



NATIONAL TRANSPORTATION SAFETY BOARD  
**Investigative Hearing**

Washington Metropolitan Area Transit Authority Metrorail train 302 that encountered heavy smoke in the tunnel between the L'Enfant Plaza Station and the Potomac River Bridge on January 12, 2015

<b>GROUP</b>	<b>B</b>
<b>EXHIBIT</b>	
<b>2.2</b>	

Agency / Organization

NTSB

Title

**Fire Investigation: Fan Data**

## Fan Data F03 L'Enfant Station and Surrounding Location

L'Enfant Station is a two level station with Green and Yellow lines located on the upper level and the Orange, Blue, and Silver lines located on the lower level. At the station there are Under Platform Exhaust (UPE) fans (Fresh Air) located on each level which consists of two fans at each level connected to ducts and grilles under the platform. The UPE fans can either exhaust air from under the platform out of the station or supply fresh outside air to under the platform. In each of the tunnels between L'Enfant Station and the next station on the line there are tunnel fans located in shafts which are connected to the tunnel. The tunnel exhaust fans can either exhaust air from the tunnel through the shaft to the exterior or supply fresh air through the shaft and into the tunnel. The table below identifies the various fans at L'Enfant Station and the surrounding rail area, along with the quantity and size at each location:

Fan	Location	Qty	Size/Capacity per fan
UPE Fan 1	L'Enfant Station upper level	1	30000 cfm (21000) cfm
UPE Fan 2	L'Enfant Station upper level	1	30000 cfm (21000) cfm
FL1 Fan 6	Fan Shaft FL1	4	50000 cfm (35000) cfm
FF2 Fan 5	Fan Shaft FF2	4	50000 cfm (35000) cfm
FF3 Fan 5	Fan Shaft FF3	2	50000 cfm (35000) cfm
FD3 Fan 1	Fan Shaft FD3	4	50000 cfm (35000) cfm
FD4 Fan1	Fan Shaft FD4	4	50000 cfm (35000) cfm

Table 1

( ) identify reverse mode capacity

There are UPE fans located on the lower level at L'Enfant Station which were not commanded on Jan. 12, 2015.

The fans at these locations can be controlled locally by emergency or WMATA maintenance personnel using the selector switch on the fan control cabinet or remotely by a person at the Rail Operations Control Center (ROCC). The remote fan operations are controlled from ROCC via Ethernet to a Remote Terminal Unit (RTU) located in the Train Control Room. The RTU is connected to the fan control cabinet via the Data Transmission System (DTS) cables.

Fan control commands are pulse type. ROCC sends control commands which energize for approximately five seconds and then sends an additional command to de-energize the control command. The fan controls are "latched" by the incoming fan control command. When ROCC sends a control command, an initial status is reported back from the fan controls to the RTU indicating the current state of the fan. Then a second status is sent back confirming the control command from ROCC. Statuses and alarms are sent from the fan control cabinet to the RTU and then to ROCC. All of the commands and statuses are logged by the Advance Information Management (AIM) system which provides a record of the controls commands and statuses. These statuses and alarms require field verification to ensure the fan(s) and associated equipment are operating properly based off the sent commands.

Figure 1 shows L'Enfant Station along with the surrounding rail stations, rail lines, and fan shafts. Figure 1 and table 2 outline the order of command events from ROCC to the RTU for the various fans for January 12, 2015. Appendix 1 contains the ROCC log data which identifies the sequence of commands and statuses for the various fans on January 12, 2015.

