the attached drg, do you actually use the bolt hole tape, item 2, on the two joints shown in detail B, and for the coal pipe to elbow gasket as circled on the drg? If you don't use the tape, what do you use?

Thanks.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

From: "Tom Shults" <Tom@advancedburner.com>
To: <jerry-f@ipsc.com>
Date: 2/6/2006 3:08:18 PM
Subject: Intermountain Thermocouples

Hello Jerry.

There has been a good deal of communication about the thermocouple design used on our burners at your plant. We recognize that you are concerned about the TCs themselves as well as the thermocouple pipes. Here we will address only the issue of the design of the thermocouples, focusing especially those used on the replacement burner provided recently.

Recently, we have used two designs for thermocouple attachment on our projects: the one provided for the retrofit burners and the recent replacement burner (Method A), and the design shown in attached drg ST-8866B (Method B). Both Method A and Method B are spring loaded, and if properly installed, will keep the TC tip bottomed out. Advantages and disadvantages for both are listed below.

Method A
>Advantages
-Head is rigidly attached to TC sheath by the shop allowing head to be used to push TC into TC pipe. (We thought this to be especially important with the curved TC pipes.)
-Head is wired in the shop to terminals inside the head.
>Disadvantages
-Head is supported by 1/2 inch sheath extension beyond screwed fittings. (This is a bigger problem with smaller diameter sheaths like those provided for the original retrofit burners.)

Method B
>Advantages
-Head supported on TC pipe after completion of installation.
>Disadvantages
-Must push TC into TC pipe with tools (pliers or the like) by grabbing the sheath.
-Head installation and wiring of head must be done in the field.

This information is provided to you for your understanding of why we supplied the TCs as we did only. If you have any additional information you would like to provide to us, please do so. For future TCs provided by ABT, we will ask for your preference, and supply accordingly. Further, we will continue our investigations regarding the use of straight thermocouple pipes, and larger diameter TCs for the 47 burners with small diameter TC pipes as promised previously, and respond to you upon completion of the reviews. In the meantime, please contact us if you have any questions or comments. We welcome your input.

Thanks.

Tom

Thomas (Tom) W. Shults, PE

Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

CC: "Sal Ferrara" <sal@advancedburner.com>, "Garry Christensen" <Garry-C@ipsc.com>, "Dean Wood" <Dean-W@ipsc.com>

From: "Tom Shults" <Tom@advancedburner.com>
To: "Garry Christensen" <Garry-C@ipsc.com>, <Alan-D@ipsc.com>
Date: 2/28/2006 8:34:23 AM
Subject: Intermountain Tiles for Elbows

Hello Garry and Alan. We put our heads together and concluded that perhaps the tiles you have on hand would be very close to the number you need. Therefore, we thought that it might be wise to have some spares, so we attached a quotation for 400 spare tiles, bedding cement, and a circular saw blade. We would need to move quickly on these bricks since it will take 4 weeks to get them to the plant.

Just a thought: did you use tile (pipe brick) when you installed the VFDs, or refractory?

Let me know if you want the bricks, or if we can help further.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

From: "Tom Shults" <Tom@advancedburner.com>
To: <Garry-C@ipsc.com>
Date: 12/2/2005 3:59:21 PM
Subject: Intermountain Unit 2 Quote for Replacement Parts

Hello Garry. Attached is our quotation for replacement parts, as discussed with you at the recent meeting. If you have any questions, pls give me a call.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

CC: "Sal Ferrara" <sal@advancedburner.com>, <Dean-W@ipsc.com>

From: "Tom Shults" <Tom@advancedburner.com>
To: <Garry-C@ipsc.com>
Date: 1/23/2006 4:09:56 PM
Subject: Intermountain Diffuser/Erosion Liner Assemblies

Hello Garry. Please read the attached letter and let us know what you think.

Thanks.

Tom

Thomas (Tom) W. Shults, PE
Project Manager
Advanced Burner Technologies
271 Route 202/206
PO Box 410
Pluckemin, NJ 07978
tom@advancedburner.com
Phone: 908 212 0573
Fax: 908 470 0479

POWER & INDUSTRIAL SERVICES CORPORATION
95 Washington Street, P.O. Box 211, Donora, PA 15033

724-379-4477
800-676-7116
Fax 724-379-4408
www.piburners.com

QUOTATION **August 9, 2006** **P&I Q06-0444B Rev. 2**

Intermountain Power Agency
Intermountain Power Project

Code: IPPIPP

Attention: Garry Christensen
Will Lovell

Phone: 435-864-6486
Fax: 435-864-6670
Email: garry-c@ipsc.com
william-l@ipsc.com

Subject: **Replacement Coal Nozzles, Tips Conical Diffusers & Coal Deflectors Intermountain Power Project, Unit 2**

Power & Industrial Services is pleased to present the following quotation. The prices quoted reflect the current price of Nickel, a major component in Heat Resistant Castings and Stainless Steel Alloy. See "Nickel Prices" below:

Item	Qty.	Description	P&I Part Number	Unit Price
1	48	Coal Nozzles, 21" ID x 121-3/8" OAL, complete with the following: • A36 22.75" OD x 3/8" wall Nozzle Body with a 1" thick Mounting Flange, 30" OD with (20) Twenty 1.125" Drilled Holes equally spaced on 27.5" • ½" Thick Pre-Engineered Alumina Ceramic Lining extending 75.375" Into the Nozzle Body • Centrifugally Cast PI-2000 Heat and Abrasion Resistant Tip.21.875' OD x 21" ID x 46" Long Delivery: 12-14 Weeks	TBD	$7250.00
2	48	Tip, Coal Nozzle; 21.875' OD x 21" ID x 40" Long Centrifugally Cast PI-2000 Heat and Abrasion Resistant Tip with one beveled end and one square end. Delivery: 8-10 Weeks	TBD	$3870.00
3	48	Conical Diffuser, for 21" ID Coal Nozzles, cast of Nitride Bonded Silicon Carbide (NBSC) and complete with U-Clips necessary for installation. Delivery: 18-20 Weeks	23-2265-A	$1225.00
4	48	Coal Deflector, for 21" ID Coal Nozzles, cast of Nitride Bonded Silicon Carbide (NBSC) and complete with dovetail mounting hardware and high temperature packing necessary for	2-4420-A	$360.00

		installation. Delivery: 18-20 Weeks		
5	48	Seal Plate, Coal Nozzle Wind Box; 28" OD x 22.75" ID x 3/8" Thick complete with (8) eight ½" Diameter Drilled Holes equally spaced on a 26" BC and split in two halves. Delivery: 6-8 Weeks	2-5365-D11	$250.00

Delivery **As Noted Above**
FOB: **SPFC; Shipping Point Freight Collect**
Terms: **Net 30 Days**

Nickel Prices
Due to the unstable price of nickel alloy, extended firm pricing of high-grade nickel based heat resistant alloy can no longer be offered. Firm pricing will be offered at the time of purchase and fixed through the shipping date.

Until prices become more stable we recommend that your purchase be made within 15 days of our quotation date.

After 15 Days, prices will be adjusted at the time of order

Sincerely yours,

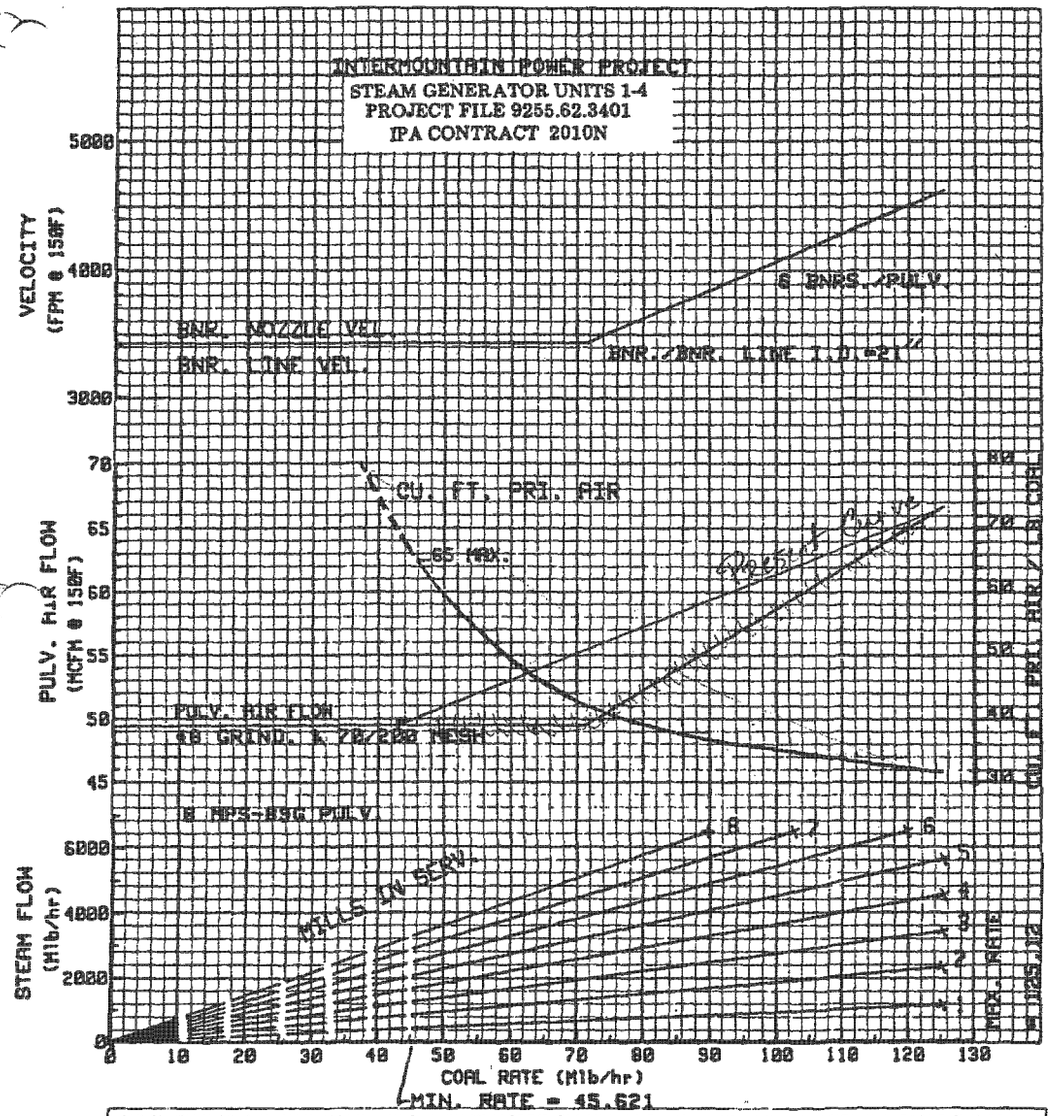
Lawrence G. Shekell

Lawrence G. Shekell

PG 896-4

Babcock & Wilcox

CONTRACT INFORMATION SHEET



THESE CURVES ARE SUBMITTED FOR THE PURCHASER'S CONVENIENCE AND THE PERFORMANCE INDICATED THEREON SHALL NOT BE OFFERED BY THE COMPANY OR CONSTRUED BY THE PURCHASER AS A PROPOSAL OR CONTRACT OBLIGATION.

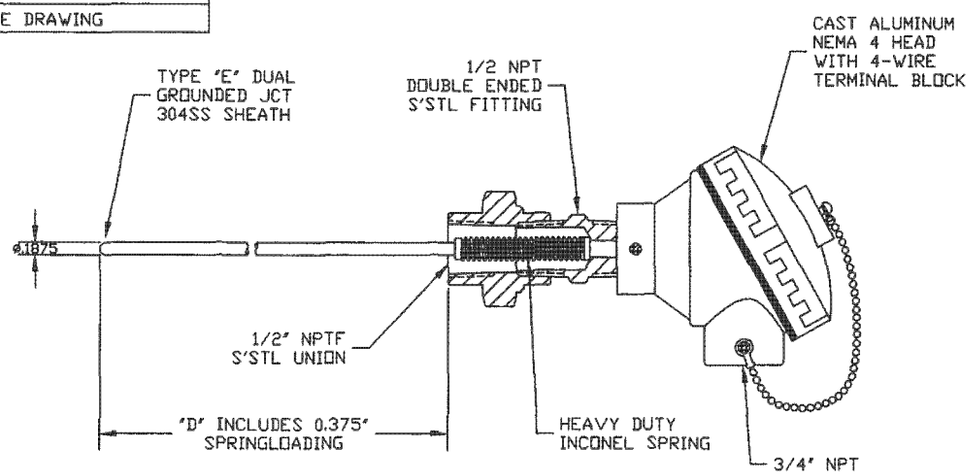
DRAWN BY	DATE	APPROVED BY	DATE	A.O.
J. NEIDERT	2-1-82	RBW	2-5-82	
REL. NO. AND DATE 1 9-8-82		CONTRACT NO. 334-0614	FILE NO. RB-614	

TITLE – PULVERIZER-BURNER COORDINATION CURVES - COAL (B)

CIS– 101.05

IP7020919

ACAD DWG NO MANUAL REVISIONS
INTERPRET PER ANSI Y14.5
DO NOT SCALE DRAWING



THIS PORTION PAINTED WITH VHT HIGH-TEMP PAINT
BLUE FOR ITEMS 1 & 2
GREEN FOR ITEMS 3 & 4

NO SPECIAL INSTRUCTIONS FOR INSTALLATION.
PUSH T/C INTO TUBE AND TIGHTEN UNION.
3/16 MIC WILL BEND EASILY TO FIT NOZZLE.

Item No.	Qty Required	Drawing No.	Item Description	"A" Dim.	"D" Dim
1	32	05006-240-A00-D21	Front Wall Nozzle	45.594	76.98
2	24	05006-240-A00-D21	Rear Wall Nozzle	21.594	52.98
3	16	05006-240-A00-D22	Front Wall Body	27.469	41.513
4	12	05006-240-A00-D22	Rear Wall Body	3.469	17.513

THIRD ANGLE PROJECTION

REV.	DESCRIPTION	BY	DATE

TEMP-PRO INC.
200 INDUSTRIAL DRIVE
NORTHAMPTON, MA 01060
PHONE: (413) 584-3165
FAX: (413) 586-3625

MATERIAL: THERMOCOUPLE ASM
FINISH:
DWN: T.CARROLL
DATE: 2/02/06
SCALE:
CHECKED:
APP'D:
TOLERANCES UNLESS OTHERWISE NOTED: DECIMAL ± 0.010 FRACTION ± 1/32 ANGLE ± 2° SURFACE SMOOTHNESS 63
CAD FILENAME: ST8866B
ST-8866B-[ ]

REV. ST-8866B-[ ]

IP7020920

From: "Tom Shults" <Tom@advancedburner.com>
To: "Garry Christensen" <Garry-C@ipsc.com>
Date: 12/5/2005 10:25:33 AM
Subject: RE: Intermountain Burner Nozzle Liner Installation Drg

If this doesn't work, let me know.

-----Original Message-----
From: Garry Christensen [mailto:Garry-C@ipsc.com]
Sent: Monday, December 05, 2005 11:55 AM
To: Tom@advancedburner.com
Subject: RE: Intermountain Burner Nozzle Liner Installation Drg

A .TIF file is the best for me if you have the ability.

