



September 1, 2006

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Serial No.	06-709
NL&OS/PRW	R0
Docket No.	50-336
License No.	DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
TRANSMITTAL OF TRACER GAS TEST REPORT

In a conference call of July 18, 2006, the NRC requested that Dominion Nuclear Connecticut, Inc. (DNC) provide the latest tracer gas test report for Millstone Power Station Unit 2 (MPS2). The test report was requested in order that the NRC staff can complete its evaluation of DNC's response for Generic Letter 2003-01, "Control Room Habitability," for MPS2.

The attachment to this letter provides the requested test report.

Should you require further information or have any questions regarding this submittal, please contact Mr. Paul R. Willoughby at (804) 273-3572.

Very truly yours,

A handwritten signature in black ink, appearing to read "Gerald T. Bischof", followed by a large, stylized flourish.

Gerald T. Bischof
Vice President – Nuclear Engineering

Attachment: Surveillance Procedure SP21205, Control Room In-Leakage
Verification - Continuous Sampling Method

Commitments in this letter: None

cc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

V. Nerses
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8 C2
Rockville, MD 20852-2738

Mr. S. M. Schneider
NRC Senior Resident Inspector
Millstone Power Station

ATTACHMENT

TRANSMITTAL OF TRACER GAS TESTING REPORT

SURVEILLANCE PROCEDURE SP 21205
CONTROL ROOM IN-LEAKAGE VERIFICATION-
CONTINUOUS SAMPLING METHOD

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

4/16/05

Approval Date

4/16/05

Effective Date

Control Room In-Leakage Verification – Continuous Sampling Method**SURVEILLANCE INFORMATION**

Reference Procedure No.: SP 21205	Form Title: Control Room In-Leakage Verification – Continuous Sampling Method
Applicable Technical Specification(s): 4.7.6.1.e.3	Frequency: Refueling (at least once every 18 months)
Applicable Mode: Modes 1 through 6	
Scheduled Date: 4-21-05	
<input checked="" type="checkbox"/> TECH SPEC SURVEILLANCE	<input type="checkbox"/> MAINTENANCE RESTORATION
<input type="checkbox"/> SYSTEM ALIGNMENT	<input type="checkbox"/> NON-TECH SPEC SURVEILLANCE
<input type="checkbox"/> ISI TESTING	

SIGNATURES

Step No.		
4.3.5.b.	Test Authorized By (SM/US): On File At Millstone Power Station	Date: 4/21/05
4.3.5.c.	Prerequisites Completed (Initials): On File At Millstone Power Station	Date: 4/21/05
4.3.5.d.	Precautions Noted (Initials): On File At Millstone Power Station	Date: 4/21/05
4.3.5.e.	AWO Number: MZ-03-13304	
4.4.14.s. 4.5.15.s. 4.6.20.q.	Shift Manager and Engrg Supv Notified of Failed Surveillance: NA	Date:
	CR Number(s): NA	
4.6.20.h. 4.7.13	Completed By: On File At Millstone Power Station	Date: 4-22-05
		ACCEPTANCE CRITERIA MET
4.7.14	Approved By (Engineering Supervisor): On File At Millstone Power Station	Date: 4/22/05
		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Comments:		

TEST EQUIPMENT

Step No.	TYPE OF TEST EQUIPMENT	QA NUMBER
4.3.5.f.	Sulfur Hexafluoride Tracer Gas	MTE-00285

Control Room In-Leakage Verification – Continuous Sampling Method

DATA EVALUATION

DATA EVALUATION

Step No.	Air In-Leakage	T/S ACCEPTANCE CRITERIA	RESULTS
4.4.14.q.	Facility 1 Air In-Leakage Rate	Less than 120 scfm	SAT <input checked="" type="checkbox"/> UNSAT <input type="checkbox"/>
4.5.15.q.	Facility 2 Air In-Leakage Rate	Less than 120 scfm	SAT <input checked="" type="checkbox"/> UNSAT <input type="checkbox"/>

Step No.	Air In-Leakage	ACCEPTANCE CRITERIA	RESULTS
4.6.20.n.	Dual Filter Fan Air In-Leakage Rate	Less than 120 scfm	SAT <input checked="" type="checkbox"/> UNSAT <input type="checkbox"/>
4.6.20.o.	Data Evaluation Completed By: <u>On File At Millstone Power Station</u>		Date: <u>4-22-05</u>

①

Control Room In-Leakage Verification – Continuous Sampling Method

FACILITY 1 TRACER DILUTION TEST

Step No.	
4.4.2	SF ₆ Concentration: <u>100</u> % Injection Concentration: <u>3.35</u> ppm

