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.b prior to each 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 list the following test data:

(1) Standby gas treatment system flow rate: 8,800 SCFM

(2) Reactor building differential pressures:

Unit 1 reactor zone: -0.25" H_2O

Unit 2 reactor zone: -0.30" H_2O

Unit 3 reactor zone: -0.27" H_2O

Refueling zone average: -0.28" H_2O

(3) Wind Speed: 8 mph

(4) Wind Direction: South

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5.0 Analysis and Interpretation

Technical Specification 4.7.C.1.b 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 12,000 SCFM shall be demonstrated at each refueling outage prior to refueling. Following shutdown of Unit 2 on April 28, 1979, the secondary containment for the common refuel zone and the Unit 2 reactor zone were leak rate tested.

These two zones were isolated from the Units 1 and 3 reactor zones. The results of this test are documented in the plant files. The SGT flow used on this date was 11,500 SCFM. Appendix A to SI 4.7.C gives the allowable inleakage per secondary containment zone documented during preoperational testing and based on a total allowable inleakage of 12,000 SCFM. Due to a personnel error, it was not understood that total inleakage for Unit 2 reactor zone and the combined refuel zones may not exceed 8,890 SCFM.

On 5/4/79, at about 12 m., it was discovered in normal surveillance review that the inleakage used in performing the test was greater than the allowable 8,890 SCFM. At this time, all fuel handling and work over the Unit 2 reactor cavity were stopped and SI 4.7.C was performed again. The data obtained is that listed in this report. The retest data from SI 4.7.C is attached. The primary containment had been broken for about five days prior to the passage of SI 4.7.C and LER 50-260/79-8 was written as a result. The leak rate was acceptable upon retest without modification or repair to the secondary

5.0 (Continued)

containment. The retest shows that with an inleakage of 8,800 SCFM in the Unit 2 reactor core and the refuel zone, the secondary containment is capable of maintaining < -.25 inch of water pressure. The results of the retest satisfy the requirements of technical specification 4.7.C.1.b.

The windspeed was not less than 5 mph as required by the technical specification. However, an analysis is attached to the SI 4.7.C-1 data sheet showing the validity of the data at a wind condition of 8 mph.

RCG:MB
6/5/79
Attachments

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TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT

SURVEILLANCE INSTRUCTION 4.7.C

SECONDARY CONTAINMENT

UNIT 1, 2 OR 3

Approved: H J Green
Plant Superintendent

Date: May 11, 1976
General Revision

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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. Referenced	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 ≤ 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

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that at a flow of ≤ 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 units' 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.

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5.0 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 ≤ 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 ≤ -1/4" H_2O.

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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 indicator.

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

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 (pnl 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 (pnl 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 (pnl 9-25-2) to the Allowable Flow of the remaining zones. See Appendix A for the Allowable Flows.

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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 stablize for 15 minutes before the next step.

6.4.11 Record flows indicated on FI-65-50 and FI-65-71 (pnl 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 reacto zone	1524
Unit 2 reactor zone	1308
Unit 3 reactor zone	1488
Reactor Building	$\leq$ 12000 CFM

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DATA COVER SHEET SI 4.7.C-1

SECONDARY CONTAINMENT CAPABILITY

UNIT 1, 2 OR 3

Performed By Joe McCollister (Unit Operator) Date 5-4-79

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) RFW-1 outage

____ Other (explain) _____

Results reviewed B.F. Mills (Assistant Shift Engineer) Date 5-4-79

Results Review and Approval

(1) Cognizant Engineer J. R. Udell Date 5-4-79

Rescheduled

QA Staff Plum Date 5-9-79

REMARKS _____

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

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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	5/4/76
3.3	SGTS	Standby Readiness	
3.4	Main Steam Line Tunnel Temperature for units being tested	$\leq$ 150° F	
3.5	16A-S34 for units tested	Not in Drywell or Torus Bypass	
3.8	FI-65-50	Currently Calibrated	
	FI-65-71	Currently Calibrated	
	PdIC-64-1 (All three units)	Currently Calibrated	
	PdIC-64-2 (All three units)	Currently Calibrated	
3.9	Inboard Equipment Access Lock Doors	Closed and Seals Inflated	
3.10	Drywell or Suppression Chamber	Purge Not Inprocess	
3.11	Doors in the following table for the tested zone(s) or the number doors for all zones.	Closed	

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Table 3.11

Data Sheet SI 4.7.C-2 (Continued)

