TENNESSEE VALLEY AUTHORITY
Division of Power Production

SECONDARY CONTAINMENT
LEAK RATE TEST
BROWNS FERRY NUCLEAR PLANT UNIT 2
CONDUCTED MARCH 20, 1978

SUBMITTED TO
THE UNITED STATES NUCLEAR REGULATORY COMMISSION
PURSUANT TO
FACILITY OPERATING LICENSE NUMBER DPR-52

1.0 - Browns Ferry Nuclear Plant Unit 2 Secondary Containment Leak Rate Test Report

2.0 Purpose

This report describes the results and analysis of the test data taken during leak rate testing of the Browns Ferry Nuclear Plant Unit 2 secondary containment pursuant to Technical Specification 4.7.C.1.c prior to the first refueling outage.

3.0 Procedure

The attached surveillance instruction, SI 4.7.C-1, outlines the procedures followed during secondary containment leak rate testing.

4.0 Data

The attached surveillance instruction data sheets lists the following test data:

(1) Standby gas treatment system flow rate: 8700 scfm

(2) Reactor building differential pressure:

Unit 2 reactor zone: -0.53" H_2O

Refueling zone average: -0.48" H_2O

(3) Wind Speed: 17.1 mph

(4) Wind direction: southwest

5.0 Analysis and Interpretation

Technical Specification 4.7.C.1.c requires that secondary containment capability to maintain 1/4 inch water vacuum under calm (<5 mph) wind conditions with a total system inleakage rate of not more than 12000 scfm shall be demonstrated at each refueling outage prior to refueling. Following shutdown of Unit 2 on March 18, 1978, the secondary containment for the common refuel zone and the Unit 2 reactor zone were leak rate tested.

5.0 Analysis and Interpretation (Continued)

These two zones were isolated from the Unit 1 and Unit 3 reactor zones. Appendix A to SI 4.7.C gives the allowable inleakage per secondary containment zone documented during preoperational testing. Assuming a total allowable inleakage of 12000 scfm, it is shown in Appendix A that the allowable inleakage for testing the refuel zone and Unit 2 reactor zone in combination under calm wind conditions is 8988 scfm. From the data taken during this test it is shown that assuming a total combined inleakage of 8700 scfm in the Unit 2 reactor zone and the refuel zone that the secondary containment system is capable of maintaining greater that 0.25 inches of water vacuum. These results fulfill the requirements of Technical Specification 4.7.C.1.c.

SI 4.7.C - Secondary Containment

Description

This surveillance is used to comply with the requirements of portions of technical specification 4.7.C. The following table lists the requirements satisfied by this instruction

Frequency	Tech. Spec. Reference	Surveillance Requirements
At each refueling outage prior to refueling	4.7.C.1.c	Demonstrate the capability of secondary containment to maintain -1/4" water pressure with a system inleakage of not more than 12,000 cfm under calm wind conditions $\leq$ 5 mph. SI 4.7.C-1 will be used to satisfy this requirement.
Any time the integrity of one zone has been violated	4.7.C.2	Isolate the affected zone from the other zones and demonstrate secondary containment capability to maintain -1/4" water pressure under calm wind conditions using the SGTS. SI 4.7.C-1 will be used to satisfy the requirements for the zones.

The reactor building is broken up into four zones, each of which can be isolated independently. These zones are the unit 1 reactor zone (U1RZ), the unit 2 Reactor zone (U2RZ), the unit 3 reactor zone (U3RZ), and the refueling zone (RFZ) which is common to all three units.

This surveillance instruction is written to use the SGTS fans A and C, B and C, or A and B, or a single fan to demonstrate that at a flow of $\leq$ 12,000 cfm the secondary containment zones can be maintained at a static pressure of -1/4" water under calm wind conditions. Manual isolation of the zones will be used since it is fast and the steam line tunnel temperature increases, which may cause a unit trip.