Step No.: 4.4.5

VENTILATION ALIGNMENT MATRIX

FAN	DESCRIPTION	AREA SERVED	ON / OFF
F-34A	MAIN EXHAUST – A	Auxiliary Building	ON
F-34B	MAIN EXHAUST – B	Auxiliary Building	OFF
F-34C	MAIN EXHAUST – C	Auxiliary Building	ON
F-142	EAST 480V RM EXHST	East 480V Room	ON
F-52	EAST 480V RM SPLY	East 480V Room	ON
F-26	480V RM AUX EXHST	East 480V Room	ON
F-16	AUX BLDG SUPPLY	Auxiliary Building	ON
F-25A	EBFS FAN – A	Fuel Handling Bldg (AEAS Mode Only)	ON
F-25B	EBFS FAN – B	Fuel Handling Bldg (AEAS Mode Only)	ON
F-17	NON-RAD WST SPLY	Cable Vault and East 480V Room	ON
F-20	SFP SUPPLY FAN	Spent Fuel Pool Area	OFF
F-112A	EAST/WEST BATTERY EXHAUST FANS	East/West Battery Rooms	OFF
F-112B	EAST/WEST BATTERY EXHAUST FANS	East/West Battery Rooms	OFF
F-19	CABLE VAULT RECIRC FAN	Cable Vault	ON
F-135	AUX BLDG ELEVATOR EQUIPMENT ROOM VENTILATION	Aux Bldg Elevator Equipment Room	ON
F161A	BLDG 110/105 SUPPLY AIR FROM ACU-6	Bldg 110/105	ON
F161B	BLDG 110/105 RETURN AIR FROM ACU-6	Bldg 110/105	ON
F162	BLDG 110/105 ROOF EXHAUST FAN	Bldg 110/105	OFF
HVT-10A	MP1 BATHROOM EXHAUST	MP1 Bathroom	OFF

Control Room In-Leakage Verification – Continuous Sampling Method

Step No.: 4.4.5

VENTILATION ALIGNMENT MATRIX

FAN	DESCRIPTION	AREA SERVED	ON / OFF
HVE-21	MP1 CABLE VAULT SMOKE EXHAUST	MP1 Cable Vault	OFF
HVE-22	MP1 CABLE VAULT SMOKE EXHAUST	MP1 Cable Vault	OFF

Step No.	
4.4.10	Background Reading: <u>0</u> ppm
4.4.12	Injection Duration: <u>180</u> sec