# SEQUENCE OF FAN OPERATIONAL COMMANDS ON 1/12/2015 – L'ENFANT STATION AND SURROUNDING FAN SHAFTS

Order number	Time	Fan	Location	Command	Description
1	15:16:09	UPE Fan 2	L'Enfant Station	Exhaust	UPE fan 2 requested from ROCC into exhaust
2	15:16:32	UPE Fan 1	L'Enfant Station	Exhaust	UPE fan 1 requested from ROCC into exhaust
3	15:24:28	FL1 Fan 6	Fan Shaft FL1	Exhaust	Fans in Fan Shaft FL1 requested from ROCC into exhaust
4	15:26:49	FD3 Fan 1	Fan Shaft FD3	Exhaust	Fans in Fan Shaft FD3 requested from ROCC into exhaust
5	15:26:49	FD4 Fan 1	Fan Shaft FD4	Exhaust	Fans in Fan Shaft FD4 requested from ROCC into exhaust
6	15:33:51	UPE Fan 1	L'Enfant Station	Exhaust	UPE fan 1 requested from ROCC into exhaust, fan already indicated to be in exhaust
7	15:35:38	UPE Fan 2	L'Enfant Station	Exhaust	UPE fan 2 requested from ROCC into exhaust, fan already indicated to be in exhaust
8	15:35:44	FL1 Fan 6	Fan Shaft FL1	Exhaust	Fans in Fan Shaft FL1 requested from ROCC into exhaust, fans already indicated to be in exhaust
9	15:44:18	FF2 Fan 5	Fan Shaft FF2	Exhaust	Fans in Fan Shaft FF2 requested from ROCC into Exhaust
10	15:44:47	FF3 Fan 5	Fan Shaft FF3	Exhaust	Fans in Fan Shaft FF3 requested from ROCC into Exhaust