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From: "Tom Shults" <Tom@advancedburner.com>
To: "Garry Christensen" <Garry-C@ipsc.com>
Date: 12/7/2005 12:25:48 PM
Subject: RE: Request for Quote for Erosion Liners

Hi Garry. Attached is the quotation you requested. Call if questions.

Tom

-----Original Message-----
From: Garry Christensen [mailto:Garry-C@ipsc.com]
Sent: Wednesday, December 07, 2005 11:41 AM
To: Tom@advancedburner.com
Subject: Request for breakdown of quote

Tom, could you give a quote for the AR400 erosion protection sleeve to cover 48 burner barrels only (both halves). Is this 1/8" thick or 1/4"? Thanks

---

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CC: "Sal Ferrara" <sal@advancedburner.com>, <Dean-W@ipsc.com>

ADVANCED BURNER TECHNOLOGIES

271 Route 202/206
P.O. Box 410
Pluckemin, NJ 07978
P 908.470.0470
F 908.470.0479
www.advancedburner.com

Mr. Garry Christensen
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

January 23, 2006

Subject: Intermountain Unit 2
Quotation for Parts No. Q05017
Diffuser/Liner Assemblies in lieu of Erosion Liners

Dear Garry,

As I mentioned to Nancy Bennett, when she called to expedite last week, we have been designing a lower cost diffuser element that we can add to the erosion liners to form a diffuser/erosion liner assembly. The use of such an assembly will provide a number of benefits. The integral diffuser element will break up any coal ropes. This will improve performance and combustion by yielding a more uniform coal distribution at the tip. Further, the elimination of roping and the distribution of the coal throughout the flow will reduce the wear on the nozzle tips by reducing concentrated particle stream impingement.

We have provided a price for these assemblies below. The price is $40,112 higher than the price of the erosion liners alone. Please note that this price reflects our providing the diffuser elements to you at our cost only.

Quantity	Description	Price
48	Fuel injector diffuser/erosion liner assemblies for 48 burners, provided in two 180 degree rolled segments 30 inches long. The diffusers are made of 1/8 inch thick Chrome Carbide overlay on ¼ inch CS plate. The erosion liners are made of ¼ inch thick AR400 plate. ABT will provide sealant for the horizontal gaps upstream of the diffuser elements. Refer to installation drg 05013-240-A06-0 Rev 0, and the TIFF file of the isometric 03008-240-A04-0, attached.	$92,000

We will be able to deliver these diffuser/erosion liner assemblies, or the plain liners already purchased, in time for your outage. The price is valid for 30 days, due to volatility in the metals market, and it includes freight but does not include taxes. Terms of payment are net 30 days.

IP7020923

Please let us know how you wish to proceed by January 30, 2006.

Very truly yours,

Tom Shults

Tom Shults
Project Manager

xc: Joel Vatsky, Sal Ferrara, Tarkel Larson

IP7020924

ADVANCED BURNER TECHNOLOGIES

271 Route 202/206
P.O. Box 410
Pluckemin, NJ 07978
P 908.470.0470
F 908.470.0479
www.advancedburner.com

Mr. Garry Christensen
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

February 28, 2006

Subject: Intermountain Unit 2
Quotation for Parts No. Q05017-Revised

Dear Garry,

Following is our revised quotation for additional pipe brick for the elbows, per today's discussion:

Quantity	Description	Price
1 Lot	400 - 1 inch thick pipe brick, 9 inches long by 2.5 inch nominal width, suitable to repair segmented elbows. Bricks are trimmed to a 6 degree 26 minute side angle to provide a self-supporting key arch attachment. Bricks will need to be fit in the field. Two large kits of Blome #2 bedding cement, consisting in total of four, 5 gallon containers of liquid, and ten, 50 pound bags of powder. Four, 10 inch diameter, continuous rim diamond impregnated masonry blades for cutting the bricks are included also. This quantity of Blome bedding cement and the four saw blades should be adequate for setting approximately 1,500 bricks.	$7,050

Delivery will be approximately 4 weeks after receipt of order. This price includes freight to your plant, and is valid for 30 days. However, the price does not include taxes. Terms of payment are net 30 days.

We look forward to hearing from you.

Tom Shults

Tom Shults
Project Manager

xc: Joel Vatsky, Sal Ferrara, Tarkel Larson

IP7020925

ADVANCED BURNER TECHNOLOGIES

271 Route 202/206
P.O. Box 410
Pluckemin, NJ 07978
P 908.470.0470
F 908.470.0479
www.advancedburner.com

Mr. Garry Christensen, PE
Performance Engineer
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624-9546

April 10, 2006

Re: Intermountain Delta #1
Burners

Dear Garry:

Advanced Burner Technologies Corp has evaluated the photographs and information provided depicting the damage to the burners on Delta #1. It appears that all the damage is cracking on the upstream side of the coal nozzles, next to the carbon steel fuel barrel.

Last fall we were notified that the furnace end of the fuel barrel, upstream of the stainless steel nozzle, was being overheated and that this problem had occurred with the OEM burners that were replaced. IPSC had modified the OEM fuel barrels by adding a stainless steel section upstream of the nozzle. However, this information had never been provided to ABT, as discussed at our meeting last fall when Joel Vatsky and Sal Ferrara visited the station.

We believe the cause of the nozzle cracking is the overheating of the fuel barrel that causes excessive stress on the weld between the carbon steel barrel and tip casting. ABT has converted both B&W and Foster Wheeler boilers to this type of burner and we have never had a single nozzle failure; nor failure of any throat casting.

We have recently tested the burners on a 530MW, 24 burner, Foster Wheeler unit, that has been in service with essentially the same burner as at Delta #1. This unit has burner throats only slightly smaller than those at Delta #1: 49" vs 51" respectively. Since the FW burners had originally been equipped with thermocouples, we retained them on the ABT burners. A test has been run where we gradually closed the register sleeve dampers to fully closed while the burner barrel and tip temperatures were measured.

The result was that the tip temperatures remained well within the temperature limitation for the casting. However, the carbon steel barrel temperatures rose to over 900°F and would have caused the same damage seen at Delta if the sleeve damper was not opened slightly. This unit has been in service nearly two years and was recently inspected during an outage. The burner barrels and nozzles, as well as the throat rings, were in "like-new" condition.

The difference in control philosophy between FW and B&W means that on the former unit the sleeve dampers are remotely operated to control flow into the individual burners, whereas the

IP7020926

latter unit's sleeve dampers are manually controlled, with flow controlled by the compartmented windbox control dampers.

If those windbox dampers are not sufficiently opened, furnace gases will come too close to the burner parts and cause the type of damage seen on the Delta #1 burners.

ABT believes that insufficient secondary air flow when the burners are out of service is the cause of this damage. The fact that IPSC resolved the barrel overheating problem by replacing a section of carbon steel barrel with stainless steel, in the section that ABT measured with high temperatures when the air flow is insufficient, confirms our analysis.

We have already requested information from IPSC to evaluate the windbox dampers' controls and actuators to see if the dampers remain sufficiently open when the burners are out of service. After this information is received, we would like to discuss this matter further with you.

Very truly yours,

Tom Shults

Tom Shults, PE
Project Manager
Advanced Burner Technologies

C: Dean Wood, Joel Vatsky, Tarkel Larson, Sal Ferrara

IP7020927

ADVANCED BURNER TECHNOLOGIES
271 Route 202/206
P.O. Box 410
Pluckemin, New Jersey 07978
Phone: 908-470-0470; FAX: 908-470-0479

DRAWING TRANSMITTAL
A05013 INTERMOUNTAIN POWER
IPSC PO 06-51899
BURNER TIP LINERS AND FUEL INJECTOR DIFFUSERS

TO: GARRY CHRISTENSEN/IPSC **DATE: 1/31/2006**
FROM: TOM SHULTS/ABT
SUBJECT: FUEL INJECTOR DIFFUSER INSTALLATION DRG.

CODE	DRAWING NUMBER	REV	DRAWING TITLE
3	05013-240-A06-0	0	COAL DIFFUSER FIELD INSTALLATION

NOTES:
1. None.

CODE

1	FOR REVIEW	2	FOR ISSUE
3	FOR INFORMATION	4	FOR COMMENT
5	FOR MANUFACTURE	6	OTHER

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ADVANCED BURNER TECHNOLOGIES
271 Route 202/206
P.O. Box 410
Pluckemin, New Jersey 07978
Phone: 908-470-0470; FAX: 908-470-0479

DRAWING TRANSMITTAL
A05013 INTERMOUNTAIN POWER
IPSC PO 06-51899
BURNER TIP LINERS AND FUEL INJECTOR DIFFUSERS

TO: GARRY CHRISTENSEN/IPSC **DATE: 2/27/2006**
FROM: TOM SHULTS/ABT
SUBJECT: VERTICAL FUEL DISTRIBUTOR REMOVAL

CODE	DRAWING NUMBER	REV	DRAWING TITLE
3	05013-500-A03-0	0	Vertical Fuel Distributor Removal

NOTES:
1. None.

CODE

1	FOR REVIEW	2	FOR ISSUE
3	FOR INFORMATION	4	FOR COMMENT
5	FOR MANUFACTURE	6	OTHER

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ADVANCED BURNER TECHNOLOGIES
271 Route 202/206
P.O. Box 410
Pluckemin, New Jersey 07978
Phone: 908-470-0470; FAX: 908-470-0479

DRAWING TRANSMITTAL
A05013 INTERMOUNTAIN POWER
IPSC PO 06-51899 & 06-51583
BURNER TIP LINERS, FUEL INJECTOR DIFFUSERS, PIPE BRICK

TO: GARRY CHRISTENSEN/IPSC **DATE: 3/23/2006**
FROM: TOM SHULTS/ABT
SUBJECT: WEAR LINER INSTALLATION

CODE	DRAWING NUMBER	REV	DRAWING TITLE
6	05013-100-A01-0	0	Fuel Injector Removal Instructions
6	000-100-Handling	0	Handling Requirements

NOTES:
1. Drawings provided for your use in the removal of the fuel injectors, as requested.

CODE

1	FOR REVIEW	2	FOR ISSUE
3	FOR INFORMATION	4	FOR COMMENT
5	FOR MANUFACTURE	6	OTHER

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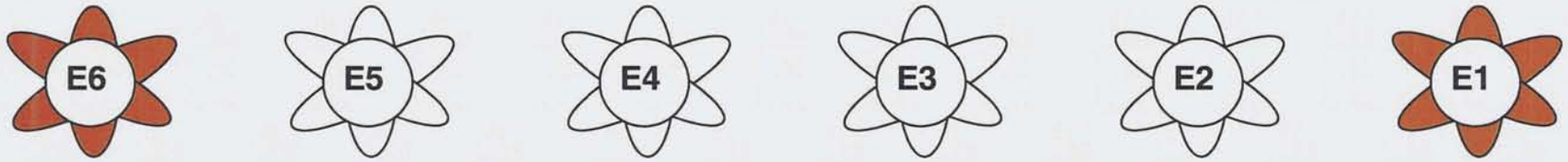
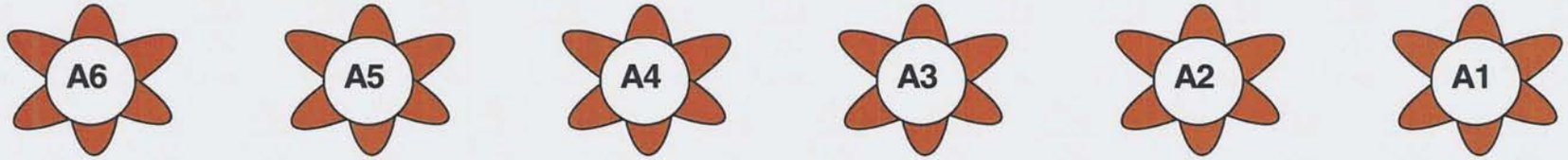
nozzles designated to pull for repairs 1st walk through. It was decided to pull and do all nozzles.