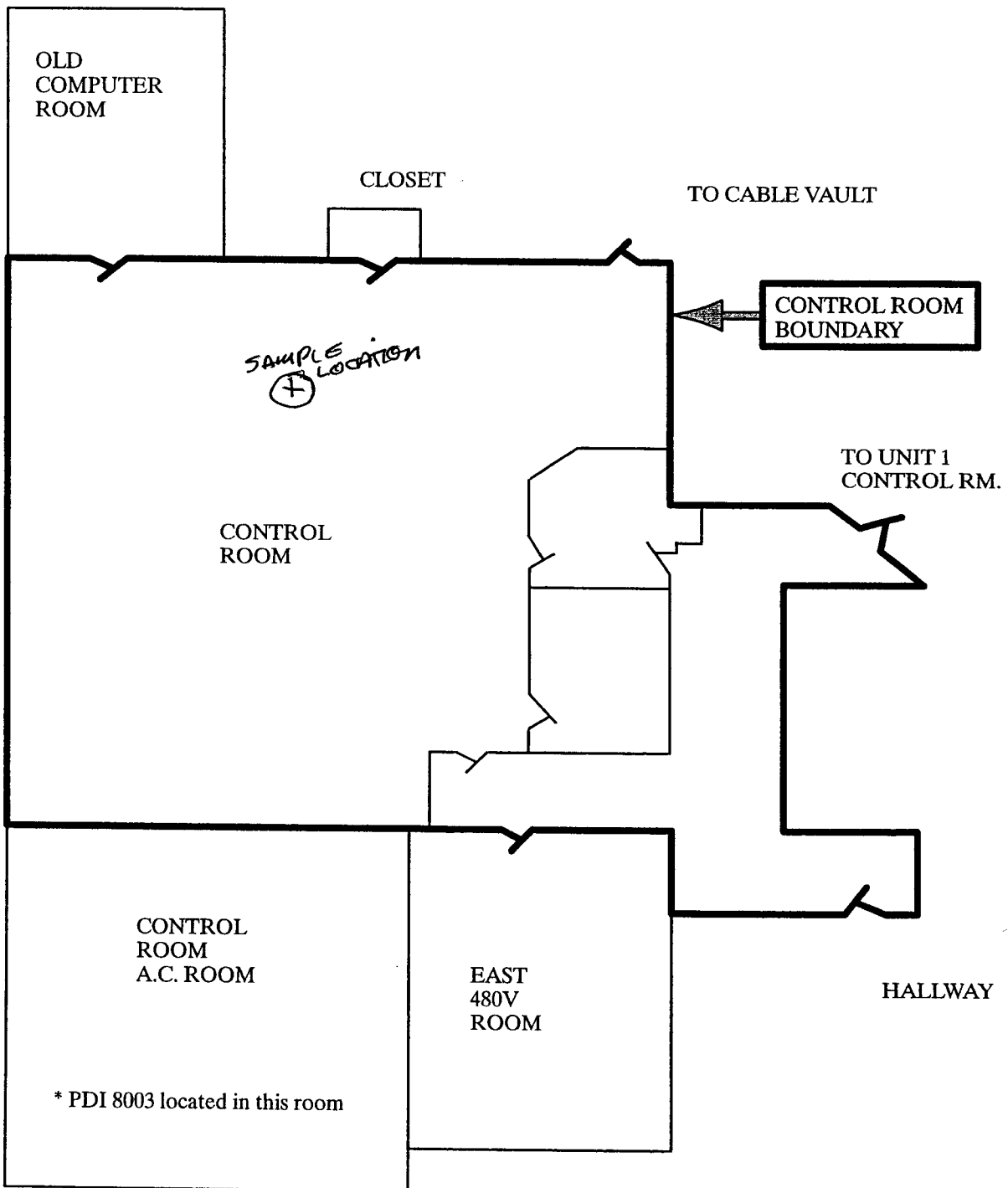
2.2 l/min

Control Room In-Leakage Verification – Continuous Sampling Method

FACILITY 1 TRACER DILUTION TEST

Step No.: 4.4.14.d.2); 4.4.14.f.2)

Air Sample Location(s):



Control Room In-Leakage Verification – Continuous Sampling Method

FACILITY 1 TRACER DILUTION TEST

Air Sampling Data Sheet
(Sheet 2 of 2)

Step No.: 4.4.14.o.

Air Change Rate Equation / Calculation

$$\begin{aligned}\text{Air Change Rate} &= \left| \frac{C_2 - C_1}{t_2 - t_1} \right| \\ &= \left| \frac{1.09192 - 1.20896}{70 - 0} \right| \\ &= \underline{-0.001672}\end{aligned}$$

(These values are taken from plot. C_1 and C_2 values are natural logarithms of concentration C_t at different times during testing, as identified by the plot of $\ln C_t$ for straight line.)

$$\begin{aligned}\text{Air In-Leakage Rate} &= \text{Air Change Rate} * 60,292 \text{ ft}^3 \\ &= \underline{0.001672} * 60,292 \text{ ft}^3 \\ &= \underline{100.81} \text{ scfm}\end{aligned}$$

(60,292 ft³ equals Control Room volume minus Control Room dead space volume)

Calculated By:

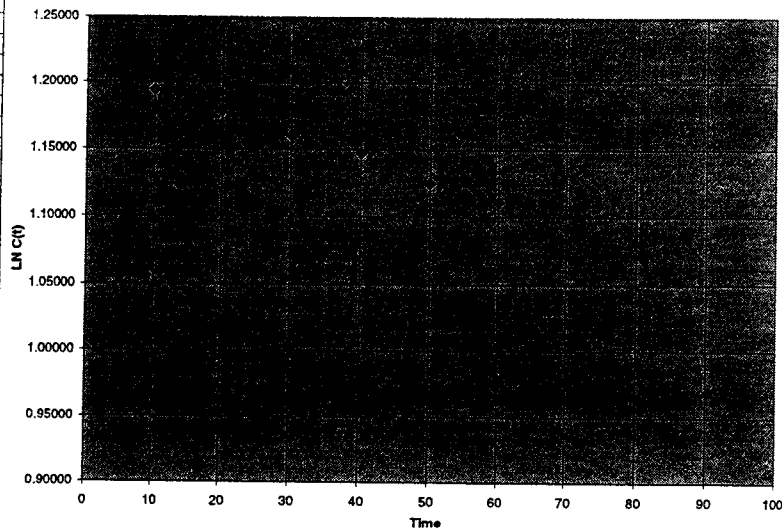
On File At Millstone Power Station

Date:

4-21-05

FACILITY 1 TRACER DILUTION TEST

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Control Room In-Leakage Verification – Continuous Sampling Method

Facility 2
~~DUAL FILTER FAN~~

Step No.	
4.5.2	SF ₆ Concentration: <u>100</u> % Injection Concentration: <u>2.55</u> ppm

