

Final Submittal

(Blue Paper)

FINAL JPMS

1. ADMINISTRATIVE JPMS
2. IN-PLANT JPMS
3. SIMULATOR JPMS (CONTROL ROOM)

Browns Ferry Nuclear Plant Operations Training Group




HLT Class 0610 NRC Exam Job Performance Measures

Facility: BFN		Date of Examination: 2/25/08
Exam Level (circle one): <u>RO</u> / SRO-I / SRO-U		Operating Test Number: HLT0610
Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Code*	Safety Function
a. Respond to a Recirc Pump Trip (OPRM'S Operable) (0610 SJPM-610F)	ADES	1
b. Perform Control Room Transfer of 4KV Unit Board 3B Power Supplies (U3 Control Room) (0610 SJPM-222)	NS	6
c. Restoration to Normal following RPS Bus Power Loss (0610 SJPM-132)	DES	7
d. Respond to Offgas Post Treat HI HI HI (0610 SJPM-190)	DSP	9
e. Respond to Stuck Open SRV (0610 SJPM-3136F)	AMELS	3
f. Placing Standby Steam Jet Air Ejector in Operation (0610 SJPM-3116F)	AMES	4
g. Respond to Drywell Pressure and/or Temperature High or Excessive Leakage into the Drywell - FAULTED - SBTG C Failed (0610 SJPM-3126F)	ADEMS	5
h. Injection system lineup-CS SYS I (0610 SJPM-322F) (RO)	ADELS	2
In-Plant Systems (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i. Bypassing RCIC Test Mode Isolation Interlocks (0610 PJPM-63)	EMR	3
j. Place a 250V Battery Charger in Service (0610 PJPM-86)	DL	6
k. Bypassing HPCI High Suppression Pool Water Level Suction transfer Interlock (0610 PJPM-66)	DEL	2
l. Respond to Stuck Open SRV (0610 PJPM-76F)	ADE	3
m. Vent and Repressurize the Scram Pilot Air Header (0610 PJPM-8)	DEP	1
n. Removal and Replacement of RPS Scram Solenoid Fuses (0610 PJPM-311)	DE	1
*Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate Path	4-6 / 4-6 / 2-3	
(C)ontrol Room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

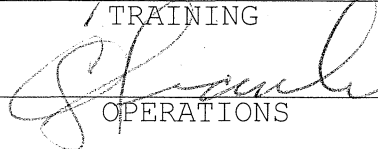
BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 610F
TITLE: RESPOND TO A DUAL REACTOR RECIRC PUMP TRIP
(OPRM's Operable)
TASK NUMBER: U-068-AB-01

SUBMITTED BY:  DATE: 1/3/08

VALIDATED BY: _____ DATE: _____

APPROVED:  DATE: 1/5/08
TRAINING

PLANT CONCURRENCE:  DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	2/9/06	ALL	NEW PROCEDURE

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 610F

TASK NUMBER: U-068-AB-01

TASK TITLE: RESPOND TO A DUAL RECIRC PUMP TRIP

K/A NUMBER: 202001A2.03 K/A RATING: RO 3.6 SRO: 3.7

TASK STANDARD: PERFORM REQUIRED OPERATOR ACTION FOR A TRIP OF
BOTH REACTOR RECIRCULATION PUMPS AT RATED POWER

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 2-AOI-68-1A, REV 4; 2-AOI-100-1 REV
83

VALIDATION TIME: CONTROL ROOM: 10:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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. Ensure you indicate to me when you understand your assigned task and when you have completed the assigned task.

INITIAL CONDITIONS: You are a Unit 2 Operator. Unit 2 is at full power. I will act as your Unit Supervisor.

INITIATING CUES: Respond to the next event.

START TIME _____

INSTRUCTOR NOTE: WHEN EXAMINEE IS READY, HAVE CONSOLE
OPERATOR TRIP ONE RECIRC PUMP.

4.1 Immediate Actions

None

Performance Step : Critical___ Not Critical X

4.2 Subsequent Actions

NOTE

Step 4.2[2] through 4.2[17.3] apply to any core flow lowering event.

[1] IF both Recirc Pumps are tripped in modes 1 or 2, THEN (Otherwise N/A)

A. SCRAM the Reactor.

B. VERIFY natural circulation by observing positive jet pump flow or core differential pressure as indicated on 2-XR-68-50 on Panel 9-5.

C. INFORM the Unit Supervisor, Tech Spec 3.4.1 requires the Reactor be placed in Mode 3 in 12 hours. Refer to 2-GOI-100-12A and Tech Specs 3.4.1.B.

Standard:

Student enters 2-AOI-68-1A and DETERMINES no condition requiring reactor SCRAM exists at this time.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical X Not Critical

- [2] **IF** Region I or II of the Power to Flow Map
(Illustration 1) is entered, **THEN** (Otherwise N/A)

IMMEDIATELY take actions to INSERT control rods to less than 95.2% loadline. Refer to 0-TI-464, Reactivity Control Plan Development and implementation.

Standard:

VERIFIES the Reactor is in Region II of the Power to Flow Map and informs the Unit Supervisor he/she is driving control rods IAW the Reactivity Control Plan to below the 95.2% rod line.

SAT	UNSAT	N/A	COMMENTS:

NOTE: REGION 2 OF THE POWER FLOW MAP WILL BE ENTERED. AS UNIT SUPERVISOR, REPEAT DRIVING RODS TO BELOW THE 95.2% ROD LINE IAW THE REACTIVITY CONTROL PLAN. IF A SECOND OPERATOR IS REQUESTED TO PERFORM PEER CHECKING, EXAMINER WILL PERFORM PEER CHECKS (AND WILL HAVE TO AGREE WITH WHATEVER THE EXAMINEE STATES).

4.2 Subsequent Actions

NOTE

Step 4.2[2] through 4.2[17.3] apply to any core flow lowering event.

[1] IF both Recirc Pumps are tripped in modes 1 or 2, THEN (Otherwise N/A)

- A. SCRAM the Reactor.
- B. VERIFY natural circulation by observing positive jet pump flow or core differential pressure as indicated on 2-XR-68-50 on Panel 9-5.
- C. INFORM the Unit Supervisor, Tech Spec 3.4.1 requires the Reactor be placed in Mode 3 in 12 hours. Refer to 2-GOI-100-12A and Tech Specs 3.4.1.B.

Standard:

EXAMINEE recognizes that both Recirc Pumps are now tripped and returns to step 4.2[1] A, B, and C to SCRAM the Reactor (and give SCRAM report), (Critical) VERIFY natural circulation on 2-XR-68-50, and INFORMS the Unit Supervisor the Tech Spec requirement to be in Mode 3 in 12 hours. (Not Critical) EXAMINEE enters 2-AOI-100-1 for the Reactor SCRAM (Entering 2-AOI-100-1 is not critical).

SAT	UNSAT	N/A	COMMENTS:

AFTER THE REACTOR IS SCRAMED, SCRAM REPORT GIVEN, NATURAL CIRCULATION VERIFIED, AND US NOTIFIED OF TECH SPEC REQUIREMENTS, CUE: **ANOTHER OPERATOR WILL PERFORM THE ACTIONS OF 2-AOI-100-1, THAT WILL BE ALL FOR NOW.**

STOP TIME _____

END OF TASK

GENERIC WORK PRACTICES

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of SELF CHECKING during this JPM.

Standard:

PERFORMER verified applicable components by utilizing SELF CHECKING in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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. Ensure you indicate to me when you understand your assigned task and when you have completed the assigned task.

INITIAL CONDITIONS: You are a Unit 2 Operator. Unit 2 is at full power. I will act as your Unit Supervisor.

INITIATING CUES: Respond to the next event.



Browns Ferry Nuclear Plant

Unit 2

Abnormal Operating Instruction

2-AOI-68-1A

Recirc Pump Trip/Core Flow Decrease OPRMs Operable

Revision 0006

Quality Related

Level of Use: Continuous Use

Effective Date: 04-16-2007

Responsible Organization: OPS, Operations

Prepared By: R L Eakin

Approved By: James A. McCrary

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 2 of 12
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Current Revision Description

Type of Change: ENHANCEMENT

Tracking Number: 7

Deleted Illustration 1, "Power To Flow Map". The latest Revisions of the Power To Flow Map is maintained in 0-TI-248"Station Reactor Engineer" and on ICS. This information is added where needed throughout this procedure.

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 3 of 12
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1.0 PURPOSE

This instruction provides the symptoms, automatic actions, and operator actions for a core flow lowering or Reactor Recirc Pump trip in one or two loops with OPRMs Operable.

<p>BFN Unit 2</p>	<p>Recirc Pump Trip/Core Flow Decrease OPRMs Operable</p>	<p>2-AOI-68-1A Rev. 0006 Page 4 of 12</p>
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1.0 PURPOSE (continued)

CAUTIONS

- 1) Operation with one recirc pump out of service and the inservice jet pump loop flow $\leq 41 \times 10^6$ lbm/hr (2-FI-68-46 or 2-FI-68-48) can result in inaccurate core flow indication. This results from positive jet pump flow in the out of service loop being subtracted instead of added. If operation in this condition is required, contact Reactor Engineers to perform Attachment 2 of 2-SR-3.4.1(SLO) to determine actual core flow and to substitute that value into the ICS as necessary.
- 2) Immediately upon the opening of the "DRIVE RUNNING" contacts, the associated jet pump loop flow is subtracted even though the loop flow is still positive. This results in a severe indicated lowering in core flow, then as the tripped loop flow decays toward zero, the core flow indication will rise toward the actual value. The severity of the indicated core flow perturbation will depend upon the cause of the Recirc pump trip and the speed of the Recirc Drive prior to the trip.
- 3) [NER/C]. The Natural circulation line on the Power/Flow map (0-TI-248 or ICS) only shows the approximate, nominal characteristic for operating with both Recirc loops out of service. Therefore, indicated core flow in natural circulation operation may not fall directly on the natural circulation line as depicted on the Power/Flow map. [NRC IN 96-016, GE SIL 516]
- 4) Per Technical Specifications, the Reactor CAN BE operated indefinitely with one Recirc loop out of service, provided the requirements of T.S. 3.4.1 are implemented within 24 hours of entering single loop operations.
- 5) [NER] The natural circulation line on the Power/Flow map (0-TI-248 or ICS) is only an approximation. Inaccuracies are evident at Low/No-Flow conditions.
- 6) Failure to monitor SJAE/OG CNDR CNDS FLOW, 2-FI-2-42, on Panel 2-9-6 for proper flow may result in SJAE isolation.
- 7) Changes in Condensate System flow may require adjustment to SPE CNDS BYPASS, 2-FCV-002-0190, either in the Control Room or locally. Personnel adjusting this valve locally should be in direct communication with the Control Room.

NOTE

Because a Reactor Recirc Pump seizure provides the same symptoms, the actions described herein cover that condition also. A seizure would most likely not be immediately discernible from other pump trips.

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 5 of 12
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2.0 SYMPTOMS

A. The following annunciators may alarm:

1. ATWS AUTO INITIATE, (2-XA-55-4A, Window 10)
2. RECIRC DRIVE 2A TRIP TIMER INITIATED (2-XA-55-4A, Window 5)
3. RECIRC DRIVE VFD A LOCKOUT (2-XA-55-4A, Window 6)
4. RECIRC DRIVE 2A TRIPPED (2-XA-55-4A, Window 7)
5. RECIRC DRIVE 2B TRIP TIMER INITIATED (2-XA-55-4B, Window 5)
6. RECIRC DRIVE VFD B LOCKOUT (2-XA-55-4B, Window 6)
7. RECIRC DRIVE 2B TRIPPED (2-XA-55-4B, Window 7)
8. LPRM DOWNSCALE (2-XA-55-5A, Window 5)
9. LPRM HIGH (2-XA-55-5A, Window 12)
10. RECIRC FLOW SYSTEM TROUBLE ALARM (2-XA-55-4A, WINDOW 23)
11. OPRM TRIP ENABLED (2-XA-55-5A, WINDOW 30)

B. Recirc Drive/Pump A and/or B speed lowering.

C. Reactor Power lowering.

D. Steam pressure lowering.

E. Recirc Pump Disch Flow (2-FR-68-5) lowering (very sharp and rapid lowering in the event of a Recirc Pump seizure).

3.0 AUTOMATIC ACTIONS

Turbine Control valves throttle to maintain reactor pressure.

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 6 of 12
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4.0 OPERATOR ACTIONS

4.1 Immediate Actions

None

4.2 Subsequent Actions

NOTE

Step 4.2[3] through Step 4.2[18.3] apply to any core flow lowering event.

- [1] **IF** both Recirc Pumps are tripped in modes 1 or 2, **THEN**
(Otherwise N/A),

A. **SCRAM** the Reactor.



CAUTION

[NER/C] Failure to restart Reactor Recirculation pumps in a timely manner may result in exceeding the differential temperature limit for pump start and subsequently require plant depressurization to avoid exceeding pressure-temperature limits for the reactor vessel. [SER 93-005]

- B. **RESTART** affected Reactor Recirculation pumps. Refer to 2-OI-68 Section 8.0.



- [2] **IF** the ΔT between the Rx vessel bottom head temperature and the moderator temperature precludes restart of a Recirc pump, **OR** forced Recirculation flow **CANNOT** be established for any reason, **THEN** (Otherwise NA)

A. **INITIATE** a plant cooldown to prevent exceeding the pressure limit for the Rx vessel bottom head temperature indicated on 2-PNL-9-47, 2-TR-56-4 pt. 10 and based on Tech Specs Figure 3.4.9-1.



B. **INFORM** the Unit Supervisor, Tech Spec 3.4.1 requires the Reactor be placed in Mode 3 in 12 hours. Refer to 2-GOI-100-12A and Tech Specs 3.4.1.B.



BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 7 of 12
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4.2 Subsequent Actions (continued)

NOTE

Power To Flow Map is maintained in 0-TI-248"Station Reactor Engineer" and on ICS.

- [3] **IF** Region I or II of the Power to Flow Map is entered, **THEN**
(Otherwise N/A)

IMMEDIATELY take actions to INSERT control rods to less than 95.2% loadline. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation. ☐

- [4] **RAISE** core flow to greater than 45%. Refer to 2-OI-68. ☐

- [5] **INSERT** control rods to exit regions if not already exited. Refer to 0-TI-464, Reactivity Control Plan Development and Implementation. ☐

NOTE

The remaining subsequent action steps apply to a single Reactor Recirc Pump trip.

- [6] **CLOSE** tripped Recirc Pump discharge valve. ☐

- [7] **MAINTAIN** operating Recirc pump flow less than 46,600 gpm. Refer to 2-OI-68. ☐

- [8] [NER/C] **WHEN** plant conditions allow, **THEN**, (Otherwise N/A)

MAINTAIN operating jet pump loop flow greater than 41×10^6 lbm/hr (2-FI-68-46 or 2-FI-68-48). [GE SIL 517] ☐

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 8 of 12
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4.2 Subsequent Actions (continued)

CAUTION

The temperature of the coolant between the dome and the idle Recirc loop should be maintained within 75°F of each other. If this limit cannot be maintained, a plant cool down should be initiated. Failure to maintain this limit and not cool down could result in hangers and/or shock suppressers exceeding their maximum travel range. [GE SIL 251, 430 and 517]

- [9] **IF** Recirc Pump was tripped due to dual seal failure, **THEN**
(Otherwise N/A)
- [9.1] **VERIFY** TRIPPED, RECIRC DRIVE 2A(2B) NORMAL FEEDER, 2-HS-57-17(14). ☐
- [9.2] **VERIFY** TRIPPED, RECIRC DRIVE 2A(2B) ALTERNATE FEEDER, 2-HS-57-15(12). ☐
- [9.3] **CLOSE** tripped recirc pump suction valve using, RECIRC PUMP 2A(2B) SUCTION VALVE, 2-HS-68-1(77). ☐
- [9.4] **IF** it is evident that 75°F between the dome **AND** the idle Recirc loop cannot be maintained, **THEN**

COMMENCE plant shut down and cool down. Refer to 2-GOI-100-12A. ☐
- [10] **NOTIFY** Reactor Engineer to **PERFORM** the following:
- Refer to Tech Specs 3.4.1
 - 2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation
 - 0-TI-248, Core Flow Determination in Single Loop Operation ☐
- [11] [NER/C] **WHEN** the Recirc Pump discharge valve has been closed for at least five minutes (to prevent reverse rotation of the pump) [GE SIL-517], **THEN** (N/A if Recirc Pump was isolated in Step 4.2[9])

OPEN Recirc Pump discharge valve as necessary to maintain Recirc Loop in thermal equilibrium. ☐

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 9 of 12
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4.2 Subsequent Actions (continued)

- [12] **REFER TO** the following ICS screens to help determine the cause of recirc pump trip/core flow lowering.
- VFDMPA(VFDPMPB), VFDAAL(VFDBAL) ☐
- [13] **CHECK** parameters associated with Recirc Drive and Recirc Pump/Motor 2A(2B) on ICS and 2-TR-68-58(84) to determine cause of trip. ☐
- [14] **PERFORM** visual inspection of tripped Reactor Recirc Drive. ☐
- [15] **PERFORM** visual inspection of Reactor Recirc Pump Drive relay boards for relay targets. ☐
- [16] **IF** necessary, **THEN** (Otherwise N/A)
- Refer to 2-OI-68 for Reactor Recirc Pump trips. ☐
- [17] **INITIATE** actions required to make the necessary repairs. (Otherwise N/A) ☐

NOTE

Restarting a Recirc Pump while in region 1 is **NOT** allowed.

- [18] For Single Loop Operation, **PERFORM** the following:
- [18.1] Refer to 2-OI-68 for guidance on single loop operation. ☐
- [18.2] Refer to Tech Specs 3.4.1. ☐
- [18.3] **WHEN** available, **THEN**
- RETURN** tripped Recirc Pump to service. Refer to 2-OI-68. ☐

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 10 of 12
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5.0 REFERENCES

5.1 Technical Specifications Requirements

Section 3.4.9, RCS Pressure and Temperature (P/T) Limits

Section 3.4.2, Jet Pumps

Section 3.4.1, Recirculation Loops Operating

Section 5.4, Procedures/Section 5.5, Programs and Manuals

5.2 Final Safety Analysis Report

Section 4.3, Reactor Recirculation System

Section 7.9, Recirculation Flow Control System

Section 13.0, Conduct of Operations

Section 14.5.5, Events Resulting in a Core Coolant Flow Decrease

5.3 Plant Instructions

2-AOI-100-1, Reactor Scram

2-ARP-9-4, Panel 9-4 Annunciator Response Procedure

2-GOI-100-1A, Unit Startup from Cold Shutdown to Power Operations

2-GOI-100-12, Power Maneuvering

2-GOI-100-12A, Unit Shutdown from Power Operation to Cold Shutdown and Reductions in Power During Power Operation

0-OI-57A,B,C,D, Auxiliary Electrical AC System

2-OI-68, Recirculation System

2-OI-70, Reactor Building Closed Cooling Water (RBCCW) System

2-OI-85, Control Rod Drive (CRD) System

2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation

0-TI-248, Station Reactor Engineer

0-TI-464, Reactivity Control Plan Development and Implementation

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 11 of 12
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5.4 Plant Drawings

2-45E718, Wiring Diagram 4160V Reactor Recirc Pump Bd 2 Single Line

2-45E719-2, Wiring Diagram 4160V RPT Boards Single Line

2-45E721, Wiring Diagram, 4160V Unit Bds 2A-2B-2C Single Line

45N763 Series, Wiring Diagram, 4160V Unit Auxiliary Power Schematic Diagrams

45N779 Series, Wiring Diagrams, 480V Shutdown Aux Power Schematic Diagrams

2-47E610-68-1, Mechanical Control Diagram, Reactor Water Recirc System

2-47E817-1, Flow Diagram, Reactor Water Recirc, Drains, Vents, and Blowdown System

729E286 Series, Reactor Recirculation Flow Control

729E424 Series, Nuclear Boiler Vessel Instr

729E725 Series, Recirculation Flow Functional Control Diagram

731E320 Series, Reactor Recirculation Flow Control

5.5 Miscellaneous Documents

GE SIL-251, Control of RPV Bottom Head Temperatures

GE SIL-430, Reactor Pressure Vessel Temperature Monitoring

GE SIL-516, Core Flow Indication in the Low-Flow Region

GE SIL-517, Single Loop Operations

NRC IN 96-016, BWR Operation with Indicated Flow Less Than Natural Circulation

Memorandum to M.E. Herrell from M. Bajestani, dated September 16, 1991 (R40 910911 871)

Memorandum to K.L. Welch from T.A. Keys, dated July 9, 1992 (L32 920709 801)

NEDC-32751P, Power Uprate Safety Analysis for the Browns Ferry Nuclear Plant (RIMS R08-980316-888)

TVA-BFN-TS-384, Technical Specification(TS) Change TS-384 - Request For License Amendment For Power Uprate Operation RIMS R08-980316-888)

GE-NE-B13-01866-39, Summary of System Evaluations and Proposed Changes to Design Criteria Documents (RIMS W79-980427-005)


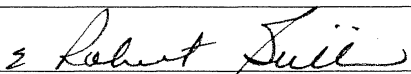

BFN Unit 2	Recirc Pump Trip/Core Flow Decrease OPRMs Operable	2-AOI-68-1A Rev. 0006 Page 12 of 12
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6.0 ILLUSTRATIONS/ATTACHMENTS

None

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 222
TITLE: PERFORM CONTROL ROOM TRANSFER OF 4KV Unit
Board 3B POWER SUPPLIES
TASK NUMBER: S-57A-NO-01

SUBMITTED BY:  DATE: 1/3/08
VALIDATED BY: _____ DATE: _____
APPROVED:  DATE: 1/5/08
TRAINING
PLANT CONCURRENCE:  DATE: 1/4/08
OPERATIONS

* Examination JPMS Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	1/3/2008	All	Initial Development

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 222

TASK NUMBER: S-57A-NO-01

TASK TITLE: PERFORM CONTROL ROOM TRANSFER OF 4KV Unit Board 3B
POWER SUPPLIES

K/A NUMBER: 262001A4.03 K/A RATING: RO 3.2 SRO: 3.4

TASK STANDARD: PERFORM CONTROL ROOM OPERATION REQUIRED TO
SUCCESSFULLY TRANSFER 4KV Unit Board 3B POWER
SUPPLY FROM NORMAL TO ALTERNATE POWER SUPPLY

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 0-OI-57A, REV 124

VALIDATION TIME: CONTROL ROOM: 8:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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: Preventative Maintenance is required on normal 4KV Unit Board Feeder Breaker 1314. The following is complete:

- Steps 8.16.1 through 8.16.3 of 0-OI-57A have been completed.
- 4KV start busses are aligned normal.
- At Unit 1, Unit Board 1A, 1B, and 1C MAN/AUTO SELECT switches are in manual.
- At Unit 2, 4KV Unit Board 2A, 2B, and 2C MAN/AUTO SELECT switches are in manual.
- Common Board A and Common Board B MAN/AUTO SELECT switches are in manual

INITIATING CUES: The Shift Manager has directed you to transfer 4KV Unit Board 3B from USST to Start Bus per 0-OI-57A, starting with step 8.16.1[4]

START TIME _____

Performance Step: Critical___ Not Critical_X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required procedure.

Standard:

IDENTIFIED OR OBTAINED copy of 0-OI-57A.

SAT___ UNSAT___ N/A___ COMMENTS: _____

8.0 INFREQUENT OPERATIONS

8.16 Control Room Transfer of 4kV Unit Board 3B Power Supplies

8.16.1 Transfer 4Kv Unit Board 3B from USST to Start Bus

[1] Review all precautions and limitations

CAUTIONS

- 1) Capacitor bank fuses are subject to clearing when Unit Boards are supplied from the 161 source and large pumps are started. Unit Supervisors should evaluate placing the Capacitor Banks in Manual prior to starting Condensate, CBP, RHR, CS, or CCW pumps.
- 2) If 4kV Unit Board 3B is fed from the Alternate Power Supply (Start Bus), then Auto transfer must be blocked for:
 - 4kV Unit BD 1A, 1B, 1C, 2A, 2B, 2C (Ref 3-45E721 OPL)
 - 4kV COM BD A and B (3-45E721 OPL)
- 3) If either 4kV UNIT BOARD 1A, 1B, 2A, or 2B is aligned to a Start Bus, prior to aligning UNIT BD 3B to the Start Bus, check Technical Specifications 3.8.1.a and 3.8.2.a to determine operability of qualified AC circuits between the offsite transmission network and the onsite Class 1E Electrical Power Distribution System

NOTES

- 1) All procedural steps are performed from Control Room Panel 3-9-8, unless specified
- 2) This procedure section contains actions ensure electrical load restrictions are not exceeded when 4kV UNIT BD 3B is placed on Alternate Supply (Start Bus)

[2] **ENSURE** 4kV Start Busses are aligned Normal

[2.1] On Panel 9-23-2, **VERIFY** 4Kv Start Bus 1A ALT
FDR BKR 1518 OPEN

[2.2] On Panel 9-23-2, **VERIFY** 4Kv Start Bus 1B ALT
FDR BKR 1414 OPEN

[3] **RE-ALIGN** 4kV Auto Transfers to met Load
Restrictions

[3.1] On Panel 1-9-8, **PLACE** 1-XS-57-4, 4kV UNIT BD
1A MAN/AUTO SELECT switch to MAN

[3.2] On Panel 1-9-8, **PLACE** 1-XS-57-7, 4kV UNIT BD
1B MAN/AUTO SELECT switch to MAN

[3.3] On Panel 1-9-8, **PLACE** 1-XS-57-10, 4kV UNIT BD
1C MAN/AUTO SELECT switch to MAN

[3.4] On Panel 2-9-8, **PLACE** 2-XS-57-4, 4kV UNIT BD
2A MAN/AUTO SELECT switch to MAN

[3.5] On Panel 2-9-8, **PLACE** 2-XS-57-7, 4kV UNIT BD
2B MAN/AUTO SELECT switch to MAN

[3.6] On Panel 2-9-8, **PLACE** 2-XS-57-10, 4kV UNIT BD
2C MAN/AUTO SELECT switch to MAN

[3.7] On Panel 0-9-23-3, **PLACE** 0-43-203-A, 4kV COM
BD A MAN/AUTO SELECT switch to MAN

[3.7] On Panel 0-9-23-4, **PLACE** 0-43-203-B, 4kV COM
BD B MAN/AUTO SELECT switch to MAN

Performance Step: Critical X Not Critical

[4] **TRANSFER** 4kV UNIT BD 3B to the ALT FDR, BKR 1528

[4.1] PLACE 0-XS-57-7, 4KV UNIT BD 3B MAN/AUTO SELECT switch to MAN.

Standard:

PLACED 4KV UNIT BD 3B MAN/AUTO SELECT switch to MAN

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

<u>Performance Step:</u>	Critical_____	Not Critical_X
--------------------------	---------------	----------------

```
[4.2]PLACE 3-XS-202-1, 4KV BD/BUS/XTMR VOLTAGE SELECT
      switch to START BUS 1B
```

Standard:

PLACED 4KV BD/BUS/XTMR VOLTAGE SELECT switch to START BUS 1B.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[4.2] CHECK START BUS 1B voltage on 3-EI-57-28 is
between 3950 and 4400 Volts.

Standard:

VERIFIED 3-EI-57-28 indicating 3950 to 4400 volts.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical X Not Critical___

[4.4] **PLACE** and **HOLD** 3-HS-57-8, 4kV UNIT BD 3B ALT FDR
BKR 1528 switch to CLOSE

Standard:

PLACED 3-HS-57-8, 4kV UNIT BD 3B ALT FDR BKR 1528 switch to
CLOSE.

SAT___ UNSAT___ N/A___ COMMENTS:_____

<u>Performance Step</u> :	<u>Critical</u>	<u>X</u>	<u>Not Critical</u>
1. Review the project plan and scope.			
2. Identify the key stakeholders and their roles.			
3. Define the project objectives and deliverables.			
4. Develop a detailed project schedule.			
5. Allocate resources and assign tasks.			
6. Monitor progress and communicate regularly.			
7. Manage risks and issues.			
8. Close the project and evaluate performance.			

[4.5] **PLACE** 3-HS-57-6, 4kV UNIT BD 3B NORM FDR BKR
1314 switch to TRIP

Standard:

PLACED 3-HS-57-6, 4kV UNIT BD 3B NORM FDR BKR 1314 switch to TRIP.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

<u>Performance Step :</u>	Critical	Not Critical X
---------------------------	----------	----------------

[4.6] **CHECK CLOSED** the 4kV UNIT BD 3B, ALT FDR
BKR 1528

Standard:

CHECKED CLOSED the 4kV UNIT BD 3B, ALT FDR BKR 1528

SAT	UNSAT	N/A	COMMENTS:

Performance Step : Critical___ Not Critical_X

[4.7] **CHECK OPEN** the 4kV UNIT BD 3B, NORM FDR BREAKER
1314.

Standard:

CHECKED OPEN the 4kV UNIT BD 3B, NORM FDR BREAKER 1314.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical_X Not Critical___

[4.8] **RELEASE** BKR's 1528 and 1314 control
switches

Standard:

RELEASED BKR's 1528 and 1314 control switches

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical___ Not Critical X

[4.9] **PLACE** 3-XS-202-1, 4kV BD/BUS/XFMR VOLTAGE
SELECT SWITCH to UNIT BD 3B

Standard:

PLACED 3-XS-202-1, 4kV BD/BUS/XFMR VOLTAGE SELECT SWITCH to
UNIT BD 3B

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical___ Not Critical X

[4.10] **CHECK** 4kV UNIT BD 3B voltage is between
3950 and 4400 Volts.

Standard:

CHECKED 4kV UNIT BD 3B voltage is between 3950 and 4400 Volts.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical___ Not Critical_ X

[4.11] Verify locally 4kV BKR 1528 closing spring target indicates charged and the amber breaker spring charged light is on.

Standard:

DISPATCHED AUO to verify breaker 1528 closing spring recharged.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: [AFTER DISPATCHED] THE AUO REPORTS THAT BREAKER 1528 CLOSING SPRING TARGET INDICATES CHARGED AND THE AMBER BREAKER SPRING CHARGED LAMP IS ILLUMINATED.

CUE: After the AUO reports closing spring information, inform the operator that Work Control is preparing a clearance and that will be all for now.

Performance Step: Critical_____ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT_____ UNSAT_____ N/A_____ COMMENTS:_____

Performance Step: Critical_____ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT_____ UNSAT_____ N/A_____ COMMENTS_____

STOP TIME: _____

END OF TASK



Browns Ferry Nuclear Plant

Unit 0

Operating Instruction

0-OI-57A

Switchyard and 4160V AC Electrical System

Revision 0122

Quality Related

Level of Use: Continuous Use

Effective Date: 08-06-2007

Responsible Organization: OPS, Operations

Prepared By: William Wambsgan

Approved By: John T. Kulisek

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Current Revision Description

Type of Change: Design Change

Tracking Number 142

Affected pages 14, 170, 177

PCR 07001429, added note to P&L step 3.5.

PCR 07001956, deleted breaker 12, Aux RCW pump.

PCR 07001058, added reference drawings to note 2. Added step 8.34[1.1] to install temporary power supply to the CAP Bank Battery Charger.

THIS REVISION DOES NOT AFFECT SYSTEM STATUS CONTROL

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ATTACHMENTS

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- Attachment 2: Switchyard and 4160V AC System Electrical Panel Lineup Checklist, Unit 0
- Attachment 3: Switchyard and 4160V AC System Electrical Lineup Checklist, Unit 0
- Attachment 4: None

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2.5 Miscellaneous Documents (continued)

Masoud Bajestani Memorandum to R.G. Jones, Actions to be Taken by the Event of a Loss of Power to the 4kV Cooling Tower Switchgear (R40 910311 828)

BFPER 02-012322-000, Loss of 161kV Cap Bank control power when 4kV common board A deenergized

IGA-6, Inter Group Agreement

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

TPS Calculation EDX 000-999-204-001, Revision 3, Browns Ferry Nuclear Plant (BFN) - Transmission System Study (TSS) - Grid Voltage Study of BFN's Off-Site Power system.

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3.0 PRECAUTIONS AND LIMITATIONS

3.1 General

- A. The switchyard and 4160V AC System is normally in service at all times. Individual portions or components of the system may be removed from service without removing the entire system from service.
- B. 4kV Boards are to be de-energized prior to performing PM Activities like cleaning bus side PT Compartment contact points or greasing the bus side PT Compartment stabs.
- C. The Generator Circuit Breaker should **NOT** be used as an isolation boundary for clearance purposes with the exception of specific applications for work that are controlled by a Job Safety Analysis (JSA) approved by the affected organization and Industrial Safety. This includes the bushing box and generator.

3.2 4kV Breakers

- A. [NER/C] Engineered Safeguards System 4kV circuit breakers should be visually inspected following each breaker closure operation to check closing springs are fully charged. Both the amber light and the mechanical flag should be checked to indicate a charged spring. [INPO SOER 82-016]
- B. Prior to transferring and after power supply transfer is complete, the breakers involved should be visually checked to ensure closing springs are charged.
- C. Whenever a safety-related 4kV breaker is being returned to service after being racked-out, the breaker should be closed and opened in the test position before it is fully racked in. **REFER TO 0-GOI-300-2** for racking and testing instructions.
- D. [QA/C] Whenever a circuit breaker on a 4kV Shutdown, RPT or Bus TIE board is **NOT** in the CONNECT position, that breaker will be restrained to limit movement in a seismic event. [BFP CAQR 881002] **REFER TO 0-GOI-300-2** for seismic restraint requirements.
- E. Breakers tripped by protective relays should **NOT** be re-closed except as directed by the Shift Manager.

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3.2 4kV Breakers (continued)

- F. The South and North Loop Line Feeder Breakers may trip immediately after closure due to circulating currents from the grounded substation transformers. This is **NOT** necessarily indicative of a problem. Therefore, at least one additional breaker closure should be attempted unless the operator has reason to believe that there is a significant problem.
- G. Placing a 4kV SD BD or SD Bus supply breaker 43 NOR/EMER switch to EMER will trip the BD or Bus Auto/Manual Reset switch to manual on Panel 9-23.
- H. Siemens 4kV breakers use vacuum chambers for arc suppression and to house their contactors. During Megger and high-Pot testing, radiation in the form of X-rays, can be emitted depending on the amount of voltage applied. The procedures which control the testing of these breakers will have the proper constraints associated with this type of testing.

3.3 4kV Board Voltage and Amperage Limits

- A. 4kV Shutdown bus amperage should never exceed 1200 amps due to bus rating.
- B. 4kV Start Bus amperage should not exceed 3000 amps due to bus rating.
- C. Print notes may require reducing auto starting loads under accident conditions by some kVA value. To determine the appropriate load reduction, use 1 hp = 1 kVA. Loads which are prevented from starting may be either 4kV load or a 480 V load which is powered from the 4kV Shutdown Board. Another method for determining kVA is to multiply board voltage, amps, square root of 3 and .001 ($kVA = .001 \times 1.732 \times (V) \times (I)$.) **REFER TO** Illustration 4, Board Restriction Verification Form for documentation of calculation verification.
- D. 4kV board voltage should remain within normal voltage limits of 3950 to 4400 volts. The degraded voltage logic will transfer the Shutdown Boards to the diesels at 3920V.
- E. NRC/CJ When both shutdown buses are being fed from the same USST, 0-GOI-300-1, Attachment 15.10, Abnormal Shutdown Bus Alignment Amperage Reading(s), is required to be completed every 4 hours. [NRC IR 92-15-01]
- F. Whenever applicable plant Safety Related Boards are fed from the 161KV supply, their voltage must be monitored once per shift, Operations should take appropriate actions to maintain board voltage ≤ 508 volts; the Lead Electrical Engineer (Site Engineering) must be contacted if unable to maintain voltages below limits. [BFPER 03-011422-000]

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3.4 4kV Board Transfer Precautions

- A. [I/C] During electrical board transfers which could affect I&C Bus A/B power supplies, Operators should be aware Recirc Pump speeds could change due to the voltage changes. Recirc Pump speed should be adjusted to compensate for this occurrence, as required. [BFPER 951670]
- B. Prior to deenergizing 4kV Common Board A, ensure that power is available to LC-66 via 480V Lighting Distribution Cabinet breaker 20 in SBPB (Security Diesel Room). This will ensure that power is available to 161kV Capacitor Bank Control Circuit. (0-75E700 and 2-45E769-13)

3.5 4kV Board Limits due to Condensate Booster Pumps Operation

NOTE

Board restrictions assume that the unit is operating at or near full power.

- A. Load on 4kV Unit Board 1A is limited to 1375 amps when:
 1. 4kV Shutdown Bus 1 is fed from 4kV Unit Board 1A AND
 2. The Unit is Operating with only 2 Condensate Booster Pumps in Operation AND
 3. Condensate Booster Pump 1A is one of the pumps in service.

When these conditions exist, the load on Unit Board 1A shall be verified less than 1375 amps twice per shift using Illustration 4.

- B. Load on 4kV Unit Board 1B is limited to 1260 amps when:
 1. 4kV Shutdown Bus 2 is fed from 4kV Unit Board 1B AND
 2. The Unit is Operating with only 2 Condensate Booster Pumps in Operation AND
 3. Condensate Booster Pump 1B is one of the pumps in service.

When these conditions exist, the load on Unit Board 1B shall be verified less than 1260 amps twice per shift using Illustration 4.

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3.5 4kV Board Limits due to Condensate Booster Pumps Operation (continued)

C. Load on 4kV Unit Board 1B must be reduced to less than 2000 amps within 30 minutes when:

1. 4kV Shutdown Bus 2 is fed from 4kV Unit Board 1B (ALT Supply) AND
2. Three Condensate Booster Pumps are in Operation AND
3. An accident signal has initiated safety related equipment on Unit 2.

When these conditions exist, the Unit 1 Operator shall immediately take action to reduce and maintain load on 4kV Unit Bd. 1B to less than 2000 amps.

D. Load on 4kV Unit Board 2A is limited to 1260 amps when:

1. 4kV Shutdown Bus 2 is fed from 4kV Unit Board 2A (Normal feed) AND
2. The Unit is Operating with only 2 Condensate Booster Pumps in Operation AND
3. Condensate Booster Pump 2A is one of the pumps in service.

When these conditions exist, the load on Unit Board 2A shall be verified twice per shift using Illustration 4.

E. Load on 4kV Unit Board 2B is limited to 1375 amps when:

1. 4kV Shutdown Bus 1 is fed from 4kV Unit Board 2B (ALT feed) AND
2. The Unit is Operating with only 2 Condensate Booster Pumps in Operation AND
3. Condensate Booster Pump 2B is one of the pumps in service.

When these conditions exist, the load on Unit Board 2B shall be verified less than 1375 amps twice per shift using Illustration 4.

3.6 Off site Power Circuits

A. Electrical Loading calculations supporting 3 Unit EPU operations have determined that, in certain 4kV System alignments, the 161kV offsite circuit may not be capable of maintaining adequate voltage levels at the shutdown boards during accident conditions. Incapacity of the 161kV circuit could occur in alignments that place pre-load on the Start Buses and then allow Unit 1, Unit 2, or Unit 3 safety related buses to automatically transfer to the Start Buses.

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3.6 Off site Power Circuits (continued)

This procedure institutes manual actions that disable the automatic transfer (to Start Bus) of selected 4kV Unit Boards and both 4kV Common Boards to prevent potential overload the 161kV offsite circuit. Illustration 6 provides a matrix of 4kV alignment and loading restrictions required to ensure operability of the AC circuits to the 161 kV offsite power source and prevent overload of components in these circuits.

The 161kV offsite AC circuit may still be considered one of the qualified offsite AC circuits required by Technical Specification 3.8.1.a and 3.8.2.a for Unit 1, Unit 2 and Unit 3. Limits and Precautions M and N define use of the 161 AC source for each unit.

- B. For Unit 1 and Unit 2 - When the 4kV Unit Bd and/or 4 kV Start Bus auto transfer is blocked, AC circuits to the 161kV offsite source may still be considered operable as a DELAYED MANUAL offsite AC circuit.

With the 161 AC circuits in the DELAYED MANUAL configuration, if both 500kV offsite circuits become unavailable, the onsite standby diesel generators would start and supply 4kV Shutdown Boards A, B, C and D. To support long term recovery of an accident unit or shutdown of a non-accident unit, Operators can manually re-power 4kV Unit Boards from the Start Bus; then the 4kV Shutdown Boards could then be manually transferred from the diesel generators to the CSST supplied 4kV Unit Boards. During this evolution, loading must be managed to maintain each Start Bus below 3000 amps.

- C. Unit 3 can consider the 161kV offsite AC circuit as a normal (available within a few seconds via auto transfer of Unit Board 3A and 3B) offsite AC circuit unless a Unit 1, Unit 2 or Common 4kV Board is aligned to a Start Bus.

If there is a Unit 1, Unit 2 or Common 4kV Board is aligned to on a Start Bus, then auto transfer (to Start Bus) of Unit Boards 3A and 3B is blocked and Unit 3 must consider the 161kV offsite AC circuit as DELAYED MANUAL offsite AC circuit.

In the Delayed Manual configuration, 4kV Unit Boards 3A, 3B, would be de-energized if the Unit 3 500kV offsite circuit was lost; the onsite standby diesel generators would supply 4kV Shutdown Boards 3EA, 3EB, 3EC and 3ED. To support long term recovery of an accident unit or shutdown of a non-accident unit, 4kV Unit Boards 3A and 3B can be manually transferred to the 4kV Start Buses, the 4kV Shutdown Boards could then be manually transferred from the diesel generators to the CSST supplied 4kV Unit Boards. During this evolution, loading must be managed to maintain each Start Bus below 3000 amps.

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3.6 Off site Power Circuits (continued)

- D. There are four Qualified Unit 1/2 AC circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards. These circuits are:
1. From the 500kV switchyard, through Unit Station Service Transformer (USST) 1B to a 4kV Unit Board. That Unit Board feeds 4kV Shutdown Bus 1 or 2, which then feeds two of the Unit 1/2 4kV Shutdown Boards (A and B or C and D)
 2. From the 500kV switchyard, through Unit Station Service Transformer (USST) 2B to a 4kV Unit Board. That Unit Board feeds 4kV Shutdown Bus 1 or 2, which then feeds two of the Unit 1/2 4kV Shutdown Boards (A and B or C and D)
 3. From the 161kV switchyard, through Common Station Service Transformer (CSST) A to start bus 1A or 1B. Then to a 4kV Unit Board. That Unit Board feeds 4kV Shutdown Bus 1 or 2, which then feeds two of the Unit 1/2 4kV Shutdown Boards (A and B or C and D)
 4. From the 161kV switchyard, through Common Station Service Transformer (CSST) B to start bus 1A or 1B. Then to a 4kV Unit Board. That Unit Board feeds 4kV Shutdown Bus 1 or 2, which then feeds two of the Unit 1/2 4kV Shutdown Boards (A and B or C and D)

For Units 1 and 2 to meet the Limiting Condition requirement of T.S. 3.8.1: two of the four qualified circuits are REQUIRED to be operable.

- E. There are three basic Unit 3 circuits from the transmission network to the safety related Division I and II 4kV Shutdown Boards. The circuits are:
1. From the 500kV switchyard, through Unit Station Service Transformer (USST) 3B to 4kV Unit Board 3A and/or 3B. Each Unit Board feeds two of the Unit 3 4kV Shutdown Boards (3EA and 3EB or 3EC and 3ED)
 2. From the 161kV transmission system, through Common Station Service Transformer (CSST) A to start bus 1A or 1B. Then to a 4kV Unit Board. That Unit Board feeds two of the Unit 3 4kV Shutdown Boards (3EA and 3EB or 3EC and 3ED)
 3. From the 161kV transmission system, through Common Station Service Transformer (CSST) B to start bus 1A or 1B. Then to a 4kV Unit Board. That Unit Board feeds two of the Unit 3 4kV Shutdown Boards (3EA and 3EB or 3EC and 3ED)

For Unit 3 to meet the Limiting Condition requirement of T.S. 3.8.1: two of the three qualified circuits are required to be operable.

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3.6 Off site Power Circuits (continued)

- F. 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.
- G. TVA's Transmission Operator (TOp) is responsible for determining if the transmission grid (500kV and 161 kV) is configured and operating within established limits that ensure the grids ability to provide QUALIFIED offsite power to Browns Ferry Nuclear Plant.

If it is determined that the transmission system (either 500kV or 161kV) may not be able to support accident loading as required, then the transmission operator is required to notify Browns Ferry Operations that the system cannot be credited as a qualified offsite circuit.

To verify qualification of the offsite source (500kV or 161kV), BFN Operations must contact the TVA Southwest TOp to verify the transmission grid is able to provide qualified offsite power to BFN.

