FINAL

Browns Ferry
ILT 1205

NRC EXAM

Admin JPMs

FINAL

FINAL

OPERATOR: _____

RO ____ SRO ____ DATE: _____

JPM NUMBER: Admin SRO/RO A1a

TASK NUMBER: Conduct of Operations

TASK TITLE: 0-SR-3.8.1.A.1, Verification of Offsite Power Availability to 4.16 KV Shutdown Boards

K/A NUMBER: 2.1.31 K/A RATING: RO 4.6 SRO 4.3

PRA:

TASK STANDARD: Marks 500KV and 161KV Sources as Qualified. Completes Attachment 1 for Unit 3 accurately, records indicated voltages for step 7.3[5] and does not sign acceptance criteria, does not sign acceptance criteria for 7.5[1], and marks acceptance criteria satisfied on Surveillance Task Sheet (STS) as NO.

LOCATION OF PERFORMANCE: Simulator

REFERENCES/PROCEDURES NEEDED: 0-SR-3.8.1.A.1

VALIDATION TIME: 20 minutes

MAX. TIME ALLOWED: 60 minutes

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are an extra Operator. Breaker 1312, 4KV Unit BD 3A Normal Feeder Breaker is out of service for a breaker swap. The 3A Diesel Generator was removed from service due to an oil leak and declared inoperable 15 minutes ago. Units 1, 2 and 3 are at 100% power. The performance of 0-SR-3.8.1.A.1, Verification of Offsite Power Availability to 4.16 KV Shutdown Boards is necessary. The TVA Transmission Operator reports that the qualification status of the 500 KV and 161 KV Sources is GREEN to Browns Ferry Nuclear Plant.

INITIATING CUE: The Unit 3 Unit Supervisor directs that you perform 0-SR-3.8.1.A.1, Verification of Offsite Power Availability to 4.16 KV Shutdown Boards for Unit 3. The Unit 1 and 2 portions have already been completed.

****

IN-SIMULATOR: I will explain the initial conditions and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. When your task is given, you will repeat the task and I will acknowledge "That's Correct". (OR "That's Incorrect", if applicable). When you have completed your assigned task, you will say, "my task is complete" and I will acknowledge that your task is complete.

****

INITIAL CONDITIONS: You are an extra Operator. Breaker 1312, 4KV Unit BD 3A Normal Feeder Breaker is out of service for a breaker swap. The 3A Diesel Generator was removed from service due to an oil leak and declared inoperable 15 minutes ago. Units 1, 2 and 3 are at 100% power. The performance of 0-SR-3.8.1.A.1, Verification of Offsite Power Availability to 4.16 KV Shutdown Boards is necessary. The TVA Transmission Operator reports that the qualification status of the 500 KV and 161 KV Sources is GREEN to Browns Ferry Nuclear Plant.

INITIATING CUE: The Unit 3 Unit Supervisor directs that you perform 0-SR-3.8.1.A.1, Verification of Offsite Power Availability to 4.16 KV Shutdown Boards for Unit 3. The Unit 1 and 2 portions have already been completed.

START TIME _____

****

Performance Step 1: Critical X Not Critical

[2] **DOCUMENT** the source qualification below.

	QUALIFIED	UNQUALIFIED
500KV SOURCE	☐	☐
161KV SOURCE	☐	☐

Standard:

Marks the 500 KV and 161 KV Sources as Qualified

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical X Not Critical

[3] **COMPLETE** Attachment 1, to document which subcomponents are credited as satisfying the requirements of a qualified offsite circuit for Unit 1, Unit 2, and Unit 3 by marking the subcomponent with a circle around it and placing an initial next to the subcomponent.

Standard:

Completes attachment 1 for Unit 3, Columns 1 and 2. **Must** use USST 3B in either column 1 or 2.

Can use **Either** CSST A or B in column 2 or 1 (whichever column USST 3B was not used for).

For USST 3B, BKR 1314, 4KV Unit BD 3B, BKR 1332, BKRs 1338 and 1342, and 4KV SD BD 3EC and 3ED.

For CSST A, BKR 1412, Start Bus 1A, BKR 1432, 4KV Unit BD 3A, BKR 1326, BKRs 1334 and 1336, and 4KV SD 3EA and 3EB.

For CSST B, BKR 1518, Start Bus 1A, BKR 1432, 4KV Unit BD 3A, BKR 1326, BKRs 1334 and 1336, and 4KV SD 3EA and 3EB.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 3: Critical _ Not Critical X

NOTE

Specific voltmeters are **NOT** listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[4] **IF** performing this procedure to satisfy Technical Specification 3.8.1 Required Action A.1 or B.1 or G.1 for Unit 1 and Unit 2, **THEN RECORD** voltages for the following boards and **CHECK** proper voltage is available, (Otherwise **N/A** Steps 7.3[4]A, 7.3[4]B, 7.3[4]C, and 7.3[4]D.)

A. 4KV SD BD A VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

B. 4KV SD BD B VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

C. 4KV SD BD C VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

D. 4KV SD BD D VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

Standard:

Step is NA

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

Cue: If Operator requests Voltage Readings A=4300, B=4250, C=4350 and D=4300

****

Performance Step 4: Critical X Not Critical

NOTE

Specific voltmeters are **NOT** listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[5] **IF** performing this procedure to satisfy Technical Specification 3.8.1 Required Action A.1 or B.1 for Unit 3, **THEN RECORD** voltages for the following boards and **CHECK** proper voltage is available, (Otherwise **N/A** Steps 7.3[5]A, 7.3[5]B, 7.3[5]C, and 7.3[5]D.)

A. 4KV SD BD 3EA VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

B. 4KV SD BD 3EB VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

C. 4KV SD BD 3EC VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

D. 4KV SD BD 3ED VOLTAGE
Voltage_____(3950 - 4400 VOLTS)

Standard:

Records voltage readings for 3EA, 3EB, 3EC and 3ED. Voltage for 3EA and 3EB are outside the required voltage range.

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

Cue: If Operator request an AUO to check voltages locally report voltages agree with control room indications

****

Performance Step 5: Critical _ Not Critical X

7.4 Verification of Unit 1 and or Unit 2 Offsite AC Power Circuits

NOTES	
1)	Step 7.4[1] and 7.4[2] may be marked N/A if this procedure is **NOT** required to satisfy Unit 1 and 2 Technical Specification 3.8.1 Required Action A.1 or B.1.
2)	Completed Attachment 1 is Utilized to **EVALUATE** offsite circuit availability.

[1] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Required Action B.1 (one required Unit 1and 2 DG inoperable), **THEN** (Otherwise N/A).

[2] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Required Action A.1 (one required offsite circuit inoperable), **THEN** (Otherwise N/A)

[3] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Condition G (one required offsite circuit inoperable and one Unit 1 and 2 DG inoperable, **THEN** (Otherwise N/A)

Standard:

Step is NA

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 6: Critical X Not Critical

7.5 Verification of Unit 3 Offsite AC Power Circuits

NOTES	
1)	Step 7.5[1] and 7.5[2] may be marked N/A if this procedure is **NOT** required to satisfy Unit 3 Technical Specification 3.8.1 Required Action A.1 or B.1.
2)	Completed Attachment 1 is Utilized to **EVALUATE** offsite circuit availability.

[1] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Required Action B.1 (one required Unit 3DG inoperable), **THEN VERIFY** at least two Unit 3 Offsite AC circuits are determined Operable in Attachment 1 and the shutdown boards included in the Operable circuits have proper voltage verified in step 7.3[5]. (Otherwise N/A).

[2] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Required Action A.1 (one required offsite circuit inoperable), **THEN VERIFY** at least one Unit 3 Offsite AC circuit is determined Operable in Attachment 1 and the shutdown boards included in the Operable circuit have proper voltage verified in step 7.3[5] (Otherwise N/A).

Standard:

Step 7.5 [1] is the reason for the surveillance, the Operator does NOT initial acceptance criteria because the voltage on 4KV SD Boards 3EA and 3EB are less than the required 3950 volts.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 7: Critical _ Not Critical X

7.6 Common Cause Failure Evaluation and Surveillance Completion

[1] **EVALUATE** the necessity to perform 0-TI-403, Determination of Common Cause Failure for Emergency Diesel Generators, if this surveillance is being performed for an inoperable Diesel Generator.

Standard:

Continue to next step.

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

CUE: The Shift Manager is evaluating the necessity of performing 0-TI-403

****

Performance Step 8: Critical X Not Critical

[2] On the Surveillance Task Sheet (STS)

A. **RECORD** the Completion Date and Time.

B. **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Performer & Date fields.

Standard:

Completes Surveillance Task Sheet (STS), the critical step is that Acceptance Criteria Satisfied is marked NO.

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

****

Performance Step 9: Critical _ Not Critical X

[3] **NOTIFY** the Unit One, Unit Two and Unit Three Operators (UO's) this Surveillance Procedure is complete.

Standard:

NOTIFIES the Unit Two and Three Unit Operators (UO's) this Surveillance Procedure is complete.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

CUE: Acknowledge Notification.

****

Performance Step 10: Critical _ Not Critical X

[4] **NOTIFY** the Unit Supervisor (US) this surveillance procedure is complete and **PROVIDE** status of any Corrective Actions or unsatisfactory performance.

Standard:

NOTIFIES the Unit Supervisor (US) this surveillance procedure is complete and **PROVIDES** status of any Corrective Actions or unsatisfactory performance.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

Cue: Acknowledge Notification

END OF TASK

STOP TIME _____

Browns Ferry Nuclear Plant

Unit 0

Surveillance Procedure

0-SR-3.8.1.A.1

Verification of Offsite Power Availability to 4.16 kV Shutdown Boards

Revision 0012

Quality Related

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P1905

Effective Date: 04-12-2011

Responsible Organization: OPS, Operations

Prepared By: Keith Smith

Approved By: Keith W. Benefield

Answer Key

Current Revision Description

Type of Change: Enhancement **Tracking Number:** 013

PCRs: 11000692

Documentation: None

Step 7.3[1] changed TRO-TO-SOP-10.128 to TRO-TO-SOP-30.128

Table of Contents

1.0 INTRODUCTION

1.1 Purpose

This procedure is performed to verify power availability from the offsite transmission network to the onsite Class 1E AC Electrical Power Distribution System in conformance with the requirements specified in Technical Specification 3.8.1 Required Action A.1 and B.1.

1.2 Scope

This procedure verifies the availability of qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System. Qualification and continuity from the offsite electrical power supply to the onsite distribution network is ensured by determining the:

[1] Qualification of the 500 KV and 161 KV off-site power system.

[2] Qualification of the 500KV and 161 off site power system.

[3] Configuration and operability for each of the four basic Unit 1/2 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards.

[4] Configuration and operability for each of the three basic Unit 3 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards.

[5] Proper voltage on the 4.16 KV shutdown boards.

1.3 Frequency

Performance of this procedure is conditional, dependent on the status of required offsite circuits and Diesel Generators. This procedure shall be performed within one hour from the time:

[1] One required offsite circuit is declared inoperable , or

[2] One required Unit 1/2 DG is declared inoperable, or

[3] One required Unit 3 DG is declared inoperable.

Then once per 8 hours thereafter, until each unit (in mode 1, 2 or 3) has two qualified offsite circuits operable and all required D/Gs operable.

1.4 Applicability

The requirements of this procedure are applicable in Modes 1, 2, and 3.

2.0 REFERENCES

2.1 Technical Specifications

Section B3.8.1, AC Sources - Operating

Section 3.8.1, AC Sources - Operating

2.2 UFSAR

Section 8.1, Summary Description

Section 8.2, Generators

Section 8.3, Transmission System

Section 8.4, Normal Auxiliary Power System

Section 8.5, Standby A-C Power Supply and Distribution

Appendix F, Unit Sharing And Interactions

2.3 Plant Instructions

0-GOI-300-4, Switchyard Manual

0-OI-57A, Switchyard and 4160V AC Electrical System

OPDP-1, Conduct of Operations

NPG-SPP-06.9.1, Conduct of Testing

NPG-SPP-06.9.2, Surveillance Test Program

2.4 TVA INSTRUCTIONS

IGA-6, Inter-group Agreement

TRO-TO-SOP-10.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide

2.5 Plant Drawings

0-15E500-1, Key Diagram of Standby Auxiliary Power System

3-15E500-3, Key Diagram of Normal & Standby Auxiliary Power System

0-45N500, Wiring Diagrams Development Single Line

0-45E506, Wiring Diagram Main Single Line SH 1 161 KV SWYD

3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

A. This procedure may be performed in any plant operating condition subject to the approval of the Unit Supervisor (US).

B. In the context of this procedure, equipment tagged and/or de-energized as indicated by indicating lights, control switch positions or indicating meters in the Control Room is NOT AVAILABLE. Skill of the performer will be utilized to make this determination.

C. Only offsite power delivered to Unit 1/2 Shutdown Boards through their normal feeder breakers can be credited, since common accident signal (CAS) logic will trip the alternate breaker.

3.2 Operability and LCO's

A. There are four basic Unit 1/2 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards. For Units 1 and 2:

1. Only two of the four qualified circuits are REQUIRED to be operable.

2. If <u>any</u> two of the four circuits are operable, then LCO 3.8.1.a is satisfied.

B. There are three basic Unit 3 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards. For Unit 3:

1. Only two of the three qualified circuits are required to be operable.

2. If <u>any</u> two of the three circuits are operable, then LCO 3.8.1.a is satisfied.

3.3 Equipment

A. Multiple units can claim a 161kV offsite power circuit simultaneously. However, if a load is connected to a 4kV Start Bus, 0-OI-57A will initiate manual actions to disable automatic transfer of selected 4kV Unit Boards and 4kV Common Boards to the 161kV circuits. The 161kV source may still be considered operable with a delayed manual transfer.

With the most restrictive manual actions in place, diesel generators would supply the safety related loads needed to mitigate the immediate consequences of an accident or analyzed operational transient. Operators can manually transfer loads to the 4kV start bus to support long term post accident or transient recovery and shutdown.

3.4 Qualified Grid Source

A. TVA's Transmission Operator (TOp) is responsible for determining if the transmission grid is configured and operating within established limits that ensure the grids ability to provide QUALIFIED offsite power to Browns Ferry Nuclear Plant.

B. This procedure verifies OPERABILITY for each of the seven basic AC circuits, from the offsite source to 4kV Shutdown boards (four Unit 1/2 circuits or three Unit 3 circuits). To be OPERABLE, each basic circuit must have a QUALIFIED offsite power source. The Browns Ferry Operator must request the TVA Southwestern TOp to determine the QUALIFICATION status of the offsite power source (500kV or 161kV) when performing this procedure.

C. A color code system is used to communicate the QUALIFICATION status of the offsite power sources, both for current conditions and for postulated grid contingencies. The TOp will verbally inform Browns Ferry Operations of status color code changes in real-time. The status color code definitions and associated restrictions and requirements are contained in TRO-TO-SOP-10.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide.

D. A QUALIFIED offsite circuit may be connected to more than one division of 4kV shutdown boards and not violate separation criteria. A circuit that is not connected to the Division I or II 4kV shutdown boards is required to have the capability to be connected to at least one division of 4kV shutdown boards to be considered OPERABLE.

Date TODAY

4.0 PREREQUISITES

[1] **VERIFY** this copy of 0-SR-3.8.1.A.1 is the current revision. DZ

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1905) DZ

5.0 SPECIAL TOOLS AND RECOMMENDED EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

[1] Responses which fail to meet the following acceptance criteria constitute unsatisfactory surveillance procedure results and require immediate notification of the Unit Supervisor at the time of failure and documentation in accordance with NPG-SPP-06.9.1, Conduct of Testing.

[1.1] Unit 1(2) LCO 3.8.1 Condition A - One required offsite circuit inoperable.

Required Action A.1 - Verify power availability from the remaining OPERABLE offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.2] Unit 3 LCO 3.8.1 Condition A - One required offsite circuit inoperable.

Required Action A.1 - Verify power availability from the remaining OPERABLE offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.3] Unit 1(2) LCO 3.8.1 Condition B - One required Unit 1 / 2 DG inoperable.

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least two qualified circuits are available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.4] UNIT 3 LCO 3.8.1 Condition B - One required Unit 3 DG inoperable.

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least two qualified circuits are available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

6.0 ACCEPTANCE CRITERIA (continued)

[1.5] Unit 1(2) LCO 3.8.1 Condition G - One required offsite circuit inoperable and One required Unit 1 / 2 DG inoperable (applicable when only one 4.16 KV Shutdown Board is affected).

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.6] Unit 3 LCO 3.8.1 Condition G - One required offsite circuit inoperable and One required Unit 3 DG inoperable (applicable when only one 4.16 KV Shutdown Board is affected).

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[2] Steps which determine the above criteria are designated by (AC) next to the initials blank.

Date TODAY

7.0 PROCEDURE STEPS

7.1 Initiation and Approvals

[1] **VERIFY** the following initial conditions:

A. All Precautions and Limitations in Section 3.0 have been reviewed. DZ

B. All Prerequisites listed in Section 4.0 are satisfied. DZ

[2] On the Surveillance Task Sheet (STS)

OBTAIN Authorization Signature and Date/Time from the Unit Supervisor to perform this surveillance. DZ

[3] [NRC/C] **NOTIFY** the Unit One, Unit Two, and Unit Three Operators (UO's) this test is commencing. [RPT-82-16, LER 259/82032] DZ

[4] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. DZ

Date TODAY

Technical Specification Required Action Determination

DENOTE, via the check box, which Technical Specification Required Action is being met by performing this procedure.

A. Unit 1 Technical Specification 3.8.1 Required Action B.1. (Requires TWO qualified AC circuits from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Bds when one Unit 1 / 2 DG inoperable). ☐

B. Unit 2 Technical Specification 3.8.1 Required Action B.1. (Requires TWO qualified AC circuits from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Bds when one Unit 1 / 2 DG inoperable). ☐

C. Unit 3 Technical Specification 3.8.1 Required Action B.1. (Requires TWO qualified AC circuits from the offsite transmission system to the Unit 3 4kV Shutdown Bds when one Unit 3 DG inoperable). ☒

D. Unit 1 Technical Specification 3.8.1 Required Action A.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Boards, when one required offsite circuit inoperable). ☐

E. Unit 2 Technical Specification 3.8.1 Required Action A.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Boards, when one required offsite circuit inoperable). ☐

F. Unit 3 Technical Specification 3.8.1 Required Action A.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 3 4kV Shutdown Boards, when one required offsite circuit inoperable). ☐

G. Unit 1(2) Technical Specification 3.8.1 Condition G.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Boards, when one required offsite circuit inoperable and one Unit 1 and 2 Diesel Generator inoperable). ☐

H. Unit 3 Technical Specification 3.8.1 Condition G.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 3 4kV Shutdown Boards, when one required offsite circuit inoperable and one Unit 3 Diesel Generator inoperable). ☐

Date TODAY

7.3 **Verification of Offsite 500kv and 161kv Sources**

NOTE

TVA's Transmission Operator (TOp) is responsible for determining if the transmission grid is configured and operating within established limits that ensure the grids ability to provide QUALIFIED offsite power to Browns Ferry Nuclear Plant.

Southwest TOp phone number is 9-1-888-882-4009.

[1] **CONTACT** the TVA Southwest TOp to **VERIFY** the transmission grid is able to provide QUALIFIED offsite power to BFN, in accordance with TRO-TO-SOP-30.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide. DZ

[2] **DOCUMENT** the source qualification below.

	QUALIFIED	UNQUALIFIED
500KV SOURCE	☒	☐
161KV SOURCE	☒	☐

Candidate Initials

[3] **COMPLETE** Attachment 1, to document which subcomponents are credited as satisfying the requirements of a qualified offsite circuit for Unit 1, Unit 2, and Unit 3 by marking the subcomponent with a circle around it and placing an initial next to the subcomponent.

Candidate Initials
see Attachment 1

Date TODAY

7.3 **Verification of Offsite 500kv and 161kv Sources (continued)**

NOTE

Specific voltmeters are not listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[4] **IF** performing this procedure to satisfy Technical Specification 3.8.1 Required Action A.1 or B.1 or G.1 for Unit 1 and Unit 2, **THEN**

RECORD voltages for the following boards and **CHECK** proper voltage is available, (Otherwise N/A.)

A. 4KV SD BD A VOLTAGE

Voltage NA (3950 - 4400 VOLTS) NA

B. 4KV SD BD B VOLTAGE

Voltage NA (3950 - 4400 VOLTS) NA

C. 4KV SD BD C VOLTAGE

Voltage NA (3950 - 4400 VOLTS) NA

D. 4KV SD BD D VOLTAGE

Voltage NA (3950 - 4400 VOLTS) NA

Date TODAY

7.3 **Verification of Offsite 500kv and 161kv Sources (continued)**

NOTE

Specific voltmeters are not listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[81] **IF** performing this procedure to satisfy Technical Specification 3.8.1 Required Action A.1 or B.1 or G.1 for Unit 3, **THEN**

RECORD voltages for the following boards and **CHECK** proper voltage is available, (Otherwise N/A)

A. 4KV SD BD 3EA VOLTAGE

* Voltage Voltage here (3950 - 4400 VOLTS) Candidate Initials

B. 4KV SD BD 3EB VOLTAGE

* Voltage Voltage here (3950 - 4400 VOLTS) Candidate Initials

C. 4KV SD BD 3EC VOLTAGE

Voltage Voltage here (3950 - 4400 VOLTS) Candidate Initials

D. 4KV SD BD 3ED VOLTAGE

Voltage Voltage here (3950 - 4400 VOLTS) Candidate Initials

* Voltages will be Low outside normal range

Date TODAY

7.4 **Verification of Unit 1 and or Unit 2 Offsite AC Power Circuits**

NOTES

1) Step 7.4[1] and 7.4[2] may be marked N/A if this procedure is not required to satisfy Unit 1 and 2 Technical Specification 3.8.1 Required Action A.1 or B.1.

2) Completed Attachment 1 is Utilized to **EVALUATE** offsite circuit availability.

[1] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Required Action B.1 (one required Unit 1 and 2 DG inoperable), **THEN**

VERIFY at least two Unit 1/2 Offsite AC circuits are determined Operable in Attachment 1 and the shutdown boards included in the Operable circuits have proper voltage verified in step 7.3[4].(Otherwise N/A). N/A (AC)

[2] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Required Action A.1 (one required offsite circuit inoperable), **THEN**

VERIFY at least one Unit 1/2 Offsite AC circuit is determined Operable in Attachment 1 and the shutdown boards included in the Operable circuit have proper voltage verified in step 7.3[4]. (Otherwise N/A) N/A (AC)

[3] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Condition G (one required offsite circuit inoperable and one Unit 1 and 2 DG inoperable, **THEN**

VERIFY at least one Unit 1/2 Offsite AC circuit is determined Operable in Attachment 1 and the Shutdown Boards included in the Operable circuit have proper voltage verified in step 7.3[4]. (Otherwise N/A) N/A (AC)

Date TODAY

7.5 Verification of Unit 3 Offsite AC Power Circuits

NOTES

1) Step 7.5[1] and 7.5[2] may be marked N/A if this procedure is not required to satisfy Unit 3 Technical Specification 3.8.1 Required Action A.1 or B.1.
2) Completed Attachment 1 is Utilized to **EVALUATE** offsite circuit availability.

[1] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Required Action B.1 (one required Unit 3 DG inoperable), **THEN**

VERIFY at least two Unit 3 Offsite AC circuits are determined Operable in Attachment 1 and the shutdown boards included in the Operable circuits have proper voltage verified in step 7.3[5]. (Otherwise N/A). Does not (AC) Initial

[2] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Required Action A.1 (one required offsite circuit inoperable), **THEN**

VERIFY at least one Unit 3 Offsite AC circuit is determined Operable in Attachment 1 and the shutdown boards included in the Operable circuit have proper voltage verified in step 7.3[5] (Otherwise N/A). N/A (AC)

[3] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Condition G (one required offsite circuit inoperable and one Unit 3 DG inoperable, **THEN**

VERIFY at least one Unit 3 Offsite AC circuit is determined Operable in Attachment 1 and the Shutdown Boards included in the Operable circuit have proper voltage verified in step 7.3[5]. (Otherwise N/A) N/A (AC)

Date TODAY

7.8 **Common Cause Failure Evaluation and Surveillance Completion**

[1] **EVALUATE** the necessity to perform 0-TI-403, Determination of Common Cause Failure for Emergency Diesel Generators, if this surveillance is being performed for an inoperable Diesel Generator. _____

[2] On the Surveillance Task Sheet (STS)

A. **RECORD** the Completion Date & Time. Candidate Initial

B. **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Performer & Date fields. Candidate Initial

[3] **NOTIFY** the Unit One, Unit Two and Unit Three Operators (UO's) this Surveillance Procedure is complete. _____

[4] **NOTIFY** the Unit Supervisor (US) this surveillance procedure is complete and **PROVIDE** status of any Corrective Actions or unsatisfactory performance. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1 - Table of Offsite and Onsite Circuits Assigned to Unit 1, 2 and 3

Attachment 1
(Page 1 of 2)

OPTION 1: Columns may be reversed

Table of Offsite and Onsite Circuits Assigned to Units 1, 2 and 3

UNIT NO.			1 and 2		3	
QUALIFIED CIRCUIT			1	2	1	2
COMPONENT DESCRIPTION	USST/CSST		USST 1B	USST 1B	USST 3B	USST 3B
			USST 2B	USST 2B	—	—
			CSST A	CSST A	CSST A	CSST A
			CSST B	CSST B	CSST B	CSST B
	FOR CSST ONLY	A	BKR 1412	BKR 1412	BKR 1412	BKR 1412
			BKR 1414	BKR 1414	BKR 1414	BKR 1414
		B	BKR 1518	BKR 1518	BKR 1518	BKR 1518
			BKR 1516	BKR 1516	BKR 1516	BKR 1516
	START BUS		START BUS 1A	START BUS 1A	START BUS 1A	START BUS 1A
			START BUS 1B	START BUS 1B	START BUS 1B	START BUS 1B
	FOR USST ONLY	1B	BKR 1112	BKR 1112	—	—
			BKR 1114	BKR 1114	—	—
		2B	BKR 1212	BKR 1212	—	—
			BKR 1214	BKR 1214	—	—
		3B	—	—	BKR 1312	BKR 1312
			—	—	BKR 1314	BKR 1314
	FOR CSST ONLY	1A	BKR 1424	BKR 1424	BKR 1432	BKR 1432
			BKR 1428	BKR 1428	—	—
		1B	BKR 1524	BKR 1524	BKR 1528	BKR 1528
			BKR 1526	BKR 1526	—	—
	4KV UNIT BD		4KV UNIT BD 1A	4KV UNIT BD 1A	4KV UNIT BD 3A	4KV UNIT BD 3A
			4KV UNIT BD 1B	4KV UNIT BD 1B	4KV UNIT BD 3B	4KV UNIT BD 3B
			4KV UNIT BD 2A	4KV UNIT BD 2A	—	—
			4KV UNIT BD 2B	4KV UNIT BD 2B	—	—
	UNIT 1 & 2 ONLY		BKR 1126 & 1612	BKR 1126 & 1612	—	—
			BKR 1132 & 1712	BKR 1132 & 1712	—	—
			BKR 1226 & 1722	BKR 1226 & 1722	—	—
			BKR 1232 & 1622	BKR 1232 & 1622	—	—
	SHUTDOWN (SD) BUS		SD BUS 1	SD BUS 1	—	—
			SD BUS 2	SD BUS 2	—	—
	UNIT 3 ONLY		—	—	BKR 1326	BKR 1326
			—	—	BKR 1332	BKR 1332
	SD BD FDR BKR		BKR 1614 & BKR 1616	BKR 1614 & BKR 1616	BKR 1334 & BKR 1336	BKR 1334 & BKR 1338
			BKR 1718 & BKR 1724	BKR 1718 & BKR 1724	BKR 1338 & BKR 1342	BKR 1338 & BKR 1342
	4 KV SHUTDOWN BD		4KV SD BD A & B	4KV SD BD A & B	4KV SD BD 3EA & 3EB	4KV SD BD 3EA & 3EB
			4KV SD BD C & D	4KV SD BD C & D	4KV SD BD 3EC & 3ED	4KV SD BD 3EC & 3ED

See Attachment 1 page 2 for explanation and information for completing the above Table.

Attachment 1 (Page 1 of 2)

OPTION 2: Columns may be reversed

Table of Offsite and Onsite Circuits Assigned to Units 1, 2 and 3

UNIT NO.			1 and 2		3	
QUALIFIED CIRCUIT			1	2	1	2
COMPONENT DESCRIPTION	USST/CSST		USST 1B	USST 1B	USST 3B	USST 3B
			USST 2B	USST 2B	—	—
			CSST A	*CSST A*	*CSST A*	*CSST A*
			CSST B	*CSST B*	*CSST B*	*CSST B*
	FOR CSST ONLY	A	BKR 1412	BKR 1412	BKR 1412	BKR 1412
			BKR 1414	BKR 1414	BKR 1414	BKR 1414
		B	BKR 1518	BKR 1518	BKR 1518	BKR 1518
			BKR 1516	BKR 1516	BKR 1516	BKR 1516
	START BUS		*START BUS 1A*	*START BUS 1A*	*START BUS 1A*	*START BUS 1A*
			START BUS 1B	*START BUS 1B*	*START BUS 1B*	*START BUS 1B*
	FOR USST ONLY	1B	BKR 1112	BKR 1112	—	—
			BKR 1114	BKR 1114	—	—
		2B	BKR 1212	BKR 1212	—	—
			BKR 1214	BKR 1214	—	—
		3B	—	—	BKR 1312	BKR 1312
			—	—	BKR 1314	BKR 1314
	FOR CSST ONLY	*1A*	*BKR 1424*	*BKR 1424*	*BKR 1432*	*BKR 1432*
			BKR 1428	*BKR 1428*	—	—
		1B	*BKR 1524*	*BKR 1524*	*BKR 1528*	*BKR 1528*
			BKR 1526	*BKR 1526*	—	—
	4KV UNIT BD		4KV UNIT BD 1A	4KV UNIT BD 1A	4KV UNIT BD 3A	4KV UNIT BD 3A
			4KV UNIT BD 1B	4KV UNIT BD 1B	4KV UNIT BD 3B	4KV UNIT BD 3B
			4KV UNIT BD 2A	4KV UNIT BD 2A	—	—
			4KV UNIT BD 2B	4KV UNIT BD 2B	—	—
	UNIT 1 & 2 ONLY		BKR 1126 & 1612	BKR 1126 & 1612	—	—
			BKR 1132 & 1712	BKR 1132 & 1712	—	—
			BKR 1226 & 1722	BKR 1226 & 1722	—	—
			BKR 1232 & 1622	BKR 1232 & 1622	—	—
	SHUTDOWN (SD) BUS		SD BUS 1	SD BUS 1	—	—
			SD BUS 2	SD BUS 2	—	—
	UNIT 3 ONLY		—	—	BKR 1326	BKR 1326
			—	—	BKR 1332	BKR 1332
	SD BD FDR BKR		BKR 1614 & BKR 1616	BKR 1614 & BKR 1616	BKR 1334 & BKR 1336	BKR 1334 & BKR 1336
			BKR 1718 & BKR 1724	BKR 1718 & BKR 1724	BKR 1338 & BKR 1342	BKR 1338 & BKR 1342
	4 KV SHUTDOWN BD		4KV SD BD A & B	4KV SD BD A & B	4KV SD BD 3EA & 3EB	4KV SD BD 3EA & 3EB
			4KV SD BD C & D	4KV SD BD C & D	4KV SD BD 3EC & 3ED	4KV SD BD 3EC & 3ED

See Attachment 1 page 2 for explanation and information for completing the above Table.

Attachment 1
(Page 2 of 2)

Following statements are applicable for completing Attachment 1:

1. Attachment 1 documents which subcomponents are credited as satisfying the requirements of a qualified offsite circuit for Unit 1, Units 2 and 3 by the performer of this procedure by marking the subcomponent with a circle around it and by placing an initial next to the subcomponent.

.2. Each subcomponent listed for Unit 1 and 2 can be marked in only ONE column. For example, subcomponent "USST IB" can be marked in only one column compared to the two options available.

3. Rows not required to be filled in for Unit 1, Units 2 or 3 are lined out with dashes.

4. 500 kV subcomponents and direct feeds are left justified; 161 kV subcomponents like CSST A and B, and associated breakers are right justified in *italics*; Common subcomponents are centered in the respective blocks for clarity.

5. For an offsite circuit to be qualified at least one subcomponent shall be marked with a circle around it along with the initial of the performer of the procedure for EACH associated component listed in the Component Description column.

Surveillance Task Sheet (STS)

WO: 111807079 **PM#:** P1905

Procedure: 0-SR-3.8.1.A.1

Title: 0-SR-3.8.1.A.1 – Verification of Offsite Power Availability to 4.16 kV Shutdown Boards

Data Sheets Attached:

Perf Grp: OPS **Unit:** 1, 2, and 3 **Loop/Div:**

Test Reason: 3A Diesel Generator Inoperable

Due Date:

Frequency: Conditional **Tech Spec:** **ASME XI:**

Applicable Modes: **Perf Modes:** Mode 1

Clearance Required: **EQ:** **LCO entered:**

Dry Cask Storage: N

Authorization to Begin: SRO — Date & Time: TODAY / EARLIER

Start Date & Time: TODAY / CURRENT — Completion Date & Time: DATE / TIME

Performed By:

Print Name	Signature	Initial	Section
DK Zielinski	DKZ	DZ	OPS
Jordan Ruby	JR	JR	OPS
Candidate Name	Sign	Int.	OPS

Was this a Complete or Partial Performance? (Explain Partial in REMARKS below) Complete [X] Partial [ ]

Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/ AMSAC* acceptance criteria satisfied? Yes [ ] No [X] N/A [ ] *

Were all other acceptance Criteria satisfied? Yes [ ] No [ ] N/A [X]

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* Criteria were not satisfied, was a LCO/ODCM action required? (Explain in REMARKS below) Yes [X] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date

N/A — Test Director; Sign — Lead Performer; Date — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

REMARKS: Acceptance Criteria not satisfied due to 4Kv Shutdown Boards 3EA and 3EB voltages less than the required 3958 volts.

* Critical Step

Browns Ferry Nuclear Plant

Unit 0

Surveillance Procedure

0-SR-3.8.1.A.1

Verification of Offsite Power Availability to 4.16 kV Shutdown Boards

Revision 0012

Quality Related

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P1905

Effective Date: 04-12-2011

Responsible Organization: OPS, Operations

Prepared By: Keith Smith

Approved By: Keith W. Benefield

Student Handout

Current Revision Description

Type of Change: Enhancement **Tracking Number:** 013

PCRs: 11000692

Documentation: None

Step 7.3[1] changed TRO-TO-SOP-10.128 to TRO-TO-SOP-30.128

Table of Contents

1.0 INTRODUCTION

1.1 Purpose

This procedure is performed to verify power availability from the offsite transmission network to the onsite Class 1E AC Electrical Power Distribution System in conformance with the requirements specified in Technical Specification 3.8.1 Required Action A.1 and B.1.

1.2 Scope

This procedure verifies the availability of qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System. Qualification and continuity from the offsite electrical power supply to the onsite distribution network is ensured by determining the:

[1] Qualification of the 500 KV and 161 KV off-site power system.

[2] Qualification of the 500KV and 161 off site power system.

[3] Configuration and operability for each of the four basic Unit 1/2 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards.

[4] Configuration and operability for each of the three basic Unit 3 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards.

[5] Proper voltage on the 4.16 KV shutdown boards.

1.3 Frequency

Performance of this procedure is conditional, dependent on the status of required offsite circuits and Diesel Generators. This procedure shall be performed within one hour from the time:

[1] One required offsite circuit is declared inoperable , or

[2] One required Unit 1/2 DG is declared inoperable, or

[3] One required Unit 3 DG is declared inoperable.

Then once per 8 hours thereafter, until each unit (in mode 1, 2 or 3) has two qualified offsite circuits operable and all required D/Gs operable.

1.4 Applicability

The requirements of this procedure are applicable in Modes 1, 2, and 3.

2.0 REFERENCES

2.1 Technical Specifications

Section B3.8.1, AC Sources - Operating

Section 3.8.1, AC Sources - Operating

2.2 UFSAR

Section 8.1, Summary Description

Section 8.2, Generators

Section 8.3, Transmission System

Section 8.4, Normal Auxiliary Power System

Section 8.5, Standby A-C Power Supply and Distribution

Appendix F, Unit Sharing And Interactions

2.3 Plant Instructions

0-GOI-300-4, Switchyard Manual

0-OI-57A, Switchyard and 4160V AC Electrical System

OPDP-1, Conduct of Operations

NPG-SPP-06.9.1, Conduct of Testing

NPG-SPP-06.9.2, Surveillance Test Program

2.4 TVA INSTRUCTIONS

IGA-6, Inter-group Agreement

TRO-TO-SOP-10.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide

2.5 Plant Drawings

0-15E500-1, Key Diagram of Standby Auxiliary Power System

3-15E500-3, Key Diagram of Normal & Standby Auxiliary Power System

0-45N500, Wiring Diagrams Development Single Line

0-45E506, Wiring Diagram Main Single Line SH 1 161 KV SWYD

3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

A. This procedure may be performed in any plant operating condition subject to the approval of the Unit Supervisor (US).

B. In the context of this procedure, equipment tagged and/or de-energized as indicated by indicating lights, control switch positions or indicating meters in the Control Room is NOT AVAILABLE. Skill of the performer will be utilized to make this determination.

C. Only offsite power delivered to Unit 1/2 Shutdown Boards through their normal feeder breakers can be credited, since common accident signal (CAS) logic will trip the alternate breaker.

3.2 Operability and LCO's

A. There are four basic Unit 1/2 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards. For Units 1 and 2:

1. Only two of the four qualified circuits are REQUIRED to be operable.

2. If <u>any</u> two of the four circuits are operable, then LCO 3.8.1.a is satisfied.

B. There are three basic Unit 3 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards. For Unit 3:

1. Only two of the three qualified circuits are required to be operable.

2. If <u>any</u> two of the three circuits are operable, then LCO 3.8.1.a is satisfied.

3.3 Equipment

A. Multiple units can claim a 161kV offsite power circuit simultaneously. However, if a load is connected to a 4kV Start Bus, 0-OI-57A will initiate manual actions to disable automatic transfer of selected 4kV Unit Boards and 4kV Common Boards to the 161kV circuits. The 161kV source may still be considered operable with a delayed manual transfer.

With the most restrictive manual actions in place, diesel generators would supply the safety related loads needed to mitigate the immediate consequences of an accident or analyzed operational transient. Operators can manually transfer loads to the 4kV start bus to support long term post accident or transient recovery and shutdown.

3.4 Qualified Grid Source

A. TVA's Transmission Operator (TOp) is responsible for determining if the transmission grid is configured and operating within established limits that ensure the grids ability to provide QUALIFIED offsite power to Browns Ferry Nuclear Plant.

B. This procedure verifies OPERABILITY for each of the seven basic AC circuits, from the offsite source to 4kV Shutdown boards (four Unit 1/2 circuits or three Unit 3 circuits). To be OPERABLE, each basic circuit must have a QUALIFIED offsite power source. The Browns Ferry Operator must request the TVA Southwestern TOp to determine the QUALIFICATION status of the offsite power source (500kV or 161kV) when performing this procedure.

C. A color code system is used to communicate the QUALIFICATION status of the offsite power sources, both for current conditions and for postulated grid contingencies. The TOp will verbally inform Browns Ferry Operations of status color code changes in real-time. The status color code definitions and associated restrictions and requirements are contained in TRO-TO-SOP-10.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide.

D. A QUALIFIED offsite circuit may be connected to more than one division of 4kV shutdown boards and not violate separation criteria. A circuit that is not connected to the Division I or II 4kV shutdown boards is required to have the capability to be connected to at least one division of 4kV shutdown boards to be considered OPERABLE.