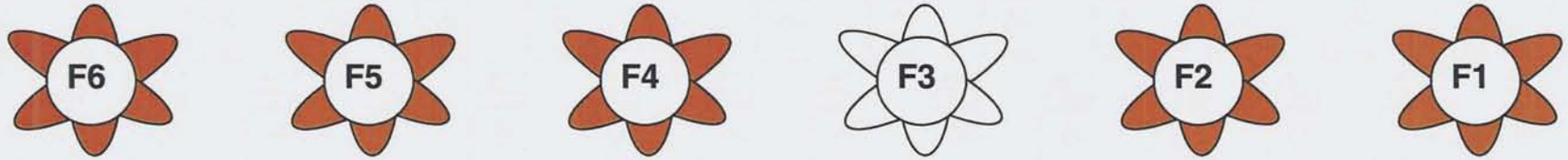
8th Floor



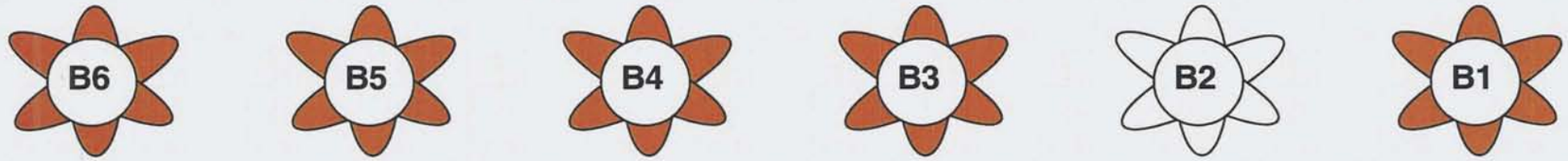
7th Floor



6th Floor



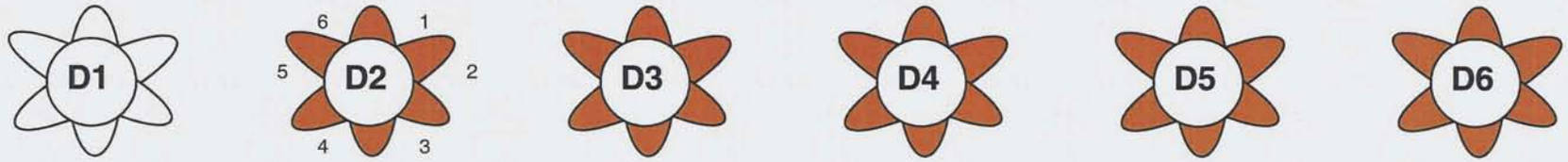
5th Floor



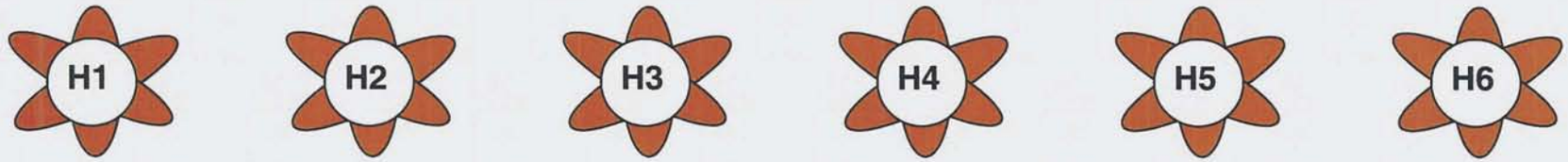
West Front wall looking North East

IP7020931

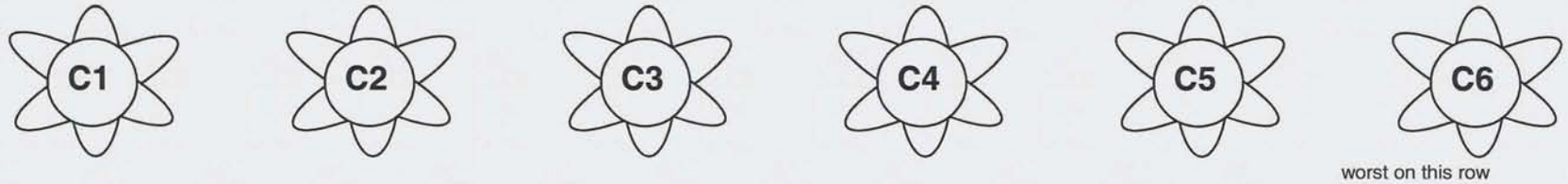
8th Floor



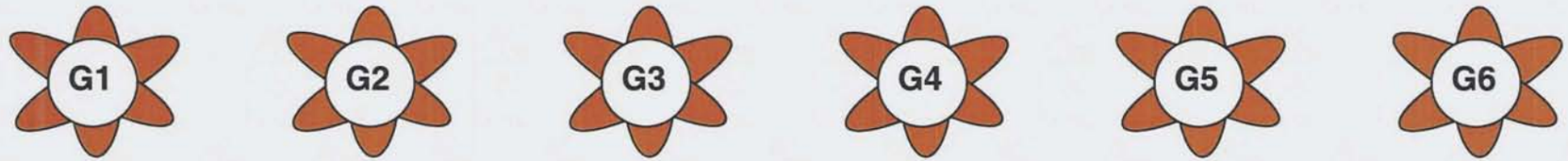
7th Floor



6th Floor



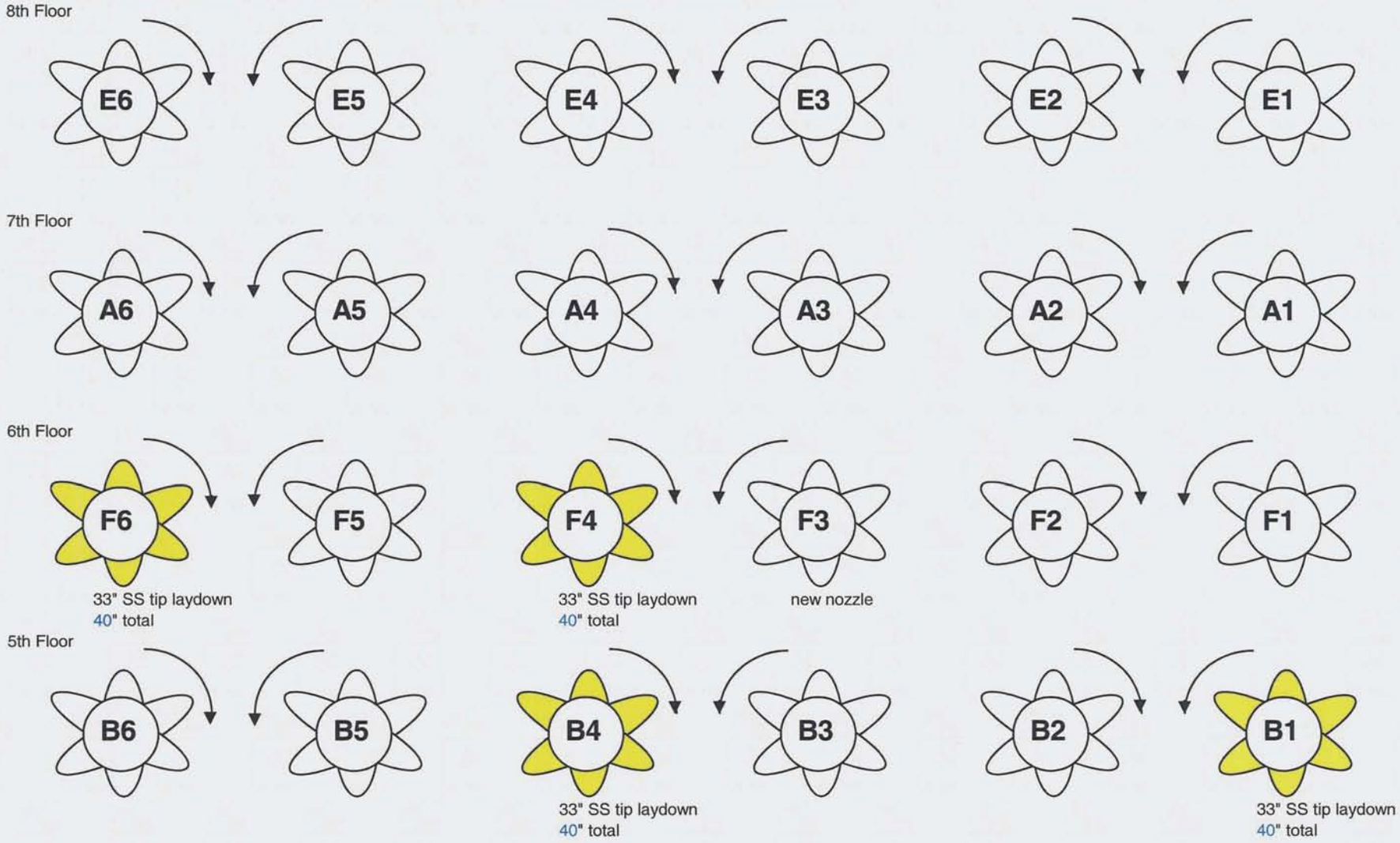
5th Floor



East Rear Wall Looking South West

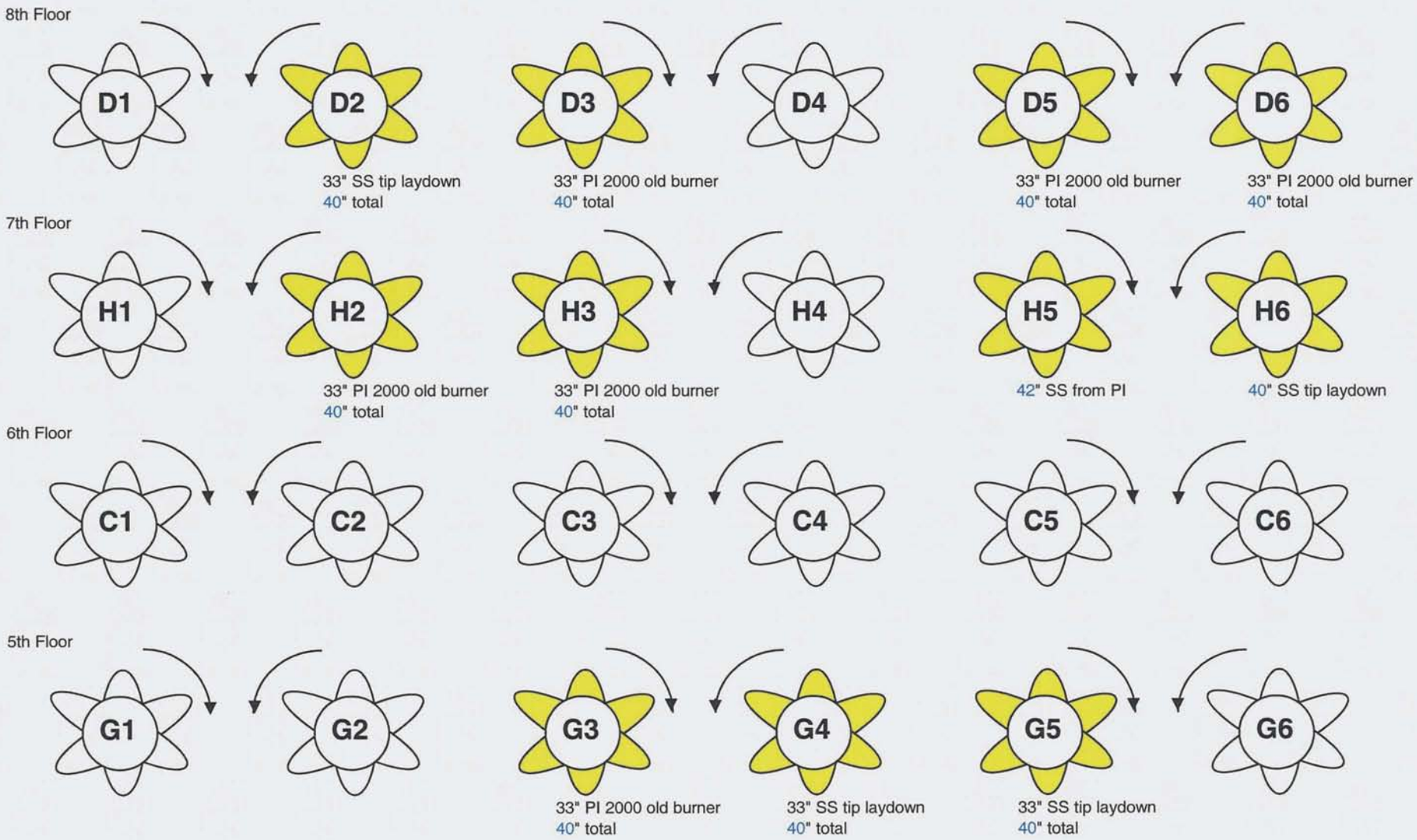
IP7020932

Tips removed and replaced designated in yellow, all others were repaired with segment wear liners on all 6 pedals.



West Front wall looking North (Tips to have air sleeve moved back.) Tip to be replaced East

IP70209 33



East Rear Wall Looking South (Tips to have air sleeve moved back) Tip to be replaced West

IP7020934

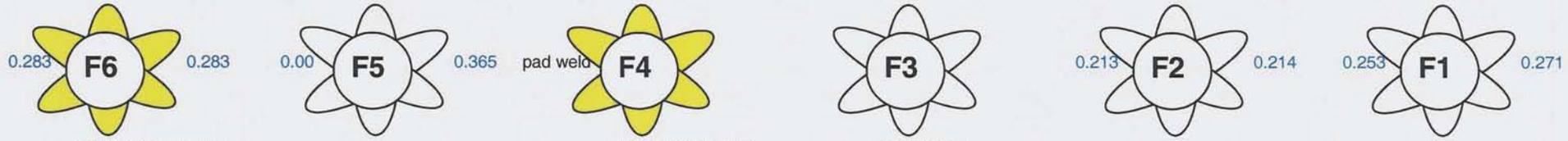
8th Floor

Erosion readings at 3 & 9 o'clock positions

Apr-06

7th Floor

6th Floor



33" SS tip laydown

33" SS tip laydown

new nozzle

5th Floor

33" SS tip laydown

33" SS tip laydown

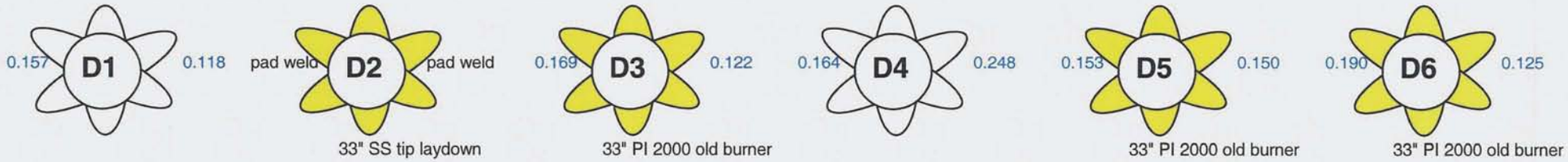
West

Front wall looking North Tips replaced Erosion Readings

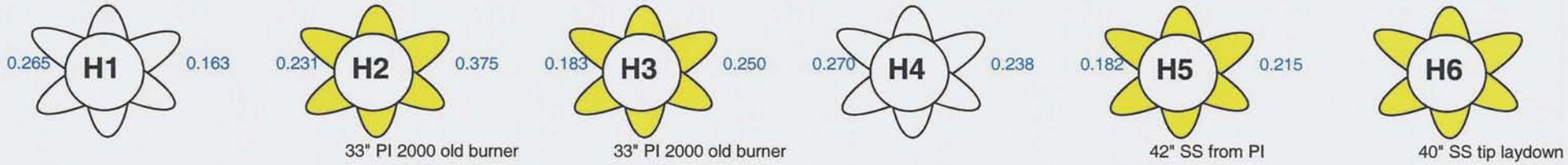
East

IP70209935

8th Floor

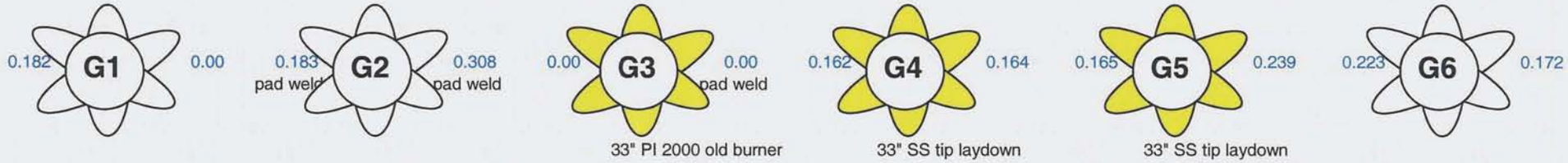


7th Floor



6th Floor

5th Floor



East Rear Wall Looking South Tips replaced Erosion Readings West

IP7020936

month

Apr-04	575	517	570	582	1091	761	561	572
	67	110	23	65	2	20		35
		33	3	54	104	2		153
		51	52		207			74
			78		42			
					39			
	160.5	177.75	181.5	175.25	371.25	195.75	140.25	208.5

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
May-04	75	49	252	137	146	53	61	215
	36	51	142	79		170	53	82
	53	8	58	4		63		104
	50	15	10	307		78		
	2		49	76		1		
			91	4				
			34					
			43					
			51					
			45					
			310					
	54	30.75	271.25	151.75	36.5	91.25	28.5	100.25

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Jun-04	5		391	2	5	3	2	
	1		21		108		12	
	1		22				3	
	920		1142					
	42							
	150							
	218							
	1							
	334.5	0	394	0.5	28.25	0.75	4.25	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Jul-04		27	873		16	3	760	
		34	6		7		2	
		10	5		12			
		10			1239			
		1						
		26						
	0	27	221	0	318.5	0.75	190.5	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Aug-04	76	1112	78		1235		1	36
			28		2		17	1
					195			145
								3
	19	278	26.5	0	358	0	4.5	46.25

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Sep-04		2750			4	118		30
		1				1		2
		28				3		2

								8
								11
								37
	0	694.75	0	0	1	30.5	0	22.5

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Oct-04	2392	121			25	120	22	7
						22		
						221		
	598	30.25	0	0	6.25	90.75	5.5	1.75

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Nov-04	2880	1	14	1	1	1	17	1
		2		1	1	1	45	1
		2		45		2	1	
		1		1		9	1	
				82		1		
				2		11		
				28				
				2				
				1				
	720	1.5	3.5	40.75	0.5	6.25	16	0.5