SI 4.7.C - Secondary Containment

Description (Continued)

SI 4.7.C-1 will be used to demonstrate secondary containment capability. This is to be accomplished by isolating the secondary containment for the reactor building or the required zones, starting the standby gas treatment trains, adjusting the flow to less than the allowable flow and verifying the static pressure of the tested zone(s) is -1/4" H_2O or less. This procedure will normally be used to test the secondary containment capability of the reactor building prior to refueling.

SI 4.7.C-1 Testing should be limited to 30 minutes if at all possible since the main steam line tunnel temperatures may trip an operating unit.

SI 4.7.C - Secondary Containment Capability

1. PURPOSE

This procedure is used to isolate the zones to be leak tested and to verify secondary containment capability to maintain -1/4" H_2O with a system in-leakage of $\leq$ 12,000 cfm without actually measuring the in-leakage.

2. REFERENCES

2.1 Technical specifications for units 1, 2, and 3, Section 4.7.C.

2.2 The following drawings:

Number	Revision	Number	Revision
45N614-5	5	47W610-64	15
45N614-6	5	47W610-65	15

3. PREREQUISITES

3.1 Notify each unit operator and assistant shift engineer such that they may communicate and be aware of the ventilation and SGTS status during this test.

3.2 Verify that the reactor building ventilation system is in a normal operational status per OI 30.

3.3 Verify that the SGTS is in standby readiness per OI 65.

3.4 Verify that each unit's main steam line tunnel temperature is not above 150° F.

3.5 Verify switch 16A-S34 is not in DRYWELL BYPASS or TORUS BYPASS on each unit or the unit that is to be tested.

SI 4.7.C-1 - Secondary Containment Capability

3. PREREQUISITES (Continued)

3.6 Station a man at the Reactor Building 480V Vent Board in case any breakers need to be reset during this test, and in the SGTS building to adjust manual dampers.

3.7 Set up communication between panel 9-25-1 and 9-25-2 and the following panels:

25-219-1
25-215-2
25-215-3
25-213-1
25-213-2
25-213-3

3.8 Verify the following process instruments to be within a current calibration period.

FI-65-50
FI-65-71
1-PdIC-64-1
2-PdIC-64-1
3-PdIC-64-1
1-PdIC-64-2
2-PdIC-64-2
3-PdIC-64-2

3.9 Verify the inboard equipment access lock doors closed with seals inflated.

3.10 Verify that a drywell or suppression chamber purge is not in process or planned during this test.

3.11 Verify on Data Sheet SI 4.7.C-1 that each of the doors are closed for the respective zones to be tested or the doors indicated by number (See Table 3.11 of Data Sheet SI 4.7.C-1) for all four zones.

4. PRECAUTIONS

4.1 Do not allow the main steam line tunnel temperature on any unit in operation to exceed 160° F. If this temperature is approached to within 10° F, stop the test and reestablish normal ventilation per OI 30 or provide another means for ventilating the main steam line tunnel to prevent a unit trip (trip point is 186° F).

4.2 Attempt to restrict testing time to 30 minutes.

5. LIMITATIONS AND ACTIONS

5.1 None

SI 4.7.C-1 - Secondary Containment Capabilities

6. PROCEDURE

6.1 Initial and perform the indicated sections on the configuration to be tested on Data Sheet SI 4.7.C-1 and perform steps indicated below.

6.1.1 U1RZ - Perform section 6.2 and section 6.4.

6.1.2 U2Rz - Perform section 6.2 and section 6.4.

6.1.3 U3RZ - Perform section 6.2 and section 6.4.

6.1.4 RFZ - Perform section 6.3 and section 6.4.

6.1.5 U1RZ and RFZ - Perform sections 6.2, 6.3 and section 6.4.

6.1.6 U2RZ and RFZ - Perform sections 6.2, 6.3 and section 6.4.

6.1.7 U3RZ and RFZ - Perform sections 6.2, 6.3 and section 6.4.

6.1.8 Reactor Building - Perform section 6.2 for each RZ, and section 6.3 for the RFZ and section 6.4.

6.2 Manual Isolation of a Reactor Zone

NOTE: HS-64-117, HS-64-120, HS-64-119, & HS-64-122 are spring return to normal.