3.7 Common Accident Signal Logic

- A. If a Unit 1/2 4kV SD Bd is being fed from its alternate power supply, credit for offsite power on that board cannot be taken due to CASA and CASB logic in the trip circuit for the alternate feeder breaker.
- B. An initiation signal for either Division I or Division II of Unit 1/2 Common Accident Signal logic will result in the trip of RHRSW Pumps A2 and C2, RCW Pump 1D and Fire Pumps A, B and C. This trip signal is sealed in for 60 seconds. Operators may manually restart the pumps as desired after 60 seconds. When restarting the pumps, operators will manually limit the loads on the 4kV Shutdown Bus 1 to less than 1200 amps.

3.8 500 kV PCB / MOD

When a 500kV PCB trips, the associated MODs should **NOT** be operated until the trip has been reset. If the trip cannot be reset, then the tripped PCB's Breaker Failure Relay circuit must removed from service. Refer to 0-GOI-300-4 and contact South West Dispatch for instructions or assistance to reset or defeat the tripped relay. This action is necessary because, currents can be induced in 500kV PCB current transformers during cycling of the associated MODs. The induced current, in conjunction with an existing PCB trip signal, could actuate the breaker failure relay and trip all PCB's on the associated 500kV bus.

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3.9 Generator Backup Relays

Units 1, 2, and 3 generators have two generator backup relays, 121GB1 on R.B. 30 and 121GB2 on R.B. 29 (221GB1 on R.B.32 and 221GB2 on R.B.35), (321GB1 on R.B.34, 321GB2 on R.B.35), both are required to trip the associated generator.

3.10 Transformers, Sudden Pressure Relays and Tap Changers

- A. Prior to energizing Main Transformers, USSTs, CSSTs, and CTTs, the associated sudden pressure relay shutoff valve should be verified open to insure the sudden pressure relays will function correctly to protect the transformers.
- B. When a transformer sudden pressure relay is required to be isolated, an evaluation is to be performed for venting and/or draining due to increased pressure from the heating (sun thermal energy) of the oil contained in the relay. This condition can create bellows elongation and operational issues.
- C. To ensure proper voltages on supplied boards during both lightly loaded and fully loaded conditions CSST A and CSST B tap setting for the manual (off-load) tap changer is 0.975 for all modes of operation.
- D. [I/C] Avoid adjusting the load tap changer or selecting a different unit station service transformer winding while a diesel generator is operating in the parallel with system mode. Adjusting the load tap changer or selecting a different transformer winding while a diesel generator is operating parallel with the system may result in tripping of the shutdown board normal supply breaker.
[BFPER 950311]
- E. For the USSTs to be considered as a qualified offsite power source, the Load Tap Changer must be in Automatic except when performing tap changer functional checks by Operations.

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3.10 Transformers, Sudden Pressure Relays and Tap Changers (continued)

F. Unit 1, Unit 2, (Unit 1/2 Spare) Main Transformers

1. Prior to Energizing the Main Transformers (MT), start one group of the cooling fans manually from the local control switch.
2. Keep one set of MT Coolers running in manual when the MT is energized.
3. The MT may operate at full load with 4 of 5 banks of coolers in service.
4. MT operation is limited to 30 minutes at full load with a loss of all coolers.
5. Operation of hand held radios is prohibited with the MT QUALITROL Relay door open unless the QUALITROL Relay Trip contacts have been disabled. Operation of hand held radios very near the QUALITROL Relay with the Relay door closed and/or within 12 ft. with the relay door open will cause the QUALITROL Relay to actuate.
6. Operation of the MT QUALITROL Sudden Press Rly isolation valves listed may result in a trip of the MT QUALITROL Sudden Pressure Relay(s).
 - a. UNIT 1
 - (1) 1-SHV-236-0001, MAIN XFMR 1A SUDDEN PRESS RLY SOV
 - (2) 1-SHV-236-0002, MAIN XFMR 1B SUDDEN PRESS RLY SOV
 - (3) 1-SHV-236-0003, MAIN XFMR 1C SUDDEN PRESS RLY SOV
 - b. UNIT 2
 - (1) 2-SHV-236-0005, MAIN XFMR 2A SUDDEN PRESS RLY SOV
 - (2) 2-SHV-236-0006, MAIN XFMR 2B SUDDEN PRESS RLY SOV
 - (3) 2-SHV-236-0007, MAIN XFMR 2C SUDDEN PRESS RLY SOV
 - c. UNIT 1/2 Spare
 - (1) 0-SHV-236-0004, MN XFMR 1/2 SP SUDDEN PRESS RLY SOV

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8.16 Control Room Transfer of 4kV Unit Board 3B Power Supplies

8.16.1 Transfer 4kV Unit Board 3B from USST to Start Bus

- [1] **REVIEW** all Precautions and Limitations.



CAUTIONS

- 1) Capacitor bank fuses are subject to clearing when Unit Boards are supplied from the 161 source and large pumps are started. Unit Supervisors should evaluate placing the Capacitor Banks in Manual prior to starting Condensate, CBP, RHR, CS or CCW pumps.
- 2) If 4kV Unit Board 3B is fed from the Alternate Power Supply (Start Bus), then Auto transfer must be blocked for:
 - 4kV UNIT BD 1A, 1B, 1C, 2A, 2B, and 2C. (Ref. 3-45E721 OPL)
 - 4kV COM BD A and B. (3-45E721 OPL)
- 3) If either 4kV UNIT BD 1A, 1B, 2A or 2B is aligned to a Start Bus, prior to aligning UNIT BD 3B to the Start Bus, check Technical Specifications 3.8.1.a and 3.8.2.a to determine operability of qualified AC circuits between the offsite transmission network and the onsite Class 1E Electrical Power Distribution System.

NOTES

- 1) All procedural steps are performed from Control Room Panel 3-9-8, unless specified.
- 2) This procedure section contains actions ensure electrical load restrictions are not exceeded when 4kV UNIT BD 3B is placed on Alternate Supply (Start Bus).

- [2] **ENSURE** 4kV Start Busses aligned Normal.

- [2.1] On Panel 9-23-2, **VERIFY** 4kV Start Bus 1A ALT FDR BKR 1518 OPEN.



- [2.2] On Panel 9-23-2, **VERIFY** 4kV Start Bus 1B ALT FDR BKR 1414 OPEN.



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8.16.1 Transfer 4kV Unit Board 3B from USST to Start Bus (continued)

[3] RE-ALIGN 4kV Auto Transfers to met Load Restrictions

- [3.1] On Panel 1-9-8, **PLACE** 1-XS-57-4, 4kV UNIT BD 1A
MAN/AUTO SELECT switch to MAN. ☐
- [3.2] On Panel 1-9-8, **PLACE** 1-XS-57-7, 4kV UNIT BD 1B
MAN/AUTO SELECT switch to MAN. ☐
- [3.3] On Panel 1-9-8, **PLACE** 1-XS-57-10, 4kV UNIT BD 1C
MAN/AUTO SELECT switch to MAN. ☐
- [3.4] On Panel 2-9-8, **PLACE** 2-XS-57-4, 4kV UNIT BD 2A
MAN/AUTO SELECT switch to MAN. ☐
- [3.5] On Panel 2-9-8, **PLACE** 2-XS-57-7, 4kV UNIT BD 2B
MAN/AUTO SELECT switch to MAN. ☐
- [3.6] On Panel 2-9-8, **PLACE** 2-XS-57-10, 4kV UNIT BD 2C
MAN/AUTO SELECT switch to MAN. ☐
- [3.7] On Panel 0-9-23-3, **PLACE** 0-43-203-A, 4kV COM BD A
MAN/AUTO SELECT switch to MAN. ☐
- [3.8] On Panel 0-9-23-4, **PLACE** 0-43-203-B, 4kV COM BD B
MAN/AUTO SELECT switch to MAN. ☐

[4] TRANSFER 4kv UNIT BD 3B to the ALT FDR, BKR 1528.

- [4.1] **PLACE** 3-XS-57-7, 4kV UNIT BD 3B MAN/AUTO
SELECT switch to MAN. ☐
- [4.2] **PLACE** 3-XS-202-1, 4kV BD/BUS/XFMR VOLTAGE
SELECT switch to START BUS 1B. ☐
- [4.3] **CHECK** START BUS 1B Voltage on 3-EI-57-28 is
between 3950 and 4400 Volts. ☐
- [4.4] **PLACE** and **HOLD** 3-HS-57-8, 4kV UNIT BD 3B ALT
FDR BKR 1528 switch to CLOSE. ☐
- [4.5] **PLACE** 3-HS-57-6, 4kV UNIT BD 3B NORM FDR
BKR 1314 switch to TRIP. ☐
- [4.6] **CHECK CLOSED** the 4kV UNIT BD 3B, ALT FDR
BREAKER 1528. ☐


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8.16.1 Transfer 4kV Unit Board 3B from USST to Start Bus (continued)

- [4.7] **CHECK OPEN** the 4kV UNIT BD 3B, NORM FDR BREAKER 1314. ☐
- [4.8] **RELEASE** BKR 1528 and 1314 control switches. ☐
- [4.9] **PLACE** 3-XS-202-1, 4kV BD/BUS/XFMR VOLTAGE SELECT SWITCH TO UNIT BD 3B. ☐
- [4.10] **CHECK** 4kV UNIT BD 3B voltage is between 3950 and 4400 Volts. ☐
- [4.11] **VERIFY LOCALLY** 4kV BKR 1528 closing spring target indicates charged and the amber breaker spring charged light is on. ☐
- [4.12] As directed by the Unit Supervisor, **PLACE** a Caution Order on the CCW Pump stating, "Evaluate the need to place CAP Banks in Manual prior to starting Pump." ☐

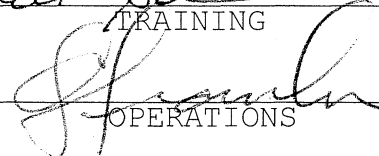
BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 132
TITLE: RESTORATION TO NORMAL FOLLOWING RPS BUS POWER LOSS
TASK NUMBER: U-099-NO-05

SUBMITTED BY:  DATE: 1/3/08

VALIDATED BY: _____ DATE: _____

APPROVED:  DATE: 1/5/08
TRAINING

PLANT CONCURRENCE:  DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	9/22/99	ALL	NEW JPM
1	10/13/00	ALL	PROCEDURE REVISION
2	08/16/02	ALL	FORMAT DOCUMENT PER PROCEDURE CHANGE, DELETED SS#.
3	09/13/03	ALL	Format; Editorial; Procedure Rev; Chg indications to sticky valve.
4	01/03/2008	ALL	PROCEDURE REVISION

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 132

TASK NUMBER: U-099-NO-05

TASK TITLE: RESTORE PLANT CONDITIONS TO NORMAL FOLLOWING RPS
BUS POWER LOSS

K/A NUMBER: 295006AA1.01 K/A RATING: RO 4.2 SRO: 4.2

TASK STANDARD: PERFORM OPERATIONS REQUIRED TO RETURN VARIOUS
SYSTEMS TO SERVICE FOLLOWING A LOSS (AND RE-
ESTABLISHMENT) OF POWER TO RPS BUS A.

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 2-OI-99, REV 73

VALIDATION TIME: CONTROL ROOM: 12:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 a Unit 2 Operator. Unit 2 has had a loss of power to RPS Bus 'A'. Power has been restored to the bus.

INITIATING CUES: The Unit 2 UNIT SUPERVISOR has the SHIFT MANAGER'S permission to restore systems to normal and directs you to restore affected systems to normal as directed by 2-OI-99, Section 8.3. Reactor and Refuel Zone Ventilation Fans have already been returned to service. SBT System has already been returned to standby readiness.

START TIME _____

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required procedure.

Standard:

IDENTIFIED OR OBTAINED copy of 2-OI-99.

SAT___ UNSAT___ N/A___ COMMENTS: _____

8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer

NOTE:

- 1) This section provides instructions for resetting the various system isolations and reopening affected valves to allow those systems to be restored to normal operation in accordance with their respective operating instructions.
- 2) The following steps are performed at Panel 2-9-5 unless otherwise noted.
- 3) When RPS Bus power is lost to some scram discharge volume level switches, their RTD heater is de-energized. Following the restoration of power, a time delay, dependent on how long the level switch was de-energized, prevents resetting the half scram signal. This may take up to 37 seconds after RPS power is restored. Precaution 3.00 can be referred to for more information on these level switches.

[1] **OBTAIN** Shift Manager's permission to restore to normal.

Performance Step : Critical X Not Critical _____

[2] **MOMENTARILY PLACE** SCRAM RESET, 2-HS-99-5A-S5, as follows:

[2.1] RESET FIRST position.

[2.2] RESET SECOND position.

[2.3] NORMAL position.

Standard:

MOMENTARILY PLACED 2-HS-99-5A-S5 in the RESET FIRST position, then RESET SECOND position, then return to NORMAL position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical___ Not Critical X

[3] **CHECK** the following conditions:

- A. All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights illuminated.
- B. The following four lights illuminated:
 - SYSTEM A BACKUP SCRAM VALVE, 2-IL-99-5A/AB.
 - SYSTEM B BACKUP SCRAM VALVE, 2-IL-99-5A/CD.
- C. Scram Discharge Volume vent and drain valves indicate open.
- D. Points SOE033 and SOE035 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "A".
- E. Points SOE034 and SOE036 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "B".

Standard:

VERIFIED the following:

- All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights illuminated.
- SYSTEM A BACKUP SCRAM VALVE, 2-IL-99-5A/AB.
- SYSTEM B BACKUP SCRAM VALVE, 2-IL-99-5A/CD.
- Scram Discharge Volume vent and drain valves indicate open.
- Points SOE033 and SOE035 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "A" and Points SOE034 and SOE036 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "B".

SAT___ UNSAT___ N/A ___ COMMENTS:___

[4] At Panel 2-9-4, **RESET** PCIS trip logic as follows:

<u>Performance Step</u> :	Critical	X	Not Critical
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[4.1] **MOMENTARILY PLACE** PCIS DIV I RESET, 2-HS-64-16A-S32,
to left and right RESET positions.

Standard:

MOMENTARILY PLACED PCIS DIV I RESET, 2-HS-64-16A-S32, to left and right RESET positions.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step :	Critical	Not Critical	X
1. The project manager is responsible for the project's success or failure.			
2. The project manager is responsible for the project's budget.			
3. The project manager is responsible for the project's schedule.			
4. The project manager is responsible for the project's quality.			
5. The project manager is responsible for the project's risk.			
6. The project manager is responsible for the project's communication.			
7. The project manager is responsible for the project's stakeholder management.			
8. The project manager is responsible for the project's team management.			
9. The project manager is responsible for the project's resource management.			
10. The project manager is responsible for the project's procurement management.			
11. The project manager is responsible for the project's integration management.			
12. The project manager is responsible for the project's monitoring and evaluation.			
13. The project manager is responsible for the project's closure.			

[4.2] **CHECK** the following red lights illuminated:

- MSIV GROUP A1.
- MSIV GROUP B1.

Standard:

VERIFIED red lights above 2-HS-64-16A-S32 are illuminated.

SAT	UNSAT	N/A	COMMENTS:

Performance Step :	Critical	X	Not Critical
1. The project manager is responsible for the project's success or failure.			
2. The project manager is responsible for the project's budget.			
3. The project manager is responsible for the project's schedule.			
4. The project manager is responsible for the project's quality.			
5. The project manager is responsible for the project's risk.			
6. The project manager is responsible for the project's communication.			
7. The project manager is responsible for the project's stakeholder management.			
8. The project manager is responsible for the project's team management.			
9. The project manager is responsible for the project's resource management.			
10. The project manager is responsible for the project's procurement management.			

[4.2] **MOMENTARILY PLACE** PCIS DIV (I) RESET, 2-HS-64-16A-S33,
3 to left and right RESET positions.

Standard:

MOMENTARILY PLACED PCIS DIV (I) RESET, 2-HS-64-16A-S33, to left and right RESET positions.

SAT	UNSAT	N/A	COMMENTS:

Performance Step :	Critical	Not Critical	X
1. The project manager is responsible for the project's success or failure.			
2. The project manager is responsible for the project's budget.			
3. The project manager is responsible for the project's schedule.			
4. The project manager is responsible for the project's quality.			
5. The project manager is responsible for the project's risk.			
6. The project manager is responsible for the project's communication.			
7. The project manager is responsible for the project's stakeholder management.			
8. The project manager is responsible for the project's team management.			
9. The project manager is responsible for the project's resource management.			
10. The project manager is responsible for the project's procurement management.			
11. The project manager is responsible for the project's change management.			
12. The project manager is responsible for the project's closure management.			

[4.2] **CHECK** the following red lights illuminated:

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- MSIV GROUP A2.
- MSIV GROUP B2.

Standard:

VERIFIED red lights above 2-HS-64-16A-S33 are illuminated.

SAT	UNSAT	N/A	COMMENTS:

NOTE

Steps 8.3[5] through 8.3[22] can be performed in any order.

Performance Step : Critical X Not Critical

- [5] **VERIFY** the green lights are illuminated on all 5 of the QLVPS located at Panel 9-14.

Standard:

VERIFIED green lights are illuminated on all 5 of the QLVPS located at Panel 9-14.

SAT UNSAT N/A COMMENTS:

Performance Step : Critical Not Critical X

- [6] **RESTORE** Reactor and Refuel Zone Ventilation to normal operation. REFER TO 2-AOI-64-2D, Group 6 Ventilation System Isolation.

- [7] **RESTORE** Standby Gas Treatment System to standby readiness.
REFER TO 0-OI-65, Section 7.0.

Standard:

GIVEN in initial conditions.

SAT UNSAT N/A COMMENTS:

<u>Performance Step</u> :	Critical	X	Not Critical
1. The project manager should identify the project goals and objectives.			
2. The project manager should identify the project stakeholders.			
3. The project manager should identify the project risks.			
4. The project manager should identify the project resources.			
5. The project manager should identify the project constraints.			
6. The project manager should identify the project communication plan.			
7. The project manager should identify the project budget.			
8. The project manager should identify the project timeline.			
9. The project manager should identify the project quality plan.			
10. The project manager should identify the project risk management plan.			

[8] At Panel 2-9-3, **PLACE** PSC head tank pumps in service as follows:

- **PLACE** PSC PUMP SUCTION INBD ISOL VALVE, 2-HS-75-57A, in AUTO After OPEN.
- **PLACE** PSC PUMP SUCTION OUTBD ISOL VALVE, 2-HS-75-58A, in AUTO After OPEN.

Standard:

MOMENTARILY PLACED 2-HS-75-57A in AUTO AFTER OPEN and
MOMENTARILY PLACED 2-HS-75-58A in AUTO AFTER OPEN position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step :	Critical	Not Critical	X
1. Identify the problem			
2. Gather information			
3. Analyze the information			
4. Develop a plan			
5. Implement the plan			
6. Evaluate the results			

[9] **IF** RHR System was in Shutdown Cooling, **THEN**

RESTORE RHR System. REFER TO 2-AOI-74-1. (N/A if Section 8.7.3[13] or 8.7.3 performed).

Standard:

NOT APPLICABLE.

SAT	UNSAT	N/A	COMMENTS:

NOTE :

2-FCV-64-139 and 2-FCV-64-140 will open and close automatically when the Drywell DP Compressor starts and stops.

Performance Step : Critical X Not Critical_____

[10] At Panel 2-9-3, **RESTORE** Drywell DP Compressor to automatic operation as follows:

[10.1] **DEPRESS** DRYWELL DP COMP SUCTION VLV RESET
pushbutton, 2-HS-64-139A.

[10.2] **DEPRESS** DRYWELL DP COMP DISCH VLV RESET
pushbutton, 2-HS-64-140A.

Standard:

DEPRESSED 2-HS-64-139A and 2-HS-64-140A.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

```

*****
Performance Step :           Critical           Not Critical   X

```

[10.3] **VERIFY OPEN** DRYWELL INBD ISOLATION VLV using 2-HS-64-31.

[10.4] **VERIFY OPEN** SUPPR CHBR INBD ISOLATION VLV using 2-
HS-64-34.

Standard:

VERIFIED DRYWELL INBD ISOLATION VLV and SUPPR CHBR INBD ISOLATION VLV indicate OPEN.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical___ Not Critical_X__

[11] At Panel 2-9-4, **RESTORE** Drywell Floor and Equipment Drain Systems to normal operation as follows:

[11.1] **NOTIFY** Radwaste Operator that Drywell Equipment and Floor Drain Sump isolation valves are being reopened.

Standard:

NOTIFIED Radwaste Operator Drywell Equipment and Floor Drain Sump isolation valve are being reopened.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: [SIMULATOR INSTRUCTOR WHEN RADWASTE OPERATOR CONTACTED] DRYWELL EQUIPMENT AND FLOOR DRAIN SUMP ISOLATION VALVES BEING OPENED.

Performance Step : Critical X Not Critical

- [11.2] **PLACE** DW EQPT DRAIN INBD ISOL VALVE, 2-HS-77-15A,
in AUTO After OPEN.
- [11.3] **PLACE** DW EQPT DRAIN OUTBD ISOL VALVE, 2-HS-77-15B,
in AUTO After OPEN.
- [11.4] **PLACE** DW FLOOR DRAIN INBD ISOL VALVE, 2-HS-77-2A,
in AUTO After OPEN.
- [11.5] **PLACE** DW FLOOR DRAIN OUTBD ISOL VALVE, 2-HS-77-2B,
in AUTO After OPEN.

Standard:

MOMENTARILY PLACED the following switches in the AUTO AFTER OPEN position:

- 2-HS-77-15A
2-HS-77-15B
- 2-HS-77-2A
2-HS-77-2B

VERIFIED the following switches in NOR and illuminated RED valve position indicating lamps above associated control switches. [NOT CRITICAL]

- 2-HS-77-2A
2-HS-77-2B
- 2-HS-77-15A
2-HS-77-15B

SAT	UNSAT	N/A	COMMENTS:

<u>Performance Step</u> :	<u>Critical</u>	<u>X</u>	<u>Not Critical</u>
1. <u>Identify the problem</u>			
2. <u>Define the problem</u>			
3. <u>Identify the causes</u>			
4. <u>Identify the effects</u>			
5. <u>Identify the stakeholders</u>			
6. <u>Identify the resources</u>			
7. <u>Identify the constraints</u>			
8. <u>Identify the opportunities</u>			
9. <u>Identify the risks</u>			
10. <u>Identify the solutions</u>			
11. <u>Identify the implementation plan</u>			
12. <u>Identify the monitoring and evaluation plan</u>			
13. <u>Identify the communication plan</u>			
14. <u>Identify the budget</u>			
15. <u>Identify the timeline</u>			
16. <u>Identify the roles and responsibilities</u>			
17. <u>Identify the risks and mitigation strategies</u>			
18. <u>Identify the success factors</u>			
19. <u>Identify the lessons learned</u>			
20. <u>Identify the next steps</u>			

[12] At Panel 2-9-2, **RESTORE** Radiation Monitoring System as follows:

[12.1] **DEPRESS** RESET pushbutton.

[12.2] **VERIFY OPEN** the associated valve (listed below).

[12.3] **RELEASE** pushbutton.

- UPPER INBD SUPPLY ISOL VALVE RESET, 2-HS-90-254A-A (opens FCV-90-254A).
- LOWER INBD SUPPLY ISOL VALVE RESET, 2-HS-90-254B-A (opens FCV-90-254B).
- OUTBD RETURN ISOL VALVE RESET, 2-HS-90-257A-A (opens FCV-90-257A).
- OUTBD SUPPLY ISOL VALVE RESET, 2-HS-90-255A (opens FCV-90-255).
- INBD RETURN ISOL VALVE RESET, 2-HS-90-257B-A (opens FCV-90-257B).

Standard:

For each of the following, **DEPRESSED** RESET pushbutton and **VERIFIED** illuminated RED valve position indicating lamp for each associated valve (Not Critical).

	<u>PUSHBUTTON</u>	<u>VALVE</u>
•	2-HS-90-254A-A	FCV-90-254A
•	2-HS-90-254B-A	FCV-90-254B
•	2-HS-90-257A-A	FCV-90-257A
•	2-HS-90-255A	FCV-90-255
•	2-HS-90-257B-A	FCV-90-257

SAT	UNSAT	N/A	COMMENTS:

CUE: NO H2/O2 ANALYSERS WERE IN SERVICE.

[13] At Panel 2-9-54, **RESTORE** H2/O2 Analyzer A as follows:

[13.1] **DEPRESS** ANALYZER 2A ISOLATION RESET pushbutton, 2-HS-76-91.

[13.2] **IF** H2/O2 Analyzer 2A was in service, **THEN**
PULL and **RELEASE** ANALYZER 2A SUPP CHBR/DW SELECT, 2-HS-76-49 (Otherwise N/A).

[14] At Panel 2-9-55, **RESTORE** H2/O2 Analyzer B as follows:

[14.1] **DEPRESS** ANALYZER 2B ISOLATION RESET pushbutton, 2-HS-76-92.

[14.2] **IF** H2/O2 Analyzer 2B was in service, **THEN**
PULL and **RELEASE** ANALYZER 2B SUPP CHBR/DW SEL, 2-HS-76-59 (Otherwise N/A).

Performance Step : Critical___ Not Critical X

[15] At Panel 2-9-55, **VERIFY** PATH A VENT FLOW CONT, 2-FIC-84-20, in AUTO with setpoint at 100 scfm.

Standard:

VERIFIED 2-FIC-84-20 in AUTO and set for 100 SCFM.

SAT___ UNSAT___ N/A___ COMMENTS:___

INSTRUCTOR'S NOTE: AS EACH OF THE BELOW STEPS [16] THROUGH [20] ARE ADDRESSED, INFORM THE PERFORMER THAT ANOTHER OPERATOR WILL PERFORM THESE STEPS.

Performance Step : Critical___ Not Critical X

[16] **RESTORE** Reactor Water Cleanup System to normal operation. REFER TO 2-OI-69, Section 5.0. (N/A if Section 8.6 performed).

[17] **RESTORE** Control Bay Emergency Pressurization System to standby readiness. REFER TO 0-OI-31, Section 7.0.

[18] **RESTORE** Containment Inerting System to normal. REFER TO 2-OI-76, Section 5.0.

[19] At Panels 2-9-10 and 2-9-11, **RESTORE** Radiation Monitoring System as follows:

[19.1] **DEPRESS** applicable RESET pushbuttons.

[19.2] **RESTORE** Radiation Monitoring System to normal. REFER TO 2-OI-90, Section 5.0.

[20] **RESTORE** Main Steam System to normal. REFER TO 2-OI-1, Section 5.0.

Standard: None.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical X Not Critical _____

[21] At Panel 2-9-14, **VERIFY** APRM and RBM Memory lights **RESET** (If current plant conditions allow).

Standard:

DEPRESSED TRIP RESET push-buttons for all 3 Channel A APRM status indicating lamps and the RBM Channel A status indicating lamps.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical X Not Critical _____

[22] At Panel 2-9-13, **DEPRESS** TIP ISOLATION RESET pushbutton.

Standard:

DEPRESSED 2-HS-94-7D-2S.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

END OF TASK

STOP TIME: _____

GENERIC WORK PRACTICES

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of SELF CHECKING during this JPM.

Standard:

PERFORMER verified applicable components by utilizing SELF CHECKING in accordance with plant standards.

SAT___ UNSAT___ N/A ___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION in accordance with plant standards.

SAT___ UNSAT___ N/A ___ COMMENTS: _____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 a Unit 2 Operator. Unit 2 has had a loss of power to RPS Bus 'A'. Power has been restored to the bus.

INITIATING CUES: The Unit 2 UNIT SUPERVISOR has the SHIFT MANAGER'S permission to restore systems to normal and directs you to restore affected systems to normal as directed by 2-OI-99, Section 8.3. Reactor and Refuel Zone Ventilation Fans have already been returned to service. SBT System has already been returned to standby readiness.



Browns Ferry Nuclear Plant

Unit 2

Operating Instruction

2-OI-99

Reactor Protection System

Revision 0073

Quality Related

Level of Use: Continuous Use

Effective Date: 04-02-2007

Responsible Organization: OPS, Operations

Prepared By: Terry Kenneth Boyer

Approved By: James A. McCrary

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Current Revision Description

Type of Change DCN 60717-03, Editorial

Tracking Number: 084

PCR: 06002112, 06003343

DCN 60717-03 removed Containment Isolation valves 2-FCV-32-0062 and 2-FCV-32-0063, associated DCA compressor suction piping, associated electrical and pneumatic controls, and PCIS trip signal circuitry in the Control Room.

Page 45 - Deleted Step 8.3[8]. 2-HS-32-62A and 2-HS-32-63A were removed by DCN 60717-03. (PCR 06002112)

Page 62 - Deleted FCV-32-62 and FCV-32-63 which were removed by DCN 60717-03. (PCR 06002112)

Page 64 - Changed the FUNCTION/SYSTEM of FCV-75-57 to PSC Pump Suction Inboard Isolation Valve. Editorial change to reflect plant conditions. (PCR 06003343)

Page 65 - Changed the FUNCTION/SYSTEM of FCV-75-58 to PSC Pump Suction Outboard Isolation Valve. Editorial change to reflect plant conditions. (PCR 06003343)

THIS REVISION DOES NOT AFFECT SYSTEM STATUS

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ATTACHMENTS

Attachment 1:	None
Attachment 2:	None
Attachment 3:	Reactor Protection System Electrical Lineup Checklist, Unit 2.
Attachment 4:	None
Attachment 5:	None

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8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer

NOTES

- 1) This section provides instructions for resetting the various system isolations and reopening affected valves to allow those systems to be restored to normal operation in accordance with their respective operating instructions.
- 2) The following steps are performed at Panel 2-9-5 unless otherwise noted.
- 3) When RPS Bus power is lost to some scram discharge volume level switches, their RTD heater is de-energized. Following the restoration of power, a time delay, dependent on how long the level switch was de-energized, prevents resetting the half scram signal. This may take up to 37 seconds after RPS power is restored. Precaution 3.00 can be referred to for more information on these level switches.

- [1] **OBTAIN** Shift Manager's permission to restore to normal. ☐
- [2] **MOMENTARILY PLACE SCRAM RESET**, 2-HS-99-5A-S5, as follows:
 - [2.1] RESET FIRST position. ☐
 - [2.2] RESET SECOND position. ☐
 - [2.3] NORMAL position. ☐
- [3] **CHECK** the following conditions:
 - A. All eight SCRAM SOLENOID GROUP A/B LOGIC RESET lights illuminated. ☐
 - B. The following four lights illuminated:
 - SYSTEM A BACKUP SCRAM VALVE, 2-IL-99-5A/AB. ☐
 - SYSTEM B BACKUP SCRAM VALVE, 2-IL-99-5A/CD. ☐
 - C. Scram Discharge Volume vent and drain valves indicate open. ☐

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8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer (continued)

- D. Points SOE033 and SOE035 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "A". ☐
- E. Points SOE034 and SOE036 on ICS computer or on the First Out Printer reads "NOTTRIP" for RPS "B". ☐

[4] At Panel 2-9-4, **RESET** PCIS trip logic as follows:

[4.1] **MOMENTARILY PLACE** PCIS DIV I RESET, 2-HS-64-16A-S32, to left and right RESET positions. ☐

[4.2] **CHECK** the following red lights illuminated:

- MSIV GROUP A1. ☐
- MSIV GROUP B1. ☐

[4.3] **MOMENTARILY PLACE** PCIS DIV II RESET, 2-HS-64-16A-S33, to left and right RESET positions. ☐

[4.4] **CHECK** the following red lights illuminated:

- MSIV GROUP A2. ☐
- MSIV GROUP B2. ☐

NOTE

Steps 8.3[5] through 8.3[22] can be performed in any order.

- [5] **VERIFY** the green lights are illuminated on all 5 of the QLVPS located at Panel 9-14. ☐
- [6] **RESTORE** Reactor and Refuel Zone Ventilation to normal operation. REFER TO 2-AOI-64-2D, Group 6 Ventilation System Isolation. ☐
- [7] **RESTORE** Standby Gas Treatment System to standby readiness. REFER TO 0-OI-65, Section 7.0. ☐

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8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer (continued)

- [8] At Panel 2-9-3, **PLACE** PSC head tank pumps in service as follows:
- **PLACE** PSC PUMP SUCTION INBD ISOL VALVE, 2-HS-75-57A, in AUTO After OPEN. ☐
 - **PLACE** PSC PUMP SUCTION OUTBD ISOL VALVE, 2-HS-75-58A, in AUTO After OPEN. ☐
- [9] **IF** RHR System was in Shutdown Cooling, **THEN**
- RESTORE** RHR System. REFER TO 2-AOI-74-1. (N/A if Section 8.7.3[13] or 8.7.3 performed). ☐

NOTE

2-FCV-64-139 and 2-FCV-64-140 opens and closes automatically when the Drywell DP Compressor starts and stops.

- [10] At Panel 2-9-3, **RESTORE** Drywell DP Compressor to automatic operation as follows:
- [10.1] **DEPRESS** DRYWELL DP COMP SUCTION VLV RESET pushbutton, 2-HS-64-139A. ☐
 - [10.2] **DEPRESS** DRYWELL DP COMP DISCH VLV RESET pushbutton, 2-HS-64-140A. ☐
 - [10.3] **VERIFY OPEN** DRYWELL INBD ISOLATION VLV using 2-HS-64-31. ☐
 - [10.4] **VERIFY OPEN** SUPPR CHBR INBD ISOLATION VLV using 2-HS-64-34. ☐

BFN Unit 2	Reactor Protection System	2-OI-99 Rev. 0073 Page 45 of 77
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8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer (continued)

[11] At Panel 2-9-4, **RESTORE** Drywell Floor and Equipment Drain Systems to normal operation as follows:

- [11.1] **NOTIFY** Radwaste Operator that Drywell Equipment and Floor Drain Sump isolation valves are being reopened. ☐
- [11.2] **PLACE** DW EQPT DRAIN INBD ISOL VALVE, 2-HS-77-15A, in AUTO After OPEN. ☐
- [11.3] **PLACE** DW EQPT DRAIN OUTBD ISOL VALVE, 2-HS-77-15B, in AUTO After OPEN. ☐
- [11.4] **PLACE** DW FLOOR DRAIN INBD ISOL VALVE, 2-HS-77-2A, in AUTO After OPEN. ☐
- [11.5] **PLACE** DW FLOOR DRAIN OUTBD ISOL VALVE, 2-HS-77-2B, in AUTO After OPEN. ☐

[12] At Panel 2-9-2, **RESTORE** Radiation Monitoring System as follows:

- [12.1] **DEPRESS** RESET pushbutton. ☐
- [12.2] **VERIFY OPEN** the associated valve (listed below). ☐
- [12.3] **RELEASE** pushbutton. ☐
 - UPPER INBD SUPPLY ISOL VALVE RESET, 2-HS-90-254A-A (opens FCV-90-254A). ☐
 - LOWER INBD SUPPLY ISOL VALVE RESET, 2-HS-90-254B-A (opens FCV-90-254B). ☐
 - OUTBD RETURN ISOL VALVE RESET, 2-HS-90-257A-A (opens FCV-90-257A). ☐
 - OUTBD SUPPLY ISOL VALVE RESET, 2-HS-90-255A (opens FCV-90-255). ☐
 - INBD RETURN ISOL VALVE RESET, 2-HS-90-257B-A (opens FCV-90-257B). ☐

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8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer (continued)

[13] At Panel 2-9-54, **RESTORE** H2/O2 Analyzer A as follows:

[13.1] **DEPRESS** ANALYZER 2A ISOLATION RESET pushbutton, 2-HS-76-91. ☐

[13.2] **IF** H2/O2 Analyzer 2A was in service, **THEN**
PULL and **RELEASE** ANALYZER 2A SUPP CHBR/DW SELECT, 2-HS-76-49 (Otherwise N/A). ☐

[14] At Panel 2-9-55, **RESTORE** H2/O2 Analyzer B as follows:

[14.1] **DEPRESS** ANALYZER 2B ISOLATION RESET pushbutton, 2-HS-76-92. ☐

[14.2] **IF** H2/O2 Analyzer 2B was in service, **THEN**
PULL and **RELEASE** ANALYZER 2B SUPP CHBR/DW SEL, 2-HS-76-59 (Otherwise N/A). ☐

[15] At Panel 2-9-55, **VERIFY** PATH A VENT FLOW CONT, 2-FIC-84-20, in AUTO with setpoint at 100 scfm. ☐

[16] **RESTORE** Reactor Water Cleanup System to normal operation. REFER TO 2-OI-69, Section 5.0. (N/A if Section 8.6 performed). ☐

[17] **RESTORE** Control Bay Emergency Pressurization System to standby readiness. REFER TO 0-OI-31, Section 7.0. ☐

[18] **RESTORE** Containment Inerting System to normal. REFER TO 2-OI-76, Section 5.0. ☐

[19] At Panels 2-9-10 and 2-9-11, **RESTORE** Radiation Monitoring System as follows:

[19.1] **DEPRESS** applicable RESET pushbuttons. ☐

[19.2] **RESTORE** Radiation Monitoring System to normal. REFER TO 2-OI-90, Section 5.0. ☐

[20] **RESTORE** Main Steam System to normal. REFER TO 2-OI-1, Section 5.0. ☐

<p>BFN Unit 2</p>	<p>Reactor Protection System</p>	<p>2-OI-99 Rev. 0073 Page 47 of 77</p>
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8.3 Restoration to Normal Following RPS Bus Power Loss or Transfer (continued)

- [21] At Panel 2-9-14, **VERIFY** APRM and RBM Memory lights
RESET (If current plant conditions allow). ☐
- [22] At Panel 2-9-13, **DEPRESS** TIP ISOLATION RESET
pushbutton. ☐

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 190

TITLE: RESPOND TO OFF-GAS POST-TREATMENT RADIATION
HI-HI-HI

TASK NUMBER: U-066-AB-02

SUBMITTED BY: 

DATE: 1/3/08

VALIDATED BY: _____

DATE: _____

APPROVED: 

DATE: 1/5/08

PLANT CONCURRENCE: 

DATE: 1/4/08

TRAINING

OPERATIONS

* Examination JPMS Require Operations Training Manager or Designee Approval and Plant Concurrence

JPM 190
REV. NO. 0
PAGE 2 OF 13

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	03/30/06	ALL	New

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____ DATE: _____

RO _____ SRO _____

JPM NUMBER: 190

TASK NUMBER: U-066-AB-02

TASK TITLE: RESPOND TO OFF-GAS POST-TREATMENT RADIATION
HI-HI-HI

K/A NUMBER: 271000K4.08 K/A RATING: RO 3.1 SRO: 3.3

TASK STANDARD: RESPOND TO OFF-GAS POST-TREATMENT RADIATION
HI-HI-HI PER 2-AOI-66-2.

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 2-AOI-66-2 REV 020

VALIDATION TIME: _____ CONTROL ROOM: 12:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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.

NON-CRITICAL STEP: At the end of this JPM, **PERFORMER** will be evaluated on **PLANT WORK EXPECTATIONS:**

PERFORMER shall demonstrate the use of TOUCH STAAR during this JPM.

PERFORMER shall demonstrate the use of 3-WAY COMMUNICATION during this JPM.

INITIAL CONDITIONS: You are a Unit 2 Operator. Unit 2 is at 100% power.

INITIATING CUES: The Unit Supervisor directs you to respond to a OFF-GAS POST-TREATMENT RADIATION HI-HI-HI annunciator.

START TIME _____

Performance Step: Critical___ Not Critical_X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required
AOI.

Standard:

IDENTIFIED OR OBTAINED copy of 2-AOI-66-2. CANIDATE MAY GO TO
ARP 4C WINDOW 35 FIRST.

SAT___ UNSAT___ N/A___ COMMENTS: _____

INSTRUCTOR NOTE: CANIDATE MAY GO TO ARP 4C WINDOW 35 AND
MAY VERIFY 2-FCV-66-28 CLOSED FROM THE ARP.

4.0 OPERATOR ACTIONS

<u>Performance Step</u> :	Critical	X	Not Critical
1. Identify the problem			
2. Gather information			
3. Analyze the data			
4. Develop a solution			
5. Implement the solution			
6. Evaluate the results			

4.1 Immediate Actions

```
[1]      If scram has NOT occurred, THEN
```

PERFORM the following:

```
[1.1] IF core flow is above 60%, THEN
```

REDUCE core flow to between 50-60%.

Standard:

PERFORMER reduced core flow to between 50-60% with recirc system.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical_X Not Critical_____

CUE: AFTER PERFORMER refers to 2-AOI-100-1, "Another operator will perform the actions of scram procedure, continue in your current procedure."

PERFORMER MANUALLY SCRAMMED the Reactor and referred to 2-AOI-100-1. (Referring to 2-AOI-100-1 is **NON-CRITICAL**.)

Performance Step : Critical___ Not Critical X

4.2 Subsequent Actions

- [1] IF OFFGAS SYSTEM ISOLATION VALVE, 2-FCV-066-0028 has been mechanically restrained open due to plant conditions **THEN**

DISENGAGE 2-FCV-066-0028 mechanical restraint by rotating the restraining handwheel fully in the counterclockwise direction, locally at the Stack. (Otherwise N/A)

Standard:

Not Applicable.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step : Critical__ Not Critical X

[2] **Verify** 2-FCV-66-28 **CLOSED** on Panel 9-53.

Standard:

PERFORMER verified that 2-FCV-66-28 is closed. (May have already verified valve closed from the ARP).

SAT__ UNSAT__ N/A__ COMMENTS:_____

Performance Step : Critical__ Not Critical X

[3] **MONITOR** area radiation levels at Panel 9-11.

Standard:

PERFORMER MONITORED radiation levels at Panel 9-11.

SAT__ UNSAT__ N/A__ COMMENTS:_____

Performance Step : Critical___ Not Critical X

[4] **REFER to EPIP-1** for emergency classification level
and response.

**CUE: THE SHIFT MANAGER IS IMPLEMENTING THE EPIP-1
CLASSIFICATION.**

Standard:

PERFORMER continued to the next step.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step : Critical___ Not Critical X

[5] **MONITOR** the following parameters:

- A MAIN STEAM LINE RADIATION, 2-RR-90-135,
Panel 2-9-2.
- B OFF-GAS PRETREATMENT RADIATION, 2-RR-90-
157, Panel 2-9-2.
- C OFF-GAS POST-TREATMENT RADIATION, 2-RR-
90-265, 266, Panel 2-9-2.
- D STACK GAS RADIATION, 0-RR-90-147, Unit 1
Panel 2-9-2.

**CUE: WHEN PERFORMER CALLS UNIT 1 OPERATOR FOR A READING ON
0-RR-90-147: STACK GAS RADIATION, 0-RR-90-147 IS
READING..... 6×10^6 cps**

Standard:

PERFORMER MONITORED 2-RR-90-135, 157, 265, 266, on Unit 2
Panel 9-2 and called Unit 1 Operator for a reading on 0-RR-
90-147, Unit 1 Panel 9-2.

SAT___ UNSAT___ N/A___ COMMENTS:_____

<u>Performance Step</u> :	Critical	X	Not Critical
1. The project manager is responsible for the project's success or failure.			
2. The project manager is responsible for the project's budget.			
3. The project manager is responsible for the project's schedule.			
4. The project manager is responsible for the project's quality.			
5. The project manager is responsible for the project's risk.			
6. The project manager is responsible for the project's communication.			
7. The project manager is responsible for the project's stakeholder management.			
8. The project manager is responsible for the project's team management.			
9. The project manager is responsible for the project's resource management.			
10. The project manager is responsible for the project's procurement management.			

[6] **IF** after five minutes from scram the Off-Gas Post
Treatment activity is NOT less than 6×10^5 cps,
 THEN

CLOSE all Main Steam Isolation Valves and Main Steam Line Drain Valves, 2-FCV-1-55 and 56.

CUE: THE UNIT HAS BEEN SCRAMMED FOR 5 MINUTES.

Standard:

PERFORMER RECOGNIZED that the OFF-GAS POST TREATMENT activity is $> 6 \times 10^5$ cps and **CLOSED** ALL Main Steam Isolation Valves and Main Steam Line Drain Valves, 2-FCV-1-55 and 56. (2-FCV-1-55 and 56 are not critical steps)

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

CUE: ANOTHER OPERATOR IS HERE TO RELIEVE YOU.

END OF TASK

STOP TIME

Performance Step: Critical____ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT____ UNSAT____ N/A____ COMMENTS:

Performance Step: Critical____ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT____ UNSAT____ N/A____ COMMENTS:

C

C

C



Browns Ferry Nuclear Plant

Unit 2

Abnormal Operating Instruction

2-AOI-66-2

Offgas Post-Treatment Radiation HI-HI-HI

Revision 0020

Quality Related

Level of Use: Continuous Use

Effective Date: 03-27-2007

Responsible Organization: OPS, Operations

Prepared By: Ricky L. Eakin

Approved By: John T. Kulisek

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Current Revision Description

Type of Change: Design Change Tracking Number: 023

DCN 63290 Installs a manual handwheel on 2-FCV-66-28, OFF-GAS SYSTEM ISOLATION VALVE. This valve can now be mechanically restrained open, if it fails closed for some reason. This will prevent having to shutdown due to this failure.