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Dec-04	2202					145		
	1							
	550.75	0	0	0	0	36.25	0	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Jan-05	135	1	2	1	2	1	108	3
	136	1	129	2	1	2	39	2578
	2	1	73	139	148	122		
	17	103	6	1	5	6		
				5	6			
	72.5	26.5	52.5	37	40.5	32.75	36.75	645.25

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Feb-05	25	693	1192	30	747	724	673	287
	722	2	27	1635		6		1
	7					29		721
						6		
	188.5	173.75	304.75	416.25	186.75	191.25	168.25	252.25

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Mar-05	1	11	2611	970	1	5	159	2
		1		1	3	3		1
		134			1	4		1
		1			2	22		
						1		
	0.25	36.75	652.75	242.75	1.75	8.75	39.75	1

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Apr-05	2		2876			2		
	0.5	0	719	0	0	0.5	0	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
May-05	481	207	469	545	18	599	209	712
	12	49	140	217	223	198	122	
			210		4			
			33					
	123.25	64	213	190.5	61.25	199.25	82.75	178

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Jun-05				6		6	2880	
						4		
						5		
	0	0	0	1.5	0	3.75	720	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Jul-05	19	3	7	34	13	5	2976	9
	96	72	84	11	103	12		100
				99		95		
	28.75	18.75	22.75	36	29	28	744	27.25

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Aug-05	251	228	241	1	3	246	2976	250
	306	276	293	255	259	301		305
	3	1	1	309	311	1		
	10	5			5			
	142.5	127.5	133.75	141.25	144.5	137	744	138.75

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Sep-05	8	1	1	1	2	11	2880	
			2		1			
					4			
	2	0.25	0.75	0.25	1.75	2.75	720	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Oct-05	32	333	147	162	1	1	570	188
	194	4	14	20	43	11	40	
	153		174	475	158	142	7	
	15				801	12	5	
	3					20	123	
						1	4	
						3		
						20		
	99.25	84.25	83.75	164.25	250.75	52.5	187.25	47

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Nov-05	203	175	199	2880	210	4	181	142
						193		58
	50.75	43.75	49.75	720	52.5	49.25	45.25	50

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Dec-05	16	11		651		1915		
	1	20		119				
	7							
	7							
	7.75	7.75	0	192.5	0	478.75	0	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Jan-06	82	58	60	84	132	2121		
		15	74			174	21	
		6	13					
	20.5	19.75	36.75	21	33	573.75	5.25	0

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Feb-06	9			7	143	4	2	2685
	13							
	5.5	0	0	1.75	35.75	1	0.5	671.25

	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv
Mar-06	66	13	56	70	1648	14	54	65
	242	184	187	323	206	62	174	1
	6	1051	5	12	9	189	2	198
						2		6
	78.5	312	62	101.25	465.75	66.75	57.5	67.5

Hours off-line using 15 min average TPH < 2.0

summary	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv	period hrs	hrs offline	shutdowns
Apr-04	160.5	177.75	181.5	175.25	371.25	195.75	140.25	208.5	719	138.25	1
May-04	54	30.75	271.25	151.75	36.5	91.25	28.5	100.25	744	14.80	1
Jun-04	334.5	0	394	0.5	28.25	0.75	4.25	0	720	0.00	0
Jul-04	0	27	221	0	318.5	0.75	190.5	0	744	0.00	0
Aug-04	19	278	26.5	0	358	0	4.5	46.25	744	0.00	0
Sep-04	0	694.75	0	0	1	30.5	0	22.5	720	0.00	0
Oct-04	598	30.25	0	0	6.25	90.75	5.5	1.75	745	0.00	0
Nov-04	720	1.5	3.5	40.75	0.5	6.25	16	0.5	720	0.00	0
Dec-04	550.75	0	0	0	0	36.25	0	0	744	0.00	0
Jan-05	72.5	26.5	52.5	37	40.5	32.75	36.75	645.25	744	29.42	1
Feb-05	188.5	173.75	304.75	416.25	186.75	191.25	168.25	252.25	672	173.80	1
Mar-05	0.25	36.75	652.75	242.75	1.75	8.75	39.75	1	744	0.00	0
Apr-05	0.5	0	719	0	0	0.5	0	0	719	0.00	0
May-05	123.25	64	213	190.5	61.25	199.25	82.75	178	744	51.73	1
Jun-05	0	0	0	1.5	0	3.75	720	0	720	0.00	0
Jul-05	28.75	18.75	22.75	36	29	28	744	27.25	744	23.55	2
Aug-05	142.5	127.5	133.75	141.25	144.5	137	744	138.75	744	133.88	2
Sep-05	2	0.25	0.75	0.25	1.75	2.75	720	0	720	0.00	0
Oct-05	99.25	84.25	83.75	164.25	250.75	52.5	187.25	47	745	36.31	2
Nov-05	50.75	43.75	49.75	720	52.5	49.25	45.25	50	720	46.60	1
Dec-05	7.75	7.75	0	192.5	0	478.75	0	0	744	0.00	0
Jan-06	20.5	19.75	36.75	21	33	573.75	5.25	0	744	0.00	0
Feb-06	5.5	0	0	1.75	35.75	1	0.5	671.25	672	0.00	0
Mar-06	78.5	312	62	101.25	465.75	66.75	57.5	67.5	744	59.98	3
hrs sum	3257.25	2155	3429.25	2634.5	2423.5	2278.25	3940.75	2458	17520	708.32	15
	2548.93	1446.68	2720.93	1926.18	1715.18	1569.93	3232.43	1749.68			

maximum reading

	E1 int temp	E1 tip temp	E2 int temp	E2 tip temp	E3 int temp	E3 tip temp	E4 int temp	E4 tip temp	E5 int temp	E5 tip temp	E6 int temp	E6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	403.71	804.44	374.35	505.85	405.82	782.02	828.63	880.88	382.69	853.59	473.21	855.06
Nov-04	406.47	1037.93	437.18	912.02	424.12	1023.27	443.03	1130.98	432.89	1108.03	453.39	981.77
Dec-04	397.44	1047.41	396.82	997.22	432.69	1091.80	436.14	1161.07	428.29	1141.63	432.65	1023.17
Jan-05	734.26	1345.62	867.57	1660.00	798.40	1525.85	868.88	1660.00	805.08	1550.17	760.29	1471.83
Feb-05	713.97	1319.48	838.70	1660.00	808.05	1496.86	867.18	1660.00	831.23	1553.16	772.16	1488.81
Mar-05	533.95	1196.83	618.54	1511.74	587.85	1377.42	594.00	1441.11	580.19	1401.76	547.15	1317.48
Apr-05	351.65	832.20	397.94	436.76	397.62	802.32	347.52	761.90	330.30	887.06	354.58	846.67
May-05	904.54	1437.72	915.97	1660.00	966.27	1660.00	1070.21	1660.00	1038.85	1660.00	970.94	1660.00
Jun-05	371.95	992.24	840.35	1590.30	429.65	1006.58	418.56	886.59	383.39	1037.06	368.28	875.21
Jul-05	629.33	1219.22	772.27	1660.00	754.34	1420.49	781.81	1609.47	772.11	1472.96	718.80	1390.81
Aug-05	621.20	1203.57	702.24	1602.21	692.10	1387.16	712.38	1557.20	698.82	1442.67	658.07	1365.65
Sep-05	681.02	1539.40	777.51	1578.16	752.16	1418.53	763.09	1577.60	776.04	1463.09	726.50	1414.15
Oct-05	976.32	1660.00	1047.98	1660.00	952.50	1660.00	1052.44	1660.00	1056.98	1660.00	946.63	1536.89
Nov-05	586.68	1491.50	693.43	1592.33	687.05	1415.10	699.72	1559.60	672.66	1471.18	650.77	1409.57
Dec-05	773.03	582.57	374.60	411.94	419.81	923.21	395.08	760.11	389.52	945.98	347.02	835.62
Jan-06	931.30	0.00	1039.88	1660.00	941.40	1591.59	1013.03	1660.00	1022.45	1601.56	892.47	1495.27
Feb-06	937.45	212.04	1004.96	419.70	928.49	1588.28	1015.90	1660.00	1029.06	1660.00	923.58	1660.00
Mar-06	944.63	218.22	1040.69	219.99	1040.67	1660.00	1092.19	1660.00	1092.52	1660.00	949.82	1660.00

hours>1660 F

	E1 int temp	E1 tip temp	E2 int temp	E2 tip temp	E3 int temp	E3 tip temp	E4 int temp	E4 tip temp	E5 int temp	E5 tip temp	E6 int temp	E6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	2.75	0	0	0	2	0	0	0	0
Feb-05	0	0	0	3.75	0	0	0	3.25	0	0	0	0
Mar-05	0	0	0	0	0	0	0	0	0	0	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	0	0	2.75	0	2	0	3	0	2.25	0	1
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0.25	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	175	0	199.75	0	5.25	0	197.25	0	50	0	0
Nov-05	0	0	0	0	0	0	0	0	0	0	0	0
Dec-05	0	0	0	0	0	0	0	0	0	0	0	0
Jan-06	0	0	0	32.25	0	0	0	32.25	0	0	0	0
Feb-06	0	0	0	0	0	0	0	34.75	0	17.5	0	12.5
Mar-06	0	0	0	0	0	154.75	0	396.25	0	258.5	0	88.5
summation	0	175	0	241.5	0	162	0	668.75	0	328.25	0	102

maximum reading

	A1 int temp	A1 tip temp	A2 int temp	A2 tip temp	A3 int temp	A3 tip temp	A4 int temp	A4 tip temp	A5 int temp	A5 tip temp	A6 int temp	A6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	879.60	0.00	0.02	0.02
Nov-04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	879.60	0.00	0.02	0.02
Dec-04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.02	0.02
Jan-05	370.87	846.96	398.72	498.45	387.98	862.89	365.12	687.21	874.78	1503.45	785.10	1605.48
Feb-05	759.45	1292.90	835.22	1615.49	799.57	1408.62	911.59	1660.00	875.12	1458.64	802.37	1615.85
Mar-05	464.44	1120.63	524.51	1126.17	536.31	1221.20	525.49	1468.82	520.73	1276.94	544.31	1340.00
Apr-05	544.69	1166.70	605.71	1285.81	618.37	1340.36	572.27	1412.88	575.16	1323.97	579.92	1387.76
May-05	755.37	1305.37	844.49	1660.00	771.47	1454.34	840.18	1660.00	883.28	1512.32	844.22	1660.00
Jun-05	353.78	1108.03	384.57	502.72	455.71	883.45	840.18	666.99	366.76	861.54	399.66	518.20
Jul-05	723.65	1177.80	766.28	1465.14	724.83	1308.11	840.18	1597.63	772.48	1337.90	748.59	1481.09
Aug-05	772.97	1201.25	795.97	1508.86	777.71	1327.41	853.90	1660.00	864.96	1378.05	838.99	1545.08
Sep-05	778.50	1200.50	802.54	1513.04	777.77	1334.04	866.19	1660.00	845.67	1280.83	838.80	1522.12
Oct-05	1008.08	1358.75	955.95	1660.00	969.54	1528.98	953.49	457.13	924.61	1497.78	922.86	1660.00
Nov-05	516.02	1017.09	572.06	1215.25	556.11	1113.89	642.11	292.08	605.60	1389.49	586.43	1348.54
Dec-05	806.38	1311.47	856.87	1660.00	829.24	1457.44	931.34	292.08	871.81	1660.00	887.18	1660.00
Jan-06	902.79	1370.73	916.64	1660.00	946.10	1528.36	995.00	292.08	923.23	1660.00	923.13	1660.00
Feb-06	865.01	1614.67	893.89	1660.00	891.39	1421.07	930.91	292.08	867.33	1660.00	899.95	1660.00
Mar-06	711.99	134.27	794.62	1593.99	772.03	1480.55	814.09	182.51	796.43	1660.00	661.81	1408.03

hours>1660 F

	A1 int temp	A1 tip temp	A2 int temp	A2 tip temp	A3 int temp	A3 tip temp	A4 int temp	A4 tip temp	A5 int temp	A5 tip temp	A6 int temp	A6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	0	0	0	6.75	0	0	0	0
Mar-05	0	0	0	0	0	0	0	0	0	0	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	0	0	57.5	0	0	0	67.75	0	0	0	64.75
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	1	0	0	0	0
Sep-05	0	0	0	0	0	0	0	1	0	0	0	0
Oct-05	0	0	0	47	0	0	0	0	0	0	0	48.75
Nov-05	0	0	0	0	0	0	0	0	0	0	0	0
Dec-05	0	0	0	2.25	0	0	0	0	0	6.25	0	4.25
Jan-06	0	0	0	12	0	0	0	0	0	20	0	19.5
Feb-06	0	0	0	0.25	0	0	0	0	0	2.25	0	2.25
Mar-06	0	0	0	0	0	0	0	0	0	10.25	0	0
	0	0	0	119	0	0	0	76.5	0	38.75	0	139.5

maximum reading

	F1 int temp	F1 tip temp	F2 int temp	F2 tip temp	F3 int temp	F3 tip temp	F4 int temp	F4 tip temp	F5 int temp	F5 tip temp	F6 int temp	F6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	713.72	1279.32	1165.47	1430.47	764.29	1190.41	711.94	1411.07	1057.67	1264.40	701.16	1341.86
Nov-04	806.26	1250.37	862.45	1409.97	871.56	1235.77	874.01	1499.45	827.74	1280.67	854.70	1361.39
Dec-04	848.37	1339.40	916.30	1500.39	923.56	1362.05	967.32	1614.46	867.98	1418.74	912.96	1471.51
Jan-05	742.09	1285.80	738.79	1451.59	740.96	1284.03	786.29	1567.05	754.69	1378.29	745.90	1375.17
Feb-05	782.48	1315.24	787.53	1456.32	786.02	1276.38	865.06	1660.00	811.63	1388.88	833.90	1415.44
Mar-05	784.30	1296.45	798.44	1451.71	812.24	1344.90	826.56	1660.00	798.15	1381.63	811.61	1387.18
Apr-05	605.57	1576.00	581.37	1416.37	621.19	1239.60	609.49	1424.12	547.12	1231.65	581.91	1345.86
May-05	892.72	1660.00	977.06	1567.77	988.17	1414.11	963.12	1660.00	921.78	1437.88	899.40	1468.80
Jun-05	791.48	1538.90	805.76	1478.75	1559.54	1580.39	852.47	1603.78	763.00	1586.94	789.19	1543.11
Jul-05	754.67	765.31	793.21	1561.17	151.62	168.02	825.39	1451.09	754.93	0.00	758.67	1389.55
Aug-05	664.55	1550.24	487.62	1607.94	147.51	139.72	513.24	1063.07	487.54	1593.64	510.86	1096.09
Sep-05	797.98	453.24	779.57	1125.75	142.50	497.88	833.60	1551.85	779.70	1482.66	754.41	632.10
Oct-05	820.27	0.00	792.67	1208.98	139.49	870.26	887.56	1660.00	796.57	1465.77	998.74	53.62
Nov-05	483.96	0.00	546.06	1195.50	131.43	574.87	566.97	1246.84	516.84	1078.77	169.48	53.62
Dec-05	839.78	0.00	889.88	1085.32	102.99	1058.93	906.43	1660.00	863.43	1568.63	169.48	53.62
Jan-06	828.12	0.00	844.47	1606.37	123.15	565.50	822.43	1448.43	866.40	1610.78	169.48	53.62
Feb-06	607.00	130.39	590.33	1241.07	139.66	742.71	632.83	554.10	647.84	1538.13	169.48	150.23
Mar-06	848.93	135.30	877.12	1610.98	137.63	129.51	900.51	175.77	924.25	186.83	127.50	178.60