# Order in which fans were commanded  
Table 2

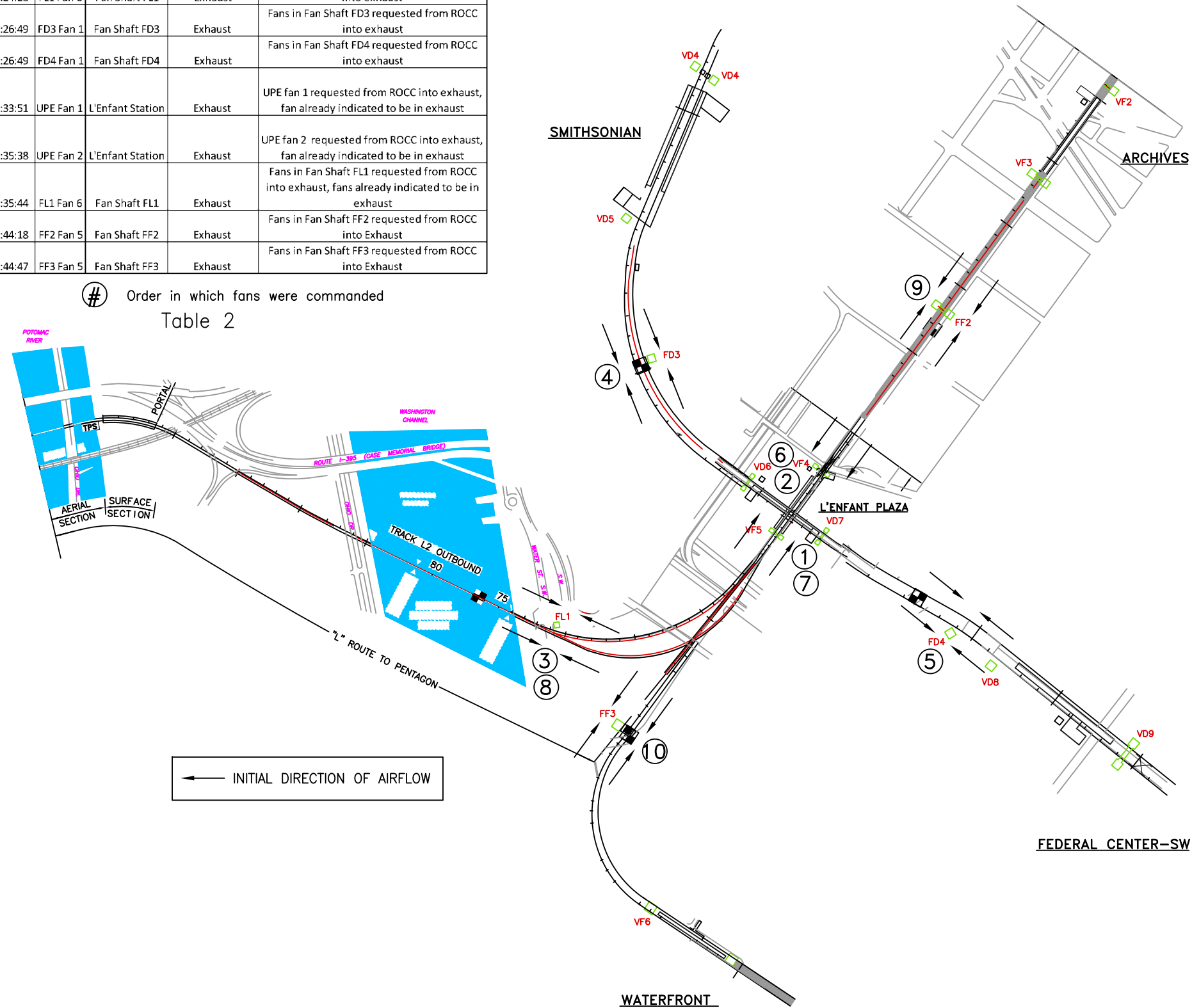


Figure 1

**Appendix 1 - ROCC Log Data**  
**Sequence of Fan Operation During 1/12/2015 Incident**

Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA	
3:16:09 PM	1/12/2015	L'Enfant PI	Up	F03-2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:16:09 PM	1/12/2015	L'Enfant PI	Up	F03-2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:16:10 PM	1/12/2015	L'Enfant PI	Up	F03-2 Fan Status COMMANDED CHANGE = Emergency On		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:16:32 PM	1/12/2015	L'Enfant PI	Up	F03-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:16:32 PM	1/12/2015	L'Enfant PI	Up	F03-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:16:33 PM	1/12/2015	L'Enfant PI	Up	F03-1 Fan Status COMMANDED CHANGE = Emergency On		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:16:56 PM	1/12/2015	Archives		F02-2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN #2 WITHIN F02 STATION	
3:16:56 PM	1/12/2015	Archives		F02-2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN #2 WITHIN F02 STATION	
3:16:56 PM	1/12/2015	Archives		F02-2 Fan Status COMMANDED CHANGE = Emergency On		GY	LAFM	1	UPE FAN #2 WITHIN F02 STATION	
3:17:14 PM	1/12/2015	Archives		F02-2 Fan Operation CURRENT STATE = Abnormal		GY	FM	4	UPE FAN #2 WITHIN F02 STATION	
3:17:26 PM	1/12/2015	Archives		F02-2 Fan Operation CURRENT STATE = Abnormal ACKNOWLEDGED BY 298380 AT	ass	t_sup-6a	GY	FM	1	UPE FAN #2 WITHIN F02 STATION
3:18:15 PM	1/12/2015	Archives		F02-2 Fan Operation CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	FM	1	UPE FAN #2 WITHIN F02 STATION
3:18:22 PM	1/12/2015	Archives		F02-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN #1 WITHIN F02 STATION	
3:18:22 PM	1/12/2015	Archives		F02-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN #1 WITHIN F02 STATION	
3:18:24 PM	1/12/2015	Archives		F02-1 Fan Status COMMANDED CHANGE = Emergency On		GY	LAFM	1	UPE FAN #1 WITHIN F02 STATION	

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Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA	
3:22:34 PM	1/12/2015	Archives		F02-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN #1 WITHIN F02 STATION	
3:22:34 PM	1/12/2015	Archives		F02-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN #1 WITHIN F02 STATION	
3:24:29 PM	1/12/2015	L'Enfant PI	Up	6-L1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FL1	
3:24:29 PM	1/12/2015	L'Enfant PI	Up	6-L1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FL1	
3:24:30 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Remote Control CURRENT STATE = Abnormal		GY	FM	4	FAN SHAFT FL1	
3:24:30 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status CURRENT STATE = Invalid 000		GY	LAFM	4	FAN SHAFT FL1	
3:24:31 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Remote Control CURRENT STATE = Normal		GY	FM	4	FAN SHAFT FL1	
3:25:00 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status UNCOMMANDED CHANGE = Emergency On		GY	LAFM	4	FAN SHAFT FL1	
3:25:31 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Remote Control CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	FM	1	FAN SHAFT FL1
3:26:01 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	LAFM	1	FAN SHAFT FL1
3:26:49 PM	1/12/2015	L'Enfant PI	LL	1-D3 Fan Exhaust COMMANDED Exhaust BY 564732 AT ob_wkst-3a		OB	LAFM	1	FAN SHAFT FD3	
3:26:49 PM	1/12/2015	L'Enfant PI	LL	1-D3 Fan On COMMANDED Emergency On BY 564732 AT ob_wkst-3a		OB	LAFM	1	FAN SHAFT FD3	
0.64362451	42016	Federal Ctr	SW	1-D4 Fan Exhaust COMMANDED Exhaust BY 564732 AT ob_wkst-3a		OB	LAFM	1	FAN SHAFT FD4	
0.64362451	42016	Federal Ctr	SW	1-D4 Fan On COMMANDED Emergency On BY 564732 AT ob_wkst-3a		OB	LAFM	1	FAN SHAFT FD4	
0.64363464	42016	Federal Ctr	SW	D04-1-D4 Fan Status UNCOMMANDED CHANGE = Emergency On		OB	LAFM	4	FAN SHAFT FD4	