6.2.1 Place HS-64-117 (Panel 9-25) in the TEST position for the reactor zone to be isolated. (Inboard and common valves)

6.2.2 Place HS-64-120 (Panel 9-25) in the TEST position for the reactor zone to be isolated. (Outboard valves)

6.2.3 Start SGTS trains A and B in accordance with OI 65 and verify actions and/or take data as indicated on Data Sheet SI 4.7.C-1 for the reactor zone that is being isolated.

NOTE: If a reactor zone is the only zone to be isolated, go to Section 6.4 and if the refuel zone is to be isolated complete Section 6.3 before going to Section 6.4.

6.3 Manual Isolation of the Plant Refueling Zone

6.3.1 Place HS-64-119 (Panel 9-25-1) in the TEST position. (Inboard and common valves)

SI 4.7.C-1 - Secondary Containment Capabilities

6. PROCEDURE (Continued)

6.3 Manual Isolation of the Plant Refueling Zone (Continued)

6.3.2 Place HS-64-122 (Panel 9-25-1) in the TEST position. (Outboard valves)

6.3.3 Start SGTS trains A and B, if not already running, in accordance with OI 65 and verify actions and/or take data as indicated on Data Sheet SI 4.7.C-1 for the refueling zone.

6.4 Secondary Containment Capability

NOTE: This section is to verify that the secondary containment is capable of maintaining a -1/4" H_2O with a system inleakage of $\leq$ 12,000 cfm for the entire reactor building or allowable in-leakage for one or more zones.

6.4.1 Adjust the total flow indicated on FI-65-50 and FI-65-71 (Panel 9-25-2) to 11,500 cfm for entire reactor building or less than allowable flow for one or more zones as shown in Appendix A by closing a SGTS fan discharge damper or if two fans are running it may be necessary to shut one fan off.

NOTE: Let the flow stabilize for 5 minutes before the next step.

6.4.2 Record flows indicated on FI-65-50 and FI-65-71 (Panel 9-25-2) and total on Data Sheet SI 4.7.C-1.

6.4.3 Record the following static pressures and the air temperatures at the differential pressure indicator locations.

Zone	Instrument	Panel
U1RZ	1-PdIC-64-2	1-25-213
U2RZ	2-PdIC-64-2	2-25-213
U3RZ	3-PdIC-64-2	3-25-213
U1RFZ	1-PdIC-64-1	1-25-219
U2RFZ	2-PdIC-64-1	2-25-215
U3RFZ	3-PdIC-64-1	3-25-215

6.4.4 Verify all four zones static pressures are $\leq$ -1/4" H_2O.

SI 4.7.C-1 - Secondary Containment Capabilities

6. PROCEDURE (Continued)

6.4 Secondary Containment Capability (Continued)

6.4.5 Record the wind direction and velocity from the 33 ft. level windspeed.

6.4.5.1 Record air temp. outside reactor building at ground level indicator.

NOTE: If all four zones static pressures are $\leq$ -1/4" H_2O this will satisfy 4.7.C.1.b and c. If one or more zones do not meet the -1/4" H_2O static pressure requirements the following steps must be completed.

NOTE: Check to assure reactor building is isolated.

6.4.6 Adjust the total flow indicated on FI-65-50 and FI-65-71 (Panel 9-25-2) to 12,000 cfm or allowable flow from Appendix A for one or more zones by opening the fan discharge damper or it may be necessary to start another fan and adjust its discharge damper.

NOTE: Let the flow stabilize for 5 minutes before the next stop. Record flows indicated on FI-65-50 and FI-65-71 (Panel 9-25-2) and total on Data Sheet SI 4.7.C-1.

6.4.7 Record the following static pressures.

Zone	Instrument	Panel
U1RZ	1-PdIC-64-2	1-25-213
U2RZ	2-PdIC-64-2	2-25-213
U3RZ	3-PdIC-64-2	3-25-213
U1RFZ	1-PdIC-64-1	1-25-219
U2RFZ	2-PdIC-64-1	2-25-215
U3RFZ	3-PdIC-64-1	3-25-215

6.4.8 Verify all four zones static pressures are $\leq$ -1/4" H_2O.

NOTE: If all four zones static pressures are $\leq$ -1/4" H_2O this will satisfy 4.7.C.1.b and c. If one or more zones do not meet the -1/4" H_2O static pressure requirement the following steps must be completed.