Step No.: 4.5.5

VENTILATION ALIGNMENT MATRIX			
FAN	DESCRIPTION	AREA SERVED	ON / OFF
F-34A	MAIN EXHAUST – A	Auxiliary Building	ON
F-34B	MAIN EXHAUST – B	Auxiliary Building	OFF
F-34C	MAIN EXHAUST – C	Auxiliary Building	ON
F-142	EAST 480V RM EXHST	East 480V Room	ON
F-52	EAST 480V RM SPLY	East 480V Room	ON
F-26	480V RM AUX EXHST	East 480V Room	ON
F-16	AUX BLDG SUPPLY	Auxiliary Building	ON
F-25A	EBFS FAN – A	Fuel Handling Bldg (AEAS Mode Only)	ON
F-25B	EBFS FAN – B	Fuel Handling Bldg (AEAS Mode Only)	ON
F-17	NON-RAD WST SPLY	Cable Vault and East 480V Room	ON
F-20	SFP SUPPLY FAN	Spent Fuel Pool Area	OFF
F-112A	EAST/WEST BATTERY EXHAUST FANS	East/West Battery Rooms	OFF
F-112B	EAST/WEST BATTERY EXHAUST FANS	East/West Battery Rooms	OFF
F-19	CABLE VAULT RECIRC FAN	Cable Vault	ON
F-135	AUX BLDG ELEVATOR EQUIPMENT ROOM VENTILATION	Aux Bldg Elevator Equipment Room	ON
F161A	BLDG 110/105 SUPPLY AIR FROM ACU-6	Bldg 110/105	ON
F161B	BLDG 110/105 RETURN AIR FROM ACU-6	Bldg 110/105	ON
F162	BLDG 110/105 ROOF EXHAUST FAN	Bldg 110/105	OFF
HVT-10A	MP1 BATHROOM EXHAUST	MP1 Bathroom	OFF

Control Room In-Leakage Verification – Continuous Sampling Method

Step No.: 4.5.5

VENTILATION ALIGNMENT MATRIX

FAN	DESCRIPTION	AREA SERVED	ON / OFF
HVE-21	MP1 CABLE VAULT SMOKE EXHAUST	MP1 Cable Vault	OFF
HVE-22	MP1 CABLE VAULT SMOKE EXHAUST	MP1 Cable Vault	OFF

Step No.	
4.5.11	Background Reading: <u>* 2.55</u> ppm
4.5.13	Injection Duration: <u>**</u> sec

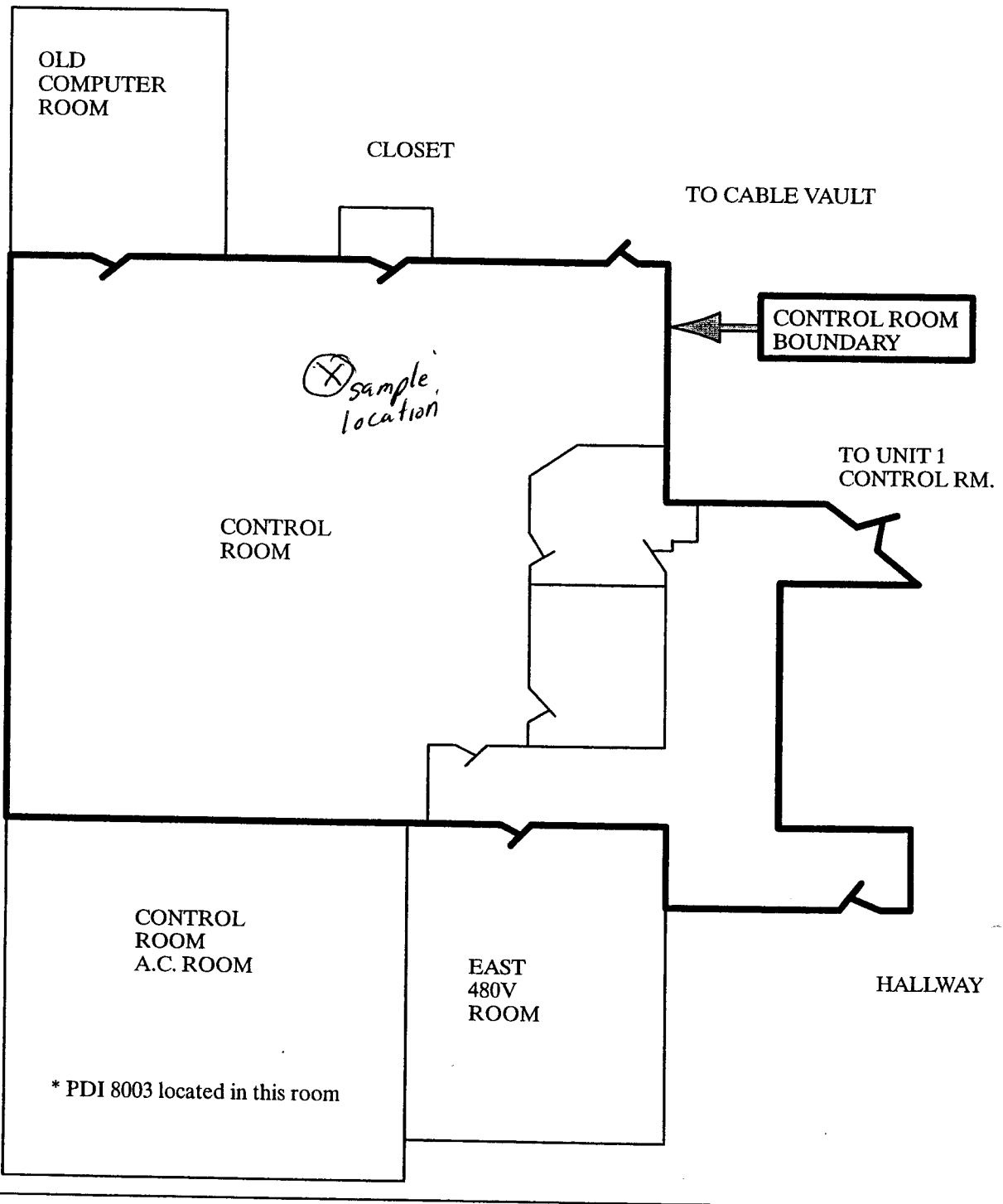
* Continued test with Facility 2
 ** did not reinject. commenced Facility.