PCR 05001776

Added the following information to the AUTOMATIC ACTION Section 3.0B: 2-FCV-66-28, OFF-GAS SYSTEM ISOLATION VALVE will not perform it's design function to automatically close, when it is Mechanically Restrained OPEN due to plant conditions.

Deleted Step 4.2[1] instructing the entry into the EOIs when an EOI entry condition is met. EOIs are entered any time an entry condition is met, no step instructing entry is needed.

Added Step 4.2[1] to disengage 2-FCV-066-0028 mechanical restraint by rotating the restraining handwheel fully in the counterclockwise direction, if previously restrained open due to plant conditions.

Added Drawing 2-115D6410RE-3, Off Gas System Elementary Drawing to Section 5.6.

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1.0 PURPOSE

This abnormal operating instruction provides symptoms, automatic actions and operator actions for a High-High-High radiation condition in the Offgas System.

2.0 SYMPTOMS

- A. Annunciators in alarm will include, but are NOT limited to, the following:
 - 1. OG POST TRTMT RADIATION HIGH (2-XA-55-4C, Window 33).
 - 2. OG POST TRTMT RADIATION HIGH-HIGH (2-XA-55-4C, Window 34).
 - 3. OG POST TRTMT RAD MONITOR HI-HI-HI/INOP (2-XA-55-4C, Window 35)
 - 4. OG PRETREATMENT RADIATION HIGH (2-XA-55-3A, Window 5).
 - 5. STACK GAS RADIATION HIGH (2-XA-55-3A, Window 13).
 - 6. STACK GAS RADIATION HIGH-HIGH (2-XA-55-3A, Window 6).
 - 7. OG AVG ANNUAL RELEASE LIMIT EXCEEDED (2-XA-55-4C, Window 27).
 - 8. OFFGAS ISOLATION VALVE CLOSED (2-XA-55-7A, Window 4).
- B. Increased activity on OFFGAS PRETREATMENT RADIATION recorder, 2-RR-90-157, Panel 2-9-2.
- C. Increased activity on OFFGAS POST TREATMENT RADIATION recorder, 2-RR-90-265, Panel 2-9-2.
- D. Increased activity on STACK GAS RADIATION recorder, 0-RR-90-147, located on Panel 1-9-2.

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3.0 AUTOMATIC ACTIONS

- A. If the OFFGAS TREATMENT SELECT handswitch, 2-XS-66-113, Panel 9-53, is in AUTO when High radiation condition exists it will automatically align, or ensure alignment of, the charcoal adsorbers to the treatment mode, i.e., the charcoal inlet valve will receive an open signal and the charcoal bypass valve will receive a close signal.
- B. OFFGAS SYSTEM ISOLATION VALVE, 2-FCV-66-28, automatically closes on any combination of Off Gas Post Treatment Hi Hi Hi, downscale, or inop simultaneously in both channels of the O.G. post treatment radiation monitoring system after 5 seconds. 2-FCV-066-0028 will not perform it's design function to automatically close, when it is mechanically restrained open due to plant conditions.

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4.2 Subsequent Actions (continued)

4.0 OPERATOR ACTIONS

4.1 Immediate Actions

[1] IF scram has not occurred, **THEN**

PERFORM the following:

[1.1] IF core flow is above 60%, **THEN**

REDUCE core flow to between 50-60%. ☐

[1.2] **MANUALLY SCRAM** the Reactor. (Reference 2-AOI-100-1). ☐

4.2 Subsequent Actions

[1] IF OFFGAS SYSTEM ISOLATION VALVE, 2-FCV-066-0028 has been mechanically restrained open due to plant conditions **THEN**

DISENGAGE 2-FCV-066-0028 mechanical restraint by rotating the restraining handwheel fully in the counterclockwise direction, locally at the Stack. (Otherwise N/A) ☐

[2] **VERIFY CLOSED** OFFGAS SYSTEM ISOLATION VALVE, 2-FCV-66-28 on Panel 3-9-53 or locally. ☐

[3] **MONITOR** area radiation levels at Panel: 2-9-11. ☐

[4] **REFER TO** EPIP-1 for emergency classification level and response. ☐

[5] **MONITOR** the following parameters:

A. MAIN STEAM LINE RADIATION, 2-RR-90-135, Panel 2-9-2. ☐

B. OFFGAS PRETREATMENT RADIATION, 2-RR-90-157, Panel 2-9-2. ☐

C. OFFGAS POST-TREATMENT RADIATION, 2-RR-90-265, Panel 2-9-2. ☐

D. STACK GAS RADIATION, 0-RR-90-147, Unit 1 Panel 1-9-2. ☐

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- [6] **IF** after five minutes from scram the Offgas Post Treatment activity is not less than 6×10^5 cps as indicated on 2-RR-90-265 on panel 2-9-2, **THEN**

CLOSE all Main Steam Isolation Valves and Main Steam Line Drain Valves, 2-FCV-1-55 and 2-FCV-1-56. ☐

NOTE

Placing additional Stack Dilution Air Fans in service should keep 0-RM-90-147 and 0-RM-90-148 on scale.

- [7] **PLACE** STACK DILUTION FAN SEL control switch, 2-XS-66-29, Panel 2-9-8, in OFF. ☐
- [8] **START** standby STACK DILUTION FAN 2B(2A) using control switch, 2-HS-66-31A(29A), Panel 2-9-8. ☐
- [9] **REQUEST** Unit 1 and Unit 3 operators to START standby Stack Dilution Air Fans. ☐
- [10] **REQUEST** Chemistry perform 0-SI-4.8.B.2-8, Airborne Effluent Analysis - Stack Noble Gas, to determine activity. ☐
- [11] **REQUEST** Chemistry sample reactor water for radioactivity. ☐

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5.0 REFERENCES

5.1 Technical Specifications

Section 5.5.8, Explosive Gas and Storage Tank Radioactivity Monitoring Program.

5.2 Offsite Dose Calculation Manual

Section 1/2.2.2 Gaseous Effluents.

5.3 Final Safety Analysis Report

Section 9.5, Gaseous Radwaste System.

Section 14.6, Analysis of Design Basis Accidents.

5.4 Technical Requirements Manual

Section 3.3.9, Offgas Hydrogen Analyzer Instrumentation.

Section 3.7.2, Airborne Effluents.

5.5 Plant Instructions

0-SI-4.8.B.2-8, Airborne Effluent Analysis - Stack Noble Gas.

EPIP-1, Emergency Plan Classification Logic.

2-GOI-100-1A, Unit Startup and Power Operation.

2-AOI-100-1, Reactor Scram.

2-OI-66, Offgas System.

2-SI-4.6.B.1-4, Reactor Coolant Chemistry.

OPDP-8, Limiting Conditions For Operation Tracking.

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5.6 Plant Drawings

2-47E610-90-2, Mechanical Control Diagram Radiation Monitoring System.

2-47E610-66-1, Mechanical Control Diagram Offgas System.

45E614-2, Wiring Diagrams 120V AC/250V DC VALVES & MISC. Schematic Diagram.

45E620-3, Wiring Diagrams Annunciator System Key Diagram.

729E814 series, Process Radiation Mon Sys.

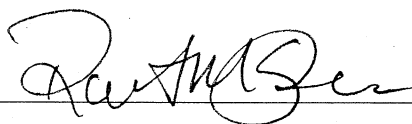
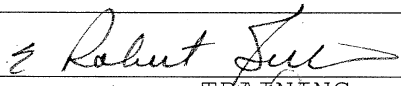
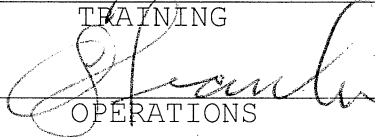
2-115D6410RE-3, Off Gas System Elementary Drawing

6.0 ILLUSTRATIONS/ATTACHMENTS

None

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 3136F
TITLE: RESPOND TO STUCK OPEN SRV
TASK NUMBER: U-001-AB-01

SUBMITTED BY:  DATE: 1/2/08
VALIDATED BY: _____ DATE: _____
APPROVED:  DATE: 1/5/08
PLANT CONCURRENCE:  DATE: 1/9/08
TRAINING
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

JPM NO. 3136F
REV. NO. 0
PAGE 2 OF 15

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	1/4/2008	ALL	New JPM

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 136F

TASK NUMBER: U-001-AB-01

TASK TITLE: RESPOND TO MAIN STEAM RELIEF VALVE STUCK OPEN

K/A NUMBER: 239002A2.03 K/A RATING: RO 4.1 SRO: 4.2

TASK STANDARD: PERFORM CONTROL ROOM OPERATIONS NECESSARY TO
RESPOND TO A STUCK OPEN MSRV AS DIRECTED BY 3-AOI-
1-1

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 3-AOI-1-1, REV 8

VALIDATION TIME: CONTROL ROOM: 6:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 Operator. Unit 2 is at 100% power. Annunciator MAIN STEAM RELIEF VALVE OPEN, 3-XA-55-3C, Window 25 is in alarm.

INITIATING CUES: The UNIT SUPERVISOR directs you to respond to the alarm as directed by 3-AOI-1-1.

START TIME: _____

Performance Step : Critical___ Not Critical_X

IDENTIFY/OBTAIN copy of required AOI.

Standard:

OBTAINED copy of 3-AOI-1-1.

SAT___ UNSAT___ N/A___ COMMENTS: _____

4.0 OPERATOR ACTION

4.1 Immediate Action

Performance Step : Critical_X Not Critical___

[1] **IDENTIFY** stuck open relief valve by **OBSERVING**
following:

- SRV TAILPIPE FLOW MONITOR 3-FMT-1-4 on Panel 3-9-3,

OR

- MSRV DISCHARGE TAILPIPE TEMPERATURE recorder, 3-TR-1-1 on Panel 3-9-47.

Standard:

IDENTIFIED MSRV 1-19 OPEN as indicated on 3-FMT-1-4 SRV Tailpipe Flow Monitor on Panel 3-9-3 or elevated tailpipe temperature as indicated on 3-TR-1-1, Panel 3-9-47.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step : Critical_X Not Critical_____

[2] **WHILE OBSERVING** the indications for the affected relief valve on the acoustic monitor;

CYCLE the affected relief valve control switch several times as required

- CLOSE TO OPEN TO CLOSE positions

Standard:

PLACED 3-HS-1-19 in the CLOSE-OPEN-CLOSE position several times. **DETERMINED** valve DID NOT close as indicated by MSRV TAILPIPE FLOW MONITOR or generator Mwe indicating no increase in power.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

.....

Performance Step :	Critical X	Not Critical
--------------------	------------	--------------

```
[3] If All SRVs are closed, THEN
```

CONTINUE at step 4.2.3 (Otherwise N/A)

Standard:

Verified that the SRV did not close and continued in the procedure at step 4.2.1

SAT	UNSAT	N/A	COMMENTS:

4.2 Subsequent Action

4.2.1 Attempt to close valve from Panel 9-3

Performance Step : Critical_X Not Critical____

[1] **PLACE** the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the off position.

Standard:

PLACED the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the off position and verifies the power is off.

SAT	UNSAT	N/A	COMMENTS:

Performance Step :	Critical X	Not Critical
--------------------	------------	--------------

[2] **PLACE** the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the ON position.

Standard:

PLACED the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the ON Position and verifies SRV 1-19 did not close.

SAT	UNSAT	N/A	COMMENTS:

Performance Step : Critical____ Not Critical X

[3] **IF** all SRV'S are CLOSED, **THEN**

CONTINUE at Step 4.2.3. (Otherwise N/A)

Standard:

VERIFIES SRV 1-19 did not close and proceeds to step [4]

SAT____ UNSAT____ N/A____ COMMENTS:_____

Performance Step : Critical X Not Critical____

[4] **PLACE** MSRV AUTO ACTUATION LOGIC INHIBIT, 3-XS-1-202 in
INHIBIT:

Standard:

PLACED MSRV AUTO ACTUATION LOGIC INHIBIT, 3-XS-1-202 in
INHIBIT.

SAT____ UNSAT____ N/A____ COMMENTS:_____

Performance Step : Critical___ Not Critical X

[5] **IF** relief valve closes, **THEN**

OPEN breaker or **PULL** fuses as necessary using
attachment 1 (UNIT 2 SRV Solenoid Power Breaker/Fuse
Table).

Standard:

VERIFIES SRV 1-19 did not close and does not open the breaker
or pull fuses

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical X Not Critical ___

[6] **PLACE** MSRV AUTO ACTUATION LOGIC INHIBIT, 3-XS-1-202
in AUTO:

Standard:

PLACED MSRV AUTO ACTUATION LOGIC INHIBIT, 3-XS-1-202
in AUTO:

SAT___ UNSAT___ N/A___ COMMENTS:_____

NOTES

- 1) Only the appropriate sections for the stuck open relief valve is required to be performed.
- 2) The ADS valves that have more than one power supply will AUTO TRANSFER on a loss of power, and are NORMAL SEEKING.
- 3) ADS Relief valves with hand-switches on Panel 25-32 are listed below and should be operated from that location first.
- 4) When opening breakers and pulling fuses, opening the breakers is the preferred method when time permits. However, the breakers with multiple locations will require opening each breaker to de-energize the control circuit. In this case, pulling the fuses from Panel 25-32 may be quicker than opening the breakers.

Performance Step : Critical X Not Critical

[7] **IF** the SRV valve did not close, **THEN**

PERFORM the appropriate section from table below.

RELIEF VALVE	STEP NUMBER	Switch Location	Breaker Location	Fuse Location
SRV 1-4	Step 4.2.2[7]		3A 250 RMOV Bd	Panel 25-32
SRV 1-5	Step 4.2.2[1]	Panel 25-32	Multiple	Panel 25-32
SRV 1-18	Step 4.2.2[5]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-19	Step 4.2.2[6]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-22	Step 4.2.2[2]	Panel 25-32	Multiple	Panel 25-32
SRV 1-23	Step 4.2.2[8]		3C 250 RMOV Bd	Panel 25-32
SRV 1-30	Step 4.2.2[9]		3A 250 RMOV Bd	Panel 25-32
SRV 1-31	Step 4.2.2[10]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-34	Step 4.2.2[3]	Panel 25-32	Multiple	Panel 25-32
SRV 1-41	Step 4.2.2[4]	Panel 25-32	Multiple	Panel 25-32
SRV 1-42	Step 4.2.2[11]		3B 250 RMOV Bd	Panel 25-32
SRV 1-179	Step 4.2.2[12]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-180	Step 4.2.2[13]		3A 250 RMOV Bd	Panel 25-32

Standard:

Verifies SRV 1-19 does not go closed and continues at step 4.2.2[6] (from the table above).

SAT UNSAT N/A COMMENTS:

4.2.2 Attempt to close valve from outside the control room:

NOTES

- 1) 2-PCV-1-31 is an ADS Valve
- 2) 2-PCV-1-31 controls have been removed from Panel 25-32.
- 3) Attachment 1 may be address for fuse and breaker information.

Performance Step : Critical X Not Critical

[6] IF 2-PCV-1-19 is NOT closed, **THEN**

PERFORM the following: (Otherwise N/A this section.)

[6.1] **REMOVE** the power from 3-PCV-1-19 by performing one of the following: (Otherwise N/A):

A. **OPEN** the following breaker (Preferred method)

- 3B 250V RMOV, compartment 1B2

OR

B. In 3-LPNL-925-0658, (EI 593' 3B Electric Board Room, South Wall)

PULL the following fuses as necessary

- Fuse 3-FU1-001-0019A
- Fuse 3-FU1-0019B

Standard:

Dispatches AUO to open breaker 1B2 on 3B 250V RMOV (PREFERRED METHOD) OR PULL FUSES IN 3-LPNL-925-0658.

SAT UNSAT N/A COMMENTS:

CUE: [WHEN THE AUO/US IS DISPATCHED] THE SIMULATOR INSTRUCTOR SHOULD WAIT APPROXIMATELY ONE MINUTE AND THEN bat 1-19off TO REMOVE POWER FROM PCV-1-19.

PHONE THE PERFORMER AND NOTIFY HIM/HER THAT POWER HAS BEEN
REMOVED FROM 3-PCV-1-19.

Performance Step : Critical X Not Critical_____

[6.2] IF the valve does **NOT** close, THEN

CLOSE breaker or **REINSTALL** fuses removed in Step 4.2.2[6.1].

[6.3] **CONTINUE** at Step 4.2.3.

Standard:

VERIFIES SRV 1-19 DID NOT CLOSE AND HAS AUO/US TO CLOSE
THE BREAKER OR REINSTALL FUSES, THEN CONTINUES ON TO
STEP 4.2.3

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN THE AUO/US IS DISPATCHED] WAIT APPROXIMATELY ONE MINUTE AND THEN bat 1-19on TO PUT POWER BACK ON PCV-1-19.

PHONE THE PERFORMER AND NOTIFY HIM/HER THAT POWER HAS BEEN RESTORED TO 2-PCV-1-19.

Performance Step : Critical___ Not Critical X

4.2.3 Other Actions and Documentation

- [1] IF ANY EOI entry condition is met, THEN
ENTER the appropriate EOI(s).
- [2] REFER TO Technical Specifications Sections 3.5.1 and 3.4.3 for Automatic Depressurization System and relief valve operability requirements.

Standard:

Examinee monitors for EOI entry conditions and notifies Unit Supervisor to review Tech Specs.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: THE UNIT SUPERVISOR IS ADDRESSING TECH SPECS. THAT WILL BE ALL FOR NOW.

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS_____

END OF TASK

STOP TIME_____

RELIEF VALVE	STEP NUMBER	Switch Location	Breaker Location	Fuse Location
SRV 1-4	Step 4.2.2[7]		3A 260 RMOV Bd	Panel 26-32
SRV 1-5	Step 4.2.2[1]	Panel 26-32	Multiple	Panel 26-32
SRV 1-16	Step 4.2.2[6]		3B 260 RMOV Bd	3-LFNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-19	Step 4.2.2[9]		3B 260 RMOV Bd	3-LFNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-22	Step 4.2.2[2]	Panel 26-32	Multiple	Panel 26-32
SRV 1-23	Step 4.2.2[8]		3C 260 RMOV Bd	Panel 26-32
SRV 1-30	Step 4.2.2[9]		3A 260 RMOV Bd	Panel 26-32
SRV 1-31	Step 4.2.2[10]		3B 260 RMOV Bd	3-LFNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-34	Step 4.2.2[3]	Panel 26-32	Multiple	Panel 26-32
SRV 1-41	Step 4.2.2[4]	Panel 26-32	Multiple	Panel 26-32
SRV 1-42	Step 4.2.2[11]		3B 260 RMOV Bd	Panel 26-32
SRV 1-179	Step 4.2.2[12]		3B 260 RMOV Bd	3-LFNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-180	Step 4.2.2[13]		3A 260 RMOV Bd	Panel 26-32



Browns Ferry Nuclear Plant

Unit 3

Abnormal Operating Instruction

3-AOI-1-1

Relief Valve Stuck Open

Revision 0008

Quality Related

Level of Use: Continuous Use

Effective Date: 12-19-2005

Responsible Organization: OPS, Operations

Prepared By: Keith Smith

Approved By: Jeffery A. Kimberlin

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 2 of 29
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Current Revision Description

Pages Affected: All

Type of Change: XP Conversion

Tracking Number: 9

PCR's:

PER's:

This procedure was converted from Word 95 to Word 2002 (XP) using Rev 7.

Along with the conversion the following changes were made:

Separated the supplementary steps into individual valves when performing outside the control room. Identified the breakers and fuses for each valve and made them into steps for the associated valves.

Added table showing which step addresses each SRV.

Formatted the procedure to be continuous use and removed the steps that referred to the tech spec after each action item.

Added step 4.2.1[7] to reference the appropriate sections.

Added to note to clarified that fuses may be used for time requirements due to the multiple breakers that may have to be operated or locations of the boards.

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 3 of 29
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1.0 PURPOSE

This abnormal operating instruction provides symptoms, automatic action and operator action for a stuck open relief valve.

2.0 SYMPTOMS

- A. Annunciator MAIN STEAM RELIEF VALVE OPEN 3-FA-1-1 (3-XA-55-3C, Window 25) is in alarm due to the SRV Tailpipe Flow monitor sensing flow.
- B. GENERATOR LOAD recorder, 3-XR-57-57, Panel 3-9-8, indication is lowering.
- C. MAIN STEAM/TURBINE STEAM FLOW, flow recorder 3-FR-46-5, Panel 3-9-5, indication is lowering.
- D. SUPPRESSION POOL WATER TEMPERATURE recorder, 3-TR-64-161 and SUPPRESSION POOL WATER TEMPERATURE recorder, 3-TR-64-162, Panel 3-9-3, indication is rising.

3.0 AUTOMATIC ACTION

None

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 4 of 29
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4.0 OPERATOR ACTION

4.1 Immediate Action

[1] **IDENTIFY** stuck open relief valve by

OBSERVING the following:

- SRV TAILPIPE FLOW MONITOR, 3-FMT-1-4, on Panel 3-9-3,

OR

- MSRV DISCHARGE TAILPIPE TEMPERATURE, 3-TR-1-1 on Panel 3-9-47. ☐

[2] **WHILE OBSERVING** the indications for the affected Relief valve on the Acoustic Monitor;

CYCLE the affected relief valve control switch several times as required:

- CLOSE to OPEN to CLOSE positions ☐

[3] **IF** all SRVs are CLOSED, **THEN**

CONTINUE at Step 4.2.3. (Otherwise N/A) ☐

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 5 of 29
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<p style="text-align: center;">NOTE</p> <p>The SRV TAILPIPE FLOW MONITOR may seal-in an OPEN position indication.</p>
--

4.2 Subsequent Action

4.2.1 Attempt to close valve from Panel 9-3:

- [1] **PLACE** the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the OFF position. ☐
- [2] **PLACE** the SRV TAILPIPE FLOW MONITOR POWER SWITCH in the ON position. ☐
- [3] **IF** all SRVs are CLOSED, **THEN**
CONTINUE at Step 4.2.3. (Otherwise N/A) ☐
- [4] **PLACE** MSRV AUTO ACTUATION LOGIC INHIBIT, 3-XS-1-202 in INHIBIT: ☐
- [5] **IF** relief valve closes, **THEN**
OPEN breaker or **PULL** fuses as necessary using Attachment 1 (Unit 3 SRV Solenoid Power Breaker/Fuse Table). ☐
- [6] **PLACE** MSRV AUTO ACTUATION LOGIC INHIBIT 3-XS-1-202, in AUTO. ☐

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 6 of 29
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4.2.1 Attempt to close valve from Panel 9-3: (continued)

NOTES	
1)	Only the appropriate sections for the stuck open relief valve is required to be performed.
2)	The ADS valves that have more than one power supply will AUTO TRANSFER on a loss of power, and are NORMAL SEEKING.
3)	ADS Relief valves with hand-switches on Panel 25-32 are listed below and should be operated from that location first.
4)	When opening breakers and pulling fuses, opening the breakers is the preferred method when time permits. However, the breakers with multiple locations will require opening each breaker to de-energize the control circuit. In this case, pulling the fuses from Panel 25-32 may be quicker than opening the breakers.

[7] IF the SRV valve did not close, THEN

PERFORM the appropriate section from table below.



RELIEF VALVE	STEP NUMBER	Switch Location	Breaker Location	Fuse Location
SRV 1-4	Step 4.2.2[7]		3A 250 RMOV Bd	Panel 25-32
SRV 1-5	Step 4.2.2[1]	Panel 25-32	Multiple	Panel 25-32
SRV 1-18	Step 4.2.2[5]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-19	Step 4.2.2[6]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-22	Step 4.2.2[2]	Panel 25-32	Multiple	Panel 25-32
SRV 1-23	Step 4.2.2[8]		3C 250 RMOV Bd	Panel 25-32
SRV 1-30	Step 4.2.2[9]		3A 250 RMOV Bd	Panel 25-32
SRV 1-31	Step 4.2.2[10]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-34	Step 4.2.2[3]	Panel 25-32	Multiple	Panel 25-32
SRV 1-41	Step 4.2.2[4]	Panel 25-32	Multiple	Panel 25-32
SRV 1-42	Step 4.2.2[11]		3B 250 RMOV Bd	Panel 25-32
SRV 1-179	Step 4.2.2[12]		3B 250 RMOV Bd	3-LPNL-925-0658, (EI 593' 3B Electric Board Room)
SRV 1-180	Step 4.2.2[13]		3A 250 RMOV Bd	Panel 25-32

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 16 of 29
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**4.2.2 Attempt to close valve from outside the control room:
(continued)**

NOTES

- 1) 3-PCV-1-19 is an ADS Valve
- 2) 3-PCV-1-19 controls have been removed from Panel 25-32.
- 3) Attachment 1 may be address for fuse and breaker information.

[6] IF 3-PCV-1-19 is NOT closed, **THEN**

PERFORM the following: (Otherwise N/A this section.)

[6.1] **REMOVE** the power from 3-PCV-1-19 by performing one of the following: (Otherwise N/A):

A. **OPEN** the following breaker: (Preferred method)

- 3B 250V RMOV, Compartment 1B2 ☐

OR

B. In 3-LPNL-925-0658, (EI 593' 3B Electric Board Room, South Wall)

PULL the following fuses as necessary:

- Fuse 3-FU1-001-0019A ☐
- Fuse 3-FU1-001-0019B ☐

[6.2] IF the valve does **NOT** close, **THEN**

CLOSE breaker or **REINSTALL** fuses removed in Step 4.2.2[6.1]. ☐

[6.3] **CONTINUE** at Step 4.2.3. ☐

BFN Unit 3	Relief Valve Stuck Open	3-AOI-1-1 Rev. 0008 Page 24 of 29
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4.2.3 Other Actions and Documentation

- [1] **IF** ANY EOI entry condition is met, **THEN**
ENTER the appropriate EOI(s). ☐
- [2] **REFER TO** Technical Specifications Sections 3.5.1 and 3.4.3
for Automatic Depressurization System and relief valve
operability requirements. ☐
- [3] **INITIATE** suppression pool cooling as necessary to maintain
suppression pool temperature less than 95°F. ☐
- [4] **IF** the relief valve can **NOT** be closed **AND** suppression pool
temperature Can **NOT** be maintained less than or equal to
95°F, **THEN**
PLACE the reactor Mode⁴ in accordance with ☐
3-GOI-100-12A.
- [5] **DOCUMENT** actions taken and **INITIATE** Work Order for the ☐
valve.

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 3116F
TITLE: PLACING STANDBY STEAM JET AIR EJECTOR IN
OPERATION
TASK NUMBER: U-066-NO-07

SUBMITTED BY: *Robert M. Z...* DATE: 1/3/08
VALIDATED BY: _____ DATE: _____
APPROVED: *Robert Sullivan* DATE: 1/5/08
TRAINING
PLANT CONCURRENCE: *J. Frank* DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

JPM NO. 3116F
REV. NO. 0
PAGE 2 OF 22

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	1/4/2008	ALL	NEW JPM

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 116F

TASK NUMBER: U-066-NO-07

TASK TITLE: PLACE THE STANDBY SJAE IN OPERATION

K/A NUMBER: 271000A4.09 K/A RATING: RO 3.3 SRO: 3.2

TASK STANDARD: PERFORM CONTROL ROOM MANIPULATIONS REQUIRED TO
PLACE THE STANDBY STEAM JET AIR EJECTOR IN
OPERATION DURING POWER OPERATION

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 3-OI-66, REV 50

VALIDATION TIME: CONTROL ROOM: 7:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 Operator. Unit 3 is at 100% power. 3A steam jet air ejector is in service in accordance with Section 5.9 of 3-OI-66. 3A steam jet air ejector is to be removed from service for maintenance and 3B steam jet air ejector is to be placed into operation. HWC is shutdown per 3-OI-4.

INITIATING CUES: _____ (NAME) _____, remove 3A steam jet air ejector from service and place 3B steam jet air ejector into operation.

START TIME _____

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required procedure.

Standard:

IDENTIFIED OR OBTAINED copy of 3-OI-66.

SAT___ UNSAT___ N/A___ COMMENTS: _____

8.4 Placing Standby SJAE in Operation

NOTES

- 1) Panel 25-105 located in Unit 3 Turbine Bldg. EI 586' T12-C.
- 2) The HWC System is shutdown prior to intentional swapping of SJAEs to prevent receipt of the automatic trip of the HWC System that occurs when both SJAE DISCHARGE VALVES 3-FCV-66-14 and 18 are closed.

Performance Step : Critical___ Not Critical X

8.4.[1] REVIEW all Precaution and Limitations in Section 3.0.

Standard:

REVIEWED all Precautions and Limitations in Section 3.0.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step : Critical___ Not Critical X

8.4.[2] VERIFY the following initial conditions have been met:

[2.1] IF HWC System is in service, **THEN** Otherwise NA)
SHUTDOWN HWC System. REFER TO 3-OI-4.

Standard:

None

SAT___ UNSAT___ N/A X COMMENTS: Given in initial
conditions.

Performance Step : Critical___ Not Critical X

[2.2] SJAES are in operation. REFER TO Section 5.9.

Standard:

None

SAT___ UNSAT___ N/A X COMMENTS: Given in initial
conditions.

Performance Step : Critical___ Not Critical X

8.4.[3] At Panel 3-9-6, VERIFY OPEN the following valves:

A. SJAE 3B(3A) CNDS INLET VALVE, using 3-HS-2-31A(36A).

B. SJAE 3B(3A) CNDS OUTLET VALVE, using 3-HS-2-35A(41A).

Standard:

At Panel 3-9-6, **VERIFIED** illuminated RED valve position indicating lamps above 3-HS-2-31A and 3-HS-2-35A.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical___ Not Critical X

8.4.[4] At Panel 25-105, **CHECK** CONDENSATE FROM SJAE B(A) pressure, 3-PI-2-34(40), is greater than 60 psig.

Standard:

DISPATCHED/CALLED Turbine Building AUO to determine reading from 3-PI-2-34, CONDENSATE FROM SJAE B, Panel 25-105.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: [WHEN DISPATCHED/CALLED] 3-PI-2-34, CONDENSATE FROM SJAE B, INDICATES 90 PSIG.

Performance Step : Critical___ Not Critical X

8.4.[5] At Panel 25-105, **VERIFY** manual/hand loader output pressure and pressure controller setpoints are adjusted as follows:

- A. Setpoint for STEAM TO SJAE B(A) STAGE I & II, 3-PC-001-152(150) set for approximately 225 psig (dial located inside controller housing).
- B. Manual/Hand loader for STEAM TO SJAE B(A) STAGE I & II, 3-PC-001-152(150) set for approximately 8 psig.
- C. Setpoint for STEAM TO SJAE B(A) STAGE III, 3-PC-001-167(166) set for approximately 225 psig (dial located inside controller housing).
- D. Manual/hand loader for STEAM TO SJAE B(A) STAGE III, 3-PC-001-167(166), set for approximately 8 psig.

CUE: [WHEN DISPATCHED/CALLED], THE SETPOINT FOR STEAM TO SJAE B STAGES I AND II, 3-PC-001-152 IS SET FOR 225 PSIG. (INSIDE CONTROLLER HOUSING).

MANUAL HAND LOADER FOR SJAE B STAGE I AND II 3PC-001-152 IS SET AT 8 PSIG.

SETPOINT FOR STEAM TO SJAE B, STAGE III, 3-PC-001-167 IS SET FOR 225 PSIG. (INSIDE CONTROLLER HOUSING)

MANUAL HAND LOADER FOR STEAM TO SJAE B, STAGE III, 3-PC-001-167 IS SET FOR 8 PSIG.

Standard:

DISPATCH US/AUO to perform/verify steps 8.4.[5].A through 8.4.[5].D

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical____Not Critical_ X

8.4.[6] At Panel 25-105, **VERIFY** both SJAE dilution steam pressure modifiers are adjusted to approximately mid-position (located at the rear of panel).

A. SJAE B(A) STG I & II PRESSURE, 3-XM-001-152(150).

B. SJAE B(A) STAGE III PRESSURE, 3-XM-001-167(166).

CUE: [WHEN DISPATCHED/CALLED], BOTH SJAE DILUTION STEAM PRESSURE MODIFIERS ARE ADJUSTED TO MID-POSITION.

Standard:

DISPATCHED US to verify both SJAE dilution steam pressure modifiers are in mid-position.

SAT____UNSAT____N/A____ COMMENTS:_____

Performance Step : Critical____Not Critical_ X

8.4.[7] At Panel 3-9-8, **VERIFY OPEN** both SJAE Inlet Valves using the following:

A. SJAE 3A INLET VALVE, 3-HS-66-11.

B. SJAE 3B INLET VALVE, 3-HS-66-15.

Standard:

VERIFIED/PLACED 3-HS-66-11 and 15 in the OPEN position.

SAT____UNSAT____N/A____ COMMENTS:_____

Performance Step : Critical X Not Critical _____

8.4.[8] At Panel 3-9-7, **PLACE** 3-HS-1-155A(156A), STEAM TO SJAE
3A(3B), in CLOSE.

Standard:

VERIFIED/PLACED 3-HS-1-155A in CLOSED position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical X Not Critical _____

8.4.[9] At Panel 3-9-7, **PLACE** 3-HS-1-150(152), SJAE 3A(3B)
PRESS CONTROLLER, in CLOSE.

Standard:

VERIFIED/PLACED 3-HS-1-150 in CLOSED position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical X Not Critical _____

8.4.[10] At Panel 3-9-8, **PLACE** 3-HS-66-14(18), SJAE 3A(3B) OG
OUTLET VALVE in CLOSE.

Standard:

VERIFIED/PLACED 3-HS-66-14 in CLOSED position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical X Not Critical _____

8.4. [11] At Panel 3-9-8, **PLACE** 3-HS-66-18(14), SJAE 3B(3A) OG
OUTLET VALVE in OPEN/AUTO.

Standard:

VERIFIED/PLACED 3-HS-66-18 in the OPEN/AUTO position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical X Not Critical _____

8.4. [12] At Panel 3-9-7, **PLACE** 3-HS-1-156A(155A), STEAM TO SJAE
3B(3A), in OPEN.

Standard:

PLACED 3-HS-1-156A in OPEN position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

```

*****
Performance Step :           Critical X   Not Critical

```

8.4. [13] At Panel 3-9-7, **PLACE** 3-HS-1-152(150), STEAM TO SJAE 3B(3A) PRESS CONTROLLER, in OPEN.

Standard:

PLACED 3-HS-1-152 in the OPEN position AND RECOGNIZED THAT
SJAEB DID NOT GO INTO SERVICE-NOTIFIED US.

SAT	UNSAT	N/A	COMMENTS:

CUE: When failure of 3B SJAE recognized, STATE as UNIT SUPERVISOR
"Place 3A SJAE back in service.....continue at step 8.4.1".

```

*****
Performance Step :          Critical    Not Critical X

```

8.4.[1] REVIEW all Precaution and Limitations in Section 3.0.

Standard:

Precautions and Limitations have already been reviewed.

SAT	UNSAT	N/A	COMMENTS:

Performance Step : Critical___ Not Critical X

8.4.[2] VERIFY the following initial conditions have been met:

[2.1] IF HWC System is in service, **THEN** Otherwise NA)
SHUTDOWN HWC System. REFER TO 3-OI-4.

Standard:

None

SAT___ UNSAT___ N/A X COMMENTS: Given in initial
conditions.

Performance Step : Critical___ Not Critical X

8.4.[3] At Panel 3-9-6, VERIFY OPEN the following valves:

A. SJAE 3B(3A) CNDS INLET VALVE, using 3-HS-2-31A(36A).

B. SJAE 3B(3A) CNDS OUTLET VALVE, using 3-HS-2-35A(41A).

Standard:

At Panel 3-9-6, **VERIFIED** illuminated RED valve position indicating lamps above 3-HS-2-36A and 3-HS-2-41A.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step : Critical___ Not Critical X

8.4.[4] At Panel 25-105, **CHECK** CONDENSATE FROM SJAE B(A)
pressure, 3-PI-2-34(40), is greater than 60 psig.

Standard:

DISPATCHED/CALLED Turbine Building AUO to determine reading
from 3-PI-2-40, CONDENSATE FROM SJAE A, Panel 25-105.

SAT___ UNSAT___ N/A___ COMMENTS: _____

**CUE: [WHEN CALLED] 3-PI-2-40, CONDENSATE FROM SJAE A
INDICATES 90 PSIG.**

Performance Step : Critical___ Not Critical X

8.4.[5] At Panel 25-105, **VERIFY** manual/hand loader output pressure and pressure controller setpoints are adjusted as follows:

- A. Setpoint for STEAM TO SJAE B(A) STAGE I & II, 3-PC-1-152(150) set for approximately 225 psig (dial located inside controller housing).
- B. Manual/Hand loader for STEAM TO SJAE B(A) STAGE I & II, 3-PC-1-152(150) set for approximately 8 psig.
- C. Setpoint for STEAM TO SJAE B(A) STAGE III, 3-PC-1-167(166) set for approximately 225 psig (dial located inside controller housing).
- D. Manual/hand loader for STEAM TO SJAE B(A) STAGE III, 3-PC-1-167(166), set for approximately 8 psig.

CUE: [WHEN DISPATCHED/CALLED], THE SETPOINT FOR STEAM TO SJAE B STAGES I AND II, 3-PC-1-150 IS SET FOR 225 PSIG. (INSIDE CONTROLLER HOUSING) .

MANUAL HAND LOADER FOR SJAE B STAGE I AND II 3-PC-1-150 IS SET AT 8 PSIG.

SETPOINT FOR STEAM TO SJAE B, STAGE III, 3-PC-1-166 IS SET FOR 225 PSIG. (INSIDE CONTROLLER HOUSING)

MANUAL HAND LOADER FOR STEAM TO SJAE B, STAGE III, 3-PC-1-166 IS SET FOR 8 PSIG.

Standard:

DISPATCH US/AUO to perform/verify steps 8.4.5.1 through 8.4.[5]

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical____Not Critical_X

8.4.[6] At Panel 25-105, **VERIFY** both SJAE dilution steam pressure modifiers are adjusted to approximately mid-position (located at the rear of panel).

A. SJAE B(A) STG I & II PRESSURE, 3-XM-1-152(150).

B. SJAE B(A) STAGE III PRESSURE, 3-XM-1-167(166).

CUE: [WHEN DISPATCHED/CALLED], BOTH SJAE DILUTION STEAM PRESSURE MODIFIERS ARE ADJUSTED TO MID-POSITION.

Standard:

DISPATCHED US to verify both SJAE dilution steam pressure modifiers are in mid-position.

SAT____UNSAT____N/A____ COMMENTS:_____

Performance Step : Critical____Not Critical_X

8.4.[7] At Panel 3-9-8, **VERIFY OPEN** both SJAE Inlet Valves using the following:

A. SJAE 3A INLET VALVE, 3-HS-66-11.

B. SJAE 3B INLET VALVE, 3-HS-66-15.

Standard:

VERIFIED/PLACED 3-HS-66-11 and 15 in the OPEN position.

SAT____UNSAT____N/A____ COMMENTS:_____

Performance Step : Critical X Not Critical _____

8.4.[8] At Panel 3-9-7, **PLACE** 3-HS-1-155A(156A), STEAM TO SJAE 3A(3B), in CLOSE.

Standard:

VERIFIED/PLACED 3-HS-1-156A in CLOSED position.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical _____ Not Critical X

8.4.[9] At Panel 3-9-7, **PLACE** 3-HS-1-150(152), SJAE 3A(3B) PRESS CONTROLLER, in CLOSE.

Standard:

PLACED 3-HS-1-152 to CLOSE.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical _____ Not Critical X

8.4.[10] At Panel 3-9-8, **PLACE** 3-HS-66-14(18), SJAE 3A(3B) OG OUTLET VALVE in CLOSE.

Standard:

PLACED 3-HS-66-18 to CLOSE.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step : Critical____Not Critical_ X

8.4. [11] At Panel 3-9-8, **PLACE** 3-HS-66-18(14), SJAE 3B(3A) OG
OUTLET VALVE in OPEN/AUTO.

Standard:

PLACED 3-HS-66-14 to OPEN/AUTO position.

SAT____UNSAT____N/A____ COMMENTS:_____

Performance Step : Critical X Not Critical____

8.4. [12] At Panel 3-9-7, **PLACE** 3-HS-1-156A(155A), STEAM TO SJAE
3B(3A), in OPEN.

Standard:

PLACED 3-HS-1-155A in OPEN.

SAT____UNSAT____N/A____ COMMENTS:_____

Performance Step : Critical X Not Critical _____

8.4. [13] At Panel 3-9-7, **PLACE** 3-HS-1-152(150), STEAM TO SJAE
3B(3A) PRESS CONTROLLER, in OPEN.

Standard:

PLACED 3-HS-1-150 in OPEN.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

NOTE

It may be necessary to return 3-HS-1-152(150) to the CLOSE position, then back to OPEN in order to open the SJAE steam supply valves. This action resets the logic sequence.

Performance Step : Critical_____Not Critical X

8.4.[14] On Panel 25-105, ADJUST manual/hand loaders until
 dilution steam pressure is indicating
 approximately 190 to 220 psig on the following
 indications:

- A. STEAM TO SJAE B(A) STAGE I & II, 3-PI-1-
 152(150).

- B. STEAM TO SJAE B(A) STAGE III, 3-PI-1-
 167(166).

**CUE: [WHEN DISPATCHED/CALLED], INFORM OPERATOR THAT LOCAL STEPS
8.4.14 THROUGH 8.4.19 HAVE BEEN COMPLETE.**

Standard:

DISPATCHED Operator to perform steps 8.4.14 through 8.4.19
locally.

SAT_____UNSAT_____N/A_____ COMMENTS:_____

Performance Step : Critical___ Not Critical X

8.4. [20] **MONITOR** hotwell pressure as indicated on HOTWELL TEMP
AND PRESS recorder, 3-XR-2-2, Panel 3-9-6.

Standard:

VERIFIED stable hotwell pressure and temperature indications
on 3-XR-2-2.

SAT___ UNSAT___ N/A___ COMMENTS: _____

CUE: This JPM is complete, THAT WILL BE ALL FOR NOW.

Performance Step: Critical____ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT____ UNSAT____ N/A____ COMMENTS:_____

Performance Step: Critical____ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT____ UNSAT____ N/A____ COMMENTS_____

END OF TASK

STOP TIME: _____

C

C

C



Browns Ferry Nuclear Plant

Unit 3

Operating Instruction

3-OI-66

Off-Gas System

Revision 0050

Quality Related

Level of Use: Continuous Use

Effective Date: 06-13-2006

Responsible Organization: OPS, Operations

Prepared By: William M. Fuller

Approved By: Jeff Kimberlin

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Current Revision Description

Pages / Steps Affected: See Below

Type of Change: ENHANCEMENT: PCR 06001084

Tracking Number: 056

Step 8.4[14] - Corrected the location fo the operation of the Manual Hand loaders from Panel 3-9-7 to local Panel 25-105.

This revision DOES NOT affect System Status

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- Attachment 3: Off-Gas System Electrical Lineup Checklist
- Attachment 4: Off-Gas System Instrument Inspection Lineup Checklist.
- Attachment 5: Off-Gas System Monthly Seal Air Flow Checklist.

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3.0 PRECAUTIONS AND LIMITATIONS

- A. [NER/C] Chemical contamination of the Off-Gas Building floor drains with glycol is to be avoided since the substance can pass through the Radwaste System process and eventually be injected to the reactor via the Condensate System.
[INPO SER 82-013]
- B. The recombiner is required to be warmed to greater than 240°F and purged with dry air prior to admitting process gas. Recombiner is **NOT** to be operated with inlet temperature less than 240°F.
- C. Reference to Technical Specifications, Technical Requirements Manual and the ODCM is required if the Off-Gas Post-Treatment Radiation Monitor, Off-Gas Hydrogen Analyzer, or Mechanical Vacuum Pump is made or found to be inoperable.
- D. Seal air to Off-Gas System valves is required to be maintained to prevent off-gas leakage through valve packing.
- E. Glycol coolant refrigeration machine crankcase heaters should be on at least 2 hours before starting glycol unit.
- F. The following stack dilution fan operational requirements should be observed:
 1. One Unit 3 Stack Dilution Fan is required to remain in operation to provide dilution air flow when Unit 3 Off Gas System is required for unit operation. This requirement provides dilution flow to any potential hydrogen concentration in Off Gas flow.
 2. The required flow for stack gas 0-FI-90-271 is 16,366 SCFM. To preclude receiving erroneous alarms, optimum flow is 18,500. Either one or both Stack Gas Dilution Fans may be placed in service to satisfy these requirements. This could require 4 Stack Dilution fans (total for the plant) to be placed in service. This requirement provides minimum main stack flow for clear and accurate isokinetic radioactive release rate sampling and monitoring. Any two Stack Dilution Fans from separate Units and one Filter Cubicle Exhaust Fan as a minimum in service could meet this flow rate.
 3. When all SBTG Trains are secured and any evolution has the potential to discharge radioactive effluents through the main stack, one Unit 2 and one Unit 3 Stack Dilution Fan should remain in operation. This requirement provides clean air flow through the dilution cross-tie to SBTG ducts. This prevents the potential back flow of radioactive effluents through the SBTG duct work.