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Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA	
3:26:50 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD3	
3:26:50 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Status UNCOMMANDED CHANGE = Emergency On		OB	LAFM	4	FAN SHAFT FD3	
3:26:52 PM	1/12/2015	Federal Ctr	SW	D04-1-D4 Fan Remote Control CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD4	
3:27:23 PM	1/12/2015	Federal Ctr	SW	D04-1-D04 Fan Operation CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD4	
3:27:29 PM	1/12/2015	Federal Ctr	SW	D04-1-D04 Fan Operation CURRENT STATE = Normal		OB	FM	4	FAN SHAFT FD4	
3:27:35 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Normal		OB	FM	4	FAN SHAFT FD3	
3:27:36 PM	1/12/2015	Federal Ctr	SW	D04-1-D04 Fan Shaft Damper CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD4	
3:27:44 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Shaft Damper CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD3	
3:27:51 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	LAFM	1	FAN SHAFT FD3
3:27:51 PM	1/12/2015	Federal Ctr	SW	D04-1-D4 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	LAFM	1	FAN SHAFT FD4
3:27:52 PM	1/12/2015	Federal Ctr	SW	D04-1-D4 Fan Remote Control CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	FM	1	FAN SHAFT FD4
3:28:30 PM	1/12/2015	Federal Ctr	SW	D04-1-D04 Fan Operation CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	FM	1	FAN SHAFT FD4
3:28:36 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	FM	1	FAN SHAFT FD3
3:28:36 PM	1/12/2015	Federal Ctr	SW	D04-1-D04 Fan Shaft Damper CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	FM	1	FAN SHAFT FD4
3:28:45 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Shaft Damper CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	FM	1	FAN SHAFT FD3

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3:33:52 PM	1/12/2015	L'Enfant Pl	Up	F03-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:33:52 PM	1/12/2015	L'Enfant Pl	Up	F03-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:35:38 PM	1/12/2015	L'Enfant Pl	Up	F03-2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:35:38 PM	1/12/2015	L'Enfant Pl	Up	F03-2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:35:44 PM	1/12/2015	L'Enfant Pl	Up	6-L1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FL1	
3:35:44 PM	1/12/2015	L'Enfant Pl	Up	6-L1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FL1	
3:36:54 PM	1/12/2015	L'Enfant Pl	Up	F03-6-L1 Fan Status CONTROL FAILURE = Automatic TIMEOUT		GY	LAFM	4	FAN SHAFT FL1	
3:37:10 PM	1/12/2015	L'Enfant Pl	Up	F03-6-L1 Fan Status CONTROL FAILURE = Automatic ACKNOWLEDGED BY 003784 AT	sil	ver_wkst-1a	GY	LAFM	1	FAN SHAFT FL1
3:37:54 PM	1/12/2015	L'Enfant Pl	Up	F03-6-L1 Fan Status CONTROL FAILURE = Automatic ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	LAFM	1	FAN SHAFT FL1
3:43:52 PM	1/12/2015	L'Enfant Pl	Up	F03-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:43:52 PM	1/12/2015	L'Enfant Pl	Up	F03-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	UPE FAN IN F03 STATION, UPPER LEVEL	
3:44:19 PM	1/12/2015	L'Enfant Pl	Up	5-F2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FF2 (ON THE MALL)	
3:44:19 PM	1/12/2015	L'Enfant Pl	Up	5-F2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FF2 (ON THE MALL)	
3:44:20 PM	1/12/2015	L'Enfant Pl	Up	F03-5-F02 Fan Operation CURRENT STATE = Abnormal		GY	FM	4	FAN SHAFT FF2 (ON THE MALL)	
3:44:20 PM	1/12/2015	L'Enfant Pl	Up	F03-5-F2 Fan Status UNCOMMANDED CHANGE = Emergency On		GY	LAFM	4	FAN SHAFT FF2 (ON THE MALL)	