Control Room In-Leakage Verification – Continuous Sampling Method

FACILITY 2 TRACER DILUTION TEST

Step No.: 4.5.15.d.2); 4.5.15.f.2)

Air Sample Location(s):



Control Room In-Leakage Verification – Continuous Sampling Method

FACILITY 2 TRACER DILUTION TEST

Air Sampling Data Sheet
(Sheet 2 of 2)

Step No.: 4.5.15.o.

Air Change Rate Equation / Calculation

$$\text{Air Change Rate} = \left| \frac{C_2 - C_1}{t_2 - t_1} \right|$$

$$= \left| \frac{0.83291 - 0.93609}{60 - 0} \right|$$

$$= -0.00172$$

(These values are taken from plot. C_1 and C_2 values are natural logarithms of concentration C_t at different times during testing, as identified by the plot of $\ln C_t$ for straight line.)

$$\text{Air In-Leakage Rate} = \text{Air Change Rate} * 60,292 \text{ ft}^3$$

$$= -0.00172 * 60,292 \text{ ft}^3$$

$$= 103.69 \text{ scfm}$$

(60,292 ft³ equals Control Room volume minus Control Room dead space volume)

Calculated By:

On File At Millstone Power Station

Date:

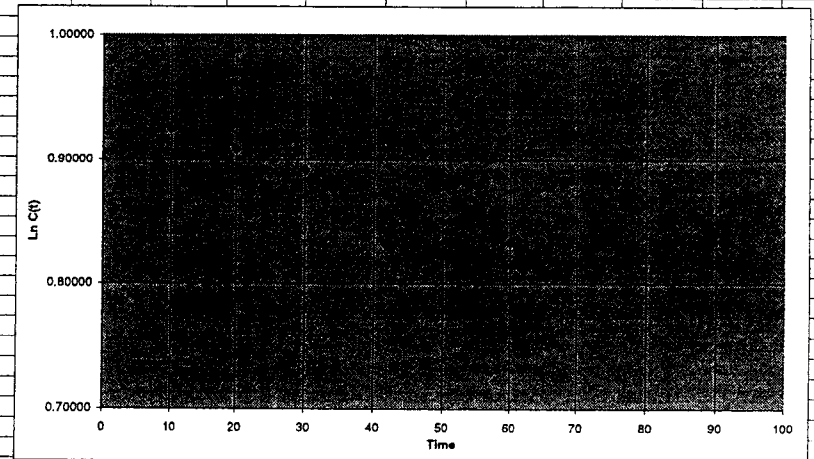
4-21-05

FACILITY 2 TRACER DILUTION TEST

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Time (t)	Delta (t)	Minutes	Ln C(t)	C(t)	In C/C(t0)	Air Change	Leakage	Ln C(t)	Minutes	CFM
22:20	0	0	0.00000	2.55	-	-	-	-	-	-
22:30	0:10	10	0.92426	2.52	-0.01183	-0.00118	-71.3	0.92426	10	71
22:40	0:20	20	0.90826	2.48	-0.01600	-0.00160	-96.5	0.90826	20	96
22:50	0:30	30	0.89200	2.44	-0.01626	-0.00163	-98.0	0.89200	30	98
23:00	0:40	40	0.87129	2.39	-0.02070	-0.00207	-124.8	0.87129	40	125
23:10	0:50	50	0.85015	2.34	-0.02114	-0.00211	-127.5	0.85015	50	127
23:20	1:00	60	0.83291	2.30	-0.01724	-0.00172	-103.9	0.83291	60	104
#####	#NUM!	#NUM!			#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
t(1)=	10	C(1)=	0.92426		Change Rate	#VALUE!	Volume	60286	Inleakage	#VALUE!
t(2)=	90	C(2)=	#VALUE!							
Delta t	80	Delt C	#VALUE!							
0.00	0	0	1.00000		I	L				
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#NUM!	#NUM!			#VALUE!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#####	#####	#VALUE!			#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

The graph displays the relationship between the natural logarithm of concentration, $\ln C(t)$, and time. The data points show a linear decrease over time, which is characteristic of exponential decay in mass transfer processes.