6.4.9 Isolate the zone(s) that have a static pressure of > -1/4" H_2O from the remaining zones and indicate zones isolated on Data Sheet SI 4.7.C-1.

6.4.10 Adjust the total flow indicated on FI-65-50 and FI-65-71 (Panel 9-25-2) to the Allowable Flow of the remaining zones. See Appendix A for the Allowable Flows.

SI 4.7.C-1 - Secondary Containment Capabilities

6. PROCEDURE (Continued)

6.4 Secondary Containment Capability (Continued)

6.4.10 (Continued)

NOTE: Let the flow stabilize for 15 minutes before the next step.

6.4.11 Record flows indicated on FI-65-50 and FI-65-71 (Panel 9-25-2) and total on Data Sheet SI 4.7.C-1.

6.4.12 Record the following static pressures.

Zone	Instrument	Panel
U1RZ	1-PdIC-64-2	1-25-213
U2RZ	2-PdIC-64-2	2-25-213
U3RZ	3-PdIC-64-2	3-25-213
U1RFZ	1-PdIC-64-1	1-25-219
U2RFZ	2-PdIC-64-1	2-25-215
U3RFZ	3-PdIC-64-1	3-25-215

6.4.13 Verify the remaining zones static pressures are $\leq$ -1/4" H_2O.

NOTE: If these zones static pressures are $\leq$ -1/4" H_2O this will satisfy 4.7.C-2. Maintenance must be performed on the isolated zone and should be indicated on Data Sheet SI 4.7.C-1 cover sheet under Remarks.

6.4.14 Check those switches that were put in the TEST position under sections 6.2 and/or 6.3 in their NORMAL position and verify on Data Sheet SI 4.7.C-1.

6.4.15 Verify on Data Sheet SI 4.7.C-1 those actions listed under RETURN TO NORMAL for the zones tested.

Appendix A

Secondary Containment Leak Rate Test Criteria

During preoperational testing for unit 3 the following in-leakage rates at -1/4" H_2O static pressure were documented.

	Documented Inleakage	Percentage
Common refuel floor (units 1, 2, & 3)	6250	64%
Unit 1 reactor zone	1239	12.7%
Unit 2 reactor zone	1064	10.9%
Unit 3 reactor zone	1211	12.4%
Total secondary containment	9764 CFM	100%

Leak rate testing will normally be done with all zones simultaneously lined up for testing; however, plant operating conditions and the technical specification do not always permit this. When less than four zones (3-unit plant) are being tested, the total allowable inleakage will be based on preoperational testing and will be based on the sum of the allowable inleakages for the zones being tested. After a secondary containment violation, the total inleakage must not be greater than the total of the allowable inleakage for each individual zone as indicated below.

The technical specifications require the total secondary containment inleakage to be less than 12,000 cfm at -1/4" differential pressure. The following are therefore established for surveillance testing various combinations of zones when secondary containment has been violated.

Zone	Allowable Inleakage
Common refuel floor	7680
Unit 1 reactor zone	1524
Unit 2 reactor zone	1308
Unit 3 reactor zone	1488
Reactor Building	$\leq$ 12000 CFM

DATA COVER SHEET SI 4.7.C-1

SECONDARY CONTAINMENT CAPABILITY

UNIT 1, (2) OR 3

Performed By Christensen/Terpstra Date 3/20/78
Unit Operator

Were criteria satisfied? ✓ Yes ____ No

If no, notify shift engineer.
If no, was a Limiting Condition for Operation violated? ____ Yes (explain in remarks)
____ No (explain in remarks)

Verified by Shift Engineer _____, Date _____

Reason for test:

_____ Maintenance complete on _____

_____ Another system (_____) inoperable

✓ Required by schedule

_____ Plant condition (explain) _____

_____ Other (explain) _____

Results reviewed John E O'Bryan Date 3-20-78
Assistant Shift Engineer

Results Review and Approval

(1) Cognizant Engineer See App B following sheet Date _____

Rescheduled

QA Staff RWM Date 4-3-78

REMARKS Note: Wind Speed 17.1 MPH

(1) Notify Maintenance that inleakage is excessive if criteria are not satisfied.