Date TODAY

4.0 PREREQUISITES

[1] **VERIFY** this copy of 0-SR-3.8.1.A.1 is the current revision. DZ

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1905) DZ

5.0 SPECIAL TOOLS AND RECOMMENDED EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

[1] Responses which fail to meet the following acceptance criteria constitute unsatisfactory surveillance procedure results and require immediate notification of the Unit Supervisor at the time of failure and documentation in accordance with NPG-SPP-06.9.1, Conduct of Testing.

[1.1] Unit 1(2) LCO 3.8.1 Condition A - One required offsite circuit inoperable.

Required Action A.1 - Verify power availability from the remaining OPERABLE offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.2] Unit 3 LCO 3.8.1 Condition A - One required offsite circuit inoperable.

Required Action A.1 - Verify power availability from the remaining OPERABLE offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.3] Unit 1(2) LCO 3.8.1 Condition B - One required Unit 1 / 2 DG inoperable.

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least two qualified circuits are available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.4] UNIT 3 LCO 3.8.1 Condition B - One required Unit 3 DG inoperable.

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least two qualified circuits are available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

6.0 ACCEPTANCE CRITERIA (continued)

[1.5] Unit 1(2) LCO 3.8.1 Condition G - One required offsite circuit inoperable and One required Unit 1 / 2 DG inoperable (applicable when only one 4.16 KV Shutdown Board is affected).

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[1.6] Unit 3 LCO 3.8.1 Condition G - One required offsite circuit inoperable and One required Unit 3 DG inoperable (applicable when only one 4.16 KV Shutdown Board is affected).

Required Action B.1 - Verify power availability from the offsite transmission network.

Acceptance Criteria - At least one qualified circuit is available between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution.

[2] Steps which determine the above criteria are designated by (AC) next to the initials blank.

Date TODAY

7.0 PROCEDURE STEPS

7.1 Initiation and Approvals

[1] **VERIFY** the following initial conditions:

A. All Precautions and Limitations in Section 3.0 have been reviewed. DZ

B. All Prerequisites listed in Section 4.0 are satisfied. DZ

[2] On the Surveillance Task Sheet (STS)

OBTAIN Authorization Signature and Date/Time from the Unit Supervisor to perform this surveillance. DZ

[3] [NRC/C] **NOTIFY** the Unit One, Unit Two, and Unit Three Operators (UO's) this test is commencing. [RPT-82-16, LER 259/82032] DZ

[4] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. DZ

Date TODAY

7.2 **Technical Specification Required Action Determination**

[1] **DENOTE,** via the check box, which Technical Specification Required Action is being met by performing this procedure.

A. Unit 1 Technical Specification 3.8.1 Required Action B.1. (Requires TWO qualified AC circuits from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Bds when one Unit 1 / 2 DG inoperable). ☐

B. Unit 2 Technical Specification 3.8.1 Required Action B.1. (Requires TWO qualified AC circuits from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Bds when one Unit 1 / 2 DG inoperable). ☐

C. Unit 3 Technical Specification 3.8.1 Required Action B.1. (Requires TWO qualified AC circuits from the offsite transmission system to the Unit 3 4kV Shutdown Bds when one Unit 3 DG inoperable). ☒

D. Unit 1 Technical Specification 3.8.1 Required Action A.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Boards, when one required offsite circuit inoperable). ☐

E. Unit 2 Technical Specification 3.8.1 Required Action A.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Boards, when one required offsite circuit inoperable). ☐

F. Unit 3 Technical Specification 3.8.1 Required Action A.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 3 4kV Shutdown Boards, when one required offsite circuit inoperable). ☐

G. Unit 1(2) Technical Specification 3.8.1 Condition G.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 1 / 2 4kV Shutdown Boards, when one required offsite circuit inoperable and one Unit 1 and 2 Diesel Generator inoperable). ☐

H. Unit 3 Technical Specification 3.8.1 Condition G.1. (Requires ONE qualified AC circuit from the offsite transmission system to the Unit 3 4kV Shutdown Boards, when one required offsite circuit inoperable and one Unit 3 Diesel Generator inoperable). ☐

Date TODAY

7.3 **Verification of Offsite 500kv and 161kv Sources**

NOTE

TVA's Transmission Operator (TOp) is responsible for determining if the transmission grid is configured and operating within established limits that ensure the grids ability to provide QUALIFIED offsite power to Browns Ferry Nuclear Plant.

Southwest TOp phone number is 9-1-888-882-4009.

[1] **CONTACT** the TVA Southwest TOp to **VERIFY** the transmission grid is able to provide QUALIFIED offsite power to BFN, in accordance with TRO-TO-SOP-30.128, Browns Ferry Nuclear Plant (BFN) Grid Operating Guide. DZ

[2] **DOCUMENT** the source qualification below.

	QUALIFIED	UNQUALIFIED
500KV SOURCE	☐	☐
161KV SOURCE	☐	☐

[3] **COMPLETE** Attachment 1, to document which subcomponents are credited as satisfying the requirements of a qualified offsite circuit for Unit 1, Unit 2, and Unit 3 by marking the subcomponent with a circle around it and placing an initial next to the subcomponent.

Date TODAY

7.3 Verification of Offsite 500kv and 161kv Sources (continued)

NOTE

Specific voltmeters are not listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[4] **IF** performing this procedure to satisfy Technical Specification 3.8.1 Required Action A.1 or B.1 or G.1 for Unit 1 and Unit 2, **THEN**

RECORD voltages for the following boards and **CHECK** proper voltage is available, (Otherwise N/A.)

A. 4KV SD BD A VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

B. 4KV SD BD B VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

C. 4KV SD BD C VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

D. 4KV SD BD D VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

Date TODAY

7.3 Verification of Offsite 500kv and 161kv Sources (continued)

NOTE

Specific voltmeters are not listed to allow the performer maximum flexibility when obtaining readings. However, Control Room indications should be used whenever possible.

[5] **IF** performing this procedure to satisfy Technical Specification 3.8.1 Required Action A.1 or B.1 or G.1 for Unit 3, **THEN**

RECORD voltages for the following boards and **CHECK** proper voltage is available, (Otherwise N/A)

A. 4KV SD BD 3EA VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

B. 4KV SD BD 3EB VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

C. 4KV SD BD 3EC VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

D. 4KV SD BD 3ED VOLTAGE

Voltage_____(3950 - 4400 VOLTS) _____

Date TODAY

7.4 Verification of Unit 1 and or Unit 2 Offsite AC Power Circuits

NOTES

1) Step 7.4[1] and 7.4[2] may be marked N/A if this procedure is not required to satisfy Unit 1 and 2 Technical Specification 3.8.1 Required Action A.1 or B.1.
2) Completed Attachment 1 is Utilized to **EVALUATE** offsite circuit availability.

[1] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Required Action B.1 (one required Unit 1 and 2 DG inoperable), **THEN**

VERIFY at least two Unit 1/2 Offsite AC circuits are determined Operable in Attachment 1 and the shutdown boards included in the Operable circuits have proper voltage verified in step 7.3[4].(Otherwise N/A). _____(AC)

[2] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Required Action A.1 (one required offsite circuit inoperable), **THEN**

VERIFY at least one Unit 1/2 Offsite AC circuit is determined Operable in Attachment 1 and the shutdown boards included in the Operable circuit have proper voltage verified in step 7.3[4]. (Otherwise N/A) _____(AC)

[3] **IF** performing this procedure to satisfy Unit 1(2) Technical Specification 3.8.1 Condition G (one required offsite circuit inoperable and one Unit 1 and 2 DG inoperable, **THEN**

VERIFY at least one Unit 1/2 Offsite AC circuit is determined Operable in Attachment 1 and the Shutdown Boards included in the Operable circuit have proper voltage verified in step 7.3[4]. (Otherwise N/A) _____(AC)

Date TODAY

7.5 Verification of Unit 3 Offsite AC Power Circuits

NOTES

1) Step 7.5[1] and 7.5[2] may be marked N/A if this procedure is not required to satisfy Unit 3 Technical Specification 3.8.1 Required Action A.1 or B.1.
2) Completed Attachment 1 is Utilized to **EVALUATE** offsite circuit availability.

[1] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Required Action B.1 (one required Unit 3 DG inoperable), **THEN**

VERIFY at least two Unit 3 Offsite AC circuits are determined Operable in Attachment 1 and the shutdown boards included in the Operable circuits have proper voltage verified in step 7.3[5]. (Otherwise N/A). _____(AC)

[2] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Required Action A.1 (one required offsite circuit inoperable), **THEN**

VERIFY at least one Unit 3 Offsite AC circuit is determined Operable in Attachment 1 and the shutdown boards included in the Operable circuit have proper voltage verified in step 7.3[5] (Otherwise N/A). _____(AC)

[3] **IF** performing this procedure to satisfy Unit 3 Technical Specification 3.8.1 Condition G (one required offsite circuit inoperable and one Unit 3 DG inoperable, **THEN**

VERIFY at least one Unit 3 Offsite AC circuit is determined Operable in Attachment 1 and the Shutdown Boards included in the Operable circuit have proper voltage verified in step 7.3[5]. (Otherwise N/A) _____(AC)

Date TODAY

7.6 Common Cause Failure Evaluation and Surveillance Completion

[1] **EVALUATE** the necessity to perform 0-TI-403, Determination of Common Cause Failure for Emergency Diesel Generators, if this surveillance is being performed for an inoperable Diesel Generator. _____

[2] On the Surveillance Task Sheet (STS)

A. **RECORD** the Completion Date & Time. _____

B. **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Performer & Date fields. _____

[3] **NOTIFY** the Unit One, Unit Two and Unit Three Operators (UO's) this Surveillance Procedure is complete. _____

[4] **NOTIFY** the Unit Supervisor (US) this surveillance procedure is complete and **PROVIDE** status of any Corrective Actions or unsatisfactory performance. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1 - Table of Offsite and Onsite Circuits Assigned to Unit 1, 2 and 3

Attachment 1 (Page 1 of 2)

Table of Offsite and Onsite Circuits Assigned to Units 1, 2 and 3

UNIT NO.			1 and 2		3	
QUALIFIED CIRCUIT			1	2	1	2
COMPONENT DESCRIPTION	USST/CSST		USST 1B	USST 1B	USST 3B	USST 3B
			USST 2B	USST 2B	—	—
			CSST A	*CSST A*	*CSST A*	*CSST A*
			CSST B	*CSST B*	*CSST B*	*CSST B*
	FOR CSST ONLY	A	BKR 1412	BKR 1412	BKR 1412	BKR 1412
			BKR 1414	BKR 1414	BKR 1414	BKR 1414
		B	BKR 1518	BKR 1518	BKR 1518	BKR 1518
			BKR 1516	BKR 1516	BKR 1516	BKR 1516
	START BUS		*START BUS 1A*	*START BUS 1A*	*START BUS 1A*	*START BUS 1A*
			START BUS 1B	*START BUS 1B*	*START BUS 1B*	*START BUS 1B*
	FOR USST ONLY	1B	BKR 1112	BKR 1112	—	—
			BKR 1114	BKR 1114	—	—
		2B	BKR 1212	BKR 1212	—	—
			BKR 1214	BKR 1214	—	—
		3B	—	—	BKR 1312	BKR 1312
			—	—	BKR 1314	BKR 1314
	FOR CSST ONLY	*1A*	*BKR 1424*	*BKR 1424*	*BKR 1432*	*BKR 1432*
			BKR 1428	*BKR 1428*	—	—
		1B	*BKR 1524*	*BKR 1524*	*BKR 1528*	*BKR 1528*
			BKR 1526	*BKR 1526*	—	—
	4KV UNIT BD		4KV UNIT BD 1A	4KV UNIT BD 1A	4KV UNIT BD 3A	4KV UNIT BD 3A
			4KV UNIT BD 1B	4KV UNIT BD 1B	4KV UNIT BD 3B	4KV UNIT BD 3B
			4KV UNIT BD 2A	4KV UNIT BD 2A	—	—
			4KV UNIT BD 2B	4KV UNIT BD 2B	—	—
	UNIT 1 & 2 ONLY		BKR 1126 & 1612	BKR 1126 & 1612	—	—
			BKR 1132 & 1712	BKR 1132 & 1712	—	—
			BKR 1226 & 1722	BKR 1226 & 1722	—	—
			BKR 1232 & 1622	BKR 1232 & 1622	—	—
	SHUTDOWN (SD) BUS		SD BUS 1	SD BUS 1	—	—
			SD BUS 2	SD BUS 2	—	—
	UNIT 3 ONLY		—	—	BKR 1326	BKR 1326
			—	—	BKR 1332	BKR 1332
	SD BD FDR BKR		BKR 1614 & BKR 1616	BKR 1614 & BKR 1616	BKR 1334 & BKR 1336	BKR 1334 & BKR 1336
			BKR 1718 & BKR 1724	BKR 1718 & BKR 1724	BKR 1338 & BKR 1342	BKR 1338 & BKR 1342
	4 KV SHUTDOWN BD		4KV SD BD A & B	4KV SD BD A & B	4KV SD BD 3EA & 3EB	4KV SD BD 3EA & 3EB
			4KV SD BD C & D	4KV SD BD C & D	4KV SD BD 3EC & 3ED	4KV SD BD 3EC & 3ED

See Attachment 1 page 2 for explanation and information for completing the above Table.

Attachment 1
(Page 2 of 2)

Following statements are applicable for completing Attachment 1:

1. Attachment 1 documents which subcomponents are credited as satisfying the requirements of a qualified offsite circuit for Unit 1, Units 2 and 3 by the performer of this procedure by marking the subcomponent with a circle around it and by placing an initial next to the subcomponent.

.2. Each subcomponent listed for Unit 1 and 2 can be marked in only ONE column. For example, subcomponent "USST IB" can be marked in only one column compared to the two options available.

3. Rows not required to be filled in for Unit 1, Units 2 or 3 are lined out with dashes.

4. 500 kV subcomponents and direct feeds are left justified; 161 kV subcomponents like CSST A and B, and associated breakers are right justified in *italics*; Common subcomponents are centered in the respective blocks for clarity.

5. For an offsite circuit to be qualified at least one subcomponent shall be marked with a circle around it along with the initial of the performer of the procedure for EACH associated component listed in the Component Description column.

Surveillance Task Sheet (STS)

WO: 111807079 **PM#:** P1905

Procedure: 0-SR-3.8.1.A.1

Title: 0-SR-3.8.1.A.1 – Verification of Offsite Power Availability to 4.16 kV Shutdown Boards

Data Sheets Attached:

Perf Grp: OPS **Unit:** 1, 2, and 3 **Loop/Div:**

Test Reason: 3A Diesel Generator Inoperable

Due Date:

Frequency: Conditional **Tech Spec:** **ASME XI:**

Applicable Modes: **Perf Modes:** Mode 1

Clearance Required: **EQ:** **LCO entered:**

Dry Cask Storage: N

[signature] TODAY / EARLIER
Authorization to Begin: SRO — Date & Time

TODAY / CURRENT
Start Date & Time — Completion Date & Time

Performed By:

Print Name	Signature	Initial	Section
DK Zielinski	[signature]	DZ	OPS
Jordan Roby	[signature]	JR	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/ AMSAC* acceptance criteria satisfied? Yes [ ] No [ ] N/A [ ]

Were all other acceptance Criteria satisfied? Yes [ ] No [ ] N/A [ ]

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* Criteria were not satisfied, was a LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date

Test Director — Lead Performer — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

REMARKS:

FINAL

OPERATOR: _____

RO ____ SRO ____ DATE:_____

JPM NUMBER: Admin RO A1b

TASK NUMBER: Conduct of Operations

TASK TITLE: 2-SR-2 ICS Computer points

K/A NUMBER: 2.1.19 K/A RATING: RO 3.9

PRA: N/A

TASK STANDARD: Perform Operator logs using ICS screens in accordance with 2-SR-2 Instrument Checks and Observations for log tables 1.1, 1.6, 1.25, and 1.30. Verify acceptance criteria are satisfied in accordance with notes.

LOCATION OF PERFORMANCE: Unit 2 Simulator (ICS computer terminal)

REFERENCES/PROCEDURES NEEDED: 2-SR-2 Rev 73

VALIDATION TIME: 20 minutes

MAX. TIME ALLOWED: (Completed for Time Critical JPMs only)

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are a Unit Operator assigned to Unit 2, and it is Friday morning at 0800. 2-SR-2, Instrument Checks and Observations, is being performed. All 2-SR-2 instrument checks and observations are complete with the exception of table 1.1, 1.6, 1.25, and 1.30.

INITIATING CUE: The Unit Supervisor directs you as the Unit Operator to complete 2-SR-2 for tables 1.1, 1.6, 1.25 and 1.30, utilizing only the ICS computer to obtain data.

****

Simulator

****

INITIAL CONDITIONS: You are a Unit Operator assigned to Unit 2, and it is Friday morning at 0800. 2-SR-2, Instrument Checks and Observations, is being performed. All 2-SR-2 instrument checks and observations are complete with the exception of table 1.1, 1.6, 1.25, and 1.30.

INITIATING CUE: The Unit Supervisor directs you as the Unit Operator to complete 2-SR-2 for tables 1.1, 1.6, 1.25 and 1.30, utilizing only the ICS computer to obtain data.

START TIME_____

****

Performance Step 1: Critical _ Not Critical X

Refers to 2-SR-2, Instrument Checks and Observations, table 1.1

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: _____ to _____

APPLICABILITY:	Mode 1 when ≥ 25% RTP Record the readings as soon as possible after the generator breaker has been closed.									
Criteria Source:	3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7									
LOCATION:	ICS Computer (Case Summary - CSUM)								Review Initials	
DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR (Note 3)	MAPRAT (Note 3)	MFDLRX (Note 3)	LIMIT (AC)	Unit Operator	Unit Supvr
Friday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Saturday	0800									
	1000									
	1200									
	1400									
	1600									
	1800			Notes 1 & 2				Notes 3, 4, & 5		
Sunday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Monday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE FOLLOWING THE TABLE!

Standard:

Selects SR-2 Group Display from the Group Display menu OR types the code "CSUM" on ICS computer to obtain data and completes table 1.1 Data for Friday at 0800, Records approximate values of 3456 for MWt, 100% for RTP, .892 for MFLCPR, .667 for MAPRAT and .763 for MFDLRX.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical _ Not Critical X

(1) Compliance with the Licensed Power Limit (LPL) (3458 Mwt) is demonstrated by the following process:

A. No actions are allowed that would intentionally raise core thermal power above 3458 Mwt for any period of time. Small, short-term fluctuations in power that are not under the direct control of the unit operator are not considered intentional.

B. Closely monitor the thermal power during steady-state power operation with the goal of maintaining the two hour average at or below 3458 Mwt. If the core thermal power average for a 2-hour period is found to exceed 3458 Mwt, Operations take timely action to ensure that thermal power is less than or equal to 3458 MWt. (This is implemented by taking action when any running average less than or equal to the 2 hour average exceeds 3458 Mwt.)

C. The core thermal power for an 8 hour period (8 hr average) is not to exceed 3458 Mwt.

D. If an evolution is expected to cause a transient increase in reactor power that could exceed 3458 Mwt, action should be taken to lower core power prior to performing the evolution.

E. If power is > 3463, REDUCE power.

F. If power is 3458 to 3463 MWt after allowing time for recent perturbations to settle, REDUCE power and EVALUATE the trend.

G. If any running 30 min average, 1 hr average, or 2 hr average is > 3458 MWt, REDUCE power.

(2) Core Thermal Power is normally recorded every 2 hours when required. However, these readings may be marked N/A during TIP trace runs, control rod pattern adjustments, or anytime Core Monitoring System is blocked and/or < 25% power. The Reactor Engineer is responsible for monitoring Core Thermal Limits. Monitoring of Core Thermal Power and other Core Thermal Limits is recommended following completion of planned rise in power and following any unexpected power change. If core monitoring software becomes unavailable, the Shift Manager and Reactor Engineer shall determine the appropriate frequency for monitoring Core Thermal Power but should not exceed 24 hours, using backup core monitoring computer, and taking into consideration current core conditions and margin to thermal limits. Power changes should not normally be made without the core monitoring software being available.

(3) Consult the Reactor Engineer when value ≥ 0.985. Refer to 0-TI-248 for Administrative Limits.

(4) If any Turbine Bypass valve(s) are inoperable or a Recirculation Loop is out of service, Contact the Reactor Engineer and Refer To the COLR for Turbine Bypass Out of Service (TBOOS) or Single Loop Operation (SLO) limits which must be applied.

(5) MAPRAT within limits is used to verify that all APLHGRs are within the limits specified within the COLR.
MFDLRX within limits is used to verify that all LHGRs are within the limits specified within the COLR.
MFLCPR within limits is used to verify that all MCPRs are within the limits specified within the COLR.

Standard:

Initial for Unit Operator for Friday at 0800 when acceptance criteria is verified in accordance with above notes.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 3: Critical _ Not Critical X

Refers to 2-SR-2, Instrument Checks and Observations, table 1.6

TABLE 1.6 HEAT BALANCE RELATED ICS ALARM SETPOINTS (Note 1) **DAY SHIFT** WEEK: _____ to _____

APPLICABILITY:	Mode 1 when ≥ 25% RTP Record the readings as soon as possible after the generator breaker has been closed.								
Criteria Source:	BFPER951914								
LOCATION:	ICS Computer							Review Initials	
	ICS Points					MAX DEV	HI and HI HI alarm setpoints listed in Table 1.B.1 & 1.B.2 are NOT exceeded. (Note 3) SAT / UNSAT / N/A	UO	Unit Supvr
	3-48A (°F)	3-48B (°F)	3-50A (°F)	3-50B (°F)	NSS0017 (°F)				
Friday						2°F (Note 2)			
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.15	N/A

Standard:

Selects SR-2 Group Display from the Group Display menu OR types the specific codes for each ICS point into the "Single Value Display" (for example: 3-48A, 3-48B, etc…) and completes table 1.6 Data for Friday. Records 377.2 for listed ICS points

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 4: Critical _ Not Critical X

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.15	N/A

Standard:

Documents Sat and initials for Unit Operator for Friday when Maximum Deviation between Feedwater temperature computer points are within 2 degrees (Note 2) and the conditions of Note 3 are satisfied IAW with tables 1.B.1 and 1.B.2.

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 5: Critical _ Not Critical X

Refers to 2-SR-2, Instrument Checks and Observations, table 1.25

TABLE 1.25 LPRM INSTRUMENTATION DAY SHIFT WEEK: _____ to _____

APPLICABILITY:	Modes 1 & 2 Readings are required at all times.													
Criteria Source:	Technical Requirements Manual TSR 3.3.5.3													
LOCATION:	Panel 2-9-14 and ICS Computer												Review Initials	
		# LPRMs BYPASSED (Note 1)								Total # LPRMs Bypassed (Note 2)	# of LPRM readings ≤ 3% on ICS (Note 3)	MAX DEV (AC)	All Data SAT/UNSAT	
DAY	TIME	APRM #2	LPRM #2	APRM #4	LPRM #4	APRM #3	LPRM #3	APRM #1	LPRM #1					UO	Unit Supvr
Friday	0800											0 (Note 4)			
Saturday	0800														
Sunday	0800														
Monday	0800														
Tuesday	0800														
Wednesday	0800														
Thursday	0800														

Standard:

Clicks on "Live LPRM Display" in the "Nuclear Heat Balance menu" and completes table 1.25 Data for Friday, #LPRMs reading ≤ 3% on ICS. Records ZERO

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 6: Critical _ Not Critical X

(1) Record number of LPRMs bypassed in the four APRM and LPRM cabinets as observed at Panel 2-9-14. Add these values together and record as Total # LPRMs Bypassed.

(2) Less than 20 LPRMs in OPERATE or Less than 3 per level for any APRM will result in a Rod Block and a trouble alarm on the display panel. This does not yield an automatic APRM trip, but does, however, make the associated APRM INOP.

(3) Record number of LPRMs reading less than 3% on the LPRM printout or display on ICS.

(4) MAX DEV is not required to be met when the APRMs are downscale; however, unexpected inconsistencies should be reported to the Reactor Engineer. The total number of LPRM's bypassed shall equal the number of LPRM's reading less than 3% on ICS.

Standard:

Documents Sat and initials for Unit Operator for Friday when the conditions of Note 4 are satisfied.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 7: Critical X Not Critical

Refers to 2-SR-2, Instrument Checks and Observations, table 1.30

TABLE 1.30 REACTOR VESSEL STEAM DOME PRESSURE INSTRUMENTATION **DAY SHIFT** WEEK: _____ to _____

APPLICABILITY:		Modes 1 & 2 Readings are required at all times.												
Surveillance Requirements:		3.3.1.1.1(f3), 3.3.3.1.1, 3.4.10.1												
LOCATION:		ICS (Note 1 & 4)		MAX DEV (AC)	2-9-86	2-9-85	2-9-84	2-9-83	MAX DEV (AC)	MAX LIMIT	All Data SAT/UNSAT	Review Initials		
Reference Leg	TIME (Note 4)	3-74A	3-74B		D	C	B	A				UO	Unit Supvr	
					2-PIS-3-22D	2-PIS-3-22C	2-PIS-3-22BB	2-PIS-3-22AA						
Friday	0800			40 psig (Note 2)					60 psig (Note 2)	Note 3 Note 5				
Saturday	0800													
Sunday	0800													
Monday	0800													
Tuesday	0800													
Wednesday	0800													
Thursday	0800													

Standard:

Selects SR-2 Group Display from the Group Display menu OR types the specific codes for each ICS point into the "Single Value Display" (for example: 3-74A, 3-74B, etc…) and completes table 1.30 Data for Friday. Records approximately 1050 psig for ICS point 3-74A and approximately 1005 psig for ICS point 3-74B.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 8: Critical X Not Critical

(1) These readings may be obtained from ICS using the Single Value Display or from the ATU output voltage translated into a PRESSURE Signal for the specific instruments. For ICS, type in "SVD" for Single Value Display, enter the point desired as "3-74A", record reading, select F4, enter "3-74B", and record the second reading.

(2) 3-74A and 3-74B have a Maximum allowable deviation of 40 psig, AND 2-PIS-3-22D, 2-PIS-3-22C, 2-PIS-3-22BB, & 2-PIS-3-22AA, have a Maximum allowable deviation of 60 psig. No comparison is required between the 3-74A(B) and 2-PIS-3-22D(C)(BB)(AA).

(3) 3-74A and 3-74B SHALL be $\leq$1050 psig. 2-PIS-3-22D, 2-PIS-3-22C, 2-PIS-3-22BB, & 2-PIS-3-22AA SHALL be $\leq$1090 psig.

(4) 3-74A and 3-74B are to be recorded at 0800. The Auxiliary Instrument Room readings are not required to be taken at precisely 0800.

(5) Following a change to Reactor Power or Pressure, verify the Steam Dome Limits are within the 0-TI-248, Administrative Limits and Design Analysis Limits (Appendix S)

Standard:

Reviews notes and documents UNSAT and initials for Unit Operator for Friday when the conditions of Notes 2 and 3 are reviewed.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

END OF TASK

STOP TIME ___

*** Answer Key***

Attachment 2
(Page 1 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION DAY SHIFT WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP
Record the readings as soon as possible after the generator breaker has been closed.

Criteria Source: 3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7

LOCATION: ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR (Note 3)	MAPRAT (Note 3)	MFDLRX (Note 3)	LIMIT (AC)	Review Initials: Unit Operator	Review Initials: Unit Supvr
Friday	0800	3456.3	100.0	Notes 1 & 2	0.899	0.672	0.769	Notes 3, 4, & 5	Initials	
	1000									
	1200									
	1400									
	1600									
	1800									
Saturday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Sunday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Monday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE FOLLOWING THE TABLE!

*** Answer Key ***

Attachment 2
(Page 2 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY:	Mode 1 when ≥ 25% RTP Record the readings as soon as possible after the generator breaker has been closed.
Criteria Source:	3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7
LOCATION:	ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR (Note 3)	MAPRAT (Note 3)	MFDLRX (Note 3)	LIMIT (AC)	Review Initials: Unit Operator	Review Initials: Unit Supvr
Tuesday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Wednesday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Thursday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE ON THE FOLLOWING PAGE!

*** Answer Key ***

Attachment 2
(Page 3 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

(1) Compliance with the Licensed Power Limit (LPL) (3458 Mwt) is demonstrated by the following process:

A. No actions are allowed that would intentionally raise core thermal power above 3458 Mwt for any period of time. Small, short-term fluctuations in power that are not under the direct control of the unit operator are not considered intentional.

B. Closely monitor the thermal power during steady-state power operation with the goal of maintaining the two-hour average at or below 3458 Mwt. If the core thermal power average for a 2-hour period is found to exceed 3458 Mwt, Operations take timely action to ensure that thermal power is less than or equal to 3458 MWt. (This is implemented by taking action when any running average less than or equal to the 2 hour average exceeds 3458 Mwt.)

C. The core thermal power for an 8 hour period (8 hr average) is not to exceed 3458 Mwt.

D. If an evolution is expected to cause a transient increase in reactor power that could exceed 3458 Mwt, action should be taken to lower core power prior to performing the evolution.

E. If power is > 3463, REDUCE power.

F. If power is 3458 to 3463 MWt after allowing time for recent perturbations to settle, REDUCE power and EVALUATE the trend.

G. If any running 30 min average, 1 hr average, or 2 hr average is > 3458 MWt, REDUCE power.

(2) Core Thermal Power is normally recorded every 2 hours when required. However, these readings may be marked N/A during TIP trace runs, control rod pattern adjustments, or anytime Core Monitoring System is blocked and/or < 25% power. The Reactor Engineer is responsible for monitoring Core Thermal Limits. Monitoring of Core Thermal Power and other Core Thermal Limits is recommended following completion of planned rise in power and following any unexpected power change. If core monitoring software becomes unavailable, the Shift Manager and Reactor Engineer shall determine the appropriate frequency for monitoring Core Thermal Power but should not exceed 24 hours, using backup core monitoring computer, and taking into consideration current core conditions and margin to thermal limits. Power changes should not normally be made without the core monitoring software being available.

(3) Consult the Reactor Engineer when value ≥ 0.985. Refer to 0-TI-248 for Administrative Limits.

(4) If any Turbine Bypass valve(s) are inoperable or a Recirculation Loop is out of service, Contact the Reactor Engineer and Refer To the COLR for Turbine Bypass Out of Service (TBOOS) or Single Loop Operation (SLO) limits which must be applied.

(5) MAPRAT within limits is used to verify that all APLHGRs are within the limits specified within the COLR.

MFDLRX within limits is used to verify that all LHGRs are within the limits specified within the COLR.

MFLCPR within limits is used to verify that all MCPRs are within the limits specified within the COLR.

*** Answer Key ***

Attachment 2
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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.6 HEAT BALANCE RELATED ICS ALARM SETPOINTS (Note 1) DAY SHIFT WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP
Record the readings as soon as possible after the generator breaker has been closed.

Criteria Source: BFPER951914

LOCATION: ICS Computer

	ICS Points					MAX DEV	HI and HI HI alarm setpoints listed in Table 1.B.1 & 1.B.2 are NOT exceeded. (Note 3) SAT / UNSAT / N/A	Review Initials	
	3-48A (°F)	3-48B (°F)	3-50A (°F)	3-50B (°F)	NSS0017 (°F)			UO	Unit Supvr
Friday	377.2	377.2	377.2	377.2	377.2	2°F (Note 2)	SAT	Initials	
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.15	N/A

*** Answer Key ***

Attachment 2
(Page 27 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.25 LPRM INSTRUMENTATION DAY SHIFT WEEK: This Week to Next Week

APPLICABILITY:	Modes 1 & 2 Readings are required at all times.
Criteria Source:	Technical Requirements Manual TSR 3.3.5.3
LOCATION:	Panel 2-9-14 and ICS Computer

		# LPRMs BYPASSED (Note 1)								Total # LPRMs Bypassed (Note 2)	# of LPRM readings ≤ 3% on ICS (Note 3)	MAX DEV (AC)	All Data SAT/UNSAT	Review Initials	
DAY	TIME	APRM #2	LPRM #2	APRM #4	LPRM #4	APRM #3	LPRM #3	APRM #1	LPRM #1					UO	Unit Supvr
Friday	0800	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	0 (Note 4)	SAT	Initials	
Saturday	0800														
Sunday	0800														
Monday	0800														
Tuesday	0800														
Wednesday	0800														
Thursday	0800														

(1) Record number of LPRMs bypassed in the four APRM and LPRM cabinets as observed at Panel 2-9-14. Add these values together and record as Total # LPRMs Bypassed.

(2) Less than 20 LPRMs in OPERATE or Less than 3 per level for any APRM will result in a Rod Block and a trouble alarm on the display panel. This does not yield an automatic APRM trip, but does, however, make the associated APRM INOP.

(3) Record number of LPRMs reading less than 3% on the LPRM printout or display on ICS.

(4) MAX DEV is not required to be met when the APRMs are downscale; however, unexpected inconsistencies should be reported to the Reactor Engineer. The total number of LPRM's bypassed shall equal the number of LPRM's reading less than 3% on ICS.

*** Answer Key ***

Attachment 2
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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.30 REACTOR VESSEL STEAM DOME PRESSURE INSTRUMENTATION DAY SHIFT WEEK: This Week to Next Week

APPLICABILITY:	Modes 1 & 2 Readings are required at all times.												
Surveillance Requirements:	3.3.1.1.1(f3), 3.3.3.1.1, 3.4.10.1												
LOCATION:		ICS (Note 1 & 4)		MAX DEV (AC)	2-9-86	2-9-85	2-9-84	2-9-83	MAX DEV (AC)	MAX LIMIT	All Data SAT/UNSAT	Review Initials	
					D	C	B	A					
Reference Leg	TIME (Note 4)	3-74A	3-74B		2-PIS-3-22D	2-PIS-3-22C	2-PIS-3-22BB	2-PIS-3-22AA				UO	Unit Supvr
Friday	0800	1050	1005	40 psig (Note 2)	1035	1035	1035	1035	60 psig (Note 2)	Note 3 Note 5	UNSAT	Initials	
Saturday	0800												
Sunday	0800												
Monday	0800												
Tuesday	0800												
Wednesday	0800												
Thursday	0800												

(1) These readings may be obtained from ICS using the Single Value Display or from the ATU output voltage translated into a PRESSURE Signal for the specific instruments. For ICS, type in "SVD" for Single Value Display, enter the point desired as "3-74A", record reading, select F4, enter "3-74B", record the second reading.

(2) 3-74A and 3-74B have a Maximum allowable deviation of 40 psig, AND 2-PIS-3-22D, 2-PIS-3-22C, 2-PIS-3-22BB, & 2-PIS-3-22AA, have a Maximum allowable deviation of 60 psig. No comparison is required between the 3-74A(B) and 2-PIS-3-22D(C)(BB)(AA).

(3) 3-74A and 3-74B SHALL be ≤ 1050 psig. 2-PIS-3-22D, 2-PIS-3-22C, 2-PIS-3-22BB, & 2-PIS-3-22AA SHALL be ≤ 1090 psig.

(4) 3-74A and 3-74B are to be recorded at 0800. The Auxiliary Instrument Room readings are not required to be taken at precisely 0800.