Control Room In-Leakage Verification – Continuous Sampling Method

DUAL FILTER FAN DILUTION TEST

Step No.	
4.6.2	SF ₆ Concentration: <u>100</u> % Injection Concentration: <u>2.08</u> ppm
4.6.4	CRAC Facility Selected for Dual Filter Fan Air In-Leakage Test: <u>Facility 2</u>

Step No.: 4.6.8			
VENTILATION ALIGNMENT MATRIX			
FAN	DESCRIPTION	AREA SERVED	ON / OFF
F-34A	MAIN EXHAUST – A	Auxiliary Building	ON
F-34B	MAIN EXHAUST – B	Auxiliary Building	OFF
F-34C	MAIN EXHAUST – C	Auxiliary Building	ON
F-142	EAST 480V RM EXHST	East 480V Room	ON
F-52	EAST 480V RM SPLY	East 480V Room	ON
F-26	480V RM AUX EXHST	East 480V Room	ON
F-16	AUX BLDG SUPPLY	Auxiliary Building	ON
F-25A	EBFS FAN – A	Fuel Handling Bldg (AEAS Mode Only)	ON
F-25B	EBFS FAN – B	Fuel Handling Bldg (AEAS Mode Only)	ON
F-17	NON-RAD WST SPLY	Cable Vault and East 480V Room	ON
F-20	SFP SUPPLY FAN	Spent Fuel Pool Area	OFF
F-112A	EAST/WEST BATTERY EXHAUST FANS	East/West Battery Rooms	OFF
F-112B	EAST/WEST BATTERY EXHAUST FANS	East/West Battery Rooms	OFF
F-19	CABLE VAULT RECIRC FAN	Cable Vault	ON 08/14/22-05 OFF
F-135	AUX BLDG ELEVATOR EQUIPMENT ROOM VENTILATION	Aux Bldg Elevator Equipment Room	ON
F161A	BLDG 110/105 SUPPLY AIR FROM ACU-6	Bldg 110/105	ON
F161B	BLDG 110/105 RETURN AIR FROM ACU-6	Bldg 110/105	ON

Control Room In-Leakage Verification – Continuous Sampling Method

Step No.: 4.6.8

VENTILATION ALIGNMENT MATRIX

FAN	DESCRIPTION	AREA SERVED	ON / OFF
F162	BLDG 110/105 ROOF EXHAUST FAN	Bldg 110/105	OFF
HVT-10A	MP1 BATHROOM EXHAUST	MP1 Bathroom	OFF
HVE-21	MP1 CABLE VAULT SMOKE EXHAUST	MP1 Cable Vault	OFF
HVE-22	MP1 CABLE VAULT SMOKE EXHAUST	MP1 Cable Vault	OFF

Step No.	
4.6.15	Background Reading: <u>* 2.08</u> ppm
4.6.18	Injection Duration: <u>**</u> sec