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

4. [III/C] When notified by RADCON of confirmed airborne radioactivity in the SBGT building, maximum blocking flow can be obtained by removing Unit 1 dilution fan from service and placing 2A, 2B, 3A, and 3B dilution fans in parallel service. [BFPER 980030]
- G. Following startup, while still at low power, recombiner performance and hydrogen concentration should be closely monitored.
- H. Off-Gas System valves are potentially spark-producing when operated; therefore, when hydrogen concentration is suspected of being greater than 4%, **NO** action is allowed to be taken that will change off-gas valve positions until after the unit is shut down except for the SJAE's, which may be started following an isolation, and alternated if required with greater than 4% hydrogen. SJAE's have non-sparking valve seats, and hydrogen flammability lower limit is **NOT** a concern in a saturated steam environment.
- I. The mechanical vacuum pump is **NOT** be used to purge the main condenser if hydrogen concentration is suspected of being present.
- J. The mechanical vacuum pumps is **NOT** be used when reactor power is greater than 5% unless being electrically rotated for Preventive Maintenance.

The mechanical vacuum pump(s) may be electrically rotated for Preventive Maintenance if the suction valve(s) are closed and the seal water in service to prevent seizing. This requires the automatic trip to be defeated by a step text Work Order. [BFPER 00-003819-000] [BFPER 02-014849-000]
- K. Charcoal bed alignment during power operation is **NOT** to be changed. Any major change in off-gas flow will disturb bed equilibrium and result in a temporary (8 to 12 days) rise in stack discharge activity.
- L. Charcoal bed prefilter and afterfilter differential pressure is **NOT** to exceed 10" H₂O. Switching to standby filters is recommended when filter differential pressure reaches 8" H₂O.

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- M. The mechanical vacuum pumps will auto trip under any of the following conditions:
 - 1. Hotwell pressure is equal to or below -26" HG, or
 - 2. Hotwell pressure is equal to or below -22" HG, with reactor pressure greater than or equal to 600 psig (vacuum pumps suction valves also auto close), or
 - 3. Main Steam Line radiation is greater than or equal to 3 times normal background at full load (vacuum pumps suction valves also close), or
 - 4. Seal water pump trips, or
 - 5. Undervoltage.
- N. During SJAЕ operation, steam supply pressure is to be maintained between 190 and 225 psig. Insufficient steam pressure will result in improper dilution of hydrogen. Excessive steam pressure causes water droplet carryover which reduces recombiner efficiency.
- O. During power operation above 25% power, the discharge of the SJAЕs is to be routed through the charcoal adsorber.
- P. Mechanical vacuum pumps will **NOT** start unless a seal water pump is running and hotwell pressure is above -26" Hg.
- Q. Off-Gas System auto isolation (closure of 3-FCV-066-0028) will occur on any combination of HI-HI-HI, downscale, or inoperable trip simultaneously in both trip channels of the post-treatment Radiation Monitoring System after a five second time delay.
- R. Dehumidifier drain 66-19, and Holdup volume drain 66-23 will auto close on high pressure in the Holdup Volume (10 psig).
- S. After auto isolation, 3-HS-90-155 is to be placed to RESET and then AUTO to place system back in service when initiating conditions clear.
- T. During operations with valid CONDENSER A, B, OR C VACUUM LOW 3-PA-47-125 alarm, and condensate temperature of 136 F or greater at the inlet of the SJAЕ (ICS point 2-28), reduced SJAЕ First Stage performance (stalling) could occur. This condition will cause reduced Off Gas flow and a loss of vacuum/turbine trip.

[BFPER 02-016091-000]

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- U. To place an individual SJAE in service (manually), the following conditions are required:
 - 1. Inlet and outlet condensate valves open and condensate pressure greater than or equal to 60 psig.
 - 2. Main Steam Supply pressure 173 psig and rising (Aux. Steam Supply pressure 165 psig and rising) (30 second time delay). (disabled for the SJAE selected by 3-HS-001-0375)
- V. Individual SJAE shutdown (PCV closure) is caused by:
 - 1. Condensate pressure less than 60 psig or inlet/outlet condensate valve fully closed.
 - 2. Main Steam or Aux Steam pressure 155 psig and lowering.
- W. Air purging of an isolated SJAE is required prior to and during maintenance of the SJAE and associated piping in order to eliminate the buildup of combustible gases.
- X. Pressure switch 3-PS-012-0080A(B) allows operation of the SJAEs on auxiliary boiler steam by opening valves 3-FCV-066-0014(0018) SJAE discharge valve and 3-FCV-001-0150(0152) SJAE intercondenser drain valves when auxiliary steam pressure is 165 psig rising. These valves will close at 155 psig lowering.
- Y. Placing handswitch 3-HS-001-0150(0152) to AUTO or OPEN will:
 - 1. Shut off auxiliary boiler steam to both SJAEs after a 60 second time delay.
 - 2. Close the main steam pressure control valves, 3-PCV-001-0151(0153) and 3-PCV-001-0166(0167) if at least 173 psig main steam supply pressure is **NOT** achieved within 30 seconds. (disabled for the SJAE selected by 3-HS-001-0375)
- Z. Once the SJAE is placed in service on main steam and the bypass switch is **NOT** selected for the operating SJAE, if steam supply pressure to the SJAE falls below 155 psig for 5 seconds to either the 1st, 2nd, or 3rd stage, the following valves will close:
 - 3-FCV-066-0014(0018), SJAE 3A(3B) OUTLET
 - 3-FCV-001-0150(0152), SJAE A(B) INTERCONDENSER DRAIN
 - 3-PCV-001-0166(0167), STEAM TO SJAE A(B) STAGE III
 - 3-PCV-001-0151(0153), STEAM TO SJAE A(B) STAGE I & II

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- AA. Just prior to establishing condenser vacuum, the CON DEMIN TO FL DR, 3-DRV-043-1020 and the HOTWELL SAMPLE TO FL DR, 3-DRV-043-1019 should be closed to prevent loss of vacuum.
- BB. [NER/C] Low point drains are required to be maintained in the open position during startup to reduce the likelihood of recombiner quenching. [GE SIL 497]
- CC. [NER/C] At least one of the hydrogen monitors is required to be placed in the manual mode during any Off-Gas System transient to ensure continuous availability of monitoring. [GE SIL 497]
- DD. A hydrogen analyzer is to be declared inoperable if no flow can be established.
- EE. Lowering recombiner temperature is a direct indication of moisture carryover. Therefore, recombiner temperature should be monitored during SJAE transfers.
- FF. Chemistry notification is required when any system changes are made that could affect the chilled water system volume (additions to or draining from, crossties between units, etc.).
- GG. [SEOPR] RCW may be isolated to the Off Gas Precooler for a maximum of 8 hours. During this time, SJAE suction pressures is to be closely monitored for the first 15 minutes that the RCW is isolated.

If either SJAE suction pressure changes by greater than 1" hg, then RCW flow is to be restored to the Precooler. [96-02-066-004]
- HH. (II/C) During routine plant evolutions, notify RADCON prior to making changes in the Off-Gas System which could cause a rise in area radiation levels

Confirmation that RADCON has implemented appropriate radiological controls/barriers for the expected Off-Gas System alignment is to be obtained prior to performing the alignment. (BFPER961778)
- II. The presence of any available oxygen in the effluent of the Off-gas recombiners indicates that sufficient oxygen is present for complete recombination of the hydrogen entering the recombiner.

The Hydrogen Water Chemistry System should be adjusted to maintain oxygen at the effluent of the recombiner at 21%, complete recombination of all hydrogen entering the recombiner does **NOT** require 21% oxygen to be present.

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- JJ. Securing Hydrogen injection to the Condensate System could result in a small net RISE or FALL in the amount of hydrogen leaving the reactor, depending upon the initial hydrogen injection rate.

Performing an immediate shutdown of the Hydrogen Water Chemistry (HWC) System in response to a High Off-gas hydrogen concentration is **NOT** recommended unless a failure in the HWC System is found.

- KK. The net amount of hydrogen leaving the reactor when operating at certain hydrogen injection rates (without Noble Metal Coating Injection) in the Hydrogen Water Chemistry System could be less than the hydrogen released by the radiolysis reaction when **NOT** using HWC.

A drop in recombiner temperatures could occur when the HWC system is in service at an injection rate just sufficient to minimize the radiolysis. Raising hydrogen injection rates to values above the rate which yields minimum radiolysis would cause recombiner temperatures to rise again due to additional hydrogen recombination.

- LL. Isolation of the Steam Jet Air Ejectors (both 3-FCV-66-14 and 66-18 closed), will result in the HWC System, if in service, having an automatic trip which immediately isolates both Hydrogen and Oxygen injection. This situation will result in rising Hydrogen concentration in the Offgas System due to very little recombination taking place. The duration of this transient will depend on the injection rate and when the SJAE is placed back in service. The duration of this transient should be less than 15 minutes from the time Offgas flow is re-established through the SJAE.

- MM. An automatic shutdown of the HWC system occurs if the Off-gas oxygen concentration either exceeds 40% or falls below 5% oxygen.

- NN. No automatic shutdown of the HWC system occurs as a result of high hydrogen levels in the Off-gas system.

- OO. The HWC system should be shut down prior to intentional swapping of SJAEs to prevent receipt of the automatic shutdown of the HWC system that will occur when both SJAE DISCHARGE VALVES 3-FCV-66-14 and 18 are closed.

- PP. The off-gas H₂/O₂ analyzers perform an auto calibration check every 12 hours. A WO should be initiated if the analyzer fails to perform this auto calibration check.

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

QQ. DCN 50884A \modified the SJAE control circuits to remove the steam block valve position interlocks between the inservice SJAE PCVs(PCV-1-151,153,166,167) and the standby SJAE steam block valves (FCV-1-155,156,172,173).

This DCN also installed a switch which bypasses the steam pressure requirement (>170psig) for the SJAE, it is normally selected to bypass the SJAE in standby.

RR. Due to being electrically interlocked, if the breaker for one Steam Packing Exhauster is racked out, then the other SPE will **NOT** run.

SS. Due to being electrically interlocked, if the breaker for one Recombiner Room Cooling Coil is racked out, then the other Recombiner Room Cooling Coil will **NOT** run.

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8.4 Placing Standby SJAE in Operation

NOTES

- 1) Panel 25-105 located in Unit 3 Turbine Bldg. El 586' T12-C.
- 2) The HWC system is shut down prior to intentional swapping of SJAEs to prevent receipt of the automatic trip of the HWC system that will occur when both SJAE DISCHARGE VALVES 3-FCV-66-14 and 18 are closed.

- [1] **REVIEW** all Precautions and Limitations in Section 3.0. ☐
- [2] **VERIFY** the following initial conditions have been met:
 - A. **IF** HWC System is in service, **THEN**
SHUT DOWN HWC System. **REFER TO**
 3-OI-4.(otherwise N/A) ☐
 - B. SJAEs are in operation. **REFER TO** Section 5.9. ☐
- [3] **VERIFY OPEN** the following valves at Panel 3-9-6, :
 - A. SJAE 3B(3A) CNDS INLET VALVE, using
 3-HS-2-31A(36A) ☐
 - B. SJAE 3B(3A) CNDS OUTLET VALVE, using
 3-HS-2-35A(41A) ☐
- [4] **VERIFY** CONDENSATE FROM SJAE B(A) pressure,
 3-PI-2-34(40), is greater than 60 psig at Panel 25-105, . ☐

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8.4 Placing Standby SJAE in Operation (continued)

- [5] **VERIFY** manual/hand loader output pressure and pressure controller setpoints at panel 25-105, are adjusted as follows:
 - A. Setpoint for STEAM TO SJAE B(A) STAGE I & II, 3-PC-001-0152(0150) set for approximately 225 psig (dial located inside controller housing). ☐
 - B. Manual/Hand loader for STEAM TO SJAE B(A) STAGE I & II, 3-PC-001-0152(0150) set for approximately 8 psig. ☐
 - C. Setpoint for STEAM TO SJAE B(A) STAGE III, 3-PC-001-0167(0166) set for approximately 225 psig (dial located inside controller housing). ☐
 - D. Manual/hand loader for STEAM TO SJAE B(A) STAGE III, 3-PC-001-0167(0166), set for approximately 8 psig. ☐
- [6] **VERIFY** both SJAE dilution steam pressure modifiers (located at the rear of panel 25-105).are adjusted to approximately mid-position
 - A. MS SJAE B(A) PRESS MODIFIER, 3-XM-001-0152(0150) ☐
 - B. MS SJAE B(A) PRESS MODIFIER, 3-XM-001-0167(0166) ☐
- [7] **VERIFY OPEN** both SJAE Inlet Valves at panel 3-9-8, using the following:
 - A. SJAE 3A INLET VALVE, 3-HS-66-11 ☐
 - B. SJAE 3B INLET VALVE, 3-HS-66-15 ☐
- [8] **PLACE** the STEAM TO SJAE 3A(3B) handswitch, 3-HS-1-155A(156A), in CLOSE at panel 3-9-7. ☐
- [9] **PLACE** the SJAE 3A(3B) PRESS CONTROLLER handswitch, 3-HS-1-150(152), in CLOSE at panel 3-9-7. ☐
- [10] At Panel 3-9-8, **PLACE** the SJAE 3A(3B) OG OUTLET VALVE using 3-HS-66-14(18) in CLOSE. ☐
- [11] **PLACE** in OPEN/AUTO the SJAE 3B(3A) OG OUTLET VALVE using, 3-HS-66-18(14) at panel 3-9-8. ☐
- [12] **PLACE** the STEAM TO SJAE 3B(3A) handswitch, 3-HS-1-156A(155A), in OPEN at panel 3-9-7. ☐

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8.4 Placing Standby SJAE in Operation (continued)

- [13] **PLACE** the STEAM TO SJAE 3B(3A)PRESS CONTROLLER handswitch, 3-HS-1-152(150), in OPEN at Panel 3-9-7. . ☐

NOTE

It may be necessary to return 3-HS-1-152(150) to CLOSE position, then back to OPEN in order to open the SJAE steam supply valves. This will reset the logic sequence.

- [14] **ADJUST** manual/hand loaders at Panel 25-105, until dilution steam pressure is indicating approximately 190 to 220 psig on the following indications:
- A. STEAM TO SJAE B(A) STAGE I & II, 3-PI-001-0152(0150) ☐
 - B. STEAM TO SJAE B(A) STAGE III, 3-PI-001-0167(0166) ☐

NOTE

It is possible in the next step to fully close the modifiers, while trying to obtain stable steam pressure. A swing of 2-3 psig is considered stable. If this occurs the indicated pressure will slowly drop to zero. Adjusting the pressure to the point where there is a swing of 2-3 psig, will indicate the modifier is **NOT** closed.

- [15] **ADJUST** the SJAE dilution steam pressure modifiers (located at the rear of panel 25-105):as necessary to obtain stable steam pressure indication on the following instruments.
- A. SJAE B(A) PRESS MODIFIER, 3-XM-1-152(150) ☐
 - B. SJAE B(A) PRESS MODIFIER, 3-XM-1-167(166) ☐

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8.4 Placing Standby SJAE in Operation (continued)

- [16] **TRANSFER** SJAE STAGE I and II pressure control from the manual/hand loader to the pressure controller at Panel 25-105, by performing the following:
- [16.1] **ADJUST** setpoint for STEAM TO SJAE B(A) STAGE I & II, 3-PC-001-0152(0150) set for approximately 200 psig (dial located inside controller housing). ☐
 - [16.2] **SLOWLY RAISE** manual/hand loader for STEAM TO SJAE B(A) STAGE I & II, 3-PC-001-0152(0150) setting to approximately 12 psig. ☐
 - [16.3] **VERIFY** stable SJAE dilution steam pressure is maintained on STEAM TO SJAE B(A) STAGE I & II, 3-PI-001-0152(0150). ☐
- [17] **TRANSFER** SJAE STAGE III pressure control from the manual/hand loader to the pressure controller at panel 25-105, by performing the following:
- [17.1] **ADJUST** setpoint for STEAM TO SJAE B(A) STAGE III, 3-PC-001-0167(0166) set for approximately 200 psig (dial located inside controller housing). ☐
 - [17.2] **SLOWLY RAISE** manual/hand loader for STEAM TO SJAE B(A) STAGE III, 3-PC-001-0167(0166) setting to approximately 10 PSIG. ☐
 - [17.3] **VERIFY** stable SJAE dilution steam pressure is maintained on STEAM TO SJAE B(A) STAGE III, 3-PI-001-0167(0166). ☐
- [18] **VERIFY** both SJAE dilution steam pressure modifiers for the SJAE removed from service are adjusted to approximately mid-position.(modifiers are located at the rear of Panel 25-105)
- A. MS SJAE A(B) PRESS MODIFIER, 3-XM-001-0150(0152) ☐
 - B. MS SJAE A(B) PRESS MODIFIER, 3-XM-001-0166(0167) ☐

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8.4 Placing Standby SJAE in Operation (continued)

- [19] **VERIFY** SJAE TRAIN PERMISSIVE 3-HS-001-0375 in the position for the SJAE selected for Standby operation SJAE A(SJAE B). ☐
- [20] **MONITOR** hotwell pressure as indicated on HOTWELL TEMP AND PRESS recorder, 3-XR-2-2 at Panel 3-9-6. . ☐
- [21] **WHEN** stable SJAE operation has been confirmed, **THEN**

The HWC System may be placed back in service at the direction of the Unit Supervisor. **REFER TO** 3-OI-4, HWC System (N/A if HWC System is unavailable). ☐

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 3126F

TITLE: RESPOND TO DRYWELL PRESSURE AND/OR
TEMPERATURE HIGH OR EXCESSIVE LEAKAGE INTO
DRYWELL

TASK NUMBER: U-064-AB-01

SUBMITTED BY:



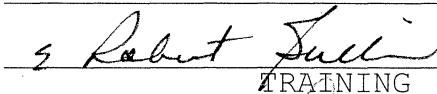
DATE:

1/3/08

VALIDATED BY:

DATE:

APPROVED:


TRAINING

DATE:

1/4/08

PLANT CONCURRENCE:


OPERATIONS

DATE:

1/4/08

* Examination JPMs Require Operations Training Manager or Designee Approval and
Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	1/4/2008	ALL	NEW JPM

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 126F

TASK NUMBER: U-064-AB-01

TASK TITLE: RESPOND TO DRYWELL PRESSURE AND/OR TEMPERATURE
HIGH OR EXCESSIVE LEAKAGE INTO DRYWELL

K/A NUMBER: 223001A4.07 K/A RATING: RO 4.2 SRO: 4.1

TASK STANDARD: PERFORM SUBSEQUENT OPERATOR ACTION REQUIRED TO
REDUCE DRYWELL PRESSURE AS DIRECTED BY 2-AOI-64-1

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 3-AOI-64-1, REV 0003

VALIDATION TIME: CONTROL ROOM: 7:00 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 Operator. Unit 3 is experiencing rising drywell pressure

INITIATING CUES: Respond to rising drywell pressure in accordance with 3-AOI-64-1.

START TIME _____

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required
Abnormal Operating Instruction.

Standard:

IDENTIFIED OR OBTAINED copy of 3-AOI-64-1.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

4.2 Subsequent Actions

4.2.1 EOI Entry Conditions

- [1] **If** any EOI entry condition is met, THEN
ENTER appropriate EOI(s). (Otherwise N/A)

4.2.2 Drywell Pressure is High

- [1] **CHECK** Drywell pressure using multiple indications.
- [2] **ALIGN and START** additional Drywell coolers and
fans as necessary. **REFER TO** 3-OI-64.

Standard:

Determine no EOI Entry condition is met and verifies all DW
coolers are in service.

SAT___ UNSAT___ N/A___ COMMENTS: _____

CAUTION

Stack release rates exceeding 1.4×10^7 $\mu\text{Ci}/\text{sec}$, or a SI-4.8.B.1.a.1 release fraction above one will result in ODCM release limits being exceeded.

Performance Step :	Critical	X	Not Critical
1. Identify the problem			
2. Gather information			
3. Analyze the information			
4. Develop a plan			
5. Implement the plan			
6. Evaluate the results			

[3] **VENT** Drywell as follows:

[3.1] **CLOSE** SUPPR CHBR INBD ISOLATION VLV 3-FCV-64-
 34 (Panel 3-9-3)

Standard:

PLACED 3-FCV-64-34 in the CLOSE position (Critical) and **VERIFIED** illuminated GREEN valve position indicating lamp above associated hand switch (Not Critical).

SAT	UNSAT	N/A	COMMENTS:

Performance Step :	Critical	Not Critical	X
1. The system is installed and configured correctly.			
2. The system is tested and found to be working correctly.			
3. The system is deployed to the production environment.			
4. The system is monitored for any issues.			
5. The system is updated with the latest patches.			
6. The system is backed up regularly.			
7. The system is documented.			
8. The system is supported by the IT team.			
9. The system is reviewed for any improvements.			
10. The system is retired when it is no longer needed.			

[3.2] **VERIFY OPEN**, DRYWELL INBD ISOLATION VLV,
3-FCV-64-31, (Panel 3-9-3).

Standard:

VERIFIED illuminated RED valve position indicating lamps above associated hand switch.

SAT	UNSAT	N/A	COMMENTS:

Performance Step : Critical___ Not Critical X

[3.3] **VERIFY** 3-FIC-84-20 is in AUTO and SET at
100 scfm (Panel 3-9-55).

Standard:

VERIFIED 3-FIC-84-20 in AUTO and set for 100 scfm.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical X Not Critical___

[3.4] **VERIFY RUNNING**, required Standby Gas Treatment
Fan(s) STGTS TRAIN(s) A, B, C (Panel 3-9-25.)

[3.5] **If** required, **then**

REQUEST Unit 1 Operator to START Standby Gas
Treatment Fan(s) SGTS Train A, B.
(Otherwise **N/A**)

Standard:

Requests Unit 1 Operator to start A or B SGT.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CAUTION

If 3-FCV-84-20 closes after 3-HS-64-35 is opened, the reason for
valve closure must be cleared and 3-HS-64-35 must be returned to
OPEN in order for 3-FCV-84-20 to re-open.

Performance Step: Critical___ Not Critical_X___

[3.6] If required, Then

RECORD venting data in 3-SI-4.7.A.2.a
(Otherwise **N/A**)

CUE: 3-SI-4.7.A.2.a is being performed by another operator.

Standard:

None.

SAT___ UNSAT___ N/A___ COMMENTS:___

Performance Step : Critical_X Not Critical___

[3.7] **PLACE** 3-FCV-84-20 CONTROL DW/SUPPR CHBR VENT,
3-HS-64-35, in OPEN (Panel 3-9-3).

Standard:

PLACED 3-HS-64-35 in the OPEN position.

SAT___ UNSAT___ N/A___ COMMENTS:___

Performance Step: Critical___ Not Critical X

[3.8] **MONITOR** stack release rates to prevent
exceeding ODCM limits.

Standard:

CONTACTED Log Person to determine stack release rates.

SAT___ UNSAT___ N/A___ COMMENTS: _____

CUE: [WHEN STEP [3.8] COMPLETED] THAT WILL BE ALL FOR NOW.

Performance Step: Critical___ Not Critical_X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical_X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:_____

END OF TASK

STOP TIME:_____



Browns Ferry Nuclear Plant

Unit 3

Abnormal Operating Instruction

3-AOI-64-1

**Drywell Pressure and/or Temperature High, or Excessive Leakage Into
Drywell**

Revision 0003

Quality Related

Level of Use: Continuous Use

Effective Date: 05-17-2005

Responsible Organization: OPS, Operations

Prepared By: R L Eakin

Approved By: Jeffrey A. Kimberlin

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 2 of 10
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Current Revision Description

Pages Affected:

Type of Change: IC - ENHANCEMENT

Tracking Number: 004

PCRS: 05001191 and 05001234

PERS:

This procedure was converted from Word 95 to Word 2002 (XP) using Rev 2.

Editorial changes were made throughout this procedure to update to the current Operational Procedure format.

Level of use of the procedure was changed to CONTINUOUS USE. [PCR 05001191]

Page 6: Caution above Step :4.2.2[3.6] was made into a more appropriate note.

Page 6: Removed note about place keeping blanks, that no longer applies due to the use of place keeping boxes

Page 7: Caution above Step 4.2.2[3] was made into a more appropriate warning.

Page 8, 9,10:Removed reference to Drywell Television Camera that is no longer used in steps 4.2.2[13], 4.2.3[6] and 4.2.4[5] {PCR 05001234]

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 3 of 10
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1.0 PURPOSE

This instruction provides symptoms, automatic actions and operator actions for a High Drywell Pressure Condition, and/or High Drywell Temperature Condition, or Drywell Excessive Leakage.

2.0 SYMPTOMS

2.1 Common Symptoms for High Drywell Pressure, High Drywell Temperature and Drywell Excessive Leakage

- DRYWELL ATMOSPHERIC TEMP HIGH (3-XA-55-3B, Window 3)
- PRI CONTAINMENT N₂ PRESS HIGH (3-XA-55-3B, Window 10)
- DRYWELL TEMP HIGH (3-XA-55-3B, Window 16)
- DRYWELL PRESS APPROACHING SCRAM (3-XA-55-3B, Window 30)
- DRYWELL LEAK DETECTION RADIATION HIGH (3-XA-55-3D, Window 12)
- RBCCW PUMP SUCT HDR TEMP HIGH (3-XA-55-4C, Window 5)
- DRYWELL FD SUMP PUMP EXCESSIVE OPRN (3-XA-55-4C, Window 11)
- DRYWELL EQPT DR SUMP PUMP EXCESSIVE OPRN (3-XA-5-4C, Window 18)
- DRYWELL PRESSURE ABNORMAL (3-XA-55-5B, Window 31)
- Drywell humidity rising as indicated on DRYWELL ATMOSPHERE DEWPOINT TEMPERATURE, (Panel 3-9-47)

2.2 Symptoms for High Drywell Pressure

- SUPPR CHAMBER WATER LEVEL ABNORMAL (3-XA-55-3B, Window 15)
- Drywell Radiation levels rising, as indicated on DW/SUPPR CHBR RAD DIV I and II, 3-RR-90-272 and 273 (Panel 3-9-54 and 55) and AIR PARTICULATE MONITOR CONSOLE, 3-CONS-90-50A (Panel 3-9-2)
- Excessive Nitrogen usage, as indicated when performing 3-SI-4.7.A.2.a

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 4 of 10
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2.3 Symptoms for High Drywell Temperature

- DRYWELL NORM OPERATING PRESS HIGH (3-XA-55-3B, Window 19)
- Drywell temperature rising, as indicated on DRYWELL TEMPERATURE/PRESSURE, 3-XR-064-050 (Panel 3-9-3)
- Drywell pressure rising, as indicated on DRYWELL TEMPERATURE/PRESSURE, 3-XR-64-50 (Panel 3-9-3)

2.4 Symptoms for Drywell Excessive Leakage

- DRYWELL NORM OPERATING PRESS HIGH (3-XA-55-3B, Window 19)
- DRYWELL FD SUMP LEVEL ABN (3-XA-55-4C, Window 2)
- DRYWELL EQPT DR SUMP LEVEL ABN (3-XA-55-4C, Window 9)
- RBCCW SURGE TANK LEVEL LOW (3-XA-55-4C, Window 13)
- DRYWELL EQPT DR SUMP TEMP HIGH (3-XA-55-4C, Window 16)
- REACTOR WATER LEVEL ABNORMAL (3-XA-55-5A, Window 8)
- RECIRC PUMP A NO. 2 SEAL LEAKAGE HIGH (3-XA-55-4A, Window 18)
- RECIRC PUMP A NO. 1 SEAL LEAKAGE ABN (3-XA-55-4A, Window 25)
- RECIRC PUMP B NO. 2 SEAL LEAKAGE HIGH (3-XA-55-4B, Window 18)
- RECIRC PUMP B NO. 1 SEAL LEAKAGE ABN (3-XA-55-4B, Window 25)

3.0 AUTOMATIC ACTIONS

None

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 5 of 10
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4.0 OPERATOR ACTIONS

NOTE

This procedure covers possible multiple symptoms of a problem within primary containment. Any or all of the symptoms may exist. The SRO will direct actions based on symptoms and experience.

4.1 Immediate Actions

None

4.2 Subsequent Actions

4.2.1 EOI Entry Conditions

[1] IF any EOI entry condition is met, THEN

ENTER appropriate EOI(s). (Otherwise N/A)

☐

4.2.2 Drywell Pressure is High

[1] CHECK Drywell pressure using multiple indications.

☐

[2] ALIGN and START additional Drywell coolers and fans as necessary. REFER TO 3-OI-64.

☐

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 6 of 10
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4.2.2 Drywell Pressure is High (continued)

WARNING

Stack release rates exceeding 1.4×10^7 $\mu\text{ci/sec}$, or a SI-4.8.B.1.a.1 release fraction above one will result in ODCM release limits being exceeded.

- [3] **VENT** Drywell as follows: ☐
- [3.1] **CLOSE** SUPPR CHBR INBD ISOLATION VLV
3-FCV-64-34 (Panel 3-9-3). ☐
- [3.2] **VERIFY OPEN**, DRYWELL INBD ISOLATION VLV,
3-FCV-64-31 (Panel 3-9-3). ☐
- [3.3] **VERIFY** 3-FIC-84-20 is in AUTO and SET at 100 scfm
(Panel 3-9-55). ☐
- [3.4] **VERIFY** Running, required Standby Gas Treatment
Fan(s) SGTS Train(s) A, B, C (Panel 3-9-25). ☐
- [3.5] **IF** required, **THEN**

REQUEST Unit 1 Operator to START Standby Gas
Treatment Fan(s) SGTS Train(s) A, B. (Otherwise **N/A**) ☐

NOTE

If 3-FCV-84-20 closes after placing 3-HS-64-35 to open, the valve's closure signal must be reset and 3-HS-64-35 must be returned to the OPEN position in order for 3-FCV-84-20 to RE-OPEN.

- [3.6] **IF** required, **THEN**

RECORD venting data in 3-SI-4.7.A.2.a (Otherwise **N/A**) ☐
- [3.7] **PLACE** 3-FCV-84-20 CONTROL DW/SUPPR CHBR
VENT, 3-HS-64-35, in OPEN (Panel 3-9-3). ☐

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 7 of 10
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4.2.2 Drywell Pressure is High (continued)

CAUTION

Stack release rates exceeding $1.4 \times 10^7 \mu\text{Ci/sec}$, or a SI-4.8.B.1.a.1 release fraction above one will result in ODCM release limits being exceeded.

- [3.8] **MONITOR** stack release rates to prevent exceeding ODCM limits. ☐
- [3.9] **WHEN** Drywell pressure has been reduced as required,
THEN
STOP SGT Train(s). ☐
- [3.10] **VERIFY** 3-HS-64-35, in AUTO and 3-FCV-84-20
CLOSED (Panel 3-9-3). ☐
- [3.11] **OPEN** SUPPR CHBR INBD ISOLATION VLV
3-FCV-64-34 (Panel 3-9-3). ☐
- [3.12] **VERIFY** Drywell DP compressor operates correctly to
maintain required Drywell to Suppression Chamber DP. ☐
- [3.13] **RECORD** SGTS Train(s) run time in appropriate Control
Room Reactor Narrative Log for transfer to 1-SR-2. ☐
- [4] **CHECK** for proper RBCCW operation. **REFER TO** 3-OI-70. ☐
- [5] **VERIFY CLOSED**, N₂ makeup valves to Drywell and
Suppression Chamber. ☐
- [6] **CHECK** Suppression Chamber pressure. ☐
- [7] **CHECK** Suppression Pool water level. ☐
- [8] **CHECK** Suppression Pool temp for indication of a leaking or
stuck open relief valve. ☐
- [9] **VERIFY CLOSED** the following (locally): ☐
 - STATION AIR TO DRYWELL, 3-FCV-33-10, (Rx Bldg.,
EI 565', above TIP Room) ☐
 - DW DEMIN WTR SPLY VLV, 3-2-1383, (Rx Bldg, EI 565') ☐

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 8 of 10
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4.2.2 Drywell Pressure is High (continued)

- [10] **CHECK** for proper Drywell Control Air System operation.
REFER TO 3-OI-32A. ☐
- [11] **CHECK** DRYWELL ATMOSPHERE DEWPOINT
TEMPERATURE, 3-MR-80-36, for indication of a steam or
water leak in the Drywell (Panel 3-9-47). ☐
- [12] **CALCULATE** Drywell Sump Leakage using the integrator or
manual method at a frequency of once every two hours.
REFER TO 3-SR-2. ☐
- [13] **NOTIFY** Chemistry to sample Drywell atmosphere for
radioactivity. ☐
- [14] **NOTIFY** Radwaste that fluids being discharged from Drywell
may be highly radioactive. ☐
- [15] **IF** Drywell pressure rise rate indicates Reactor Scram at
2.45 psi is imminent, **THEN**

REDUCE Reactor power via Recirc flow to minimize the
impact of a scram from high power. (Otherwise **N/A**) ☐

4.2.3 High Drywell Temperature

- [1] **IF** Reactor is at power **AND** Drywell cooling is lost and can
NOT be immediately restored, **THEN**

PERFORM the following: (Otherwise **N/A**) ☐
- [1.1] **IF** core flow is above 60%, **THEN**

REDUCE core flow to between 50-60%. ☐
- [1.2] **MANUALLY SCRAM** the reactor and **REFER TO**
3-AOI-100-1. ☐
- [1.3] **INITIATE** a 90°F/hr cooldown rate. **REFER TO**
3-AOI-100-1. ☐
- [2] **CHECK** Drywell temperature using multiple indications. ☐
- [3] **ALIGN** and **START** additional Drywell coolers and fans as
necessary. **REFER TO** 3-OI-64. ☐
- [4] **VENT** Drywell. **REFER TO** Section 4.2.2[3]. ☐

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 9 of 10
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4.2.3 High Drywell Temperature (continued)

- [5] **CHECK** RBCCW for proper operation. **REFER TO** 3-OI-70. ☐
- [6] **CALCULATE** Drywell Sump Leakage, using the integrator or manual method, at a frequency of once every two hours. **REFER TO** 3-SR-2. ☐

4.2.4 Excessive Leakage Drywell

- [1] **CALCULATE** Drywell sump leakage using the integrator or the manual method, at a frequency of once every two hours. **REFER TO** 3-SR-2. ☐
- [2] **CHECK** DRYWELL EQPT DRAIN SUMP TEMP, 3-TIS-77-14 (Panel 3-9-4). ☐
- [3] **CHECK** Recirc Pump seal pressures. ☐
- [4] **IF** any of the following conditions exist: ☐
- Unidentified leakage is ≥ 5 gpm, ☐
 - ≥ 2 gpm rise in unidentified leakage within the previous 24 hour period, ☐
 - Total leakage is ≥ 30 gpm averaged over a 24 hour period, **THEN** ☐
- REFER TO** Tech Specs 3.4.4 (Otherwise **N/A**) ☐
- [5] **IF** possible **AND** with Shift Manager concurrence, **THEN** **SHUT DOWN** and **ISOLATE** components to determine source of leak. (Otherwise **N/A**) ☐
- [6] **IF** leakage exceeds Tech Spec limits **AND** can **NOT** be reduced or stopped, **THEN** **COMMENCE** a normal Reactor Shutdown. **REFER TO** 3-GOI-100-12A. (Otherwise **N/A**) ☐

BFN Unit 3	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	3-AOI-64-1 Rev. 0003 Page 10 of 10
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5.0 REFERENCES

5.1 Technical Specification

Section 3.3.6.1, Primary Containment Isolation Instrumentation

Section 3.4.4, RCS Operational Leakage

5.2 Final Safety Analysis Report

Section 5.2, Primary Containment System

5.3 Plant Instructions

3-ARP-9-3, Panel 9-3 Annunciator Response Procedure

3-ARP-9-4, Panel 9-4 Annunciator Response Procedure

3-ARP-9-5, Panel 9-5 Annunciator Response Procedure

3-ARP-9-6, Panel 9-6 Annunciator Response Procedure

3-AOI-70-1, Loss of RBCCW

3-AOI-100-1, Reactor Scram

3-OI-32A, Drywell Control Air System

3-OI-64, Primary Containment System

3-OI-70, Reactor Building Closed Cooling Water System

3-SR-2, Instruments Checks and Observations

3-SI-4.7.A.2.a, Primary Containment Nitrogen Consumption and Leakage

REP Implementing Procedures Document

5.4 Plant Drawings

730E927 Series, Primary Containment Isolation System

6.0 ILLUSTRATIONS/ATTACHMENTS


None

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 322F

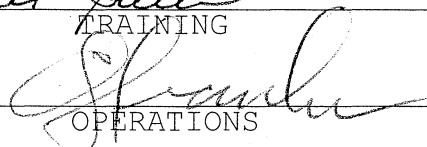
TITLE: 3-EOI APPENDIX 6D - INJECTION SUBSYSTEM LINEUP -
CS SYSTEM I

TASK NUMBER: U-000-EM-35

SUBMITTED BY:  DATE: 1/3/08

VALIDATED BY: _____ DATE: _____

APPROVED:  DATE: 1/5/08
TRAINING

PLANT CONCURRENCE:  DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

JPM NO. 322F
REV. NO. 0
PAGE 2 OF 9

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	01/04/2008	ALL	NEW JPM

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 322F

TASK NUMBER: U-000-EM-35

TASK TITLE: LINE UP INJECTION SUBSYSTEMS - CORE SPRAY LOOP I
IN ACCORDANCE WITH 3-EOI APPENDIX 6D

K/A NUMBER: 209001A4.05 K/A RATING: RO 3.8 SRO: 3.6

TASK STANDARD: PERFORM VALVE MANIPULATION REQUIRED TO INJECT
WATER INTO THE RPV VIA CORE SPRAY SYSTEM I AS
DIRECTED BY 2-EOI APPENDIX 6D

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: 3-EOI APPENDIX 6D, REV 3

VALIDATION TIME: _____ CONTROL ROOM: 4:15 LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 the Board Unit Operator. The Unit 3 reactor has scrammed and RPV water level is lowering slowly. EOI-1 has been entered and followed to RC/L-4.

INITIATING CUES: The Unit Supervisor directs you to inject water into the RPV to restore RPV water level using Core Spray System I as directed by 3-EOI Appendix 6D, INJECTION SUBSYSTEMS LINEUP - CORE SPRAY SYSTEM I.

START TIME _____

INSTRUCTOR NOTE:

VERIFY LP# CS VALVES ARE ALIGNED INBD - OPEN, OUTBOARD
CLOSED. (This is the fault)

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required
procedure.

Standard:

IDENTIFIED OR OBTAINED copy of 3-EOI APPENDIX 6D.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

1. **VERIFY OPEN** the following valves:

- 3-FCV-75-2, CORE SPRAY PUMP 3A SUPPR POOL
SUCT VLV.

Standard:

VERIFIED illuminated RED valve position indicating lamp
located above 3-HS-75-2A.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

- 3-FCV-75-11, CORE SPRAY PUMP 3C SUPPR POOL SUCT VLV.

Standard:

VERIFIED illuminated RED valve position indicating lamp located above 3-HS-75-11A.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical X Not Critical___

- 3-FCV-75-23, CORE SPRAY SYS I OUTBD INJECT VALVE.

Standard:

RECOGNIZED illuminated **GREEN** valve position indicating lamp located above 3-HS-75-23A (OUTBOARD VALVE) and **RED** valve position indicating lamp located above 3-HS-75-25A (INBOARD VALVE): **CLOSED** 3-FCV-75-25 with 3-HS-75-25A and **OPENED** 3-FCV-75-23 with 3-HS-75-23A.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

2. **VERIFY CLOSED** 3-FCV-75-22, CORE SPRAY SYS I TEST VALVE.

Standard:

VERIFIED illuminated GREEN valve position indicating lamp located above 3-HS-75-22A.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical X Not Critical___

3. **VERIFY** CS Pump 3A and/or 3C running.

Standard:

PLACED 3-HS-74-5A and/or 3-HS-74-14A in the START position and **VERIFIED** illuminated RED motor breaker position indicating lamp(s) above associated control switches.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical_X Not Critical_____

4. WHEN...RPV pressure is below 450 psig,
THEN...**THROTTLE** 3-FCV-75-25, CORE SPRAY SYS I
INBD INJECT VALVE, as necessary to control injection at
or below 4000 gpm per pump.

Standard:

PLACED 3-HS-75-25A in the OPEN position and **VERIFIED** illuminated RED valve position indicating lamp above associated control switch. (And verify flow <4000 gpm for 1 pump or <8000 gpm for 2 pumps). (Only 1 pump required to restore level, but both may be started).

Instructor Note: It is not necessary to recover level to +2 to +51 inches as long as level is recovering. IF level drops to -122 prior to examinee injecting to recover level, it will be considered a failure.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

CAUTION

Continuous operation with inadequate NPSH may result in pump damage or pump inoperability.

Performance Step :	Critical	Not Critical	X
1. The system is installed and configured correctly.			
2. The system is tested and found to be working correctly.			
3. The system is deployed to the production environment.			
4. The system is monitored for any issues.			
5. The system is updated with the latest patches.			
6. The system is backed up regularly.			
7. The system is documented.			
8. The system is reviewed for any improvements.			
9. The system is retired when it is no longer needed.			
10. The system is replaced with a new one.			

5. **MONITOR** Core Spray Pump NPSH using Attachment 1.

CUE: (If level is recovering), THAT WILL BE ALL FOR NOW.

Standard:

COMPARED pump flow rate with suppression pool temperature and suppression pool pressure and **DETERMINED** adequate **NPSH**.

SAT	UNSAT	N/A	COMMENTS:

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS_____

END OF TASK

STOP TIME _____

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EOI PROGRAM MANUAL SECTION IX

3-EOI APPENDIX-6D

**INJECTION SUBSYSTEMS LINEUP
CORE SPRAY SYSTEM I**

REVISION 3

PREPARED BY: MICHAEL MORROW

PHONE: 3708

RESPONSIBLE ORGANIZATION: Operations

APPROVED BY: GILBERT LITTLE

EFFECTIVE DATE: 04/07/02

LEVEL OF USE: REFERENCE USE

VALIDATION DATE: 05/04/94

QUALITY-RELATED

HISTORY OF REVISION/REVIEW
3-EOI APPENDIX-6D

<u>REV. NO.</u>	<u>DATE:</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION</u>
0	7/28/95	ALL	New procedure. Necessary to support implementation of BFNP Unit 3 EOIs.
1	10/01/98	ALL 3	CONVERTED TO MSWORD. CHANGE VORTEX LIMIT (10 FT) DUE TO DCN T40211A.
2	12/17/98	2	CS Vortex Limit Due to worksheet 13 recalculation
3	04/07/02	1	Step 4: Deleted "OPEN" following "THROTTLE."

3-EOI APPENDIX-6D

INJECTION SUBSYSTEMS LINEUP CORE SPRAY SYSTEM I

LOCATION: Unit 3 Control Room

ATTACHMENTS: 1. NPSH Monitoring

(✓)

1. **VERIFY OPEN** the following valves:

- 3-FCV-75-2, CORE SPRAY PUMP 3A SUPPR POOL SUCT VLV _____
- 3-FCV-75-11, CORE SPRAY PUMP 3C SUPPR POOL SUCT VLV _____
- 3-FCV-75-23, CORE SPRAY SYS I OUTBD INJECT VALVE. _____

2. **VERIFY CLOSED** 3-FCV-75-22, CORE SPRAY SYS I TEST VALVE. _____

3. **VERIFY** CS Pump 3A and/or 3C **RUNNING**. _____

4. WHEN ...RPV pressure is below 450 psig,
THEN ... **THROTTLE** 3-FCV-75-25, CORE SPRAY SYS I INBD
INJECT VALVE, as necessary to control injection
at or below 4000 gpm per pump. _____

CAUTION

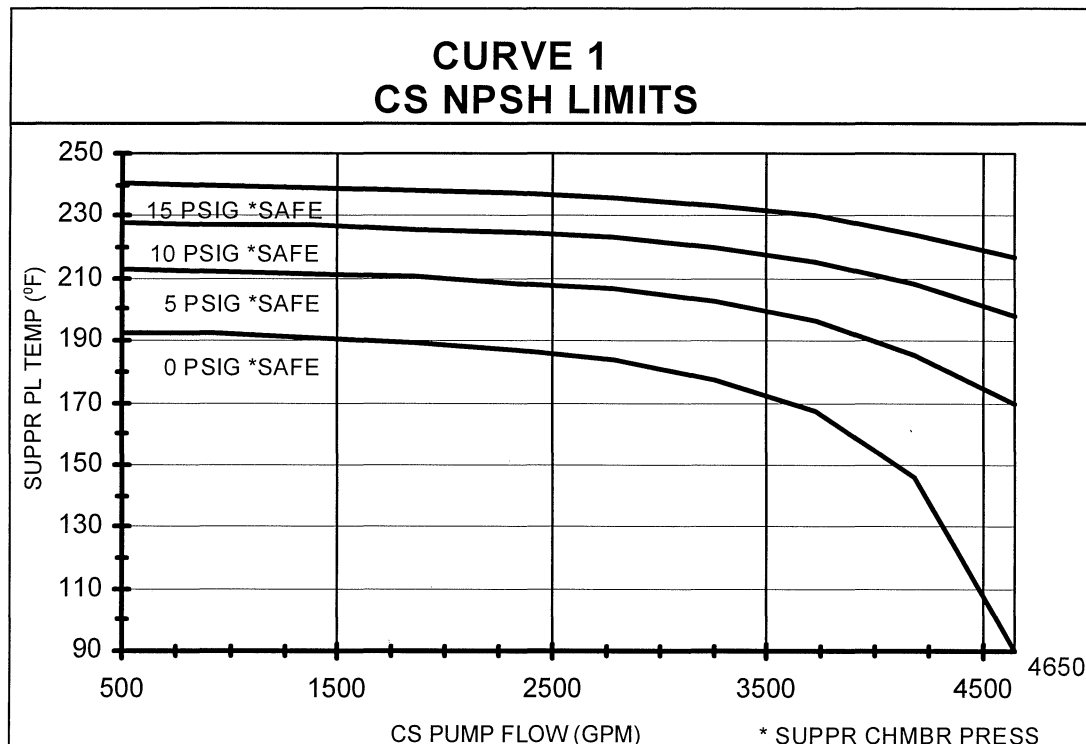
Continuous operation with inadequate NPSH may result in pump
damage or pump inoperability.