(5) Following a change to Reactor Power or Pressure, verify the Steam Dome Limits are within the 0-TI-248, Administrative Limits and Design Analysis Limits (Appendix S)

TRIGGER:

CASE SUMMARY

bf2ppxa

LAST POWERPLEX MONITOR CASE

Date / /
Time : :

REACTOR CONDITIONS

CTP	3456.2	(MWt)	99.9	% Rated
	1150.2	(MWe)	99.7	% Rated
WT	87.0	MLB/HR	84.9	% Rated
DHS	30.6	BTU/LB		
CAVEX	14952.0	MWT/MTU		
EFF	33.3	%		
LOAD LINE	110.3	%	CRD	0.035
XENON WORTH	1.15	%	K-EFF	1.0145

CORE THERMAL LIMITS

	Value	IX	JY	K
MFLCPR	0.892	47	28	
MAPRAT	0.667	15	34	5
MFDLRX	0.763	13	34	5
P-PCS	0.91	13	32	7
P-PCFC	0.91	13	32	7

POWERPLEX HEAT BALANCE

NOT UPDATING

Date / /
Time : :

CORE THERMAL POWER / CORE FLOW

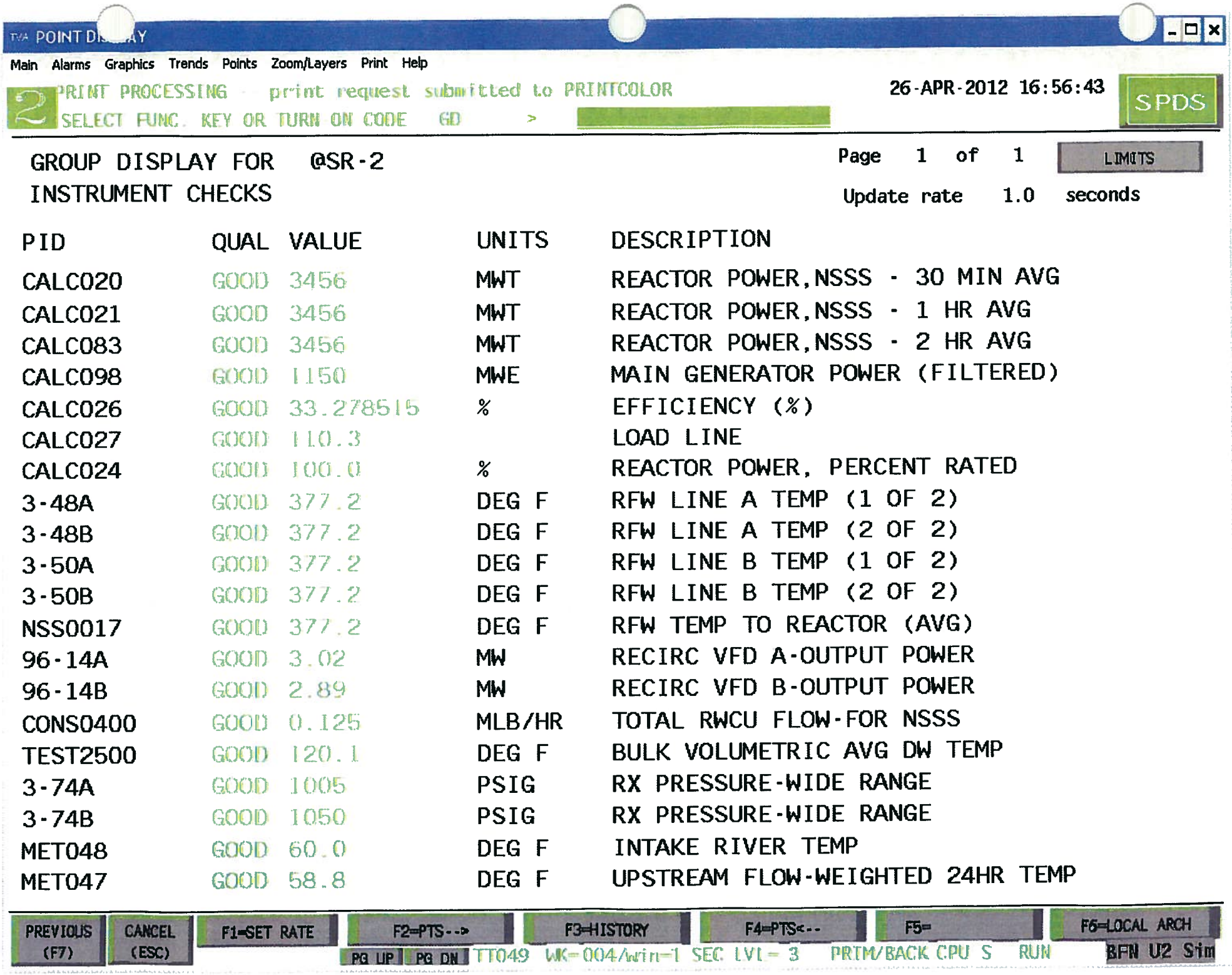
CTP		(MWt)		% Rated
CTP CALCULATED FROM				
WT		MLB/HR		% Rated
WTSUB		MLB/HR		
WTFLAG				
LOAD LINE(CTP, WT)		%		

POWERPLEX DATA FILE READ STATUS

DATA CONSTANTS FOR ICS NSP6 PROGRAM
CONSTANTS READ SUCCESSFULLY

VALUES FROM LAST PPLX MONITOR CASE
VALUES READ SUCCESSFULLY

VALUES FROM LAST PPLX HEAT BALANCE
VALUES READ SUCCESSFULLY


TVA POINT DISPLAY
Main Alarms Graphics Trends Points Zoom/Layers Print Help
PRINT PROCESSING - print request submitted to PRINTCOLOR
SELECT FUNC. KEY OR TURN ON CODE GD >
26-APR-2012 16:56:43
SPDS
GROUP DISPLAY FOR @SR-2
INSTRUMENT CHECKS
Page 1 of 1
LIMITS
Update rate 1.0 seconds
PID QUAL VALUE UNITS DESCRIPTION
CALC020 GOOD 3456 MWT REACTOR POWER,NSSS - 30 MIN AVG
CALC021 GOOD 3456 MWT REACTOR POWER,NSSS - 1 HR AVG
CALC083 GOOD 3456 MWT REACTOR POWER,NSSS - 2 HR AVG
CALC098 GOOD 1150 MWE MAIN GENERATOR POWER (FILTERED)
CALC026 GOOD 33.278515 % EFFICIENCY (%)
CALC027 GOOD 110.3 LOAD LINE
CALC024 GOOD 100.0 % REACTOR POWER, PERCENT RATED
3-48A GOOD 377.2 DEG F RFW LINE A TEMP (1 OF 2)
3-48B GOOD 377.2 DEG F RFW LINE A TEMP (2 OF 2)
3-50A GOOD 377.2 DEG F RFW LINE B TEMP (1 OF 2)
3-50B GOOD 377.2 DEG F RFW LINE B TEMP (2 OF 2)
NSS0017 GOOD 377.2 DEG F RFW TEMP TO REACTOR (AVG)
96-14A GOOD 3.02 MW RECIRC VFD A-OUTPUT POWER
96-14B GOOD 2.89 MW RECIRC VFD B-OUTPUT POWER
CONS0400 GOOD 0.125 MLB/HR TOTAL RWCU FLOW-FOR NSSS
TEST2500 GOOD 120.1 DEG F BULK VOLUMETRIC AVG DW TEMP
3-74A GOOD 1005 PSIG RX PRESSURE-WIDE RANGE
3-74B GOOD 1050 PSIG RX PRESSURE-WIDE RANGE
MET048 GOOD 60.0 DEG F INTAKE RIVER TEMP
MET047 GOOD 58.8 DEG F UPSTREAM FLOW-WEIGHTED 24HR TEMP
PREVIOUS (F7)
CANCEL (ESC)
F1=SET RATE
F2=PTS-->
F3=HISTORY
F4=PTS<--
F5=
F6=LOCAL ARCH
PG UP
PG DN
TT049 WK=004/win=1 SEC LVL=3 PRIM/BACK CPU S RUN
BFN U2 Sim

RAW LPR[illegible]EADINGS

Main Alarms Graphics Trends Points Zoom/Layers Print Help

PRINT PROCESSING -- print request submitted to PRINTCOLOR

26-APR-2012 16:56:43

SPDS

SELECT FUNC. KEY OR TURN ON CODE RAWLPRM >

	08	16	24	32	40	48	56
57D		16.85	20.37	19.85	19.45		
C		24.67	31.58	31.09	28.66		
B		29.22	39.02	37.99	34.56		
A		24.29	31.79	31.00	28.37		
49D	17.78	29.55	32.15	33.40	31.18	23.95	
C	27.09	50.32	55.37	57.56	53.08	39.67	
B	32.84	65.63	71.11	73.37	69.88	52.00	
A	27.35	55.45	57.88	60.09	58.03	45.67	
41D	23.86	32.45	33.25	30.42	34.39	31.27	19.05
C	36.92	54.18	46.05	42.04	50.44	53.17	28.76
B	45.04	69.64	54.03	49.72	60.92	69.30	35.03
A	36.42	56.17	40.76	37.22	48.13	57.45	29.47
33D	24.54	31.91	30.64	31.09	30.59	33.37	19.34
C	40.03	52.67	38.96	39.83	42.28	57.54	30.89
B	48.18	66.17	43.98	40.06	49.37	73.17	38.22
A	38.63	52.75	31.17	28.47	37.05	59.89	31.53
25D	25.14	31.66	32.56	30.90	33.24	32.02	20.58
C	40.35	52.15	41.72	39.04	45.96	54.97	31.56
B	49.33	66.96	48.03	43.66	53.90	71.19	38.80
A	39.69	53.42	34.63	31.01	40.71	57.55	31.49
17D	21.20	32.10	31.87	32.04	32.26	29.47	17.04
C	32.42	55.69	52.42	52.55	53.95	50.13	24.80
B	39.61	72.19	66.57	66.20	70.09	65.09	28.72
A	33.52	60.00	53.66	53.51	57.16	55.11	23.66
09D		21.26	25.32	24.64	23.68	17.94	
C		32.56	40.34	39.83	36.79	26.93	
B		39.53	49.18	48.47	45.28	32.29	
A		33.20	39.52	38.97	37.39	27.22	

PREVIOUS (F7) CANCEL (ESC) F1=CLEAR F2= F3= F4= F5= F6=

PG UP PG DN TT049 WK-004/win-1 SEC LVL= 3 PRIM/BACK CPU S RUN BFN U2 Sim

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Attachment 2
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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This week to Next Week

APPLICABILITY:	Mode 1 when ≥ 25% RTP Record the readings as soon as possible after the generator breaker has been closed.
Criteria Source:	3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7
LOCATION:	ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR (Note 3)	MAPRAT (Note 3)	MFDLRX (Note 3)	LIMIT (AC)	Review Initials: Unit Operator	Review Initials: Unit Supvr
Friday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Saturday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Sunday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Monday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE FOLLOWING THE TABLE!

*** Student Handout ***

Attachment 2
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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP
Record the readings as soon as possible after the generator breaker has been closed.

Criteria Source: 3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7

LOCATION: ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR (Note 3)	MAPRAT (Note 3)	MFDLRX (Note 3)	LIMIT (AC)	Review Initials: Unit Operator	Review Initials: Unit Supvr
Tuesday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Wednesday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Thursday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE ON THE FOLLOWING PAGE!

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Attachment 2
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Surveillance Procedure Data Package - Modes 1, 2, & 3

(1) Compliance with the Licensed Power Limit (LPL) (3458 Mwt) is demonstrated by the following process:

A. No actions are allowed that would intentionally raise core thermal power above 3458 Mwt for any period of time. Small, short-term fluctuations in power that are not under the direct control of the unit operator are not considered intentional.

B. Closely monitor the thermal power during steady-state power operation with the goal of maintaining the two-hour average at or below 3458 Mwt. If the core thermal power average for a 2-hour period is found to exceed 3458 Mwt, Operations take timely action to ensure that thermal power is less than or equal to 3458 MWt. (This is implemented by taking action when any running average less than or equal to the 2 hour average exceeds 3458 Mwt.)

C. The core thermal power for an 8 hour period (8 hr average) is not to exceed 3458 Mwt.

D. If an evolution is expected to cause a transient increase in reactor power that could exceed 3458 Mwt, action should be taken to lower core power prior to performing the evolution.

E. If power is > 3463, REDUCE power.

F. If power is 3458 to 3463 MWt after allowing time for recent perturbations to settle, REDUCE power and EVALUATE the trend.

G. If any running 30 min average, 1 hr average, or 2 hr average is > 3458 MWt, REDUCE power.

(2) Core Thermal Power is normally recorded every 2 hours when required. However, these readings may be marked N/A during TIP trace runs, control rod pattern adjustments, or anytime Core Monitoring System is blocked and/or < 25% power. The Reactor Engineer is responsible for monitoring Core Thermal Limits. Monitoring of Core Thermal Power and other Core Thermal Limits is recommended following completion of planned rise in power and following any unexpected power change. If core monitoring software becomes unavailable, the Shift Manager and Reactor Engineer shall determine the appropriate frequency for monitoring Core Thermal Power but should not exceed 24 hours, using backup core monitoring computer, and taking into consideration current core conditions and margin to thermal limits. Power changes should not normally be made without the core monitoring software being available.

(3) Consult the Reactor Engineer when value ≥ 0.985. Refer to 0-TI-248 for Administrative Limits.

(4) If any Turbine Bypass valve(s) are inoperable or a Recirculation Loop is out of service, Contact the Reactor Engineer and Refer To the COLR for Turbine Bypass Out of Service (TBOOS) or Single Loop Operation (SLO) limits which must be applied.

(5) MAPRAT within limits is used to verify that all APLHGRs are within the limits specified within the COLR.

MFDLRX within limits is used to verify that all LHGRs are within the limits specified within the COLR.

MFLCPR within limits is used to verify that all MCPRs are within the limits specified within the COLR.

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Attachment 2
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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.6 HEAT BALANCE RELATED ICS ALARM SETPOINTS (Note 1) **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP
Record the readings as soon as possible after the generator breaker has been closed.

Criteria Source: BFPER951914

LOCATION: ICS Computer

	ICS Points					MAX DEV	HI and HI HI alarm setpoints listed in Table 1.B.1 & 1.B.2 are NOT exceeded. (Note 3) SAT / UNSAT / N/A	Review Initials	
	3-48A (°F)	3-48B (°F)	3-50A (°F)	3-50B (°F)	NSS0017 (°F)			UO	Unit Supvr
Friday						2°F (Note 2)			
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.15	N/A

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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.25 LPRM INSTRUMENTATION DAY SHIFT WEEK: This Week to Next Week

APPLICABILITY:	Modes 1 & 2 Readings are required at all times.
Criteria Source:	Technical Requirements Manual TSR 3.3.5.3
LOCATION:	Panel 2-9-14 and ICS Computer

DAY	TIME	# LPRMs BYPASSED (Note 1)								Total # LPRMs Bypassed (Note 2)	# of LPRM readings ≤ 3% on ICS (Note 3)	MAX DEV (AC)	All Data SAT/UNSAT	Review Initials	
		APRM #2	LPRM #2	APRM #4	LPRM #4	APRM #3	LPRM #3	APRM #1	LPRM #1					UO	Unit Supvr
Friday	0800	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø			0 (Note 4)			
Saturday	0800														
Sunday	0800														
Monday	0800														
Tuesday	0800														
Wednesday	0800														
Thursday	0800														

(1) Record number of LPRMs bypassed in the four APRM and LPRM cabinets as observed at Panel 2-9-14. Add these values together and record as Total # LPRMs Bypassed.

(2) Less than 20 LPRMs in OPERATE or Less than 3 per level for any APRM will result in a Rod Block and a trouble alarm on the display panel. This does not yield an automatic APRM trip, but does, however, make the associated APRM INOP.

(3) Record number of LPRMs reading less than 3% on the LPRM printout or display on ICS.

(4) MAX DEV is not required to be met when the APRMs are downscale; however, unexpected inconsistencies should be reported to the Reactor Engineer. The total number of LPRM's bypassed shall equal the number of LPRM's reading less than 3% on ICS.

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Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.30 REACTOR VESSEL STEAM DOME PRESSURE INSTRUMENTATION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY:	Modes 1 & 2 Readings are required at all times.
Surveillance Requirements:	3.3.1.1.1(f3), 3.3.3.1.1, 3.4.10.1

LOCATION:		ICS (Note 1 & 4)		MAX DEV (AC)	2-9-86	2-9-85	2-9-84	2-9-83	MAX DEV (AC)	MAX LIMIT	All Data SAT/UNSAT	Review Initials	
					D	C	B	A					
Reference Leg	TIME (Note 4)	3-74A	3-74B		2-PIS-3-22D	2-PIS-3-22C	2-PIS-3-22BB	2-PIS-3-22AA				UO	Unit Supvr
Friday	0800			40 psig (Note 2)	1035	1035	1035	1035	60 psig (Note 2)	Note 3 Note 5			
Saturday	0800												
Sunday	0800												
Monday	0800												
Tuesday	0800												
Wednesday	0800												
Thursday	0800												

(1) These readings may be obtained from ICS using the Single Value Display or from the ATU output voltage translated into a PRESSURE Signal for the specific instruments. For ICS, type in "SVD" for Single Value Display, enter the point desired as "3-74A", record reading, select F4, enter "3-74B", record the second reading.

(2) 3-74A and 3-74B have a Maximum allowable deviation of 40 psig, AND 2-PIS-3-22D, 2-PIS-3-22C, 2-PIS-3-22BB, & 2-PIS-3-22AA, have a Maximum allowable deviation of 60 psig. No comparison is required between the 3-74A(B) and 2-PIS-3-22D(C)(BB)(AA).

(3) 3-74A and 3-74B SHALL be ≤ 1050 psig. 2-PIS-3-22D, 2-PIS-3-22C, 2-PIS-3-22BB, & 2-PIS-3-22AA SHALL be ≤ 1090 psig.

(4) 3-74A and 3-74B are to be recorded at 0800. The Auxiliary Instrument Room readings are not required to be taken at precisely 0800.

(5) Following a change to Reactor Power or Pressure, verify the Steam Dome Limits are within the 0-TI-248, Administrative Limits and Design Analysis Limits (Appendix S)

OPERATOR: _____

RO ____ SRO ____ DATE:_____

JPM NUMBER: Admin RO A1b

TASK NUMBER: Conduct of Operations

TASK TITLE: 3-SR-2 ICS Computer points

K/A NUMBER: 2.1.19 K/A RATING: RO 3.9

PRA: N/A

TASK STANDARD: Perform Operator logs using ICS screens in accordance with 3-SR-2 Instrument Checks and Observations for log tables 1.1, 1.6, 1.25, and 1.30. Verify acceptance criteria are satisfied in accordance with notes.

LOCATION OF PERFORMANCE: Unit 3 Simulator (ICS computer terminal)

REFERENCES/PROCEDURES NEEDED: 3-SR-2 Rev 70

VALIDATION TIME: 20 minutes

MAX. TIME ALLOWED: (Completed for Time Critical JPMs only)

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are a Unit Operator assigned to Unit 3, and it is Friday morning at 0800. 3-SR-2, Instrument Checks and Observations, is being performed. All 3-SR-2 instrument checks and observations are complete with the exception of table 1.1, 1.6, 1.25, and 1.30.

INITIATING CUE: The Unit Supervisor directs you as the Unit Operator to complete 3-SR-2 for tables 1.1, 1.6, 1.25 and 1.30, utilizing only the ICS computer to obtain data

****

Simulator

****

INITIAL CONDITIONS: You are a Unit Operator assigned to Unit 3, and it is Friday morning at 0800. 3-SR-2, Instrument Checks and Observations, is being performed. All 3-SR-2 instrument checks and observations are complete with the exception of table 1.1, 1.6, 1.25, and 1.30.

INITIATING CUE: The Unit Supervisor directs you as the Unit Operator to complete 3-SR-2 for tables 1.1, 1.6, 1.25 and 1.30, utilizing only the ICS computer to obtain data

START TIME_____

****

Performance Step 1: Critical _ Not Critical X

Refers to 3-SR-2, Instrument Checks and Observations, table 1.1

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: _____ to _____

APPLICABILITY:	Mode 1 when ≥ 25% RTP (Refer To P&L Step 3.6A) **RECORD** the readings as soon as possible after the generator breaker has been closed.									
Criteria Source:	3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7									
LOCATION:	ICS Computer (Case Summary - CSUM)								Review Initials	
DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR Note 3	MAPRAT Note 3	MFDLRX Note 3	LIMIT (AC)	Unit Operator	Unit Supvr
Friday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Saturday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Sunday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Monday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE FOLLOWING THE TABLE!

Standard:

Selects SR-2 Group Display from the Group Display menu OR types the code "CSUM" on ICS computer to obtain data and completes table 1.1 Data for Friday at 0800, Records approximate values of 3456 for MWt, 100% for RTP, .876 for MFLCPR, .766 for MAPRAT, and .838 for MFDLRX

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical _ Not Critical X

(1) Compliance with the Licensed Power Limit (LPL) (3458 Mwt) is demonstrated by the following process:

A. No actions are allowed that would intentionally raise core thermal power above 3458 Mwt for any period of time. Small, short-term fluctuations in power that are not under the direct control of the unit operator are not considered intentional.

B. Closely monitor the thermal power during steady-state power operation with the goal of maintaining the two-hour average at or below 3458 Mwt. If the core thermal power average for a 2-hour period is found to exceed 3458 Mwt, Operations take timely action to ensure that thermal power is less than or equal to 3458 MWt. (This is implemented by taking action when any running average less than or equal to the 2 hour average exceeds 3458 Mwt.)

C. The core thermal power for an 8 hour period (8 hr average) is not to exceed 3458 Mwt.

D. If an evolution is expected to cause a transient increase in reactor power that could exceed 3458 Mwt, action should be taken to lower core power prior to performing the evolution.

E. IF power is > 3463, REDUCE power.

F. IF power is 3458 to 3463 MWt after allowing time for recent perturbations to settle, REDUCE power and EVALUATE the trend.

G. IF any running 30 min Avg, 1 hr average, or 2 hr average is > 3458 MWt, REDUCE power.

(2) Core Thermal Power is normally recorded every 2 hours when required. However, these readings may be marked N/A during TIP trace runs, control rod pattern adjustments, or anytime Core Monitoring System is blocked and/or < 25% power. The Reactor Engineer is responsible for monitoring Core Thermal Limits. Monitoring of Core Thermal Power and other Core Thermal Limits is recommended following completion of planned rise in power and following any unexpected power change. If core monitoring software becomes unavailable, the Unit Supervisor/SRO and Reactor Engineer shall determine the appropriate frequency for monitoring Core Thermal Power but should not exceed 24 hours, using backup core monitoring computer, and taking into consideration current core conditions and margin to thermal limits. Power changes should not normally be made without the core monitoring software being available.

(3) Consult Reactor Engineer when value ≥ 0.985. Refer to 0-TI-248 for Administrative Limits.

(4) If any Turbine Bypass valve(s) are inoperable or a Recirculation Loop is out of service, contact the Reactor Engineer and refer to the COLR for Turbine Bypass Out of Service (TBOOS) or Single Loop Operation (SLO) limits which must be applied.

(5) MAPRAT within limits is used to verify that all APLHGRs are within the limits specified within the COLR.
MFDLRX within limits is used to verify that all LHGRs are within the limits specified within the COLR.
MFLCPR within limits is used to verify that all MCPRs are within the limits specified within the COLR.

Standard:

Initial for Unit Operator for Friday at 0800 when acceptance criteria is verified in accordance with above notes.

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 3: Critical _ Not Critical X

Refers to 3-SR-2, Instrument Checks and Observations, table 1.6

TABLE 1.6 HEAT BALANCE RELATED ICS ALARM SETPOINTS (Note 1) **DAY SHIFT** WEEK: _____ to _____

APPLICABILITY:	Mode 1 when ≥ 25% RTP(Refer To P&L Step 3.6A) **RECORD** the readings as soon as possible after the generator breaker has been closed.								
Criteria Source:	BFPER951914								
LOCATION:	ICS Computer							Review Initials	
	ICS Points					MAX DEV Note 2	Verify HI and HI HI alarm setpoints listed in Table 1.B.1 & 1.B.2 are NOT exceeded. (Note 3) SAT / UNSAT / N/A	I/O	Unit Supvr
	3-48A (°F)	3-48B (°F)	3-50A (°F)	3-50B (°F)	NSS0017 (°F)				
Friday						2°F			
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

Standard:

Selects SR-2 Group Display from the Group Display menu OR types the specific codes for each ICS point into the "Single Value Display" (for example: 3-48A, 3-48B, etc…) and Completes table 1.6 Data for Friday. Records 377.2 for listed ICS points

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 4: Critical _ Not Critical X

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.168	N/A

Standard:

Documents Sat and initials for Unit Operator for Friday when Maximum Deviation between Feedwater temperature computer points are within 2 degrees (Note 2) and the conditions of Note 3 are satisfied IAW with tables 1.B.1 and 1.B.2.

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 5: Critical _ Not Critical X

Refers to 3-SR-2, Instrument Checks and Observations, table 1.25

TABLE 1.25 LPRM INSTRUMENTATION DAY SHIFT WEEK: _____ to _____

APPLICABILITY:	Modes 1 & 2 Readings are required at all times. (Refer To P&L Step 3.6A)
Criteria Source:	Technical Requirements Manual TSR 3.3.5.3
LOCATION:	Panel 3-9-14 and ICS Computer

		# LPRMs BYPASSED (Note 1)								Total # LPRMs Bypassed (Note 2)	# LPRMs reading ≤ 3% on ICS (Note 3)	MAX DEV (AC) (Note 4)	All Data SAT/UNSAT	Review Initials	
DAY	TIME	APRM #2	LPRM #2	APRM #4	LPRM #4	APRM #3	LPRM #3	APRM #1	LPRM #1					UO	Unit Supvr
Friday	0800														
Saturday	0800														
Sunday	0800														
Monday	0800											0			
Tuesday	0800														
Wednesday	0800														
Thursday	0800														

Standard:

Clicks on "Live LPRM Display" in the "Nuclear Heat Balance menu" and completes table 1.25 Data for Friday, #LPRMs reading ≤ 3% on ICS. Records ZERO

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 6: Critical _ Not Critical X

(1) Record number of LPRMs bypassed in the four APRM and LPRM cabinets as observed at Panel 3-9-14. add these values together and record as Total # LPRMs Bypassed.

(2) Less than 20 LPRMs in OPERATE or Less than 3 per level for any APRM will result in a Rod Block and a trouble alarm on the display panel. This does not yield an automatic APRM trip, but does, however, make the associated APRM INOP.

(3) Record number of LPRMs reading less than 3% on the LPRM printout or display on ICS.

(4) MAX DEV is not required to be met when the APRMs are downscale; however, unexpected inconsistencies should be reported to the Reactor Engineer. The total number of LPRM's bypassed shall equal the number of LPRM's reading less than 3% on ICS.

Standard:

Documents Sat and initials for Unit Operator for Friday when the conditions of Note 4 are satisfied.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 7: Critical X Not Critical

Refers to 3-SR-2, Instrument Checks and Observations, table 1.30

TABLE 1.30 REACTOR VESSEL STEAM DOME PRESSURE INSTRUMENTATION **DAY SHIFT** WEEK: _____ to _____

APPLICABILITY:	Modes 1 & 2 (Refer To P&L Step 3.6A) Readings are required at all times.
Surveillance Requirements:	3.3.1.1.1(f3), 3.3.3.1.1, 3.4.10.1

LOCATION:		ICS (Notes 1 & 4)		MAX DEV (AC)	3-9-86	3-9-85	3-9-84	3-9-83	MAX DEV (AC)	MAX LIMIT	All Data SAT/UNSAT	Review Initials	
Reference Leg	TIME (Note 4)	3-74A	3-74B		D	C	B	A				UO	Unit Supvr
					3-PIS-3-22D	3-PIS-3-22C	3-PIS-3-22BB	3-PIS-3-22AA					
Friday	0800			40 psig (Note 2)					60 psig (Note 2)	(Note 3) (Note 5)			
Saturday	0800												
Sunday	0800												
Monday	0800												
Tuesday	0800												
Wednesday	0800												
Thursday	0800												

Standard:

Selects SR-2 Group Display from the Group Display menu OR types the specific codes for each ICS point into the "Single Value Display" (for example: 3-74A, 3-74B, etc…) and completes table 1.30 Data for Friday. Records approximately 1050 psig for ICS point 3-74A and approximately 1005 psig for ICS point 3-74B.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 8: Critical X Not Critical

(1) These readings may be obtained from ICS using the Single Value Display or from the ATU output voltage translated into a PRESSURE Signal for the specific instruments. For ICS, type in "SVD" for Single Value Display, enter the point desired as "3-74A", record reading, select F4, enter "3-74B", record the second reading.

(2) 3-74A and 3-74B have a Maximum allowable deviation of 40 psig, AND 3-PIS-3-22D, 3-PIS-3-22C, 3-PIS-3-22BB, & 3-PIS-3-22AA, have a Maximum allowable deviation of 60 psig. No comparison is required between the 3-74A(B) and 3-PIS-3-22D(C)(BB)(AA).

(3) 3-74A and 3-74B SHALL be $\leq$ 1050 psig. 3-PIS-3-22D, 3-PIS-3-22C, 3-PIS-3-22BB, & 3-PIS-3-22AA SHALL be $\leq$ 1090 psig.

(4) 3-74A and 3-74B are to be recorded at 0800. The Auxiliary Instrument Room readings are not required to be taken at precisely 0800.

(5) Following a change to Reactor Power and/or Pressure, verify the Steam Dome Limits are within the 0-TI-248, Administrative Limits and Design Analysis Limits (Appendix S)

Standard:

Reviews notes and documents UNSAT and initials for Unit Operator for Friday when the conditions of Notes 2 and 3 are reviewed.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

END OF TASK

STOP TIME ___

*** Answer Key ***

Attachment 2
(Page 1 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP (Refer To P&L Step 3.6A)
RECORD the readings as soon as possible after the generator breaker has been closed.

Criteria Source: 3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7

LOCATION: ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR Note 3	MAPRAT Note 3	MFDLRX Note 3	LIMIT (AC)	Review Initials: Unit Operator	Review Initials: Unit Supvr
Friday	0800	3456.6	100.0	Notes 1 & 2	0.875	0.767	0.839	Notes 3, 4, & 5	Initials	
	1000									
	1200									
	1400									
	1600									
	1800									
Saturday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Sunday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Monday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE FOLLOWING THE TABLE!

*** Answer Key ***

Attachment 2
(Page 2 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY:	Mode 1 when ≥ 25% RTP (Refer To P&L Step 3.6A) **RECORD** the readings as soon as possible after the generator breaker has been closed.
Criteria Source:	3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7
LOCATION:	ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR Note 3	MAPRAT Note 3	MFDLRX Note 3	LIMIT (AC)	Review Initials: Unit Operator	Review Initials: Unit Supvr
Tuesday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Wednesday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Thursday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE ON THE FOLLOWING PAGE!

*** Answer Key ***

Attachment 2
(Page 3 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

(1) Compliance with the Licensed Power Limit (LPL) (3458 Mwt) is demonstrated by the following process:

A. No actions are allowed that would intentionally raise core thermal power above 3458 Mwt for any period of time. Small, short-term fluctuations in power that are not under the direct control of the unit operator are not considered intentional.

B. Closely monitor the thermal power during steady-state power operation with the goal of maintaining the two-hour average at or below 3458 Mwt. If the core thermal power average for a 2-hour period is found to exceed 3458 Mwt, Operations take timely action to ensure that thermal power is less than or equal to 3458 MWt. (This is implemented by taking action when any running average less than or equal to the 2 hour average exceeds 3458 Mwt.)

C. The core thermal power for an 8 hour period (8 hr average) is not to exceed 3458 Mwt.

D. If an evolution is expected to cause a transient increase in reactor power that could exceed 3458 Mwt, action should be taken to lower core power prior to performing the evolution.

E. IF power is > 3463, REDUCE power.

F. IF power is 3458 to 3463 MWt after allowing time for recent perturbations to settle, REDUCE power and EVALUATE the trend.

G. IF any running 30 min Avg, 1 hr average, or 2 hr average is > 3458 MWt, REDUCE power.

(2) Core Thermal Power is normally recorded every 2 hours when required. However, these readings may be marked N/A during TIP trace runs, control rod pattern adjustments, or anytime Core Monitoring System is blocked and/or < 25% power. The Reactor Engineer is responsible for monitoring Core Thermal Limits. Monitoring of Core Thermal Power and other Core Thermal Limits is recommended following completion of planned rise in power and following any unexpected power change. If core monitoring software becomes unavailable, the Unit Supervisor/SRO and Reactor Engineer shall determine the appropriate frequency for monitoring Core Thermal Power but should not exceed 24 hours, using backup core monitoring computer, and taking into consideration current core conditions and margin to thermal limits. Power changes should not normally be made without the core monitoring software being available.

(3) Consult Reactor Engineer when value ≥ 0.985. Refer to 0-TI-248 for Administrative Limits.

(4) If any Turbine Bypass valve(s) are inoperable or a Recirculation Loop is out of service, contact the Reactor Engineer and refer to the COLR for Turbine Bypass Out of Service (TBOOS) or Single Loop Operation (SLO) limits which must be applied.

(5) MAPRAT within limits is used to verify that all APLHGRs are within the limits specified within the COLR.
MFDLRX within limits is used to verify that all LHGRs are within the limits specified within the COLR.
MFLCPR within limits is used to verify that all MCPRs are within the limits specified within the COLR.

*** Answer Key ***

Attachment 2
(Page 10 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.6 HEAT BALANCE RELATED ICS ALARM SETPOINTS (Note 1) **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP(Refer To P&L Step 3.6A)
RECORD the readings as soon as possible after the generator breaker has been closed.

Criteria Source: BFPER951914

LOCATION: ICS Computer

	ICS Points					MAX DEV Note 2	Verify HI and HI HI alarm setpoints listed in Table 1.B.1 & 1.B.2 are NOT exceeded. (Note 3) SAT / UNSAT / N/A	Review Initials	
	3-48A (°F)	3-48B (°F)	3-50A (°F)	3-50B (°F)	NSS0017 (°F)			UO	Unit Supvr
Friday	377.2	377.2	377.2	377.2	377.2	2°F	SAT	Initials	
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.168	N/A

*** Answer Key ***

Attachment 2
(Page 27 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.25 LPRM INSTRUMENTATION DAY SHIFT WEEK: This Week to Next Week

APPLICABILITY:	Modes 1 & 2 Readings are required at all times. (Refer To P&L Step 3.6A)
Criteria Source:	Technical Requirements Manual TSR 3.3.5.3
LOCATION:	Panel 3-9-14 and ICS Computer

		# LPRMs BYPASSED (Note 1)								Total # LPRMs Bypassed (Note 2)	# LPRMs reading ≤ 3% on ICS (Note 3)	MAX DEV (AC) (Note 4)	All Data SAT/UNSAT	Review Initials	
DAY	TIME	APRM #2	LPRM #2	APRM #4	LPRM #4	APRM #3	LPRM #3	APRM #1	LPRM #1					UO	Unit Supvr
Friday	0800	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	0	SAT	Initials	
Saturday	0800														
Sunday	0800														
Monday	0800														
Tuesday	0800														
Wednesday	0800														
Thursday	0800														

(1) Record number of LPRMs bypassed in the four APRM and LPRM cabinets as observed at Panel 3-9-14. add these values together and record as Total # LPRMs Bypassed.

(2) Less than 20 LPRMs in OPERATE or Less than 3 per level for any APRM will result in a Rod Block and a trouble alarm on the display panel. This does not yield an automatic APRM trip, but does, however, make the associated APRM INOP.

(3) Record number of LPRMs reading less than 3% on the LPRM printout or display on ICS.

(4) MAX DEV is not required to be met when the APRMs are downscale; however, unexpected inconsistencies should be reported to the Reactor Engineer. The total number of LPRM's bypassed shall equal the number of LPRM's reading less than 3% on ICS.

*** Answer Key ***

Attachment 2
(Page 33 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.30 REACTOR VESSEL STEAM DOME PRESSURE INSTRUMENTATION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY:	Modes 1 & 2 (Refer To P&L Step 3.6A) Readings are required at all times.
Surveillance Requirements:	3.3.1.1.1(f3), 3.3.3.1.1, 3.4.10.1

LOCATION:		ICS (Notes 1 & 4)		MAX DEV (AC)	3-9-86	3-9-85	3-9-84	3-9-83	MAX DEV (AC)	MAX LIMIT	All Data SAT/UNSAT	Review Initials	
Reference Leg	TIME (Note 4)	3-74A	3-74B		D	C	B	A				UO	Unit Supvr
					3-PIS-3-22D	3-PIS-3-22C	3-PIS-3-22BB	3-PIS-3-22AA					
Friday	0800	1050	1005	40 psig (Note 2)	1035	1035	1035	1035	60 psig (Note 2)	(Note 3) (Note 5)	UNSAT	Initials	
Saturday	0800												
Sunday	0800												
Monday	0800												
Tuesday	0800												
Wednesday	0800												
Thursday	0800												

(1) These readings may be obtained from ICS using the Single Value Display or from the ATU output voltage translated into a PRESSURE Signal for the specific instruments. For ICS, type in "SVD" for Single Value Display, enter the point desired as "3-74A", record reading, select F4, enter "3-74B", record the second reading.

(2) 3-74A and 3-74B have a Maximum allowable deviation of 40 psig, AND 3-PIS-3-22D, 3-PIS-3-22C, 3-PIS-3-22BB, & 3-PIS-3-22AA, have a Maximum allowable deviation of 60 psig. No comparison is required between the 3-74A(B) and 3-PIS-3-22D(C)(BB)(AA).

(3) 3-74A and 3-74B SHALL be ≤ 1050 psig. 3-PIS-3-22D, 3-PIS-3-22C, 3-PIS-3-22BB, & 3-PIS-3-22AA SHALL be ≤ 1090 psig.

(4) 3-74A and 3-74B are to be recorded at 0800. The Auxiliary Instrument Room readings are not required to be taken at precisely 0800.

(5) Following a change to Reactor Power and/or Pressure, verify the Steam Dome Limits are within the 0-TI-248, Administrative Limits and Design Analysis Limits (Appendix S)

TRIGGER: 2HR

CASE SUMMARY

bf3ppxa

LAST POWERPLEX MONITOR CASE

Date 1/31/12
Time 22: 4:53

REACTOR CONDITIONS

CTP	3456.1	(MWt)	99.9	% Rated
	1150.2	(MWe)	99.7	% Rated
WT	87.0	MLB/HR	84.9	% Rated
DHS	30.6	BTU/LB		
CAVEX	15827.0	MWT/MTU		
EFF	33.3	%		
LOAD LINE	110.3	%	CRD	0.052
XENON WORTH	0.00	%	K-EFF	1.0240

CORE THERMAL LIMITS

	Value	IX	JY	K
MFLCPR	0.876	15	24	
MAPRAT	0.766	37	48	4
MFDLRX	0.838	35	48	4
P-PCS	2.20	35	50	4
P-PCFC	2.20	35	50	4

POWERPLEX HEAT BALANCE

Date 1/31/12
Time 22:13:26

CORE THERMAL POWER / CORE FLOW

CTP	0.0	(MWt)	0.0	% Rated
CTP CALCULATED FROM		HEAT BALANCE		
WT	0.0	MLB/HR	0.0	% Rated
WTSUB	0.0	MLB/HR		
WTFLAG	0			
LOAD LINE(CTP, WT)		0.0	%	

POWERPLEX DATA FILE READ STATUS

DATA CONSTANTS FOR ICS NSP6 PROGRAM
CONSTANTS READ SUCCESSFULLY

VALUES FROM LAST PPLX MONITOR CASE
VALUES READ SUCCESSFULLY

VALUES FROM LAST PPLX HEAT BALANCE
VALUES READ SUCCESSFULLY

TVA POINT DISPLAY

Main Alarms Graphics Trends Points Zoom/Layers Print Help

23-APR-2012 15:36:27 SPDS

3 SELECT FUNC. KEY OR TURN-ON CODE GD >

GROUP DISPLAY FOR @SR-2 Page 1 of 1 LIMITS

INSTRUMENT CHECKS Update rate 1.0 seconds

PID	QUAL	VALUE	UNITS	DESCRIPTION
CALC020	GOOD	3456	MWT	REACTOR POWER,NSSS - 30 MIN AVG
CALC021	GOOD	3456	MWT	REACTOR POWER,NSSS - 1 HR AVG
CALC083	GOOD	3456	MWT	REACTOR POWER,NSSS - 2 HR AVG
CALC098	GOOD	1150	MWE	MAIN GENERATOR POWER (FILTERED)
CALC026	GOOD	33.277023	%	EFFICIENCY (%)
CALC027	GOOD	110.3		LOAD LINE
CALC024	GOOD	100.0	%	REACTOR POWER, PERCENT RATED
3-48A	DALM	377.2	DEG F	RFW LINE A TEMP (1 OF 2)
3-48B	GOOD	377.2	DEG F	RFW LINE A TEMP (2 OF 2)
3-50A	GOOD	377.2	DEG F	RFW LINE B TEMP (1 OF 2)
3-50B	GOOD	377.2	DEG F	RFW LINE B TEMP (2 OF 2)
NSS0017	GOOD	377.2	DEG F	RFW TEMP TO REACTOR (AVG)
96-14A	GOOD	3.07	MW	RECIRC VFD A-OUTPUT POWER
96-14B	GOOD	2.85	MW	RECIRC VFD B-OUTPUT POWER
CONS0400	GOOD	0.143	MLB/HR	TOTAL RWCU FLOW-FOR NSSS
TEST2500	GOOD	119.0	DEG F	BULK VOLUMETRIC AVG DW TEMP
3-74A	GOOD	1050	PSIG	RX PRESSURE-WIDE RANGE
3-74B	GOOD	1005	PSIG	RX PRESSURE-WIDE RANGE

PREVIOUS (F7) | CANCEL (ESC) | F1=SET RATE | F2=PTS--> | F3=HISTORY | F4=PTS<-- | F5= | F6=LOCAL ARCH

PG UP PG DN TT044 WK=004/win=1 SEC LVL=3 PRIM/BACKCPU S RUN BFN U3 Sim

TVA RAW LPRM READINGS

Main Alarms Graphics Trends Points Zoom/Layers Print Help

23-APR-2012 15:36:27 SPDS

SELECT FUNC. KEY OR TURN-ON CODE RAWLPRM >

	08	16	24	32	40	48	56
57D		21.11	27.73	26.54	24.94		
C		24.50	35.68	34.85	30.64		
B		25.75	42.47	39.40	35.27		
A		17.07	30.22	29.30	25.24		
49D	22.55	38.79	43.14	44.36	42.32	31.06	
C	23.79	44.62	55.87	53.93	52.94	33.27	
B	22.94	47.25	64.25	59.65	60.58	33.56	
A	13.80	32.96	45.65	42.57	44.61	21.78	
41D	30.39	45.90	49.09	46.69	47.59	41.38	25.24
C	36.36	57.13	53.31	52.71	53.21	53.57	30.49
B	40.68	61.76	58.04	55.95	60.36	59.61	35.04
A	27.29	45.74	40.49	40.34	43.54	43.83	25.37
33D	32.21	46.05	49.49	49.71	46.82	43.78	26.15
C	40.24	53.34	52.88	50.73	52.79	52.67	32.94
B	45.69	56.58	54.71	50.05	56.58	58.40	39.23
A	32.39	39.48	39.05	36.87	40.05	42.20	30.22
25D	33.67	46.12	48.39	48.88	48.83	42.08	26.66
C	42.36	56.74	51.09	53.92	52.70	54.35	34.39
B	48.86	63.55	55.56	54.40	57.67	62.86	42.65
A	35.91	47.06	38.01	39.15	40.88	47.25	32.36
17D	26.55	43.44	46.06	45.63	45.66	37.31	19.28
C	30.06	52.07	56.82	53.06	55.49	43.69	23.25
B	32.82	56.06	64.19	56.82	62.59	47.71	26.37
A	22.83	42.07	45.94	40.11	47.44	34.40	18.24
09D		25.65	33.72	31.59	28.63	19.83	
C		30.41	42.37	39.74	36.35	23.04	
B		32.29	49.03	45.50	43.40	23.60	
A		22.10	36.68	34.00	31.35	15.53	

PREVIOUS (F7) CANCEL (ESC) F1=CLEAR F2= F3= F4= F5= F6=

PG UP PG DN TT044 WK=004/win=1 SEC LVL=3 PRIM/BACKCPU S RUN BFN U3 Sim

*** Student Handout ***

Attachment 2
(Page 1 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP (Refer To P&L Step 3.6A)
RECORD the readings as soon as possible after the generator breaker has been closed.