Elevation	U1RZ	U2RZ	U3RZ	RFZ
519.0	30 31	34, 36 35, 37	40 41	
541.5	42	43, 44	45	
565.0	#221 #231 224 #229 #228 #232 #230 #230a	#236, #241 #237 #238 240 242	#249 #250 #251 255	255 242 226 231
583.0	#298		#826, #827	
593.0	#538 #539 490	497, 501 #540 #541	506 #513 #514	
621.25	#534 #637 635	640, 647 #648 #649	651 #657 #658	
639.0	670	672 673	675	2238 536
664.0	704 700 705 701 706 712 707 708	713 717 714 715 716	724 715 725 716 722 717 723	700, 702, 724, 715, 713 701, 703, 725, 716, 714 704, 720, 722, 706, 717 705, 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		N/A 5/4/7
6.1.2	U2RZ	Configuration		N/A
6.1.3	U3RZ	Configuration		N/A
6.1.4	RFZ	Configuration		N/A
6.1.5	U1RZ and RFZ	Configuration		N/A
6.1.6	U2RZ and RFZ	Configuration		[illegible]
6.1.7	U3RZ and RFZ	Configuration		N/A
6.1.8	Reactor Building Configuration			N/A
6.2.1	1-HS-64-117		TEST Position	N/A
	2-HS-64-117		TEST Position	[signature]
	3-HS-64-117		TEST Position	N/A
6.2.2	1-HS-64-120		TEST Position	N/A
	2-HS-64-120		TEST Position	[signature]
	3-HS-64-120		TEST Position	N/A
6.2.3	SGTS Train A		START	[illegible]
	or SGTS Train B		START	N/A
	or SGTS Train C		START	[signature]
	Unit 1 Reactor Zone			
	U-1 Reactor Zone Ventilation Sys.		Shutdown	N/A
	1-FCO-64-13		Closed	N/A
	1-FCO-64-14		Closed	N/A
	1-FCO-64-42		Closed	N/A
	1-FCO-64-43		Closed	N/A

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 5/4/79
	1-FCO-64-40	Open	N/A
	1-FCO-64-41	Open	N/A
	1-FCO-64-60A	Closed	N/A
	1-FCO-64-60B	Closed	N/A
	1-FCO-64-60C	Closed	N/A
	1-FCO-64-60D	Closed	N/A
	U-1 Stair Hall Supply Fan	Shutdown	N/A
	Unit 2 Reactor Zone		
	U-2 Reactor Zone Ventilation Sys	Shutdown	
	2-FCO-64-13	Closed	
	2-FCO-64-14	Closed	
	2-FCO-64-42	Closed	
	2-FCO-64-43	Closed	
	2-FCO-64-15	Open	
	2-FCO-64-40	Open	
	2-FCO-64-41	Open	
	Unit 3 Reactor Zone		
	U-3 Reactor Zone Ventilation Sys	Shutdown	N/A
	3-FCO-64-13	Closed	N/A
	3-FCO-64-14	Closed	N/A
	3-FCO-64-42	Closed	N/A
	3-FCO-64-43	Closed	N/A
	3-FCO-64-15	Open	N/A
	3-FCO-64-40	Open	N/A

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	N/A 5/4/79
	3-FCO-64-60A	Closed	N/A
	3-FCO-64-60B	Closed	N/A
	3-FCO-64-60C	Closed	N/A
	3-FCO-64-60D	Closed	N/A
	U-3 Stair Hall Supply Fan	Shutdown	N/A
6.3.1	1-HS-64-119	TEST Position	JS
6.3.2	1-HS-64-122	TEST Position	JS
6.3.3	SGTS Train A	START	JS
	or SGTS Train B	START	* JS
	or SGTS Train C	START	* JS
	Refueling Zone		
	U-1 Area Refueling Zone Vent Sys	Shutdown	JS
	U-2 Area Refueling Zone Vent Sys	Shutdown	JS
	U-3 Area Refueling Zone Vent Sys	Shutdown	JS
	1-FCO-64-6	Close	JS
	2-FCO-64-6	Close	JS
	3-FCO-64-6	Close	JS
	1-FCO-64-5	Close	JS
	2-FCO-64-5	Close	JS
	3-FCO-64-5	Close	JS
	1-FCO-64-10	Close	JS
	2-FCO-64-10	Close	JS
	3-FCO-64-10	Close	JS