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Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA	
3:44:23 PM	1/12/2015	L'Enfant Pl	Up	F03-5-F2 Fan Status UNCOMMANDED CHANGE = Emergency O ACKNOWLEDGED BY 003784 AT	sil	ver_wkst-1a	GY	LAFM	1	FAN SHAFT FF2 (ON THE MALL)
3:44:33 PM	1/12/2015	Waterfront		F04-2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a			G	LAFM	1	UPE FAN #2 WITHIN F04 STATION
3:44:33 PM	1/12/2015	Waterfront		F04-2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			G	LAFM	1	UPE FAN #2 WITHIN F04 STATION
3:44:34 PM	1/12/2015	Waterfront		F04-2 Fan Status COMMANDED CHANGE = Emergency On			G	LAFM	1	UPE FAN #2 WITHIN F04 STATION
3:44:38 PM	1/12/2015	Waterfront		F04-2 Fan Status UNCOMMANDED CHANGE = Automatic			G	LAFM	4	UPE FAN #2 WITHIN F04 STATION
3:44:39 PM	1/12/2015	L'Enfant Pl	Up	F03-5-F02 Fan Shaft Damper CURRENT STATE = Abnormal			GY	FM	4	FAN SHAFT FF2 (ON THE MALL)
3:44:42 PM	1/12/2015	Waterfront		F04-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a			G	LAFM	1	UPE FAN #1 WITHIN F04 STATION
3:44:42 PM	1/12/2015	Waterfront		F04-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			G	LAFM	1	UPE FAN #1 WITHIN F04 STATION
3:44:43 PM	1/12/2015	Waterfront		F04-1 Fan Status COMMANDED CHANGE = Emergency On			G	LAFM	1	UPE FAN #1 WITHIN F04 STATION
3:44:47 PM	1/12/2015	Waterfront		5-F03 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a			G	LAFM	1	FAN SHAFT FF3
3:44:47 PM	1/12/2015	Waterfront		5-F03 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			G	LAFM	1	FAN SHAFT FF3
3:44:48 PM	1/12/2015	Waterfront		F04-5-F03 Fan Status UNCOMMANDED CHANGE = Emergency On			G	LAFM	4	FAN SHAFT FF3
3:45:12 PM	1/12/2015	L'Enfant Pl	Up	F03-5-F02 Fan Operation CURRENT STATE = Normal			GY	FM	4	FAN SHAFT FF2 (ON THE MALL)
3:45:19 PM	1/12/2015	L'Enfant Pl	Up	F03-5-F2 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	LAFM	1	FAN SHAFT FF2 (ON THE MALL)
3:45:37 PM	1/12/2015	Waterfront		F04-2 Fan Status UNCOMMANDED CHANGE = Automatic ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	G	LAFM	1	UPE FAN #2 WITHIN F04 STATION



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3:45:38 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Shaft Damper CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	FM	1 FAN SHAFT FF2 (ON THE MALL)
3:45:48 PM	1/12/2015	Waterfront		F04-5-F03 Fan Status UNCOMMANDED CHANGE = Emergency ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	G	LAFM	1 FAN SHAFT FF3
3:45:48 PM	1/12/2015	Waterfront		F04-5-F03 Fan Operation CURRENT STATE = Abnormal			G	FM	4 FAN SHAFT FF3
3:46:11 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Operation CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	FM	1 FAN SHAFT FF2 (ON THE MALL)
3:46:48 PM	1/12/2015	Waterfront		F04-5-F03 Fan Operation CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	G	FM	1 FAN SHAFT FF3
4:22:00 PM	1/12/2015	L'Enfant PI	Up	F03-2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a			GY	LAFM	1 UPE FAN IN F03 STATION, UPPER LEVEL
4:22:00 PM	1/12/2015	L'Enfant PI	Up	F03-2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			GY	LAFM	1 UPE FAN IN F03 STATION, UPPER LEVEL
4:22:06 PM	1/12/2015	L'Enfant PI	Up	F03-1 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a			GY	LAFM	1 UPE FAN IN F03 STATION, UPPER LEVEL
4:22:06 PM	1/12/2015	L'Enfant PI	Up	F03-1 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			GY	LAFM	1 UPE FAN IN F03 STATION, UPPER LEVEL
4:22:35 PM	1/12/2015	L'Enfant PI	Up	6-L1 Fan Exhaust COMMANDED Supply BY 567909 AT asst_sup-5a			GY	LAFM	1 FAN SHAFT FL1
4:22:35 PM	1/12/2015	L'Enfant PI	Up	6-L1 Fan On COMMANDED Emergency On BY 567909 AT asst_sup-5a			GY	LAFM	1 FAN SHAFT FL1
4:22:36 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Operation CURRENT STATE = Abnormal			GY	FM	4 FAN SHAFT FL1
4:22:36 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Orientation COMMANDED CHANGE = Supply			GY	LAFM	1 FAN SHAFT FL1
4:22:36 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status CURRENT STATE = Invalid 000			GY	LAFM	4 FAN SHAFT FL1
4:23:10 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status UNCOMMANDED CHANGE = Emergency On			GY	LAFM	4 FAN SHAFT FL1