Criteria Source: 3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7

LOCATION: ICS Computer (Case Summary - CSUM)

DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR Note 3	MAPRAT Note 3	MFDLRX Note 3	LIMIT (AC)	Review Initials Unit Operator	Review Initials Unit Supvr
Friday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Saturday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Sunday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Monday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE FOLLOWING THE TABLE!

*** Student Handout ***

Attachment 2
(Page 2 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.1 CORE THERMAL POWER AND CORE POWER DISTRIBUTION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY:	Mode 1 when ≥ 25% RTP (Refer To P&L Step 3.6A) **RECORD** the readings as soon as possible after the generator breaker has been closed.									
Criteria Source:	3.2.1.1; 3.2.2.1; 3.2.3.1; DEFINITIONS SECTION 1.1 - FSAR 3.7.7									
LOCATION:	ICS Computer (Case Summary - CSUM)								Review Initials	
DAY	TIME Note 2	Core Thermal Power (MWt)	Percent Power (% RTP)	LIMIT (AC)	MFLCPR Note 3	MAPRAT Note 3	MFDLRX Note 3	LIMIT (AC)	Unit Operator	Unit Supvr
Tuesday	0800			Notes 1 & 2				Notes 3, 4, & 5		
	1000									
	1200									
	1400									
	1600									
	1800									
Wednesday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									
Thursday	0800									
	1000									
	1200									
	1400									
	1600									
	1800									

NOTES ARE ON THE FOLLOWING PAGE!

*** Student Handout ***

Attachment 2
(Page 3 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

(1) Compliance with the Licensed Power Limit (LPL) (3458 Mwt) is demonstrated by the following process:

A. No actions are allowed that would intentionally raise core thermal power above 3458 Mwt for any period of time. Small, short-term fluctuations in power that are not under the direct control of the unit operator are not considered intentional.

B. Closely monitor the thermal power during steady-state power operation with the goal of maintaining the two-hour average at or below 3458 Mwt. If the core thermal power average for a 2-hour period is found to exceed 3458 Mwt, Operations take timely action to ensure that thermal power is less than or equal to 3458 MWt. (This is implemented by taking action when any running average less than or equal to the 2 hour average exceeds 3458 Mwt.)

C. The core thermal power for an 8 hour period (8 hr average) is not to exceed 3458 Mwt.

D. If an evolution is expected to cause a transient increase in reactor power that could exceed 3458 Mwt, action should be taken to lower core power prior to performing the evolution.

E. IF power is > 3463, REDUCE power.

F. IF power is 3458 to 3463 MWt after allowing time for recent perturbations to settle, REDUCE power and EVALUATE the trend.

G. IF any running 30 min Avg, 1 hr average, or 2 hr average is > 3458 MWt, REDUCE power.

(2) Core Thermal Power is normally recorded every 2 hours when required. However, these readings may be marked N/A during TIP trace runs, control rod pattern adjustments, or anytime Core Monitoring System is blocked and/or < 25% power. The Reactor Engineer is responsible for monitoring Core Thermal Limits. Monitoring of Core Thermal Power and other Core Thermal Limits is recommended following completion of planned rise in power and following any unexpected power change. If core monitoring software becomes unavailable, the Unit Supervisor/SRO and Reactor Engineer shall determine the appropriate frequency for monitoring Core Thermal Power but should not exceed 24 hours, using backup core monitoring computer, and taking into consideration current core conditions and margin to thermal limits. Power changes should not normally be made without the core monitoring software being available.

(3) Consult Reactor Engineer when value ≥ 0.985. Refer to 0-TI-248 for Administrative Limits.

(4) If any Turbine Bypass valve(s) are inoperable or a Recirculation Loop is out of service, contact the Reactor Engineer and refer to the COLR for Turbine Bypass Out of Service (TBOOS) or Single Loop Operation (SLO) limits which must be applied.

(5) MAPRAT within limits is used to verify that all APLHGRs are within the limits specified within the COLR.
MFDLRX within limits is used to verify that all LHGRs are within the limits specified within the COLR.
MFLCPR within limits is used to verify that all MCPRs are within the limits specified within the COLR.

*** Student Handout ***

Attachment 2
(Page 10 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.6 HEAT BALANCE RELATED ICS ALARM SETPOINTS (Note 1) **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY: Mode 1 when ≥ 25% RTP(Refer To P&L Step 3.6A)
RECORD the readings as soon as possible after the generator breaker has been closed.

Criteria Source: BFPER951914

LOCATION: ICS Computer

	ICS Points					MAX DEV Note 2	Verify HI and HI HI alarm setpoints listed in Table 1.B.1 & 1.B.2 are NOT exceeded. (Note 3) SAT / UNSAT / N/A	Review Initials	
	3-48A (°F)	3-48B (°F)	3-50A (°F)	3-50B (°F)	NSS0017 (°F)			UO	Unit Supvr
Friday						2°F			
Saturday									
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									

(1) The computer points listed in Table 1.B.1 and 1.B.2 are inputs to the ICS Core Thermal Power Heat Balance calculations. The points are monitored to ensure the inputs are in agreement and to ensure the license limits for thermal power are maintained. In addition to the above, these points should be monitored any time reactor power changes are performed.

(2) A difference between Feedwater temperature points 3-48A, 3-48B, 3-50A, 3-50B, and NSS0017 of greater than 2 degrees will require the notification of Site Engineering and suspending any rise in power until the discrepancy is resolved.

(3) An alarm setpoint being exceeded will require notifying the Unit Supervisor immediately and, if action cannot be taken immediately to return the value to within limits, Site Engineering will be notified for assistance.

TABLE 1.B.1

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
CALCO20	Rx Power 30 Min Avg.	3458	3463
CALCO21	Rx Power 1 Hr. Avg.	3458	3461
CALCO83	Rx Power 2 Hr. Avg.	3458	3459
CALCO98	Generator Power	1185	1190
CALCO26	Efficiency	35	36
CALCO27	Load Line	N/A	113.6
CALCO24	Rx Power %	100.2	100.5

TABLE 1.B.2

ICS POINT	DESCRIPTION	HI ALARM	HI HI ALARM
3-48A	FW Temp	382	386
3-48B	FW Temp	382	386
3-50A	FW Temp	382	386
3-50B	FW Temp	382	386
NSS0017	Avg. FW Temp.	382	386
CONS0400	Total RWCU Flow	0.168	N/A

*** Student Handout ***

Attachment 2
(Page 27 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.25 LPRM INSTRUMENTATION DAY SHIFT WEEK: This week to Next week

APPLICABILITY:	Modes 1 & 2 Readings are required at all times. (Refer To P&L Step 3.6A)
Criteria Source:	Technical Requirements Manual TSR 3.3.5.3
LOCATION:	Panel 3-9-14 and ICS Computer

		# LPRMs BYPASSED (Note 1)								Total # LPRMs Bypassed (Note 2)	# LPRMs reading ≤ 3% on ICS (Note 3)	MAX DEV (AC) (Note 4)	All Data SAT/UNSAT	Review Initials	
DAY	TIME	APRM #2	LPRM #2	APRM #4	LPRM #4	APRM #3	LPRM #3	APRM #1	LPRM #1					UO	Unit Supvr
Friday	0800	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø						
Saturday	0800														
Sunday	0800														
Monday	0800											0			
Tuesday	0800														
Wednesday	0800														
Thursday	0800														

(1) Record number of LPRMs bypassed in the four APRM and LPRM cabinets as observed at Panel 3-9-14. add these values together and record as Total # LPRMs Bypassed.

(2) Less than 20 LPRMs in OPERATE or Less than 3 per level for any APRM will result in a Rod Block and a trouble alarm on the display panel. This does not yield an automatic APRM trip, but does, however, make the associated APRM INOP.

(3) Record number of LPRMs reading less than 3% on the LPRM printout or display on ICS.

(4) MAX DEV is not required to be met when the APRMs are downscale; however, unexpected inconsistencies should be reported to the Reactor Engineer. The total number of LPRM's bypassed shall equal the number of LPRM's reading less than 3% on ICS.

*** Student Handout ***

Attachment 2
(Page 33 of 86)

Surveillance Procedure Data Package - Modes 1, 2, & 3

TABLE 1.30 REACTOR VESSEL STEAM DOME PRESSURE INSTRUMENTATION **DAY SHIFT** WEEK: This Week to Next Week

APPLICABILITY:		Modes 1 & 2 (Refer To P&L Step 3.6A) Readings are required at all times.											
Surveillance Requirements:		3.3.1.1.1(f3), 3.3.3.1.1, 3.4.10.1											
LOCATION:		ICS (Notes 1 & 4)		MAX DEV (AC)	3-9-86	3-9-85	3-9-84	3-9-83	MAX DEV (AC)	MAX LIMIT	All Data SAT/UNSAT	Review Initials	
Reference Leg	TIME (Note 4)	3-74A	3-74B		D	C	B	A				UO	Unit Supvr
					3-PIS-3-22D	3-PIS-3-22C	3-PIS-3-22BB	3-PIS-3-22AA					
Friday	0800			40 psig (Note 2)	1035	1035	1035	1035	60 psig (Note 2)	(Note 3) (Note 5)			
Saturday	0800												
Sunday	0800												
Monday	0800												
Tuesday	0800												
Wednesday	0800												
Thursday	0800												

(1) These readings may be obtained from ICS using the Single Value Display or from the ATU output voltage translated into a PRESSURE Signal for the specific instruments. For ICS, type in "SVD" for Single Value Display, enter the point desired as "3-74A", record reading, select F4, enter "3-74B", record the second reading.

(2) 3-74A and 3-74B have a Maximum allowable deviation of 40 psig, AND 3-PIS-3-22D, 3-PIS-3-22C, 3-PIS-3-22BB, & 3-PIS-3-22AA, have a Maximum allowable deviation of 60 psig. No comparison is required between the 3-74A(B) and 3-PIS-3-22D(C)(BB)(AA).

(3) 3-74A and 3-74B SHALL be ≤ 1050 psig. 3-PIS-3-22D, 3-PIS-3-22C, 3-PIS-3-22BB, & 3-PIS-3-22AA SHALL be ≤ 1090 psig.

(4) 3-74A and 3-74B are to be recorded at 0800. The Auxiliary Instrument Room readings are not required to be taken at precisely 0800.

(5) Following a change to Reactor Power and/or Pressure, verify the Steam Dome Limits are within the 0-TI-248, Administrative Limits and Design Analysis Limits (Appendix S)

FINAL

OPERATOR: _____

RO ____ SRO ____ DATE:_____

JPM NUMBER: Admin SRO A1b

TASK NUMBER: Conduct of Operations

TASK TITLE: NRC Event Notification

K/A NUMBER: 2.1.18 K/A RATING: SRO 3.8

PRA: 1.5% CDF Contribution

TASK STANDARD: Determine NRC Event Notification requirements and Technical Specification actions required.

LOCATION OF PERFORMANCE: Class Room

REFERENCES/PROCEDURES NEEDED: NPG-SPP-03.5

VALIDATION TIME: 10 minutes

MAX. TIME ALLOWED: (Completed for Time Critical JPMs only)

PERFORMANCE TIME:

COMMENTS: _____

_____

_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: Unit 1 is in Mode 1 at 100% Reactor Power. 1-SR-3.5.1.1(HPCI), MAINTENANCE OF FILLED DISCHARGE PIPING, is in progress and it is discovered that 1-FCV-73-44, HPCI PUMP INJECTION VALVE, failed to open from the Control Room with handswitch, 1-HS-73-44A.

INITIATING CUE: As the Shift Manager, evaluate these plant conditions for appropriate notifications and technical specification actions, if any, and document your conclusions on the correct form(s), if necessary. The valve failed to open 30 minutes ago.

****

Class Room

****

INITIAL CONDITIONS: Unit 1 is in Mode 1 at 100% Reactor Power. 1-SR-3.5.1.1(HPCI), MAINTENANCE OF FILLED DISCHARGE PIPING, is in progress and it is discovered that 1-FCV-73-44, HPCI PUMP INJECTION VALVE, failed to open from the Control Room with handswitch, 1-HS-73-44A.

INITIATING CUE: As the Shift Manager, evaluate these plant conditions for appropriate notifications and technical specification actions, if any, and document your conclusions on the correct form(s), if necessary. The valve failed to open 30 minutes ago.

START TIME_____

****

Performance Step 1: Critical X Not Critical

Refers to Technical Specification Section 3.5.1

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of six safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to HPCI.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. HPCI System inoperable.	C.1	Verify by administrative means RCIC System is OPERABLE.	Immediately
	AND		
	C.2	Restore HPCI System to OPERABLE status.	14 days

Standard:

Determines that Tech Spec LCO 3.5.1 is applicable and the plant is not in compliance. Determines Condition C applies and the required action is to verify by administrative means that RCIC is OPERABLE and restore HPCI to OPERABLE status within 14 days.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical X Not Critical

Evaluates NPG-SPP-03.5

Appendix A: 3.1.D.4. (4)

4. §50.72(b)(3)(v) - Any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(A) Shut down the reactor and maintain it in a safe shutdown condition;

(B) Remove residual heat;

(C) Control the release of radioactive material; or

(D) Mitigate the consequences of an accident.

Standard:

Determines an 8-Hr Non-Emergency notification is required.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

Examiner Note:	When/If candidate determines that NPG-SPP-03.5-1 – NRC Form 361, Event Notification Worksheet is required (Attachment 1 of NPG-SPP-03.5), then provide candidate with a blank copy of the form.

****

Performance Step 3: Critical X Not Critical

Completes Attachment 1, NPG-SPP-3.5-1 - NRC Event Notification Worksheet

Standard:

Under Event Classification a check in box for 50.72 Non-Emergency

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 4: Critical X Not Critical

Complete Attachment 1, NPG-SPP-3.5-1 - NRC Event Notification Worksheet

Standard:

Under 8-Hr Non-Emergency 10CFR50.72 (b) (3) a check in the box (v) (D) Accident Mitigation AIND

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 5: Critical __ Not Critical X

Complete NPG-SPP-3.5-1 - NRC Event Notification Worksheet

Standard:

Power/Mode Before will be 100%/Mode 1; Power/Mode After will be 100%/Mode 1 and a brief description stating that the HPCI Pump Injection Valve failed to open, therefore affecting accident mitigation.

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

CUE: JPM complete once an entry is made in description block on first page, Additional Information page not required to be completed.

END OF TASK

STOP TIME ___

*** Answer Key ***

Attachment 1
(Page 4 of 5)

NPG-SPP-03.5-1 - NRC Form 361, Event Notification Worksheet

NRC EVENT NOTIFICATION WORKSHEET
Page 1 of 2

U.S. NUCLEAR REGULATORY COMMISSION
OPERATIONS CENTER

NRC EVENT NOTIFICATION WORKSHEET EN # XXX

NRC OPERATION TELEPHONE NUMBER: PRIMARY - 301-816-5100 OR 800-532-3469, BACKUP - [1st] 301-951-0500 or 800-449-3694 [2nd] 301-415-0550 AND [3rd] 301-415-0553

NOTIFICATION TIME	FACILITY OR ORGANIZATION	UNIT	NAME OF CALLER	CALL BACK #
Current	BFN	1	(Name)	(Phone #)

EVENT TIME & ZONE	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER
time / CST	Today	100% / Mode 1	100% / Mode 1

EVENT CLASSIFICATIONS		1-Hr Non-Emergency 10 CFR 50.72(b)(1)			4-Hr Non-Emergency 10 CFR 50.72(b)(2)			8-Hr Non-Emergency 10 CFR 50.72(b)(3)		
☐	GENERAL EMERGENCY Gen/AAEC	☐	TS Deviation ADEV		☐	(i) TS Required S/D ASHU		☐	(ii)(A) Degraded Condition ADEG	
☐	SITE AREA EMERGENCY SIT/AAEC				☐	(iv)(A) ECCS Discharge to RCS ACCS		☐	(ii)(B) Unanalyzed Condition AUNA	
☐	ALERT ALE/AAEC				☐	(iv)(B) RPS Actuation (scram) ARPS		☐	(iv)(A) Specified System Actuation AESF	
☐	UNUSUAL EVENT UNU/AAEC				☐	(x) Offsite Notification APRE				
☒	50.72 NON-EMERGENCY (see next columns)									
☐	PHYSICAL SECURITY (73.71) DDDD									
☐	MATERIAL/EXPOSURE B???									
☐	FITNESS FOR DUTY HFIT									
☐	Other Unspecified Reqmt. (see last column)									
☐	INFORMATION ONLY NINF									

☐	(v)(A) Safe S/D Capability AINA	☐	(v)(B) RHR Capability AINB	☐	(v)(C) Control of Rad Release AINC	☒	(v)(D) Accident Mitigation AIND	☐	(xii) Offsite Medical AMED
☐	(xiii) Lost Comm/Asmt/Resp ACOM								

60-Day Optional 10 CFR 50.73(a)(1)		Other Unspecified Requirement (identify)	
☐	Invalid Specified System Actuation AINV	☐	NONR
		☐	NONR

DESCRIPTION

Include: Systems affected, actuations & their initiating signals, causes, effect of event on plant, actions taken or planned, etc. (Continue on page 2)

Unanticipated loss of Unit 1 HPCI injection capability. Unit 1 HPCI is required to be operable to mitigate an accident that does not result in depressurization of the Reactor.

Technical Specification 3.5.1
Condition C
Actions C.1 and C.2

NOTIFICATIONS	YES	NO	WILL BE
NRC RESIDENT	☒	☐	☐
STATE(s)	☐	☒	☐
LOCAL	☐	☒	☐
Other Gov Agencies	☐	☒	☐
Media/Press Release	☐	☒	☐

Anything Unusual or Not Understood? ☐ Yes *(Explain above)* ☒ No

Did All Systems Function As Required? ☐ Yes ☒ No *(Explain above)*

Mode of Operation Until Corrected: Mode 1 | Estimated Restart Date: N/A | Additional INFO on page 2? ☐ Yes ☒ No

*** Student Handout ***

Attachment 1
(Page 4 of 5)

NPG-SPP-03.5-1 - NRC Form 361, Event Notification Worksheet

NRC EVENT NOTIFICATION WORKSHEET
Page 1 of 2

U.S. NUCLEAR REGULATORY COMMISSION
OPERATIONS CENTER

NRC EVENT NOTIFICATION WORKSHEET EN # _____

NRC OPERATION TELEPHONE NUMBER: PRIMARY - 301-816-5100 OR 800-532-3469, BACKUP - [1st] 301-951-0500 or 800-449-3694 [2nd] 301-415-0550 AND [3rd] 301-415-0553

NOTIFICATION TIME	FACILITY OR ORGANIZATION	UNIT	NAME OF CALLER	CALL BACK #

EVENT TIME & ZONE	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER

EVENT CLASSIFICATIONS		1-Hr Non-Emergency 10 CFR 50.72(b)(1)			1-Hr Non-Emergency 10 CFR 50.72(b)(1)		
☐	GENERAL EMERGENCY Gen/AAEC	☐	TS Deviation	ADEV	☐ (v)(A)	Safe S/D Capability	AINA
☐	SITE AREA EMERGENCY SIT/AAEC	4-Hr Non-Emergency 10 CFR 50.72(b)(2)			☐ (v)(B)	RHR Capability	AINB
☐	ALERT ALE/AAEC	☐ (i)	TS Required S/D	ASHU	☐ (v)(C)	Control of Rad Release	AINC
☐	UNUSUAL EVENT UNU/AAEC	☐ (iv)(A)	ECCS Discharge to RCS	ACCS	☐ (v)(D)	Accident Mitigation	AIND
☐	50.72 NON-EMERGENCY *(see next columns)*	☐ (iv)(B)	RPS Actuation (scram)	ARPS	☐ (xi)	Offsite Medical	AMED
☐	PHYSICAL SECURITY (73.71) DDDD	☐ (xi)	Offsite Notification	APRE	☐ (xii)	Lost Comm/Asmt/Resp	ACOM
☐	MATERIAL/EXPOSURE B???	8-Hr Non-Emergency 10 CFR 50.72(b)(3)			60-Day Optional 10 CFR 50.73(a)(1)		
☐	FITNESS FOR DUTY HFIT	☐ (ii)(A)	Degraded Condition	ADEG	☐	Invalid Specified System Actuation	AINV
☐	Other Unspecified Reqmt. (see last column)	☐ (ii)(B)	Unanalyzed Condition	AUNA	Other Unspecified Requirement (Identify)		
☐	INFORMATION ONLY NINF	☐ (iv)(A)	Specified System Actuation	AESF	☐		NONR
					☐		NONR

DESCRIPTION

Include: Systems affected, actuations & their initiating signals, causes, effect of event on plant, actions taken or planned, etc. (Continue on page 2)

NOTIFICATIONS	YES	NO	WILL BE
NRC RESIDENT	☐	☐	☐
STATE(s)	☐	☐	☐
LOCAL	☐	☐	☐
Other Gov Agencies	☐	☐	☐
Media/Press Release	☐	☐	☐

Anything Unusual or Not Understood?	☐ Yes *(Explain above)*	☐ No	
Did All Systems Function As Required?	☐ Yes	☐ No *(Explain above)*	
Mode of Operation Until Corrected:	Estimated Restart Date:	Additional INFO on page 2? ☐ Yes ☐ No	

*** Student Handout ***

Attachment 1
(Page 5 of 5)

NPG-SPP-03.5-1 - NRC Form 361, Event Notification Worksheet

NRC EVENT NOTIFICATION WORKSHEET
Page 2 of 2

RADIOLOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)					
☐ Liquid Release	☐ Gaseous Release	☐ Unplanned Release	☐ Planned Release	☐ Ongoing	☐ Terminated
☐ Monitored	☐ Unmonitored	☐ Offsite Release	☐ T.S. Exceeded	☐ RM Alarms	☐ Areas Evacuated
☐ Personnel Exposed or Contaminated		☐ Offsite Protective Actions Recommended		*State release path in description.	

	Release Rate (Ci/sec)	% T. S. Limit	HOO Guide	Total Activity (Ci)	% T.S. Limit	HOO Guide
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 uCi/sec			0.01 Ci
Particulate			1 uCi/sec			1 mCi
Liquid *(excluding tritium & dissolved noble gases)*			10 uCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

	Plant Stack	Condenser/Air Ejector	Main Steam Line	SG Blowdown	Other
RAD Monitor Readings:					
Alarm Setpoints:					
% T.S. Limit *(if applicable)*					

RCS or SG Tube Leaks: Check or Fill in Applicable Items: *(specific details/explanations should be covered in event description)*

LOCATION OF THE LEAK *(e.g., SG #, valve, pipe, etc.)*

LEAK RATE	UNITS: gpm/gpd	T. S. LIMITS	SUDDEN OR LONG TERM DEVELOPMENT
LEAK START DATE	TIME	COOLANT ACTIVITY & UNITS	PRIMARY - SECONDARY -

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL

EVENT DESCRIPTION *(Continued from page 1)*

FINAL

OPERATOR: _____

RO ____ SRO ____ DATE: _____

JPM NUMBER: RO A2

TASK NUMBER: Equipment Control

TASK TITLE: 3-SI-4.7.A.2.A - Primary Containment Nitrogen Consumption and Leakage

K/A NUMBER: 2.2.12 K/A RATING: RO 3.7 SRO 4.1

PRA:

TASK STANDARD: Perform section 7.8 of 3-SI-4.7.A.2.A and determine Average Nitrogen Leakage does not meet Acceptance Criteria

LOCATION OF PERFORMANCE: Classroom

REFERENCES/PROCEDURES NEEDED: 3-SI-4.7.A.2.A

VALIDATION TIME: 10 minutes

MAX. TIME ALLOWED:

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are an extra Operator. The time is 2400 hours. The plant is in Mode 1. 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage, is in progress and has been completed thru section 7.7.

INITIATING CUE: The Unit Supervisor (US) directs you to complete 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage.

****

Class Room

****

INITIAL CONDITIONS: You are an extra Operator. The time is 2400 hours. The plant is in Mode 1. 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage, is in progress and has been completed thru section 7.7.

INITIATING CUE: The Unit Supervisor (US) directs you to complete 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage.

START TIME _____

****

Performance Step 1: Critical __ Not Critical X

7.8 Average Nitrogen Consumption and Leakage

7.8.1 Attachment 7 – Section A – Net Nitrogen Leakage

[1] Total Drywell Control Leakage, - **RECORD** the Total Drywell Control Air Leakage from Attachment 2 in the Gas Addition to the Drywell table.

Standard:

Refers to Attachment 2 and records 1017.40 ft^3 for Total Drywell Control Air Leakage on Attachment 7

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical __ Not Critical X

[2] Cumulative Nitrogen Makeup, - **RECORD** the total cumulative nitrogen makeup from Attachment 4 Section A in the Gas Addition to the Drywell table.

Standard:

Refers to Attachment 4 and records 9912 ft^3 for cumulative nitrogen makeup on attachment 7

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 3: Critical X Not Critical

[3] **CALCULATE** the Total Gas Addition as follows:

ADD all the Gas addition types together from the Gas Addition Table and **RECORD** the sum as the Total Gas Addition in the Gas Addition to the Drywell table.

Standard:

Adds the Total Drywell Control Air Leakage and the Cumulative Nitrogen Makeup and determines the Total Gas Addition is 10929.40 ft^3.

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

****

Performance Step 4: Critical __ Not Critical X

[4] Total Drywell and Suppression Chamber Temperature Correction, - **RECORD** the TOTAL VENTING CORRECTION from Attachment 3, Section A in the Correction Factor table.

Standard:

Refers to Attachment 3 and records 0 ft^3 for Total DW and SC Temperature Correction on Attachment 7

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

****

Performance Step 5: Critical __ Not Critical X

[5] Total Suppression Chamber Level Correction, - **RECORD** the total Suppression Chamber level correction from Attachment 1, Section A in the Correction Factor table.

Standard:

Refers to Attachment 1 and records (-)682.35 ft^3 for Total DW and SC Temperature Correction on Attachment 7

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 6: Critical __ Not Critical X

[6] Total Venting Correction using 3-FIC 84-20, - **RECORD** the total Drywell Venting Correction from Attachment 5, Section A in the Correction Factor table.

Standard:

Refers to Attachment 5 and records 0 ft^3 for Total Venting Correction using 3-FIC 84-20 on Attachment 7 due to no venting performed during previous 24 hours

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 7: Critical __ Not Critical X

[7] Total Alternate Venting Correction, - **RECORD** the total Drywell Venting Correction from Attachment 6, Section B in the Correction Factor table.

Standard:

Refers to Attachment 6 and records 0 ft^3 for Total Alternate Venting Correction on Attachment 7 due to no venting performed during previous 24 hours

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 8: Critical X Not Critical

[8] **CALCULATE** the the Total Correction Factor as follows:

ADD all the Correction Factor Types together from the Correction Factor Table and **RECORD** the sum as the Total Correction Factor in the Correction Factor table.

Standard:

Adds the Total Suppression Chamber Level Correction, the Total Venting Correction using 3-FIC 84-20, and the Total Alternate Venting Correction together and determines the Total Correction Factor is (-)682.35 ft^3

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 9: Critical X Not Critical

[9] **CALCULATE** the Net Nitrogen Leakage as follows:

Total Gas Addition for the Net Nitrogen Leakage and **SUBTRACT** the Air Temperature calculation and **SUBTRACT** the Total Correction Factor.

Standard:

Subtracts the Total DW and SC Temperature Correction and the Total Correction Factor from the Total Gas Addition and determines the Net Nitrogen Leakage

10929.40 ft^3 – 0 ft^3 – (-)682.35 ft^3 = **11611 ± 1.0 ft^3**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 10: Critical X Not Critical

7.8.2 Attachment 7 – Section B – Average Nitrogen Leakage

Cue: There is an identified Procedure Error, Section 7.8.2 [1] should read: "MULTIPLY the net nitrogen leakage from Attachment 7, Section A, (Nitrogen Leakage table), by (1.136/Hours during the day).

[1] **MULTIPLY** the net nitrogen leakage from Attachment 6 **(should read Attachment 7)**, Section A, (Nitrogen Leakage table), by (1.136/Hours during the day).

[2] **RECORD** the result on the Average Nitrogen Leakage line.

Standard:

Multiplies Net Nitrogen Leakage of 11611 ± 1.0 ft^3 (obtained from Attachment 7, Section A) by 1.136 and divides by 24 hours to determine an Average Nitrogen Leakage of 549.62 ± 2.0 SCFH. Determines that the Average Nitrogen Leakage is greater than 542 SCFH (AC) and does not initial for the Acceptance Criteria. Checks "No" on the Surveillance Task Sheet (STS) for "Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot reqt AMSAC* acceptance criteria satisfied."

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

END OF TASK

STOP TIME _____

*** Answer Key ***

Surveillance Task Sheet (STS)

WO: 111807079 **PM#:** P3402

Procedure: 3-SI-4.7.A.2.A

Title: 3-SI-4.7.A.2.A – PRIMARY CONTAINMENT NITROGEN CONSUMPTION AND LEAKAGE

Data Sheets Attached:

Perf Grp: OPS **Unit:** 3 **Loop/Div:**

Test Reason: Conditional

Due Date:

Frequency: 1 Days **Tech Spec:** **ASME XI:**

Applicable Modes: **Perf Modes:** Mode 1

Clearance Required: **EQ:** **LCO entered:**

Dry Cask Storage: N

Authorization to Begin: SRO — Today / Midnight (Date & Time)

Today / 0000 (Start Date & Time) — Date / Time (Completion Date & Time)

Performed By:

Print Name	Signature	Initial	Section
Jordan Ruby		JR	OPS
Candidate Name	sign	Int.	OPS

Was this a Complete or Partial Performance? (Explain Partial in REMARKS below) Complete [X] Partial [ ]

Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/ AMSAC* acceptance criteria satisfied? Yes [ ] No [X] N/A [ ] * Critical Step

Were all other acceptance Criteria satisfied? Yes [ ] No [ ] N/A [X]

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* Criteria were not satisfied, was a LCO/ODCM action required? (Explain in REMARKS below) Yes [X] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date

N/A (Test Director) — sign (Lead Performer) — date (Date)

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

REMARKS: Acceptance Criteria not satisfied due to Average Nitrogen Leakage being greater than allowed Nitrogen Leakage (Average)

*** Answer Key ***

Attachment 7
(Page 1 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

A. Net Nitrogen Leakage (Section 7.8)

1. **SUM** all Gas additions to obtain the Total Addition:

Gas Addition to the Drywell	
Total Drywell Control Air Leakage	1017.40 ft^3 Attachment 2, Section A
Cumulative Nitrogen Makeup	+ 9912 ft^3 Attachment 4, Section A
Total Gas Addition	= 10929.40 ft^3

2. Air Temperature Correction

Air Temperature	
Total DW and SC Temperature Correction	Ø ft^3 Attachment 3, Section A

3. **SUM** all the Correction Factors to obtain a Total Correction Factor:

Correction Factor	
Total Supp Chamber Level Correction	-682.35 ft^3 Attachment 1, Section B
Total Venting Correction using 3-FIC 84-20	Ø ft^3 Attachment 5, Section A
Total Alternate Venting Correction	+ Ø ft^3 Attachment 6, Section B
Total Correction Factor	= -682.35 ft^3

4. **CALCULATE** Net Nitrogen leakage:

Total Gas Addition - Total DW and SC Tempe Correction - Total Correction Factor

Nitrogen Leakage	
Total Gas Addition	10929.40 ft^3 (Step 1 above)
Total DW and SC Temperature Correction	- Ø ft^3(Step 2 above)
Total Correction Factor	- -682.35 ft^3(Step 3 above)
Net Nitrogen Leakage	= 11611.75 ft^3

11611 ± 1.0 ft^3

* * * Answer Key * * *

Attachment 7
(Page 2 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

NOTES

1) For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.

2) The average nitrogen leakage (adjusted) must be <542 SCFH (Step 6.0A.1). Notify the Unit Supervisor (US) if the nitrogen leakage exceeds 542 SCFH (Refer to 3-AOI-64-7 and Tech Specs 3.6.1.1.).

B. Average Nitrogen Leakage (Section 7.8.2)

CALCULATE the Average Nitrogen Leakage

$$\text{Avg. Nitrogen Leakage} = \frac{\text{Net nitrogen leakage} \times 1.136}{\text{Hours during the day}} =$$

$$\text{Avg. Nitrogen Leakage} = \frac{(1161.75\ \text{ft}^3) \times 1.136}{(24\ \text{Hours})}$$

Avg. Nitrogen Leakage $\frac{549.62}{(\text{AC})}$ SCFH

549.62 ± 2.0 SCFH

Candidate does not initial

(AC)
UO

IV

*** Student Handout ***

Surveillance Task Sheet (STS)

WO: 111807079 PM#: P3402

Procedure: 3-SI-4.7.A.2.A

Title: 3-SI-4.7.A.2.A – PRIMARY CONTAINMENT NITROGEN CONSUMPTION AND LEAKAGE

Data Sheets Attached:

Perf Grp: OPS Unit: 3 Loop/Div:

Test Reason: Conditional

Due Date:

Frequency: 1 Days Tech Spec: ASME XI:

Applicable Modes: Perf Modes: Mode 1

Clearance Required: EQ: LCO entered:

Dry Cask Storage: N

Authorization to Begin: SRO — TODAY / MIDNIGHT (Date/& Time)

TODAY / 0000 (Start Date & Time) — (Completion Date & Time)

Performed By:

Print Name	Signature	Initial	Section
JORDAN RUBY		JR	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/ AMSAC* acceptance criteria satisfied? Yes [ ] No [ ] N/A [ ]

Were all other acceptance Criteria satisfied? Yes [ ] No [ ] N/A [ ]

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* Criteria were not satisfied, was a LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date

Test Director — Lead Performer — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

REMARKS:

Browns Ferry Nuclear Plant

Unit 3

Surveillance Instruction

3-SI-4.7.A.2.A

Primary Containment Nitrogen Consumption and Leakage

Revision 0024

Quality Related

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P3402

Effective Date: 02-29-2012

Responsible Organization: OPS, Operations

Prepared By: J D Savage

Approved By: Jeffery D. Morrison

Current Revision Description

Type of Change: Enhancements. Tracking Number: 028

PCR's: 11000391

PERs none

Documentation None

Minor changes to correct typo's and align step with attachments. This PCR was written for U1 but applies to U3 also.

Table of Contents

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Purpose

This Surveillance Instruction provides the necessary steps to monitor the primary containment nitrogen consumption rate (i.e., primary containment system leakage) in compliance with the requirements in Technical Specification 3.6.1.1 and TRM 3.6.2, and 3.6.5.

1.2 Scope

Primary containment nitrogen consumption is monitored to determine the average daily nitrogen consumption. Corrections are made for Suppression Chamber level changes and Drywell/Suppression Chamber venting that may occur. The average nitrogen leakage is calculated using data gathered during the day of this test.

For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.

1.3 Frequency

This Surveillance Instruction shall be performed each day (24-hour duration except the days converting to Daylight Saving Time and returning to Central Standard Time) and reviewed each shift while the reactor is in the RUN mode (Mode 1) and primary containment is inerted.

This procedure is initially started when the conditions are met during Reactor Startup and remains in process until the following Midnight (2400 Hours).

This procedure should be initiated at Midnight (0000 Hours) and remain in process for a 24 Hour period (until the following Midnight (2400 Hours)) or when conditions are no longer met during Reactor Shutdown per Tech Specs..

2.0 REFERENCES

2.1 Technical Specifications

Section 3.6.1.1, Primary Containment

2.2 Technical Requirements Manual - TRM

Section 3.6.2, Oxygen Concentration Monitors

Section 3.6.5, Nitrogen Makeup to Containment

2.3 Final Safety Analysis Report

Section 5.2.2.8, Primary Containment-Safety Design Basis

Section 5.2.3.8, Containment Inerting System

Section 5.2.4.5, Primary Containment Leakage Analysis

Section 5.2.5.1, Primary Containment Integrity and Leak-Tightness

Table 5.2-1, Principal Design Parameters and Characteristics of Primary Containment

2.4 Plant Instructions

3-AOI-64-7, Primary Containment N_2 Usage High

0-OI-57C, 208/120V AC Electrical System Operating Instructions

3-OI-64, Primary Containment System Operating Instructions

3-OI-84, Containment Atmosphere Dilution System

NPG-SPP-06.9.1, Conduct of Testing

NPG-SPP-06.9.2, Surveillance Test Program

2.5 Plant Drawings

1-47E610-76-1, Mechanical Control Diagram Containment Inerting System

3-47E610-64-1, 2, 3, Mechanical Control Diagram Primary Containment System

3-47E610-76-1, Mechanical Control Diagram Containment Inerting System

1-47E860-1, Flow Diagram Containment Inerting System

3-47E860-1, Flow Diagram Containment Inerting System

2.6 Plant Generated Calculations

PGC-003-064-0, Change in Torus Free Volume Per 1" of Water Level

2.7 Miscellaneous

BFPER970886, Calculating Leakage when CAD is cross-tied to Drywell Control Air

3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

A. This procedure should be initiated at Midnight (0000 Hours) and remain in process for a 24 Hour period (until the following Midnight (2400 Hours)).

B. If it is necessary to begin a new revision to the procedure before the time period is completed, then the appropriate data must be transferred to the new document and the two procedures maintained together.

C. For an INDEPENDENT REVIEWER signature, the STA or SRO cannot perform any actions or signoffs in the body of the procedure. This will ensure an adequate review of the procedure.

3.2 Operability and LCO's

A. If Nitrogen leakage exceeds 542 SCFH, 3-AOI-64-7 and TECH SPECS must be referred to for further action.

1. If 24-Hour average N_2 makeup to the primary containment is > 542 scfh, then Primary Containment must be declared INOP immediately. (Refer to LCO 3.6.1.1.)

B. If the nitrogen consumption demonstrates a trend that will be greater than 542 SCFH for the 24-hour period, notify the Unit Supervisor (US) immediately.

3.3 Equipment

A. When a Drywell Control Air Totalizer is inop, the DWCA System Engineer will use the AUO Rounds to determine the average flow to be used for N2 Drywell Control Air Flow.

B. When a Drywell Control Air Totalizer is INOP and a break or a leak occurs in the drywell from an air line, then the number of times the drywell is vented will rise based upon the severity of the leak or break. System Engineering should monitor and address any raise in Venting Requirements to determine if it is caused by a Drywell Control Air Line leak or due to atmospheric conditions.

3.4 Initiation/Isolation/Trips

None

3.5 Interlocks

None

3.6 Performance Testing

A. Since changes in Suppression Chamber level change the Suppression Chamber free volume, the Torus atmospheric pressure will change, although nitrogen may not have been lost or added.

1. The Suppression Chamber level may change for any number of events such as venting the drywell/suppression chamber, pumping down the Suppression Chamber, MSRVs Leakage or testing Core Spray, RHR, HPCI, or RCIC Systems.

2. The correction for level changes is based on the assumption that the Suppression Chamber level change is relatively small (-1" to -7.25" indicated level) allowing the effect of Suppression Chamber curvature to be neglected. Therefore, the 909.8 cubic feet change in volume per one inch change in Suppression Chamber level is assumed constant.

B. Changes in either the Drywell or Suppression Chamber Air Temperature would cause a change in Containment Pressure under idea conditions. Due to the continuous Drywell Control Air addition and possible venting during the 24 hour period the changes in containment pressures may not be as expected. Therefore when a change of more than 2 °F in either area occurs a Temperature Correction will be performed for that area's Air Temperature, otherwise zero "0" will be used for the correction factor.

C. For Sections 7.5and 7.7.2 if one pressure indicator and/or differential indicator is inoperable, (NA the appropriate column on the Attachment, note the inop indicator on Attachment 3 and 6, and delete dividing by 2 for that particular term in the equation.)

D. Attachment 3, Section B should be used to calculate the venting correction factor when any of the following instrumentation is unavailable.

1. Both DRYWELL PRESSURE, 3-PI-64-135 and 3-PI-64-136

2. DRYWELL TEMPERATURE, 3-TI-64-52AB

E. Attachment 4, Section B should be used to calculate the venting correction factor when any of the following instrumentation is unavailable.