hours>1660 F

	F1 int temp	F1 tip temp	F2 int temp	F2 tip temp	F3 int temp	F3 tip temp	F4 int temp	F4 tip temp	F5 int temp	F5 tip temp	F6 int temp	F6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	0	0	0	3.25	0	0	0	0
Mar-05	0	0	0	0	0	0	0	2.5	0	0	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	3.75	0	0	0	0	0	106.75	0	0	0	0
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	0	0	0	0	0	0	0.75	0	0	0	0
Nov-05	0	0	0	0	0	0	0	0	0	0	0	0
Dec-05	0	0	0	0	0	0	0	0.5	0	0	0	0
Jan-06	0	0	0	0	0	0	0	0	0	0	0	0
Feb-06	0	0	0	0	0	0	0	0	0	0	0	0
Mar-06	0	0	0	0	0	0	0	0	0	0	0	0
	0	3.75	0	0	0	0	0	113.75	0	0	0	0

maximum reading

	B1 int temp	B1 tip temp	B2 int temp	B2 tip temp	B3 int temp	B3 tip temp	B4 int temp	B4 tip temp	B5 int temp	B5 tip temp	B6 int temp	B6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04	804.90	1156.71	811.64	1394.62	365.69	748.07	0.02	124.85	143.76	213.72	104.27	0.02
Oct-04	785.23	1055.74	833.21	1261.36	915.99	1182.91	923.33	1454.62	844.54	1087.17	783.02	1213.34
Nov-04	451.14	787.04	459.03	679.30	375.02	828.88	468.81	854.56	497.41	939.06	555.53	1131.59
Dec-04	457.29	774.56	453.35	712.48	361.22	809.07	388.93	657.67	434.87	778.35	491.53	939.75
Jan-05	440.00	793.16	456.65	633.17	442.82	852.91	451.21	617.86	438.28	792.14	503.70	928.86
Feb-05	494.54	978.77	505.27	1189.83	438.34	1012.37	437.47	757.15	432.53	796.35	488.15	994.31
Mar-05	760.27	1046.90	814.43	1401.04	806.10	1111.12	838.95	1414.63	798.50	1020.84	744.03	1099.93
Apr-05	375.57	791.71	384.39	505.19	373.14	777.86	401.54	535.18	371.97	909.26	455.92	904.85
May-05	815.45	1112.83	838.85	1481.96	804.99	1162.60	804.45	1362.52	743.67	1055.50	783.88	1142.62
Jun-05	366.97	759.44	391.25	735.76	371.42	865.63	405.31	484.34	363.54	904.96	445.76	825.23
Jul-05	505.62	758.98	509.40	891.49	494.28	907.13	524.56	623.90	487.78	913.25	537.28	840.94
Aug-05	618.26	864.57	638.05	1003.20	619.09	876.39	628.68	1036.79	609.57	864.48	644.68	937.85
Sep-05	352.29	769.84	378.09	919.70	368.59	822.03	424.10	1008.29	342.55	910.16	426.75	791.08
Oct-05	849.78	1112.40	899.98	1298.25	851.24	1150.12	869.48	1446.08	853.32	1125.08	820.64	1200.72
Nov-05	436.35	1040.51	439.75	938.73	422.05	1050.68	454.74	516.06	392.88	994.81	445.78	972.86
Dec-05	740.71	1029.53	766.49	1192.65	740.86	1401.76	743.64	154.54	733.79	1044.42	759.92	1112.95
Jan-06	861.93	663.43	892.68	1314.85	858.40	1602.11	831.85	154.54	839.23	1098.50	832.20	1256.24
Feb-06	359.91	663.43	379.58	911.12	410.11	449.02	423.43	154.54	313.59	969.24	437.81	1384.32
Mar-06	870.40	173.89	898.58	1385.41	866.86	161.25	824.50	171.11	845.12	1221.37	822.45	1395.51

hours>1660 F

	B1 int temp	B1 tip temp	B2 int temp	B2 tip temp	B3 int temp	B3 tip temp	B4 int temp	B4 tip temp	B5 int temp	B5 tip temp	B6 int temp	B6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	0	0	0	0	0	0	0	0
Mar-05	0	0	0	0	0	0	0	0	0	0	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	0	0	0	0	0	0	0	0	0	0	0
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	0	0	0	0	0	0	0	0	0	0	0
Nov-05	0	0	0	0	0	0	0	0	0	0	0	0
Dec-05	0	0	0	0	0	0	0	0	0	0	0	0
Jan-06	0	0	0	0	0	0	0	0	0	0	0	0
Feb-06	0	0	0	0	0	0	0	0	0	0	0	0
Mar-06	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0

maximum reading

	D1 int temp	D1 tip temp	D2 int temp	D2 tip temp	D3 int temp	D3 tip temp	D4 int temp	D4 tip temp	D5 int temp	D5 tip temp	D6 int temp	D6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0.02	0.02	0.00	0.02	0.02	0.02	141.36	0.02	0.02	0.02	0.02	1040.75
Nov-04	967.79	1610.03	1004.26	1563.09	973.14	1660.00	1014.24	1542.69	966.12	1660.00	920.18	1418.35
Dec-04	788.18	1433.79	762.45	1416.42	825.57	1563.62	767.90	1413.28	789.22	1615.60	774.07	1351.78
Jan-05	725.98	1371.85	690.75	1304.10	758.48	1471.28	693.44	1350.99	733.50	1523.94	719.11	1302.55
Feb-05	941.39	1582.99	964.54	1570.52	968.22	1660.00	941.53	1610.93	955.82	1660.00	927.70	1471.12
Mar-05	910.40	1507.80	947.18	1517.00	976.05	1660.00	965.68	1550.11	929.55	1660.00	921.60	1419.82
Apr-05	342.60	667.02	390.29	845.09	392.04	690.34	380.41	933.30	393.93	383.41	394.16	817.14
May-05	1022.11	1660.00	1061.18	1660.00	1012.10	1660.00	1013.54	1611.05	999.65	1660.00	1029.04	1541.87
Jun-05	819.01	1538.63	799.35	1569.84	846.60	1660.00	788.84	1430.08	826.88	1660.00	805.48	1465.89
Jul-05	1004.58	1606.15	1041.02	1602.52	997.81	1660.00	1023.34	1607.59	988.36	1660.00	995.24	1660.00
Aug-05	593.50	1212.98	567.70	1407.46	635.72	1521.27	579.44	1346.43	597.29	1298.37	583.30	1443.75
Sep-05	355.25	728.36	411.66	1070.77	441.39	817.05	379.84	1017.76	432.96	1614.58	494.87	968.12
Oct-05	1014.10	1585.97	997.98	1660.00	889.37	1660.00	1018.13	1578.62	951.71	1588.49	951.72	1028.93
Nov-05	931.85	1516.21	983.89	1660.00	940.55	1660.00	1044.64	1610.42	969.75	0.00	972.13	1054.74
Dec-05	954.74	1595.73	1003.94	1660.00	975.80	1660.00	1061.86	1574.99	960.56	1660.00	965.63	1096.18
Jan-06	974.13	1572.67	1020.48	0.00	914.97	616.97	966.52	1599.30	901.52	1177.84	890.81	928.26
Feb-06	630.07	1211.73	655.32	1086.04	706.13	616.97	686.87	1332.44	630.99	1177.84	610.70	662.71
Mar-06	788.37	1505.64	754.13	169.08	829.95	174.29	818.40	1495.27	774.83	156.04	748.67	889.93

hours>1660 F

	D1 int temp	D1 tip temp	D2 int temp	D2 tip temp	D3 int temp	D3 tip temp	D4 int temp	D4 tip temp	D5 int temp	D5 tip temp	D6 int temp	D6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	18.25	0	0	0	19.25	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	0	104.75	0	0	0	213.75	0	0
Mar-05	0	0	0	0	0	37.75	0	0	0	169	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	89.25	0	105.25	0	135.5	0	0	0	135.5	0	0
Jun-05	0	0	0	0	0	1.25	0	0	0	1.25	0	0
Jul-05	0	0	0	0	0	8	0	0	0	7.75	0	2.5
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	0	0	117.5	0	118.25	0	0	0	0	0	0
Nov-05	0	0	0	588.75	0	668	0	0	0	0	0	0
Dec-05	0	0	0	93.75	0	162.5	0	0	0	163	0	0
Jan-06	0	0	0	0	0	0	0	0	0	0	0	0
Feb-06	0	0	0	0	0	0	0	0	0	0	0	0
Mar-06	0	0	0	0	0	0	0	0	0	0	0	0
	0	89.25	0	905.25	0	1254.25	0	0	0	709.5	0	2.5

maximum reading

	H1 int temp	H1 tip temp	H2 int temp	H2 tip temp	H3 int temp	H3 tip temp	H4 int temp	H4 tip temp	H5 int temp	H5 tip temp	H6 int temp	H6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Nov-04	433.88	930.32	752.56	823.65	385.51	772.05	494.90	1138.22	507.95	1145.22	744.49	784.04
Dec-04	463.51	1112.45	462.98	1166.93	441.59	1158.16	593.50	1356.99	596.28	1328.21	440.14	957.50
Jan-05	909.47	1415.28	997.86	1471.71	1025.46	1660.00	1025.46	1480.68	1000.62	1510.43	941.66	1284.48
Feb-05	797.11	1314.72	1002.44	1578.59	807.53	1561.31	750.82	1328.52	808.13	1333.63	819.84	1226.42
Mar-05	582.48	1265.88	598.73	1341.81	630.74	1519.99	612.05	1372.30	620.12	1426.92	605.49	1148.88
Apr-05	389.77	890.77	358.89	781.24	363.92	530.79	365.71	824.25	366.45	934.68	346.51	776.31
May-05	977.73	1541.23	1065.88	1536.50	1043.40	1660.00	1027.70	1504.10	1081.59	1613.72	980.48	1298.68
Jun-05	878.37	1503.83	856.23	1450.34	956.56	1602.60	950.20	1477.39	939.59	1541.94	915.95	1258.22
Jul-05	658.93	1270.64	696.36	1577.91	734.25	1564.18	722.16	1287.65	716.01	1315.55	669.92	1046.81
Aug-05	570.08	1212.59	575.60	1471.12	597.69	1512.06	590.75	1282.83	579.28	1281.65	556.67	1030.84
Sep-05	382.47	817.93	355.11	523.32	404.52	501.23	391.56	1320.74	352.38	893.39	335.73	795.36
Oct-05	888.97	1471.67	566.06	1467.43	910.00	1660.00	985.56	1598.37	960.51	1660.00	910.65	1380.01
Nov-05	725.42	1213.70	441.95	1235.62	757.54	1602.60	777.82	1220.78	781.50	1503.34	734.70	1523.72
Dec-05	400.79	1213.70	325.72	343.06	389.34	472.83	382.02	726.44	344.95	631.63	327.37	772.70
Jan-06	396.18	1213.70	319.32	341.46	364.58	385.79	407.57	662.06	334.25	624.40	322.52	772.70
Feb-06	1031.03	1213.70	1081.20	1660.00	1034.80	1660.00	1037.27	1427.20	1093.50	1660.00	945.43	772.70
Mar-06	811.05	153.03	833.39	1660.00	871.78	1604.85	925.35	1380.63	734.86	1513.53	838.32	155.27

hours>1660 F

	H1 int temp	H1 tip temp	H2 int temp	H2 tip temp	H3 int temp	H3 tip temp	H4 int temp	H4 tip temp	H5 int temp	H5 tip temp	H6 int temp	H6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	346	0	0	0	0	0	0
Feb-05	0	0	0	0	0	0	0	0	0	0	0	0
Mar-05	0	0	0	0	0	0	0	0	0	0	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	0	0	0	0	121.5	0	0	0	0	0	0
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	0	0	0	0	3.75	0	0	0	1.5	0	0
Nov-05	0	0	0	0	0	0	0	0	0	0	0	0
Dec-05	0	0	0	0	0	0	0	0	0	0	0	0
Jan-06	0	0	0	0	0	0	0	0	0	0	0	0
Feb-06	0	0	0	573	0	103.5	0	0	0	211.25	0	0
Mar-06	0	0	0	26.75	0	0	0	0	0	0	0	0
	0	0	0	599.75	0	574.75	0	0	0	212.75	0	0

maximum reading

	C1 int temp	C1 tip temp	C2 int temp	C2 tip temp	C3 int temp	C3 tip temp	C4 int temp	C4 tip temp	C5 int temp	C5 tip temp	C6 int temp	C6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0.00	0.02	0.02	0.02	0.02	130.38	0.02	0.02	123.90	0.02	0.02	132.40
Nov-04	694.02	1205.50	774.84	1280.86	746.15	1526.56	747.53	1314.58	712.60	1361.82	668.02	1086.54
Dec-04	698.68	1217.34	759.94	1259.45	764.59	1596.99	744.22	1267.62	723.55	1349.34	688.95	1035.57
Jan-05	719.08	1271.17	785.85	1322.55	783.63	1602.35	779.02	1365.62	754.72	1419.92	715.72	1123.52
Feb-05	853.58	1259.30	911.24	1320.13	953.86	1660.00	953.15	1326.51	838.82	1459.16	864.24	1130.90
Mar-05	896.94	1378.17	983.06	1438.79	1021.91	1660.00	1007.47	1482.48	891.45	1548.29	894.92	1299.71
Apr-05	842.79	1377.68	902.45	1368.17	966.19	1660.00	916.93	1448.96	891.39	1599.05	905.02	1405.93
May-05	960.65	1426.35	1013.39	1452.83	1023.10	1660.00	1026.96	1486.76	978.03	1613.08	917.38	1415.12
Jun-05	364.06	951.19	345.35	956.06	389.43	500.32	392.48	1027.33	375.57	754.30	402.68	854.90
Jul-05	624.75	1282.22	686.17	1154.01	672.23	1458.65	555.14	1265.60	638.05	1380.78	635.72	1186.96
Aug-05	551.66	1026.46	582.77	685.91	520.90	1115.47	455.95	879.82	480.19	1046.39	573.11	912.49
Sep-05	623.98	1172.31	669.47	960.83	673.50	1416.75	581.12	1161.36	633.21	1315.20	651.20	1019.27
Oct-05	946.51	1355.52	980.04	1018.25	1002.87	1660.00	1036.23	1420.02	921.51	1598.30	894.64	1294.22
Nov-05	808.80	1307.00	887.82	1188.09	823.20	1660.00	810.16	1370.89	761.10	1461.34	771.91	1137.32
Dec-05	323.03	1202.61	352.64	1081.69	378.09	444.98	378.00	874.98	346.19	646.63	378.01	912.36
Jan-06	941.67	1451.21	1016.27	922.81	990.75	1660.00	1022.88	1562.00	948.33	1660.00	899.79	1477.44
Feb-06	310.94	967.32	329.29	742.61	375.99	459.03	367.08	842.97	410.00	747.72	390.35	1477.44
Mar-06	529.07	950.91	560.81	161.98	542.05	1129.05	545.41	989.37	706.01	1390.50	723.68	150.89