5. **MONITOR** Core Spray Pump NPSH using Attachment 1. _____

END OF TEXT

NPSH MONITORING

Adequate NPSH is assured by maintaining pump flow rates below the curve for the applicable Suppression Chamber pressure. For Suppression Chamber pressures between the values on the curves extrapolation must be used.



Other indications of inadequate NPSH are:


- Suppression pool level below 10 ft
- System flowrate decreasing with constant valve position
- System flowrate or discharge pressure less than expected for present system conditions
- Pump discharge pressure lower than expected or fluctuating excessively
- Pump motor amps lower than expected or fluctuating excessively
- Pump suction pressure low (local indication)

LAST PAGE

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 63

TITLE: EOI APPENDIX 16B - BYPASSING RCIC MODE
ISOLATION

SUBMITTED BY:  DATE: 1/3/08

VALIDATED BY: _____ DATE: _____

APPROVED: 2 Robert J. Smith DATE: 1/5/08
TRAINING

PLANT CONCURRENCE:  DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
1	12/7/94	1,2,3,4	REVISE TO NEW FORMAT
2	11/12/99	4,6,8,10	CHANGED INITIAL CONDITIONS C2-11 TO C2- 12, ASOS TO US, DELETED CONTACT 5 & 6 FROM PAGE 6 AND CHANGED ATTACHMENT 1 TO ATTACH 2., ADDED PLANT WORK EXPECT., TOUCH STAAR, SAFETY, AND 3-WAY COMM.
3	10/16/00	4	REVIEWED FOR ACCURACY. REMOVED NON-CRITICAL STEPS.
4	8/31/02	3,8	CHANGED REV NO., ADDED NOTE
5	8/17/07	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 63

TASK NUMBER: U-000-EM-67

TASK TITLE: BYPASS RCIC TEST MODE ISOLATION INTERLOCKS IN
ACCORDANCE WITH EOI APPENDIX 16B

K/A NUMBER: 217000A2.01 K/A RATING: RO 3.8 SRO: 3.7

TASK STANDARD: PERFORM OPERATIONS NECESSARY TO BYPASS RCIC TEST
MODE ISOLATION INTERLOCKS AS DIRECTED BY EOI
APPENDIX 16B

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT X CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 2-EOI APPENDIX 16B, REV 3

VALIDATION TIME: CONTROL ROOM: 12:00 LOCAL: 10:00

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

PERFORMANCE TIME: _____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. 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 Operator. The reactor has scrammed and emergency depressurization is required. RCIC is NOT needed for level control but is required as an alternate means of depressurization as directed by C2-12. Appendix 11B is in progress.

INITIATING CUES: The US directs you to bypass RCIC test mode isolation interlocks as directed by 2-EOI Appendix 16B.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME: _____

Performance Step: _____ Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required
EOI Appendix.

Standard:

IDENTIFIED OR OBTAINED copy of 2-EOI Appendix 16B.

SAT___ UNSAT___ N/A___ COMMENTS: _____

NOTE: Steps 3 AND 4 may be performed before Steps 1 AND 2.

EXAMINER NOTE: Due to the note above, if Candidate elects to
perform steps 3 AND 4 first, proceed to page 8 of 12.

Performance Step: Critical___ Not Critical X

1. **REFER TO** Attachment 1 and **OBTAIN** tools and equipment from EOI Equipment Storage Box (Unit 2 RB, NE, El 621 ft, Panel 25-31).

Standard:

SIMULATED OBTAINING two relay finger contact boots and small fuse puller from EOI Equipment Storage Box near Panel 2-25-31.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: [WHEN SIMULATED] YOU HAVE TWO RELAY FINGER CONTACT BOOTS AND A SMALL FUSE PULLER.

NOTE: Step 2 bypasses the following RCIC Auto Initiation signals:

- Auto-Close signal for 2-FCV-71-38, RCIC PUMP CST TEST VLV
- Auto-Open signal for 2-FCV-71-39, RCIC PUMP INJECTION VALVE.

<u>Performance Step:</u>	Critical	X	Not Critical
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2. **REFER** to Attachment 2 and **INSTALL** boots on the following relay contacts (Panel 2-25-31, Front):

- 13A-K2, contact 5-6

Standard:

SIMULATED removing relay cover and pulling back contact fingers and installing boots on 13A-K2, contact 11-12 (first contact finger from the left of the relay) AND 13A-K2, contact 5-6 (third contact finger from the right of the relay).

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN SIMULATED PROPERLY] THE BOOTS ARE INSTALLED BETWEEN CONTACTS 11 AND 12 AND CONTACTS 5 AND 6 ON RELAY 13A-K2.

Performance Step: Critical___ Not Critical_X

3. **REFER** to Attachment 1 and **OBTAIN** tools and equipment from EOI Equipment Storage Box in Auxiliary Instrument Room.

Standard:

SIMULATED OBTAINING two relay finger contact boots and small fuse puller from Unit 2 Aux Instrument Room EOI Equipment Storage Box.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: [WHEN SIMULATED] YOU HAVE TWO RELAY CONTACT FINGER BOOTS AND A SMALL FUSE PULLER.

NOTE: Step 4 bypasses Auto-Close signal for 2-FCV-73-36, HPCI/RCIC
CST TEST VLV.

Performance Step: Critical X Not Critical

4. **REFER** to Attachment 2 and **INSTALL** boots on the following relay contacts (Panel 2-9-39, Front):
- 23A-K1, contact 3-4.
 - 23A-K4, contact 5-6.

Standard:

SIMULATED removing relay cover and pulling back contact fingers and installing boots on 23A-K1, contact 3-4 (second contact finger from the right of the relay) AND 23A-K4, contact 5-6 (third contact finger from the right of the relay)

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN SIMULATED PROPERLY] THE BOOTS ARE INSTALLED BETWEEN CONTACTS 3 AND 4 ON RELAY 23A-K1 AND CONTACTS 5 AND 6 ON RELAY 23A-K4.

Performance Step: Critical___ Not Critical X

5. **NOTIFY** Unit Operator that RCIC Test Mode Isolation Interlocks are bypassed.

Standard:

SIMULATED NOTIFYING Unit 2 Operator that RCIC test mode isolation interlocks are bypassed per 2-EOI Appendix-16B.

SAT___ UNSAT___ N/A___ COMMENTS: _____

CUE: [WHEN SIMULATED] UNIT 2 OPERATOR ACKNOWLEDGES RCIC TEST MODE ISOLATION INTERLOCKS ARE BYPASSED PER 2-EOI APPENDIX-16B.

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

PERFORMER complied with all safety rules and regulations.

Standard:

PERFORMER complied with all safety rules and regulations (hardhat, safety glasses, sideshields, and hearing protection was worn **AS REQUIRED.**) (INSTRUCTOR determines if N/A due to plant conditions)

ELECTRICAL SAFETY was also adhered to: Exposed conductive articles such as rings, metal wristwatches, bracelets, and metal necklaces shall not be worn by employees within reaching distance of exposed energized electrical conductors of 50 volts or greater.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:_____

END OF TASK

STOP TIME _____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

STUDENT HANDOUT

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. 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 Operator. The reactor has scrammed and emergency depressurization is required. RCIC is NOT needed for level control but is required as an alternate means of depressurization as directed by C2-12. Appendix 11B is in progress.

INITIATING CUES: The US directs you to bypass RCIC test mode isolation interlocks as directed by 2-EOI Appendix 16B.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

C

C

C

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EOI PROGRAM MANUAL SECTION IX

2-EOI APPENDIX-16B

**BYPASSING RCIC TEST MODE
ISOLATION INTERLOCKS**

REVISION 3

PREPARED BY: M. Morrow

PHONE: 3708

RESPONSIBLE ORGANIZATION: Operations

APPROVED BY: A. S. Bhatnagar

EFFECTIVE DATE: 10/26/00

LEVEL OF USE: REFERENCE USE

VALIDATION DATE: 01/08/92

QUALITY-RELATED

HISTORY OF REVISION/REVIEW
2-EOI APPENDIX-16B

<u>REV. NO.</u>	<u>DATE:</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION</u>
0	6/15/92	ALL	New procedure. Necessary to support implementation of Revision 4 EPGs into BFPN EOIs.
1	7/10/92	1,2	Incorporated Writer's Guide discrepancies, typos, and plant nomenclature discrepancies
2	4/21/93	ALL	Converted from WordPerfect 5.1 to Pagemaker 4.0 to better support desktop publishing capabilities. Steps that used "Perform the following:" were reworded to summarize the tasks presented by the associated substeps. Deleted Caution regarding electrical shock hazard that is common operator knowledge through training. Added a note informing operators of the effect of Step 4 on the HPCI test valve.
3	10/26/00	All	Converted to MS-Word.

2-EOI APPENDIX-16B**BYPASSING RCIC TEST MODE
ISOLATION INTERLOCKS**

LOCATION: 1. Unit 2 RB NE, El 621 ft
2. Unit 2 Auxiliary Instrument Room

ATTACHMENTS: 1. Tools and Equipment
2. Panel 2-25-31 and Panel 2-9-39 Relay Layouts (✓)

NOTE: Steps 3 AND 4 may be performed before Steps 1 AND 2.

1. **REFER** to Attachment 1 and **OBTAIN** tools and equipment from EOI Equipment Storage Box (Unit 2 RB, NE, El 621 ft, Panel 2-25-31). _____

NOTE: Step 2 bypasses the following RCIC Auto Initiation signals:

- Auto-Close signal for 2-FCV-71-38, RCIC PUMP CST TEST VLV
- Auto-Open signal for 2-FCV-71-39, RCIC PUMP INJECTION VALVE.

2. **REFER** to Attachment 2 and **INSTALL** boots on the following relay contacts (Panel 2-25-31, Front): _____

- 13A-K2, contact 11-12
- 13A-K2, contact 5-6. _____

3. **REFER** to Attachment 1 and **OBTAIN** tools and equipment from EOI Equipment Storage Box in Auxiliary Instrument Room. _____

NOTE: Step 4 bypasses Auto-Close signal for 2-FCV-73-36, HPCI/RCIC CST TEST VLV.

4. **REFER** to Attachment 2 and **INSTALL** boots on the following relay contacts (Panel 2-9-39, Front): _____

- 23A-K1, contact 3-4
- 23A-K4, contact 5-6. _____

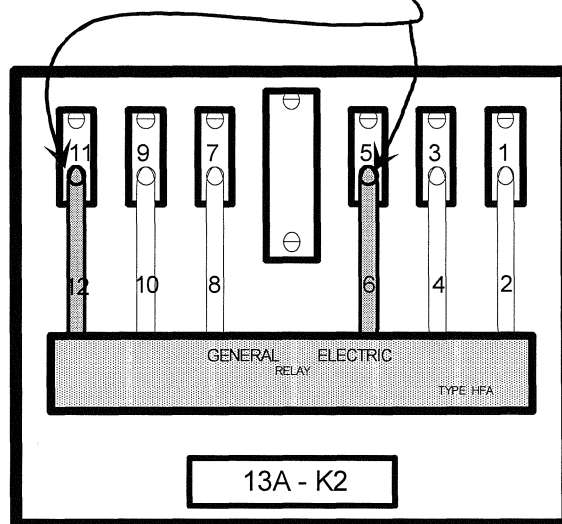
5. **NOTIFY** Unit Operator that RCIC Test Mode Isolation Interlocks are bypassed. _____

END OF TEXT

TOOLS AND EQUIPMENT:	LOCATION:
1. Two relay finger contact boots. 2. Fuse pullers.	Unit 2 RB NE, El 621 ft, at Panel 25-31, EOI Equipment Storage Box.
1. Two relay finger contact boots. 2. Fuse pullers.	Unit 2, Auxiliary Instrument Room, EOI Equipment Storage Box.

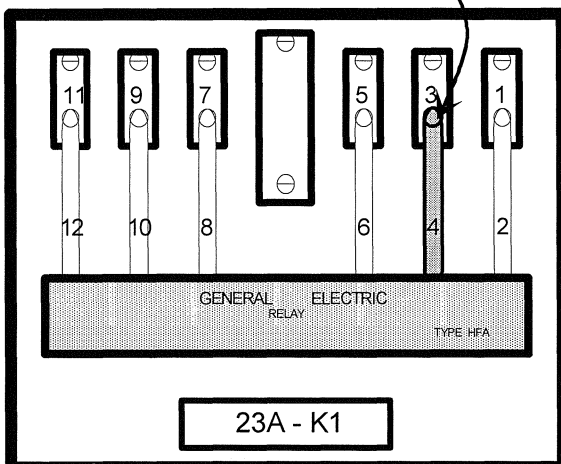
PANEL 25-31 (FRONT)

GENTLY PULL BACK
 CONTACT FINGER,
 USING SMALL FUSE
 PULLERS TO PREVENT
 ELECTRICAL SHOCK,
 AND SLIP BOOT OVER
 TIP OF FINGER HERE



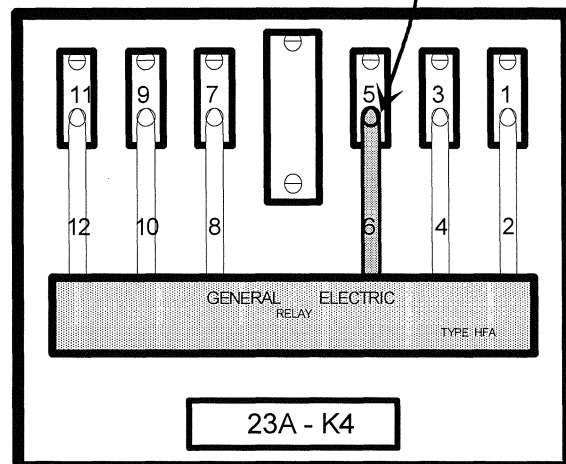
PANEL 9-39 (FRONT)

GENTLY PULL BACK
 CONTACT FINGER,
 USING SMALL FUSE
 PULLERS TO PREVENT
 ELECTRICAL SHOCK,
 AND SLIP BOOT OVER
 TIP OF FINGER HERE



PANEL 9-39 (FRONT)

GENTLY PULL BACK
 CONTACT FINGER,
 USING SMALL FUSE
 PULLERS TO PREVENT
 ELECTRICAL SHOCK,
 AND SLIP BOOT OVER
 TIP OF FINGER HERE



BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: JPM 86

TITLE: PLACE A 250V BATTERY CHARGER IN SERVICE

SUBMITTED BY:



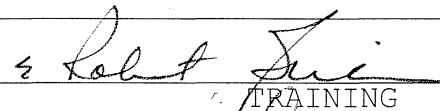
DATE:

1/3/08

VALIDATED BY:

DATE:

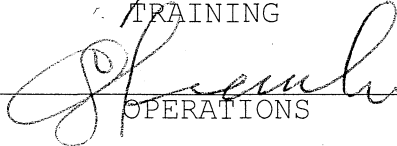
APPROVED:


TRAINING

DATE:

1/5/08

PLANT CONCURRENCE:


OPERATIONS

DATE:

1/4/08

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
2	10/4/94	1,2,3,4	REVISE TO NEW FORMAT
3	12/1/94	1,2,3,4	REVISE TO NEW FORMAT
4	4/25/95	ALL	GENERAL
5	10/26/95	1,2,3,6,11,15	PROCEDURE REVISION
6	10/31/95	11	ADDED INSTRUCTOR'S NOTE
7	11/9/95	15	ADDED CUES
8	11/30/95	11	STEP 5.2.7.5 CHANGED TO NOT CRITICAL
9	10/9/97	ALL	FORMAT, PROCEDURE REVISION, ADDED PLANT WORK EXPECTATIONS TOUCH STAAR, SAFETY, AND 3-WAY COMM., AND INST. STATEMENT REQUIRING PROCEDURE REV. CHECK ON FIRST JPM.
10	10/28/98	3,4	PROCEDURE REVISION
11	10/11/00	all	GENERAL REVISION
12	8/27/05	all	PROCEDURE REVISION
13	08/17/07	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____ SS# _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: JPM 86

TASK NUMBER: S-57D-NO-02

TASK TITLE: PLACE A 250V UNIT BATTERY CHARGER IN SERVICE TO A
BATTERY BOARD

K/A NUMBER: 263000A4.1 K/A RATING: RO 3.3 SRO: 3.5

TASK STANDARD: SIMULATE PLACING 250V UNIT BATTERY CHARGER 2A IN
SERVICE TO BATTERY BOARD 2

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT X CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 0-OI-57D, REV 114

VALIDATION TIME: _____ CONTROL ROOM: _____ LOCAL: 25:00

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

PERFORMANCE TIME: _____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. 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 operator. 250V Battery Board 2 is being fed by 250V (Spare) Battery Charger 2B for testing purposes. Testing has been completed. 250V Unit Battery 2 is in service in accordance with Section 5.1 of 0-OI-57D.

INITIATING CUES: The US has directed you to return 250V Battery Board 2 to its normal charging supply, i.e. place 250V Battery Charger 2A in service to Battery Board 2 using the NORMAL power source as directed by 0-OI-57D.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME _____

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required procedure, 0-OI-57D.

Standard:

IDENTIFIED OR OBTAINED copy of 0-OI-57D.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

5.2.2 Placing the 250V Unit Battery Charger 2A in Service to Battery Board 2

[1] VERIFY 250V Battery 2 is in service in accordance with Section 5.1.

Standard: N/A GIVEN IN INITIAL CONDITIONS.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[2] REVIEW all Precautions and Limitations in Section 3.0.

Standard:

REVIEWED precautions and limitations in Section 3.0.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical X Not Critical X

[3] **VERIFY** the following AC source breakers are CLOSED:

- Normal Source

480v SD Bd 2A, Compt 6D, 2-BKR-248-0002A/6D

Standard:

LOCATED Compartment 6D on 480V SD Bd 2A and **VERIFIED** breaker position indicator indicates CLOSED.

CUE: (IF IN A DIFFERENT POSITION) THE BREAKER INDICATES CLOSED.

SAT___ UNSAT___ N/A___ COMMENTS: _____

EXAMINER NOTE: This next step is required as it will count as the required RCA entry.

Performance Step: Critical___ Not Critical X

- Alternate Source

(Charger Service Bus) 480v Common Bd 1, Compt 3A,
0-BKR-215-0001/03A

Standard:

LOCATED Compartment 3A on 480v Common Bd 1 and **VERIFIED** breaker position indicator indicates CLOSED.

CUE: (IF IN A DIFFERENT POSITION) THE BREAKER INDICATES CLOSED.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[4] **PERFORM** the following in Battery Board Room 2:

[4.1] **VERIFY** that DC BUS FILTER CAPACITORS U2, 0-BKR-280-0002/711 is ON.

Standard:

LOCATED breaker 0-BKR-280-0002/711 and **VERIFIED** in the ON position IN BB RM 2.

CUE: (IF IN A DIFFERENT POSITION) THE BREAKER INDICATES ON.

SAT___ UNSAT___ N/A___ COMMENTS: _____

NOTE

BATTERY CHARGER 2A INPUT TRANSFER SWITCH, 2-XSW-248-0002AA has a mechanical interlock that prevents closing both input supply breakers simultaneously on Battery Charger 2A.

Performance Step:	Critical	X	Not Critical
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[4.2] IF the NORMAL SUPPLY INPUT FROM 480V SD BD 2A/6D,
2-BKR-248-0002AA is the desired AC power source,
THEN

ALIGN BATTERY CHARGER 2A INPUT TRANSFER SWITCH, 2-XSW-248-0002AA, **AND CLOSE** the NORMAL SUPPLY INPUT FROM 480V SD BD 2A/6D, 2-BKR-248-0002AA.

Standard:

LOCATED battery charger input transfer switch on battery charger 2A and **SIMULATED CLOSING** the NORMAL SUPPLY INPUT FROM 480V SD BD 2A/6D, 2-BKR-248-0002AA. **VERIFIED** by observation that mechanical interlock in place to prevent paralleling power supplies.

CUE: (WHEN SIMULATED) YOU HEAR A LOUD CLICK, THE NORMAL SUPPLY INPUT BREAKER INDICATES CLOSED. (IF SIMULATED) THE MECHANICAL INTERLOCK IS IN PLACE.

SAT	UNSAT	N/A	COMMENTS:

Performance Step: Critical___ Not Critical X

[4.3] IF the ALTERNATE SUPPLY INPUT FROM 480V CMN
BD 1/3A, 2-BKR-248-0002AB is the desired AC power
source, **THEN**

ALIGN BATTERY CHARGER 2A INPUT TRANSFER
SWITCH, 2-XSW-248-0002AA, **AND CLOSE** the
ALTERNATE SUPPLY INPUT FROM 480V CMN
BD 1/3A, 2-BKR-248-0002AB.

Standard:

DOES **NOT** CLOSE THE ALTERNATE SUPPLY 2-BKR-248-0002AB

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical X Not Critical___

[4.4] VERIFY the 250V BAT CHGR 2A DISCT FROM BAT
BD 2 NORM FDR, 0-BKR-280-0002/608 on Battery
Board 2 is ON.

Standard:

LOCATED BREAKER 0-BKR-280-0002/608 ON BATTERY BOARD 2 AND
VERIFIED THE BREAKER IS IN ON.

CUE: (IF IN A DIFFERENT POSITION) THE BREAKER INDICATES ON.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical X Not Critical _____

[5] **IF** the 250V BATTERY CHARGER 2B, 0-CHGA-248-0002B is supplying power to Battery Board 2 **AND** a transfer to 250V BATTERY CHARGER 2A, 2-CHGA-248-0002A is desired, **THEN**

[5.1] **PLACE** the 2B Battery Charger POWER ON, 0-HS-248-0002B switch to OFF.

Standard:

LOCATED 2B Battery Charger POWER ON switch 0-HS-248-0002B and **SIMULATED PLACING** in the OFF position.

CUE: (WHEN SIMULATED) YOU HEAR A CLICK, THE 2B CHARGER POWER SWITCH IS IN OFF.

SAT ___ UNSAT ___ N/A ___ COMMENTS: _____

Performance Step: Critical X Not Critical _____

[5.2] **PLACE** the DC BREAKER, 0-BKR-248-0002B/DC on front of 250V Battery Charger 2B to OFF.

Standard:

LOCATED 2B Battery Charger DC BREAKER 0-BKR-248-0002B/DC and **SIMULATED PLACING** in the OFF position.

CUE: (WHEN SIMULATED) YOU HEAR A LOUD CLICK, THE 2B CHARGER DC BREAKER IS IN OFF.

Performance Step: Critical X Not Critical

[5.3] PLACE the following AC input supply breakers on front of 250V Battery Charger 2B to OFF:

- NORMAL SUPPLY INPUT FROM 480V SD
BD 2B/6D, 0-BKR-248-0002BA
- ALTERNATE SUPPLY INPUT FROM 480V CMN
BD 1/3A, 0-BKR-248-0002BB

Standard:

LOCATED the NORMAL and ALTERNATE AC INPUT SUPPLY BREAKERS and **SIMULATED PLACING** both switches in the **OFF** position.

CUE: (WHEN SIMULATED FOR EACH BREAKER) YOU HEAR A LOUD CLICK, THE BREAKER IS IN THE OFF POSITION.

SAT	UNSAT	N/A	COMMENTS:

bioRxiv preprint doi: <https://doi.org/10.1101/2019.05.20.256400>; this version posted May 20, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.

Performance Step: Critical___ Not Critical X

[5.4] **PLACE** the following 2B BATTERY CHARGER
OUTPUT TRANSFER SWITCH 2B, 0-XSW-248-0002B
breaker to OFF:

- TO BATTERY BD 2 BKR 607

Standard:

At 250V Battery Charger 2B Output Transfer Switch Panel,
SIMULATED PLACING TO BATTERY BD 2 BKR 607 to the OFF
position.

**CUE: (WHEN SIMULATED) YOU HEAR A LOUD CLICK, THE BREAKER IS IN THE
OFF POSITION.**

SAT___ UNSAT___ N/A___ COMMENTS: _____

NOTE

BATTERY CHARGER 2A OUTPUT TRANSFER SWITCH, 2-XSW-248-0002A has a
mechanical interlock that prevents closing output supply breakers
simultaneously. OUTPUT XFER SW, 2-BKR-248-0002AD and OUTPUT XFER
SW, 2-BKR-248-000AC are spare output supply breakers.

Performance Step : Critical___ Not Critical X

[6] **ALIGN** BATTERY CHARGER 2A OUTPUT TRANSFER SWITCH, 2-XSW-248-0002A on 250V Battery Charger 2A Output Transfer Switch Panel to OUTPUT XFER SW TO BKR 608, 2-BKR-248-0002AE.

[6.1] **PLACE** OUTPUT XFER SW TO BKR 608, 2-BKR-248-0002AE ON.

Standard:

SIMULATED placing OUTPUT XFER SW TO BKR 608 TO ON.

CUE: (WHEN SIMULATED) YOU HEAR A LOUD CLICK, THE BREAKER IS IN THE ON POSITION.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical X Not Critical___

[7] **PLACE** the POWER ON, 2-HS-248-0002A to ON and allow voltage to stabilize for approximately 2 minutes.

Standard:

LOCATED BATTERY CHARGER 2A POWER ON Select Switch and **SIMULATED PLACING** in the ON position and allowed to stabilize.

CUE: (WHEN SIMULATED) THE SWITCH IS IN THE ON POSITION. 2 MINUTES HAVE ELAPSED

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

- [8] **CHECK** DC Voltage stabilized greater than 250 Volts on
DC VOLTMETER, 2-EI-248-0002A.

Standard:

Indicates stable voltage greater than 250v.

CUE: (WHEN SIMULATED) VOLTAGE IS STABLE AND GREATER THAN 250V.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical X Not Critical___

- [9] **CLOSE** the DC BREAKER, 2-BKR-248-0002A/DC on front of
Battery Charger 2A by placing it to ON.

Standard:

LOCATED 250V BATTERY CHARGER 2A DC BREAKER and
SIMULATED PLACING in the ON position.

**CUE: (WHEN SIMULATED) YOU HEAR A LOUD CLICK, THE BREAKER IS IN THE
ON POSITION.**

SAT___ UNSAT___ N/A___ COMMENTS: _____

CAUTION

If a charger malfunction occurs, the Normal and Alternate AC Input Supply and DC Breakers should be placed to the OFF position and the Shift Manager informed immediately.

Performance Step: Critical___ Not Critical X

[10] **WHEN** load shed logic is reset (LOCA signal reset or off-site power restored), **OR IF** fire was in Fire Area 16 and battery control circuit is confirmed to have load shed logic in reset condition, **THEN**

PERFORM the following:

clarify

- [10.1] **OPEN** the DC BREAKER, 2-BKR-248-0002A/DC on front of Battery Charger 2A by placing it to OFF.
- [10.2] **PLACE** POWER ON, 2-HS-248-0002A to ON.
- [10.3] **CHECK** DC Voltage stabilized greater than 250 Volts on DC VOLTMETER, 2-EI-248-0002A.
- [10.4] **CLOSE** the DC BREAKER, 2-BKR-248-0002A/DC on front of Battery Charger 2A by placing it to ON.

CUE: SSI PROCEDURE HAS NOT BEEN IMPLEMENTED AND NO LOCA SIGNAL OR LOSS OF OFF-SITE POWER HAS BEEN RECEIVED.

Standard:

N/A's [10] - [10.4] after CUE given.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

[11] **CHECK** the following indications of normal operation on 250V Battery Charger 2A, 2-CHGA-248-0002A:

- DC VOLTMETER, 2-EI-248-0002A greater than 250 Volts
- DC amps, 2-II-248-0002A less than 300 amps
- POWER ON, 2-IL-248-0002AA light illuminated
- TRANSFORMER OVER TEMPERATURE, 2-IL-248-0002AB light extinguished
- DC OVER VOLTAGE, 2-IL-248-0002AC light extinguished
- DC UNDER VOLTAGE, 2-IL-248-0002AD light extinguished
- AC UNDER VOLTAGE, 2-IL-248-0002AE light extinguished

CUES: (IF INDICATIONS ARE NOT GOOD, SUBSTITUTE THESE AS EACH IS CHECKED)

DC VOLTAGE is indicated as 265 VOLTS

DC AMPERES are indicated as 125

THE POWER ON light is illuminated

TRANSFORMER OVERTEMP light extinguished

OVERVOLTAGE DC light extinguished

UNDERVOLTAGE DC light extinguished

UNDERVOLTAGE AC light extinguished

Standard:

LOCATED AND CHECKED the following as indications of normal operation; DC Volts > 250, DC Amps < 300, POWER ON light ON, XFMR OVERTEMP light out, OV DC light out, UV DC light out, and UV AC light out.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical_X

[12] **VERIFY** that EQUALIZE TIMER, 2-TMR-248-0002A is set to zero.

Standard:

LOCATED equalize timer and **VERIFIED** set to zero.

CUE: (IF TIMER NOT SET TO ZERO) THE TIMER INDICATES ZERO.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Step: Critical___ Not Critical_X

[13] **IF** the 250V Battery Board 2 is unloaded, **THEN**
LOAD the Battery Board IAW 2-SR-3.8.4.4(MB-2).

CUE: THE BATTERY BOARD IS ALREADY LOADED. THIS ENDS THE JPM.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___Not Critical_X___

PERFORMER complied with all safety rules and regulations.

Standard:

PERFORMER complied with all safety rules and regulations (hardhat, safety glasses, sasheshields, and hearing protection was worn **AS REQUIRED.**) (INSTRUCTOR determines if N/A due to plant conditions)

ELECTRICAL SAFETY was also adhered to: Exposed conductive articles such as rings, metal wristwatches, bracelets, metal necklaces, key chains, and metal belt buckles shall not be worn by employees within reaching distance of exposed energized electrical conductors of 50 volts or greater.

SAT___ UNSAT___ N/A___ COMMENTS:_____

END OF TASK

STOP TIME _____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

STUDENT HANDOUT

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. 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 operator. 250V Battery Board 2 is being fed by 250V (Spare) Battery Charger 2B for testing purposes. Testing has been completed. 250V Unit Battery 2 is in service in accordance with Section 5.1 of 0-OI-57D.

INITIATING CUES: The US has directed you to return 250V Battery Board 2 to its normal charging supply, i.e. place 250V Battery Charger 2A in service to Battery Board 2 using the NORMAL power source as directed by 0-OI-57D.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

C

C

C



Browns Ferry Nuclear Plant

Unit 0

Operating Instruction

0-OI-57D

DC Electrical System

Revision 0114

Quality Related

Level of Use: Continuous Use

Effective Date: 08-10-2007

Responsible Organization: OPS, Operations

Prepared By: William Wambsgan

Approved By: John T. Kulisek

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Current Revision Description

Type of Change: Enhancement Tracking Number: 151

Affected Pages 137,174, 220,221,222,223,226,227,228,229
Attachment 3: 17,18,22,24,45,55
Attachment 3B: 10

PCR 07002942, added N/A's to bullets in step 8.1[5] for connecting BB 4, 5, 6 to Battery Charger 2B. Also made editorial change to note above step 8.1[5].
PCR 07002941, changed step 7.2.5[4.3] to read "less than 200 volts" on...
PCR 07001384, updated various Panel UNID's in main body of procedure.
PCR 07001383, Attachment 3, updated various Panel UNID's.
PCR 07001752, Attachment 3B, cleaned up tables and added UNID to breakers 8B2 and 9B2.

THIS REVISION DOES NOT AFFECT SYSTEM STATUS

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ATTACHMENTS

Attachment 1: None

Attachment 2: None

Attachment 3: DC Electrical System Electrical Lineup Checklist, Unit 0

Attachment 3A: DC Electrical System Electrical Lineup Checklist, Unit 1

Attachment 3B: DC Electrical System Electrical Lineup Checklist, Unit 2

Attachment 3C: DC Electrical System Electrical Lineup Checklist, Unit 3

Attachment 4: None

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3.0 PRECAUTIONS AND LIMITATIONS

A. In the event a Unit Battery System is removed from service or a 250VDC RMOV Board is transferred to the alternate supply, one or more of the limitations below may apply. If time permits, a Caution Order should be placed on the affected MOV handswitches prior to transfer of board to alternate to prevent violation of these safe shutdown restrictions.

1. In the event any 250VDC RMOV Board is on its alternate supply, the following restrictions apply to DC motor operated valves that are supplied from a battery that is feeding any RMOV board alternate supply:
 - a. No DC MOV may be operated except as required to mitigate accident conditions, to obtain safe shutdown or to comply with Technical Specifications(i.e. to comply with LCO ACTIONS statements only).
 - b. Testing(including SI/SRs) that requires DC motor operated valve operation is NOT allowed. [Ref. Dwgs. 1-45E701-3, 2-45E702-4, 3-45E703-3]

DC MOVs that may NOT be operated except as required to mitigate accident conditions or to obtain safe shutdown or to comply with Technical Specifications(i.e. to comply with LCO ACTIONS statements only) with RMOV boards on alternate supply.

RMOV BOARD ON ALTERNATE	NORMAL SUPPLY BATTERY	ALTERNATE SUPPLY BATTERY	MAY NOT OPERATE MOVs SUPPLIED FROM RMOV BD (i.e. supplied from the alternate battery)
1A	1	2	1C, 2A, 3C, 1A
1B	3	1	1A, 2C, 3B, 1B
1C	2	1	1A, 2C, 3B, 1C
2A	2	3	1B, 2B, 3A, 2A
2B	3	1	1A, 2C, 3B, 2B
2C	1	2	1C, 2A, 3C, 2C
3A	3	2	1C, 2A, 3C, 3A
3B	1	3	1B, 2B, 3A, 3B
3C	2	3	1B, 2B, 3A, 3C

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

2. If Battery System 1 is out of service or 250VDC RMOV Board 1A is on alternate supply, the following actions are required:
[Ref. Dwg.: 1-45E701-3, 1-45E712-1]
 - a. If Battery System 1 is out of service, 1-FCV-073-0044, 2-FCV-73-44 and 3-FCV-73-44 and their supply circuit breakers must be open.
 - b. If 250V DC MOV Board 1A is transferred to alternate supply, 1-FCV-0073-0044 and 2-FCV-73-44 and their supply circuit breakers must be open.
3. If Battery System 2 is out of service or 250VDC RMOV Board 2A is on the alternate supply, the following additional actions and limitations are required: [Ref. Dwgs.: 2-45E702-4, 2-45E712-1]
 - a. If Battery System is out of service, valves 1-FCV-73-44, 2-FCV-73-44 and 3-FCV-73-44 and their associated supply circuit breakers must be opened.
 - b. If 250VDC RMOV Board 2A is transferred to the alternate supply, valves 2-FCV-73-44 and 3-FCV-73-44 and their associated supply circuit breakers must be opened.
4. If Battery System 3 is out of service or 250VDC RMOV Board 3A is on the alternate supply, the following additional actions and limitations are required: [Ref. Dwgs.: 3-45E703-3, 3-45E712-1]
 - a. If Battery System is out of service, valves 1-FCV-73-44, 2-FCV-73-44 and 3-FCV-73-44 and their associated supply circuit breakers must be opened.
 - b. If 250VDC RMOV Board 3A is transferred to the alternate supply, valves 3-FCV-73-44 and 2-FCV-73-44 and their associated supply circuit breakers must be opened.
- B. If Battery System 4, 5 or 6 becomes inoperable the emergency bearing oil pump motor must be started upon transfer to the alternate source. This action ensures D.C. system availability during design basis conditions.
- C. Prior to entry into Battery Room(s) ventilation fans to the Battery Room(s) should be in service.
- D. Extreme care should be used when deenergizing equipment while locating grounds to prevent interruption of power to vital and safeguard equipment. REFER TO 0-GOI-300-2, Electrical.

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- E. All safety requirements concerning smoking, fires or sparks should be observed when in the Battery-Battery Board Rooms because of potential accumulation of hydrogen in flammable amounts.
- F. 250V Unit Battery Charger 1,2A,2B and 3 Emergency ON select switch bypasses battery charger emergency load shed contacts. Placing the select switch in Emergency ON reestablishes charger operations with an accident signal present and Diesel Generator voltage available. Battery Charger 4 supply breaker, 480V Shutdown Board 3B, Compt 6D, receives a trip signal from the load shed logic and the breaker must be manually re-closed after a 40 second time delay to restore the charger to service. The annunciation circuit for the 250V Unit Battery Charger 3 does NOT work when the EMER/OFF/ON Select Switch is in the EMER Position.
- G. [I/C] Neutron monitoring battery chargers are NOT stand alone power supplies and shall only be operated while connected to the neutron monitoring batteries. [BFPER 940862]
- H. Within 30 minutes after the loss of the normal charger to a 250V Unit Battery another charger shall be placed in service to that battery and load reduced so that the battery is NOT discharging.
- I. [NRC/C] Upon return to service of 24V DC Neutron Monitoring Battery A or B, Instrument Maintenance must perform functional tests on SRMs and IRMs that are powered from the affected battery board (In that the IRMs and SRMs are normally inoperable after entering RUN mode due to lack of testing, these tests are N/A for the IRMs and the SRMs if the Unit is in RUN Mode and the IRMs and SRMs are inoperable). Prior to calling the IRMs and SRMs operable, the tests have to be performed. [NRC IE Inspect Follow-up Item 86-40]
- J. To return equipment to service following a failure or trip, the shutdown section of this instruction should be performed on the equipment failed. The initial conditions may NOT be applicable in this case.
- K. [NRC/C] The transfer of 250VDC control power to a 4kV Shutdown Board with a diesel generator operating may cause an inadvertent start of a RHRSW pump. [LER 88021/25]

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- L. The 250 V DC RMOV boards have alternate power supplies from another 250 V Unit DC board. For a unit in MODES 1, 2, or 3, the boards are considered inoperable when powered from their alternate feeder breakers because a single failure of the power source could affect both divisions depending on the board alignment.
 - 1. The alternate battery that has been loaded due to the transfer may be considered operable if the controlled drawing restrictions as referenced in P&L W are met.
 - 2. Transfer of individual loads required by the Technical Specifications on the Unit Batteries such as the RPT Logic should be considered inoperable if divisional separation cannot be proven. If transfer of such loads is performed solely due to an inoperable distribution board or source, then Technical Specification LCO 3.0.6 can apply to the loads, however, a distribution LCO must be entered.
 - 3. For a unit in MODE 4 or 5, the DC boards can be placed on their alternate feeder breakers and considered OPERABLE as long as the restrictions on the associated drawings are met.
- M. A 250V DC unit battery charger should NOT be considered operable if its safety related supply is NOT available. If normal power(safety related supply) is available but the charger is on its alternate supply it is still considered operable.
- N. When a 250V RMOV board is transferred to the alternate supply (except for 2B 250V DC RMOV Bd), both divisions (I and II) will be supplied from the same source.
- O. Battery Boards should be unloaded before removing Battery or Battery Charger from service, unless the evolution is of short duration (i.e. transferring battery chargers) or plant conditions warrant otherwise.
- P. A critical voltage for any cell is 2.13 volts. Prolonged operation of a cell below 2.13 volts will reduce its life expectancy. However it is NOT unusual for a replacement cell to measure 2.07 volts (on float charge) and to slowly rise in voltage over a 3 month period to normal float voltage ranges.
- Q. Any Battery suspected to have been discharged shall be recharged immediately to prevent battery damage.
- R. The 250V spare battery charger shall be stored in the seismic restraint at all times unless the charger is being transported to another location.
- S. Battery Board 1 is the only EQ power supply to Unit 2 ADS valves 1-5 and 1-34. Valves 1-5 and 1-34 are still considered operable when on there alternate power supply.

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3.0 PRECAUTIONS AND LIMITATIONS (continued)

- T. ^[III/F] To prevent the interruption of test equipment and chemical analyses, the Radiochemical Lab (RCL) shall be notified prior to transferring the power supply to Battery Board 2. ^[II-B-91-056]
- U. Environmental calculations assume battery ambient temperatures at 60° to 110°F for all batteries except Shutdown Board 3EB and DG batteries which are 40°F - 110°F.
- V. ^[CAQR/C] Unless the spare and normal 48V Annunciator battery chargers are operated in parallel, a discharged battery CANNOT be recharged within 12 hours while supplying normal loads. ^[CAQR BFP 880827]
- W. Plant controlled drawings document restrictions on Unit 1, 2, & 3 loads which could adversely affect Unit 1, 2, 3 Safe Shutdown capability based on Nuclear Engineering calculations for plant configurations. Due to these restrictions operators must check the restrictions on the associated prints prior to manipulating the following loads.

BOARD	Drawing No.
250V Battery Bd 1	1-45E701-3
250V Battery Bd 2	2-45E702-4
250V Battery Bd 3	3-45E703-3
250V Battery Bd 4	0-45E704
250V Battery Bd 5	0-45E704-1
250V Battery Bd 6	0-45E704-2
250V RMOV Bd 1A	1-45E712-1
250V RMOV Bd 1B	1-45E712-2
250V RMOV Bd 1C	1-45E712-3
250V RMOV Bd 2A	2-45E712-1
250V RMOV Bd 2B	2-45E712-2
250V RMOV Bd 2C	2-45E712-3
250V RMOV Bd 3A	3-45E712-1
250V RMOV Bd 3B	3-45E712-2
250V RMOV Bd 3C	3-45E712-3

BFN Unit 0	DC Electrical System	0-OI-57D Rev. 0114 Page 39 of 241
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5.2.2 Placing the 250V Battery Charger 2A in Service to Battery Board 2

- [1] **VERIFY** 250V Battery 2 is in service in accordance with Section 5.1. ☐
- [2] **REVIEW** all Precautions and Limitations in Section 3.0. ☐
- [3] **VERIFY** the following AC source breakers are CLOSED:
 - Normal Source
480V SD Bd 2A, Compt 6D, 2-BKR-248-0002A/6D ☐
 - Alternate Source
(Charger Service Bus) 480V Common Bd 1, Compt 3A, 0-BKR-215-0001/03A ☐
- [4] **PERFORM** the following in Battery Board Room 2:
 - [4.1] **VERIFY** that DC BUS FILTER CAPACITORS U-2, 0-BKR-280-0002/711 is ON. ☐

NOTE

BATTERY CHARGER 2A INPUT TRANSFER SWITCH, 2-XSW-248-0002AA has a mechanical interlock that prevents closing both input supply breakers simultaneously on Battery Charger 2A.