1. Both DRYWELL PRESSURE, 3-PI-64-135 and 3-PI-64-136

2. Both DW/SUPPR CHBR DIFF PRESS, 3-PDI-64-137 and 3-PDI-64-138

3. DRYWELL TEMPERATURE, 3-TI-64-52AB

4. SUPPR POOL WATER LEVEL, 3-LI-64-54A and 3-LI-64-66

3.6 Performance Testing (continued)

F. Drywell/Suppression Chamber venting may be required to maintain Drywell pressure within limits during changes in barometric pressure, maintenance on Drywell Delta P Air Compressors, or other similar events. When using the Alternate Venting Correction equation in Attachment 6, the following assumptions are used.

1. The Drywell free volume is 159,000 cubic feet.

2. The Suppression Chamber free volume is 126,200 cubic feet at -1 inches (3-LI-64-54A or 66, Suppr Pool Water Level), and an additional 909.8 cubic feet of free volume for each inch that water level is lowered.

3. The actual venting process is a rapid event so barometric pressure changes can be neglected.

4. The average Drywell temperature change is represented by DRYWELL TEMPERATURE indicator 3-TI-64-52AB, and DRYWELL TEMPERATURE/PRESSURE recorder 3-XR-64-50.

5. Drywell and Suppression Chamber nitrogen pressures are low enough to use the ideal gas law as a model, i.e.

$$V_C = 1 - \left[\frac{P_B T_A}{P_A T_B}\right] \times V_t$$

Where:		
	V_C=	Venting Correction
	P_B=	Drywell or Suppression Chamber pressure before venting
	P_A=	Drywell or Suppression Chamber pressure after venting
	T_B=	Drywell or Suppression Chamber temperature before venting
	T_A=	Drywell or Suppression Chamber temperature after venting
	V_t=	Total free volume of Drywell or Suppression Chamber

6. The Suppression Chamber water and atmospheric temperatures are in equilibrium.

Date: TODAY

4.0 PREREQUISITES

[1] **VERIFY** this instruction to be the most current revision. JR

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P3402) JR

[3] **VERIFY** Cabinet 2, Panel 9-9 is energized in accordance with 0-OI-57C, 208/120V AC Electrical System Operating Instruction. JR

5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

A. Calculator

6.0 ACCEPTANCE CRITERIA

A. Responses which fail to meet the following acceptance criteria constitute unsatisfactory surveillance instruction results and require the immediate notification of the Unit Supervisor at the time of failure:

1. Nitrogen makeup to the primary containment, averaged over 24 hours (corrected for Suppression Chamber level changes and Drywell/Suppression Chamber venting) is less than 542 standard cubic feet per hour (SCFH).

B. Steps which determine the above criteria are designated by (AC) next to the initials blank.

Date: TODAY

NOTES

1) This procedure should be initiated at Midnight which is represented as (0000 Hours) and remain in process for a 24 Hour period (until the following Midnight which is represented as (2400 Hours)). These times are used to represent the difference from the start and the completion of this SR and may not match the proper military times that is used by the electronic narrative logs.

2) If it is necessary to stop this procedure and recommence with a new revision before the time period is completed, the appropriate data must be transferred to the new document and the two procedures maintained together..

7.0 PROCEDURE STEPS

7.1 Initial Requirements And Notifications

[1] **VERIFY** the Precautions and Limitations in Section 3.0 have been reviewed. JR

[2] **VERIFY** the Prerequisites in Section 4.0 are satisfied. JR

[3] On the Surveillance Task Sheet (STS)

OBTAIN Authorization Signature and Date/Time from the Unit Supervisor/SRO to perform this surveillance. JR

[4] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. JR

[5] **RECORD** the date on each data sheet Attachments 1 through 7. JR

Date: TODAY

NOTES

1) This procedure should be initiated by the midnight shift Unit Supervisor or by the Unit Supervisor of any shift meeting the requirements of Section 1.3.

2) For the first run of the 24-hour period, the previous cumulative total is zero since totals are not carried over from the previous 24-hour test.

7.2 **Data Collection As Close To Midnight (0000 Hour) As Possible**

[1] **RECORD** on Attachment 1 Part A, the initial Suppression Pool Level (0000 Hour), in column (1) for each of the following instruments (if available) on Panel 9-3.

- SUPPR POOL WATER LEVEL, 3-LI-64-54A
- SUPPR POOL WATER LEVEL, 3-LI-64-66 JR

[2] **RECORD** on Attachment 2 in the "INITIAL" column, the Drywell Control Air Loop A flow from the N2 Containment Inerting system, from one of the following:

- DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 (Rx Bldg El 565' R16 S Line).

  OR

- Average flow as determined by the DWCA System Engineer if 3-FIQ-032-0092 is INOP. (Reference Step 3.3A) JR

[3] **RECORD** on Attachment 2 in the "INITIAL" column, the Drywell Control Air Loop B flow from the N2 Containment Inerting system, from one of the following:

- DWCA FLOW ELEMENT HEADER B, 3-FIQ-032-0075 (Rx Bldg El 565' R20 Q Line).

  OR

- Average flow as determined by the DWCA System Engineer if 3-FIQ-032-0075 is INOP. (Reference Step 3.3A) JR

Date: TODAY

7.2 **Data Collection As Close To Midnight (0000 Hour) As Possible (continued)**

[4] **RECORD** on Attachment 3 in the 0000 Hours the following data.

- Drywell Pressure 3-PI-64-135
- Drywell Pressure 3-PI-64-136
- Drywell Temperature 3-TI-64-52AB
- Drywell Differential Pressure 3-DPI-64-137
- Drywell Differential Pressure 3-DPI-64-138
- SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

JR

NOTE

The correction for level changes is based on the assumption that the Suppression Chamber level change is relatively small (-1" to -7.25" indicated level) allowing the effect of Suppression Chamber curvature to be neglected. Therefore, the 909.8 cubic feet change in volume per one inch change in Suppression Chamber level is assumed constant.

7.3 **Suppression Chamber Level**

7.3.1 **Attachment 1 - Section A- Suppression Chamber Level Corrections Data**

[1] At the beginning of the surveillance (0000 hours), **RECORD** the Suppr Pool Water Level from indicators 3-LI-64-54A and 3-LI-64-66 on Panel 9-3, in column (1) for each available instrument.

[2] At the end of the surveillance (2400 hours), **RECORD** the Suppression Chamber level from indicators 3-LI-64-54A and 3-LI-64-66 on Panel 9-3, in column (2), for each available instrument.

[3] **IF** both instruments are available, 3-LI-64-54A and 3-LI-64-66, **THEN**

SUBTRACT column (2) from column (1) to determine the amount of change in Suppression Chamber level and **RECORD** in column (3) (negative numbers are possible).

[4] For each instrument 3-LI-64-54A and 3-LI-64-66, **CALCULATE** the change in Suppression Chamber free volume as standard cubic feet (SCF) by multiplying column (3) by column (4) (909.8 ft^3/in.) and **RECORD** in column (5).

7.3.2 **Attachment 1 - Section B - Total Suppression Chamber Level Correction**

- **IF** both (64-54A & 64-66) instrument are available, **THEN**

  ADD column (5) for each instrument and **DIVIDE** by two (for calculating the average) and **RECORD** results as the Total Suppression Chamber Level Correction blank.

- **IF** an instrument is unavailable, **THEN**

  USE only the operable instrument and **ENTER** the column (5) value for the operable instrument as Total Suppression Chamber Level Correction blank.

7.4 Calculating the Drywell Control Air leakage

7.4.1 Attachment 2 - Calculate the Drywell Control Air Line A leakage

[1] At the beginning of the surveillance (0000 hours), **RECORD** the DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 in the column (2) "INITIAL (0000 hours)".

[2] At the end of the surveillance (2400 hours), **RECORD** the DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 in the Column (1) "ENDING (2400 hours)"

[3] **CALCULATE** the daily difference for Drywell Control Air Loop A, 3-FIQ-032-0092.

Column (1) - Column (2) = Difference (Column 3)

7.4.2 Attachment 2 - Calculate the Drywell Control Air Line B leakage

[1] At the beginning of the surveillance (0000 hours), **RECORD** the DWCA FLOW ELEMENT HEADER B, 3-FIQ-032-0075 in the column (2) "INITIAL (0000 hours)".

[2] At the end of the surveillance (2400 hours), **RECORD** the DWCA FLOW ELEMENT HEADER B, 3-FIQ-032-0075 in the Column (1) "ENDING (2400 hours)"

[3] **CALCULATE** the daily difference for Drywell Control Air Loop A, 3-FIQ-032-0075.

Column (1) - Column (2) = Difference (Column 3)

7.4.3 Calculate The Total Drywell Control Air Leakage

- **SUM** the Drywell Control Air Loop A, 3-FIQ-032-0092 Difference and Drywell Control Air Loop B, 3-FIQ-032-0075 Difference.

3-FIQ-032-0092 (Difference) + 3-FIQ-032-0075 (Difference) = Total

Date: TODAY

7.5 **Air Temperature Correction**

7.5.1 **Attachment 3 - Section A - Drywell and Suppression Chamber Data**

[1] At the beginning of the surveillance (0000 hours), **RECORD** on Attachment 3 in the 0000 Hours the following data.

- DRYWELL PRESSURE 3-PI-64-135
- DRYWELL PRESSURE 3-PI-64-136
- DRYWELL TEMPERATURE 3-TI-64-52AB
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-137
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-138
- SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

[2] At the end of the surveillance (2400 hours), **RECORD** on Attachment 3 in the 2400 Hours the following data.

- DRYWELL PRESSURE 3-PI-64-135
- DRYWELL PRESSURE 3-PI-64-136
- DRYWELL TEMPERATURE 3-TI-64-52AB
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-137
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-138
- SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)
- Suppression Pool Level 3-LI-64-54A or 3-LI-64-66

[3] **IF** the Drywell Temperature has changed by 2°F or more, **THEN**

PERFORM the calculation using Section B for Drywell and enter the result in column (8) of Section A. (Otherwise enter "0" (Zero) for the calculation.)

[4] **IF** the Suppression Chamber Air Temperature has changed by 2°F or more, **THEN**

PERFORM the calculation using Section C for Suppression Chamber and enter the result in column (9) of Section A. (Otherwise enter "0" (Zero) for the calculation.)

[5] Calculate the Total Correction Factor as follows

SUM the Drywell (Column 8) and Suppression Chamber (Column 9) and entering the results in Column (10).

NOTES

1) A Stopwatch may be used to perform Section 7.6.1.
2) Nitrogen flow should be less than 60 SCFM in accordance with 3-OI-64, Primary Containment when performing Section 7.6.1.

7.6 Nitrogen Makeup

7.6.1 Attachment 4 - Section A - Nitrogen Makeup Data

[1] **IF** Makeup is from the Nitrogen Storage Tank, **THEN**.

PERFORM the following during Nitrogen additions:

[1.1] In EVENT Column, **RECORD** "N2 Tank".

[1.2] In column (1), **RECORD** the time each nitrogen addition begins.

[1.3] In column (2), **RECORD** the nitrogen makeup duration, in minutes, from the chart of DW/SUPPR CHBR N2 MAKEUP FLOW/PRESS recorder, 3-XR-076-0014 on Panel 9-3 or from stopwatch.

[1.4] In column (3), **RECORD** the nitrogen makeup flow in cubic feet per minute as indicated by the Red Pen on DW/SUPPR CHBR N2 MAKEUP FLOW/PRESS, 3-XR-076-0014 on Panel 9-3.

[1.5] **CALCULATE** the amount of nitrogen, in cubic feet (ft^3), added during the run by multiplying column (2) by column (3) and **RECORD** in column (4).

[1.6] **CALCULATE** the total cumulative nitrogen use in cubic feet for the 24-hour period of this test by adding the latest entry in column (4) to the previous cumulative total in column (5) and **RECORD** the new cumulative total in column (5).

7.6.1 **Attachment 4 - Section A - Nitrogen Makeup Data (continued)**

[2] [QC/C] **IF** CAD is cross-tied to Drywell Control Air, **THEN**

PERFORM the following: (**REFER TO** 3-OI-84) [BFPER950935]

NA

[2.1] In EVENT Column, - **RECORD** "CAD/DCA".

[2.2] In Column (1), - **RECORD** the time CAD was cross-tied to Drywell Control Air on the CAD/DCA line provide.

[2.3] In Column (2), - **RECORD** the duration in minutes that CAD was cross-tied to Drywell control air.

[2.4] **OBTAIN** calculated Total Leakage(CFM) from Site Engineering.

[2.5] In Column (3), **RECORD** the calculated Total Leakage(CFM) obtained from Site Engineering.

[2.6] **CALCULATE** the amount of nitrogen added during the period by multiplying columns (2) and (3) and **RECORD** in column (4).

[2.7] **CALCULATE** the total cumulative nitrogen use in cubic feet for the 24-hour period of this test by adding the latest entry in column (4) to the previous cumulative total in column (5) and **RECORD** the new cumulative total in column (5).

7.6.1 Attachment 4 - Section A - Nitrogen Makeup Data (continued)

NOTES

1) Measure the CAD addition using a stop watch.
2) Use a separate Event Column for each CAD TRAIN if both trains are being used at the same time.

[3] **IF** CAD is aligned to Containment other than Section 7.6.1[2], **THEN**

PERFORM the following for any CAD additions.

NA

[3.1] In EVENT Column, **RECORD** "CAD/CONT"

[3.2] In column (1), **RECORD** the time each CAD addition begins.

[3.3] In column (2), **RECORD** the CAD addition duration, in minutes from the stopwatch.

[3.4] In column (3), **RECORD** the CAD makeup flow in cubic feet per minute for each CAD train being used:

CAD A N2 SYSTEM FLOW

- 0-FI-84-7/3, CAD A N2 SYSTEM FLOW, on 3-PNL-9-54.

  OR

- 0-FI-84-7, CAD LINE A N2 FLOW, on (Unit 1) PNL-9-54

CAD B N2 SYSTEM FLOW

- 0-FI-84-18/3, CAD B N2 SYSTEM FLOW, on 3-PNL-9-55.

  OR

- 0-FI-84-18, CAD B N2 SYSTEM FLOW, on (Unit 1) PNL-9-55.

[3.5] **CALCULATE** the amount of nitrogen, in cubic feet (ft^3), added during the run by multiplying column (2) by column (3) and **RECORD** in column (4).

[3.6] **CALCULATE** the total cumulative nitrogen use in cubic feet for the 24-hour period of this test by adding the latest entry in column (4) to the previous cumulative total in column (5) and **RECORD** the new cumulative total in column (5).

7.1 **Containment Venting**

7.7.1 **Attachment 5 - Section A - Containment Venting Data using 3-FIC-84-20**

NA [1] In column (1), -

RECORD the time the venting begins.

[2] In column (4), -

RECORD the vent flow rate indicated on PATH A VENT FLOW CONT, 3-FIC-84-20.

[3] In column (2), -

RECORD the time the venting ends.

[4] In column (3), -

RECORD the elapsed venting time in minutes by subtracting column (1) from column (2).

[5] In column (5), -

RECORD the Suppression Chamber Venting Correction Factor by multiplying column (3) by column (4).

[6] In column (6), Total Cumulative Correction -

RECORD the SUM of the previous event column (6) and the current event column (5).

NOTE

Alternate Containment Venting Data is performed when 3-FIC-84-20 indication is not available.

7.7.2 **Attachment 6 - Section A - Alternate Containment Venting Data**

NA

[1] **PRIOR** to Venting

PERFORM the following using instruments on Panel 9-3:

A. In column (1),

RECORD the time the venting begins.

B. In column (2), block P_{B1},

RECORD the DRYWELL PRESSURE, 3-PI-64-135 indication.

C. In column (3), block P_{B2},

RECORD the DRYWELL PRESSURE, 3-PI-64-136 indication.

D. In column (4), block T_{B1},

RECORD the DRYWELL TEMPERATURE, 3-TI-64-52AB.

E. In column (5), block P_{B3},

RECORD the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-137 indication

F. In column (6), block P_{B4},

RECORD the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-138, indication

G. In column (7), block T_{B2},

RECORD the SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

7.7.2 **Attachment 6 - Section A - Alternate Containment Venting Data (continued)**

NA [2] **AFTER** the Venting Event is completed,

A. In column (2), block $P_{A1,}$ - **RECORD** the DRYWELL PRESSURE, 3-PI-64-135 indication.

B. In column (3), block $P_{A2,}$ - **RECORD** the DRYWELL PRESSURE, 3-PI-64-136 indication.

C. In column (4), block $T_{A1,}$ - **RECORD** the DRYWELL TEMPERATURE 3-TI-64-52AB.

D. In column (5), block $P_{A3,}$ - **RECORD** the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-137 indication

E. In column (6), block $P_{A4,}$ - **RECORD** the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-138, indication

F. In column (7), block $T_{A2,}$ - SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

G. In column (8), - **RECORD** the SUPPR POOL WATER LEVEL, 3-LI-64-54A. (Use 3-LI-64-66 if 3-LI-64-54A is INOP.)

H. In column (9), - **CALCULATE** the DRYWELL VENTING CORRECTION using the Drywell Venting Correction Formula in Section C.

I. In column (10), - **CALCULATE** the SUPPRESSION CHAMBER VENTING CORRECTION using the Suppression Chamber Venting Correction Formula in Section C.

J. In column (11), - **RECORD** the sum the DRYWELL VENTING CORRECTION Column (9) and SUPPRESSION CHAMBER VENTING CORRECTION Column (10).

7.7.3 **Attachment 6 - Section B - Alternate Containment Venting Correction**

NA [1] At the completion of the 24-hour period

- In column (12) - **RECORD** the Total Venting Correction, Attachment 6, Section B by

  ADDING all the TOTAL VENTING CORRECTION from Section A, Column (11).

7.8 Average Nitrogen Consumption And Leakage

7.8.1 Attachment 7 - Section A - Net Nitrogen Leakage

[1] Total Drywell Control Leakage, - **RECORD** the Total Drywell Control Air Leakage from Attachment 2 in the Gas Addition to the Drywell table.

[2] Cumulative Nitrogen Makeup, - **RECORD** the total cumulative nitrogen makeup from Attachment 4 Section A in the Gas Addition to the Drywell table.

[3] **CALCULATE** the Total Gas Addition as follows:

ADD all the Gas addition types together from the Gas Addition Table and **RECORD** the sum as the Total Gas Addition in the Gas Addition to the Drywell table.

[4] Total Drywell and Suppression Chamber Temperature Correction, - **RECORD** the TOTAL VENTING CORRECTION from Attachment 3, Section A in the Correction Factor table.

[5] Total Suppression Chamber Level Correction, - **RECORD** the total Suppression Chamber level correction from Attachment 1, Section A in the Correction Factor table.

[6] Total Venting Correction using 3-FIC 84-20, - **RECORD** the total Drywell Venting Correction from Attachment 5, Section A in the Correction Factor table

[7] Total Alternate Venting Correction, - **RECORD** the total Drywell Venting Correction from Attachment 6, Section B in the Correction Factor table.

[8] **CALCULATE** the Total Correction Factor as follows:

ADD all the Correction Factor Types together from the Correction Factor Table and **RECORD** the sum as the Total Correction Factor in the Correction Factor table.

[9] **CALCULATE** the Net Nitrogen Leakage as follows.

Total Gas Addition for the Net Nitrogen Leakage and **SUBTRACT** the Air Temperature calculation and **SUBTRACT** the Total Correction Factor.

7.8.2 Attachment 7 - Section B - Average Nitrogen Leakage

NOTE

Leakage rates, for comparison purposes, should always be converted to standard flow rate conditions (flow at 70°F, one standard atmosphere). Since nitrogen gas is supplied by evaporating liquid nitrogen and heating it to approximately 70°F then reducing the pressure to 2.0 psig the conversion is:

$$\frac{14.7\text{psia} + 2.0\text{psig}}{14.7\text{psia}} \times \frac{460°\text{R} + 70°\text{F}}{460°\text{R} + 70°\text{F}} = 1.136$$

Where:
- 14.7 psia = 1 standard atmosphere
- 2.0 psig = nitrogen supply pressure
- 460°R = Fahrenheit to Rankine conversion factor
- 70°F = degrees Fahrenheit of nitrogen, actual and standard

For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.

To average the net nitrogen usage (in $ft^{3)}$ for a day, a 24 hour period is normally used and the result are expressed in standard cubic feet per hour. The net nitrogen leakage is multiplied by a conversion factor 1.136, then divided by the number of hours in the day. The result gives the average nitrogen leakage in standard cubic feet per hour for that day. When Daylight Savings Time and Central Standard Time changes take place, the appropriate number of hours will be used instead of 24 (hours).

[1] **MULTIPLY** the net nitrogen leakage from Attachment 6, Section A, (Nitrogen Leakage table), by (1.136/Hours during the day).

[2] **RECORD** the result on the Average Nitrogen Leakage line.

Date: TODAY

7.9 Completion And Notifications

[1] On the Surveillance Task Sheet (STS),

[1.1] **RECORD** the Completion Date & Time. _____

[1.2] **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Performer & Date fields. _____

[2] **NOTIFY** the Unit Supervisor that this Surveillance Instruction is complete. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1: Suppression Chamber Water Level Correction

Attachment 2: Drywell Control Air Leakage Correction

Attachment 3: Containment Air Temperature Correction

Attachment 4: Nitrogen Makeup Correction

Attachment 5: Containment Venting Corrections

Attachment 6: Alternate Venting Correction

Attachment 7: Average Nitrogen Consumption and Leakage

Attachment 1
(Page 1 of 1)

Suppression Chamber Level Correction

Date: TODAY

1.0 SUPPRESSION CHAMBER LEVEL CORRECTION DATA

NOTES

1) If both Instruments are Operable, then calculate the average of BOTH Operable Instruments by Dividing the sum of their SUPPRESSION CHAMBER LEVEL CORRECTION (column 5) by 2 (two) and record as the TOTAL SUPPRESSION CHAMBER LEVEL CORRECTION.

2) If one of the instruments is INOP, then use only the Operable Instrumentation Correction Factor for the TOTAL SUPPRESSION CHAMBER LEVEL CORRECTION.

A. Suppression Chamber Level Data (Section 7.3.1)

	(1)	(2)	(3)	(4)	(5)	
Instrument	Initial Suppr Chbr Level (IN.) (0000 Hours)	Ending Suppr Chbr LEVEL (IN.) (2400 Hours)	Change in Suppr Chbr Level (IN.)	Conversion Factor 909.8 FT^3/IN.	Suppr Chbr Level Correction (FT^3)	UO INIT
3-LI-64-54A	-3.0 -	-2.0 =	-1.0	x 909.8 =	-909.8	JR
3-LI-64-66	-3.7 -	-3.2 =	-0.5	x 909.8 =	-454.9	JR

B. Total Suppression Chamber Level Correction Calculation (Section 7.3.2)

$$\frac{\text{Column 5}(ft^3)\text{ for 3-LI-64-54A} + \text{Column 5}(ft^3)\text{ for 3-LI-64-66}}{2} = \text{Average Suppression Chamber Level}$$

$$\frac{-909.8\ (ft^3)_{3-LI-64-54A} + -454.9\ (ft^3)_{3-LI-64-66}}{2} = -682.35\ (ft^3)$$

JR
UO

Attachment 2
(Page 1 of 1)

Drywell Control Air Leakage Correction

Date: TODAY

A. Drywell Control Air Leakage (Section 7.4)

Drywell Control Air Line A FLOW
DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 (Rx Bldg El 565' 16 S Line)

(1) ENDING (2400 hours)		(2) INITIAL (0000 hours)		(3) Difference
210815.7 (FT^3)	-	210384.7 (FT^3)	=	431.00 (FT^3)

Drywell Control Air Line B Flow
DWCA FLOW ELEMENT HEADER B,3-FIQ-032-0075 (Rx Bldg El 565' R20 Q Line).

(1) ENDING (2400 hours)		(2) INITIAL (0000 hours)		(3) Difference
334278.6 (FT^3)	-	333692.2 (FT^3)	=	586.40 (FT^3)

Drywell Control Air Leakage				
3-FIQ-032-0092 Difference (Column 3)		3-FIQ-032-0075 Difference (Column 3)		Total
431.00 (FT^3)	+	586.40 (FT^3)	=	1017.40 (FT^3)

JR
UO

Attachment 3
(Page 1 of 2)

Containment Air Temperature Correction

Date: TODAY

NOTES

1) If Drywell Temperature changed less than 2 °F, enter zero (0) in Column 8.
2) If Suppression Chamber Air Temperature changed less than 2 °F, enter zero (0) in Column 9

A. Drywell and Suppression Chamber Data

	DRYWELL			Differential Pressure		Suppression Chamber	
	Pressure		Temp			Air Temp	Level
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3-PI-64-135 (psig)	3-PI-64-136 (psig)	3-TI-64-52AB (°F)	3-PDI-64-137 (psid)	3-PDI-64-138 (psid)	3-XR-64-52 Point 1 (°F)	3-LI-64-54A or 66
0000 hours	P_{B1} 1.37	P_{B2} 1.30	T_{B1} 135	P_{B3} 1.20	P_{B4} 1.22	T_{B2} 90	N/A
2400 hours	P_{A1} 1.37	P_{A2} 1.30	T_{A1} 135	P_{A3} 1.20	P_{A4} 1.22	T_{A2} 90	L_A -3.0

(8) DRYWELL VENTING CORRECTION	(9) SUPRESSION CHMBR VENTING CORRECTION	(10) Total VENTING CORRECTION	UO Initials
Ø FT^3 +	Ø FT^3 =	Ø FT^3	JR

Attachment 3
(Page 2 of 2)

B. Drywell Temperature Correction Equation (Section 7.7.3)

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)\right]\times(T_{A1}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)\right]\times(T_{B1}+460)}\right]\right]\times 159000 = \text{Drywell Temperature Correction}$$

where:

P_{B1} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{B2} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

P_{A1} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{A2} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

$T_{B1}+460$ = Drywell temperature before venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)

$T_{A1}+460$ = Drywell temperature after venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)

C. Suppression Chamber Temperature Correction Equation

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)-\left(\frac{P_{B3}+P_{B4}}{2}\right)\right]\times(T_{A2}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)-\left(\frac{P_{A3}+P_{A4}}{2}\right)\right]\times(T_{B2}+460)}\right]\right]\times[126200-[(L_A+1)\times 909.8]] = \text{Suppression Chamber Temperature Correction}$$

where:

P_{B1} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{B2} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

P_{B3} = Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137

P_{B4} = Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138

$T_{B2}+460$ = Suppression Chamber temperature before venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, (3-XR-64-52 Point 1) and corrected to absolute temperature (Rankine)

$T_{A2}+460$ = Suppression Chamber temperature after venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, 3-XR-64-52 (Point 1) and corrected to absolute temperature (Rankine)

P_{A1} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{A2} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

P_{A3} = Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137

P_{A4} = Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138

L_A = Suppression Chamber water level taken from SUPPR POOL WATER LEVEL indicator 3-LI-64-54A or 66.

Attachment 4
(Page 1 of 1)

Nitrogen Makeup Correction

Date: TODAY

(A.) Nitrogen Makeup Data (Section 7.6.1)

	EVENT	TIME (1)	MAKEUP DURATION (MINUTES) (2)		N_2 MAKEP FLOW (CFM) (3)		N_2 ADDED (2) X (3) (FT 3) (4)	N_2 MAKEUP (4) + PREVIOUS (5) (FT 3) (5)	UO Initials
1.	N_2 Tank	0220	10	x	59	=	590	590	JR
2.	N_2 Tank	0510	23	x	59	=	1357	1947	JR
3.	N_2 Tank	0915	16	x	59	=	944	2891	JR
4.	N_2 Tank	1140	20	x	59	=	1180	4071	JR
5.	N_2 Tank	1320	24	x	59	=	1416	5487	JR
6.	N_2 Tank	1750	18	x	59	=	1062	6549	JR
7.	N_2 Tank	2005	28	x	59	=	1652	8201	JR
8	N_2 Tank	2320	29	x	59	=	1711	9912	JR

Remarks: None

Attachment 5
(Page 1 of 1)

Containment Venting Correction

Date: Today

A. Venting Data using 3-FIC 84-20,

NOTE

Enter data for each venting event: (ie. flow started and stopped through vent valves)

	EVENT		Calculations				
	(1)	(2)	(3)	(4)	(5)	(6)	
	START TIME	END TIME	ELAPSED VENT TIME (MIN)	FLOW RATE 3-FIC-84-20 (SCFM)	Event Total (SCF) (Note 1)	Total Cumulative Correction (Note 2)	UO Initials
1							
2							
3							
4							
5							
6							
7							
8							
9			N/A				
10							
11							
12							
13							
14							
15							
16							
17							
18							

Note 1 Column (3) x Column (4)
Note 2 Previous Event Column (6) + Current Event Column (5)

Attachment 6
(Page 1 of 3)
Alternate Venting Correction

Date: TODAY

NOTE

1) Alternate Containment Venting Data is performed when 3-FIC-84-20 indication is not available.
2) In this table the BEFORE is prior to establishing flow through the vent valves.
3) The AFTER is when venting is completed, regardless of the number of times for the event. It can also be taken either before or after the DP Air Compressor pumps up the drywell, but do not take data while the DP is running.
4) Use 3-LI-64-54A unless INOP then use 3-LI-64-66.

A. Alternate Venting Data (Section 7.7.2)

(1) EVENT TIME			DRYWELL Pressure (2) 3-PI-64-135 (psig)	DRYWELL Pressure (3) 3-PI-64-136 (psig)	DRYWELL Temp (4) 3-TI-64-52AB (°F)	Differential Pressure (5) 3-PDI-64-137 (psid)	Differential Pressure (6) 3-PDI-64-138 (psid)	Suppression Chamber Air Temp (7) 3-XR-64-52 Point 1 (°F)	Suppression Chamber Level (8) 3-LI-64-54A or 66
1		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
2		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
3		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
4		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
5		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A

Attachment 6
(Page 2 of 3)

Alternate Venting Correction

Date: TODAY

	(9) DRYWELL VENTING CORRECTION		(10) SUPRESSION CHMBR VENTING CORRECTION		(11) TOTAL VENTING CORRECTION	UO Initials
1	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
2	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
3	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
4	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
5	_____ ft^3	+	N/A ft^3	=	_____ ft^3	_____

B. Total Alternate Venting Correction

Sum all of the Total Venting Corrections from Section A, Column 11

(12) TOTAL VENTING CORRECTION	UO Initial
_____ FT^3	_____

Attachment 6
(Page 3 of 3)
Alternate Venting Correction

C. Alternate Venting Correction Formulas (Section 7.7.2)

1. Drywell Correction Equation

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)\right]\times(T_{A1}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)\right]\times(T_{B1}+460)}\right]\right]\times 159000 = \text{Drywell Temperature Correction}$$

where:

- P_{B1} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
- P_{B2} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
- P_{A1} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
- P_{A2} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
- $T_{B1}+460$ = Drywell temperature before venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)
- $T_{A1}+460$ = Drywell temperature after venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)

2. Suppression Chamber Correction Equation

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)-\left(\frac{P_{B3}+P_{B4}}{2}\right)\right]\times(T_{A2}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)-\left(\frac{P_{A3}+P_{A4}}{2}\right)\right]\times(T_{B2}+460)}\right]\right]\times[126200-[(L_A+1)\times 909.8]] = \text{Suppression Chamber Temperature Correction}$$

where:

- P_{B1} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
- P_{B2} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
- P_{B3} = Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137
- P_{B4} = Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138
- $T_{B2}+460$ = Suppression Chamber temperature before venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, (3-XR-64-52 Point 1) and corrected to absolute temperature (Rankine)
- $T_{A2}+460$ = Suppression Chamber temperature after venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, 3-XR-64-52 (Point 1) and corrected to absolute temperature (Rankine)
- P_{A1} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
- P_{A2} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
- P_{A3} = Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137
- P_{A4} = Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138
- L_A = Suppression Chamber water level taken from SUPPR POOL WATER LEVEL indicator 3-LI-64-54A or 66.

Attachment 7
(Page 1 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

(A.) Net Nitrogen Leakage (Section 7.8)

1. **SUM** all Gas additions to obtain the Total Addition:

Gas Addition to the Drywell	
Total Drywell Control Air Leakage	_____ ft^3 Attachment 2, Section A
Cumulative Nitrogen Makeup	+ _____ ft^3 Attachment 4, Section A
Total Gas Addition	= _____ ft^3

2. Air Temperature Correction

Air Temperature	
Total DW and SC Temperature Correction	_____ ft^3 Attachment 3, Section A

3. **SUM** all the Correction Factors to obtain a Total Correction Factor:

Correction Factor	
Total Supp Chamber Level Correction	_____ ft^3 Attachment 1, Section B
Total Venting Correction using 3-FIC 84-20	_____ ft^3 Attachment 5, Section A
Total Alternate Venting Correction	+ _____ ft^3 Attachment 6, Section B
Total Correction Factor	= _____ ft^3

4. **CALCULATE** Net Nitrogen leakage:

Total Gas Addition - Total DW and SC Tempe Correction - Total Correction Factor

Nitrogen Leakage	
Total Gas Addition	_____ ft^3 (Step 1 above)
Total DW and SC Temperature Correction	- _____ ft^3(Step 2 above)
Total Correction Factor	- _____ ft^3(Step 3 above)
Net Nitrogen Leakage	= _____ ft^3

Attachment 7
(Page 2 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

NOTES

1) For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.
2) The average nitrogen leakage (adjusted) must be <542 SCFH (Step 6.0A.1). Notify the Unit Supervisor (US) if the nitrogen leakage exceeds 542 SCFH (Refer to 3-AOI-64-7 and Tech Specs 3.6.1.1.).

B. Average Nitrogen Leakage (Section 7.8.2)

CALCULATE the Average Nitrogen Leakage

$$\text{Avg. Nitrogen Leakage} = \frac{\text{Net nitrogen leakage} \times 1.136}{\text{Hours during the day}} =$$

$$\text{Avg. Nitrogen Leakage} = \frac{(\quad \text{ft}^3) \times 1.136}{(\_\_\_\_\_ \text{Hours})}$$

Avg. Nitrogen Leakage _____ SCFH
(AC)

_____(AC)
UO

_____
IV

FINAL

OPERATOR: _____

RO ____ SRO ____ DATE: _____

JPM NUMBER: SRO A2

TASK NUMBER: Equipment Control

TASK TITLE: 3-SI-4.7.A.2.A Primary Containment Nitrogen Consumption and Leakage

K/A NUMBER: 2.2.12 K/A RATING: RO 3.7 SRO 4.1

PRA:

TASK STANDARD: Perform section 7.8 of 3-SI-4.7.A.2.A and determine Average Nitrogen Leakage does not meet Acceptance Criteria. Determine proper Technical Specification entry requirements.

LOCATION OF PERFORMANCE: Classroom

REFERENCES/PROCEDURES NEEDED: 3-SI-4.7.A.2.A

VALIDATION TIME: 20 minutes

MAX. TIME ALLOWED:

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are the Unit Supervisor (US). The time is 2400 hours. The plant is in Mode 1. 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage, and has been completed thru section 7.7.

INITIATING CUE: The Shift Manager (SM) directs you to complete 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage, and determine any required actions.

****

Class Room

****

INITIAL CONDITIONS: You are the Unit Supervisor (US). The time is 2400 hours. The plant is in Mode 1. 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage, and has been completed thru section 7.7.

INITIATING CUE: The Shift Manager (SM) directs you to complete 3-SI-4.7.A.2.A, Primary Containment Consumption and Leakage, and determine any required actions.

START TIME _____

****

Performance Step 1: Critical __ Not Critical X

7.8 Average Nitrogen Consumption and Leakage

7.8.1 Attachment 7 – Section A – Net Nitrogen Leakage

[1] Total Drywell Control Leakage, - **RECORD** the Total Drywell Control Air Leakage from Attachment 2 in the Gas Addition to the Drywell table.

Standard:

Refers to Attachment 2 and records 1017.40 ft^3 for Total Drywell Control Air Leakage on Attachment 7

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 2: Critical __ Not Critical X

[2] Cumulative Nitrogen Makeup, - **RECORD** the total cumulative nitrogen makeup from Attachment 4 Section A in the Gas Addition to the Drywell table.

Standard:

Refers to Attachment 4 and records 9912 ft^3 for cumulative nitrogen makeup on attachment 7

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 3: Critical X Not Critical

[3] **CALCULATE** the Total Gas Addition as follows:

ADD all the Gas addition types together from the Gas Addition Table and **RECORD** the sum as the Total Gas Addition in the Gas Addition to the Drywell table.

Standard:

Adds the Total Drywell Control Air Leakage and the Cumulative Nitrogen Makeup and determines the Total Gas Addition is 10929.40 ft^3.

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 4: Critical __ Not Critical X

[4] Total Drywell and Suppression Chamber Temperature Correction, - **RECORD** the TOTAL VENTING CORRECTION from Attachment 3, Section A in the Correction Factor table.

Standard:

Refers to Attachment 3 and records 0 ft^3 for Total DW and SC Temperature Correction on Attachment 7

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 5: Critical __ Not Critical X

[5] Total Suppression Chamber Level Correction, - **RECORD** the total Suppression Chamber level correction from Attachment 1, Section A in the Correction Factor table.

Standard:

Refers to Attachment 1 and records (-)682.35 ft^3 for Total DW and SC Temperature Correction on Attachment 7

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 6: Critical __ Not Critical X

[6] Total Venting Correction using 3-FIC 84-20, - **RECORD** the total Drywell Venting Correction from Attachment 5, Section A in the Correction Factor table.

Standard:

Refers to Attachment 5 and records 0 ft^3 for Total Venting Correction using 3-FIC 84-20 on Attachment 7 due to no venting performed during previous 24 hours

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 7: Critical __ Not Critical X

[7] Total Alternate Venting Correction, - **RECORD** the total Drywell Venting Correction from Attachment 6, Section B in the Correction Factor table.

Standard:

Refers to Attachment 6 and records 0 ft^3 for Total Alternate Venting Correction on Attachment 7 due to no venting performed during previous 24 hours

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 8: Critical X Not Critical

[8] **CALCULATE** the Total Correction Factor as follows:

ADD all the Correction Factor Types together from the Correction Factor Table and **RECORD** the sum as the Total Correction Factor in the Correction Factor table.

Standard:

Adds the Total Suppression Chamber Level Correction, the Total Venting Correction using 3-FIC 84-20, and the Total Alternate Venting Correction together and determines the Total Correction Factor is (-)682.35 ft^3

SAT__ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 9: Critical X Not Critical

[9] **CALCULATE** the Net Nitrogen Leakage as follows:

Total Gas Addition for the Net Nitrogen Leakage and **SUBTRACT** the Air Temperature calculation and **SUBTRACT** the Total Correction Factor.

Standard:

Subtracts the Total DW and SC Temperature Correction and the Total Correction Factor from the Total Gas Addition and determines a Net Nitrogen Leakage of 11611 ±1.0 ft^3

10929.40 ft^3 – 0 ft^3 – (-)682.35 ft^3 = **11611 ± 1.0 ft^3**

SAT___ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 10: Critical X Not Critical

7.8.2 Attachment 7 – Section B – Average Nitrogen Leakage

Cue: There is an identified Procedure Error, Section 7.8.2 [1] should read: "MULTIPLY the net nitrogen leakage from Attachment 7, Section A, (Nitrogen Leakage table), by (1.136/Hours during the day).

[1] **MULTIPLY** the net nitrogen leakage from Attachment 6 **(should read Attachment 7)**, Section A, (Nitrogen Leakage table), by (1.136/Hours during the day).

[2] **RECORD** the result on the Average Nitrogen Leakage line.

Standard:

Multiplies Net Nitrogen Leakage of 11611 ±1.0 ft^3 (obtained from Attachment 7, Section A) by 1.136 and divides by 24 hours to determine an Average Nitrogen Leakage of 549.62 ± 2.0 SCFH. Determines that the Average Nitrogen Leakage is greater than 542 SCFH (AC) and does not initial for the Acceptance Criteria. Checks "No" on the Surveillance Task Sheet (STS) for "Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot reqt AMSAC* acceptance criteria satisfied."