* Did not need for flow

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	JS 5/4/79
	2-FCO-64-9	Close	JS
	3-FCO-64-9	Close	61M
	1-FCO-64-63	Open	JS
	1-FCO-64-7	Open	JS
*	1-FCO-64-65A	Close	JS
*	1-FCO-64-65B	Close	JS
*	1-FCO-64-65C	Close	JS
*	1-FCO-64-65D	Close	JS
	1-FCO-64-44	Open	JS
	1-FCO-64-45	Open	JS
	Equipment Access Lock Exhaust Fan	Shutdown	JS
	U-1 Stair Hall Supply Fan	Shutdown	JS
	U-3 Stair Hall Supply Fan	Shutdown	JS
6.4.2	FI-65-50	5200 sfcm	JS
	FI-65-71	3600 sfcm	JS
	Total	8800 sfcm	JS

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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	-.25 "H_2O	5/4/78
	* Thermometer Rx Zone	78° F°	
	2-PdIC-64- Rx Zone	-.30 "H_2O	
	* Thermometer Rx Zone	77° F°	
	3-PdIC-64- Rx Zone	-.27 "H_2O	
	* Thermometer Rx Zone	76° F°	
	1-PdIC-64- Refueling Zone	-.19 "H_2O	
	2-PdIC-64- Refueling Zone	-.28 "H_2O	
	3-PdIC-64- Refueling Zone	-.28 "H_2O	
	* Thermometer Refueling Zone	78° F°	
6.4.4	All zones ≤ -1/4" H_2O		
		5 Direction	
*6.4.5	33 ft. level/ Windspeed	7/8 mph	
*6.4.5.1	Thermometer/ Outside temp.	65 F°	
6.4.6	FI-65-50	scfm	N/A
	FI-65-71	scfm	N/A
	Total	scfm	N/A
6.4.7	1-PdIC-64-2 Rx Zone	"H_2O	N/A
	2-PdIC-64-2 Rx Zone	"H_2O	N/A
	3-PdIC-64-1 Rx Zone	"H_2O	N/A
	1-PdIC-64-1 Refueling Zone	"H_2O	N/A
	2-PdIC-64-1 Refueling Zone	"H_2O	N/A
	3-PdIC-64-1 Refueling Zone	"H_2O	N/A
6.4.8	All zones ≤ -1/4"H_2O		N/A
6.4.9	Zones Isolated List	N/A	
		N/A	
		N/A	
		N/A	

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UNIT 2 SI 4.7.C.1 5/4/79

ATTACHMENT 1 Rf 5/4/79

1. Purpose

To analyze the effect of a windspeed in excess of 5 mph on the test results

2. CALCULATIONS

a. Windspeed at the time of the test was 8 mph.

b. Analysis is required for the effects of 3 mph (8-5) on the test results

c. Per FSAR 12.2.2.9.1 the dynamic pressure is

$$q = 0.002558\ V^2 \qquad \frac{lb}{ft^2}$$

In this instance this becomes

$$q = .002558\ (3)^2\ \frac{lb}{ft^2}\left(\frac{1\ ft_{H_2O}}{62.4\ lb/ft^2}\right)\left(12\ \frac{in_{H_2O}}{ft_{H_2O}}\right)$$

$$= .0044\ in_{H_2O}$$

3. ANALYSIS

Assuming that any wind in excess of the allowable 5 mph has a detrimental effect directly applicable to the demonstrated vacuum in the affected zone, subtract the calculated value from the observed value as shown below.

Reactor zone = $-.30 - (-.0044) = -.2956$
Refuel zone = $-.28 - (-.0044) = -.2756$

Since both these values demonstrate the required vacuum (-.25) and the measured flow of 8800 cfm is below the allowable maximum (8988 cfm) it is demonstrated that there is sufficient conservatism to satisfy the technical specification requirements.