hours>1660 F

	C1 int temp	C1 tip temp	C2 int temp	C2 tip temp	C3 int temp	C3 tip temp	C4 int temp	C4 tip temp	C5 int temp	C5 tip temp	C6 int temp	C6 tip temp
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	0	61.75	0	0	0	0	0	0
Mar-05	0	0	0	0	0	165.25	0	0	0	0	0	0
Apr-05	0	0	0	0	0	90.75	0	0	0	0	0	0
May-05	0	0	0	0	0	41.25	0	0	0	0	0	0
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	0	0	0	0	42.75	0	0	0	0	0	0
Nov-05	0	0	0	0	0	0.5	0	0	0	0	0	0
Dec-05	0	0	0	0	0	0	0	0	0	0	0	0
Jan-06	0	0	0	0	0	33.25	0	0	0	1	0	0
Feb-06	0	0	0	0	0	0	0	0	0	0	0	0
Mar-06	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	435.5	0	0	0	1	0	0

maximum reading

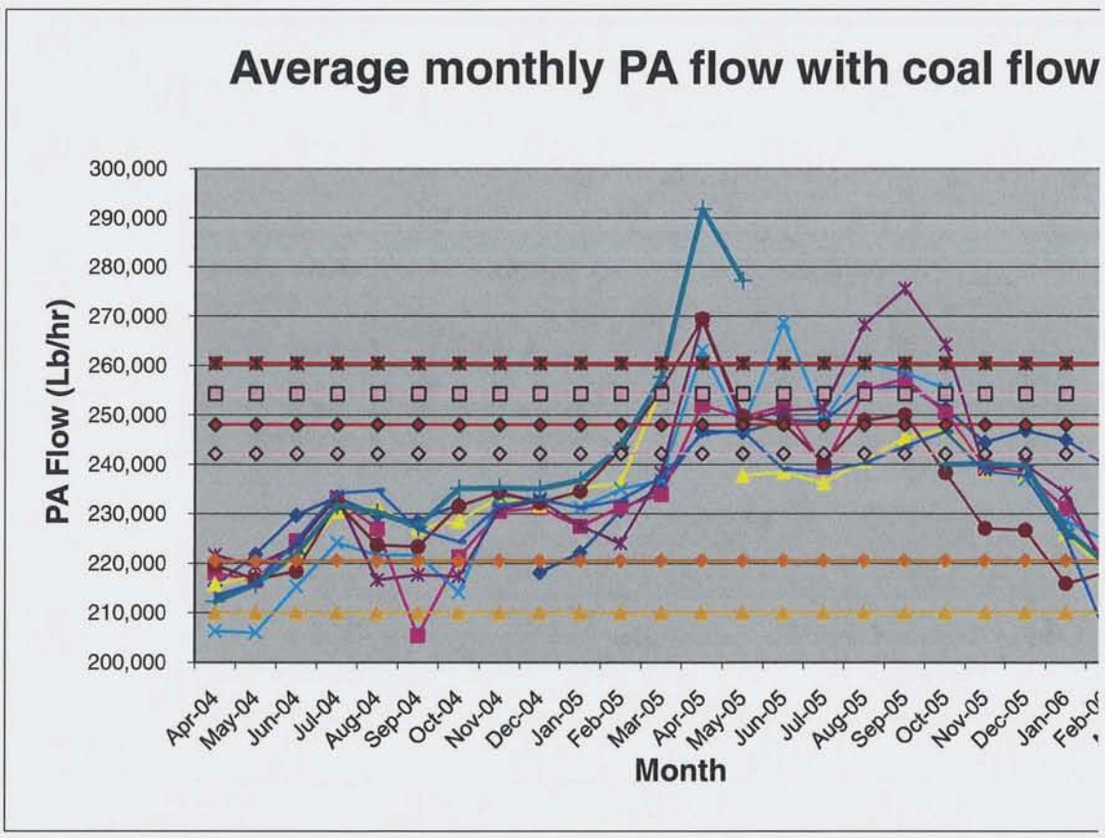
	G1 int tem	G1 tip tem	G2 int tem	G2 tip tem	G3 int tem	G3 tip tem	G4 int tem	G4 tip tem	G5 int tem	G5 tip tem	G6 int tem	G6 tip tem
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	480.74	871.84	472.04	774.35	421.51	920.78	362.48	791.74	520.11	625.47	483.62	787.63
Nov-04	806.99	1156.02	789.30	1019.55	894.90	1199.37	873.04	1026.71	803.48	1102.20	760.22	960.41
Dec-04	422.31	843.24	435.39	759.15	399.13	858.65	378.06	788.35	461.46	562.35	434.88	749.05
Jan-05	676.97	1032.70	670.51	917.51	687.43	1106.10	664.64	954.25	674.38	1067.58	617.08	883.25
Feb-05	444.38	813.10	498.46	744.04	507.22	858.71	476.64	800.25	504.52	682.89	440.72	760.54
Mar-05	756.61	1197.19	779.34	1584.79	898.08	1241.23	835.03	1020.56	779.98	943.76	733.40	935.96
Apr-05	381.52	1338.54	419.35	1264.43	362.73	939.65	311.37	777.55	384.93	688.86	398.79	1575.28
May-05	831.72	1225.82	778.62	1051.84	917.45	1404.30	894.63	1138.28	863.53	1186.58	814.73	1564.64
Jun-05	854.30	1291.53	787.42	1051.84	881.78	1451.13	899.47	1179.24	867.63	1222.78	843.25	1216.23
Jul-05	790.87	1256.11	761.61	1051.84	920.16	1503.23	821.23	1193.79	806.79	1130.49	837.47	1199.98
Aug-05	799.10	1317.91	755.52	1308.82	862.07	1530.28	797.66	1212.64	790.06	1168.20	837.86	1267.37
Sep-05	760.97	1275.60	766.65	1331.54	859.37	1520.62	795.39	1254.84	810.16	1235.67	797.02	1219.41
Oct-05	879.85	1357.62	863.57	1416.18	805.59	1414.97	738.94	1380.94	778.92	1144.74	828.68	1442.93
Nov-05	450.34	602.11	432.80	0.00	486.31	1231.18	460.25	973.03	436.17	525.90	445.94	1280.70
Dec-05	365.56	800.41	363.92	0.00	394.66	1167.96	355.38	985.25	379.78	606.57	401.23	603.97
Jan-06	749.33	334.84	726.09	0.00	756.33	1167.96	770.73	1538.13	711.30	1037.88	709.15	1166.38
Feb-06	455.27	334.84	438.83	131.35	457.38	1167.96	467.56	916.83	455.15	916.69	491.79	717.45
Mar-06	661.51	136.87	637.34	135.92	679.82	116.37	642.54	127.85	609.82	1541.19	591.73	898.37

hours>1660 F

	G1 int tem	G1 tip tem	G2 int tem	G2 tip tem	G3 int tem	G3 tip tem	G4 int tem	G4 tip tem	G5 int tem	G5 tip tem	G6 int tem	G6 tip tem
Apr-04												
May-04												
Jun-04												
Jul-04												
Aug-04												
Sep-04												
Oct-04	0	0	0	0	0	0	0	0	0	0	0	0
Nov-04	0	0	0	0	0	0	0	0	0	0	0	0
Dec-04	0	0	0	0	0	0	0	0	0	0	0	0
Jan-05	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	0	0	0	0	0	0	0	0
Mar-05	0	0	0	0	0	0	0	0	0	0	0	0
Apr-05	0	0	0	0	0	0	0	0	0	0	0	0
May-05	0	0	0	0	0	0	0	0	0	0	0	0
Jun-05	0	0	0	0	0	0	0	0	0	0	0	0
Jul-05	0	0	0	0	0	0	0	0	0	0	0	0
Aug-05	0	0	0	0	0	0	0	0	0	0	0	0
Sep-05	0	0	0	0	0	0	0	0	0	0	0	0
Oct-05	0	0	0	0	0	0	0	0	0	0	0	0
Nov-05	0	0	0	0	0	0	0	0	0	0	0	0
Dec-05	0	0	0	0	0	0	0	0	0	0	0	0
Jan-06	0	0	0	0	0	0	0	0	0	0	0	0
Feb-06	0	0	0	0	0	0	0	0	0	0	0	0
Mar-06	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0

PA flow average over time Pulv coal flow > 34 tph

summary	A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv	from email
Apr-04	215,509	218,009	215,804	206,315	221,619	219,578	212,301	213,513	210,000
May-04	221,835	216,438	217,311	206,066	219,395	216,709	215,740	215,907	210,000
Jun-04	229,734	224,469	220,564	215,403	223,409	218,329	221,922	224,611	210,000
Jul-04	233,415	232,971	230,447	224,236	233,520	232,144	231,799	234,237	210,000
Aug-04	229,795	226,900	231,325	221,748	216,560	223,710	230,380	234,806	210,000
Sep-04	228,591	205,259	227,039	221,830	217,624	223,324	227,468	226,784	210,000
Oct-04	231,898	221,212	228,579	214,187	217,321	231,523	235,160	224,409	210,000
Nov-04		230,434	233,375	233,663	230,857	234,379	235,336	231,719	210,000
Dec-04	218,133	231,173	231,622	233,074	232,642	232,230	235,110	232,925	210,000
Jan-05	222,115	227,400	235,284	231,204	227,589	234,537	236,803	231,279	210,000
Feb-05	230,673	231,370	236,286	235,059	223,987	243,070	243,615	232,776	210,000
Mar-05	235,279	233,859	255,380	236,863	238,209	255,200	257,714	237,403	210,000
Apr-05	246,825	251,977		263,174	269,221	269,423	291,858	246,200	210,000
May-05	246,476	249,421	237,687	247,542	248,661	249,705	277,282	246,885	210,000
Jun-05	248,961	251,788	238,452	268,784	250,892	248,342		239,055	210,000
Jul-05	248,727	239,344	236,224	249,001	251,311	240,289		238,608	210,000
Aug-05	255,407	254,964	240,726	260,724	268,216	248,877		240,251	210,000
Sep-05	255,881	257,271	245,353	258,746	275,509	249,998		243,659	210,000
Oct-05	251,196	250,371	247,139	255,350	264,186	238,287	240,067	246,618	210,000
Nov-05	244,459	239,394	238,918		238,874	227,009	240,195	238,594	210,000
Dec-05	246,872	238,176	237,844	237,036	239,917	226,649	239,758	237,753	210,000
Jan-06	244,947	230,969	226,013	228,584	234,050	215,841	226,891	225,223	210,000
Feb-06	239,794	220,455	218,748	224,725	218,409	218,096	219,911	205,754	210,000
Mar-06	232,916	225,606	221,733	221,872	218,709	216,975	218,466	216,910	210,000
maximum	255,881	257,271	255,380	268,784	275,509	269,423	291,858	246,885	