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Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA
4:23:36 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Operation CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY FM	1	FAN SHAFT FL1
4:24:10 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY LAFM	1	FAN SHAFT FL1
4:24:55 PM	1/12/2015	L'Enfant PI	Up	5-F2 Fan Exhaust COMMANDED Exhaust BY 010335 AT yg_wkst-3a			GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:24:55 PM	1/12/2015	L'Enfant PI	Up	5-F2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:26:04 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Status CONTROL FAILURE = Automatic TIMEOUT			GY LAFM	4	FAN SHAFT FF2 (ON THE MALL)
4:27:04 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Status CONTROL FAILURE = Automatic ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:40:40 PM	1/12/2015	L'Enfant PI	Up	5-F2 Fan Exhaust COMMANDED Supply BY 010335 AT yg_wkst-3a			GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:40:40 PM	1/12/2015	L'Enfant PI	Up	5-F2 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a			GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:40:41 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Operation CURRENT STATE = Abnormal			GY FM	4	FAN SHAFT FF2 (ON THE MALL)
4:40:41 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Shaft Damper CURRENT STATE = Normal			GY FM	4	FAN SHAFT FF2 (ON THE MALL)
4:40:41 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Orientation COMMANDED CHANGE = Supply			GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:40:41 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Status CURRENT STATE = Invalid 000			GY LAFM	4	FAN SHAFT FF2 (ON THE MALL)
4:41:04 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Status CURRENT STATE = Invalid 000 ACKNOWLEDGED BY 003784 AT	sil	ver_wkst-1a	GY LAFM	1	FAN SHAFT FF2 (ON THE MALL)
4:41:06 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Shaft Damper CURRENT STATE = Abnormal			GY FM	4	FAN SHAFT FF2 (ON THE MALL)
4:41:09 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Status UNCOMMANDED CHANGE = Emergency On			GY LAFM	4	FAN SHAFT FF2 (ON THE MALL)

**Appendix 1 - ROCC Log Data**  
**Sequence of Fan Operation During 1/12/2015 Incident**

Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA
4:41:39 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Operation CURRENT STATE = Normal		GY	FM	4	FAN SHAFT FF2 (ON THE MALL)
4:42:06 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Shaft Damper CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	1	FAN SHAFT FF2 (ON THE MALL)
4:42:09 PM	1/12/2015	L'Enfant PI	Up	F03-5-F2 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	1	FAN SHAFT FF2 (ON THE MALL)
4:42:39 PM	1/12/2015	L'Enfant PI	Up	F03-5-F02 Fan Operation CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	1	FAN SHAFT FF2 (ON THE MALL)
4:42:42 PM	1/12/2015	L'Enfant PI	LL	1-D3 Fan Exhaust COMMANDED Supply BY 564732 AT ob_wkst-3a		OB	LAFM	1	FAN SHAFT FD3
4:42:42 PM	1/12/2015	L'Enfant PI	LL	1-D3 Fan On COMMANDED Emergency On BY 564732 AT ob_wkst-3a		OB	LAFM	1	FAN SHAFT FD3
4:42:43 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD3
4:42:43 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Shaft Damper CURRENT STATE = Normal		OB	FM	4	FAN SHAFT FD3
4:42:43 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Orientation COMMANDED CHANGE = Supply		OB	LAFM	1	FAN SHAFT FD3
4:42:43 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Status CURRENT STATE = Invalid 000		OB	LAFM	4	FAN SHAFT FD3
4:43:00 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Abnormal ALARM FINAL ACK. BY 006286	AT	atc-2a	OB	1	FAN SHAFT FD3
4:43:00 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Shaft Damper CURRENT STATE = Normal ALARM FINAL ACK. BY 006286	AT	atc-2a	OB	1	FAN SHAFT FD3
4:43:00 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Status CURRENT STATE = Invalid 000 ACKNOWLEDGED BY 006286 AT	atc	-2a	OB	1	FAN SHAFT FD3
4:43:06 PM	1/12/2015	Waterfront		5-F03 Fan Exhaust COMMANDED Supply BY 010335 AT yg_wkst-3a		G	LAFM	1	FAN SHAFT FF3
4:43:06 PM	1/12/2015	Waterfront		5-F03 Fan On COMMANDED Emergency On BY 010335 AT yg_wkst-3a		G	LAFM	1	FAN SHAFT FF3