Data Sheet SI 4.7.C-1 (Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
3.2	Rx. Bldg. Ventilation System	Normal	×SuB/3-19-78
3.3	SGTS	Standby Readiness	×SuB/3-19-78
3.4	Main Steam Line Tunnel Temperature for units being tested	≤ 150° F	×SuB/3-19-78
3.5	16A-S34 for units tested	Not in Drywell or Torus Bypass	×SuB/3-19-78
3.8	FI-65-50 02 9-25 CR	Currently Calibrated	Rge 3/19/78
	FI-65-71 02 9-25 CR	Currently Calibrated	Rge 3/19/78
	PdIC-64-1 (All three units) RFF 01 25-219 25-215	Currently Calibrated	Rge 3/19/78
	PdIC-64-2 (All three units) 25-213	Currently Calibrated	Rge 3/19/78
4TH (SU) 3.9	Inboard Equipment Access Lock Doors	Closed and Seals Inflated	×LRJ 3/12/78
3.10	Drywell or Suppression Chamber	Purge Not Inprocess	×SuB 3-19-78
3.11	Doors in the following table for the tested zone(s) or the number doors for all zones.	Closed	×LRJ 3/12/78

Table 3.11

Data Sheet SI 4.7.C-2 (Continued)

Elevation	U1RZ	U2RZ	U3RZ	RFZ
519.0	30	34, 36	40	
	31	35, 37	41	
541.5	42	43, 44	45	
565.0	#221	#236, #241	#249	255
	#231	#237	#250	242
	224	#238	#251	226
	#229	240	255	231
	#228	242		
	#232	244		
	#230	336		
	#230a			
583.0	#298		#826, #827	
593.0	#538	497, 501	506	
	#539	#540	#513	
	490	#541	#514	
621.25	#534	640, 647	651	
	#637	#648	#657	
	635	#649	#658	
639.0	670	672	675	
		673		
664.0	704, 700	713, 717	724, 715	700, 702, 724, 715, 713
	705, 701	714	725, 716	701, 703, 725, 716, 714
	706, 712	715	722, 717	704, 720, 722, 706, 717
	707, 708	716	723	705, 721, 723, 708, 707, 712

DATA SHEET SI 4.7.C-1 (Continued)

Step	Component/Process Variable		Verify and/or Record	Initials/Date
6.1.1	U1RZ	Configuration		CA
6.1.2	U2RZ	Configuration		NA
6.1.3	U3RZ	Configuration		NA
6.1.4	RFZ	Configuration		NA
6.1.5	U1RZ and RFZ	Configuration		NA
6.1.6	U2RZ and RFZ	Configuration		~~ABJ~~ 3/17/78
6.1.7	U3RZ and RFZ	Configuration		NA
6.1.8	Reactor Building Configuration			NA
6.2.1	1-HS-64-117		TEST Position	NA
	2-HS-64-117		TEST Position	~~SwB~~
	3-HS-64-117		TEST Position	NA
6.2.2	1-HS-64-120		TEST Position	NA
	2-HS-64-120		TEST Position	~~SwB~~
	3-HS-64-120		TEST Position	NA
6.2.3	SGTS Train A		START	NA
	or SGTS Train B		START	NA
	or SGTS Train C		START	~~SwB~~
	Unit 1 Reactor Zone			
	U-1 Reactor Zone Ventilation Sys.		Shutdown	NA
	1-FCO-64-13		Closed	
	1-FCO-64-14		Closed	
	1-FCO-64-42		Closed	
	1-FCO-64-43		Closed	