- [4.2] **IF** the NORMAL SUPPLY INPUT FROM 480V SD BD 2A/6D, 2-BKR-248-0002AA is the desired AC power source, **THEN**

ALIGN BATTERY CHARGER 2A INPUT TRANSFER SWITCH, 2-XSW-248-0002AA, **AND CLOSE** the NORMAL SUPPLY INPUT FROM 480V SD BD 2A/6D, 2-BKR-248-0002AA. ☐

BFN Unit 0	DC Electrical System	0-OI-57D Rev. 0114 Page 40 of 241
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5.2.2 Placing the 250V Battery Charger 2A in Service to Battery Board 2 (continued)

[4.3] **IF** the ALTERNATE SUPPLY INPUT FROM 480V CMN BD 1/3A, 2-BKR-248-0002AB is the desired AC power source, **THEN**

ALIGN BATTERY CHARGER 2A INPUT TRANSFER SWITCH, 2-XSW-248-0002AA, **AND CLOSE** the ALTERNATE SUPPLY INPUT FROM 480V CMN BD 1/3A, 2-BKR-248-0002AB. ☐

[4.4] **VERIFY** the 250V BAT CHGR 2A DISCT FROM BAT BD 2 NORM FDR, 0-BKR-280-0002/608 on Battery Board 2 is ON. ☐

[5] **IF** the 250V BATTERY CHARGER 2B, 0-CHGA-248-0002B is supplying power to Battery Board 2 **AND** a transfer to 250V BATTERY CHARGER 2A, 2-CHGA-248-0002A is desired, **THEN**

[5.1] **PLACE** the 2B Battery Charger POWER ON, 0-HS-248-0002B switch to OFF. ☐

[5.2] **PLACE** the DC BREAKER, 0-BKR-248-0002B/DC on front of 250V Battery Charger 2B to OFF. ☐

[5.3] **PLACE** the following AC input supply breakers on front of 250V Battery Charger 2B to OFF:

- NORMAL SUPPLY INPUT FROM 480V SD BD 2B/6D, 0-BKR-248-0002BA ☐

- ALTERNATE SUPPLY INPUT FROM 480V CMN BD 1/3A, 0-BKR-248-0002BB ☐

[5.4] **PLACE** the following 2B BATTERY CHARGER OUTPUT TRANSFER SWITCH 2B, 0-XSW-248-0002B breaker to OFF:

- TO BATTERY BD 2 BKR 607 ☐

BFN Unit 0	DC Electrical System	0-OI-57D Rev. 0114 Page 41 of 241
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5.2.2 Placing the 250V Battery Charger 2A in Service to Battery Board 2 (continued)

NOTE

BATTERY CHARGER 2A OUTPUT TRANSFER SWITCH, 2-XSW-248-0002A has a mechanical interlock that prevents closing output supply breakers simultaneously. OUTPUT XFER SW, 2-BKR-248-0002AD and OUTPUT XFER SW, 2-BKR-248-000AC are spare output supply breakers.

- [6] **ALIGN** BATTERY CHARGER 2A OUTPUT TRANSFER SWITCH, 2-XSW-248-0002A on 250V Battery Charger 2A Output Transfer Switch Panel to OUTPUT XFER SW TO BKR 608, 2-BKR-248-0002AE. ☐
- [6.1] **PLACE** OUTPUT XFER SW TO BKR 608, 2-BKR-248-0002AE ON. ☐
- [7] **PLACE** the POWER ON, 2-HS-248-0002A to ON and allow voltage to stabilize for approximately 2 minutes. ☐
- [8] **CHECK** DC Voltage stabilized greater than 250 Volts on DC VOLTMETER, 2-EI-248-0002A. ☐
- [9] **CLOSE** the DC BREAKER, 2-BKR-248-0002A/DC on front of Battery Charger 2A, by placing it to ON. ☐

CAUTION

If a charger malfunction occurs, the Normal and Alternate AC Input Supply and DC Breakers should be placed to the OFF position and the Shift Manager informed immediately.

- [10] **WHEN** load shed logic is reset (LOCA signal reset or off-site power restored), **OR IF** fire was in Fire Area 16 and battery control circuit is confirmed to have load shed logic in reset condition, **THEN**

PERFORM the following:

- [10.1] **OPEN** the DC BREAKER, 2-BKR-248-0002A/DC on front of Battery Charger 2A by placing it to OFF. ☐
- [10.2] **PLACE** POWER ON, 2-HS-248-0002A to ON. ☐

BFN Unit 0	DC Electrical System	0-OI-57D Rev. 0114 Page 42 of 241
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5.2.2 Placing the 250V Battery Charger 2A in Service to Battery Board 2 (continued)

- [10.3] **CHECK** DC Voltage stabilized greater than 250 Volts on DC VOLTMETER, 2-EI-248-0002A. ☐
- [10.4] **CLOSE** the DC BREAKER, 2-BKR-248-0002A/DC on front of Battery Charger 2A by placing it to ON. ☐
- [11] **CHECK** the following indications of normal operation on 250V Battery Charger 2A, 2-CHGA-248-0002A:
- DC VOLTMETER, 2-EI-248-0002A greater than 250 Volts ☐
 - DC amps, 2-II-248-0002A less than 300 amps ☐
 - POWER ON, 2-IL-248-0002AA light illuminated ☐
 - TRANSFORMER OVER TEMPERATURE, 2-IL-248-0002AB light extinguished ☐
 - DC OVER VOLTAGE, 2-IL-248-0002AC light extinguished ☐
 - DC UNDER VOLTAGE, 2-IL-248-0002AD light extinguished ☐
 - AC UNDER VOLTAGE, 2-IL-248-0002AE light extinguished ☐
- [12] **VERIFY** that EQUALIZE TIMER, 2-TMR-248-0002A is set to zero. ☐
- [13] **CHECK** 250V DC Battery Charger 2A is supplying power to the bus by observing DC amps, 2-II-248-0002A indication greater than zero amps. ☐
- [14] **IF** the 250V Battery Board 2 is unloaded, **THEN**
- LOAD** the Battery Board IAW 2-SR-3.8.4.4(MB-2). ☐

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 66

TITLE: 2-EOI APPENDIX 16E - BYPASSING HPCI HIGH
SUPPRESSION POOL WATER LEVEL SUCTION TRANSFER
INTERLOCK

SUBMITTED BY:

Robert Fusi

DATE:

1/3/08

VALIDATED BY:

DATE:

APPROVED:

E Robert Fusi
TRAINING

DATE:

1/4/08

PLANT CONCURRENCE:

[Signature]
OPERATIONS

DATE:

1/4/08

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
2	2/8/95	1,2,3,4	REVISE TO NEW FORMAT
3	10/30/96	4, 10	ADDED NON-CRITICAL STEPS ON TOUCH STAAR AND SAFETY, CHANGED ASOS TO SM, DELETED UNDERSTAND.
4	11/04/99	ALL	FORMAT DOCUMENT, CHANGED MGT. EXPECT. TO PLANT WORK EXPECT., ADDED NON- CRIT. STEP 3-WAY COMM., ADDED NEW SAT/UNSAT/NA COMMENTS.
5	8/20/03	ALL	FORMAT; EDITORIAL; PROCEDURE REV

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 66

TASK NUMBER: U-000-EM-70

TASK TITLE: BYPASS HPCI HIGH SUPPRESSION POOL WATER LEVEL
SUCTION TRANSFER INTERLOCK IN ACCORDANCE WITH EOI
APPENDIX 16E.

K/A NUMBER: 295029EA1.01 K/A RATING: RO3.4 SRO: 3.5

TASK STANDARD: PERFORM OPERATIONS NECESSARY TO BYPASS HPCI HIGH
SUPPRESSION POOL LEVEL SUCTION TRANSFER AS DIRECTED
BY 2-EOI APPENDIX 16E.

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT X CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 2-EOI-APPENDIX 16E, REV 3

VALIDATION TIME: CONTROL ROOM: 6:00 LOCAL: 3:00

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

PERFORMANCE TIME: ____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. SELF CHECKING may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. Observe ALL plant radiological and safety precautions. I will provide initiating cues and indicate any steps to be discussed. 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 a Unit 2 operator. The Unit 2 reactor has scrambled. EOI-1 has been followed to RC/L-8. 2-EOI-Appendix 7J, Alternate RPV Injection System Lineup - HPCI Using Auxiliary Steam, is in progress.

INITIATING CUES: The Unit Supervisor has directed you to bypass the HPCI Suppression Pool Level Suction Transfer Interlock as directed by 2-EOI Appendix 16E.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required
EOI Appendix.

Standard:

IDENTIFIED OR OBTAINED copy of 2-EOI Appendix 16E.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

1. **NOTIFY** Unit Operator and **CONTINUE** in this procedure.

Standard:

SIMULATED NOTIFYING Unit Operator and **CONTINUED** in this
procedure.

SAT___ UNSAT___ N/A___ COMMENTS:_____

**CUE: [WHEN CONTACTED] UNIT 2 OPERATOR ACKNOWLEDGES,
"CONTINUING WITH 2-EOI-APPENDIX 16E".**

Performance Step: Critical___ Not Critical X

2. **REFER TO** Attachment 1 and **OBTAIN** necessary tools and equipment.

Standard:

REFERRED to Attachment 1 and **SIMULATED OBTAINING** pliers, tape, and screwdriver from the EOI Equipment Storage Box in Unit 2 Aux Instrument Room.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

3. **LOCATE** terminal strip CC inside Panel 9-39, Rear.

Standard:

LOCATED terminal strip CC inside Panel 9-39.

SAT___ UNSAT___ N/A___ COMMENTS:_____

<u>Performance Step:</u>	<u>Critical</u>	<u>X</u>	<u>Not Critical</u>
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4. **LOCATE** white wire and gray wire attached to terminal CC-13.

Standard:

LOCATED white wire and grey wire on terminal CC-13.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step:	Critical X	Not Critical
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5. **REMOVE** terminal screw at terminal CC-13 WHILE holding white wire with needle-nose pliers.

Standard:

SIMULATED REMOVING terminal screw while holding white wire with needle-nose pliers.

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN SIMULATED] THE TERMINAL SCREW HAS BEEN REMOVED FROM TERMINAL CC-13 AND YOU ARE HOLDING THE WHITE WIRE WITH NEEDLE-NOSE PLIERS.

<u>Performance Step:</u>	<u>Critical</u>	<u>X</u>	<u>Not Critical</u>
--------------------------	-----------------	----------	---------------------

6. **REMOVE** and **TAPE** lugged end of white wire lifted from terminal CC-13.

Standard:

SIMULATED removing/taping lugged end of white wire lifted from terminal CC-13.

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN SIMULATED] THE LUGGED END OF THE WHITE WIRE HAS BEEN TAPED.

Performance Step:	Critical	X	Not Critical
-------------------	----------	---	--------------

7. **REPLACE** terminal screw to secure gray wire on CC-13.

Standard:

SIMULATED replacing terminal screw on terminal CC-13 to secure gray wire.

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN SIMULATED] THE GREY WIRE HAS BEEN SECURED ON
TERMINAL CC-13.

Performance Step: Critical___ Not Critical X

8. **NOTIFY** Unit Operator that HPCI High Suppression Pool Water Level Suction Transfer Interlock is bypassed.

Standard:

NOTIFIED UO that HPCI High Suppression Pool Water Level Suction Transfer Interlock is bypassed.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: [WHEN SIMULATED] UNIT 2 OPERATOR ACKNOWLEDGES HPCI HIGH SUPPRESSION POOL WATER LEVEL SUCTION TRANSFER INTERLOCK BYPASSED.

END OF TASK

STOP TIME: _____

GENERIC WORK PRACTICES

Performance Step: Critical___ Not Critical X

PERFORMER complied with all safety rules and regulations.

Standard:

PERFORMER complied with all safety rules and regulations (hardhat, safety glasses, sideshields, and hearing protection was worn **AS REQUIRED.**)

ELECTRICAL SAFETY was also adhered to **AS REQUIRED:** Exposed conductive articles such as rings, metal wristwatches, bracelets, and metal necklaces shall not be worn by employees within reaching distance of exposed energized electrical conductors of 50 volts or greater.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated proper radiological practices **AS REQUIRED.**

Standard:

PERFORMER applied proper radiological practices, **AS REQUIRED**, during JPM performance.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of SELF CHECKING during this JPM.

Standard:

PERFORMER verified applicable components by utilizing SELF CHECKING in accordance with plant standards.

SAT___ UNSAT___ N/A ___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION in accordance with plant standards.

SAT___ UNSAT___ N/A ___ COMMENTS:_____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. SELF CHECKING may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. Observe ALL plant radiological and safety precautions. I will provide initiating cues and indicate any steps to be discussed. 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 a Unit 2 operator. The Unit 2 reactor has scrammed. EOI-1 has been followed to RC/L-8. 2-EOI-Appendix 7J, Alternate RPV Injection System Lineup - HPCI Using Auxiliary Steam, is in progress.

INITIATING CUES: The Unit Supervisor has directed you to bypass the HPCI Suppression Pool Level Suction Transfer Interlock as directed by 2-EOI Appendix 16E.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EOI PROGRAM MANUAL SECTION IX

2-EOI APPENDIX-16E

**BYPASSING HPCI HIGH SUPPRESSION POOL
WATER LEVEL SUCTION TRANSFER INTERLOCK**

REVISION 3

PREPARED BY: M. Morrow

PHONE: 3708

RESPONSIBLE ORGANIZATION: Operations

APPROVED BY: A. S. Bhatnagar

EFFECTIVE DATE: 10/26/00

LEVEL OF USE: REFERENCE USE

VALIDATION DATE: 01/08/92

QUALITY-RELATED

HISTORY OF REVISION/REVIEW
2-EOI APPENDIX-16E

<u>REV.</u> <u>NO.</u>	<u>DATE:</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION</u>
0	6/15/92	ALL	New procedure. Necessary to support implementation of Revision 4 EPGs into BFPN EOIs.
1	7/10/92	1	Incorporated Writer's Guide discrepancies, typos, and plant nomenclature discrepancies
2	4/21/93	ALL	Converted from WordPerfect 5.1 to Pagemaker 4.0 to better support desktop publishing capabilities. Deleted a step which returned tools and equipment to EOI Equipment Storage Box for consistency with other procedures. Step 5 action verb changed from Loosen to Remove.
3	10/26/00	All	Converted to MS-Word.

2-EOI APPENDIX-16E**BYPASSING HPCI HIGH SUPPRESSION POOL
WATER LEVEL SUCTION TRANSFER INTERLOCK**

LOCATION: Unit 2 Auxiliary Instrument Room

ATTACHMENTS: 1. Tools and Equipment

(✓)

1. **NOTIFY** Unit Operator and **CONTINUE** in this procedure. _____
2. **REFER** to Attachment 1 and **OBTAIN** necessary tools and equipment. _____
3. **LOCATE** terminal strip CC inside Panel 9-39, Rear. _____
4. **LOCATE** white wire and gray wire attached to terminal CC-13. _____
5. **REMOVE** terminal screw at terminal CC-13 WHILE holding white wire with needle-nose pliers. _____
6. **REMOVE** and **TAPE** lugged end of white wire lifted from terminal CC-13. _____
7. **REPLACE** terminal screw to secure gray wire on CC-13. _____
8. **NOTIFY** Unit Operator that HPCI High Suppression Pool Water Level Suction Transfer Interlock is bypassed. _____

END OF TEXT

TOOLS AND EQUIPMENT:	LOCATION:
<ol style="list-style-type: none">1. Needle-nose pliers2. Electrical tape3. Screwdriver	Unit 2, Auxiliary Instrument Room, EOI Equipment Storage Box.

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 76F
TITLE: RESPOND TO STUCK OPEN SRV

SUBMITTED BY:

Robert M. Gier

DATE:

1/3/08

VALIDATED BY:

DATE:

APPROVED:

Robert L. Luce
TRAINING

DATE:

1/5/08

PLANT CONCURRENCE:

James H. Smith
OPERATIONS

DATE:

1/4/08

* Examination JPMS Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	08/17/07	All	New Procedure

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 76F

TASK NUMBER: U-001-AB-01

TASK TITLE: RESPOND TO MAIN STEAM RELIEF VALVE STUCK OPEN

K/A NUMBER: 239002A2.03 K/A RATING: RO 4.1 SRO: 4.2

TASK STANDARD: PERFORM OPERATION NECESSARY TO RESPOND TO A STUCK
OPEN MSRV AS DIRECTED BY 2-AOI-1-1

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT X CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 2-AOI-1-1, REV 24

VALIDATION TIME: CONTROL ROOM: 5:00 LOCAL: 3:00

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

PERFORMANCE TIME: _____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. SELF CHECKING may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. Observe ALL plant radiological and safety precautions. I will provide initiating cues and indicate any steps to be discussed. 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: U2 is a 100% power. You are an operator. You have been notified that unit 2 has a stuck open relief valve.

INITIATING CUES: The Unit Supervisor has directed you to open breaker(s) or remove fuses for 2-SRV-1-179 in accordance with 2-AOI-1-1, step 4.2.1[7].

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME _____

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required
AOI.

Standard:

IDENTIFIED OR OBTAINED copy of 2-AOI-1-1.

SAT___ UNSAT___ N/A___ COMMENTS: _____

INSTRUCTOR NOTE: Provide student with copy of 2-AOI-1-1. They
already proved they can locate a procedure on the Simulator.

NOTES

- 1) Only the appropriate sections for the stuck open relief valve is required to be performed.
- 2) The ADS valves that have more than one power supply will AUTO TRANSFER on a loss of power, and are NORMAL SEEKING.
- 3) ADS Relief valves with hand-switches on Panel 25-32 are listed below and should be operated from that location first.
- 4) When opening breakers and pulling fuses, opening the breakers is the preferred method when time permits. However, the breakers with multiple locations will require opening each breaker to de-energize the control circuit. In this case, pulling the fuses from Panel 25-32 may be quicker than opening the breakers.

Performance Step: Critical___ Not Critical X

4.2.1 **Attempt to close valve from Panel 9-3: (continued)**

[7] **If** the SRV valve did not close, **THEN**

PERFORM the appropriate section from table below.

RELIEF VALVE	STEP NUMBER	Switch Location	Breaker Location	Fuse Location
SRV 1-4	Step 4.2.2[8]		2A 250 RMCV Bd	Panel 25-32
SRV 1-5	Step 4.2.2[1]	Panel 25-32	Multiple	Panel 25-32
SRV 1-18	Step 4.2.2[9]		2B 250 RMCV Bd	Panel 25-32
SRV 1-19	Step 4.2.2[5]		2B 250 RMCV Bd	2B 250 RMCV Bd
SRV 1-22	Step 4.2.2[2]	Panel 25-32	Multiple	Panel 25-32
SRV 1-23	Step 4.2.2[10]		2C 250 RMCV Bd	Panel 25-32
SRV 1-30	Step 4.2.2[3]	Panel 25-32	Multiple	Panel 25-32
SRV 1-31	Step 4.2.2[6]		2B 250 RMCV Bd	2B 250 RMCV Bd
SRV 1-34	Step 4.2.2[4]	Panel 25-32	Multiple	Panel 25-32
SRV 1-41	Step 4.2.2[11]		2A 250 RMCV Bd	Panel 25-32
SRV 1-42	Step 4.2.2[12]		2B 250 RMCV Bd	Panel 25-32
SRV 1-179	Step 4.2.2[7]		2B 250 RMCV Bd	2B 250 RMCV Bd
SRV 1-180	Step 4.2.2[13]		2C 250 RMCV Bd	Panel 25-32

Standard:

Refers to table and continues at step 4.2.2[7]

SAT___ UNSAT___ N/A___ COMMENTS:_____

<u>Performance Step:</u>	Critical <u>X</u>	Not Critical <u> </u>
1. Review the project plan and scope.		
2. Identify the key stakeholders and their roles.		
3. Develop a communication plan.		
4. Establish a baseline for project performance.		
5. Monitor project progress and performance.		
6. Report project status to stakeholders.		
7. Review project performance and adjust the plan as needed.		

4.2.2 Attempt to close valve from outside the control room: (continued)

NOTES

- 1) 2-PCV-1-179 is an ADS valve.
- 2) 2-PCV-1-179 controls have been removed from Panel 25-32.
- 3) Attachment 1 may be addressed for fuse and breaker information.

[7] **IF** 2-PCV-1-179 is NOT closed, **THEN**

PERFORM the following: (Otherwise N/A this section)

[7.1] **REMOVE** the power from 2-PCV-1-179 by performing one of the following: (otherwise N/A)

A. **OPEN** the following breaker (Preferred method)

- 2B 250v RMOV , compartment 8C2

OR

B. In 2B 250v RMOV, compartment R8A (backside)

PULL the following fuses as necessary

- Fuse FU2-1-179 (1FU and 2FU)

Standard:

OPENS breaker 8C2 at 2B 250v RMOV bd OR PULLS fuses 1FU and 2FU (FU2-1-179) at 2B 250v RMOV bd compt R8A.

SAT	UNSAT	N/A	COMMENTS:
-----	-------	-----	-----------

CUES: (IF THE BREAKER IS OPENED) 8C2 BREAKER IS OPEN.

OR

(IF FUSES PULLED) FU2-1-179 1FU AND 2FU HAVE BEEN REMOVED.

Performance Step:	Critical	X	Not Critical
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4.2.2 Attempt to close valve from outside the control room: (continued)

[7.2] **IF** the valve does **NOT** close, **THEN**

CLOSE breaker or **REINSTALL** fuses removed in step 4.2.2[7.1].

Standard:

Calls control room to determine if valve closed or remains open, and upon discovering the valve is still open, recloses the breaker or reinstalls fuses (Critical). Notifies Control Room after breaker closed or fuses installed (Not Critical)

CUE: (WHEN CONTROL ROOM IS CALLED) SRV 1-179 IS STILL OPEN.

(FAILURE TO RECLOSE THE BREAKER OR REPLACE FUSES WILL CONSTITUTE FAILURE OF THIS CRITICAL STEP)

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

END OF TASK

STOP TIME

GENERIC WORK PRACTICES

Performance Step: Critical___ Not Critical X

PERFORMER complied with all safety rules and regulations.

Standard:

PERFORMER complied with all safety rules and regulations (hardhat, safety glasses, sideshields, and hearing protection was worn **AS REQUIRED.**)

ELECTRICAL SAFETY was also adhered to **AS REQUIRED:** Exposed conductive articles such as rings, metal wristwatches, bracelets, and metal necklaces shall not be worn by employees within reaching distance of exposed energized electrical conductors of 50 volts or greater.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated proper radiological practices **AS REQUIRED.**

Standard:

PERFORMER applied proper radiological practices, **AS REQUIRED**, during JPM performance.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of SELF CHECKING during this JPM.

Standard:

PERFORMER verified applicable components by utilizing SELF CHECKING in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

STUDENT HANDOUT

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. SELF CHECKING may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. Observe ALL plant radiological and safety precautions. I will provide initiating cues and indicate any steps to be discussed. 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: U2 is a 100% power. You are an operator. You have been notified that unit 2 has a stuck open relief valve.

INITIATING CUES: The Unit Supervisor has directed you to open breaker(s) or remove fuses for 2-SRV-1-179 in accordance with 2-AOI-1-1.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!



Browns Ferry Nuclear Plant

Unit 2

Abnormal Operating Instruction

2-AOI-1-1

Relief Valve Stuck Open

Revision 0024

Quality Related

Level of Use: Continuous Use

Effective Date: 12-19-2005

Responsible Organization: OPS, Operations

Prepared By: Keith Smith

Approved By: Jeffery A. Kimberlin

BFN Unit 2	Relief Valve Stuck Open	2-AOI-1-1 Rev. 0024 Page 6 of 28
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4.2.1 Attempt to close valve from Panel 9-3: (continued)

NOTES	
1)	Only the appropriate sections for the stuck open relief valve is required to be performed.
2)	The ADS valves that have more than one power supply will AUTO TRANSFER on a loss of power, and are NORMAL SEEKING.
3)	ADS Relief valves with hand-switches on Panel 25-32 are listed below and should be operated from that location first.
4)	When opening breakers and pulling fuses, opening the breakers is the preferred method when time permits. However, the breakers with multiple locations will require opening each breaker to de-energize the control circuit. In this case, pulling the fuses from Panel 25-32 may be quicker than opening the breakers.

[7] IF the SRV valve did not close, THEN

PERFORM the appropriate section from table below.



RELIEF VALVE	STEP NUMBER	Switch Location	Breaker Location	Fuse Location
SRV 1-4	Step 4.2.2[8]		2A 250 RMOV Bd	Panel 25-32
SRV 1-5	Step 4.2.2[1]	Panel 25-32	Multiple	Panel 25-32
SRV 1-18	Step 4.2.2[9]		2B 250 RMOV Bd	Panel 25-32
SRV 1-19	Step 4.2.2[5]		2B 250 RMOV Bd	2B 250 RMOV Bd
SRV 1-22	Step 4.2.2[2]	Panel 25-32	Multiple	Panel 25-32
SRV 1-23	Step 4.2.2[10]		2C 250 RMOV Bd	Panel 25-32
SRV 1-30	Step 4.2.2[3]	Panel 25-32	Multiple	Panel 25-32
SRV 1-31	Step 4.2.2[6]		2B 250 RMOV Bd	2B 250 RMOV Bd
SRV 1-34	Step 4.2.2[4]	Panel 25-32	Multiple	Panel 25-32
SRV 1-41	Step 4.2.2[11]		2A 250 RMOV Bd	Panel 25-32
SRV 1-42	Step 4.2.2[12]		2B 250 RMOV Bd	Panel 25-32
SRV 1-179	Step 4.2.2[7]		2B 250 RMOV Bd	2B 250 RMOV Bd
SRV 1-180	Step 4.2.2[13]		2C 250 RMOV Bd	Panel 25-32

BFN Unit 2	Relief Valve Stuck Open	2-AOI-1-1 Rev. 0024 Page 17 of 28
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**4.2.2 Attempt to close valve from outside the control room:
(continued)**

NOTES

- 1) 2-PCV-1-179 is an ADS Valve
- 2) 2-PCV-1-179 controls have been removed from Panel 25-32.
- 3) Attachment 1 may be address for fuse and breaker information.

[7] **IF** 2-PCV-1-179 is NOT closed, **THEN**

PERFORM the following: (Otherwise N/A this section.)

[7.1] **REMOVE** the power from 2-PCV-1-179 by performing one of the following: (Otherwise N/A):

A. **OPEN** the following breaker (Preferred method)

- 2B 250V RMOV, compartment 8C2 ☐

OR

B. In 2B 250V RMOV, compartment R8A (backside)

PULL the following fuses as necessary

- Fuse FU2-1-179 (1FU and 2FU) ☐

[7.2] **IF** the valve does **NOT** close, **THEN**

CLOSE breaker or **REINSTALL** fuses removed in Step 4.2.2[7.1]. ☐

[7.3] **CONTINUE** at Step 4.2.3. ☐

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 8

TITLE: 2-EOI APPENDIX 1B - VENT AND REPRESSURIZE THE
SCRAM PILOT AIR HEADER

SUBMITTED BY: *Randy Scur* DATE: 1/3/08

VALIDATED BY: _____ DATE: _____

APPROVED: *E. Robert Lucci* DATE: 1/5/08
TRAINING

PLANT CONCURRENCE: *[Signature]* DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
3	11/30/94	1,2,3,4	REVISE TO NEW FORMAT
4	11/7/96	4, 5, 10	ADDED NON-CRITICAL STEPS ON TOUCH STAAR AND SAFETY, CHANGED ASOS TO US.
5	09/15/97	ALL	FORMAT AND PROCEDURE UPGRADE, CHANGED MGT EXPECTATIONS TO PLANT WORK EXPECTATIONS, ADDED 3-WAY COMM.
6	10/28/98	4	GENERAL REVISION
7	8/25/02	ALL	GENERAL REVISION
8	10/2/05	All	General Revision
9	8/31/07	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 8

TASK NUMBER: U-000-EM-20

TASK TITLE: VENT AND REPRESSURIZE THE SCRAM PILOT AIR HEADER
IN ACCORDANCE WITH EOI APPENDIX 1B

K/A NUMBER: 295015AA1.01 K/A RATING: RO 3.8 SRO: 3.9

TASK STANDARD: SIMULATE COMPONENT MANIPULATIONS REQUIRED TO VENT
AND SUBSEQUENTLY REPRESSURIZE THE SCRAM PILOT AIR
HEADER AS DIRECTED BY EOI APPENDIX 1B

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT X CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 2-EOI-APPENDIX 1B, REV 4

VALIDATION TIME: CONTROL ROOM: 10.00 LOCAL: 7:00

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

PERFORMANCE TIME: ____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. Touch STAAR may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. I will provide initiating cues and indicate any steps to be discussed. 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 operator. The Unit 2 reactor has scrammed and all control rods failed to insert to position 02. EOI-1 has been entered and followed to RC/Q-23.

INITIATING CUES: The UNIT SUPERVISOR has directed you to perform 2-EOI Appendix 1B, VENTING AND REPRESSURIZING THE SCRAM PILOT AIR HEADER.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME _____

Performance Step: Critical___ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required procedure.

Standard:

IDENTIFIED OR OBTAINED copy of 2-EOI Appendix 1B.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

1. **NOTIFY** the Unit Operator and **CONTINUE** in this procedure.

NOTE: A ladder may be required to perform the following step. REFER TO Tools and Equipment, Attachment 1.

Standard:

SIMULATED NOTIFYING Unit 2 Operator by phone or radio that procedure is being performed.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical X Not Critical _____

2. **CLOSE** 2-085-0331, CONT AIR SPLY HDR SOV (RB North wall,
near Scram Air Header Pressure Regulators).

Standard:

LOCATED AND SIMULATED CLOSING 2-085-0331.

CUE: THE HANDWHEEL IS TURNING, THE STEM IS MOVING INWARD.


PAUSE

THE HANDWHEEL IS SNUG, THE STEM HAS STOPPED MOVING.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

Performance Step: Critical X Not Critical _____

3. **OPEN** INSTR DRAIN VLVS for the following
pressure switch and gauge (located on Panel 2-25-18,
East end):

VALVE  2-DRIV-085-0038A, (2-PS-085-0038, CRD SCRAM
PILOT AIR HEADER PRESS.

Standard:

LOCATED AND SIMULATED OPENING instrument drain valve 2-DRIV-
085-0038A for 2-PS-085-0038.

CUE: THE HANDWHEEL IS TURNING, THE STEM IS MOVING OUTWARD.

PAUSE

THE HANDWHEEL IS SNUG, THE STEM HAS STOPPED MOVING.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

*

Critical	X	Not Critical

2-DRIV-085-0038B (2-PI-085-0038, CRD SCRAM
VALVE PILOT AIRHEADER PRESS).

Standard:

LOCATED AND SIMULATED OPENING instrument drain valve 2-DRIV-085-0038B for 2-PI-085-0038.

CUE: THE HANDWHEEL IS TURNING, THE STEM IS MOVING OUTWARD.

PAUSE

THE HANDWHEEL IS SNUG, THE STEM HAS STOPPED MOVING.

SAT	UNSAT	N/A	COMMENTS:

CUE: 2-PI-85-38 INDICATES 0 PSIG.

Performance Step: Critical _____ Not Critical X

4. WHEN...2-PI-085-0038, CRD SCRAM VALVE PILOT AIR HEADER
PRESS, indicates 0 psig,

THEN...**NOTIFY** Unit 2 Operator.

Standard:

SIMULATED NOTIFYING Unit 2 Operator by phone or radio that 2-
PI-085-0038 indicates 0 psig.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

CUE: THE UNIT SUPERVISOR HAS DIRECTED REPRESSURIZING THE
SCRAM PILOT AIR HEADER

<u>Performance Step:</u>	Critical	X	Not Critical
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5. WHEN...UNIT SUPRVR. directs repressurizing Scram Pilot Air Header,
THEN...**REPRESSURIZE** the Scram Pilot Air Header as follows:

- a. **CLOSE** the two INST DRAIN VLVS for the following:

 2-DRIV-085-0038A (2-PS-085-0038, CRD SCRAM VALVE PILOT AIR HEADER PRESS).

Standard:

SIMULATED CLOSING 2-DRIV-085-0038A for 2-PS-085-0038.


CUE: THE HANDWHEEL IS TURNING, THE STEM IS MOVING INWARD.

PAUSE

THE HANDWHEEL IS SNUG, THE STEM HAS STOPPED MOVING.

SAT	UNSAT	N/A	COMMENTS:

Performance Step: Critical X Not Critical _____

 2-DRIV-085-0038B (2-PI-085-0038, CRD SCRAM VALVE
PILOT AIR HEADER PRESS).

Standard:

SIMULATED CLOSING 2-DRIV-085-0038B for 2-PI-085-0038.

CUE: THE HANDWHEEL IS TURNING, THE STEM IS MOVING INWARD.

PAUSE

THE HANDWHEEL IS SNUG, THE STEM HAS STOPPED MOVING.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

<u>Performance Step:</u>	Critical	X	Not Critical
--------------------------	----------	---	--------------

NOTE: A ladder may be required to perform the following step. REFER TO Tools and Equipment, Attachment 1.

b. **SLOWLY OPEN** 2-SHV-085-0331, CONT AIR SPLY HDR SOV.

Standard:

SIMULATED SLOWLY OPENING 2-SHV-085-0331.

CUE: THE HANDWHEEL IS TURNING, THE STEM IS MOVING OUTWARD.

PAUSE

THE HANDWHEEL IS SNUG, THE STEM HAS STOPPED MOVING.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

CUE: 2-PI-85-38 INDICATES 73 PSIG.

Performance Step: Critical___ Not Critical X

6. WHEN...Scram Pilot Air Header is re-pressurized,
THEN...**NOTIFY** Unit Operator.

Standard:

NOTIFIED Unit 2 Operator by phone or radio that scram pilot
air header is re-pressurized.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

PERFORMER complied with all safety rules and regulations.

Standard:

PERFORMER complied with all safety rules and regulations
(hardhat, safety glasses, sideshields, and hearing protection
was worn **AS REQUIRED**.) (INSTRUCTOR determines if N/A due to
plant conditions)

ELECTRICAL SAFETY was also adhered to: Exposed conductive
articles such as rings, metal wristwatches, bracelets, and
metal necklaces shall not be worn by employees within
reaching distance of exposed energized electrical
conductors of 50 volts or greater.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical_X___

PERFORMER demonstrated the use of TOUCH STAAR during this JPM.

Standard:

PERFORMER verified applicable components by utilizing TOUCH STAAR (Standard is subjective and instructor must evaluate the need for additional training on TOUCH STAAR to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:

Performance Step:

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT___ UNSAT___ N/A___ COMMENTS:

END OF TASK

STOP TIME _____

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EOI PROGRAM MANUAL SECTION IX

2-EOI APPENDIX-1B

**VENTING AND REPRESSURIZING
THE SCRAM PILOT AIR HEADER**

REVISION 4

PREPARED BY: M. Morrow

PHONE: 3708

RESPONSIBLE ORGANIZATION: Operations

APPROVED BY: A. S. Bhatnagar

EFFECTIVE DATE: 10/26/00

LEVEL OF USE: REFERENCE USE

VALIDATION DATE: 01/08/92

QUALITY-RELATED

HISTORY OF REVISION/REVIEW
2-EOI APPENDIX-1B

<u>REV. NO.</u>	<u>DATE:</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION</u>
0	6/15/92	ALL	New procedure. Necessary to support implementation of Revision 4 EPGs into BFNP EOIs.
1	7/10/92	ALL	Incorporate Writer's Guide discrepancies, typos, and plant nomenclature discrepancies.
2	4/21/93	ALL	Converted from WordPerfect 5.1 to Pagemaker 4.0 to better support desktop publishing capabilities.
3	6/18/97	1	BFPER 970889 identified areas of potential discrepancies in using ladders. This revision clarifies the EOI ladder locations. Added UNID for INSTR. DRAIN VLVS, 2-DRIV-085-0038A and 0038B.
4	10/26/00	All	Convert to MS Word.

2-EOI APPENDIX-1B**VENTING AND REPRESSURIZING
THE SCRAM PILOT AIR HEADER**

LOCATION: Unit 2 RB NE, El 565 ft, Panel 2-25-18

ATTACHMENTS: 1. Tools and Equipment

(✓)

1. **NOTIFY** Unit Operator and **CONTINUE** in this procedure. _____

NOTE: A ladder may be required to perform the following step. **REFER** to Tools and Equipment, Attachment 1.

2. **CLOSE** 2-SHV-085-0331, CONT AIR SPLY HDR SOV (RB North wall, near Scram Air Header Pressure Regulators). _____
3. **OPEN** INSTR DRAIN VLV for the following pressure switch and gauge (located on Panel 2-25-18, east end):
- 2-DRIV-085-0038A (2-PS-085-0038, CRD SCRAM VALVE PILOT AIR HEADER PRESS) _____
 - 2-DRIV-085-0038B (2-PI-085-0038, CRD SCRAM VALVE PILOT AIR HEADER PRESS) _____
4. WHEN ... 2-PI-085-0038, CRD SCRAM VALVE PILOT AIR HEADER PRESS, indicates 0 psig,
THEN ... **NOTIFY** Unit 2 Operator. _____
5. WHEN ... Unit Supervisor directs re-pressurizing Scram Pilot Air Header,
THEN ... **REPRESSURIZE** the Scram Pilot Air Header as follows:
- a. **CLOSE** the two INSTR DRAIN VLVS for the following:
- 2-DRIV-085-0038A (2-PS-085-0038, CRD SCRAM VALVE PILOT AIR HEADER PRESS) _____
 - 2-DRIV-085-0038B (2-PI-085-0038, CRD SCRAM VALVE PILOT AIR HEADER PRESS). _____

NOTE: A ladder may be required to perform the following step. **REFER** to Tools and Equipment, Attachment 1.

- b. **SLOWLY OPEN** 2-SHV-085-0331, CONT AIR SPLY HDR SOV. _____
6. WHEN ... Scram Pilot Air Header is re-pressurized,
THEN ... **NOTIFY** Unit 2 Operator. _____

END OF TEXT

TOOLS AND EQUIPMENT:	LOCATION:
1. 24 ft ladder.	Ladder Station 2-RB-565-1, U2 RB, el 565 R-10, 0-line.

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 311

TITLE: 3-EOI APPENDIX 1A - REMOVAL AND REPLACEMENT OF RPS
SCRAM SOLENOID FUSES

SUBMITTED BY:



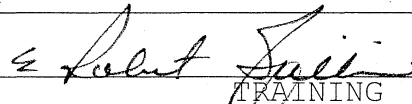
DATE:

1/3/08

VALIDATED BY:

DATE:

APPROVED:


TRAINING

DATE:

1/5/08

PLANT CONCURRENCE:


OPERATIONS

DATE:

1/4/08

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	10/17/95	ALL	NEW JPM
1	11/11/96	4, 11	ADDED NON-CRITICAL STEP ON TOUCH STAAR, CHANGED ASOS TO US.
2	11/04/99	4, 11	CHANGED MGT. EXPECT. TO PLANT WORK EXPECT., ADDED NON-CRITICAL STEP 3-WAY COMM., FORMAT DOCUMENT
3	10/16/00	ALL	GENERAL REVISION
4	10/02/01	ALL	PROCEDURE REVISION
5	09/18/03	ALL	EDITORIAL; FORMAT
6	11/27/05	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: 311

TASK NUMBER: U-000-EM-19

TASK TITLE: EOI APPENDIX 1A - REMOVAL AND REPLACEMENT OF RPS
SCRAM SOLENOID FUSES

K/A NUMBER: 212000A2.20 K/A RATING: RO 4.1 SRO: 4.2

TASK STANDARD: SIMULATE REMOVING EIGHT (8) SCRAM SOLENOID FUSES
AS DIRECTED BY APPENDIX 1A

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT X CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 3-EOI APPENDIX 1A, REV 1

VALIDATION TIME: _____ CONTROL ROOM: _____ LOCAL: 6:00
MAX. TIME ALLOWED: _____ (Completed for Time Critical JPMS only)

PERFORMANCE TIME: _____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: **SATISFACTORY** _____ **UNSATISFACTORY** _____

SIGNATURE: _____ DATE: _____
EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. SELF CHECKING may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. Observe ALL plant radiological and safety precautions. I will provide initiating cues and indicate any steps to be discussed. 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 the Extra Operator. The Unit 3 reactor has scrammed and all control rods did not fully insert. All eight scram solenoid lights on Panel 9-5 are still illuminated. EOI-1 has been entered and followed to RC/Q-21.

INITIATING CUES: The Unit 3 "UNIT SUPERVISOR" has directed you to remove the RPS scram solenoid fuses in accordance with 3-EOI Appendix 1A.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

START TIME _____

Performance Step: Critical___ Not Critical_X

WHEN REQUESTED BY EXAMINER identify/obtain copy of the
required procedure.

Standard:

IDENTIFIED OR OBTAINED copy of 3-EOI Appendix 1A.

SAT___ UNSAT___ N/A___ COMMENTS: _____

1. **VERIFY CLOSED** Scram Discharge Volume Vent and Drain
Valves at the SCRAM DISCHARGE VOLUME VENT/DRAIN VLVS
display on Panel 9-5.

**CUE: RESPOND AS U3 CONTROL ROOM OPERATOR, "SDV VENTS AND
DRAINS ARE CLOSED."**

2. **DISPATCH** personnel to Unit 3 Auxiliary Instrument Room
to perform the following:

Performance Step: Critical___ Not Critical X

- a. **REFER TO** Attachment 1 and **OBTAIN** fuse pullers from
EOI Equipment Storage box.

Standard:

REFERRED to Attachment 1 and **SIMULATED** unlocking the EOI
Storage Box and **OBTAINING** fuse pullers from EOI Equipment
Storage box.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: YOU HAVE A SMALL FUSE PULLER.

Performance Step: Critical X Not Critical___

- b. **LOCATE** Terminal Strip CC inside Panel 9-15, Bay 2,
Rear.

Standard:

INDICATED location of terminal strip CC inside Panel 3-9-15.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical X Not Critical

- c. **REMOVE** the following fuses (located at the bottom of terminal strip CC, Panel 3-9-15):

RPS BUS "A"

<u>BLOCK</u>	<u>NUMBER</u>	<u>FUSE ID</u>	<u>REMOVED</u>	<u>REPLACED</u>
CC	FOUR (4)	3-FU1-085-0037AA		
CC	FIVE (5)	3-FU1-085-0039A/2		
CC	SIX (6)	3-FU1-085-0039A/3		
CC	SEVEN (7)	3-FU1-085-0039A/4		

Standard:

SIMULATED REMOVING listed fuses.

RPS BUS "A"

<u>BLOCK</u>	<u>NUMBER</u>	<u>FUSE ID</u>	<u>REMOVED</u>	<u>REPLACED</u>
CC	FOUR (4)	3-FU1-085-0037AA		
CC	FIVE (5)	3-FU1-085-0039A/2		
CC	SIX (6)	3-FU1-085-0039A/3		
CC	SEVEN (7)	3-FU1-085-0039A/4		

SAT	UNSAT	N/A	COMMENTS:

CUE: [WHEN PROPER FUSES INDICATED] THE FUSES HAVE BEEN REMOVED.



Performance Step: Critical X Not Critical

- e. **REMOVE** the following fuses (located at the bottom of terminal strip CC, Panel 9-17):

RPS BUS "B"

<u>BLOCK</u>	<u>NUMBER</u>	<u>FUSE ID</u>	<u>REMOVED</u>	<u>REPLACED</u>
CC	FOUR (4)	3-FU1-085-0037BA	<u> </u>	<u> </u>
CC	FIVE (5)	3-FU1-085-0039B/2	<u> </u>	<u> </u>
CC	SIX (6)	3-FU1-085-0039B/3	<u> </u>	<u> </u>
CC	SEVEN (7)	3-FU1-085-0039B/4	<u> </u>	<u> </u>

Standard:

SIMULATED REMOVING listed fuses.

RPS BUS "B"

<u>BLOCK1</u>	<u>NUMBER</u>	<u>FUSE ID</u>	<u>REMOVED</u>	<u>REPLACED</u>
CC	FOUR (4)	3-FU1-085-0037BA	<u> </u>	<u> </u>
CC	FIVE (5)	3-FU1-085-0039B/2	<u> </u>	<u> </u>
CC	SIX (6)	3-FU1-085-0039B/3	<u> </u>	<u> </u>
CC	SEVEN (7)	3-FU1-085-0039B/4	<u> </u>	<u> </u>

SAT UNSAT N/A COMMENTS:

CUE: [WHEN PROPER FUSES INDICATED] THE FUSES HAVE BEEN REMOVED.

Performance Step: Critical____Not Critical X

- f. WHEN...ALL fuses are removed,
THEN...**NOTIFY** the Unit Operator.

Standard:

SIMULATED NOTIFYING Unit 3 Operator after all fuses removed.

SAT____UNSAT____N/A____ COMMENTS:_____

CUE: [UNIT OPERATOR REPEATS BACK] "ALL EIGHT RPS SCRAM
SOLENOID FUSES HAVE BEEN REMOVED PER APPENDIX 1A."
PAUSE
THE UNIT SUPERVISOR DOES NOT WANT THE FUSES REPLACED AT
THIS TIME.

END OF TASK

STOP TIME _____

Performance Step: Critical___ Not Critical X

PERFORMER complied with all safety rules and regulations.

Standard:

PERFORMER complied with all safety rules and regulations (hardhat, safety glasses, sasheshields, and hearing protection was worn **AS REQUIRED.**)

ELECTRICAL SAFETY was also adhered to **AS REQUIRED:** Exposed conductive articles such as rings, metal wristwatches, bracelets, and metal necklaces shall not be worn by employees within reaching distance of exposed energized electrical conductors of 50 volts or greater.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated proper radiological practices **AS REQUIRED.**

Standard:

PERFORMER applied proper radiological practices, **AS REQUIRED**, during JPM performance.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of SELF CHECKING during this JPM.