SAT___ UNSAT___ N/A ___COMMENTS: _____

_____

****

Performance Step 11: Critical X Not Critical

3-AOI-64-7, N_2 Usage High

4.2 Subsequent Actions (Continued)

[8] IF 24-Hour average N2 makeup to the primary containment is > 542 scfh, THEN

[8.1] DECLARE Primary Containment INOP immediately.

[8.2] RESTORE Primary Containment to Operable within ONE HOUR. REFER TO LCO 3.6.1.1.

[9] IF it is discovered that Primary Containment Integrity does NOT exist during the evaluation, THEN RESTORE Primary Containment to Operable within ONE HOUR,

OR

BEGIN actions to place the unit in Mode 3 in 12 hours and Mode 4 in 36 Hours. REFER TO LCO 3.6.1.1.

Primary Containment
3.6.1.1

3.6 CONTAINMENT SYSTEMS

3.6.1.1 Primary Containment

LCO 3.6.1.1 Primary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Primary containment inoperable.	A.1	Restore primary containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours
	AND		
	B.2	Be in MODE 4.	36 hours

Standard:

Declares Primary Containment Inoperable Immediately and determines Primary Containment must be restored within 1 hour OR be in Mode 3 in 12 hours and Mode 4 in 36 hours

SAT___ UNSAT___ N/A ___COMMENTS: _____

_____

END OF TASK

STOP TIME _____

** Answer Key ***

Surveillance Task Sheet (STS)

WO: 111807079 **PM#:** P3402

Procedure: 3-SI-4.7.A.2.A

Title: 3-SI-4.7.A.2.A – PRIMARY CONTAINMENT NITROGEN CONSUMPTION AND LEAKAGE

Data Sheets Attached:

Perf Grp: OPS **Unit:** 3 **Loop/Div:**

Test Reason: Conditional

Due Date:

Frequency: 1 Days **Tech Spec:** **ASME XI:**

Applicable Modes: **Perf Modes:** Mode 1

Clearance Required: **EQ:** **LCO entered:**

Dry Cask Storage: N

[signature] — Authorization to Begin: SRO

TODAY / MIDNIGHT — Date & Time

TODAY / 0000 — Start Date & Time

DATE / TIME — Completion Date & Time

Performed By:

Print Name	Signature	Initial	Section
Jordan Ruby	[signature]	JR	OPS
Candidate Name	Sign	Int.	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [X] Partial [ ]

Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/ AMSAC* acceptance criteria satisfied? Yes [ ] No [X] N/A [ ] * Critical Step

Were all other acceptance Criteria satisfied? Yes [ ] No [ ] N/A [X]

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* Criteria were not satisfied, was a LCO/ODCM action required?
(Explain in REMARKS below) Yes [X] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date

N/A — Test Director

Sign — Lead Performer

date — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

REMARKS: Acceptance Criteria not satisfied due to Average Nitrogen Leakage being greater than allowed Nitrogen Leakage (Average). Tech Spec LCO 3.6.1.1 must be entered and primary containment must be declared INOP immediately.

*** Answer Key ***

Attachment 7
(Page 1 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

A. Net Nitrogen Leakage (Section 7.8)

1. **SUM** all Gas additions to obtain the Total Addition:

Gas Addition to the Drywell	
Total Drywell Control Air Leakage	1017.40 ft³ Attachment 2, Section A
Cumulative Nitrogen Makeup	+ 9912 ft³ Attachment 4, Section A
Total Gas Addition	= 10929.40 ft³

2. Air Temperature Correction

Air Temperature	
Total DW and SC Temperature Correction	Ø ft³ Attachment 3, Section A

3. **SUM** all the Correction Factors to obtain a Total Correction Factor:

Correction Factor	
Total Supp Chamber Level Correction	-682.35 ft³ Attachment 1, Section B
Total Venting Correction using 3-FIC 84-20	Ø ft³ Attachment 5, Section A
Total Alternate Venting Correction	+ Ø ft³ Attachment 6, Section B
Total Correction Factor	= -682.35 ft³

4. **CALCULATE** Net Nitrogen leakage:

Total Gas Addition - Total DW and SC Tempe Correction - Total Correction Factor

Nitrogen Leakage	
Total Gas Addition	10929.40 ft³ (Step 1 above)
Total DW and SC Temperature Correction	- Ø ft³(Step 2 above)
Total Correction Factor	- -682.35 ft³(Step 3 above)
Net Nitrogen Leakage	= 11611.75 ft³

11611 ± 1.0 ft³

*** Answer Key ***

Attachment 7
(Page 2 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

NOTES

1) For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.

2) The average nitrogen leakage (adjusted) must be <542 SCFH (Step 6.0A.1). Notify the Unit Supervisor (US) if the nitrogen leakage exceeds 542 SCFH (Refer to 3-AOI-64-7 and Tech Specs 3.6.1.1.).

B. Average Nitrogen Leakage (Section 7.8.2)

CALCULATE the Average Nitrogen Leakage

$$\text{Avg. Nitrogen Leakage} = \frac{\text{Net nitrogen leakage} \times 1.136}{\text{Hours during the day}} =$$

$$\text{Avg. Nitrogen Leakage} = \frac{(1161.75\ \text{ft}^3) \times 1.136}{(24\ \text{Hours})}$$

Avg. Nitrogen Leakage 549.62 (AC) SCFH

549.62 ± 2.0 SCFH

Candidate does not initial

(AC)
UO

IV

*** Student Handout ***

Surveillance Task Sheet (STS)

WO: 111807079 PM#: P3402

Procedure: 3-SI-4.7.A.2.A

Title: 3-SI-4.7.A.2.A – PRIMARY CONTAINMENT NITROGEN CONSUMPTION AND LEAKAGE

Data Sheets Attached:

Perf Grp: OPS Unit: 3 Loop/Div:

Test Reason: Conditional

Due Date:

Frequency: 1 Days Tech Spec: ASME XI:

Applicable Modes: Perf Modes: Mode 1

Clearance Required: EQ: LCO entered:

Dry Cask Storage: N

Authorization to Begin: SRO — TODAY / MIDNIGHT (Date/& Time)

TODAY / 0000 (Start Date & Time) — (Completion Date & Time)

Performed By:

Print Name	Signature	Initial	Section
JORDAN RUBY		JR	OPS

Was this a Complete or Partial Performance?
(Explain Partial in REMARKS below) Complete [ ] Partial [ ]

Were all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/ AMSAC* acceptance criteria satisfied? Yes [ ] No [ ] N/A [ ]

Were all other acceptance Criteria satisfied? Yes [ ] No [ ] N/A [ ]

If all Tech Spec/Tech Req/ISFSI/CoC/ODCM/Fire Prot req/AMSAC* Criteria were not satisfied, was a LCO/ODCM action required?
(Explain in REMARKS below) Yes [ ] No [ ] N/A [ ]

*PWR only.

Subsequent Reviews:

Group:	Signature	Date

Test Director — Lead Performer — Date

Acceptance Criteria Review: SRO — Date & Time

Independent Reviewer — Date & Time

PERMANENT COMMENTS:

REMARKS:

Browns Ferry Nuclear Plant

Unit 3

Surveillance Instruction

3-SI-4.7.A.2.A

Primary Containment Nitrogen Consumption and Leakage

Revision 0024

Quality Related

Level of Use: Continuous Use

Level of Use or Other Information: Key Number P3402

Effective Date: 02-29-2012

Responsible Organization: OPS, Operations

Prepared By: J D Savage

Approved By: Jeffery D. Morrison

Current Revision Description

Type of Change: Enhancements. Tracking Number: 028

PCR's: 11000391

PERs none

Documentation None

Minor changes to correct typo's and align step with attachments. This PCR was written for U1 but applies to U3 also.

Table of Contents

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Purpose

This Surveillance Instruction provides the necessary steps to monitor the primary containment nitrogen consumption rate (i.e., primary containment system leakage) in compliance with the requirements in Technical Specification 3.6.1.1 and TRM 3.6.2, and 3.6.5.

1.2 Scope

Primary containment nitrogen consumption is monitored to determine the average daily nitrogen consumption. Corrections are made for Suppression Chamber level changes and Drywell/Suppression Chamber venting that may occur. The average nitrogen leakage is calculated using data gathered during the day of this test.

For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.

1.3 Frequency

This Surveillance Instruction shall be performed each day (24-hour duration except the days converting to Daylight Saving Time and returning to Central Standard Time) and reviewed each shift while the reactor is in the RUN mode (Mode 1) and primary containment is inerted.

This procedure is initially started when the conditions are met during Reactor Startup and remains in process until the following Midnight (2400 Hours).

This procedure should be initiated at Midnight (0000 Hours) and remain in process for a 24 Hour period (until the following Midnight (2400 Hours)) or when conditions are no longer met during Reactor Shutdown per Tech Specs..

2.0 REFERENCES

2.1 Technical Specifications

Section 3.6.1.1, Primary Containment

2.2 Technical Requirements Manual - TRM

Section 3.6.2, Oxygen Concentration Monitors

Section 3.6.5, Nitrogen Makeup to Containment

2.3 Final Safety Analysis Report

Section 5.2.2.8, Primary Containment-Safety Design Basis

Section 5.2.3.8, Containment Inerting System

Section 5.2.4.5, Primary Containment Leakage Analysis

Section 5.2.5.1, Primary Containment Integrity and Leak-Tightness

Table 5.2-1, Principal Design Parameters and Characteristics of Primary Containment

2.4 Plant Instructions

3-AOI-64-7, Primary Containment N_2 Usage High

0-OI-57C, 208/120V AC Electrical System Operating Instructions

3-OI-64, Primary Containment System Operating Instructions

3-OI-84, Containment Atmosphere Dilution System

NPG-SPP-06.9.1, Conduct of Testing

NPG-SPP-06.9.2, Surveillance Test Program

2.5 Plant Drawings

1-47E610-76-1, Mechanical Control Diagram Containment Inerting System

3-47E610-64-1, 2, 3, Mechanical Control Diagram Primary Containment System

3-47E610-76-1, Mechanical Control Diagram Containment Inerting System

1-47E860-1, Flow Diagram Containment Inerting System

3-47E860-1, Flow Diagram Containment Inerting System

2.6 Plant Generated Calculations

PGC-003-064-0, Change in Torus Free Volume Per 1" of Water Level

2.7 Miscellaneous

BFPER970886, Calculating Leakage when CAD is cross-tied to Drywell Control Air

3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

A. This procedure should be initiated at Midnight (0000 Hours) and remain in process for a 24 Hour period (until the following Midnight (2400 Hours)).

B. If it is necessary to begin a new revision to the procedure before the time period is completed, then the appropriate data must be transferred to the new document and the two procedures maintained together.

C. For an INDEPENDENT REVIEWER signature, the STA or SRO cannot perform any actions or signoffs in the body of the procedure. This will ensure an adequate review of the procedure.

3.2 Operability and LCO's

A. If Nitrogen leakage exceeds 542 SCFH, 3-AOI-64-7 and TECH SPECS must be referred to for further action.

1. If 24-Hour average N_2 makeup to the primary containment is > 542 scfh, then Primary Containment must be declared INOP immediately. (Refer to LCO 3.6.1.1.)

B. If the nitrogen consumption demonstrates a trend that will be greater than 542 SCFH for the 24-hour period, notify the Unit Supervisor (US) immediately.

3.3 Equipment

A. When a Drywell Control Air Totalizer is inop, the DWCA System Engineer will use the AUO Rounds to determine the average flow to be used for N2 Drywell Control Air Flow.

B. When a Drywell Control Air Totalizer is INOP and a break or a leak occurs in the drywell from an air line, then the number of times the drywell is vented will rise based upon the severity of the leak or break. System Engineering should monitor and address any raise in Venting Requirements to determine if it is caused by a Drywell Control Air Line leak or due to atmospheric conditions.

3.4 Initiation/Isolation/Trips

None

3.5 Interlocks

None

3.6 Performance Testing

A. Since changes in Suppression Chamber level change the Suppression Chamber free volume, the Torus atmospheric pressure will change, although nitrogen may not have been lost or added.

1. The Suppression Chamber level may change for any number of events such as venting the drywell/suppression chamber, pumping down the Suppression Chamber, MSRVs Leakage or testing Core Spray, RHR, HPCI, or RCIC Systems.

2. The correction for level changes is based on the assumption that the Suppression Chamber level change is relatively small (-1" to -7.25" indicated level) allowing the effect of Suppression Chamber curvature to be neglected. Therefore, the 909.8 cubic feet change in volume per one inch change in Suppression Chamber level is assumed constant.

B. Changes in either the Drywell or Suppression Chamber Air Temperature would cause a change in Containment Pressure under idea conditions. Due to the continuous Drywell Control Air addition and possible venting during the 24 hour period the changes in containment pressures may not be as expected. Therefore when a change of more than 2 °F in either area occurs a Temperature Correction will be performed for that area's Air Temperature, otherwise zero "0" will be used for the correction factor.

C. For Sections 7.5and 7.7.2 if one pressure indicator and/or differential indicator is inoperable, (NA the appropriate column on the Attachment, note the inop indicator on Attachment 3 and 6, and delete dividing by 2 for that particular term in the equation.)

D. Attachment 3, Section B should be used to calculate the venting correction factor when any of the following instrumentation is unavailable.

1. Both DRYWELL PRESSURE, 3-PI-64-135 and 3-PI-64-136

2. DRYWELL TEMPERATURE, 3-TI-64-52AB

E. Attachment 4, Section B should be used to calculate the venting correction factor when any of the following instrumentation is unavailable.

1. Both DRYWELL PRESSURE, 3-PI-64-135 and 3-PI-64-136

2. Both DW/SUPPR CHBR DIFF PRESS, 3-PDI-64-137 and 3-PDI-64-138

3. DRYWELL TEMPERATURE, 3-TI-64-52AB

4. SUPPR POOL WATER LEVEL, 3-LI-64-54A and 3-LI-64-66

3.6 Performance Testing (continued)

F. Drywell/Suppression Chamber venting may be required to maintain Drywell pressure within limits during changes in barometric pressure, maintenance on Drywell Delta P Air Compressors, or other similar events. When using the Alternate Venting Correction equation in Attachment 6, the following assumptions are used.

1. The Drywell free volume is 159,000 cubic feet.

2. The Suppression Chamber free volume is 126,200 cubic feet at -1 inches (3-LI-64-54A or 66, Suppr Pool Water Level), and an additional 909.8 cubic feet of free volume for each inch that water level is lowered.

3. The actual venting process is a rapid event so barometric pressure changes can be neglected.

4. The average Drywell temperature change is represented by DRYWELL TEMPERATURE indicator 3-TI-64-52AB, and DRYWELL TEMPERATURE/PRESSURE recorder 3-XR-64-50.

5. Drywell and Suppression Chamber nitrogen pressures are low enough to use the ideal gas law as a model, i.e.

$$V_C = 1 - \left[\frac{P_B T_A}{P_A T_B}\right] \times V_t$$

Where:	V_C=	Venting Correction
	P_B=	Drywell or Suppression Chamber pressure before venting
	P_A=	Drywell or Suppression Chamber pressure after venting
	T_B=	Drywell or Suppression Chamber temperature before venting
	T_A=	Drywell or Suppression Chamber temperature after venting
	V_t=	Total free volume of Drywell or Suppression Chamber

6. The Suppression Chamber water and atmospheric temperatures are in equilibrium.

Date: TODAY

4.0 PREREQUISITES

[1] **VERIFY** this instruction to be the most current revision. JR

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P3402) JR

[3] **VERIFY** Cabinet 2, Panel 9-9 is energized in accordance with 0-OI-57C, 208/120V AC Electrical System Operating Instruction. JR

5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

A. Calculator

6.0 ACCEPTANCE CRITERIA

A. Responses which fail to meet the following acceptance criteria constitute unsatisfactory surveillance instruction results and require the immediate notification of the Unit Supervisor at the time of failure:

1. Nitrogen makeup to the primary containment, averaged over 24 hours (corrected for Suppression Chamber level changes and Drywell/Suppression Chamber venting) is less than 542 standard cubic feet per hour (SCFH).

B. Steps which determine the above criteria are designated by (AC) next to the initials blank.

Date: TODAY

NOTES

1) This procedure should be initiated at Midnight which is represented as (0000 Hours) and remain in process for a 24 Hour period (until the following Midnight which is represented as (2400 Hours)). These times are used to represent the difference from the start and the completion of this SR and may not match the proper military times that is used by the electronic narrative logs.

2) If it is necessary to stop this procedure and recommence with a new revision before the time period is completed, the appropriate data must be transferred to the new document and the two procedures maintained together..

7.0 PROCEDURE STEPS

7.1 Initial Requirements And Notifications

[1] **VERIFY** the Precautions and Limitations in Section 3.0 have been reviewed. JR

[2] **VERIFY** the Prerequisites in Section 4.0 are satisfied. JR

[3] On the Surveillance Task Sheet (STS)

OBTAIN Authorization Signature and Date/Time from the Unit Supervisor/SRO to perform this surveillance. JR

[4] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. JR

[5] **RECORD** the date on each data sheet Attachments 1 through 7. JR

Date: TODAY

NOTES

1) This procedure should be initiated by the midnight shift Unit Supervisor or by the Unit Supervisor of any shift meeting the requirements of Section 1.3.

2) For the first run of the 24-hour period, the previous cumulative total is zero since totals are not carried over from the previous 24-hour test.

7.2 Data Collection As Close To Midnight (0000 Hour) As Possible

[1] **RECORD** on Attachment 1 Part A, the initial Suppression Pool Level (0000 Hour), in column (1) for each of the following instruments (if available) on Panel 9-3.

- SUPPR POOL WATER LEVEL, 3-LI-64-54A
- SUPPR POOL WATER LEVEL, 3-LI-64-66

JR

[2] **RECORD** on Attachment 2 in the "INITIAL" column, the Drywell Control Air Loop A flow from the N2 Containment Inerting system, from one of the following:

- DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 (Rx Bldg El 565' R16 S Line).

  OR

- Average flow as determined by the DWCA System Engineer if 3-FIQ-032-0092 is INOP. (Reference Step 3.3A)

JR

[3] **RECORD** on Attachment 2 in the "INITIAL" column, the Drywell Control Air Loop B flow from the N2 Containment Inerting system, from one of the following:

- DWCA FLOW ELEMENT HEADER B, 3-FIQ-032-0075 (Rx Bldg El 565' R20 Q Line).

  OR

- Average flow as determined by the DWCA System Engineer if 3-FIQ-032-0075 is INOP. (Reference Step 3.3A)

JR

Date: TODAY

7.2 **Data Collection As Close To Midnight (0000 Hour) As Possible (continued)**

[4] **RECORD** on Attachment 3 in the 0000 Hours the following data.

- Drywell Pressure 3-PI-64-135
- Drywell Pressure 3-PI-64-136
- Drywell Temperature 3-TI-64-52AB
- Drywell Differential Pressure 3-DPI-64-137
- Drywell Differential Pressure 3-DPI-64-138
- SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

JR

NOTE

The correction for level changes is based on the assumption that the Suppression Chamber level change is relatively small (-1" to -7.25" indicated level) allowing the effect of Suppression Chamber curvature to be neglected. Therefore, the 909.8 cubic feet change in volume per one inch change in Suppression Chamber level is assumed constant.

7.3 **Suppression Chamber Level**

7.3.1 **Attachment 1 - Section A- Suppression Chamber Level Corrections Data**

[1] At the beginning of the surveillance (0000 hours), **RECORD** the Suppr Pool Water Level from indicators 3-LI-64-54A and 3-LI-64-66 on Panel 9-3, in column (1) for each available instrument.

[2] At the end of the surveillance (2400 hours), **RECORD** the Suppression Chamber level from indicators 3-LI-64-54A and 3-LI-64-66 on Panel 9-3, in column (2), for each available instrument.

[3] **IF** both instruments are available, 3-LI-64-54A and 3-LI-64-66, **THEN**

SUBTRACT column (2) from column (1) to determine the amount of change in Suppression Chamber level and **RECORD** in column (3) (negative numbers are possible).

[4] For each instrument 3-LI-64-54A and 3-LI-64-66, **CALCULATE** the change in Suppression Chamber free volume as standard cubic feet (SCF) by multiplying column (3) by column (4) (909.8 ft^3/in.) and **RECORD** in column (5).

7.3.2 **Attachment 1 - Section B - Total Suppression Chamber Level Correction**

- **IF** both (64-54A & 64-66) instrument are available, **THEN**

  ADD column (5) for each instrument and **DIVIDE** by two (for calculating the average) and **RECORD** results as the Total Suppression Chamber Level Correction blank.

- **IF** an instrument is unavailable, **THEN**

  USE only the operable instrument and **ENTER** the column (5) value for the operable instrument as Total Suppression Chamber Level Correction blank.

7.4 Calculating the Drywell Control Air leakage

7.4.1 Attachment 2 - Calculate the Drywell Control Air Line A leakage

[1] At the beginning of the surveillance (0000 hours), **RECORD** the DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 in the column (2) "INITIAL (0000 hours)".

[2] At the end of the surveillance (2400 hours), **RECORD** the DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 in the Column (1) "ENDING (2400 hours)"

[3] **CALCULATE** the daily difference for Drywell Control Air Loop A, 3-FIQ-032-0092.

Column (1) - Column (2) = Difference (Column 3)

7.4.2 Attachment 2 - Calculate the Drywell Control Air Line B leakage

[1] At the beginning of the surveillance (0000 hours), **RECORD** the DWCA FLOW ELEMENT HEADER B, 3-FIQ-032-0075 in the column (2) "INITIAL (0000 hours)".

[2] At the end of the surveillance (2400 hours), **RECORD** the DWCA FLOW ELEMENT HEADER B, 3-FIQ-032-0075 in the Column (1) "ENDING (2400 hours)"

[3] **CALCULATE** the daily difference for Drywell Control Air Loop A, 3-FIQ-032-0075.

Column (1) - Column (2) = Difference (Column 3)

7.4.3 Calculate The Total Drywell Control Air Leakage

- **SUM** the Drywell Control Air Loop A, 3-FIQ-032-0092 Difference and Drywell Control Air Loop B, 3-FIQ-032-0075 Difference.

3-FIQ-032-0092 (Difference) + 3-FIQ-032-0075 (Difference) = Total

Date: TODAY

7.5 **Air Temperature Correction**

7.5.1 **Attachment 3 - Section A - Drywell and Suppression Chamber Data**

[1] At the beginning of the surveillance (0000 hours), **RECORD** on Attachment 3 in the 0000 Hours the following data.

- DRYWELL PRESSURE 3-PI-64-135
- DRYWELL PRESSURE 3-PI-64-136
- DRYWELL TEMPERATURE 3-TI-64-52AB
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-137
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-138
- SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

[2] At the end of the surveillance (2400 hours), **RECORD** on Attachment 3 in the 2400 Hours the following data.

- DRYWELL PRESSURE 3-PI-64-135
- DRYWELL PRESSURE 3-PI-64-136
- DRYWELL TEMPERATURE 3-TI-64-52AB
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-137
- DW/SUPPR CHBR DIFF PRESS 3-DPI-64-138
- SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)
- Suppression Pool Level 3-LI-64-54A or 3-LI-64-66

[3] **IF** the Drywell Temperature has changed by 2°F or more, **THEN**

PERFORM the calculation using Section B for Drywell and enter the result in column (8) of Section A. (Otherwise enter "0" (Zero) for the calculation.)

[4] **IF** the Suppression Chamber Air Temperature has changed by 2°F or more, **THEN**

PERFORM the calculation using Section C for Suppression Chamber and enter the result in column (9) of Section A. (Otherwise enter "0" (Zero) for the calculation.)

[5] Calculate the Total Correction Factor as follows

SUM the Drywell (Column 8) and Suppression Chamber (Column 9) and entering the results in Column (10).

NOTES

1) A Stopwatch may be used to perform Section 7.6.1.
2) Nitrogen flow should be less than 60 SCFM in accordance with 3-OI-64, Primary Containment when performing Section 7.6.1.

7.6 Nitrogen Makeup

7.6.1 Attachment 4 - Section A - Nitrogen Makeup Data

[1] **IF** Makeup is from the Nitrogen Storage Tank, **THEN**.

PERFORM the following during Nitrogen additions:

[1.1] In EVENT Column, **RECORD** "N2 Tank".

[1.2] In column (1), **RECORD** the time each nitrogen addition begins.

[1.3] In column (2), **RECORD** the nitrogen makeup duration, in minutes, from the chart of DW/SUPPR CHBR N2 MAKEUP FLOW/PRESS recorder, 3-XR-076-0014 on Panel 9-3 or from stopwatch.

[1.4] In column (3), **RECORD** the nitrogen makeup flow in cubic feet per minute as indicated by the Red Pen on DW/SUPPR CHBR N2 MAKEUP FLOW/PRESS, 3-XR-076-0014 on Panel 9-3.

[1.5] **CALCULATE** the amount of nitrogen, in cubic feet (ft^3), added during the run by multiplying column (2) by column (3) and **RECORD** in column (4).

[1.6] **CALCULATE** the total cumulative nitrogen use in cubic feet for the 24-hour period of this test by adding the latest entry in column (4) to the previous cumulative total in column (5) and **RECORD** the new cumulative total in column (5).

7.6.1 **Attachment 4 - Section A - Nitrogen Makeup Data (continued)**

[2] [QC/C] **IF** CAD is cross-tied to Drywell Control Air, **THEN**

PERFORM the following: (**REFER TO** 3-OI-84) [BFPER950935]

NA

[2.1] In EVENT Column, - **RECORD** "CAD/DCA".

[2.2] In Column (1), - **RECORD** the time CAD was cross-tied to Drywell Control Air on the CAD/DCA line provide.

[2.3] In Column (2), - **RECORD** the duration in minutes that CAD was cross-tied to Drywell control air.

[2.4] **OBTAIN** calculated Total Leakage(CFM) from Site Engineering.

[2.5] In Column (3), **RECORD** the calculated Total Leakage(CFM) obtained from Site Engineering.

[2.6] **CALCULATE** the amount of nitrogen added during the period by multiplying columns (2) and (3) and **RECORD** in column (4).

[2.7] **CALCULATE** the total cumulative nitrogen use in cubic feet for the 24-hour period of this test by adding the latest entry in column (4) to the previous cumulative total in column (5) and **RECORD** the new cumulative total in column (5).

7.6.1 Attachment 4 - Section A - Nitrogen Makeup Data (continued)

NOTES

1) Measure the CAD addition using a stop watch.
2) Use a separate Event Column for each CAD TRAIN if both trains are being used at the same time.

[3] **IF** CAD is aligned to Containment other than Section 7.6.1[2], **THEN**

PERFORM the following for any CAD additions.

NA

[3.1] In EVENT Column, **RECORD** "CAD/CONT"

[3.2] In column (1), **RECORD** the time each CAD addition begins.

[3.3] In column (2), **RECORD** the CAD addition duration, in minutes from the stopwatch.

[3.4] In column (3), **RECORD** the CAD makeup flow in cubic feet per minute for each CAD train being used:

CAD A N2 SYSTEM FLOW

- 0-FI-84-7/3, CAD A N2 SYSTEM FLOW, on 3-PNL-9-54.

  OR

- 0-FI-84-7, CAD LINE A N2 FLOW, on (Unit 1) PNL-9-54

CAD B N2 SYSTEM FLOW

- 0-FI-84-18/3, CAD B N2 SYSTEM FLOW, on 3-PNL-9-55.

  OR

- 0-FI-84-18, CAD B N2 SYSTEM FLOW, on (Unit 1) PNL-9-55.

[3.5] **CALCULATE** the amount of nitrogen, in cubic feet (ft^3), added during the run by multiplying column (2) by column (3) and **RECORD** in column (4).

[3.6] **CALCULATE** the total cumulative nitrogen use in cubic feet for the 24-hour period of this test by adding the latest entry in column (4) to the previous cumulative total in column (5) and **RECORD** the new cumulative total in column (5).

7.1 **Containment Venting**

7.7.1 **Attachment 5 - Section A - Containment Venting Data using 3-FIC-84-20**

NA [1] In column (1), -

RECORD the time the venting begins.

[2] In column (4), -

RECORD the vent flow rate indicated on PATH A VENT FLOW CONT, 3-FIC-84-20.

[3] In column (2), -

RECORD the time the venting ends.

[4] In column (3), -

RECORD the elapsed venting time in minutes by subtracting column (1) from column (2).

[5] In column (5), -

RECORD the Suppression Chamber Venting Correction Factor by multiplying column (3) by column (4).

[6] In column (6), Total Cumulative Correction -

RECORD the SUM of the previous event column (6) and the current event column (5).

NOTE

Alternate Containment Venting Data is performed when 3-FIC-84-20 indication is not available.

7.7.2 **Attachment 6 - Section A - Alternate Containment Venting Data**

NA [1] **PRIOR** to Venting

PERFORM the following using instruments on Panel 9-3:

A. In column (1),

RECORD the time the venting begins.

B. In column (2), block P_{B1},

RECORD the DRYWELL PRESSURE, 3-PI-64-135 indication.

C. In column (3), block P_{B2},

RECORD the DRYWELL PRESSURE, 3-PI-64-136 indication.

D. In column (4), block T_{B1},

RECORD the DRYWELL TEMPERATURE, 3-TI-64-52AB.

E. In column (5), block P_{B3},

RECORD the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-137 indication

F. In column (6), block P_{B4},

RECORD the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-138, indication

G. In column (7), block T_{B2},

RECORD the SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

7.7.2 **Attachment 6 - Section A - Alternate Containment Venting Data (continued)**

NA [2] **AFTER** the Venting Event is completed,

A. In column (2), block $P_{A1,}$ - **RECORD** the DRYWELL PRESSURE, 3-PI-64-135 indication.

B. In column (3), block $P_{A2,}$ - **RECORD** the DRYWELL PRESSURE, 3-PI-64-136 indication.

C. In column (4), block $T_{A1,}$ - **RECORD** the DRYWELL TEMPERATURE 3-TI-64-52AB.

D. In column (5), block $P_{A3,}$ - **RECORD** the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-137 indication

E. In column (6), block $P_{A4,}$ - **RECORD** the DW/SUPPR CHBR DIFF PRESS, 3-DPI-64-138, indication

F. In column (7), block $T_{A2,}$ - SUPP CHBR TEMP, 3-TE-64-52B on SUPPRESSION CHAMBER TEMPERATURE/PRESSURE, 3-XR-64-52 (point 1)

G. In column (8), - **RECORD** the SUPPR POOL WATER LEVEL, 3-LI-64-54A. (Use 3-LI-64-66 if 3-LI-64-54A is INOP.)

H. In column (9), - **CALCULATE** the DRYWELL VENTING CORRECTION using the Drywell Venting Correction Formula in Section C.

I. In column (10), - **CALCULATE** the SUPPRESSION CHAMBER VENTING CORRECTION using the Suppression Chamber Venting Correction Formula in Section C.

J. In column (11), - **RECORD** the sum the DRYWELL VENTING CORRECTION Column (9) and SUPPRESSION CHAMBER VENTING CORRECTION Column (10).

7.7.3 **Attachment 6 - Section B - Alternate Containment Venting Correction**

NA [1] At the completion of the 24-hour period

- In column (12) - **RECORD** the Total Venting Correction, Attachment 6, Section B by

  ADDING all the TOTAL VENTING CORRECTION from Section A, Column (11).

7.8 Average Nitrogen Consumption And Leakage

7.8.1 Attachment 7 - Section A - Net Nitrogen Leakage

[1] Total Drywell Control Leakage, - **RECORD** the Total Drywell Control Air Leakage from Attachment 2 in the Gas Addition to the Drywell table.

[2] Cumulative Nitrogen Makeup, - **RECORD** the total cumulative nitrogen makeup from Attachment 4 Section A in the Gas Addition to the Drywell table.

[3] **CALCULATE** the Total Gas Addition as follows:

ADD all the Gas addition types together from the Gas Addition Table and **RECORD** the sum as the Total Gas Addition in the Gas Addition to the Drywell table.

[4] Total Drywell and Suppression Chamber Temperature Correction, - **RECORD** the TOTAL VENTING CORRECTION from Attachment 3, Section A in the Correction Factor table.

[5] Total Suppression Chamber Level Correction, - **RECORD** the total Suppression Chamber level correction from Attachment 1, Section A in the Correction Factor table.

[6] Total Venting Correction using 3-FIC 84-20, - **RECORD** the total Drywell Venting Correction from Attachment 5, Section A in the Correction Factor table

[7] Total Alternate Venting Correction, - **RECORD** the total Drywell Venting Correction from Attachment 6, Section B in the Correction Factor table.

[8] **CALCULATE** the Total Correction Factor as follows:

ADD all the Correction Factor Types together from the Correction Factor Table and **RECORD** the sum as the Total Correction Factor in the Correction Factor table.

[9] **CALCULATE** the Net Nitrogen Leakage as follows.

Total Gas Addition for the Net Nitrogen Leakage and **SUBTRACT** the Air Temperature calculation and **SUBTRACT** the Total Correction Factor.

7.8.2 Attachment 7 - Section B - Average Nitrogen Leakage

NOTE

Leakage rates, for comparison purposes, should always be converted to standard flow rate conditions (flow at 70°F, one standard atmosphere). Since nitrogen gas is supplied by evaporating liquid nitrogen and heating it to approximately 70°F then reducing the pressure to 2.0 psig the conversion is:

$$\frac{14.7\text{psia} + 2.0\text{psig}}{14.7\text{psia}} \times \frac{460°\text{R} + 70°\text{F}}{460°\text{R} + 70°\text{F}} = 1.136$$

Where: 14.7 psia = 1 standard atmosphere

2.0 psig = nitrogen supply pressure

460°R = Fahrenheit to Rankine conversion factor

70°F = degrees Fahrenheit of nitrogen, actual and standard

For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.

To average the net nitrogen usage (in $ft^{3)}$ for a day, a 24 hour period is normally used and the result are expressed in standard cubic feet per hour. The net nitrogen leakage is multiplied by a conversion factor 1.136, then divided by the number of hours in the day. The result gives the average nitrogen leakage in standard cubic feet per hour for that day. When Daylight Savings Time and Central Standard Time changes take place, the appropriate number of hours will be used instead of 24 (hours).

[1] **MULTIPLY** the net nitrogen leakage from Attachment 6, Section A, (Nitrogen Leakage table), by (1.136/Hours during the day).

[2] **RECORD** the result on the Average Nitrogen Leakage line.

Date: TODAY

7.9 Completion And Notifications

[1] On the Surveillance Task Sheet (STS),

[1.1] **RECORD** the Completion Date & Time. _____

[1.2] **REVIEW** and **COMPLETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Performer & Date fields. _____

[2] **NOTIFY** the Unit Supervisor that this Surveillance Instruction is complete. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1: Suppression Chamber Water Level Correction

Attachment 2: Drywell Control Air Leakage Correction

Attachment 3: Containment Air Temperature Correction

Attachment 4: Nitrogen Makeup Correction

Attachment 5: Containment Venting Corrections

Attachment 6: Alternate Venting Correction

Attachment 7: Average Nitrogen Consumption and Leakage

Attachment 1
(Page 1 of 1)

Suppression Chamber Level Correction

Date: TODAY

1.0 SUPPRESSION CHAMBER LEVEL CORRECTION DATA

NOTES

1) If both Instruments are Operable, then calculate the average of BOTH Operable Instruments by Dividing the sum of their SUPPRESSION CHAMBER LEVEL CORRECTION (column 5) by 2 (two) and record as the TOTAL SUPPRESSION CHAMBER LEVEL CORRECTION.

2) If one of the instruments is INOP, then use only the Operable Instrumentation Correction Factor for the TOTAL SUPPRESSION CHAMBER LEVEL CORRECTION.

A. Suppression Chamber Level Data (Section 7.3.1)

	(1)	(2)	(3)	(4)	(5)	
Instrument	Initial Suppr Chbr Level (IN.) (0000 Hours)	Ending Suppr Chbr LEVEL (IN.) (2400 Hours)	Change in Suppr Chbr Level (IN.)	Conversion Factor 909.8 FT^3/IN.	Suppr Chbr Level Correction (FT^3)	UO INIT
3-LI-64-54A	-3.0 -	-2.0 =	-1.0	x 909.8 =	-909.8	JR
3-LI-64-66	-3.7 -	-3.2 =	-0.5	x 909.8 =	-454.9	JR

B. Total Suppression Chamber Level Correction Calculation (Section 7.3.2)

$$\frac{\text{Column 5}(ft^3)\text{ for 3-LI-64-54A} + \text{Column 5}(ft^3)\text{ for 3-LI-64-66}}{2} = \text{Average Suppression Chamber Level}$$

$$\frac{-909.8\ (ft^3)_{3-LI-64-54A} + -454.9\ (ft^3)_{3-LI-64-66}}{2} = -682.35\ (ft^3)$$

JR
UO

Attachment 2
(Page 1 of 1)

Drywell Control Air Leakage Correction

Date: TODAY

A. Drywell Control Air Leakage (Section 7.4)

Drywell Control Air Line A FLOW
DWCA FLOW ELEMENT HEADER A, 3-FIQ-032-0092 (Rx Bldg El 565' 16 S Line)

(1) ENDING (2400 hours)		(2) INITIAL (0000 hours)		(3) Difference
210815.7 (FT^3)	-	210384.7 (FT^3)	=	431.00 (FT^3)

Drywell Control Air Line B Flow
DWCA FLOW ELEMENT HEADER B,3-FIQ-032-0075 (Rx Bldg El 565' R20 Q Line).

(1) ENDING (2400 hours)		(2) INITIAL (0000 hours)		(3) Difference
334278.6 (FT^3)	-	333692.2 (FT^3)	=	586.40 (FT^3)

Drywell Control Air Leakage				
3-FIQ-032-0092 Difference (Column 3)		3-FIQ-032-0075 Difference (Column 3)		Total
431.00 (FT^3)	+	586.40 (FT^3)	=	1017.40 (FT^3)

JR
UO

Attachment 3
(Page 1 of 2)

Containment Air Temperature Correction

Date: TODAY

NOTES

1) If Drywell Temperature changed less than 2 °F, enter zero (0) in Column 8.
2) If Suppression Chamber Air Temperature changed less than 2 °F, enter zero (0) in Column 9

A. Drywell and Suppression Chamber Data

	DRYWELL			Differential Pressure		Suppression Chamber	
	Pressure		Temp			Air Temp	Level
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	3-PI-64-135 (psig)	3-PI-64-136 (psig)	3-TI-64-52AB (°F)	3-PDI-64-137 (psid)	3-PDI-64-138 (psid)	3-XR-64-52 Point 1 (°F)	3-LI-64-54A or 66
0000 hours	P_{B1} 1.37	P_{B2} 1.30	T_{B1} 135	P_{B3} 1.20	P_{B4} 1.22	T_{B2} 90	N/A
2400 hours	P_{A1} 1.37	P_{A2} 1.30	T_{A1} 135	P_{A3} 1.20	P_{A4} 1.22	T_{A2} 90	L_A -3.0

(8) DRYWELL VENTING CORRECTION		(9) SUPRESSION CHMBR VENTING CORRECTION		(10) Total VENTING CORRECTION	UO Initials
Ø	FT^3 +	Ø	FT^3 =	Ø	FT^3 JR

Attachment 3
(Page 2 of 2)

B. Drywell Temperature Correction Equation (Section 7.7.3)

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)\right]\times(T_{A1}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)\right]\times(T_{B1}+460)}\right]\right]\times 159000 = \text{Drywell Temperature Correction}$$

where:

P_{B1} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{B2} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

P_{A1} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{A2} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

$T_{B1}+460$ = Drywell temperature before venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)

$T_{A1}+460$ = Drywell temperature after venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)

C. Suppression Chamber Temperature Correction Equation

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)-\left(\frac{P_{B3}+P_{B4}}{2}\right)\right]\times(T_{A2}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)-\left(\frac{P_{A3}+P_{A4}}{2}\right)\right]\times(T_{B2}+460)}\right]\right]\times[126200-[(L_A+1)\times 909.8]] = \text{Suppression Chamber Temperature Correction}$$

where:

P_{B1} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{B2} = Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

P_{B3} = Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137

P_{B4} = Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138

$T_{B2}+460$ = Suppression Chamber temperature before venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, (3-XR-64-52 Point 1) and corrected to absolute temperature (Rankine)

$T_{A2}+460$ = Suppression Chamber temperature after venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, 3-XR-64-52 (Point 1) and corrected to absolute temperature (Rankine)

P_{A1} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135

P_{A2} = Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136

P_{A3} = Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137

P_{A4} = Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138

L_A = Suppression Chamber water level taken from SUPPR POOL WATER LEVEL indicator 3-LI-64-54A or 66.