**Appendix 1 - ROCC Log Data  
Sequence of Fan Operation During 1/12/2015 Incident**

Time:	Date:	Station:	Platform:	Entry: (System Alias, Equipment, Disposition, Employee, Computer Terminal)	Workstation	Line	Functional Partition	Priority	FAN SYSTEM FOR CLARIFICATION NOT FROM LOG DATA
4:43:07 PM	1/12/2015	Waterfront		F04-5-F03 Fan Orientation COMMANDED CHANGE = Supply		G	LAFM	1	FAN SHAFT FF3
4:43:15 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Status UNCOMMANDED CHANGE = Emergency On		OB	LAFM	4	FAN SHAFT FD3
4:43:31 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Shaft Damper CURRENT STATE = Abnormal		OB	FM	4	FAN SHAFT FD3
4:43:35 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Normal		OB	FM	4	FAN SHAFT FD3
4:43:47 PM	1/12/2015	Waterfront		F04-5-F03 Fan Shaft Damper CURRENT STATE = Abnormal		G	FM	4	FAN SHAFT FF3
4:44:15 PM	1/12/2015	L'Enfant PI	LL	D03-1-D3 Fan Status UNCOMMANDED CHANGE = Emergency O ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	1	FAN SHAFT FD3
4:44:31 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Shaft Damper CURRENT STATE = Abnormal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	1	FAN SHAFT FD3
4:44:35 PM	1/12/2015	L'Enfant PI	LL	D03-1-D03 Fan Operation CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	OB	1	FAN SHAFT FD3
4:44:41 PM	1/12/2015	Waterfront		F04-5-F03 Fan Shaft Damper CURRENT STATE = Abnormal ALARM FINAL ACK. BY 006286	AT	atc-2a	G	1	FAN SHAFT FF3
5:21:40 PM	1/12/2015	L'Enfant PI	Up	6-L1 Fan On COMMANDED Emergency Off BY 010335 AT yg_wkst-3a		GY	LAFM	1	FAN SHAFT FL1
5:21:42 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Operation CURRENT STATE = Normal		GY	FM	4	FAN SHAFT FL1
5:21:42 PM	1/12/2015	L'Enfant PI	Up	F03-6-L1 Fan Status COMMANDED CHANGE = Emergency Off		GY	LAFM	1	FAN SHAFT FL1
5:22:41 PM	1/12/2015	L'Enfant PI	Up	F03-6-L01 Fan Operation CURRENT STATE = Normal ALARM FINAL ACK. BY SYSTEM	AT	ctfhost-fa	GY	1	FAN SHAFT FL1

MECH SCAN SHEET ALIASES	PROPER SYSTEM NAME
5-F2	FF2 FAN SHAFT
F03-5-F02	FF2 FAN SHAFT
F03-5-F2	FF2 FAN SHAFT
5-F03	FF3 FAN SHAFT
F04-5-F03	FF3 FAN SHAFT
6-L1	FL1 FAN SHAFT
F03-6-L01	FL1 FAN SHAFT
F03-6-L1	FL1 FAN SHAFT
F02-1	UPE FAN WITHIN F02 STATION
F02-2	UPE FAN WITHIN F02 STATION
F03-1	UPE FAN WITHIN F03 STATION, UPPER LEVEL
F03-2	UPE FAN WITHIN F03 STATION, UPPER LEVEL
F04-1	UPE FAN WITHIN F04 STATION
F04-2	UPE FAN WITHIN F04 STATION
D03-2	UPE FAN WITHIN D03 STATION, LOWER LEVEL
D03-3	UPE FAN WITHIN D03 STATION, LOWER LEVEL
1-D4	FAN SHAFT FD4
D04-1-D04	FAN SHAFT FD4
D04-1-D4	FAN SHAFT FD4
D04-2	UPE FAN WITHIN D04 STATION
D04-3	UPE FAN WITHIN D04 STATION