Data Sheet SI 4.7.C-1 (Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
6.2.3	(Continued)		
	1-FCO-64-15	Open	N/A
	1-FCO-64-40	Open	
	1-FCO-64-41	Open	
	1-FCO-64-60A	Closed	
	1-FCO-64-60B	Closed	
	1-FCO-64-60C	Closed	
	1-FCO-64-60D	Closed	
	U-1 Stair Hall Supply Fan	Shutdown	
	Unit 2 Reactor Zone		
	U-2 Reactor Zone Ventilation Sys	Shutdown	X
	2-FCO-64-13	Closed	
	2-FCO-64-14	Closed	
	2-FCO-64-42	Closed	
	2-FCO-64-43	Closed	ARC
	2-FCO-64-15	Open	ARC
	2-FCO-64-40	Open	ARC
	2-FCO-64-41	Open	
	Unit 3 Reactor Zone		
	U-3 Reactor Zone Ventilation Sys	Shutdown	N/A
	3-FCO-64-13	Closed	
	3-FCO-64-14	Closed	
	3-FCO-64-42	Closed	
	3-FCO-64-43	Closed	
	3-FCO-64-15	Open	
	3-FCO-64-40	Open	

Data Sheet SI 4.7.C-1 (Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
6.2.3	(Continued)		
	Unit 3 Reactor Zone (Continued)		
	3-FCO-64-41	Open	NA
	3-FCO-64-60A	Closed	/
	3-FCO-64-60B	Closed	/
	3-FCO-64-60C	Closed	/
	3-FCO-64-60D	Closed	/
	U-3 Stair Hall Supply Fan	Shutdown	V
6.3.1	1-HS-64-119	TEST Position	[illegible]
6.3.2	1-HS-64-122	TEST Position	[illegible]
6.3.3	SGTS Train A	START	(1) ARC
	or SGTS Train B	START	N/A
	or SGTS Train C.	START	N/A
	Refueling Zone		
	U-1 Area Refueling Zone Vent Sys	Shutdown	[illegible]
	U-2 Area Refueling Zone Vent Sys	Shutdown	[illegible]
	U-3 Area Refueling Zone Vent Sys	Shutdown	[illegible]
	1-FCO-64-6	Close	[illegible]
	2-FCO-64-6	Close	[illegible]
	3-FCO-64-6	Close	[illegible]
	1-FCO-64-5	Close	[illegible]
	2-FCO-64-5	Close	[illegible]
	3-FCO-64-5	Close	[illegible]
	1-FCO-64-10	Close	[illegible]
	2-FCO-64-10	Close	[illegible]
	3-FCO-64-10	Close	[illegible]

Data Sheet SI 4.7.C-1 (Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
6.3.3	(Continued)		
	Refueling Zone (Continued)		
	1-FCO-64-9	Close	SmB
	2-FCO-64-9	Close	SmB
	3-FCO-64-9	Close	SmB
	1-FCO-64-63	Open	(*) SmB AKC
	1-FCO-64-7	Open	SmB
*	3& 1-FCO-64-65A	Close	JC
*	3& 1-FCO-64-65B	Close	JC
*	3& 1-FCO-64-65C	Close	JC
*	3& 1-FCO-64-65D	Close	JC
	1-FCO-64-44	Open	JC
	1-FCO-64-45	Open	JC
	Equipment Access Lock Exhaust Fan	Shutdown	JC
	U-1 Stair Hall Supply Fan	Shutdown	JC
	U-3 Stair Hall Supply Fan	Shutdown	JC

* No Equipment Access lock on U-3.