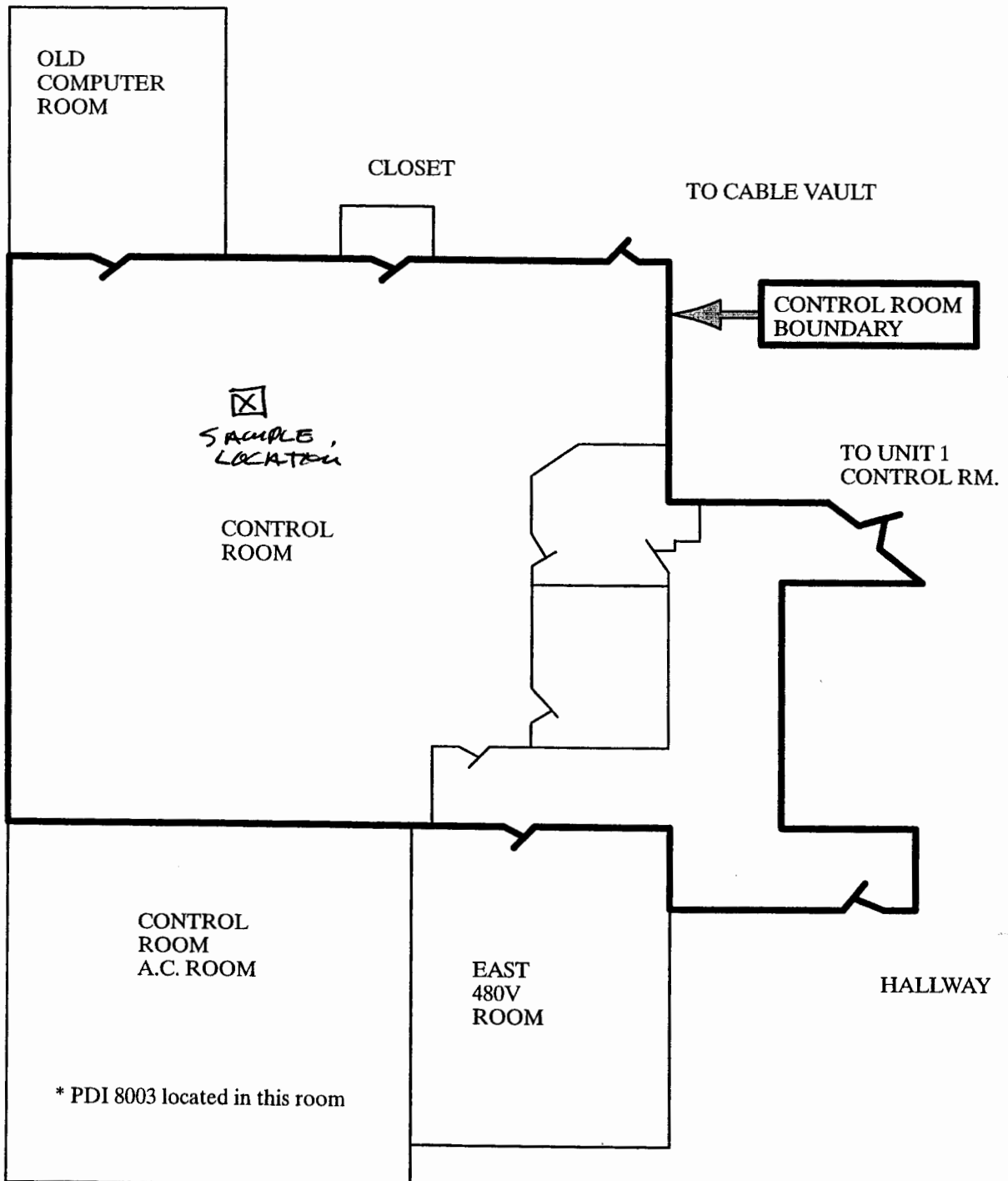
* went from Facility 2 test to dual Train;
 ** Did not have to reinject to perform test.
 started test after the facility 2 test.

Control Room In-Leakage Verification – Continuous Sampling Method

DUAL FILTER FAN DILUTION TEST

Step No.: 4.6.20.a.2); 4.6.20.b.2); 4.6.20.c.3)

Air Sample Location(s):



Control Room In-Leakage Verification – Continuous Sampling Method

DUAL FILTER FAN DILUTION TEST

Air Sampling Data Sheet
(Sheet 2 of 2)

Step No.: 4.6.20.I.

Air Change Rate Equation / Calculation

$$\begin{aligned}\text{Air Change Rate} &= \left| \frac{C_2 - C_1}{t_2 - t_1} \right| \\ &= \left| \frac{0.64185 - 0.73236}{50 - 0} \right| \\ &= \underline{-0.00181}\end{aligned}$$

(These values are taken from plot. C_1 and C_2 values are natural logarithms of concentration C_t at different times during testing, as identified by the plot of $\ln C_t$ for straight line.)

$$\begin{aligned}\text{Air In-Leakage Rate} &= \text{Air Change Rate} * 60,292 \text{ ft}^3 \\ &= \underline{0.00181} * 60,292 \text{ ft}^3 \\ &= \underline{109.14} \text{ scfm}\end{aligned}$$

(60,292 ft³ equals Control Room volume minus Control Room dead space volume)

Calculated By:

On File At Millstone Power Station

Date:

4-22-05

DUAL FILTER FAN DILUTION TEST

[illegible]

Attachment 7

Installation and Removal of Temporary Modification PTM2-03-0008 Wire Jumper in NF26

(Sheet 1 of 3)

Installation of Wire Jumper in NF26.

NOTE

To Maintain F17 and F26 during the testing, a jumper must be installed to defeat TS-8850 which normally starts these fans at 75°F.

SM/US Authorization to install Temp Mod ^{On File At} Millstone Power Station [?] 4/21/05
Signature _____ Date

Operations →

1.

IF jumper will be installed for more than one shift, DOCUMENT Temp mod in turn over log.

2.

Refer To OP 2315B, "Non-Radwaste Ventilation System," and REMOVE F17 and F26 from service.

3.

OPEN breaker B41A11, supply breaker for F26.

4.

DIRECT I&C to install #14AWG minimum SIS wire jumper in NF26 across terminal 6 and terminal 7 (wires 22 and 12 respectively).

Actions	Performer	Dual Verifier
PLACE jumper across Terminal 6 and Terminal 7 (wires 22 and 12 respectively)	On File At Millstone Power Station	On File At Millstone Power Station

Operations →

5.

CLOSE breaker B41A11, supply breaker for F26.