POOR ORIGINAL

RB Cockrell 5/4/79

Step	Component/Process Variable	Verify and/or Record	Initials/Date
	Return to Normal		
6.4.11	FI-65-50	_____ scfm	N/A
	FI-65-71	_____ scfm	N/A
	Total	_____ scfm	N/A
6.4.12	1-PdIC-64-2 Rx Zone	_____ "H_2O	N/A
	2-PdIC-64-2 Rx Zone	_____ "H_2O	N/A
	3-PdIC-64-2 Rx Zone	_____ "H_2O	N/A
	1-PdIC-64-1 Refueling Zone	_____ "H_2O	N/A
	2-PdIC-64-1 Refueling Zone	_____ "H_2O	N/A
	3-PdIC-64-1 Refueling Zone	_____ "H_2O	N/A
6.4.13	Remaining zones $\leq$ -1/4"H_2O		N/A
6.4.14	1-HS-64-117	NORMAL	N/A
	2-HS-64-117	NORMAL	5/18/87
	3-HS-64-117	NORMAL	N/A
	1-HS-64-120	NORMAL	N/A
	2-HS-64-120	NORMAL	5/18/87
	3-HS-64-120	NORMAL	N/A
	1-HS-64-119	NORMAL	5/18/87
	1-HS-64-122	NORMAL	5/18/87

Step	Component/Process Variable	Verify and/or Record	Initials/Date
	Return to Normal		
6.4.15	SGTS Fan A	OFF	JM/off 5/4/76
	FCO-65-3	Closed	JM
	A-SGTS humidity control heater	OFF	JM
	A-SGTS charcoal heater	ON	JM
	SGTS Fan B	OFF	N/A
	FCO-65-25	Closed	N/A
	B-SGTS humidity control heater	OFF	N/A
	B-SGTS charcoal heater	ON	N/A
	SGTS Fan C	OFF	N/A
	FCO-65-51	Closed	N/A
	C-SGTS humidity control heater	OFF	N/A
	C-SGTS charcoal heater	ON	N/A
	Unit 1 Reactor Zone		
	U-1 Reactor Zone Ventilation System	In operation as required	
	1-FCO-64-13	OPEN	N/A
	1-FCO-64-14	OPEN	N/A
	1-FCO-64-42	OPEN	N/A
	1-FCO-64-43	OPEN	N/A
	1-FCO-64-15	Closed	N/A
	1-FCO-64-40	Closed	N/A
	1-FCO-64-41	Closed	N/A
	1-FCO-64-60A	Open	N/A
	1-FCO-64-60B	Open	N/A
	1-FCO-64-60C	Open	N/A
	1-FCO-64-60D	Open	N/A
	U-1 Stair Hall Supply Fan	In operation as required	

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	JM 5/4/76
	2-FCO-64-14	Open	JM
	2-FCO-64-42	Open	JM
	2-FCO-64-43	Open	JM
	2-FCO-64-15	Closed	JM
	2-FCO-64-40	Closed	JM
	2-FCO-64-41	Closed	JM
	Unit 3 Reactor Zone		
	U-3 Reactor Zone Ventilation System	In operation as required	
	3-FCO-64-13	Open	N/A
	3-FCO-64-14	Open	N/A
	3-FCO-64-42	Open	N/A
	3-FCO-64-43	Open	N/A
	3-FCO-64-15	Closed	N/A
	3-FCO-64-40	Closed	N/A
	3-FCO-64-41	Closed	N/A
	3-FCO-64-60A	Open	N/A
	3-FCO-64-60B	Open	N/A
	3-FCO-64-60C	Open	N/A
	3-FCO-64-60D	Open	N/A
	U-3 Stair Hall Supply Fan	In Operation as Required	

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	
	U-2 Area Refueling Zone Vent Sys	In Operation as required	
	U-3 Area Refueling Zone Vent Sys	In Operation as required	
	1-FCO-64-6	Open	JM SK
	2-FCO-64-6	Open	JM
	3-FCO-65-6	Open	JM
	1-FCO-64-5	Open	JM
	2-FCO-64-5	Open	JM
	3-FCO-64-5	Open	JM
	1-FCO-64-10	Open	JM
	2-FCO-64-10	Open	JM
	3-FCO-64-10	Open	JM
	1-FCO-64-9	Open	JM
	2-FCO-64-9	Open	JM
	3-FCO-64-9	Open	JM
	1-FCO-64-63	Close	JM
	1-FCO-64-7	Close	JM
	* 1-FCO-64-65A	Open	JM
	* 1-FCO-64-65B	Open	JM
	* 1-FCO-64-65C	Open	JM
	* 1-FCO-64-65D	Open	JM
	1-FCO-64-44	Close	JM
	1-FCO-64-45	Close	JM
	Equipment Access Lock Exhaust Fan	In Operation as required	
	U-1 Stair Hall Supply Fan	In Operation as required	
	U-3 Stair Hall Supply Fan	In Operation as required	

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