Standard:

PERFORMER verified applicable components by utilizing SELF CHECKING in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN-PLANT: I will explain the initial conditions and state the task to be performed. ALL STEPS WILL BE SIMULATED. Do NOT operate any plant equipment. SELF CHECKING may be carried out to the point of touching a label. If it becomes necessary to physically touch a control switch, use a non-conductive pointing device. Observe ALL plant radiological and safety precautions. I will provide initiating cues and indicate any steps to be discussed. 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 the Extra Operator. The Unit 3 reactor has scrammed and all control rods did not fully insert. All eight scram solenoid lights on Panel 9-5 are still illuminated. EOI-1 has been entered and followed to RC/Q-21.

INITIATING CUES: The Unit 3 "UNIT SUPERVISOR" has directed you to remove the RPS scram solenoid fuses in accordance with 3-EOI Appendix 1A.

CAUTION: DO NOT OPERATE ANY PLANT EQUIPMENT!

C

C

C

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EOI PROGRAM MANUAL SECTION IX

3-EOI APPENDIX-1A

**REMOVAL AND REPLACEMENT OF
RPS SCRAM SOLENOID FUSES**

REVISION 1

PREPARED BY: M. Morrow

PHONE: 3708

RESPONSIBLE ORGANIZATION: Operations

APPROVED BY: A. S. Bhatnagar

EFFECTIVE DATE: 10/26/00

LEVEL OF USE: REFERENCE USE

VALIDATION DATE: 01/08/92

QUALITY-RELATED

HISTORY OF REVISION/REVIEW
3-EOI APPENDIX-1A

<u>REV.</u> <u>NO.</u>	<u>DATE:</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION</u>
0	7/28/95	ALL	New procedure. Necessary to support implementation of BFNP Unit 3 EOIs.
1	10/26/00	All	Converted to MS-Word.

3-EOI APPENDIX-1A

REMOVAL AND REPLACEMENT OF RPS SCRAM SOLENOID FUSES

LOCATION: Unit 3 Auxiliary Instrument Room

ATTACHMENTS: 1. Tools and Equipment

(✓)

1. **VERIFY CLOSED** Scram Discharge Volume Vent and Drain Valves at the SCRAM DISCH VOL VENT/DRAIN VLVS display on Panel 9-5.
2. **DISPATCH** personnel to Unit 3 Auxiliary Instrument Room to perform the following:
 - a. **REFER TO** Attachment 1 and **OBTAIN** fuse pullers from EOI Equipment Storage box.
 - b. **LOCATE** Terminal Strip CC inside Panel 9-15, Bay 2, Rear.
 - c. **REMOVE** the following fuses (located at bottom of terminal strip CC, Panel 9-15):

RPS BUS "A"

<u>BLOCK</u>	<u>NUMBER</u>	<u>FUSE ID</u>	<u>REMOVED</u>	<u>REPLACED</u>
CC	FOUR (4)	3-FU1-085-0037AA	_____	_____
CC	FIVE (5)	3-FU1-085-0039A/2	_____	_____
CC	SIX (6)	3-FU1-085-0039A/3	_____	_____
CC	SEVEN (7)	3-FU1-085-0039A/4	_____	_____

- d. **LOCATE** Terminal Strip CC inside Panel 9-17, Bay 2, Rear.
- e. **REMOVE** the following fuses (located at bottom of terminal strip CC, Panel 9-17):

RPS BUS "B"

<u>BLOCK</u>	<u>NUMBER</u>	<u>FUSE ID</u>	<u>REMOVED</u>	<u>REPLACED</u>
CC	FOUR (4)	3-FU1-085-0037BA	_____	_____
CC	FIVE (5)	3-FU1-085-0039B/2	_____	_____
CC	SIX (6)	3-FU1-085-0039B/3	_____	_____
CC	SEVEN (7)	3-FU1-085-0039B/4	_____	_____

2. (continued from previous page)

f. WHEN ... ALL fuses are removed,
THEN ... **NOTIFY** Unit Operator. _____

g. WHEN ... SRO directs replacement of the fuses,
THEN ... **REPLACE** fuses listed in Steps 2.c and 2.e. _____

h. WHEN ... ALL fuses are replaced,
THEN ... **NOTIFY** Unit Operator. _____

END OF TEXT


TOOLS AND EQUIPMENT:	LOCATION:
1. Fuse pullers.	Unit 3, Auxiliary Instrument Room, EOI Equipment Storage Box.

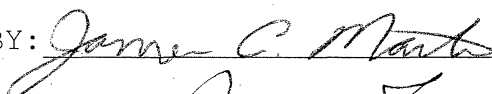
BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 542F

TITLE: Perform 2-SR-3.4.9.3&4 Reactor Recirculation Pump Start
Limitations

ALTERNATE PATH YES X NO

SUBMITTED BY:  DATE: 1/3/08

VALIDATED BY:  DATE: 1/4/08

APPROVED:  DATE: 1/5/08
TRAINING

PLANT CONCURRENCE:  DATE: 1/4/08
OPERATIONS

* Examination JPMS Require Operations Training Manager or
Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	2/26/06	ALL	NEW
1	01/03/08	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: New

JPM TITLE: Perform 2-SR-3.4.9.3&4 Reactor Recirculation Pump
Start Limitations (While in S/D Cooling)

TASK NUMBER: x-068-xx-xx

TASK TITLE: Perform 2-SR-3.4.9.3&4

K/A NUMBER: 2.2.12 K/A RATING: RO 3.0 SRO: 3.4

TASK STANDARD: Upon performing 2-SR-3.4.9.3&4, determine that no
Recirc Pump can be started.

LOCATION OF PERFORMANCE: SIMULATOR ☒ PLANT _____ CONTROL ROOM ☒

REFERENCES/PROCEDURES NEEDED: 2-SR-3.4.9.3&4 Reactor Recirculation
Pump Start Limitations Rev 9

VALIDATION TIME: _____ CONTROL ROOM: _____ LOCAL: _____

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

EXAMINER SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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 the Unit 2 Unit Operator. Unit 2 is in Cold S/D (Mode 4) with Loop II RHR in S/D Cooling and is to remain in service for the time being. RWCU system is tagged for modifications. There are no Recirc Pumps in service at this time. You have been handed a current (verified) copy of 2-SR-3.4.9.3&4 Rev 7, just printed from BSL. You have a contact pyrometer (Omega model HH22, ID# 12345, Cal Due date 6/6/09) and a biddle. The process computer is not available.

INITIATING CUES: The Unit Supervisor has directed you to perform 2-SR-3.4.9.3&4 up through step 7.10 and determine if a Recirc Pump(s) can be started, and if not, give reason it cannot be started.

The following data is available at this instant in time:

Inst/Rcdr	Panel	Pt/Pen	Reading	Inst/Rcdr	Panel	Pt/Pen	Reading
2-TR-68-2	9-4	Red Pen	150 deg	2-TR-56-4	9-47	TE-56-29	121 deg
2-TR-68-2	9-4	Grn Pen	132 deg	2-TR-56-4	9-47	TE-56-30	125 deg
				2-TR-56-4	9-47	TE-56-31	120 deg
2-PI-3-54	9-5	PI-3-54	0 psig	2-TR-56-4	9-47	TE-56-35	110 deg
2-PI-3-61	9-5	PI-3-61	0 psig	2-TR-56-4	9-47	TE-56-8	121 deg
				2-TR-56-4	9-47	TE-56-23	122 deg
2-TR-74-80	9-21	TE-74-9	70 deg	2-TR-56-4	9-47	TE-56-26	124 deg
2-TR-74-80	9-21	TE-74-21	72 deg				
2-TR-74-80	9-21	TE-74-32	182 deg				
2-TR-74-80	9-21	TE-74-43	186 deg				

Local pyrometer reading of the CRD discharge temp by AUO, 120 deg

Performance Step: Critical___ Not Critical X

4.0 PREREQUISITES

- [1] Verify this procedure is the most current revision.
- [2] The following personnel are available to perform this Surveillance Procedure.

Standard:

Examinee signs off step. (Information given in initial conditions)

SAT___ UNSAT___ N/A___ COMMENTS:_____

NOTE: The RWCU Demins are **NOT** required to be in service, however, flow must be passing through the system for the performance of this SR.

Performance Step: Critical___ Not Critical X

- [3] The RWCU system is required to be operating in accordance with (IAW) 2-OI-69 (except as noted above). This assures accurate temperature indication of the reactor coolant in the vessel bottom head (this step may be N/A'd on occasions where the reactor is in Cold Shutdown).

Standard:

Examinee N/A's the step due to RWCU being tagged and being in Cold Shutdown.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

5.0 SPECIAL TOOLS AND EQUIPMENT

Contact Pyrometer (Omega Model HH22 **OR** TEGAM Model 819, **OR** equivalent).

Biddle (If necessary for inop recorder.)

Standard:

Given in the initial conditions.

SAT___ UNSAT___ N/A___ COMMENTS: _____

6.0 ACCEPTANCE CRITERIA

A. Responses which fail to satisfy the following Acceptance Criteria (AC) constitute unsatisfactory Surveillance Procedure results **AND** require immediate notification of the Unit Supervisor (US) at the time of failure.

1. Within 15 minutes prior to starting a Reactor Recirculation Pump the difference between the bottom head coolant temperature **AND** the RPV coolant temperature is required to be $\delta 145^{\circ}\text{F}$.
2. Within 15 minutes prior to starting a Reactor Recirculation Pump in an idle loop the difference in temperature between the coolant temperature in the recirculation loop to be started **AND** the RPV coolant temperature is required to be $\delta 50^{\circ}\text{F}$. In MODE 2 with **BOTH** recirculation pumps **NOT** in operation, the difference may be $\delta 75^{\circ}\text{F}$.

B. Steps which determine the above criteria are designated by (AC) next to the signoff blank.

Standard:

Examinee reads Acceptance Criteria.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

7.0 PROCEDURE STEPS

[1] **VERIFY** that the following initial conditions are satisfied:

[1.1] **VERIFY ALL** precautions **AND** limitations in Section 3.0
have been reviewed.

[1.2] **VERIFY ALL** prerequisites listed in Section 4.0 are
satisfied.

Standard:

Examinee reviews the P&L's in Section 3 and signs off step 7[1.1]
and signs step 7[1.2].

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[2] **RECORD** the start date **AND** time, reason for test, plant
conditions **AND ANY** pre-test remarks on Attachment 1,
Surveillance Procedure Review Form in Section 8.0.

Standard:

Examinee fills out Attachment with date; time; reason for test
(Other - as directed by SRO to start pump); and plant condition
(Cold S/D).

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[3] **RECORD** Recirc Loop temperature(s) in Table 1 **AND**

RECORD the time the Recirc Loop temperature(s) data was taken (**IF** applicable, **THEN**

N/A the loop temperature for the loop **NOT** being started).

Record time _____

Standard:

Examinee records the recirc loop B temperature (132 deg - given in handout), and N/A's recirc loop A temperature (Cannot start recirc pump A with loop II RHR in S/D cooling). And records time.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[4] **RECORD** Reactor Steam Dome pressure in Table 1.

Standard:

Examinee records 0 psig in Table 1 from information given in handout.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[5] **DETERMINE** Reactor Coolant temperature as follows using the first step that satisfies its conditional requirement: (**N/A** the steps **NOT** used.):

[5.1] **IF** the Reactor Coolant System is producing steam,
(in a saturated steam condition) **THEN**

CONVERT Reactor Steam Dome pressure to saturation temperature using Illustration 1 **OR** use computer Point CALCO46 **AND**

RECORD this value in Table 1.

Standard:

Examinee N/A's step 7[5.1] since the reactor is not producing steam and continues to step 7[5.2].

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[5.2] **IF** one Recirculation Loop is in operation **AND** the reactor is **NOT** in Mode 1, **THEN**

RECORD in Table 1 the temperature from the operating Recirc Loop as RPV coolant temperature using the same number recorded in Table 1 by Step 7.0[3].

Standard:

Examinee N/A's step 7[5.2] since no recirc pump is in operation and continues to step 7[5.3].

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[5.3] **IF Shutdown Cooling is in service, THEN**

RECORD the maximum of the following temperatures for the Residual Heat Removal (RHR) Loop in shutdown cooling in Table 1. (N/A those **NOT** in S/D Cooling)

2-TR-74-80-11, RHR HX 2A RHR INLET TE-74-09 ___°F
2-TR-74-80-12, RHR HX 2C RHR INLET TE-74-21 ___°F
2-TR-74-80-13, RHR HX 2B RHR INLET TE-74-32 ___°F
2-TR-74-80-14, RHR HX 2D RHR INLET TE-74-43 ___°F

Standard:

Examinee N/A's TE-74-09 and TE-74-21 (2A & 2C RHR HX since loop I RHR is not in S/D cooling), and records 182 deg and 186 deg for TE-74-32 & TE-74-43 respectively and then records the maximum temperature (186) in Table 1.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

[5.4] **IF the reactor is in cold shutdown at zero pressure with NO forced circulation, THEN**

RECORD 212°F in Table 1.

Standard:

Examinee N/A's step 7[5.4] since step 7[5.3] was the first step to be satisfied and also because there is forced circulation from the S/D cooling loop.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical X

- [6] **DETERMINE** Reactor Bottom Head Drain temperature as follows using **EITHER** step that satisfies its conditional requirement (**N/A** the step **NOT** used):

NOTE

On occasions where recorder 2-TR-56-4 is out of service, **NOTIFY** the IMs to use a Biddle to read 2-TE-56-8. Record the instrument number **AND** cal due date in the remarks section.

[6.1] **IF** RWCU is in service, **THEN**

RECORD 2-TR-56-4, Point 2-TE-56-8 **OR**

RECORD Integrated Computer System (ICS) Point 56-8 as the bottom Head Drain temperature in Table 1.

Standard:

Examinee N/A's step 7[6.1] since the RWCU system is out of service and continues to step 7[6.2].

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

[6.2] IF RWCU is out of service, THEN

PERFORM the following (OTHERWISE, N/A):

[6.2.1] RECORD the following temperatures from
Panel 2-9-47 (OR ICS Point):

2-TR-56-4, TE-56-29 (ICS 56-29) _____°F
2-TR-56-4, TE-56-30 (ICS 56-30) _____°F
2-TR-56-4, TE-56-31 (ICS 56-31) _____°F
2-TR-56-4, TE-56-35 (ICS 56-35) _____°F
2-TR-56-4, TE-56-08 (ICS 56-08) _____°F
2-TR-56-4, TE-56-23 (ICS 56-23) _____°F
2-TR-56-4, TE-56-26 (ICS 56-26) _____°F

Standard:

Examinee records the temperatures as given in student handout:
121, 125, 120, 110, 121, 122, 124, for TE-56-29, 30, 31, 35, 8,
23, and 36 respectively.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical___ Not Critical_X

[6.2.2] **OBTAIN** a temperature reading at the discharge of
the operating CRD pump using a Contact Pyrometer.

Pyrometer ID#_____ Cal Due Date_____

Temperature_____F

Standard:

Examinee records the temperature as given in student handout (120 deg) and provides ID# and Cal due date.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical_X

[6.2.3] **DETERMINE** the minimum of all temperatures
recorded in Steps 7.0[6.2.1] **AND** 7.0[6.2.2], **AND**

ENTER that temperature in Table 1 as the Bottom
Head Drain temperature.

Standard:

Examinee records the minimum temperature (110 deg) in Table 1 as
the bottom head drain temperature.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical_X

- [7] **CALCULATE** the difference between Bottom Head Coolant temperature **AND** the RPV Coolant Temperature by SUBTRACTING Reactor Bottom Head Drain temperature from RPV coolant temperature **AND**

RECORD this value in Table 1. (N/A the other loop on occasions where only one loop is being started).

Standard:

Examinee subtracts 110 (step [7.6]) from 186 (step [7.5]) and records 76 deg in Table 1.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical_X Not Critical___

- [8] **VERIFY** the difference between the Bottom Head Coolant temperature **AND** the RPV Coolant temperature is $\delta 145^{\circ}\text{F}$, **AND**

RECORD the time of verification.

Record time _____

Standard:

Examinee verifies 76 deg is less than 145 deg and signs AC step and records time.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical_X

- [9] **CALCULATE** the difference between the Coolant temperature in the Recirculation Loop to be started **AND** the RPV Coolant temperature by **SUBTRACTING** the Recirculation Loop to be started from the RPV Coolant temperature **AND**

RECORD this value in Table 1. (N/A the other loop on occasions where only one loop is being started).

Standard:

Examinee subtracts B recirc loop temp 132 deg (step [7.3]) from RPV coolant temp 184 deg (step [7.5]) and records 52 deg for B loop.

(It's possible that the student will not realize that recirc pump A cannot be started with RHR loop II in S/D cooling, if so he/she will subtract A recirc loop temp 150 deg (step [7.3]) from RPV coolant temp 184 deg (step [7.5]) and records 34 deg for A loop.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step: Critical X Not Critical

[10] **VERIFY** the difference between the Coolant temperature in the Recirculation Loop to be started the **AND** the RPV Coolant is $\leq 50^{\circ}\text{F}$.

OR

In Mode 2 **AND** Both Recirc Pumps are **NOT** in operation, the difference may be $\leq 75^{\circ}\text{F}$.

Record time

Standard:

Examinee verifies the B recirc pump can NOT be started (>50 deg delta temp and not in mode 2) and verifies the A recirc pump cannot be started (due to RHR loop II in S/D cooling). Notifies the Unit Supervisor that No Recirc pump can be started.

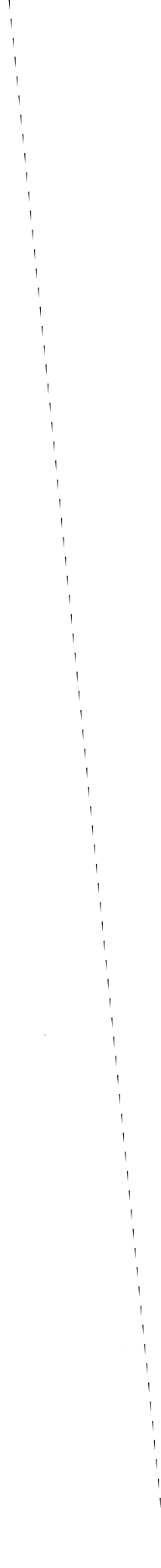
SAT UNSAT N/A COMMENTS:

Stop Time

C

C

C





Browns Ferry Nuclear Plant

Unit 2

Surveillance Procedure

2-SR-3.4.2.1

Jet Pump Mismatch and Operability

Revision 0021

Quality Related

Level of Use: Continuous Use

Effective Date: 05-19-2007

Responsible Organization: OPS, Operations

Prepared By: Keith Smith

Approved By: James McCrary

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 2 of 28
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Current Revision Description

Type of Change: ENHANCEMENTS Tracking Number: 022

PCR's 07002058

PER, DCN, TACF None

Steps 4.0[4] corrected the greater than 25% RTP sign.

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 3 of 28
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1.0 INTRODUCTION

1.1 Purpose

- This pump operability test is performed to verify recirculation loop jet pump flow mismatch for the Recirculation loops which are in service in conformance with the requirements specified in Technical Specification 3.4.1.1 for dual Recirculation loop operation.
- Also this test will determine the integrity of the jet pumps of the Reactor Recirculation System in conformance with the requirements specified in Technical Specifications 3.4.2.1.

1.2 Scope

- This SR is designed to verify jet pump mismatch and to detect significant degradation in jet pump performance that precedes jet pump failure.
- This SR is required to be performed only when the loop has forced recirculation flow.
- The jet pump failure of concern is complete mixer displacement due to jet pump beam failure. Jet pump plugging is also of concern since it adds flow resistance to the recirculation loop.
- This procedure satisfies both SR 3.4.1.1 and SR 3.4.2.1 for dual Recirculation loop operation.
- This procedure satisfies only SR 3.4.2.1 for single Recirculation loop operation.
- The procedure 2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation, satisfies Technical Specification 3.4.1 during single Recirculation loop operation.

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 4 of 28
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NOTES

- 1) SR 3.4.1.1 is not REQUIRED TO BE PERFORMED UNTIL 24 HOURS AFTER BOTH RECIRCULATION LOOPS ARE IN OPERATION.
- 2) SR 3.4.2.1 is not required to be performed until:
 - 4 hours after associated recirculation loop is in operation.

OR

 - 24 hours after > 25% RTP

1.3 Frequency

- A. Recirculation Loop Jet Pump Flow Mismatch (SR 3.4.1.1) if both Recirculation loops are in operation.
 1. Once per 24 hours
- B. Jet Pump Operability (SR 3.4.2.1)
 1. Once per 24 hours

1.4 Applicability

Modes 1 and 2.

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 5 of 28
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2.0 REFERENCES

2.1 Technical Specifications

Sections 3.4.1, Recirculation Loops Operating

Sections 3.4.2, Jet Pumps

2.2 Final Safety Analysis Report

Sections 3.3.4, Description (Reactor Vessel Internals Mechanical Design)

Sections 4.3, Reactor Recirculation System

Sections 7.8.5, Description (Reactor Vessel Instrumentation)

Sections 14.6.3, Loss of Coolant Accident (LOCA)

2.3 Plant Instructions

2-OI-68, Reactor Recirculation System

2-GOI-100-1A, Rx Startup from Cold Shutdown to Power Operations (Unit Startup and Power Operation)

2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation.

2-SR-3.4.1(DLO), Reactor Recirculation System Dual Loop Operation.

2.4 TVA Drawings

2-47E610-68 Series, Mechanical Control Diagram, Reactor Water Recircn System

2-47E817-1 & 2, Flow Diagram, Reactor Water Recirculation

2-47E600-60, Mechanical Instruments and Controls

2.5 Miscellaneous Documents

General Electric SIL 330 and SIL 330 Addenda - Jet Pump Beam Cracks

NUREG/CR - 3052, Closeout of IE Bulletin 80-07: BWR Jet Pump Assembly Failure

Technical Specification Change No. 387, Single Loop Operation (SLO)

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 6 of 28
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3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

- A. No Recirc pump speed changes or Control Rod manipulations are to be made during the performance of this procedure.
- B. Improper instrument calibration can severely affect the data and cause unnecessary failures of the test in this SR.
- C. Refueling activities such as fuel assembly replacement or shuffle, modifications to fuel support, orifice size or core plate bypass flow can affect the relationship between core flow and recirculation loop flow. These relationships may need to be re-established each cycle. During initial weeks of operation under such conditions, while baselining new "established patterns," engineering judgment of daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.

3.2 Operability and LCO's

- A. Technical Specification SR 3.4.2.1 criteria c will not be used in this instruction (Each jet pump flow differs by $\leq 10\%$ from established patterns). This criteria use individual jet pump flows which is not available at BFN. Criteria b is used for plants with differential pressure instrumentation.

3.3 Equipment

- A. The Robicon VFD for each pump and displayed on 2-SI-96-61 (Pump 2A) and 2-SI-96-73 (Pump 2B) or ICS points 96-61 and 96-73. The VFD control system calculates speed indications using the VFD output frequency and motor (pump) load. Based on these parameters the actual motor speed for any output frequency and load can be calculated. Since the speeds are calculated they should be used only if the two actual speed indications provide by the Bentley-Nevada system cannot be obtained.

3.4 Initiation/Isolation/Trips

None

3.5 Interlocks

None

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-----------------------	--	--

3.6 Performance Testing

- A. Turbulence in the Jet Pump diffuser causes the differential pressure signal to be noisy when the pump is in operation. The proper method for recording differential pressure is to take the average of the high and low readings.
- B. Browns Ferry has not operated in single loop for a significant period of time. Therefore, not enough single loop operating data has been obtained. Until operation under such conditions and a baseline data has been obtained the engineering judgment of daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.
- C. System Engineering should be notified to create new graphs when conditions are such that the end of the plotted area is reached.
- D. The illustration graphs in this procedure are created using the data from the computer. During the Operation Cycle, the graphs used in the Illustrations of this procedure changes based upon the core's life.
 - 1. As this occurs an Engineering Judgment/Review should be performed when the graphs fall outside the illustrations to meet the Acceptance Criteria.
 - 2. The Engineering Judgment/Review should establish new graphs to be incorporated into the procedure as time permits.
- E. Step 4.0[4] is used to ensure the Current graphs are updated on a regular basis.
- F. System Engineering should be notified prior to the "Good Thru Date" on any Illustration being exceeded. This will allow System Engineering time to generate new graphs. This date represents 8 months from the date the graphs were created. The graphs can still be used if the "Good Thru Date" is exceeded. The Eight (8) months is used as a guideline and the graphs can be updated on a more frequently if desired.
- G. During startup following a Refueling Outage, the Illustrations are used as a guideline and when enough data is obtained System Engineering will create new Illustrations. The graphs should be used in conjunction with the Engineering Judgment/Review processes.

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 8 of 28
---------------	-----------------------------------	---

Date: _____

4.0 PREREQUISITES

- [1] **VERIFY** that this procedure is the most current revision. _____
- [2] **VERIFY** Reactor recirculation system is in operation in accordance with 2-OI-68, Reactor Recirculation System. _____
- [3] **VERIFY** the listed qualified Personnel are available to perform this surveillance procedure. _____

UO 1 _____

- [4] Using the following Illustration graphs:
 - Illustration 1 - 2A Recirculation Loop Pump Speed VS Recirculation Pump Flow
 - Illustration 2 - 2A Recirculation Pump Speed VS Jet Pump Flow
 - Illustration 3 - 2B Recirculation Loop Pump Speed VS Recirculation Pump Flow
 - Illustration 4 - 2B Recirculation Pump Speed VS Jet Pump Flow
 - Illustration 5 - 2A Jet Pump Differential Pressure VS Total Core Flow
 - Illustration 6 - 2B Jet Pump Differential Pressure VS Total Core Flow

PERFORM the following:

- [4.1] **IF** RTP is > 25% or Section 7.4 is required to be performed, **THEN** _____

VERIFY the graphs on the Illustrations are good as follows: (Otherwise N/A)

- **VERIFY** the "Good Thru Date" on all Illustrations has not been exceeded.

OR

- **IF** the "Good Thru Date" is exceeded on any Illustrations, **THEN**

NOTIFY System Engineering to provide updated Illustration graphs to Operations Procedure. _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 9 of 28
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5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

- A. 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.
- B. Recirculation loop jet pump flow mismatch with both recirculation loops in operation shall be verified by the following criteria [2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation, satisfies Technical Specification 3.4.1 during single Recirculation loop operation]:
 - 1. $\leq 10\%$ of rated core flow when operating at $< 70\%$ of rated core flow (≤ 10.25 Mlb/hr).
 - 2. $\leq 5\%$ of rated core flow when operating at $\geq 70\%$ of rated core flow (≤ 5.12 Mlb/hr).

<p>BFN Unit 2</p>	<p>Jet Pump Mismatch and Operability</p>	<p>2-SR-3.4.2.1 Rev. 0021 Page 10 of 28</p>
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6.0 ACCEPTANCE CRITERIA (continued)

NOTE

If either condition in Step 6.0C.1, 6.0C.2 or 6.0C.3 exists, the Tech Spec Acceptance Criteria would be satisfied. However, failure of either Step 6.0C.1 or 6.0C.2 of the criteria may be an indication of jet pump degradation and shall be immediately reported to the Unit Supervisor.

- C. Jet pump operation shall be checked by verifying that at least one of the following criteria (6.0C.1 or 6.0C.2) is satisfied for each of the operating recirculation loops:
 1. Recirculation pump flow to speed ratio differs by $\leq 5\%$ from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by $\leq 5\%$ from established patterns.
 2. Each jet pump diffuser to lower plenum differential pressure differs by $\leq 20\%$ from established patterns.
 3. Since refueling activities such as fuel assembly replacement or shuffle, modifications to fuel support, orifice size or core plate bypass flow can affect the relationship between core flow, and recirculation loop flow, these relationships may need to be re-established each cycle.
 - a. During initial weeks of operation under such conditions, while baselining new "established patterns," an engineering evaluation of daily surveillance results may be used to meet the Acceptance Criteria for conditions Steps 6.0C.1 and 6.0C.2 above.
 - b. This evaluation is to conclude that daily surveillance results do not indicate significant abnormalities or Jet Pump failure.
 4. After the new baselining has been completed and new "Established Patterns" have been set, methodology for determining the acceptance criteria as being Completed Satisfactorily, as stipulated in Step 6.0C.3 will not be allowed.
- D. Steps which determine the above criteria are designated by (AC) next to the initials blank.

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Date: _____

7.0 PROCEDURE STEPS

7.1 Initial Conditions

[1] **PERFORM** the following checks:

- **CHECK** that all Precautions and Limitations in Section 3.0 have been reviewed. _____
- **CHECK** that all Prerequisites listed in Section 4.0 are satisfied. _____

[2] **OBTAIN** permission from the Unit Supervisor to perform this test. _____

US

[3] [NRC/C] **NOTIFY** the Unit Operator (UO) that this test is commencing. [RPT 82-16, LER 259/8232] _____

[4] **RECORD** the date & time started, plant conditions and any pre-test remarks on Attachment 1, Surveillance Procedure Review Form. _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 12 of 28
---------------	-----------------------------------	--

Date: _____

7.2 Data Collections

7.2.1 Core Power and Flow Readings

- [1] **RECORD** the Core thermal power from Core Power and Flow Log. (N/A if ICS is not available)

Point CALC002 _____ CMWT _____

- [2] **RECORD** the Core plate differential pressure from ICS point 68-52 or 2-XR-68-50 (Green Pen). (N/A if not available).

Core Press Drop 68-52 _____ PSID _____

- [3] **RECORD** the Total Core flow.

Total Core Flow (Red Pen) 2-XR-68-50
_____ Mlb/hr

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 13 of 28
---------------	-----------------------------------	--

Date: _____

NOTES

- 1) If 2-SIT-68-59/71 (RB. EI 565 R-9 S-line - Local Panel) is used log the reason in post test Remarks.
- 2) Use the 2-SI-96-61 (or ICS PT 96-61) if both 2-SI-68-59 and 2-SIT-68-59 are not available for the 2A Pump Motor and log the reason in post test Remarks.
- 3) Use the 2-SI-96-73 (or ICS PT 96-73) if both 2-SI-68-71 and 2-SIT-68-71 are not available for the 2B Pump Motor and log the reason in post test Remarks.
- 4) If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

7.2.2 Recirculation Pump Loops

- [1] **RECORD** the Recirc Pump 2A and 2B Mtr Speeds for operating Recirc Pumps and circle instrumentation used.

Pump Mtr 2A	Pump Mtr 2B
2-SI-68-59 or 2-SIT-068-0059 or 2-SI-96-61	2-SI-68-71 or 2-SIT-068-0071 or 2-SI-96-73
_____ RPM	_____ RPM

- [2] **RECORD** the Recirc Pump Discharge flows.

Loop 2A 2-FI-68-5	Loop 2B 2-FI-68-81
_____ gpm X 1000	_____ gpm X 1000

- [3] **RECORD** the Recirc loop 2A and 2B Jet Pump Flow.

Loop 2A 2-FI-68-46	Loop 2B 2-FI-68-48
_____ Mlb/hr	_____ Mlb/hr

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 14 of 28
-----------------------	--	---

Date: _____

NOTE

If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

7.2.3 Jet Pump Loops

[1] **RECORD** the following Differential Pressure readings below:

Loop 2A			Loop 2B		
INSTRUMENT	JET PUMP	PSID	INSTRUMENT	JET PUMP	PSID
2-PDI-68-38	11		2-PDI-68-15	1	
2-PDI-68-39	12		2-PDI-68-18	2	
2-PDI-68-40	13		2-PDI-68-19	3	
2-PDI-68-42	14		2-PDI-68-21	4	
2-PDI-68-43	15		2-PDI-68-22	5	
2-PDI-68-07	16		2-PDI-68-25	6	
2-PDI-68-08	17		2-PDI-68-26	7	
2-PDI-68-10	18		2-PDI-68-28	8	
2-PDI-68-11	19		2-PDI-68-29	9	
2-PDI-68-13	20		2-PDI-68-30	10	

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-----------------------	--	---

Date: _____

NOTES

- 1) Section 7.3 is performed when both Recirculation Pumps are in service. This section should be N/A'ed when in Single Loop Operation.
- 2) To satisfy procedure Acceptance Criteria, either Step 7.3[3] or Step 7.3[4] must be satisfied.

7.3 Tech Spec 3.4.1.1 - Recirculation Loop Mismatch Verification With Both Recirculation Loops In Operation Checks

- [1] **CALCULATE** percent of rated core flow (%WT) using data obtained in Section 7.2.1[3] as follows.

(Step 7.2.1[3] ÷ 102.5) X 100 =	% Core Flow
(_____ ÷ 102.5) X 100 =	_____

- [2] **CALCULATE** the absolute value for Recirculation Loop Jet Mismatch using data obtained in Section 7.2.2[3] as follows.

2-FI-68-46	-	2-FI-68-48	=	Mismatch
------------	---	------------	---	----------

_____ Mlb/hr	-	_____ Mlb/hr	=	_____ Mlb/hr
--------------	---	--------------	---	--------------

- [3] **IF** %WT is < 70% as recorded in Step 7.3[1], **THEN**

VERIFY Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is ≤ 10.25 Mlb/hr. (Otherwise N/A) _____(AC)

- [4] **IF** %WT is ≥ 70% as recorded in Step 7.3[1], **THEN**

VERIFY Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is ≤ 5.12 Mlb/hr. (Otherwise N/A) _____(AC)

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 16 of 28
-----------------------	--	---

Date: _____

NOTES

- 1) Section 7.4 should be marked as N/A if RTP is $\leq 25\%$.
- 2) Jet Pump Operability is not required to be performed until 4 hours after associated recirculation loop is in operation and then only within 24 hours after RTP is $> 25\%$.

7.4 Tech Spec 3.4.2.1 - Part A -Recirculation Pump and Jet Pump Flow to Recirculation Pump Speed:

7.4.1 Jet Pump Loop 2A

- [1] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Pump Flow recorded in Step 7.2.2[2]:

CHECK that the plot falls between the two bold lines on Illustration 1 and **RECORD** below.

Plot falls between the bold lines Yes ☐ No ☐ _____

- [2] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Jet Pump Flow in Step 7.2.2[3]:

CHECK that the plot falls between the two bold lines on Illustration 2 and **RECORD** below.

Plot falls between the bold lines Yes ☐ No ☐ _____

- [3] Using Steps 7.4.1[1] and 7.4.1[2] from above:

DETERMINE if the Jet Pump Loop 2A criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2A criteria is satisfied Yes ☐ No ☐ _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 17 of 28
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Date: _____

7.4.2 Jet Pump Loop 2B

- [1] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Pump Flow recorded in Step 7.2.2[2]:

CHECK that the plot falls between the two bold lines on Illustration 3 and **RECORD** below.

Plot falls between the bold lines	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----------------------------------	-----	--------------------------	----	--------------------------

- [2] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Jet Pump Flow recorded in Step 7.2.2[3]:

CHECK that the plot falls between the two bold lines on Illustration 4 and **RECORD** below.

Plot falls between the bold lines	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----------------------------------	-----	--------------------------	----	--------------------------

- [3] Using Steps 7.4.2[1] and 7.4.2[2] from above:

DETERMINE if the Jet Pump Loop 2B criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2B criteria is satisfied	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
--	-----	--------------------------	----	--------------------------

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 18 of 28
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Date: _____

7.4.3 Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification:

- [1] Using the individual 2A Jet Pump DP's recorded in Step 7.2.3[1]

CHECK that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 5 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2A Individual DP's are between the bold lines.	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
--	-----	--------------------------	----	--------------------------

- [2] Using the individual 2B Jet Pump DP's recorded in Step 7.2.3[1]

CHECK that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 6 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2B Individual DP's are between the bold lines.	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
--	-----	--------------------------	----	--------------------------

- [3] Using Steps 7.4.3[1] and 7.4.3[2]

DETERMINE whether the Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
--	-----	--------------------------	----	--------------------------

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 19 of 28
-----------------------	--	---

Date: _____

CAUTION

An Engineering Judgment/Review may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

7.4.4 Operability Determination

[1] **IF** any of the following conditions apply:

- Following Refueling Outage. (See Caution above)

OR

- The Reactor is in Single Loop Operation (See Caution above)

OR

- If Steps 7.4.1[3], 7.4.2[3] and 7.4.3[3] fall outside the bolded lines, to determine if the graphs need updating

THEN

PERFORM Attachment 2, Engineering Judgment/Review:
(Otherwise N/A if not required.)

[2] **MARK** the appropriate criteria results for the following.
(N/A any criteria not performed.)

Steps	Criteria Results	Yes	No	N/A
7.4.1[3] and 7.4.2[3]	Both Jet Pump Loops steps are marked as YES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.3[3]	Jet Pump DP to criteria is marked as YES.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attachment 2	Engineering Evaluation is marked as YES.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[3] Using the Criteria Results in Step 7.4.4[2]

VERIFY at least one Criteria Results is satisfied and marked as YES.

_____(AC)

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 20 of 28
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Date: _____

7.5 Notification and completions

- [1] **IF** an Engineering Judgment/Review was performed, **THEN**

VERIFY the Engineering Judgment/Review documentation is attached to this SR. (Otherwise N/A) _____
- [2] **COMPLETE** Attachment 1, Surveillance Procedure Review Form, up to Unit Supervisor review. _____
- [3] **NOTIFY** the Unit Supervisor that this test is complete. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

- Attachment 1 - Surveillance Procedure Review Form
- Attachment 2 - Engineering Judgment/Review
- Illustration 1 - 2A Recirculation Loop Pump Speed VS Recirculation Pump Flow
- Illustration 2 - 2A Recirculation Pump Speed VS Jet Pump Flow
- Illustration 3 - 2B Recirculation Loop Pump Speed VS Recirculation Pump Flow
- Illustration 4 - 2B Recirculation Pump Speed VS Jet Pump Flow
- Illustration 5 - 2A Jet Pump Differential Pressure VS Total Core Flow
- Illustration 6 - 2B Jet Pump Differential Pressure VS Total Core Flow

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 21 of 28
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**Attachment 1
(Page 1 of 1)**

Surveillance Procedure Review Form

REASON FOR TEST:

- ☐ Scheduled Surveillance
☐ System Inoperable (Explain in Remarks)
☐ Maintenance (WO No. _____)
☐ Other (Explain in Remarks)

DATE/TIME STARTED _____

DATE/TIME COMPLETED _____

PLANT CONDITIONS _____

PRE-TEST REMARKS: _____

PERFORMED BY:

<u>Initials</u>	<u>Name (Print)</u>	<u>Name (Signature)</u>
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____ (Test Dir/Lead Perf)	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Delays or Problems (If yes, explain in POST-TEST REMARKS)?

☐ Yes

☐ No

Acceptance Criteria Satisfied?

☐ Yes

☐ No

If the above answer is no, the Unit Supervisor shall
determine if an LCO exists.