4803 ^{On File At} Millstone Power Station

Level of Use
Reference



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SM/US Authorization to remove Temp Mod . On File At 4/22/05
 Signature _____ Date _____

1. Refer To OP 2315B, "Non-Radwaste Ventilation System," and REMOVE F17 and F26 from service.
2. OPEN breaker B41A11, supply breaker for F26.
3. DIRECT I&C to remove #14AWG minimum SIS wire jumper in NF26 across terminal 6 and terminal 7 (wires 22 and 12 respectively).

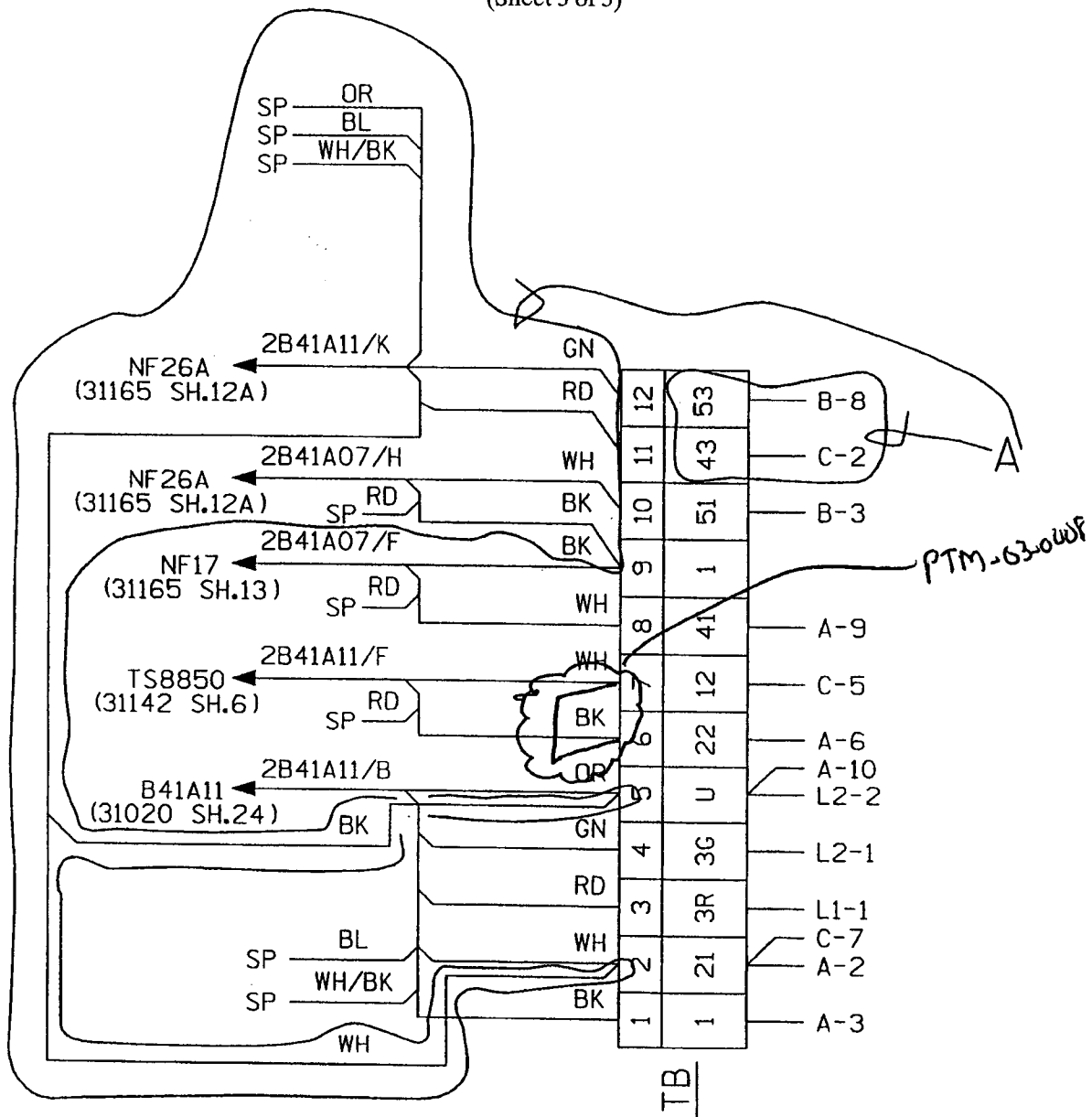
Actions	Performer	Dual Verifier
REMOVE jumper across Terminal 6 and Terminal 7 (wires 22 and 12 respectively)	On File At Millstone Power Station	On File At Millstone Power Station

4. CLOSE breaker B41A11, supply breaker for F26.

STOP THINK ACT REVIEW

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Attachment 7 **Installation and Removal of Temporary Modification PTM2-03-0008** **Wire Jumper in NF26** (Sheet 3 of 3)



**Level of Use
Reference**



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