6.4.2	FI-65-50	5200	sfcm	3/19/76
	FI-65-71	3500	sfcm	3/19/76
	Total	8700	sfcm	3/19/76

Data Sheet SI 4.7.C-1 (Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
6.4.3	1-PdIC-64- Rx Zone	NA "H_2O	NA
	2-PdIC-64- Rx Zone	-0.53 "H_2O	1/19/76
	3-PdIC-64- Rx Zone	NA "H_2O	NA
	1-PdIC-64- Refueling Zone	-0.48 "H_2O	1/19/76
	2-PdIC-64- Refueling Zone	-0.49 "H_2O	1/19/76
	3-PdIC-64- Refueling Zone	-0.47 "H_2O	1/19/76
6.4.4	All zones ≤ -1/4" H_2O		1/19/76
		SW Direction	
6.4.5	XR-90-102	17.1 mph	
6.4.6	FI-65-50	scfm	NA
	FI-65-71	scfm	
	Total	scfm	
6.4.7	1-PdIC-64-2 Rx Zone	"H_2O	
	2-PdIC-64-2 Rx Zone	"H_2O	
	3-PdIC-64-1 Rx Zone	"H_2O	
	1-PdIC-64-1 Refueling Zone	"H_2O	
	2-PdIC-64-1 Refueling Zone	"H_2O	
	3-PdIC-64-1 Refueling Zone	"H_2O	
6.4.8	All zones ≤ -1/4"H_2O		
6.4.9	Zones Isolated	List	

Data Sheet SI 4.7.C-1

Step	Component/Process Variable	Verify and/or Record	Initials/Date
	Return to Normal		
6.4.11	FI-65-50	_____ scfm	NA
	FI-65-71	_____ scfm	
	Total	_____ scfm	
6.4.12	1-PdIC-64-2 Rx Zone	_____ "H_2O	
	2-PdIC-64-2 Rx Zone	_____ "H_2O	
	3-PdIC-64-2 Rx Zone	_____ "H_2O	
	1-PdIC-64-1 Refueling Zone	_____ "H_2O	
	2-PdIC-64-1 Refueling Zone	_____ "H_2O	
	3-PdIC-64-1 Refueling Zone	_____ "H_2O	
6.4.13	Remaining zones $\leq$ -1/4"H_2O		
6.4.14	1-HS-64-117	NORMAL	NA
	2-HS-64-117	NORMAL	(1) ARC
	3-HS-64-117	NORMAL	NA
	1-HS-64-120	NORMAL	NA
	2-HS-64-120	NORMAL	(2) ARC
	3-HS-64-120	NORMAL	NA
	1-HS-64-119	NORMAL	* ARC
	1-HS-64-122	NORMAL	(*) ARC.

Data Sheet SI 4.7.C-1

Step	Component/Process Variable	Verify and/or Record	Initials/Date
	Return to Normal		
6.4.15	SGTS Fan A	OFF	ARC
	FCO-65-3	Closed	ARC
	A-SGTS humidity control heater	OFF	ARC
	A-SGTS charcoal heater	ON	ARC
	SGTS Fan B	OFF	NA
	FCO-65-25	Closed	NA
	B-SGTS humidity control heater	OFF	NA
	B-SGTS charcoal heater	ON	NA
	SGTS Fan C	OFF	NA
	FCO-65-51	Closed	NA
	C-SGTS humidity control heater	OFF	NA
	C-SGTS charcoal heater	ON	NA
	Unit 1 Reactor Zone		
	U-1 Reactor Zone Ventilation System	In operation as required	
	1-FCO-64-13	OPEN	NA
	1-FCO-64-14	OPEN	
	1-FCO-64-42	OPEN	
	1-FCO-64-43	OPEN	
	1-FCO-64-15	Closed	
	1-FCO-64-40	Closed	
	1-FCO-64-41	Closed	
	1-FCO-64-60A	Open	
	1-FCO-64-60B	Open	
	1-FCO-64-60C	Open	
	1-FCO-64-60D	Open	
	U-1 Stair Hall Supply Fan	In operation as required	

Data Sheet SI 4.7.C-1 (Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
6.4.15	(Continued)		
	Unit 2 Reactor Zone		
	U-2 Reactor Zone Ventilation System	In operation as required	
	2-FCO-64-13	Open	ARC
	2-FCO-64-14	Open	ARC
	2-FCO-64-42	Open	ARC
	2-FCO-64-43	Open	ARC
	2-FCO-64-15	Closed	ARC
	2-FCO-64-40	Closed	ARC
	2-FCO-64-41	Closed	ARC
	Unit 3 Reactor Zone		
	U-3 Reactor Zone Ventilation System	In operation as required	
	3-FCO-64-13	Open	NA
	3-FCO-64-14	Open	
	3-FCO-64-42	Open	
	3-FCO-64-43	Open	
	3-FCO-64-15	Closed	
	3-FCO-64-40	Closed	
	3-FCO-64-41	Closed	
	3-FCO-64-60A	Open	
	3-FCO-64-60B	Open	
	3-FCO-64-60C	Open	
	3-FCO-64-60D	Open	
	U-3 Stair Hall Supply Fan	In Operation as Required	