Attachment 4
(Page 1 of 1)

Nitrogen Makeup Correction

Date: TODAY

(A.) Nitrogen Makeup Data (Section 7.6.1)

	EVENT	TIME (1)	MAKEUP DURATION (MINUTES) (2)		N_2 MAKEP FLOW (CFM) (3)		N_2 ADDED (2) X (3) (FT 3) (4)	N_2 MAKEUP (4) + PREVIOUS (5) (FT 3) (5)	UO Initials
1.	N_2 Tank	0220	10	x	59	=	590	590	JR
2.	N_2 Tank	0510	23	x	59	=	1357	1947	JR
3.	N_2 Tank	0915	16	x	59	=	944	2891	JR
4.	N_2 Tank	1140	20	x	59	=	1180	4071	JR
5.	N_2 Tank	1320	24	x	59	=	1416	5487	JR
6.	N_2 Tank	1750	18	x	59	=	1062	6549	JR
7.	N_2 Tank	2005	28	x	59	=	1652	8201	JR
8	N_2 Tank	2320	29	x	59	=	1711	9912	JR

Remarks: NONE

Attachment 5
(Page 1 of 1)

Containment Venting Correction

Date: Today

A. Venting Data using 3-FIC 84-20,

NOTE

Enter data for each venting event: (ie. flow started and stopped through vent valves)

EVENT			Calculations				
	(1)	(2)	(3)	(4)	(5)	(6)	
	START TIME	END TIME	ELAPSED VENT TIME (MIN)	FLOW RATE 3-FIC-84-20 (SCFM)	Event Total (SCF) (Note 1)	Total Cumulative Correction (Note 2)	UO Initials
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

N/A

Note 1 Column (3) x Column (4)
Note 2 Previous Event Column (6) + Current Event Column (5)

Attachment 6
(Page 1 of 3)
Alternate Venting Correction

Date: TODAY

NOTE

1) Alternate Containment Venting Data is performed when 3-FIC-84-20 indication is not available.
2) In this table the BEFORE is prior to establishing flow through the vent valves.
3) The AFTER is when venting is completed, regardless of the number of times for the event. It can also be taken either before or after the DP Air Compressor pumps up the drywell, but do not take data while the DP is running.
4) Use 3-LI-64-54A unless INOP then use 3-LI-64-66.

A. Alternate Venting Data (Section 7.7.2)

	(1) EVENT TIME		DRYWELL Pressure (2) 3-PI-64-135 (psig)	DRYWELL Pressure (3) 3-PI-64-136 (psig)	DRYWELL Temp (4) 3-TI-64-52AB (°F)	Differential Pressure (5) 3-PDI-64-137 (psid)	Differential Pressure (6) 3-PDI-64-138 (psid)	Suppression Chamber Air Temp (7) 3-XR-64-52 Point 1 (°F)	Suppression Chamber Level (8) 3-LI-64-54A or 66
1		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
2		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
3		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
4		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A
5		(BEFORE)	P_{B1}	P_{B2}	T_{B1}	P_{B3}	P_{B4}	T_{B2}	N/A
		(AFTER)	P_{A1}	P_{A2}	T_{A1}	P_{A3}	P_{A4}	T_{A2}	L_A

Attachment 6
(Page 2 of 3)

Alternate Venting Correction

Date: TODAY

	(9) DRYWELL VENTING CORRECTION		(10) SUPRESSION CHMBR VENTING CORRECTION		(11) TOTAL VENTING CORRECTION	UO Initials
1	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
2	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
3	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
4	_____ ft^3	+	_____ ft^3	=	_____ ft^3	_____
5	_____ ft^3	+	N/A ft^3	=	_____ ft^3	_____

B. Total Alternate Venting Correction

Sum all of the Total Venting Corrections from Section A, Column 11

(12) TOTAL VENTING CORRECTION	UO Initial
_____ FT^3	_____

Attachment 6
(Page 3 of 3)
Alternate Venting Correction

C. Alternate Venting Correction Formulas (Section 7.7.2)

1. Drywell Correction Equation

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)\right]\times(T_{A1}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)\right]\times(T_{B1}+460)}\right]\right]\times 159000 = \text{Drywell Temperature Correction}$$

where:

P_{B1}	=	Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
P_{B2}	=	Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
P_{A1}	=	Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
P_{A2}	=	Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
T_{B1}+460	=	Drywell temperature before venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)
T_{A1}+460	=	Drywell temperature after venting taken from DRYWELL TEMPERATURE indicator 3-TI-64-52AB and corrected to absolute temperature (Rankine)

2. Suppression Chamber Correction Equation

NA

$$\left[1-\left[\frac{\left[14.7+\left(\frac{P_{B1}+P_{B2}}{2}\right)-\left(\frac{P_{B3}+P_{B4}}{2}\right)\right]\times(T_{A2}+460)}{\left[14.7+\left(\frac{P_{A1}+P_{A2}}{2}\right)-\left(\frac{P_{A3}+P_{A4}}{2}\right)\right]\times(T_{B2}+460)}\right]\right]\times[126200-[(L_A+1)\times 909.8]] = \text{Suppression Chamber Temperature Correction}$$

where:

P_{B1}	=	Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
P_{B2}	=	Drywell pressure before venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
P_{B3}	=	Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137
P_{B4}	=	Drywell/Suppression Chamber differential pressure before venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138
T_{B2} + 460	=	Suppression Chamber temperature before venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, (3-XR-64-52 Point 1) and corrected to absolute temperature (Rankine)
T_{A2} + 460	=	Suppression Chamber temperature after venting taken from SUPPRESSION CHAMBER TEMPERATURE/PRESSURE recorder, 3-XR-64-52 (Point 1) and corrected to absolute temperature (Rankine)
P_{A1}	=	Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-135
P_{A2}	=	Drywell pressure after venting taken from DRYWELL PRESSURE indicator 3-PI-64-136
P_{A3}	=	Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-137
P_{A4}	=	Drywell/Suppression Chamber differential pressure after venting taken from DW/SUPPR CHBR DIFF PRESS indicator 3-PDI-64-138
L_A	=	Suppression Chamber water level taken from SUPPR POOL WATER LEVEL indicator 3-LI-64-54A or 66.

Attachment 7
(Page 1 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

A. Net Nitrogen Leakage (Section 7.8)

1. **SUM** all Gas additions to obtain the Total Addition:

Gas Addition to the Drywell	
Total Drywell Control Air Leakage	_____ ft^3 Attachment 2, Section A
Cumulative Nitrogen Makeup	+ _____ ft^3 Attachment 4, Section A
Total Gas Addition	= _____ ft^3

2. Air Temperature Correction

Air Temperature	
Total DW and SC Temperature Correction	_____ ft^3 Attachment 3, Section A

3. **SUM** all the Correction Factors to obtain a Total Correction Factor:

Correction Factor	
Total Supp Chamber Level Correction	_____ ft^3 Attachment 1, Section B
Total Venting Correction using 3-FIC 84-20	_____ ft^3 Attachment 5, Section A
Total Alternate Venting Correction	+ _____ ft^3 Attachment 6, Section B
Total Correction Factor	= _____ ft^3

4. **CALCULATE** Net Nitrogen leakage:

Total Gas Addition - Total DW and SC Tempe Correction - Total Correction Factor

Nitrogen Leakage	
Total Gas Addition	_____ ft^3 (Step 1 above)
Total DW and SC Temperature Correction	- _____ ft^3(Step 2 above)
Total Correction Factor	- _____ ft^3(Step 3 above)
Net Nitrogen Leakage	= _____ ft^3

Attachment 7
(Page 2 of 2)

Average Nitrogen Consumption and Leakage

Date: TODAY

NOTES

1) For calculation purposes, a day consist of 24-hours. During the days when the time changes to Daylight Savings Time (DST) 23-hours will be used. When returning to Central Standard Time (CST) 25-hours will be used.
2) The average nitrogen leakage (adjusted) must be <542 SCFH (Step 6.0A.1). Notify the Unit Supervisor (US) if the nitrogen leakage exceeds 542 SCFH (Refer to 3-AOI-64-7 and Tech Specs 3.6.1.1.).

B. Average Nitrogen Leakage (Section 7.8.2)

CALCULATE the Average Nitrogen Leakage

$$\text{Avg. Nitrogen Leakage} = \frac{\text{Net nitrogen leakage} \times 1.136}{\text{Hours during the day}} =$$

$$\text{Avg. Nitrogen Leakage} = \frac{(\quad \text{ft}^3) \times 1.136}{(\quad \text{Hours})}$$

Avg. Nitrogen Leakage _____ SCFH
(AC)

_____(AC)
UO

_____
IV

FINAL

OPERATOR: _____

RO ____ SRO ____ DATE: _____

JPM NUMBER: Admin RO/SRO A3

TASK NUMBER: Radiation Control

TASK TITLE: Calculate Airborne Effluent Release Rate iaw 0-SI-4.8.b.1.a.1

K/A NUMBER: 2.3.11 K/A RATING: RO 3.8 SRO 4.3

PRA:

TASK STANDARD: Calculate Stack Release Rate and Total Site Release Fraction determine it does not meet Acceptance Criteria, and determine that vent flowrate must be reduced in accordance with 2-EOI Appendix-12.

LOCATION OF PERFORMANCE: Classroom

REFERENCES/PROCEDURES NEEDED: 0-SI-4.8.B.1.a.1, 2-EOI-Appendix-12

VALIDATION TIME: 15 minutes

MAX. TIME ALLOWED:

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are an extra operator. Unit2 reactor has scrammed. A small leak exists in primary containment. EOI-2 has been followed to PC/P-1. Primary Containment Venting is in progress in accordance with 2-EOI Appendix-12, Primary Containment Venting. The Control Bay AUO has partially completed Attachment 11 of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate.

INITIATING CUE: The Shift Manager directs you to complete the remainder of Attachment 11 of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, starting at [10.3] and stopping at [12]; determine what actions are required, if any, in accordance with 2-EOI Appendix-12.

NOTE: The Control Bay AUO has gathered all required data; therefore, some subsequent steps after [10.3] may be completed.

****

Classroom

****

INITIAL CONDITIONS: You are an extra operator. Unit2 reactor has scrammed. A small leak exists in primary containment. EOI-2 has been followed to PC/P-1. Primary Containment Venting is in progress in accordance with 2-EOI Appendix-12, Primary Containment Venting. The Control Bay AUO has partially completed Attachment 11 of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate.

INITIATING CUE: The Shift Manager directs you to complete the remainder of Attachment 11 of 0-SI-4.8.B.1.a.1, Airborne Effluent Release Rate, starting at [10.3] and stopping at [12]; determine what actions are required, if any, in accordance with 2-EOI Appendix-12.

NOTE: The Control Bay AUO has gathered all required data; therefore, some subsequent steps after [10.3] may be completed.

START TIME_____

****

Performance Step 1: Critical X Not Critical

7.0 Procedure Steps (continued)

[10.3] **MULTIPLY** the release rate by the release factor and **RECORD** the answer under the column labeled "Actual Rate" on Attachment 4.

Standard:

Multiplies the Release Rate from the RM-90-250, RM-90-249, and the RM-90-251 by the Release Factor to determine the Actual Rate; candidate will perform this action for each Unit as well as the Radwaste Building (0-RM-90-252) and record the data on Attachment 11 pages 3-6. Refer to Answer Sheet for correct values or see below.

Unit 1	Unit 2	Unit 3	Radwaste
Reactor Building (1-RM-90-250) **4000 x 0.64 = 2560**	Reactor Building (2-RM-90-250) **4300 x 0.73 = 3139**	Reactor Building (3-RM-90-250) **3100 x 0.69 = 2139**	
Turbine Building (1-RM-90-249) **500 x 0.75 = 375** (1-RM-90-251) **910 x 0.80 = 728**	Turbine Building (2-RM-90-249) **840 x 1.00 = 840** (2-RM-90-251) **2200 x 1.00 = 2200**	Turbine Building (3-RM-90-249) **1600 x 0.40 = 640** (3-RM-90-251) **1900 x 0.75 = 1425**	0-RM-90-252 **225 x 0.62 = 139-140**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 2: Critical X Not Critical

[10.4] For each unit, **SUM** the actual rates for the RM-90-249, RM-90-250, and RM-90-251 monitors. **RECORD** the unit total release rates in the appropriate columns on Attachment 4.

Standard:

Sums the Actual Rates from the RM-90-249, RM-90-250, and RM-90-251 monitors for each Unit and records the Total Release Rate for each Unit on Attachment 11 page 6. Refer to Answer Sheet for correct values or see below.

Unit 1	Unit 2	Unit 3
2560 + 375 + 728 = 3663	**3139 + 840 + 2200 = 6179**	**2139 + 640 + 1425 = 4204**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 3: Critical X Not Critical

[10.5] **SUM** the three unit total release rates and the 0-RM-90-252 actual rate. **RECORD** the building ventilation release rate on Attachment 4.

Standard:

Sums each Units Total Release Rate and the Radwaste Building Actual Release Rate (0-RM-90-252) and records the Building Ventilation Release Rate on Attachment 11 page 6. Refer to Answer Sheet for correct value or see below.

Unit 1		Unit 2		Unit 3		Radwaste		Total
3663	+	6179	+	4204	+	139-140	=	**14185 - 14186**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 4: Critical X Not Critical

NOTE

For reporting purposes, the release fraction should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded as 0.123.
A release fraction of 0.00012 should be recorded as 0.000.

[10.6] **DETERMINE** the building ventilation release fraction by dividing the total building ventilation release rate by 1.50 E+05 (or 150,000) µCi/sec. **RECORD** the fraction on both Attachment 2 and Attachment 4.

Standard:

Divides the Total Building Ventilation Release Rate by 150,000 µCi/sec and determines the Building Ventilation Release Fraction; records on Attachment 11 page 6 and page 2. Refer to Answer Sheet for correct value or see below.

14185.5 ± 0.5 / 150,000 = **0.095**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 5: Critical X Not Critical

[10.7] **VERIFY** the acceptance criteria as given in Step 6.0B.1 has been met. The building ventilation release fraction must be less than or equal to 0.90. **IF** the acceptance criteria have failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Standard:

Determines Building Ventilation Release Fraction is less than 0.90 and does not contact the Unit Supervisors (US). Refer to Answer Sheet for correct value or look at performance step 4.

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

****

Performance Step 6: Critical _ Not Critical X

[11] **DETERMINE** the elevated (stack) noble gas release rate once per shift by completing the following steps:

[11.1] **RECORD** the highest noble gas count rates (counts per second, cps) for the 0-RM-90-147 and 0-RM-90-148 monitors in the appropriate columns of Attachment 6 in accordance with one of the following steps:

[11.1.1] **IF** both the 0-RR-90-147 and at least one of the radiation monitors are operable, **THEN OBTAIN** the necessary information from 0-RR-90-147 on Panel 9-2. **IF** applicable, **THEN RECORD** "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

Standard:

Steps [11.1] and [11.1.1] have already been completed and the data has been recorded on Attachment 11 page 7. Steps [11.1.2] and [11.2.3] are not applicable and will not be performed

SAT__ UNSAT__ N/A __COMMENTS:_____

_____

****

Performance Step 7: Critical _ Not Critical X

NOTE

If 0-SI-4.8.B.1.a.2 is in effect for the stack monitors, the Chemical Laboratory will report the stack release rate in μCi/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value. In this case, Steps 7.0[11.2] and 7.0[11.3] are **NOT** applicable.

[11.2] **DETERMINE** the stack flow rate and **RECORD** in the appropriate column of Attachment 6.

[11.2.1] **IF** 0-FI-90-271 on Panel 1-9-53 is operable, **THEN RECORD** the stack flow in standard cubic feet per minute (scfm).

Standard:

Steps [11.2] and [11.2.1] have already been completed and the data has been recorded on Attachment 11 page 7. Steps [11.2.2] and [11.2.3] are not applicable and will not be performed

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 8: Critical X Not Critical

[11.3] **DETERMINE** the stack release rate by using the gross count rate and total stack flow in accordance with the following equation. When there are two gross count rate readings, **USE** the highest gross count rate. IF both monitors (0-RM-90-147/8) are INOP, **THEN**

CONTINUE with Step 7.0[11.4].

Total Stack Flow (scfm) x Gross Count Rate (cps) x 1.23 E-03 [(μCi/sec)/(cps-scfm)]

Standard:

Determines that the Highest Gross Count Rate is the 0-RM-90-147 (Red Pen) and records this reading on Attachment 11 page 7; calculates the Stack Release Rate by multiplying Total Stack Flow, the Highest Gross Count Rate, and 1.23 E-03 [(μCi/sec) together. Refer to Answer Sheet for correct value or see below.

22700 **x** 5.75×10^{5} **x** 1.23×10^{-3} = **$1.605 \pm 0.005 \times 10^{7}$**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 9: Critical X Not Critical

[11.4] **RECORD** in the appropriate column of Attachment 6 either the release rate calculated in Step 7.0[11.3] or as reported by the Chemical Laboratory for an inoperable monitor.

Standard:

Records the Stack Release Rate calculated in previous step on Attachment 11 page 7.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 10: Critical _ Not Critical X

NOTE

Alternative sampling for the WRGERM monitor is satisfied by taking readings from the normal stack release monitors, 0-RM-90-147 and/or 0-RM-90-148, when operable or by manual sampling in accordance with 0-SI-4.8.B.1.a.2 when the normal stack monitors are inoperable. This alternate sampling succession satisfies the requirement for a preplanned alternate method as required in TABLE 3.3.5-1 of the TRM.

[11.5] Wide Range Gaseous Effluent Radiation Monitor (WRGERM), 0-RM-90-306, Panel 2-9-10.

[11.5.1] IF the monitor is inoperable, THEN

RECORD "INOP" in the appropriate column of Attachment 6 and CONTINUE with Step 7.0[11.6]. Otherwise, CONTINUE with Step 7.0[11.5.2].

[11.5.2] ENSURE 0-RM-90-306 is in the Sample Mode.

[11.5.3] RECORD the noble gas release rate in µCi/sec in the appropriate column of Attachment 6. RECORD results to two decimal places (e.g., 2.95E 00).

Standard:

Step [11.5], [11.5.2], and [11.5.3] have already been completed and the data has been recorded on Attachment 11 page 8; steps [11.5.1] and [11.6] are not applicable and will not be performed

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 11: Critical _ Not Critical X

[11.7] **IF** all release streams to the stack are isolated, **THEN**

USE a release rate factor of 0.00. Otherwise, **USE** 1.00. **RECORD** the release rate factor in the appropriate column of Attachment 6.

Standard:

Step [11.7] has already been completed and a Release Rate Factor of 1.00 has already been recorded on Attachment 11 page 8

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 12: Critical X Not Critical

[11.8] **CALCULATE** the actual release rate by multiplying the highest release rate (0-RM-90-147/148 or 0-RM-90-306) by the release factor. **RECORD** the information in the Actual Release Rate column on Attachment 6.

Standard:

Records the Highest Stack Release Rate (Stack Release) on Attachment 11 page 8; calculates the Actual Release Rate by multiplying the Highest Stack Release Rate (Stack Release) by the Release Rate Factor (1.00) determined in previous step; records on Attachment 11 page 8. Refer to Answer Sheet for correct value or see below.

$1.605\pm0.005 \times 10^{7}$ x 1.00 = **$1.605\pm0.005 \times 10^{7}$**

SAT__ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 13: Critical X Not Critical

NOTE

For reporting purposes, the release fractions should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded only as 0.123.
A release fraction of 0.00012 should be recorded only as 0.000.

[11.9] **CALCULATE** the stack release fraction by dividing the actual release rate by 1.44 E+07 (or 14,400,000) µCi/sec. **RECORD** this information on both Attachment 2 and Attachment 6.

Standard:

Calculates the Stack Release Fraction by dividing the Actual Release Rate determined in previous step by 14,400,000 µCi/sec; records this data on Attachment 11 page 8 and page 2. Refer to Answer Sheet for correct value or see below.

$1.605 \pm 0.005 \times 10^{7} \; / \; 1.44 \times 10^{7}$ = **1.111 – 1.118**

SAT___ UNSAT___ N/A ___COMMENTS:_____

****

Performance Step 14: Critical X Not Critical

[11.10] **VERIFY** the acceptance criteria as given in Step 6.0B.2 has been met. The stack release fraction must be less than or equal to 0.10. IF the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Standard:

Determines that the Stack Release Fraction does not meet the Acceptance Criteria (AC)

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 15: Critical X Not Critical

[12] **CALCULATE** the total site release fraction by adding the building ventilation and stack release fractions on Attachment 2. **VERIFY** the site release fraction acceptance criteria as given in Step 6.0B.3 has been met. **IF** the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Standard:

Calculates the Total Site Release Fraction by adding the Building Ventilation Release Rate Fraction and the Stack Release Rate Fraction; records this data on Attachment 11 page 2. Refer to Answer Sheet for correct value or see below. Determines that it does not meet Acceptance Criteria (AC). Determines that the venting flowrate must be reduced until the Stack Release Fraction and the Total Site Release Fraction meet their respective Acceptance Criteria iaw 2-EOI-Appendix-12

0.095 + 1.111-1.118 = **1.206-1.213**

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

****

Performance Step 16: Critical X Not Critical

12. **ADJUST** 2-FIC-84-19, PATH B VENT FLOW CONT, or 2-FIC-84-20, PATH A VENT FLOW CONT, as applicable, to maintain ALL of the following:

- Stable flow as indicated on controller,
  AND
- 2-PA-84-21, VENT PRESS TO SGT HIGH, alarm light extinguished,
  AND
- Release rates as determined below:

i. IF PRIMARY CONTAINMENT FLOODING per C-1, Alternate Level Control, is in progress, THEN **MAINTAIN** release rates below those specified in Attachment 2.

ii. IF Severe Accident Management Guidelines are being executed, THEN **MAINTAIN** release rates below those specified by the TSC SAM Team.

iii. IF Venting for ANY other reason than items i or ii above, THEN **MAINTAIN** release rates below

- Stack release rate of 1.4 x 107 μCi/s
  AND
- 0-SI-4.8.B.1.a.1 release fraction of 1.

Standard:

Determines that the venting flowrate must be reduced in accordance with 2-EOI Appendix-12, Primary Containment Venting, step (12.iii) until the Stack Release Fraction and the Total Site Release Fraction meet their respective Acceptance Criteria

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

STOP TIME _____

END OF TASK

*** Answer Key ***

Attachment 11
(Page 1 of 8)

EPIP Release Rate Log

NOTES

1) This attachment is used to record data during EOIs and REP conditions.
2) Page 2 of 8 is similar to Attachment 2. 3 of 8 through 6 of 8 are similar to Attachment 4, and 7 of 8 and 8 of 8 are similar to Attachment 6.
3) Pages from this attachment may be used to document plant release data on as frequent a basis as needed.
4) Multiple copies of forms from this attachment may be used as needed.
5) Any entries on this form may be NA'ed as needed.

Special Instructions for this attachment.

A. **RECORD** the "From To" dates.

B. **RECORD** the day of the month (under DAY) and time on each line as needed.

C. Instructions for recording the data for each item are as given in the main body of the SI.

*** Answer Key ***

Attachment 11
(Page 2 of 8)

Site Effluent Release Rate Summary

From Today To _____

DAY	TIME	SI STEP		Reactor Power (MWT)			Building Ventilation Release Rate Fraction	Stack Release Rate Fraction	Total Site Release Rate Fraction
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]	7.0[10.6]	7.0[11.9]	7.0[12]
Today	0815	JR	JR	3403	Ø	3456	0.095	1.111-1.118	1.206-1.213

*** Answer Key ***

Attachment 11
(Page 3 of 8)

Building Effluent Release Rate Log - Unit 1

From Today To _____

Unit 1

DAY	TIME	Reactor Building			Turbine Building					
		1-RM-90-250			1-RM-90-249			1-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]
Today	0815	4000	0.64	2560	500	0.75	375	910	0.80	728

*** Answer Key ***

Attachment 11
(Page 4 of 8)

Building Effluent Release Rate Log - Unit 2

From Today To _____

Unit 2

DAY	TIME	Reactor Building			Turbine Building					
		2-RM-90-250			2-RM-90-249			2-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]
Today	0815	4300	0.73	3139	840	1.00	840	2200	1.00	2200

*** Answer Key ***

Attachment 11
(Page 5 of 8)

Building Effluent Release Rate Log - Unit 3

From Today To _____

Unit 3

DAY	TIME	Reactor Building			Turbine Building					
		3-RM-90-250			3-RM-90-249			3-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]
Today	0815	3100	0.69	2139	1600	0.40	640	1900	0.75	1425

*** Answer Key ***

Attachment 11
(Page 6 of 8)

Building Effluent Release Rate Log - Unit 0

From Today To _____

DAY	TIME	Radwaste Building 0-RM-90-252 Release Rate (µCi/sec) 7.0[10.1]	Radwaste Building 0-RM-90-252 Release Factor 7.0[10.2]	Radwaste Building 0-RM-90-252 Actual Rate (µCi/sec) 7.0[10.3]	Unit Total Release Rates (µCi/sec) Unit 1 7.0[10.4]	Unit Total Release Rates (µCi/sec) Unit 2 7.0[10.4]	Unit Total Release Rates (µCi/sec) Unit 3 7.0[10.4]	Building Ventilation Release Rate (µCi/sec) 7.0[10.5]	Building Ventilation Release Fraction 7.0[10.6]
Today	0815	225	0.62	139-140	3663	6179	4204	14185-14186	0.095

*** Answer Key ***

Attachment 11
(Page 7 of 8)

From Today To _____

Elevated Effluent Release Rate Log

DAY	TIME	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS) 7.0[11.1]	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS) 7.0[11.1]	HIGHEST GROSS COUNT RATE (CPS)	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTE 1) -OR- ATT 7 7.0[11.2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (µCi/SEC) 7.0[11.3] & 7.0[11.4]
Today	0815	5.75×10^5	4.9×10^5	5.75×10^5	22700	1.23E-03	$1.605 \pm 0.005 \times 10^7$
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	

1 Minimum acceptable flow rate for 0-FI-90-271 operability is 16,366 SCFM (See note 3).

2 Data from manual sampling results or 0-90-147/148 [(Stack Flow) X Highest Gross Count X 1.23E-03].

3 The minimum acceptable flow rate was revised to 16,366 SCFM (BFPER980545).

*** Answer Key ***

Attachment 11
(Page 8 of 8)

Building Effluent Release Rate Log - Unit 0

From Today To _____

DAY	TIME	WRGERMS Noble Gas Release Rate 0-RM-90-306 (µCi/sec) 7.0[11.5]	Highest Stack Release Rate (µCi/sec) (Note 1).	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (µCi/sec) 7.0[11.8]	Stack Release Fraction (Note 2) 7.0[11.9]
Today	0815	1.55×10^7	$1.605 \pm 0.005 \times 10^7$	1.00	$1.605 \pm 0.005 \times 10^7$	1.111 - 1.118

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate (µCi/sec) by 1.44E+07 µCi/sec.

*** Student Handout ***

Browns Ferry Nuclear Plant

Unit 0

Surveillance Instruction

0-SI-4.8.B.1.a.1

Airborne Effluent Release Rate

Revision 0055

Quality Related

Level of Use: Reference Use

Level of Use or Other Information: Key Number P1470

Effective Date: 04-01-2011

Responsible Organization: CEM, Chemistry

Prepared By: John Marshall

Approved By: Jeffery Fenton

Current Revision Description

Type of Change: Corrective Action Tracking Number: 064

PER CA 271917-001

Deleted old Attachment 1 as required by NPG-SPP-06.9.2.

Added reference to NPG-SPP-06.9.2 Surveillance Test Program.

Changed steps as required due to Surveillance Task Sheet (STS) being utilized instead of Atttachment 1.

Changed 2-FR-66-111 to 2-XR-66-103 after DCN 70195, S-2 was implemented.

Table of Contents

1.0 INTRODUCTION

1.1 Purpose

This Surveillance Instruction (SI) is used by Browns Ferry Operations and Radiochemical Laboratory personnel to satisfy the following Technical Requirements Manual (TRM) requirements, ODCM requirements, and data recording functions:

- Airborne effluent release rates in accordance with ODCM Surveillance Requirement 2.2.2.1.1.a.
- The instrumentation checks required by ODCM Table 2.1-2.
- The Wide Range Gaseous Effluent Radiation Monitor (WRGERMS), 0-RM-90-306, inoperability requirements in accordance with TABLE 3.3.5-1 of the TRM.
- The WRGERMS instrumentation check required by TABLE 3.3.5-1 of the TRM.
- Attachment 11 is used to record data during EOI's and REP conditions.

1.2 Scope

- ODCM Control 1.2.2.1 requires that the general public dose rate from noble gas effluents to be limited to less than 500 mRem per year to the total body and less than 3000 mRem per year to the skin. The Off site Dose Calculation Manual (ODCM) describes the methodology by which the dose rate limits are converted to plant process variables such as the stack noble gas radioactive release rate limit. The limiting release rates for the authorized effluent release points have been calculated as 0.15 curies (Ci) per second for the building level release points and 14.4 Ci per second for the stack.
- To ensure compliance with ODCM Control 1.2.2.1, each airborne effluent release point is required to be continuously monitored while actively releasing an airborne stream. This is usually accomplished by in-line process instrumentation which has Control Room alarm capabilities. If a monitor is inoperable, releases via that gas stream may continue provided compensatory sampling measures are initiated. Compensatory sampling is accomplished by having the Radiochemical Laboratory personnel obtain and analyze grab samples at a prescribed frequency.
- Technical Instruction (TI) 15 provides the engineering basis for establishing instrumentation alarm set points, monitor sampling rates, and release point allocation factors for the various plant radiation monitors. The conservative parameters prescribed by TI-15 ensure ODCM Control 1.2.2.1 limits are satisfied.

1.2 Scope (continued)

- Instrumentation checks will be used to provide a reasonable assurance that an unmonitored release does **NOT** go undetected. The instrument checks will be performed on the required monitoring instrumentation at a frequency such that a failed monitor is readily detected. The instrument checks will usually consist of data acquisition/instrument readings of such a detail that they will permit the calculation of the total site release rate.

NOTE

The source check formerly in this SI (Rev. 40 and previous Revs) are now in 0-SI-2.1-2.

- Additionally, this SI provides the pre-planned alternate monitoring instructions for the WRGERMS instrumentation, 0-RM-90-306 and 0-RR-90-360, in the event that the minimum number of operable instrument channels is less than the required number as given in TABLE 3.3.5-1 in the TRM.

1.3 Frequency

The normal performance band for this SI is one week. The procedure will typically start at 0700 Friday and end 0659 the following Friday.

Once per shift, the following checks will be made:

- Release rate information will be obtained for each effluent stream having continuous monitoring capabilities.
- The overall site release rate will be calculated from the release rate information.
- Offgas pretreatment and post-treatment monitors, offgas flow rate, and offgas hydrogen concentration will be recorded during main condenser and offgas treatment systems operations.
- The WRGERMS instrumentation operability will be demonstrated by an instrumentation check.

Once per day, each effluent radiation monitor shall demonstrate the operability of its sampling rate instrumentation and associated sample flow alarms.

2.0 REFERENCES

Browns Ferry Nuclear Plant Technical Requirements Manual (TRM).

Updated Final Safety Analysis Report (UFSAR)

- Section 7.12, Process Radiation Monitoring.
- Section 9.5, Gaseous Radwaste System (Modified).

Operating Instructions (OI)

- 1-, 2-, and 3-OI-90, Radiation Monitoring System

Surveillance Instructions (SI)

- 0-SI-2.1-2, Airborne Effluent Radiation Monitor Source Checks.
- 0-SI-4.8.B.1.a.2, Airborne Effluent Release Rate by Manual Sampling when a Gaseous Effluent Monitor is Inoperable.
- 1-, 2-, and 3-SI-4.8.B.1.a.3, Off Gas Post-Treatment Release Rate by Manual Sampling.
- 1-, 2-, and 3-SI-4.8.B.5.a, Off Gas Hydrogen Concentration by Manual Sampling.

Technical Instructions (TI)

- TI-15, Radioactive Gaseous Effluent Engineering Calculations and Measurements.
- 0-TI-336, Continuous Air Monitor Flow Regulator Adjustment.

Offsite Dose Calculation Manual (ODCM).

Part 302 to Title 40 of the Code of Federal Regulations (40 CFR 302), Designation, Reportable Quantities, and Notification.

Memorandum from John W. Sabados to Masoud Bajestani, Subject: Sampling Set points for the Eberline Continuous Air Monitor (R46 901116 823).

Date Today

2.0 REFERENCES (continued)

Controlled Vendor Manuals (CVM)

- Technical Manual for the 250 CAM Monitoring System, BFN-CVM-2083.
- Technical Manual for the 252 CAM Monitoring System, BFN-CVM-2084.
- Technical Manual for the 249-251 CAM Monitoring System, BFN-CVM-2085.
- Technical and Operating Manual for the CT-2B(s) Control Terminal, BFN-CVM-2090.

Memorandum from M. Bajestani to J. W. Sabados, Subject: Steam Packing Exhauster flow (R40 911018 914).

Stack Post Mod. Test for DCN W17999 (PMT-256) 20 April, 1993.

Technical Requirements Manual

Memorandum from Rick Givens to Phil Chadwell, Subject: Stack Flow Requirements (R70 980730 843) [BFPER880545].

NPG-SPP-06.9.2 Surveillance Test Program

3.0 PRECAUTIONS AND LIMITATIONS

[NRC/C] Radiation monitors may be removed from service for maintenance, calibration, or testing for periods **NOT** to exceed 4 hours. If it becomes apparent that a monitor cannot be returned to service within the 4 hours, the Unit Supervisor shall be immediately notified to ensure compensatory sampling has been initiated. [LER 260/89021]

The night shifts and day shifts are defined by the day on which the shift begins. (i.e., Friday dayshift is Friday 0700-1900, Friday night shift is Friday 1900 to Saturday 0700.)

4.0 PREREQUISITES

[1] **VERIFY** this copy of the procedure is the most current revision. JR

[2] **OBTAIN** a Surveillance Task Sheet (STS) for this procedure and Work Activity. (Key Number P1470) JR

5.0 SPECIAL TOOLS AND EQUIPMENT RECOMMENDED

None

6.0 ACCEPTANCE CRITERIA

A. Responses which fail to meet the acceptance criteria constitute unsatisfactory surveillance instruction results and require immediate notification of the Unit Supervisor at the time of failure. Failure of release rate acceptance criteria requires notification of the Chemistry Manager. Failure of release rate acceptance criteria will require a National Response Center reportability determination in accordance with Part 302 to Title 40 of the Code of Federal Regulation (40 CFR 302).

B. The noble gas release rate must be limited such that the off site dose and dose rates are in compliance with ODCM Control 1.2.2.1. This will be accomplished by establishing release rate limits for the building/ground and the stack/elevated release points. The corresponding release rate limits will be checked in accordance with the values listed below.

1. The sum of the building release rate fraction must be less than or equal to 0.90. The building release rate fraction is defined as the radioactive noble gas release rate at each monitored building release point divided by the ODCM building release limit of 1.50 E+05 µCi/sec.

2. The stack release rate fraction must be less than or equal to 0.10. The stack release rate fraction is defined as the radioactive noble gas release rate at the stack divided by the ODCM release rate limit of 1.44 E+07 µCi/sec.

3. The total site release rate fraction must be less than or equal to 1.00. The total site release rate fraction is defined as the sum of the building and stack release rate fractions.

4. Compensatory sampling measures must be initiated whenever a radiation monitor is out of service and effluent releases are continuing via that release point.

6.0 ACCEPTANCE CRITERIA (continued)

C. The radioactive gaseous effluent instrumentation operability shall be demonstrated by performance of shiftly and/or daily instrument checks as noted below.

1. Shiftly Checks. The following instrumentation checks must be accomplished at least once per shift during the noted periods of required operability. These instrumentation checks will be used to satisfy ODCM Surveillance Requirements in 2.2.2.1.1.a, Table 2.1-2, TRM Table 3.3.5-1, and TRM TSR 3.3.9.1 (noble gas monitor and hydrogen analyzer daily requirements only).

Monitor(s)	Required Period of Operability
1-, 2-, 3-RM-90-249, 1-, 2-, 3-RM-90-250, 1-, 2-, 3-RM-90-251, and 0-RM-90-252	When actively releasing an airborne effluent stream (i.e., vents are open and the ventilation fans are on).
0-RM-90-147 and/or 148	When actively releasing an airborne effluent stream.
0-RM-90-306, and 0-RR-90-360	When one or more of the site units are in either MODES 1 or 2.
1-, 2-, 3-RM-90-265, and/or 1-, 2-, 3-RM-90-266	When actively processing an off gas stream (i.e., unit FCV-66-28 is open).
1-, 2-, 3-H2R-66-96 (Channels A and/or B)	During main condenser offgas treatment system operations.

The shiftly checks shall be accomplished by recording the release rates or release concentrations as displayed on the appropriate control room recorders. If a monitor is out of service during a required period of operability, compensatory sampling measures will be initiated in accordance with the instructions given in Steps 7.0[9.5], 7.0[10.1.3], and/or 7.0[11.1.3].

6.0 ACCEPTANCE CRITERIA (continued)

2. Daily Checks. The following instrumentation checks must be accomplished at least once per day during the noted periods of required operability. These instrumentation checks will be used to satisfy ODCM surveillance requirements in Table 2.1-2 (sample flow instrumentation and sample flow annunciators only).

Instrumentation	Required Period of Operability
1-, 2-, 3-RM-90-249, 1-, 2-, 3-RM-90-250, 1-, 2-, 3-RM-90-251, and 0-RM-90-252 sample flow instrumentation	When actively releasing an airborne effluent stream (i.e., vents are open and the ventilation fans are on).
0-RM-90-147/148 sample flow rate and 0-FA-90-150 flow abnormal alarm	When actively releasing an airborne effluent stream.
1-, 2-, 3-PA-90-262 sample pressure abnormal alarm	When actively processing an off gas stream (i.e., unit FCV-66-28 is open).

The daily checks shall be accomplished by recording the sample flow rates from the appropriate control room instrumentation and/or testing the alarm annunciator condition. Satisfactory sample flow rate checks must fall within the range specified in the following table. Satisfactory annunciator test results will consist of a simple "go/no-go" test.

If a monitor is out of service during a required period of operability, compensatory sampling measures will be initiated in accordance with the instructions given in Steps 7.0[9.5], 7.0[10.1.3], and/or 7.0[11.1.3]. Compensatory sample flow rate measurements are required to be made every four hours, but are **NOT** required to satisfy the sample rate limits in the following table.

Monitor	Sample Flow (scfm)	
	Low	High
1-, 2-, 3-RM-90-249 1-, 2-, 3-RM-90-251	1.73	2.27
0-RM-90-252	1.12	1.87
1-, 2-, 3-RM-90-250	3.6	4.4
0-RM-90-147/148	1.1	1.5

6.0 ACCEPTANCE CRITERIA (continued)

D. The concentration of hydrogen gas in the off gas shall be less than or equal to 4 percent by volume (TRM LCO 3.7.2) as measured by the applicable unit H2R-66-96 Hydrogen Analyzer or as determined from off gas grab samples.