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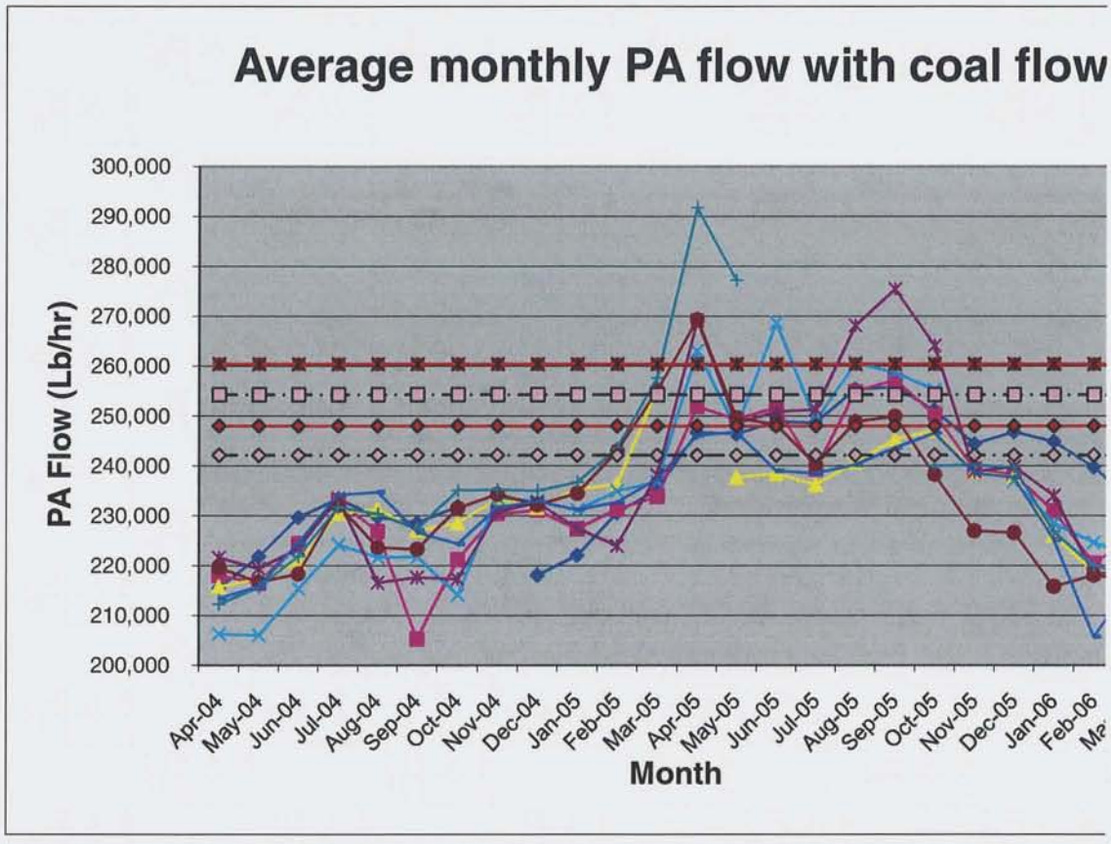
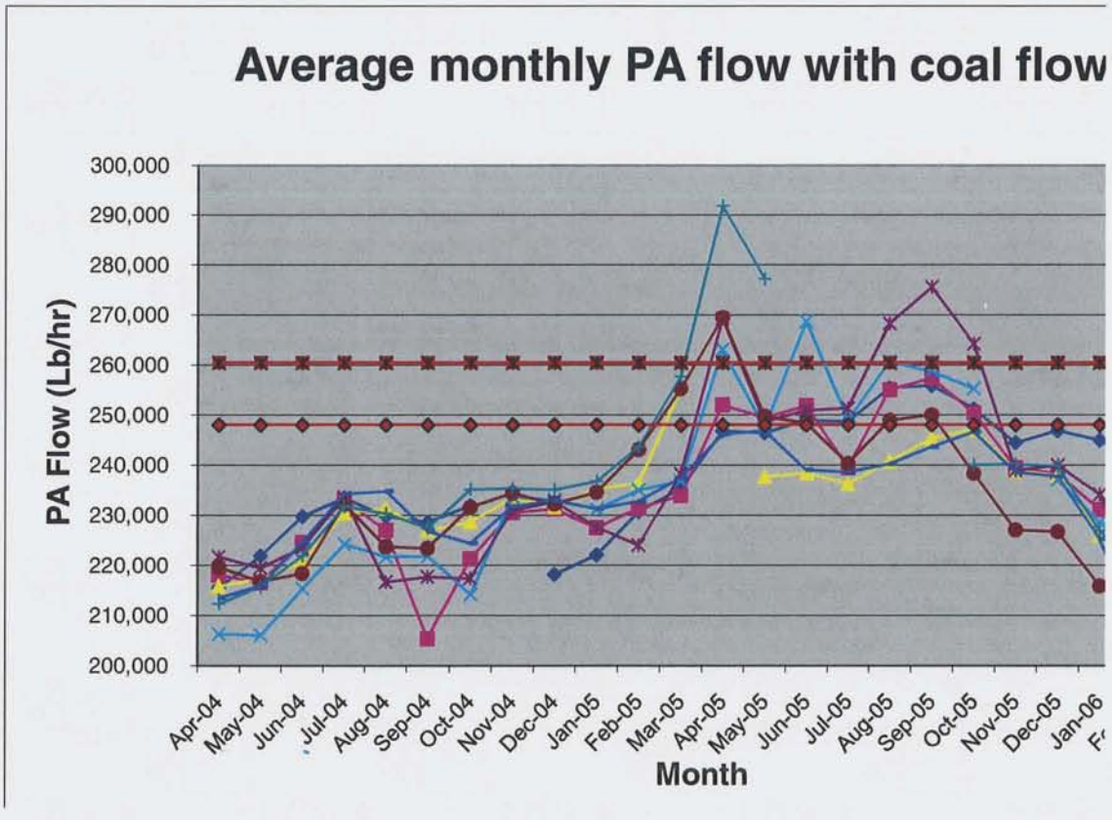
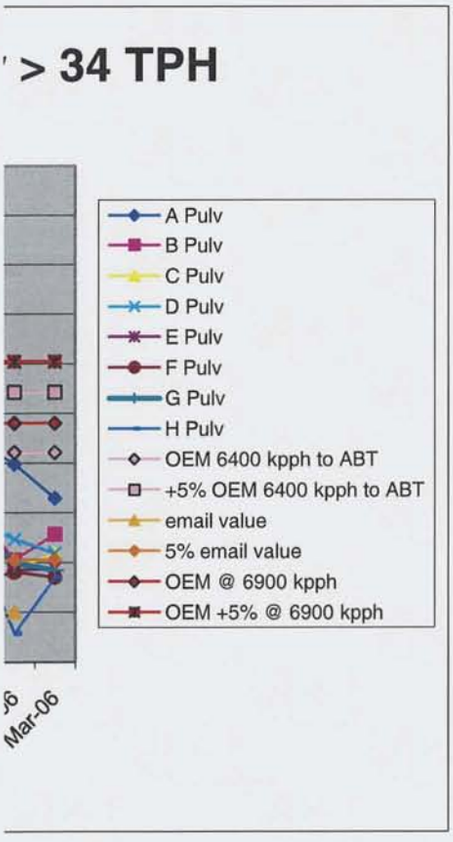
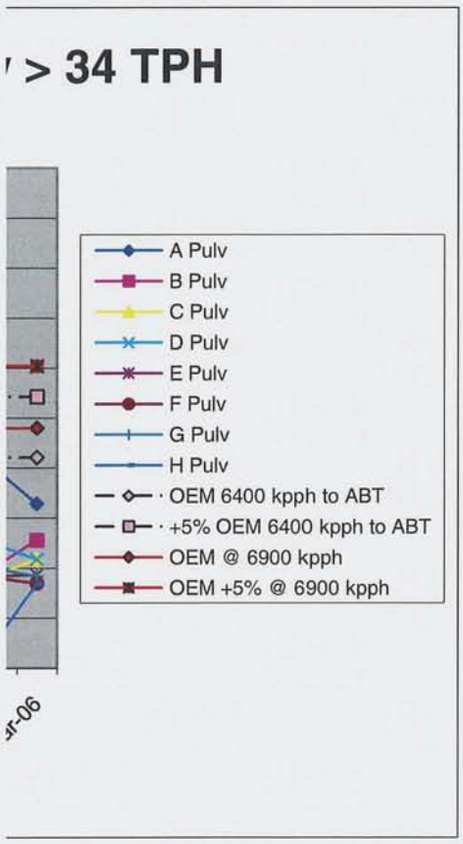
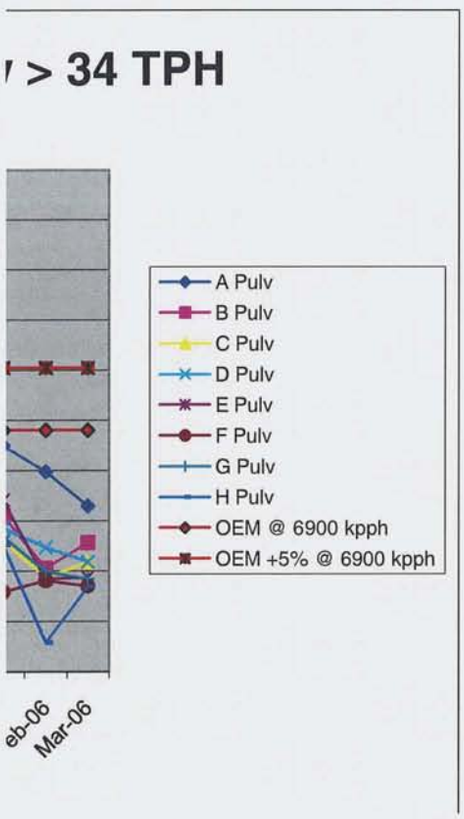

Average monthly PA flow with coal flow
PA Flow (Lb/hr)
300,000
290,000
280,000
270,000
260,000
250,000
240,000
230,000
220,000
210,000
200,000
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
Oct-05
Nov-05
Dec-05
Jan-06
Feb-06
Month


Average monthly PA flow with coal flow
PA Flow (Lb/hr)
300,000
290,000
280,000
270,000
260,000
250,000
240,000
230,000
220,000
210,000
200,000
Apr-04
May-04
Jun-04
Jul-04
Aug-04
Sep-04
Oct-04
Nov-04
Dec-04
Jan-05
Feb-05
Mar-05
Apr-05
May-05
Jun-05
Jul-05
Aug-05
Sep-05
Oct-05
Nov-05
Dec-05
Jan-06
Month

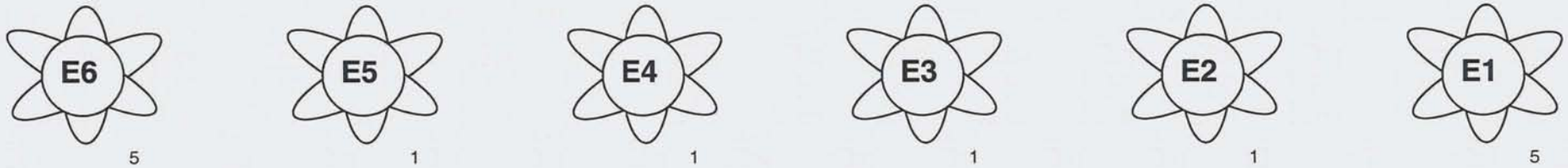
	from OEM	+ 5% PA flow	from OEM	+ 5% PA flow
+ 5% PA flow	@ 6,400 mlb/hr	@ 6,400 mlb/hr	@ 6,900 mlb/hr	@ 6,900 mlb/hr
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433
220,500	242,172	254,281	248,031	260,433



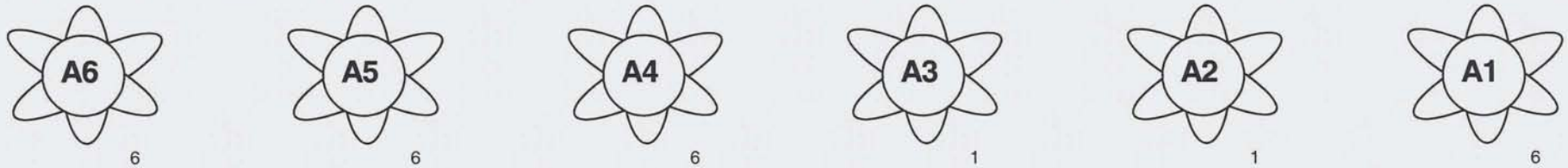

> 34 TPH
A Pulv
B Pulv
C Pulv
D Pulv
E Pulv
F Pulv
G Pulv
H Pulv
OEM 6400 kpph to ABT
+5% OEM 6400 kpph to ABT
OEM @ 6900 kpph
OEM +5% @ 6900 kpph
r-06


> 34 TPH
A Pulv
B Pulv
C Pulv
D Pulv
E Pulv
F Pulv
G Pulv
H Pulv
OEM @ 6900 kpph
OEM +5% @ 6900 kpph
eb-06
Mar-06

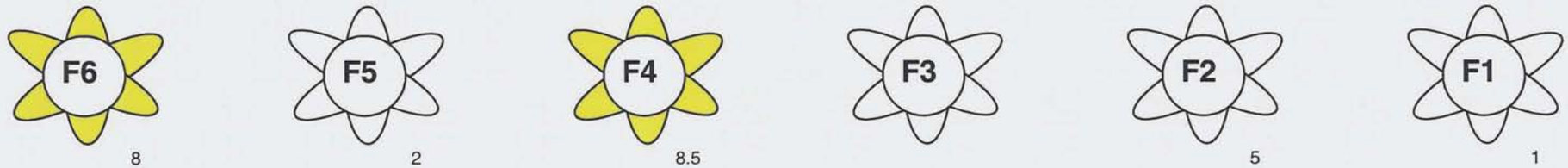
8th Floor



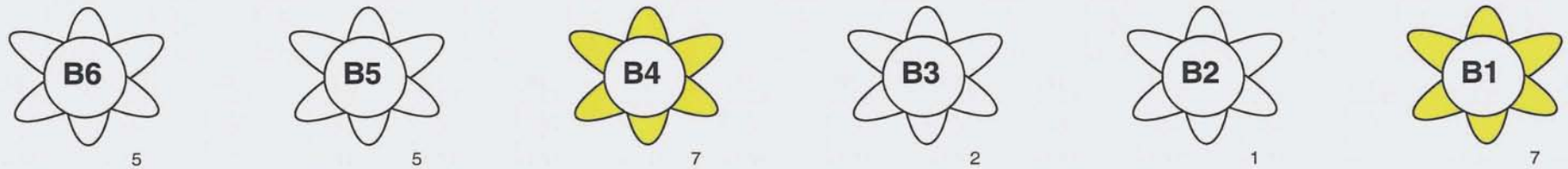
7th Floor



6th Floor



5th Floor



West

Front wall looking North (Tips replaced)

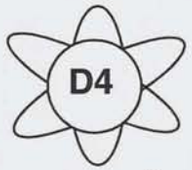
East

IP70209954

8th Floor

8

9



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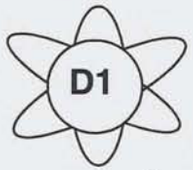
9

8



1

7th Floor

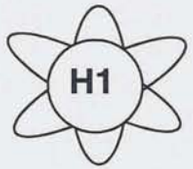
8.5

8.5

3

8.5

8



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6th Floor

4

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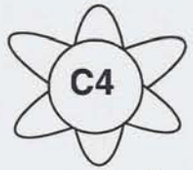

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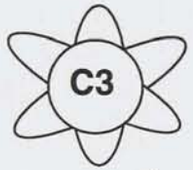

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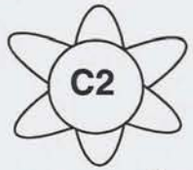

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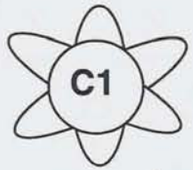


1

5th Floor

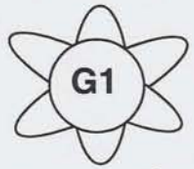
5

8

8

8

5



2

West

Rear Wall Looking North (Tips replaced)

East

IP70209955

HHVC		hours with PA > 260 kpph A Pulv	B Pulv	C Pulv	D Pulv	E Pulv	F Pulv	G Pulv	H Pulv	
11,762	Apr-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PA flow lim
11,952	May-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12,004	Jun-04									various pul
11,760	Jul-04									various pul
11,643	Aug-04									various pul
11,484	Sep-04									various pul
11,332	Oct-04									various pul
10,893	Nov-04									various pul
10,752	Dec-04									various pul
10,959	Jan-05									PA flow lim
11,186	Feb-05									
11,078	Mar-05									new PA flo
11,310	Apr-05	117.25	131.50	0.00	584.50	300.00	576.00	700.25	0.00	
11,596	May-05	0.00	0.50	0.00	0.25	1.50	25.25	563.50	0.75	
11,864	Jun-05	25.50	122.75	0.00	619.25	20.75	6.50	7.25	0.00	
11,805	Jul-05	107.50	17.00	0.00	62.00	54.00	0.00	0.00	36.00	
11,582	Aug-05	145.00	184.25	23.50	400.00	344.25	2.50	0.00	3.00	
11,578	Sep-05	173.00	174.75	112.25	323.25	583.00	34.00	0.00	59.75	
11,456	Oct-05	178.50	120.00	164.75	259.50	262.00	0.00	0.00	101.50	
11,405	Nov-05	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11,433	Dec-05	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11,501	Jan-06	110.50	49.50	2.50	2.75	43.50	0.00	0.00	0.00	PA flow 10(
11,559	Feb-06	49.75	0.00	0.00	0.00	7.25	0.00	0.00	0.00	
11,661	Mar-06	1.75	3.00	0.00	0.00	2.50	0.00	0.00	0.00	