Data Sheet SI 4.7.C-1(Continued)

Step	Component/Process Variable	Verify and/or Record	Initials/Date
6.4.15	(Continued)		
	Refueling Zone		
	U-1 Area Refueling Zone Vent Sys	In Operation as required	ARC
	U-2 Area Refueling Zone Vent Sys	In Operation as required	ARC
	U-3 Area Refueling Zone Vent Sys	In Operation as required	ARC
	1-FCO-64-6	Open	ARC
	2-FCO-64-6	Open	ARC
	3-FCO-65-6	Open	ARC
	1-FCO-64-5	Open	ARC
	2-FCO-64-5	Open	ARC
	3-FCO-64-5	Open	ARC
	1-FCO-64-10	Open	ARC
	2-FCO-64-10	Open	ARC
	3-FCO-64-10	Open	ARC
	1-FCO-64-9	Open	ARC TC
	2-FCO-64-9	Open	ARC
	3-FCO-64-9	Open	ARC
	1-FCO-64-63	Close	ARC
	1-FCO-64-7	Close	ARC
3&	1-FCO-64-65A	Open	JL
3&	1-FCO-64-65B	Open	JL
3&	1-FCO-64-65C	Open	JL
3&	1-FCO-64-65D	Open	JL
	1-FCO-64-44	Close	ARC
	1-FCO-64-45	Close	ARC
	Equipment Access Lock Exhaust Fan	In Operation as required	JL
	U-1 Stair Hall Supply Fan	In Operation as required	ARC
	U-3 Stair Hall Supply Fan	In Operation as required	JL

FOLLOWUP DATA REQUEST FOR INCOMPLETE SURVEILLANCE INSTRUCTION DATA SHEET

Unit 2

TO : RGM

FROM: LFB

DATE: 3-20-77

SI 4.7.C-1, SCLRT

Date Performed 3-20-77 has deficiencies on the data sheet(s) as described below.

Followup data reviewed and approved L Blanton Date 3-29-77
Cognizant Engineer

Item No.	Deficiency	Corrective Action (1)(2)
1	See step 6.4.3 — Wind velocity was >5mph	See attached calculation of q for v = 17.1 mph and analysis of test results. The test results were acceptable when corrected to calm wind conditions. L Blanton 3-20-77

(1) Corrective action must be filled out explicitly, additional sheets or [illegible] may be attached, or references to documents, such as maintenance history records or trouble reports, that contain explicit information so that common-mode failures can be evaluated and quality assurance established.

(2) Signature and date of person resolving deficiency required for each item.

*Revised

Attachment to SI 4.7.C.1 (Unit 2/3-20-78)

Calculate dynamic pressure, q:

(See FSAR § 12.2.2.9.1) $q = .002558\ V^2$

$$q = .002552\ (17.1)^2\ psf \left(.01602 \frac{ft\ H_2O}{psf}\right)\left(12 \frac{in\ H_2O}{ft\ H_2O}\right)$$

$\boxed{q = .14\ in\ H_2O}$ Note: Containment ΔP was .5
Limit = .25
Margin = .25 in H_2O

Analysis

	Unit 2		Refuel Zone	Total
Limit (In House)	1308	+	7680	= 8988
Measured	3500	+	5200	= 8700

Margin to Limit = 288 scfm

On 3-20-78, a margin to the leak rate limit of 288 scfm was measured for unit 2. This margin would be reduced at calm wind conditions. However, since the dynamic pressure of the winds (.14 in H_2O) was less than the excess of Δp (~.25 in H_2O) occurring during the test, there was sufficient conservatism to satisfy Tech Spec require-

LD, L

Prepared By
The Man.

Look Darling, See
that I get this back!