E. Acceptance criteria determination steps will be designated by (AC).

F. The off gas pretreatment radiation levels (1-, 2-, and 3-RM-090-0157) and the off gas flow rate (1-FR-066-0111, 2-XR-66-103, and 3-FR-066-0111) instrumentation readings are required for monitoring system performance and for failed fuel performance calculations. There is no Technical Specification surveillance requirements associated with these observations. The observation will be made shiftly during periods of main condenser/offgas treatment system operation.

G. In the event that 1-, 2-, or 3-PA-090-0262 is inoperable, but 1-, 2, or 3 RM-090-0265 or 0266 is operable, the off gas post treatment flow must be recorded at least once every 4 hours and the flow must be at least 0.06 cfm. If both 1-, 2, or 3 RM-090-0265 and 0266 are inoperable a flow is not required. If the flow acceptance criteria is not met, declare 1-, 2, or 3 RM-090-0265 and 0266 inoperable and notify Chemistry to initiate1-, 2, or 3-SI-4.8.B.1.a.3.

Date Today

7.0 PROCEDURE STEPS

NOTES

1. All notes, remarks, and comments are to be recorded on Attachment 1. Each statement is to be numbered and cross-referenced to the appropriate attachment or SI step.
2. Attachments **NOT** used in the performance of this SI do **NOT** need to be included in the completed SI package.

[1] **OBTAIN** permission from the Unit 1 Unit Supervisor to perform this instruction. DR U1

[2] **OBTAIN** permission from the Unit 2 Unit Supervisor to perform this instruction. MG U2

[3] **OBTAIN** permission from the Unit 3 Unit Supervisor to perform this instruction. DZ U3

[4] [NRC/C] **NOTIFY** the Unit Operator (U2) of the intent to begin this instruction. [RPT 82-16, LER 259/8232] GH

[5] On the Surveillance Task Sheet (STS)

RECORD the Start Date & Time. JR

NOTE

SI step performance and acceptance criteria verification are to be noted on the appropriate SI attachments for Steps 7.0[6] through 7.0[15]

[6] **REVIEW** the Precautions and Limitations in Section 3.0.
INITIAL on Attachment 2.

[7] **ENSURE** that all Prerequisites in Section 4.0 have been met.
INITIAL on Attachment 2.

Date Today

7.0 **PROCEDURE STEPS (continued)**

[8] **OBTAIN** the following information.

[8.1] Once per shift, **RECORD** on Attachment 2 each unit's 8 hour average power level in megawatts thermal (MWT). **IF** shutdown, THEN

ENTER 0.

NOTE

Due to variations in required performance frequency and to minimize impact on personnel, Steps 7.0[9], 7.0[10], and 7.0[11] through 7.0[15] can be completed independently. If the stack flow instrumentation (0-FI-90-271) is inoperable or out of service and 0-FI-90-348 is **NOT** used, Attachment 7 must be completed before Step 7.0[11] can be completed.

[9] Fan Status Determination

[9.1] RM-90-249

[9.1.1] Once per shift: **RECORD** on Attachment 3 the operating status of each ventilation fan monitored by this CAM. The status shall be indicated with "X" in the appropriate ON/OFF column.

[9.1.2] Once per day (night shift): **IF** all fans serviced by this CAM are off and the monitor is out of service, **THEN**

VERIFY the exhausts' fan control switches are tagged out of service and **VERIFY** the fan dampers are closed.

[9.2] RM-90-250

[9.2.1] Once per shift: **CHECK** the status of each fan contributing flow to the ventilation path monitored by the RM-90-250 CAM. **USE** an "A" or "B" to denote which fan is operating. **INDICATE** the fan status by using the "O" column for all fans off (if applicable), the "S" column for fans on slow, or the "F" column for fans on fast.

[9.3] RM-90-251

[9.3.1] Once per shift: **RECORD** on Attachment 3 the operating status of each ventilation fan monitored by this CAM. The status shall be indicated with "X" in the appropriate ON/OFF column.

7.0 **PROCEDURE STEPS (continued)**

[9.3.2] Once per day (Night shift): **IF** all fans serviced by this CAM are off and the monitor is out of service, **THEN**

ENSURE the exhausts' fan control switches are tagged out of service and **VERIFY** the fan dampers are closed.

[9.4] 0-RM-90-252 (Unit 1 Only)

[9.4.1] Once each shift: **RECORD** the operating status of fans monitored by this CAM with an "X" in the appropriate column of Attachment 3. **USE** column "0" for all fans off, column "1" for one fan on, or column "2" for two fans on.

[9.5] **IF** any of the indicated fans (stack dilution or CAM) are operating and the corresponding monitor is declared inoperable, **THEN**

CONTACT the Chemical Laboratory and **ENSURE** that compensatory sampling in accordance with 0-SI-4.8.B.1.a.2 is being conducted.

[9.6] Prior to 0659 Friday morning, **TOTAL** the number of shifts each column of Attachment 3 was marked. **RECORD** the totals at the bottom of Attachment 3.

Date Today

7.0 **PROCEDURE STEPS (continued)**

10 **DETERMINE** the building ventilation noble gas release rate once per shift by completing the following steps and **VERIFY** that all monitors with an open release path are **OPERABLE:**

10.1 For each monitor listed on Attachment 4, **COMPLETE** one of the **FOLLOWING** four steps:

[10.1.1] From the CONTINUOUS AIR MONITORING SYSTEM OPERATOR CONSOLE, 0-CONS-90-361, **PANEL 1-9-2, OBTAIN** the noble gas release rate by **USING** the touchscreen options on the console. **SELECT** the noble gas option on the screen (NGAS). **RECORD** the noble gas release rate (µCi/sec) in the appropriate columns of Attachment 4 for each operable building ventilation radiation monitor. The radiation monitor should register a positive release rate; **OTHERWISE, DECLARE** the monitor inoperable. This recording is performed as an Instrument Check **(CHANNEL CHECK).**

[10.1.2] **IF** the operator console 0-CONS-90-361 is **NOT** available and the CAMs are operating, **THEN**

N/A **OBTAIN** the release rate data from the local display on each CAM by **SELECTING** channel 1 with the thumb wheel or directly reading the Chemistry CAM display. The radiation monitor should register a positive release rate; **OTHERWISE, DECLARE** the monitor inoperable. This recording is performed as an Instrument Check **(CHANNEL CHECK).**

Date Today

7.0 **PROCEDURE STEPS (continued)**

NOTE

If 0-SI-4.8.B.1.a.2 is in effect for the CAMs, the Chemical Laboratory will report the release rate in µCi/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value.

[10.1.3] N/A For out of service and/or inoperable CAMs with ventilation system in service, **CONTACT** the Chemical Laboratory and **ENSURE** that manual sampling is being accomplished in accordance with 0-SI-4.8.B.1.a.2. **RECORD** on Attachment 4 the release rate for each inoperable CAM as reported by the Chemical Laboratory.

[10.1.4] N/A **IF** the ventilation system for a CAM is totally isolated (i.e., no environmental releases occurring), **THEN**

RECORD "OOS" in all three columns on Attachment 4.

[10.2] For each monitor, **USE** Attachments 3 and 5 and **DETERMINE** the release factor based on fan status. **RECORD** the release factors from attachment 5 in the appropriate columns on Attachment 4.

[10.3] **MULTIPLY** the release rate by the release factor and **RECORD** the answer under the column labeled "Actual Rate" on Attachment 4.

[10.4] For each unit, **SUM** the actual rates for the RM-90-249, RM-90-250, and RM-90-251 monitors. **RECORD** the unit total release rates in the appropriate columns on Attachment 4.

[10.5] **SUM** the three unit total release rates and the 0-RM-90-252 actual rate. **RECORD** the building ventilation release rate on Attachment 4.

7.0 PROCEDURE STEPS (continued)

NOTE

For reporting purposes, the release fraction should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded as 0.123.

A release fraction of 0.00012 should be recorded as 0.000.

[10.6] **DETERMINE** the building ventilation release fraction by dividing the total building ventilation release rate by 1.50 E+05 (or 150,000) µCi/sec. **RECORD** the fraction on both Attachment 2 and Attachment 4.

[10.7] **VERIFY** the acceptance criteria as given in Step 6.0B.1 has been met. The building ventilation release fraction must be less than or equal to 0.90. **IF** the acceptance criteria have failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

Date Today

7.0 **PROCEDURE STEPS (continued)**

[11] **DETERMINE** the elevated (stack) noble gas release rate once per shift by completing the following steps:

[11.1] **RECORD** the highest noble gas count rates (counts per second, cps) for the 0-RM-90-147 and 0-RM-90-148 monitors in the appropriate columns of Attachment 6 in accordance with one of the following steps:

[11.1.1] **IF** both the 0-RR-90-147 and at least one of the radiation monitors are operable, **THEN**

OBTAIN the necessary information from 0-RR-90-147 on Panel 9-2. **IF** applicable, **THEN**

RECORD "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

[11.1.2] **IF** 0-RR-90-147 is inoperable and at least one of the radiation monitors is operable, **THEN**

N/A

OBTAIN the necessary data from the 0-RM-90-147B and/or 0-RM-90-148B monitors located on Panel 1-9-10. **IF** applicable, **THEN**

RECORD "OOS" in the appropriate column of Attachment 6 if one of the monitors is out of service.

[11.1.3] **IF** both monitors are inoperable, **THEN**

N/A

CONTACT the Chemical Laboratory and **ENSURE** that manual sampling has been initiated in accordance with 0-SI-4.8.B.1.a.2. **RECORD** "OOS" in the appropriate columns of Attachment 6.

7.0 **PROCEDURE STEPS (continued)**

NOTE

If 0-SI-4.8.B.1.a.2 is in effect for the stack monitors, the Chemical Laboratory will report the stack release rate in µCi/sec for each grab sample. The reported release rate will assume a maximum flow rate and will yield a conservative (high) release value. In this case, Steps 7.0[11.2] and 7.0[11.3] are **NOT** applicable.

[11.2] **DETERMINE** the stack flow rate and **RECORD** in the appropriate column of Attachment 6.

[11.2.1] **IF** 0-FI-90-271 on Panel 1-9-53 is operable, **THEN**

RECORD the stack flow in standard cubic feet per minute (scfm).

[11.2.2] If 0-FI-90-271 on Panel 1-9-53 is inoperable, the flow can be determined from 0-FI-90-348 on Panel 25-412 in the WRGERMS building. **IF** 0-FI-90-348 is used for the flow, **THEN**

N/A

MAKE a note in the remarks log that 0-FI-90-348 was used.

[11.2.3] **IF** 0-FI-90-271 on Panel 1-9-53 is inoperable and 0-FI-90-348 is **NOT** used, **THEN**

N/A

ESTIMATE the stack flow every four hours using Attachment 7. **RECORD** the total stack flow in scfm on Attachment 7. **RECORD** on Attachment 6 the most current value of the 4 hour observations from Attachment 7.

[11.3] **DETERMINE** the stack release rate by using the gross count rate and total stack flow in accordance with the following equation. When there are two gross count rate readings, **USE** the highest gross count rate. **IF** both monitors (0-RM-90-147/8) are INOP, **THEN**

CONTINUE with Step 7.0[11.4].

Total Stack Flow (scfm) x Gross Count Rate (cps) x 1.23 E-03 [(µCi/sec)/(cps-scfm)]

[11.4] **RECORD** in the appropriate column of Attachment 6 either the release rate calculated in Step 7.0[11.3] or as reported by the Chemical Laboratory for an inoperable monitor.

7.0 PROCEDURE STEPS (continued)

NOTE

Alternative sampling for the WRGERM monitor is satisfied by taking readings from the normal stack release monitors, 0-RM-90-147 and/or 0-RM-90-148, when operable or by manual sampling in accordance with 0-SI-4.8.B.1.a.2 when the normal stack monitors are inoperable. This alternate sampling succession satisfies the requirement for a preplanned alternate method as required in TABLE 3.3.5-1 of the TRM.

[11.5] Wide Range Gaseous Effluent Radiation Monitor (WRGERM), 0-RM-90-306, Panel 2-9-10.

[11.5.1] **IF** the monitor is inoperable, **THEN**

N/A **RECORD** "INOP" in the appropriate column of Attachment 6 and **CONTINUE** with Step 7.0[11.6]. Otherwise, **CONTINUE** with Step 7.0[11.5.2].

[11.5.2] **ENSURE** 0-RM-90-306 is in the Sample Mode.

[11.5.3] **RECORD** the noble gas release rate in µCi/sec in the appropriate column of Attachment 6. **RECORD** results to two decimal places (e.g., 2.95E 00).

[11.6] **IF** the WRGERM monitor is inoperable for a period greater than one day, **THEN**

N/A **CONTACT** the Chemistry Manager. **IF** the monitor remains inoperable for a period of seven days, **THEN**

INITIATE a Problem Evaluation Report within 24 hours in accordance with TRM Table 3.3.5-1 (Action E.2).

[11.7] **IF** all release streams to the stack are isolated, **THEN**

USE a release rate factor of 0.00. Otherwise, **USE** 1.00. **RECORD** the release rate factor in the appropriate column of Attachment 6.

[11.8] **CALCULATE** the actual release rate by multiplying the highest release rate (0-RM-90-147/148 or 0-RM-90-306) by the release factor. **RECORD** the information in the Actual Release Rate column on Attachment 6.

7.0 PROCEDURE STEPS (continued)

NOTE

For reporting purposes, the release fractions should only be recorded to three decimal places.

EXAMPLES

A release fraction of 0.12345 should be recorded only as 0.123.

A release fraction of 0.00012 should be recorded only as 0.000.

[11.9] **CALCULATE** the stack release fraction by dividing the actual release rate by 1.44 E+07 (or 14,400,000) µCi/sec. **RECORD** this information on both Attachment 2 and Attachment 6.

[11.10] **VERIFY** the acceptance criteria as given in Step 6.0B.2 has been met. The stack release fraction must be less than or equal to 0.10. **IF** the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

[12] **CALCULATE** the total site release fraction by adding the building ventilation and stack release fractions on Attachment 2. **VERIFY** the site release fraction acceptance criteria as given in Step 6.0B.3 has been met. **IF** the acceptance criterion has failed, **THEN**

IMMEDIATELY CONTACT the Unit Supervisors. (AC)

NOTE

Verify 2-FCV-66-28 is unrestrained, open and locked.

[13] Once per shift, **RECORD** the Unit 1, 2, and 3 offgas instrumentation readings on Attachment 8.

[13.1] In the "FCV-66-28" column, **PLACE** an "X" in the appropriate box (open or closed).

[13.2] **IF** the unit's FCV-66-28 is CLOSED, **THEN**

RECORD all other offgas readings as **"N/A"** (**NOT** applicable). **CONTINUE** with Step 7.0[13.6].

7.0 PROCEDURE STEPS (continued)

[13.3] **IF** the unit is **NOT** under main condenser/offgas treatment system operations, **THEN**

RECORD the offgas flowrate recorder, offgas pretreatment radiation monitor, and the offgas recombiner readings as **"N/A" (NOT** applicable, i.e., **NOT** required). **CONTINUE** with Step 7.0[13.5].

[13.4] **RECORD** the offgas flowrate recorder [Readings from FR-66-20 (Units 1, 2 and 3) should be recorded if FR-66-111 is inoperable. **IF** readings are taken from FR-66-20 on Units 1, 2 or 3, **THEN**

MAKE a note in the remarks log that readings were taken from FR-66-20], offgas pretreatment radiation monitor, the offgas post-treatment radiation monitors, and the offgas recombiner readings. **IF** the instrumentation is inoperable, **THEN**

RECORD the readings as "INOP". For the FR-66-111, **IF** the narrow range is saturated (upscale; most readings are greater than 30 scfm), **THEN**

USE the wide range recorder; **OTHERWISE** use the narrow range.

[13.5] **IF** both of the offgas post-treatment monitors (RM-90-265 and RM-90-266) for a particular unit are inoperable and the unit FCV-66-28 valve is OPEN, **THEN**

CONTACT the Chemical Laboratory and **ENSURE** that manual sampling has been initiated in accordance with the applicable Units 1-, 2-, and 3-SI-4.8.B.1.a.3.

[13.6] **IF** the observations have been complete for all units, **THEN**

CONTINUE with Step 7.0[14]. **OTHERWISE, CONTINUE** with the next unit.

[14] Once per day (day shift), **RECORD** on Attachment 9 the various radiation monitor's sample flow rate and/or the abnormal sampling annunciator response in accordance with the following instructions:

[14.1] GE Stack Gas Monitor: **RECORD** the sample flow rate from the STACK GAS SAMPLE FLOW indicator/transmitter, 0-FIT-090-0153.

7.0 PROCEDURE STEPS (continued)

[14.2] Continuous Air Monitors:

[14.2.1] From the CONTINUOUS AIR MONITORING SYSTEM OPERATOR CONSOLE, 0-CONS-90-361, **PANEL 1-9-2, OBTAIN** the noble gas sampling rate by **USING** the touchscreen options on the console. **SELECT** the flow option on the screen (FLOW). **RECORD** the noble gas sampling rate (scfm) in the appropriate columns of Attachment 9 for each operable building ventilation radiation monitor.

[14.2.2] **IF** the operator console 0-CONS-90-361 is **NOT** available and the CAMs are operating, **THEN**

OBTAIN the sampling rate data from the local display on each CAM by **SELECTING** channel 15 with the thumb wheel or directly reading the Chemistry CAM display.

[14.2.3] **IF** the sampling flow rate data is **NOT** available, **THEN**

REQUEST the US to declare the CAM inoperable, **CONTACT** the Chemical Laboratory, and **ENSURE** manual sampling has been initiated in accordance with 0-SI-4.8.B.1.a.2.

NOTE

The following alarm annunciators will be tested during the performance of Steps 7.0[14.3] and 7.0[14.4]. Appropriate communications must be established with the unit control room(s) prior to initiating the alarm.

0-FA-090-0150 STACK GAS SAMPLE FLOW ABNORMAL (1-XA-055-0022B, Window 1)

1-PA-090-0262 OFFGAS SAMPLE LINE PRESSURE ABNORMAL (1-XA-055-0004C, Window 28)

2-PA-090-0262 OG POST TRTMT SAMPLE LINE PRESS ABNORMAL (2-XA-055-0004C, Window 28)

3-PA-090-0262 OFFGAS SAMPLE LINE PRESSURE ABNORMAL (3-XA-055-0004C, Window 28)

7.0 PROCEDURE STEPS (continued)

[14.3] Stack Sample Flow Abnormal

NOTE

All manipulations are performed from the Stack unless noted otherwise.

[14.3.1] **ESTABLISH** communications with Unit 1 Operator.

[14.3.2] **VERIFY** 0-FA-090-0150, STACK GAS SAMPLE FLOW ABNORMAL on 1-XA-055-0022B window 1 on Panel 9-22 RESET.

[14.3.3] **OBSERVE** 0-FIT-090-0153, STACK GAS SAMPLE FLOW indication.

[14.3.4] **PLACE** 0-FC-090-0153, STACK GAS SAMPLE FLOW CONTROLLER to MAN.

[14.3.5] **PLACE** 0-FC-090-0153, STACK GAS SAMPLE FLOW CONTROLLER valve positioner to OPEN.

[14.3.6] **WHEN** 0-FIT-090-0153, STACK GAS SAMPLE FLOW indicates 3.0 SCFM or greater, **THEN**

VERIFY 0-FA-090-0150, STACK GAS SAMPLE FLOW ABNORMAL IN ALARM.

[14.3.7] **PLACE** 0-FC-090-0153, STACK GAS SAMPLE FLOW CONTROLLER valve positioner to STOP.

[14.3.8] **PLACE** 0-FC-090-0153, STACK GAS SAMPLE FLOW CONTROLLER to AUTO.

[14.3.9] **OBSERVE** 0-FIT-090-0153, STACK GAS SAMPLE FLOW indication returns to approximately the value observed in Step 7.0[14.3.3].

[14.3.10] **VERIFY** 0-FA-090-0150, STACK GAS SAMPLE FLOW ABNORMAL will **RESET**.

[14.3.11] **IF** 0-FA-090-0150, STACK GAS SAMPLE FLOW ABNORMAL fails to alarm or reset and 0-RM-090-0147/0148 are operable, **THEN**

PERFORM Attachment 10 to record sample flow readings every four hours.

Date _____

7.0 PROCEDURE STEPS (continued)

[14.4] Offgas Post-Treatment Sample Flow Abnormal

[14.4.1] **NOTIFY** the Unit Operators that they will receive annunciation on the following alarms:

1-PA-090-0262	OG POST TRTMT SAMPLE LINE PRESS ABNORMAL (1-XA-055-0004C, Window 28)
2-PA-090-0262	OG POST TRTMT SAMPLE LINE PRESS ABNORMAL (2-XA-055-0004C, Window 28)
3-PA-090-0262	OFFGAS SAMPLE LINE PRESSURE ABNORMAL (3-XA-055-0004C, Window 28)

[14.4.2] On Panel 25-94 in the Offgas Post-Treatment Building, **CLOSE** the unit SHV-090-0512 valve.

[14.4.3] **VERIFY** with the UO that the annunciator is in ALARM.**(AC)**

[14.4.4] **OPEN** the unit SHV-090-0512 valve.

[14.4.5] **VERIFY** with the UO that the annunciator will clear when reset. **(AC)**

[14.4.6] **IF** PA-090-0262 fails the AC and RM-090-0265/0266 are operable with the FCV-066-0028 valve open, **THEN**

USE Attachment 10 to record the sample flow readings every 4 hours.

[14.4.7] **CONTINUE** with the next unit, until all three unit offgas post-treatment systems have been completed.

[15] **PERFORM** the following reviews at the completion of each shift or as stated:

[15.1] Unit Supervisor: **PERFORM** Independent Verification of calculations and Acceptance Criteria on Attachments 2, 4, 6, 7, 8, and 9.

[15.2] STA: **REVIEW** the data for Technical Requirements Manual and ODCM compliance.

Date _____

7.0 PROCEDURE STEPS (continued)

[16] **PERFORM** the following during night shift:

[16.1] **MAKE** a copy of the up-to-date Attachments 3, 6, and 8. **PLACE** the copies in a folder marked for the Radiochemical Laboratory pickup. **KEEP** the folder at the log AUO's desk until picked up by a Chemistry person.

NOTE

The following steps are to be performed and initialed at the end of the SI performance week.

[17] **REVIEW** all applicable attachments and **VERIFY** they are complete. _____

[18] **ENSURE** all initials which appear in this instruction have been properly recorded and identified as required on Surveillance Task Sheet (STS). This includes, but is **NOT** limited to AUOs, Unit Supervisors, Shift Manager, and STAs. _____

[19] **ENSURE** all Acceptance Criteria listed in Step 6.0 were met. _____

[20] For each Acceptance Criteria failure, **ENSURE** a PER and/or WO is initiated as applicable. **ENSURE** each PER and/or WO is identified in the Remarks Log. **N/A** if no Acceptance Criteria is failed. _____

[21] On the Surveillance Task Sheet (STS)

- **RECORD** the Completion Date & Time _____
- **REVIEW** and **COMLPETE** the Surveillance Task Sheet (STS) through the Test Director/Lead Perform & Date fields _____

[22] **NOTIFY** the Unit Operators and the Unit Supervisors that this instruction is complete. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

Attachment 1: Independent Review and Remarks Log

Attachment 2: Site Effluent Release Rate Summary

Attachment 3: Fan Status Report

Attachment 4: Building Effluent Release Rate Log

Attachment 5: Building Ventilation System Release Factors

Attachment 6: Elevated Effluent Release Rate Log

Attachment 7: Airborne Effluent for Total Stack Flow Rates

Attachment 8: Offgas Instrumentation Log

Attachment 9: Airborne Effluent Release Rate

Attachment 10: Sample Flow Abnormal Log

Attachment 11: EPIP Release Rate Log

Attachment 3
(Page 1 of 3)

Fan Status Report

Week From Today To _____

Unit 1 DAY	SHIFT	Reactor Building									Turbine Building																		Radwaste Building			AUO Init
		1-RM-90-250									1-RM-90-251										1-RM-90-249								0-RM-90-252			
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J					
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	0	1	2	
Fri	D		B				A		A		X			X	X		X		X		X		X		X			X		X		GH
	N		B				A		A		X			X	X		X		X		X		X		X			X		X		GH
Sat	D		B				A		A		X			X	X		X		X		X		X		X			X		X		JB
	N																															
Sun	D																															
	N																															
Mon	D																															
	N																															
Tue	D																															
	N																															
Wed	D																															
	N																															
Thu	D																															
	N																															
Total																																

Attachment 3
(Page 2 of 3)

Week From Today To _____

Unit 2 DAY	SHIFT	Reactor Building									Turbine Building																		AUO Init
		2-RM-90-250									2-RM-90-251										2-RM-90-249								
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J		
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	
Fri	D		R				A		A		X		X		X		X		X		X		X		X		X		GH
	N		B				A		A		X		X		X		X		X		X		X		X		X		GH
Sat	D		B				A		A		X		X		X		X		X		X		X		X		X		JR
	N																												
Sun	D																												
	N																												
Mon	D																												
	N																												
Tue	D																												
	N																												
Wed	D																												
	N																												
Thu	D																												
	N																												
Total																													

Attachment 3
(Page 3 of 3)

Week From Today To _____

Unit 3 DAY	SHIFT	Reactor Building									Turbine Building																		AUO Init.
		3-RM-90-250									3-RM-90-251									3-RM-90-249									
		Refuel			Reactor			Turbine			A		B		C		D		E		F		G		H		J		
		O	S	F	O	S	F	O	S	F	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	
Fri	D		A				B		A			X	X		X		X			X		X	X		X			X	GH
	N		A				B		A			X	X		X		X			X		X	X		X			X	GH
Sat	D		A				B		A			X	X		X		X			X		X	X		X			X	JR
	N																												
Sun	D																												
	N																												
Mon	D																												
	N																												
Tue	D																												
	N																												
Wed	D																												
	N																												
Thu	D																												
	N																												
Total																													

Attachment 5
(Page 1 of 2)

Building Ventilation System Release Factors

NOTE

If one or more of the fans are off and one or more of the fans are on, assume off fans are on "slow". (This will cover the case where the fans are off, off, slow; off, slow, off; etc.)

1-, 2-, and 3- RM-90-250					
Fan Status (Note)			Release Factor		
Refuel	Reactor	Turbine	Unit 1	Unit 2	Unit 3
Off	Off	Off	0.00	0.00	0.00
Slow	Slow	Slow	0.49	0.53	0.49
Fast	Slow	Slow	0.63	0.60	0.59
Slow	Fast	Slow	0.64	0.73	0.69
Slow	Slow	Fast	0.72	0.73	0.71
Fast	Fast	Slow	0.77	0.80	0.78
Fast	Slow	Fast	0.86	0.80	0.81
Slow	Fast	Fast	0.87	0.94	0.91
Fast	Fast	Fast	1.00	1.00	1.00

0-RM-90-252			
Number Fans On	0	1	2 Fans
Release Factor	0.00	0.62	1.00

Attachment 5
(Page 2 of 2)

Turbine Floor CAM Release Factors

1-RM-90-249, 2-RM-90-249, and 3-RM-90-251					
Number Fans On	0	1	2	3	4
Release Factor	0.00	0.25	0.50	0.75	1.00

1-RM-90-251, 2-RM-90-251, and 3-RM-90-249						
Number Fans On	0	1	2	3	4	5
Release Factor	0.00	0.20	0.40	0.60	0.80	1.00

Attachment 11
(Page 1 of 8)

EPIP Release Rate Log

NOTES

1) This attachment is used to record data during EOIs and REP conditions.
2) Page 2 of 8 is similar to Attachment 2. 3 of 8 through 6 of 8 are similar to Attachment 4, and 7 of 8 and 8 of 8 are similar to Attachment 6.
3) Pages from this attachment may be used to document plant release data on as frequent a basis as needed.
4) Multiple copies of forms from this attachment may be used as needed.
5) Any entries on this form may be NA'ed as needed.

Special Instructions for this attachment.

A. **RECORD** the "From To" dates.

B. **RECORD** the day of the month (under DAY) and time on each line as needed.

C. Instructions for recording the data for each item are as given in the main body of the SI.

Attachment 11
(Page 2 of 8)

Site Effluent Release Rate Summary

From Today To _____

DAY	TIME	SI STEP		Reactor Power (MWT)			Building Ventilation Release Rate Fraction	Stack Release Rate Fraction	Total Site Release Rate Fraction
		7.0[6]	7.0[7]	Unit 1 7.0[8.1]	Unit 2 7.0[8.1]	Unit 3 7.0[8.1]	7.0[10.6]	7.0[11.9]	7.0[12]
Today	0815	JR	JR	3403	Ø	3456			

Attachment 11
(Page 3 of 8)

Building Effluent Release Rate Log - Unit 1

From Today To _____

Unit 1

DAY	TIME	Reactor Building			Turbine Building					
		1-RM-90-250			1-RM-90-249			1-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]
Today	0815	4000	0.64		500	0.75		910	0.80	

Attachment 11
(Page 4 of 8)

Building Effluent Release Rate Log - Unit 2

From Today To _____

Unit 2

DAY	TIME	Reactor Building			Turbine Building					
		2-RM-90-250			2-RM-90-249			2-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]
Today	0815	4300	0.73		840	1.00		2200	1.00	

Attachment 11
(Page 5 of 8)

Building Effluent Release Rate Log - Unit 3

From Today To _____

Unit 3

DAY	TIME	Reactor Building			Turbine Building					
		3-RM-90-250			3-RM-90-249			3-RM-90-251		
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]
Today	0815	3100	0.69		1600	0.40		1900	0.75	

Attachment 11
(Page 6 of 8)

Building Effluent Release Rate Log - Unit 0

From Today To _____

DAY	TIME	Radwaste Building 0-RM-80-252			Unit Total Release Rates (µCi/sec)			Building Ventilation Release Rate (µCi/sec) 7.0[10.5]	Building Ventilation Release Fraction 7.0[10.6]
		Release Rate (µCi/sec) 7.0[10.1]	Release Factor 7.0[10.2]	Actual Rate (µCi/sec) 7.0[10.3]	Unit 1 7.0[10.4]	Unit 2 7.0[10.4]	Unit 3 7.0[10.4]		
Today	0815	225	0.62						

Attachment 11
(Page 7 of 8)

From Today To _____

Elevated Effluent Release Rate Log

DAY	TIME	0-RM-90-147 Red Pen GROSS COUNT RATE (CPS) 7.0[11.1]	0-RM-90-148 Green Pen GROSS COUNT RATE (CPS) 7.0[11.1]	HIGHEST GROSS COUNT RATE (CPS)	STACK FLOW RATE 0-FI-90-271 INOP<16,366 (NOTE 1) -OR- ATT 7 7.0[11.2]	CONVERSION FACTOR	STACK RELEASE RATE (NOTE 2) (µCi/SEC) 7.0[11.3] & 7.0[11.4]
Today	0815	5.75×10^5	4.9×10^5		22700	1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	
						1.23E-03	

1 Minimum acceptable flow rate for 0-FI-90-271 operability is 16,366 SCFM (See note 3).

2 Data from manual sampling results or 0-90-147/148 [(Stack Flow) X Highest Gross Count X 1.23E-03].

3 The minimum acceptable flow rate was revised to 16,366 SCFM (BFPER980545).

Attachment 11
(Page 8 of 8)

Building Effluent Release Rate Log - Unit 0

From Today To _____

DAY	TIME	WRGERMS Noble Gas Release Rate 0-RM-90-306 (µCi/sec) 7.0[11.5]	Highest Stack Release Rate (µCi/sec) (Note 1).	Release Rate Factor (0.00 or 1.00) 7.0[11.7]	Actual Release Rate (µCi/sec) 7.0[11.8]	Stack Release Fraction (Note 2) 7.0[11.9]
Today	0815	1.55×10^{7}		1.00		

1 Use the higher of the Stack release rate or the WRGERMS release rate.

2 Divide actual Stack release rate (µCi/sec) by 1.44E+07 µCi/sec.

FINAL

OPERATOR: _____

SRO ____ DATE: _____

JPM NUMBER: SRO A4

TASK NUMBER: Emergency Plan

TITLE: Classify the event per REP (Uncontrolled water level decrease in SFSP)

K/A NUMBER: 2.4.41 K/A RATING: SRO 4.6

PRA:

TASK STANDARD: The event is classified as an ALERT based on uncontrolled water level decrease in spent fuel pool with irradiated fuel assemblies expected to result in irradiated fuel assemblies being uncovered.

LOCATION OF PERFORMANCE: Classroom

REFERENCES/PROCEDURES NEEDED: EPIP 1, EPIP 3

VALIDATION TIME: 30 minutes

MAX. TIME ALLOWED: 15 minutes to classify and 15 minutes to notify

PERFORMANCE TIME:

COMMENTS: _____
_____
_____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

INITIAL CONDITIONS: You are the Shift Manager (SM). Unit 1 and Unit 2 are at 100% power. The Unit 1 board operator has just acknowledged alarm "Start of Strong Motion Accelerograph," 1-XA-55-22C, Window 5 and multiple personnel in the Unit 1/2 Control Room felt the ground shake. The Unit 2 board operator then acknowledged alarm, "Fuel Pool Skimmer Surge Tank Level Lo/Lo-Lo," and referred to ARP 2-XA-55-4C, Window 4. An AUO was dispatched to panels 25-15 and 25-16. Subsequently, alarms, "Fuel Pool System Abnormal," 2-XA-55-4C, Window 1 AND "Fuel Pool Floor Area Radiation High," 2-XA-55-3A, Window 1 were received. The AUO determines the cause of the alarms to be lowering level in the Spent Fuel Storage Pool. The AUO reports that the Fuel Pool liner appears to be leaking and level is slowly trending downward. Condensate makeup valve 2-SHV-078-0532 is danger tagged closed and all other methods of makeup to the Spent Fuel Storage Pool are unavailable. System Engineering has determined that it will be one (1) hour before the fuel in the Spent Fuel Pool will be in danger of being uncovered. 2-SHV-078-0532, Condensate makeup valve, cannot be untagged for another (2) hours to provide an adequate makeup source.

The TSC and CECC are not staffed.

Reactor Water Level	(+33 inches on normal range) and steady
Reactor Pressure	1035 psig and steady
DW Pressure	1.35 psig and steady
DW Temperature	148 degrees F and steady
DW Radiation	RR-90-256 reading normal
Torus Temperature	89 F° and steady
Torus Pressure	0.20 psig and steady
Torus Level	-1 inch on narrow range and steady
Fuel Pool Level	2 feet below normal (trending down slowly at approximately 4 inches/minute)
Radiation around fuel pool	2-RI-90-1A indicates 21 mR/HR and slowly rising 2-RI-90-2A indicates 20 mR/HR and slowly rising 2-RI-90-3A indicates 20 mR/HR and slowly rising
Wind Direction	105°
Wind Speed	20 mph
NOTE:	No abnormal radiological release is expected offsite.

INITIATING CUE: Identify the HIGHEST <u>REQUIRED</u> emergency classification, and complete the associated initial notification form. Raise your hand <u>immediately</u> once you have classified the event, and the examiner will then provide you with the EPIP you've chosen so you can begin completing the initial notification form.

JPM is Time Critical

****

Classroom

****

INITIAL CONDITIONS: You are the Shift Manager (SM). Unit 1 and Unit 2 are at 100% power. The Unit 1 board operator has just acknowledged alarm "Start of Strong Motion Accelerograph," 1-XA-55-22C, Window 5 and multiple personnel in the Unit 1/2 Control Room felt the ground shake. The Unit 2 board operator then acknowledged alarm, "Fuel Pool Skimmer Surge Tank Level Lo/Lo-Lo," and referred to ARP 2-XA-55-4C, Window 4. An AUO was dispatched to panels 25-15 and 25-16. Subsequently, alarms, "Fuel Pool System Abnormal," 2-XA-55-4C, Window 1 AND "Fuel Pool Floor Area Radiation High," 2-XA-55-3A, Window 1 were received. The AUO determines the cause of the alarms to be lowering level in the Spent Fuel Storage Pool. The AUO reports that the Fuel Pool liner appears to be leaking and level is slowly trending downward. Condensate makeup valve 2-SHV-078-0532 is danger tagged closed and all other methods of makeup to the Spent Fuel Storage Pool are unavailable. System Engineering has determined that it will be one (1) hour before the fuel in the Spent Fuel Pool will be in danger of being uncovered. 2-SHV-078-0532, Condensate makeup valve, cannot be untagged for another (2) hours to provide an adequate makeup source.

The TSC and CECC are not staffed.

Reactor Water Level	(+33 inches on normal range) and steady
Reactor Pressure	1035 psig and steady
DW Pressure	1.35 psig and steady
DW Temperature	148 degrees F and steady
DW Radiation	RR-90-256 reading normal
Torus Temperature	89 F° and steady
Torus Pressure	0.20 psig and steady
Torus Level	-1 inch on narrow range and steady
Fuel Pool Level	2 feet below normal (trending down slowly at approximately 4 inches/minute)
Radiation around fuel pool	2-RI-90-1A indicates 21 mR/HR and slowly rising 2-RI-90-2A indicates 20 mR/HR and slowly rising 2-RI-90-3A indicates 20 mR/HR and slowly rising
Wind Direction	105°
Wind Speed	20 mph
NOTE:	No abnormal radiological release is expected offsite.

INITIATING CUE: Identify the HIGHEST <u>REQUIRED</u> emergency classification, and complete the associated initial notification form. Raise your hand <u>immediately</u> once you have classified the event, and the examiner will then provide you with the EPIP you've chosen so you can begin completing the initial notification form.

JPM is Time Critical

START TIME_____

****

Performance Step 1: Critical X Not Critical

Refers to EPIP 1 to classify emergency event.

Standard:

SHIFT MANAGER refers to EPIP 1and declares an ALERT, EAL 1.1-A2, based on uncontrolled water level decrease in Spent Fuel Storage Pool expected to result in irradiated fuel assemblies being uncovered.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

TIME Classified _____

START TIME_____

****

Performance Step 2: Critical X Not Critical

Implements EPIP-3 Alert and completes Appendix A of EPIP 3

Standard:

Shift Manager completes Appendix A of EPIP 3 within 15 minutes of event classification

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

TIME Appendix A Complete _____

****

Performance Step 3: Critical X Not Critical

Completes Appendix A of EPIP 3

Standard:

Following are Critical portions of Appendix A: EAL Designator 1.1-A2, Unit 2 is checked, Time and Date Event declared, PAR recommendation "NONE" is checked, and "This is a drill" is checked.

SAT___ UNSAT___ N/A ___COMMENTS:_____

_____

END OF TASK

APPENDIX A
Page 1 of 1
ALERT INITIAL NOTIFICATION FORM

1. * ☒ This is a Drill ☐ This is an Actual Event - Repeat - This is an Actual Event

2. This is Name, **Browns Ferry** has declared an **ALERT** affecting:

☐ **UNIT 1** * ☒ **UNIT 2** ☐ **UNIT 3** ☐ **COMMON**

3. **EAL Designator:** * 1.1-A2 (USE ONLY ONE EAL DESIGNATOR)

4. **Brief Description of the Event:**

Uncontrolled water level decrease in Spent Fuel Storage Pool expected to result in irradiated fuel assemblies being uncovered.

5. **Radiological Conditions:** (Check one under both Airborne and Liquid column.)

Airborne Releases Offsite	**Liquid** Releases Offsite
☒ Minor releases within federally approved limits[1]	☒ Minor releases within federally approved limits[1]
☐ Releases above federally approved limits[1]	☐ Releases above federally approved limits[1]
☐ Release information not known ([1]Tech Specs/ODCM)	☐ Release information not known ([1]Tech Specs/ODCM)

6. **Event Declared:** Time: * Time Declared Date: * Date Declared

7. **Provide Protective Action Recommendation:** * ☒ None

8. **Please repeat the information you have received to ensure accuracy.**

9. **ODS FAX number 5-751-8620**
State of Alabama FAX number 9-1-205-280-2495

* critical steps