11,481 average

it at 239 kpph

v PA hitting upper limit of 239 kpph
v PA hitting upper limit of 239 kpph
v PA hitting upper limit of 239 kpph
v PA hitting upper limit of 239 kpph
v PA hitting upper limit of 239 kpph
v PA hitting upper limit of 239 kpph
v PA hitting upper limit of 239 kpph
it moved to 265 kpph

v into PI with limit 300 kpph

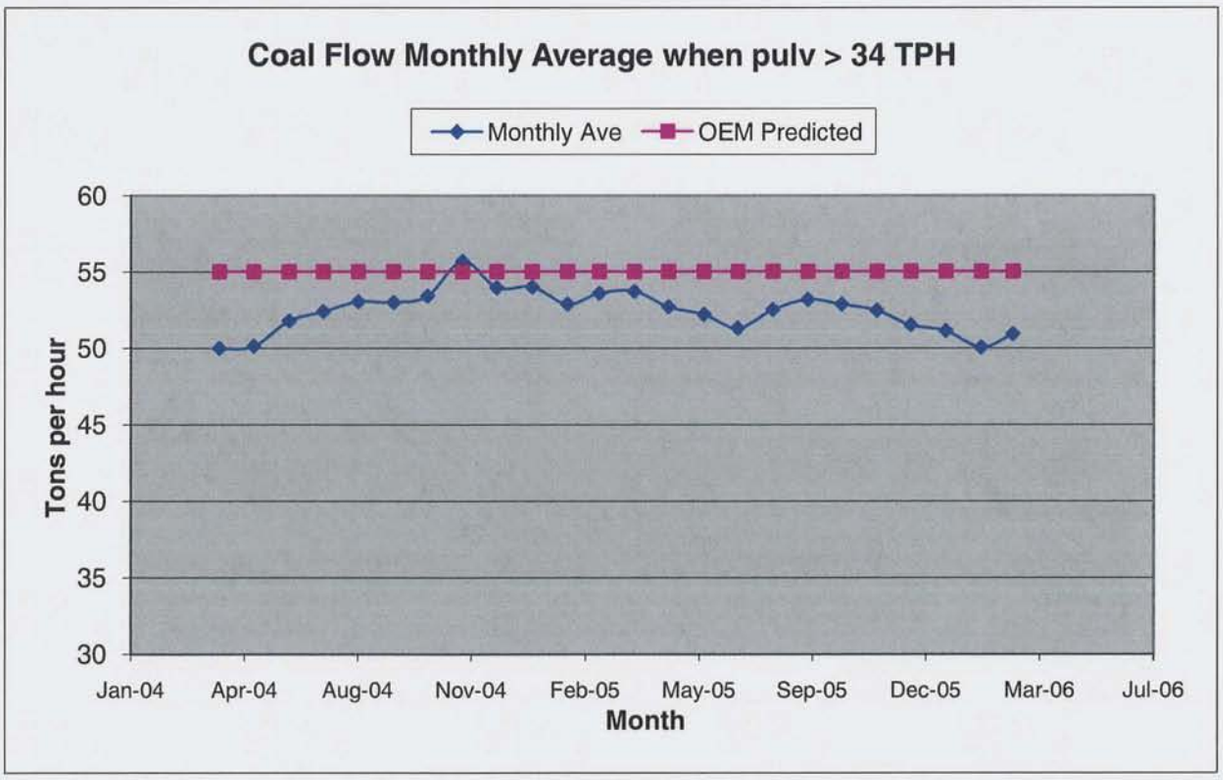
)% set back to 239 kpph

	HHVC	difference from 11,500	difference from 11,292
Apr-04	11,762	262	470
May-04	11,952	452	660
Jun-04	12,004	504	712
Jul-04	11,760	260	468
Aug-04	11,643	143	351
Sep-04	11,484	(16)	192
Oct-04	11,332	(168)	40
Nov-04	10,893	(607)	(399)
Dec-04	10,752	(748)	(540)
Jan-05	10,959	(541)	(333)
Feb-05	11,186	(314)	(106)
Mar-05	11,078	(422)	(214)
Apr-05	11,310	(190)	18
May-05	11,596	96	304
Jun-05	11,864	364	572
Jul-05	11,805	305	513
Aug-05	11,582	82	290
Sep-05	11,578	78	286
Oct-05	11,456	(44)	164
Nov-05	11,405	(95)	113
Dec-05	11,433	(67)	141
Jan-06	11,501	1	209
Feb-06	11,559	59	267
Mar-06	11,661	161	369
		sum of difference	sum of difference
average	11,481	(445)	4,547

	coal flow average when > 34 tph		
	A Pulv	B Pulv	C Pulv
Apr-04	49.93	49.98	51.40
May-04	49.75	50.57	51.36
Jun-04	51.77	52.66	53.07
Jul-04	53.60	54.00	51.07
Aug-04	52.63	54.41	51.51
Sep-04	53.05	48.61	54.98
Oct-04	52.82	54.26	55.83
Nov-04		54.25	59.22
Dec-04	52.71	53.82	57.67
Jan-05	54.10	54.52	57.02
Feb-05	53.22	52.91	54.29
Mar-05	54.00	53.46	57.96
Apr-05	54.53	54.53	
May-05	52.97	52.65	55.63
Jun-05	53.02	51.47	55.12
Jul-05	52.14	50.84	53.87
Aug-05	54.17	53.30	54.07
Sep-05	54.74	53.66	54.46
Oct-05	53.60	53.68	54.18
Nov-05	53.98	54.01	53.93
Dec-05	52.97	52.98	52.98
Jan-06	51.38	52.41	52.45
Feb-06	52.80	53.12	53.06
Mar-06	52.33	51.97	51.97

	average	
Apr-04	49.99	55
May-04	50.14	55
Jun-04	51.80	55
Jul-04	52.41	55
Aug-04	53.06	55
Sep-04	53.01	55
Oct-04	53.43	55
Nov-04	55.71	55
Dec-04	53.96	55
Jan-05	54.02	55
Feb-05	52.90	55
Mar-05	53.60	55
Apr-05	53.73	55
May-05	52.71	55
Jun-05	52.22	55
Jul-05	51.31	55
Aug-05	52.52	55
Sep-05	53.19	55
Oct-05	52.88	55
Nov-05	52.47	55
Dec-05	51.51	55
Jan-06	51.14	55
Feb-06	50.06	55
Mar-06	50.92	55

D Pulv	E Pulv	F Pulv	G Pulv	H Pulv	average	coal flow maximum value A Pulv	B Pulv	C Pulv	D Pulv	E Pulv
49.53	49.83	48.25	50.92	50.06	49.99	67.32	59.63	65.00	53.18	56.28
49.69	48.80	48.08	53.21	49.68	50.14	64.94	60.60	65.26	60.20	62.95
52.83	49.80	44.89	57.09	52.26	51.80	64.38	65.12	62.48	64.95	67.91
54.30	51.11	51.19	51.19	52.79	52.41	67.41	67.38	67.56	67.93	65.97
53.59	53.70	52.07	54.01	52.57	53.06	64.21	63.69	63.61	65.60	65.08
54.29	54.44	52.66	52.94	53.10	53.01	66.36	53.03	67.37	66.90	65.09
54.10	54.07	50.72	53.80	51.80	53.43	63.02	65.97	66.57	65.88	64.11
56.72	53.93	53.27	56.16	56.39	55.71	-	66.45	68.00	66.15	65.03
55.12	52.13	50.29	55.10	54.88	53.96	65.02	67.65	68.00	67.88	64.10
54.48	52.96	52.76	52.66	53.68	54.02	67.04	67.16	67.09	67.05	62.19
53.62	51.82	52.36	52.58	52.43	52.90	64.03	67.78	67.10	61.20	64.79
51.62	51.41	52.23	54.55	53.60	53.60	65.55	63.37	68.00	61.43	63.61
54.50	50.25	53.24	54.92	54.16	53.73	58.19	60.75	-	60.37	56.46
52.75	49.84	52.23	53.11	52.52	52.71	59.69	61.16	63.31	60.77	68.00
52.67	48.22	52.67		52.37	52.22	63.33	63.56	66.27	63.22	60.00
51.71	49.91	49.35		51.35	51.31	64.08	64.34	67.16	61.67	63.44
53.46	48.83	50.42		53.41	52.52	66.05	61.70	66.19	63.30	57.51
54.48	50.05	50.84		54.09	53.19	67.20	65.04	66.30	66.97	63.94
53.70	51.34	49.40	53.53	53.58	52.88	63.50	65.90	65.84	65.49	62.57
	52.68	45.53	53.86	53.27	52.47	59.75	60.51	60.42	-	58.86
51.70	50.90	45.12	53.14	52.32	51.51	60.04	60.08	59.98	57.01	60.30
52.10	49.66	46.58	52.65	51.88	51.14	63.09	63.11	67.98	62.66	60.31
52.20	49.32	45.92	53.25	40.83	50.06	62.61	62.70	62.59	62.21	59.30
51.70	50.63	45.39	52.06	51.30	50.92	61.59	61.66	61.60	61.23	58.91



F Pulv	G Pulv	H Pulv
63.29	67.79	67.46
61.52	66.57	65.07
61.49	67.60	64.54
67.69	67.85	67.53
64.86	65.83	59.89
64.67	66.99	62.56
64.01	65.66	63.60
64.40	63.94	65.87
63.51	67.86	67.61
67.03	63.76	61.70
67.78	67.83	65.95
62.23	63.84	62.99
57.65	60.75	59.81
59.94	61.22	59.31
62.92	-	62.65
61.21	-	63.32
54.53	-	65.31
59.80	-	66.35
54.51	66.02	65.12
45.90	60.57	59.55
46.50	60.14	59.26
54.42	63.22	62.29
57.17	62.84	43.81
55.82	61.30	60.82

west east

Burner #	6	5	4	3	2	1	row ave	hrs o/s
E	5	1	1	1	1	5	**2.3**	2424
A	6	6	6	1	1	6	**4.3**	3257
F	8	2	8.5		5	1	**4.9**	2278
B	5	5	7	2	1	7	**4.5**	2155
front burner ave	**6.0**	**3.5**	**5.6**	**1.3**	**2.0**	**4.8**	**3.9**	
D	8	9	3	9	8	1	**6.3**	2633
H	8.5	8.5	3	8.5	8	3	**6.6**	2458
C	4	4	2	1	1	1	**2.2**	3429
G	5	8	8	8	5	2	**6.0**	3941
rear burner ave	**6.4**	**7.4**	**4.0**	**6.6**	**5.5**	**1.8**	**5.3**	
column average	**6.2**	**5.4**	**4.8**	**4.0**	**3.8**	**3.3**	**4.6**	

ABT 2006 Spring Outage

Parts		
Segment Wear Liners	$	107,100.00
Fuel Injector diffuser/wear liner	$	92,000.00
Ceramic Bricks	$	7,050.00
Tips, 309SS 42" from PI	$	4,570.00
Throat Segments	$	3,660.00
# bags Super Abrade	$	798.00
F3 burner PO # 06-48595	$	107,150.00
Sub Total	$	322,328.00

		Parts	Utah Sales Tax	Additional Freight	Utah Sales Tax	labor		Total
p.o. #06-51899-1	$	107,100.00	$ 6,426.00	$ 1,550.00	$ 93.00		$	115,169.00
p.o. #06-51899-2	$	92,000.00	$ 5,520.00				$	97,520.00
p.o. #06-48595-1	$	42,860.00					$	42,860.00
p.o. #06-48595-2	$	64,290.00	$ 3,857.40				$	68,147.40
p.o. #06-51583	$	7,050.00	$ 423.00				$	7,473.00
	$	4,570.00	$ 274.20				$	4,844.20
	$	3,660.00	$ 219.60				$	3,879.60
	$	798.00	$ 47.88				$	845.88
subtotal	$	322,328.00	$16,768.08	$ 1,550.00	$ 93.00	$ -	$	340,739.08

Total Material

	Labor		TIMS
AP&F	Work Release #06-45603-320	$	249,651.02
AP&F	Work Release #06-45603-319	$	21,000.00
AP&F	Work Release #06-45603-293 F3	$	6,183.20
	Regular Labor w.o. # 06-88388	$	1,544.22
I&C	Regular Labor w.o. # 06-88388-1	$	613.44
I&C	Regular Labor w.o. # 06-88388-2	$	1,048.00
	Sub Total	$	280,039.88
	Total	$	602,367.88

By work order		**materials**		**labor**		
w.o. # 06-88963	$	24,887.52				
w.o. # 06-88964	$	282,300.44	contains more than burner			
w.o. # 06-88966	$	24,886.04				
w.o. # 06-88388-0	$	85,081.02		$ 1,544.22		
w.o. # 06-88388-1				$ 613.44		
w.o. # 06-88388-2				$ 1,048.00		
w.o. #06-74346-2	$	6,183.20				
	$	423,338.22		$ 3,205.66	$	426,543.88

2008

ABT	Unit Price	Quantity	Total
Fuel Injectors price each	$ 36,300.00	48	$ 1,742,400.00
	shipping	10%	$ 174,240.00
15% discount if ordered by June 15, 2006	taxes		$ 12,196.80
	misc		$ 20,000.00
	total materials + 10%		$ 2,143,720.48
Labor			$ 350,000.00
	sub total		$ 2,493,720.48
	3% inflation		$ 2,568,532.09

2008

Power Industrial (PI)			
	Unit Price	Quantity	Total
Coal Nozzles	$ 7,250.00	48	$ 348,000.00
Conical Diffuser	$ 1,225.00	48	$ 58,800.00
Coal Deflector	$ 360.00	48	$ 17,280.00
Seal Plate	$ 250.00	48	$ 12,000.00
	misc		$ 20,000.00
		sub total	$ 456,080.00
	material change	+20%	$ 547,296.00
	shipping	10%	$ 54,729.60
	taxes		$ 3,831.07
	Total materials		$ 605,856.67
Labor	Total labor		$ 350,000.00
	Total		$ 955,856.67

Tip Only Option			
	Unit Price	Quantity	Total
Coal Tip	$ 4,110.00	48	$ 197,280.00
	material change	20%	$ 236,736.00
	misc		$ 20,000.00
	shipping		$ 19,728.00
	taxes		$ 1,380.96
	Total materials		$ 277,844.96
	Total Labor		$ 350,000.00
	Total		$ 627,844.96

65000
5000
4788.96
10453.14
5000
189994.04
2179.76
16778.66
27636.22
107100
92000.16

History of Burner/Nozzle Replacements at IGS

Year	Unit 1	Unit 2
1986	Initial operation with the original B&W Mark IV Low NOx (DRB) Dual Register Burners installes with initial construction. 22" alloy seam tip. CS conical diffuser	
1987		Initial operation with the original B&W Mark IV Low NOx (DRB) Dual Register Burners installes with initial construction. 22" alloy seam tip. CS conical diffuser
1991		Repaired and modified the burners. Structural modifications to the backplate and registers to prevent warping from overheat. Conical diffusers used. Flame stabilizers installed to shade the burner front from radiant heat. HD registers
1992	New B&W Dual Register Phase 5 Low NOx burners installed. Structural modifications to the backplate and registers (HD registers) to prevent warping from overheat. Conical diffuser used. Flame stabilizers installed to shade the burner front from radiant heat. Overheating was the result of design flaws from B&W. 33" seamless alloy tip used.	
1998		All nozzles replaced with a 63" ceramic lined section with a 33" centrifugally cast PI-2000 heat and abrasion resistant tip. Nitride Bonded Silicon Carbide Conical diffuser 4-98
1999	All nozzles replaced with a 63" ceramic lined section with a 33" centrifugally cast PI-2000 heat and abrasion resistant tip. Nitride Bonded Silicon Carbide Conical diffuser 4-99	
2004		New burners installed due to structural failures from overheating. Advanced Burner Technologies (ABT) Opti-flow Low NOx flame Stabilization nozzle (flower pedal shaped) tip. 28" cast tip. X-vane installed in a spool piece and a kicker in the elbow installed. No conical diffuser.
2006		Repaired and modified the ABT burners. Tip wear liners installed along with a fuel injector diffuser and wear liner. Elbow kicker removed. Modifications due to holes in nozzles at 3 o'clock and 9 o'clock positions from x-vane, holes through sweep elbows, and tips eroded through and cracked. 20 tips irrepairable and replaced with a 40" straight tip section. Unit 2 failed before Unit 1 because Unit 2's were not replaced in 1992 which was the case for Unit 1.
2007	Replacement nozzles 81" ceramic lined with 44" cast PI-2000 heat and abrasion resistant tip. Nitride Bonded silicon Carbide Conical Diffusers used.	