LCO

☐ Yes

☐ No

UNIT SUPERVISOR _____ Date _____

INDEPENDENT REVIEWER (OPS) _____ Date _____

SCHEDULING COORDINATOR _____ Date _____

POST-TEST REMARKS: _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 22 of 28
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**Attachment 2
(Page 1 of 1)**

Engineering Judgment/Review

Date: _____

CAUTION

Engineering Judgment Evaluation may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

[1] **MARK** the condition that applies:

• Following Refueling Outage.	<input type="checkbox"/>
• The Reactor is in Single Loop Operation	<input type="checkbox"/>
• Steps 7.4.1[3], 7.4.2[3] and 7.4.3[3] fall outside the bolded lines	<input type="checkbox"/>

[2] **REQUEST** System Engineering to perform an Engineering Judgment/Review. _____

[3] **IF** the Engineering Judgment/Review was performed following a Refueling Outage or during Single Loop Operation, **THEN**

DETERMINE if the Jet Pump Criteria is satisfied and no significant abnormalities which could indicate a jet pump failure are indicated and **RECORD** the results below. (Otherwise N/A)

Jet Pump Criteria is satisfied. Yes ☐ No ☐ _____

[4] **IF** the Engineering Judgment/Review was performed to determine if the graphs needs updated, **THEN**

REQUEST a System Engineering to: (Otherwise N/A)

A. **SUPPLY** Operations with new graphs to Operations Procedures. _____

B. **RECORD** below if Jet Pump Criteria is satisfied.

Jet Pump Criteria is satisfied. Yes ☐ No ☐ _____

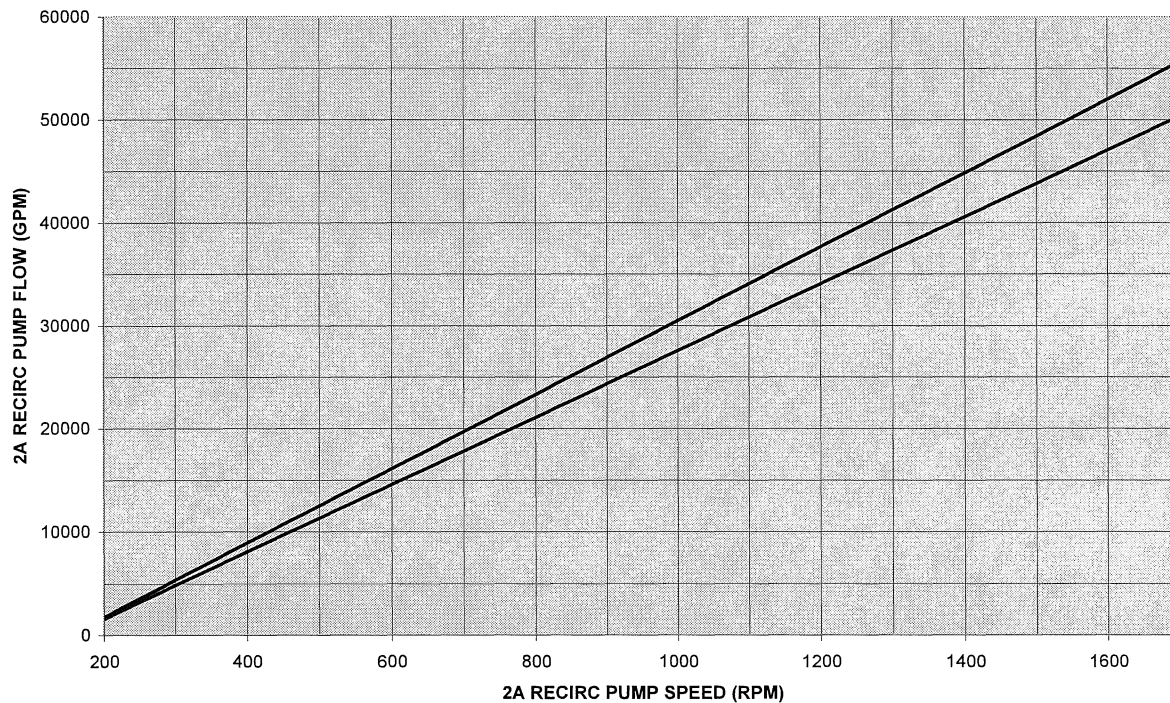
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 23 of 28
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**Illustration 1
(Page 1 of 1)**

**2A Recirculation Loop Pump Speed VS Recirculation Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008**

Date: _____

**2A RECIRC PUMP SPEED VS PUMP FLOW
TWO LOOP OPERATION**



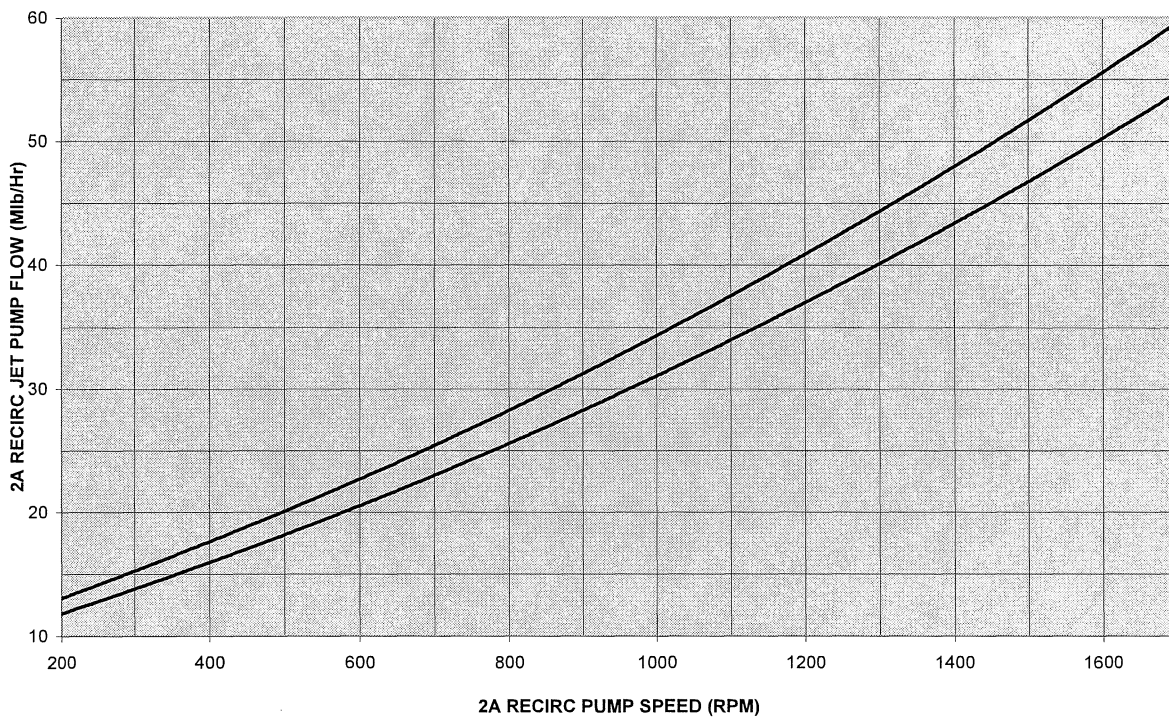
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 24 of 28
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Illustration 2
(Page 1 of 1)

2A Recirculation Pump Speed VS Jet Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____

2A RECIRC SPEED VS JET PUMP FLOW
TWO LOOP OPERATION



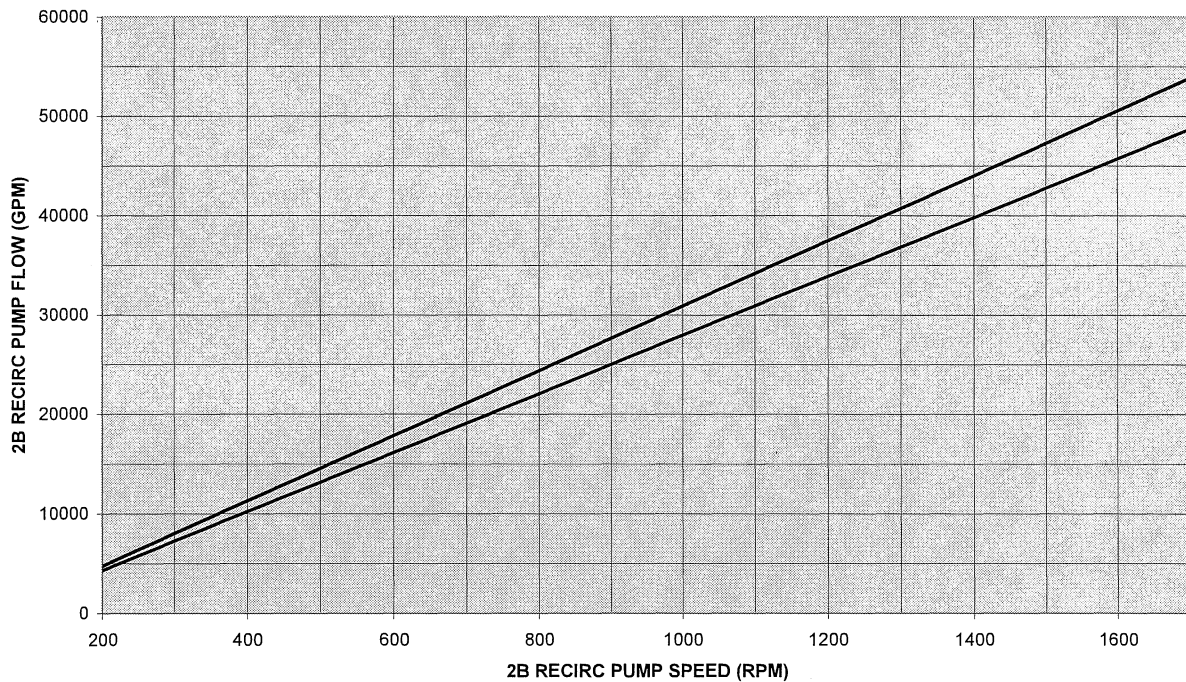
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 25 of 28
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Illustration 3
(Page 1 of 1)

2B Recirculation Loop Pump Speed VS Recirculation Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____

2B RECIRC PUMP SPEED VS PUMP FLOW
TWO LOOP OPERATION



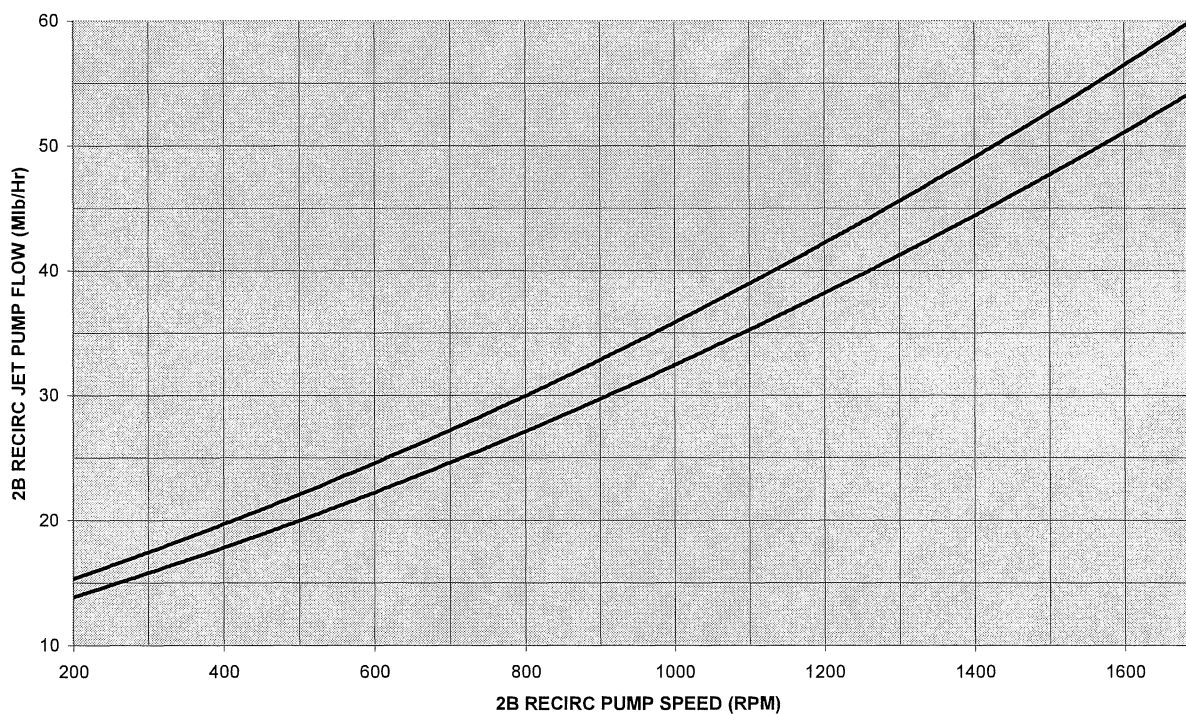
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 26 of 28
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Illustration 4
(Page 1 of 1)

2B Recirculation Pump Speed VS Jet Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____

2B RECIRC PUMP SPEED VS JET PUMP FLOW
TWO LOOP OPERATION



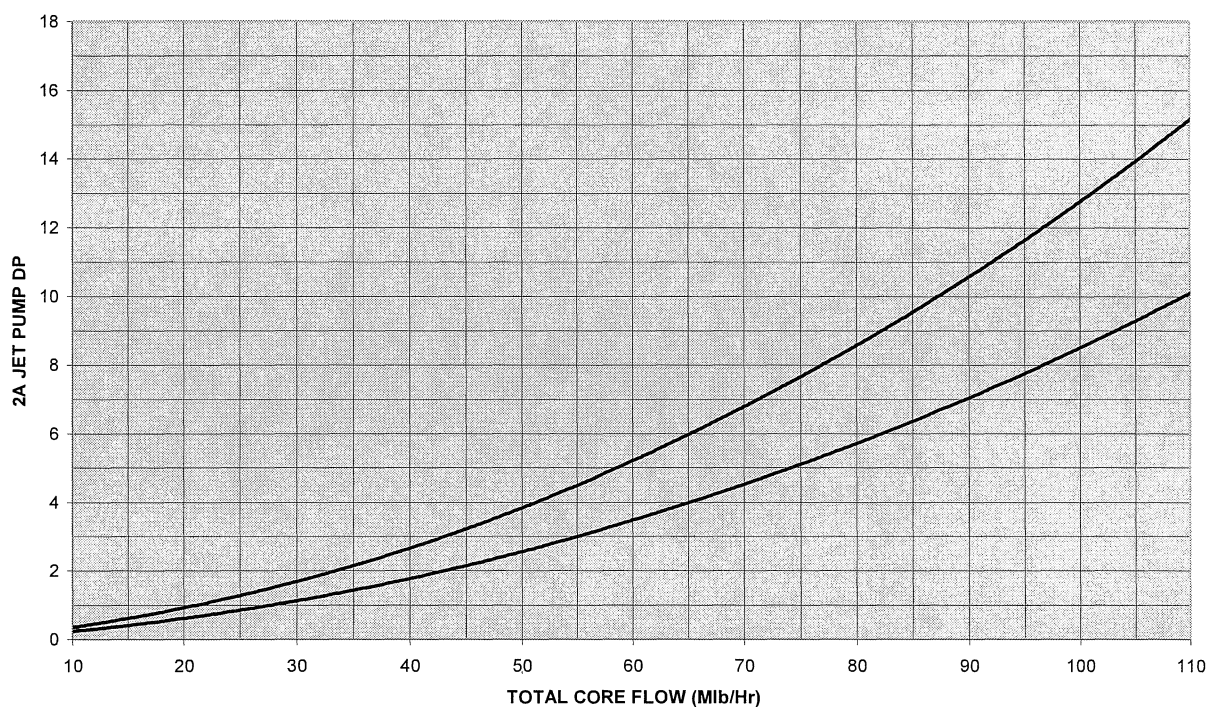
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 27 of 28
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**Illustration 5
(Page 1 of 1)**

**2A Jet Pump Differential Pressure VS Total Core Flow
Unit 2 Cycle 15
Good Thru 01-07-2008**

Date: _____

**2A TOTAL CORE FLOW VS JET PUMP DP
TWO LOOP OPERATION**



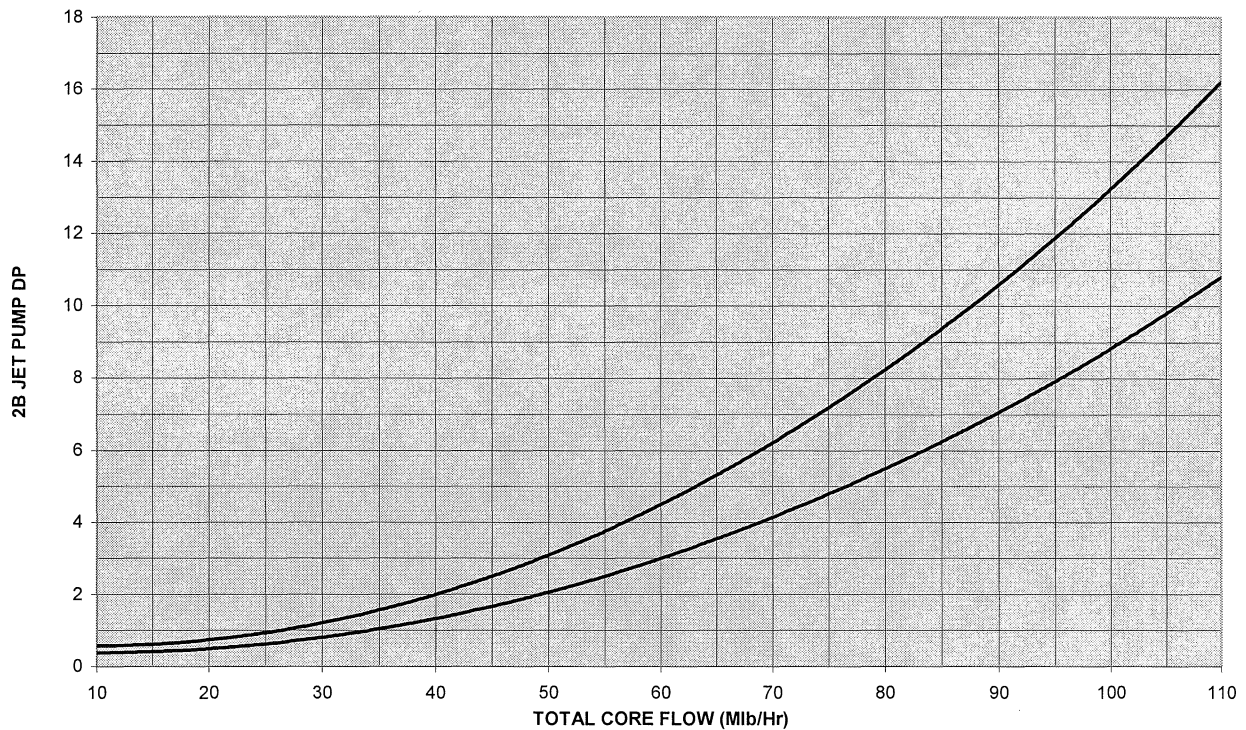
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 28 of 28
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**Illustration 6
(Page 1 of 1)**

**2B Jet Pump Differential Pressure VS Total Core Flow
Unit 2 Cycle 15
Good Thru 01-07-2008**

Date: _____

**2B TOTAL CORE FLOW VS JET PUMP DP
TWO LOOP OPERATION**



BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: JPM 504

TITLE: DETERMINATION OF ACTIVE/INACTIVE LICENSE STATUS

ALTERNATE PATH YES ___ NO X

SUBMITTED BY: *Robert M. Ziem* DATE: 1/3/08
VALIDATED BY: *James C. Math* DATE: 1/4/08
APPROVED: *Robert M. Ziem* DATE: 1/5/08
PLANT CONCURRENCE: *Carol J. French* DATE: 1/4/08
TRAINING
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	XX/XX/XX	ALL	INITIAL ISSUE
1	01/02/08	All	Procedure Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____ SS# _____

RO _____ SRO _____ DATE: _____

JPM NUMBER: JPM 504

TASK TITLE: DETERMINATION OF ACTIVE/INACTIVE LICENSE STATUS

K/A NUMBER: 2.1.2 K/A RATING: RO 3.0 SRO: 4.0

TASK STANDARD: DETERMINATION OF ACTIVE/INACTIVE LICENSE STATUS

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM X

REFERENCES/PROCEDURES NEEDED: OPDP-1, Rev. 8

VALIDATION TIME: CONTROL ROOM: 15 Min. LOCAL: _____

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

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL _____

COMMENTS: _____

Additional comment sheets attached? YES ___ NO ___

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____

EXAMINER

IN-PLANT: I will explain the initial conditions and state the task to be performed. All steps shall be simulated. I will provide initiating cues and indicate any steps to be discussed. Ensure that you observe electrical safety precautions when working near energized equipment. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task and when you have completed the assigned task.

INITIAL CONDITIONS: You are the Unit 1 Operator. Units 1, 2, and 3 are operating at 100%.

INITIATING CUES: The UNIT SUPERVISOR direct you to review the number of shifts [12 hrs] that certain individuals have worked to determine if they

1] MET the requirements (i.e. worked enough license positions in the third quarter for their license to be active in the fourth quarter) and

2] DETERMINE if their license will be active for the FIRST QUARTER of 2008 (i.e. worked enough license positions in the fourth quarter for their license to be active in the first quarter 2008). Also

3] report if any individual worked a required active license position (fourth quarter) when their license was not active. ALL were active starting in June 2007(Except SRO1). The following is the work history of the individuals that are to be evaluated.

	2007			2007		
MONTH	JUL	AUG	SEPT	OCT	NOV	DEC
RO1	S1 = SST S2 = U2	S3 = U2 S4 = U3	S5 = U2		S1 = U1 S2 = SST S3 = SST	S4 = U1 S5 = U3 S6 = U3
RO2	S1 = U1 S2 = U2 S3 = U2	S4 = U3 S5 = U3		S1 = U3 S2 = U3 S3 = U2 S4 = U1 S5 = U3	S6 = SST S7 = SST S8 = U1	S9 = SST S10 = U1 S11 = U1
RO3	S1 = SST S2 = SST	S3 = SST S4 = U1 S5 = U3	S6 = U2 S7 = U2	S1 = SST S2 = U2 S3 = U2	S4 = U3 S5 = U1 S6 = SST	S7 = SST S8 = SST S9 = SST
SRO1	S1 = U2 S2 = U2	S3 = U3 S4 = U2	S5 = U1 S6 = U3	S1 = U3 S2 = U3	S3 = OS S4 = OS	S5 = U2 S6 = U2
SRO2			BI S1 = U2	S1 = U3 S2 = U3		S3 = OS S4 = OS S5 = OS
SRO3	S1 = U3 S2 = U3	S3 = U3 S4 = U3	S5 = U3 S6 = U3	S1 = STA S2 = STA	S3 = STA S4 = U2	S5 = U3 S6 = U3

S = Shift of 12 hours

BI = BREAKIN REQUIREMENTS COMPLETED

OS = OUTSIDE UNIT SUPERVISOR

STA = SHIFT TECHNICAL ADVISOR

SST = SHIFT SUPPORT TAGGING

START TIME: _____

Performance Step : Critical _____ Not Critical X

WHEN REQUESTED BY EXAMINER identify/obtain copy of required procedure.

Standard:

OBTAINS current copy of OPDP-1, Conduct of Operations (If requested – Provide copy)

SAT _____ UNSAT _____ N/A _____
COMMENTS: _____

Performance Step : Critical X Not Critical _____

1. **EVALUATES** RO1 quarterly status and reports on three areas requested by Unit Supervisor.

Standard

OPERATOR reports following: Worked enough shifts third quarter = NO
 Worked enough shifts fourth quarter = NO
 Worked an active license position with inactive license = YES

SAT _____ UNSAT _____ N/A _____
COMMENTS: _____

Performance Step : Critical X Not Critical _____

1. **EVALUATES** RO2 quarterly status and reports on three areas requested by Unit Supervisor.

Standard

OPERATOR reports following: Worked enough shifts third quarter = YES
 Worked enough shifts fourth quarter = YES
 Worked an active license position with inactive license = NO

SAT _____ UNSAT _____ N/A _____
COMMENTS: _____

Performance Step :

Critical X Not Critical

1. **EVALUATES** RO3 quarterly status and reports on three areas requested by Unit Supervisor.

Standard

OPERATOR reports following: Worked enough shifts third quarter = NO
 Worked enough shifts fourth quarter = NO
 Worked an active license position with inactive license = YES

SAT _____ UNSAT _____ N/A _____

COMMENTS: _____

Performance Step :

Critical X Not Critical

1. **EVALUATES** SRO1 quarterly status and reports on three areas requested by Unit Supervisor.

Standard

OPERATOR reports following: Worked enough shifts third quarter = YES
 Worked enough shifts fourth quarter = NO
 Worked an active license position with inactive license = NO

SAT _____ UNSAT _____ N/A _____

COMMENTS: _____

Performance Step :

Critical X Not Critical_____

1. **EVALUATES** SRO2 quarterly status and reports on three areas requested by Unit Supervisor.

Standard

OPERATOR reports following: Worked enough shifts third quarter = YES, after BREAKIN
 Worked enough shifts fourth quarter = NO
 Worked an active license position with inactive license = NO

SAT	UNSAT	N/A
-----	-------	-----

COMMENTS: _____

Performance Step :

Critical X Not Critical

1. **EVALUATES** SRO3 quarterly status and reports on three areas requested by Unit Supervisor.

Standard

OPERATOR reports following:

- Worked enough shifts third quarter = YES
- Worked enough shifts fourth quarter = NO
- Worked an active license position with inactive license = NO

SAT_____ UNSAT_____ N/A_____

COMMENTS: _____

END OF TASK

STOP TIME: _____

CANDIDATE'S HANDOUT

IN-PLANT: I will explain the initial conditions and state the task to be performed. All steps shall be simulated. I will provide initiating cues and indicate any steps to be discussed. Ensure that you observe electrical safety precautions when working near energized equipment. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task and when you have completed the assigned task.

INITIAL CONDITIONS: You are the Unit 1 Operator. Units 1, 2, and 3 are operating at 100%.

INITIATING CUES: The UNIT SUPERVISOR direct you to review the number of shifts [12 hrs] that certain individuals have worked to determine if they

1] MET the requirements (i.e. worked enough license positions in the third quarter for their license to be active in the fourth quarter) and

2] DETERMINE if their license will be active for the FIRST QUARTER of 2008 (i.e. worked enough license positions in the fourth quarter for their license to be active in the first quarter 2008). Also

3] report if any individual worked a required active license position (fourth quarter) when their license was not active. ALL were active starting in June 2007(Except SRO1). The following is the work history of the individuals that are to be evaluated.

	2007			2007		
MONTH	JUL	AUG	SEPT	OCT	NOV	DEC
RO1	S1 = SST S2 = U2	S3 = U2 S4 = U3	S5 = U2		S1 = U1 S2 = SST S3 = SST	S4 = U1 S5 = U3 S6 = U3
RO2	S1 = U1 S2 = U2 S3 = U2	S4 = U3 S5 = U3		S1 = U3 S2 = U3 S3 = U2 S4 = U1 S5 = U3	S6 = SST S7 = SST S8 = U1	S9 = SST S10 = U1 S11 = U1
RO3	S1 = SST S2 = SST	S3 = SST S4 = U1 S5 = U3	S6 = U2 S7 = U2	S1 = SST S2 = U2 S3 = U2	S4 = U3 S5 = U1 S6 = SST	S7 = SST S8 = SST S9 = SST
SRO1	S1 = U2 S2 = U2	S3 = U3 S4 = U2	S5 = U1 S6 = U3	S1 = U3 S2 = U3	S3 = OS S4 = OS	S5 = U2 S6 = U2
SRO2			BI S1 = U2	S1 = U3 S2 = U3		S3 = OS S4 = OS S5 = OS
SRO3	S1 = U3 S2 = U3	S3 = U3 S4 = U3	S5 = U3 S6 = U3	S1 = STA S2 = STA	S3 = STA S4 = U2	S5 = U3 S6 = U3

S = Shift of 12 hours

BI = BREAKIN REQUIREMENTS COMPLETED

OS = OUTSIDE UNIT SUPERVISOR

STA = SHIFT TECHNICAL ADVISOR

SST = SHIFT SUPPORT TAGGING

C

C

C



**TVAN Standard
Department
Procedure**

TITLE

Conduct of Operations

OPDP-1

Rev. 0008

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Quality Related

☒ Yes

☐ No

PORC Required

☐ Yes

☒ No

Effective Date

3/19/2007

Responsible Peer Team:

Operations

Concurred by: M. H. Palmer 3/9/07
Primary Sponsor Date
James R. Douet 3/12/07
Peer Team Mentor Date

Approved by:

*Nuclear Assurance SDPs are approved by General
Manager, NA. Site-specific changes are approved by
Site Sponsor and Site Vice President (see PCF)

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License Status - Active/Inactive License

A. License Status

1. To maintain an active status, the licensee shall actively perform the functions of an operator or senior operator for a minimum of seven 8-hour shifts a calendar quarter or five 12-hour shifts a calendar quarter. It is the licensee's responsibility to maintain cognizance of his/her license status.
2. A listing of "Active" license status is provided to the SM at the end of each quarter. If an individual's license is currently listed as being "Inactive" (not on the active list), it is imperative that he or she not perform in a TS licensed position.

The STA will remain active by complying with Section 3.4 of TRN-11.6.

B. Regaining Active Status

1. In order to regain active status, the following requirements must be met:
 - a. The licensee qualifications (SCBA, valid physical in the last two years) are current and satisfactory completion of license operator requalification training.
 - b. The licensee has completed a minimum of 40 hours of shift functions under the direction of a RO or SRO and in the position to which the individual will be assigned. These shifts must occur with the unit in Modes 1 - 6. The forty hours must include a complete tour of the plant (with active licensed operator of equal status, SRO requires another SRO, RO may be accompanied by a SRO or RO) and a review of all required shift turnover procedures. This tour shall be in those areas covered by the Return to Active Status Checklist and should consist of:
 - (1) Inspection of running equipment,
 - (2) Review of safety-related equipment out of service,
 - (3) Review of evolutions in progress in each area,
 - (4) Inspection of equipment in standby to meet TS requirements,
 - (5) Inspection of any plant modifications recently installed.
2. Entries in the operating logs should be used to document the 40-hour shift function requirement for ROs and SROs. Copies of this documentation and the applicable forms from this appendix should be attached to Form OPDP-1-4 Licensee Documentation Form.
3. If an SRO is activating a license for fuel handling only, then a minimum of one eight hour shift under the direction of an active SRO must be completed. Copies of documentation and the applicable forms from this appendix should be attached to Form OPDP-1-4 Licensee Documentation Form.

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License Status - Active/Inactive License

Return to Active Status Checklist

Sheet 1 of 4

Licensed Individual _____

The licensed individual has completed a minimum of 40 hours of shift functions under the direction of an active licensed operator of qualifications equal to or above the position to which the individual will be assigned. SRO-licensed individuals assuming a SRO position shall perform the actions and responsibilities of the Unit Supervisor (US) or Shift Manager (SM). SRO or RO-licensed individuals assuming an RO position shall perform the actions of a Unit Operator (UO). The 40 hours must have included a complete review of all required shift turnover procedures. SRO licensed individuals who reactivate their license solely to allow watchstanding in the UO must complete 40 hours of shift functions as a Unit UO under the directions of a UO prior to being assigned to the position. Attach a copy of security door printouts for both the licensed individual reactivating and the supervising license for each date listed below.

Date	Hours	Total Hours	Position (circle one)	Supervising Licensee
			SRO/RO	
			SRO/RO	
			SRO/RO	
			SRO/RO	
			SRO/RO	
			SRO/RO	
			SRO/RO	

Verified by: _____

Superintendent - Shift Operations

Date

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License Status - Active/Inactive License

Return to Active Status Checklist

For Sequoyah Only

Sheet 2 of 4

During the minimum of 40 hours of shift functions above, the licensed individual has completed a plant tour including all areas listed below (excluding high radiation areas) under the direction of an operator or senior operator as appropriate. Tours will include a review of all required NLO shift turnover procedures. Attach a copy of the security door printouts for both the licensed individual reactivating and the supervising license for each date listed below.

Date	Time	Area Toured	Supervising Licensee
		All Levels of Auxiliary Building	
		All Levels of Turbine Building and Cond DI Building	
		Diesel Generator Building	
		All Levels of Control Building	
		Outside areas, including CCW Building, New Makeup DI Building and Switchyard	
		ERCW Structure	
		Review AUO Shift Turnovers	

Verified by: _____
Superintendent - Shift Operations
Date

Ensure the licensed individual has reviewed the required reading, standing orders, and ODMIs for the period of absence or for the most recent requalification cycle to present date, whichever is shorter, and the current standing orders. Ensure requirements of 0-PI-OPS-000-027.0 met and appropriate forms attached.

Verified by: _____
Superintendent - Shift Operations
Date

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License Status - Active/Inactive License

Return to Active Status Checklist

For Watts Bar Only

Sheet 3 of 4

During the minimum of 40 hours of shift functions above, the licensed individual has completed a plant tour including all areas listed below (excluding high radiation areas) under the direction of an operator or senior operator as appropriate. Tours will include a review of all required NLO shift turnover procedures. Attach a copy of the security door printouts for both the licensed individual reactivating and the supervising license for each date listed below.

Date	Time	Area Toured	Supervising Licensee
		All Levels of Auxiliary Building	
		All Levels of Turbine Building	
		Diesel Generator Building	
		All Levels of Intake Pumping Station	
		Outside areas, including CCW Building, New makeup DI Building and Switchyard	
		All Levels of Control Building	
		Review AUO Shift Turnovers	

Verified by: _____
Superintendent - Shift Operations
Date

Ensure the licensed individual has reviewed the required reading, standing orders, and ODMIs for the period of absence or for the most recent requalification cycle to present date whichever is shorter and the current standing orders.

Verified by: _____
Superintendent - Shift Operations
Date

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License Status - Active/Inactive License

**Return to Active Status Checklist
For Sequoyah and Watts Bar**

Sheet 4 of 4

Ensure Emergency Preparedness Manager is notified of the return to active status of the licensee (WBN PER 90074).

Verified by: _____

Superintendent - Shift Operations
Date

Ensure all medical qualifications are current including respirator training, SCBA and fit test.

Verified by: _____

Superintendent - Shift Operations
Date

Ensure uninterrupted participation in the Licensed Operator Requalification Program or meet with the Operations Training Manager or Designee to discuss the material from all requalification sessions which were missed.

Verified by: _____

Operations Training Manager or Designee
Date

Ensure all on-the-job training and evaluation requirements of the Requalification Program are current.

Verified by: _____

Operations Training Manager or Designee
Date

I certify the requirements for returning to active status have been met for the above-named licensed individual.

Verified by: _____

Manager - Operations
Date

After receiving the final review signature, this checklist becomes a QA RECORD and should be submitted to Document Services.

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License Status - Active/Inactive License

Activation of SRO License Limited to Fuel Handling

Sheet 1 of 2

Licensed Individual _____

NOTE

Personnel who activate their SRO License Limited to Fuel Handling MAY NOT stand watch in the Main Control Room or any other position that requires an active licensed SRO.

Licensed Individual SSN. The above named licensed individual has successfully completed the following:

Uninterrupted participation in the Licensed Operator Requalification Program or met with the Superintendent - Operations Training or Designee to discuss the material from all requalification sessions which were missed.

Verified by: _____

Operations Training Manager or Designee

Date

Work for one shift, (12 hours) moving fuel under the direction of an active licensed SRO***.

Date*	Position Moving Fuel	Moving Fuel Hours**	Active Licensed SRO***

*Should include shift turnover.

**Must include a total of 12 hours moving fuel under the direction of an active licensed SRO

***Active SRO or Active SRO Limited to Fuel Handling.

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License Status - Active/Inactive License

Activation of SRO License Limited to Fuel Handling

Sheet 2 of 2

The licensed individual has completed a tour of fuel handling areas with an active Senior Licensed Operator*** including all levels of the Fuel Handling Area, (excluding high radiation areas) and the Reactor Containment Building (if fuel handling activities are in progress).

Verified by: _____
Superintendent - Shift Operations
Date

I certify the requirements for returning to active status, limited to fuel handling, as listed in OMM-001, Section 5.5.2, have been met for the above named licensed individual.

Verified by: _____
Superintendent - Shift Operations
Date

***Active SRO or Active SRO Limited to Fuel Handling.

After receiving the final review signature, this checklist becomes a QA RECORD and should be submitted to Document Services.

**Appendix O
(Page 8 of 22)**

License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT
REQUIREMENTS FOR MAINTAINING ACTIVE LICENSE STATUS

Sheet 1 of 4

1.0 PURPOSE

The purpose of this document is to provide administrative instructions in order to comply with 10CFR55.53 (e), ... "actively performing the functions of an operator or senior operator."

2.0 REFERENCES/BACKGROUND

2.1 References

- 10 CFR 50.54(m)(2)(i)
- 10 CFR 55.4
- 10 CFR 55.53(e)
- NUREG-1262 - Preface; pages 71-80
- Technical Specification

2.2 To maintain active status, per 55.53(e), Conditions of License, the licensee shall actively perform the functions of an operator or senior operator on a minimum of seven (7) 8-hour or five (5) 12-hour shifts per calendar quarter.

2.3 Actively performing the functions of an operator or senior operator means that an individual has a position on the shift crew that requires the individual to be licensed as defined in Technical Specification, and that the individual carries out and is responsible for the duties covered by that position.

2.4 Technical Specifications and 10 CFR 50.54 specify the minimum requirement per shift.

2.5 Licensed personnel who do not meet these requirements are designated as inactive licensees.

3.0 RESPONSIBILITIES

3.1 All licensed personnel who maintain an active license shall comply with these requirements.

3.2 All licensed personnel who maintain an active license and are OFF SHIFT (not part of a rotating shift) shall provide on-shift documentation quarterly to the Operations Superintendent. [Form 1].

3.3 The Operations Superintendent is responsible for administering this program and documentation.

4.0 INSTRUCTIONS

4.1 Individuals assigned to the following positions, AND NO OTHERS, on each shift, are considered to be actively performing the functions of an operator or senior operator in order to maintain active license status:

Browns Ferry Nuclear

- Shift Manager
- Unit 1 Unit Supervisor [Control Room SRO]
- Unit 2 Unit Supervisor [Control Room SRO]
- Unit 3 Unit Supervisor [Control Room SRO]
- Unit 1 Board and Desk ROs
- Unit 2 Board and Desk ROs
- Unit 3 Board and Desk ROs

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT
REQUIREMENTS FOR MAINTAINING ACTIVE LICENSE STATUS

Sheet 2 of 4

- 4.2 To be granted credit for a shift, the individual will be present from shift turnover thru shift turnover. Short absences from the Control Room are acceptable (i.e., rest room visits). Absences from the Control Room for extended periods (i.e., Fitness for Duty testing) will not count towards shift functions. For these type of cases, the time absence will be made up by working additional time on another shift or an additional shift.
- 4.3 The shift period is defined by the schedule worked by the rotating shift crews. Either 12-hour or 8-hour shifts is the normal. If a 12-hour shift rotation is used, then a minimum of five (5) shifts in a licensed position per quarter, or if an 8-hour shift rotation is used, then a minimum of seven (7) shifts in a licensed position per quarter is required in order to remain "active."
- 4.4 Technical Specifications / 10CFR50 for each site contains the requirement for the minimum number of licenses required. However, only the positions listed for the applicable site as listed in 4.1 above qualify for license maintenance.
- 4.5 If the operating crews convert from an 8-hour to a 12-hour, or a 12-hour to an 8-hour shift rotation schedule during a calendar quarter, then the number of shifts required to be worked in a licensed position to be credited for active license maintenance on the combination of shifts (8's and 12's) will be in accordance with the following:

8-Hour Shifts TO 12-Hour Shifts		12-Hour Shifts TO 8-Hour Shifts	
# Shifts Completed Prior to Change	# Additional Shifts Needed On New Schedule	# Shifts Completed Prior to Change	# Additional Shifts Needed On New Schedule
6	1	4	2
5	2	3	3
4	3	2	5
3	3	1	6
2	4	0	7
1	5	-	-
0	5	-	-

- 4.6 The individual assigned to one of the seven (7) positions designated for maintaining an active license, shall log "in" and "out" on the Narrative Log for each shift worked.
- 4.7 The Shift Manager on each shift shall verify that the data entered into the "Shift Staffing Log" in the Narrative Log is correct for their shift.
- 4.8 A Shift Manager shall actively perform the functions of a Shift Manager a minimum of seven 8-hour or five 12-hour shifts per calendar quarter to remain current.

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR MAINTAINING ACTIVE LICENSE STATUS
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Sheet 3 of 4

5.0 DOCUMENTATION

- 5.1 Form 1 of this Appendix contains the form "(Active) Licensed Off-Shift Personnel Quarterly On-Shift Time Documentation" that is submitted by active off-shift licensed individuals each quarter to the Operations Superintendent.
- 5.2 The Control Room logs are the legal record of watchstander assignment.

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR MAINTAINING ACTIVE LICENSE STATUS
--

Sheet 4 of 4

(ACTIVE) LICENSED OFF SHIFT PERSONNEL
QUARTERLY ON-SHIFT TIME DOCUMENTATION

FORM 1 (BFN)

NAME: _____

I certify that on the dates listed below, I performed the licensed duties as defined in 10 CFR 55 for a minimum of five (5) 12-hour shifts, seven (7) 8-hour shifts, or combination as described in this procedure.

Covering Quarter: ☐ Jan - March ☐ April - June ☐ July - Sept ☐ Oct - Dec

DATES	SHIFT		POSITIONS									
	8 HR	12 HR	SM	U1 US	U2 US	U3 US	U1 BD	U1 DK	U2 BD	U2 DK	U3 BD	U3 DK
DAY 1:												
DAY 2:												
DAY 3:												
DAY 4:												
DAY 5:												
DAY 6:												
DAY 7:												
DAY 8: NOTE (2)												

NOTE: (1) Indicate the date, check the shift duration and appropriate position held.

NOTE: (2) The Day 8 slot is to be used if one does not complete full shift on one of the first seven days.

NOTE: (3) Once the form is completed, forward to Operations Superintendent. Do not retain form until the end of the quarter.

Signature: _____

Date: _____

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

Sheet 1 of 7

1.0 PURPOSE

This document is intended to provide additional guidance, to return a licensed individual to an active status.

2.0 REFERENCES/BACKGROUND

- 2.1 The Code of Federal Regulation, 10 CFR55.53 f(2) specifies returning a license to active status. The intent of the law is to ensure proficiency in the conduct of licensed activities prior to assuming licensed duties. The following requirements are addressed as part of this law:
- 2.1.1 The qualifications and status of the licensee are current and valid. This requirement ensures the licensee has completed all required requalification training, including plant modifications and industry events; and secondly, that all conditions of his/her license are still being met.
 - 2.1.2 This licensee has completed a minimum of 40 hours of shift functions under the direction of a reactor operator or senior operator, as appropriate, and in the position to which the individual will be assigned. This ensures that an active license is directing or performing the manipulations of plant controls, and allows the inactive individual to obtain proficiency at his/her watch station. Included within the minimum of 40 hours is the following:
 - a. A complete review of turnover procedures by the reactor operator or senior reactor operator as appropriate for the position, to ensure that the licensee is familiar with current shift turnover practices.
 - b. A complete tour of the plant, to ensure the individual is aware of changing plant conditions that have occurred since he/she has been inactive. The individual performing the tour will be accompanied by a Licensed Reactor Operator or a Licensed Senior Reactor Operator, as appropriate.

3.0 RESPONSIBILITIES

- 3.1 All licensed personnel who maintain an active license shall comply with these requirements. The Operations Superintendent is responsible for administering the process.

4.0 INSTRUCTIONS

- 4.1 The following guidelines are to be used when reactivating a license:
- 4.1.1 Prior to standing the minimum of 40 hours of shift functions, the licensed individual shall meet with the Operation Training Manager and the Operations Superintendent to discuss his/her current status and any standards and/or expectations. For certain individuals, additional requirements may be imposed (greater than those required by law) if directed by the Operations Superintendent.
 - 4.1.2 The following positions are the only ones that qualify for reactivation of a license: Browns Ferry Nuclear
 - Shift Manager
 - Unit 1 Unit Supervisor [Control Room SRO]
 - Unit 2 Unit Supervisor [Control Room SRO]
 - Unit 3 Unit Supervisor [Control Room SRO]
 - Unit 1 Board and Desk ROs
 - Unit 2 Board and Desk ROs
 - Unit 3 Board and Desk ROs

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

Sheet 2 of 7

- 4.1.3 The individual shall be under the direct supervision of an active licensed individual in the position to which the individual will be assigned. To receive credit for a shift, the individual will be present from shift turnover thru shift turnover. Short absences from the Control Room are acceptable (i.e., rest room visits); however, the total time in the Control Room under supervision will total at least 40 hours (this 40 hours does not include the plant tour).

To ensure that the minimum of 40 hours is obtained in the Control Room under supervision, the break-in period will be seven (7)-8 hour shifts or five (5)-12 hour shifts. This applies to all positions used to re-activate a license to active status.

- 4.1.4 The individual shall make a Narrative log entry at the start of the shift which will include the following at a minimum:
- Name and time of assuming shift
 - Shift Position (as identified in 4.1.2) assumed under direction
 - Name of the operators (Board and Desk), Control Room SRO, or Shift Manager providing supervision.
- 4.1.5 The individual shall make a Narrative Log entry at the end of the shift indicating they have completed the shift under supervision. A copy of the Narrative log for each shift worked shall be obtained for processing after the break-in is complete. This will be the entire log for the shift worked and not selected entries.
- 4.1.6 The individual shall complete Form 2 for each shift listing unit, shift, position assuming, along with the activities the individual was personally involved in. Time, Position, Unit, Activity, and Date must be filled out for each activity performed. The position the individual is holding must be one of the seven indicated in step 4.1.2. Form 3 is to be used to account for a plant tour and shift turnover briefing. Form 3 is required to be signed by the Operations Superintendent ensuring that all appendixes have been reviewed and once reviewed, these appendixes will be submitted with the reactivation documentation and will become part of the individuals training record.
- 4.1.7 If license re-activation is for a multi-unit site, then the individual shall divide their time between the units to ensure adequate break-in in all license areas they may be assigned. The amount of time in each Control Room does not have to be equalized between units, but should be enough to ensure that the individual will be ready to assume the shift once their license is returned to active status.
- 4.1.8 If an individual moves from one unit to another unit during the same shift for the purpose of breaking-in on the other unit, the individual shall make an log entry indicating that they are moving to the other unit to continue their break-in. Another entry, to include the areas in 4.1.4, will be made when the individual goes under instruction on the new unit. This requirement is not applicable to an individual being re-activated as a Shift Manager since the break-in would still be under the same individual.

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BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

Sheet 3 of 7

- 4.1.9 The individual shall review the turnover procedures with an active reactor operator or senior reactor operator, as applicable. The following are the minimum procedures that will be reviewed:
- Plant Operations Manager, Operations Superintendent, and/or Operations Support Superintendent will decide the requirements here.
 -
- 4.1.10 As a minimum, the following shall be completed to satisfy the plant tour requirement:
- a. Review of Control Room logs and equipment status in order to ascertain current plant status and configuration.
 - b. Review of radiological conditions in the plant.
 - c. Tour of accessible plant areas where significant modifications have occurred or major maintenance activities are occurring, with special attention if safety-related systems are involved.
 - (1) Prior to beginning the tour, a discussion should be held with the Shift Manager to obtain guidance on which areas to focus on during the plant tour.
 - (2) Document areas discussed on Form 3 and have the Shift Manager sign that the discussion was held.
 - (3) The plant tour will be performed by the individual accompanied by a Licensed Reactor Operator or a Senior Reactor Operator, as applicable, and logged in the Narrative Log.
- 4.1.11 Additionally, the following are considerations for performing the plant tour:
- a. ALARA will be considered when deciding which areas of the plant to tour.
 - b. The individual should walkdown additional areas, as he/she deems appropriate, to ensure he/she is comfortable with plant conditions.
- 4.2 Returning an Inactive Shift Manager to active Status
- 4.2.1 Before resumption of independent Shift Manager duties, the Plant Manager or designee will certify the following:
- 4.2.1.1 The individual has completed 40 hours of break-in under the current Shift Manager.
 - 4.2.1.2 Prior to a Shift Manager being assigned to an on-shift crew, that individual should attend simulator training with the other licensed members of that crew.
 - 4.2.1.3 Documentation of completion shall be forwarded to Operations Training Manager for retention.

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BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

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5.0 DOCUMENTATION

The completed Forms 2 and 3, with Narrative logs, and all required signatures on the "To Licensed Status Certification" shall be completed prior to being reactivated. The "Return To Licensed Status Certification" form, Forms 2 and 3, and the narrative logs will then become part of the individual's training record.

For the Shift Manager, the log of activities outside of the Control Room will also become part of the individual's training record, if applicable.

Complete and Attach OPDP-1-4, Licensee Documentation Form, as the cover-sheet for this record [BFN PER 01-008306-000]

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BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

Sheet 5 of 7

To: Operations Training Manager

From: Operations Superintendent _____

Date

RETURN TO ACTIVE LICENSE STATUS CERTIFICATION

NAME: _____

1. Licensee requalification training is current, including a simulator evaluation within the past 12 months in the position(s) to be assumed and the licensee has had a physical in the last two years.
(To be verified prior to standing the 40 hours of shift functions under instruction.)

Date: ____/____/____

Operational Training Manager

2. The qualifications and status of the licensed individual listed above are current and valid, and Standards and Expectations have been discussed, prior to standing the 40 hours of shift functions under instruction.

Date: ____/____/____

Operational Superintendent

3. If the licensee has a medical restriction requiring corrective lenses, the licensee will verify that he/she has the proper corrective lenses required to Don SCBA available while performing license duties (N/A if corrective lenses are not required).

Date: ____/____/____

Licensee

4. The above licensed individual has completed at least 40 hours of shift functions under the direction of an operator or senior operator, as appropriate, including a complete tour of the plant accompanied by a licensed RO or SRO, as applicable, and review of all required shift turnover procedures.

Date: ____/____/____

Licensee

Date: ____/____/____

Shift Manager

Date: ____/____/____

Operations Superintendent

Date: ____/____/____

Operations Manager

5. The above licensed individual is authorized to resume licensed activities.

Date: ____/____/____

Plant Manager

6. Complete and Attach OPDP-1-4, Licensee Documentation Form (SRO & RO) as the cover sheet for this documentation.

Date: ____/____/____

Licensee

cc:

Operations Manager
Training File

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REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

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BROWNS FERRY NUCLEAR PLANT REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

Sheet 6 of 7

Form 2
(Completed for EACH Shift)

NAME: _____
Licensee

Date: _____

Shift and position _____

- Narrative Log Entry made including the following: Name and _____ (Licensee)
time assuming shift
Shift Position assumed under direction
Name of Operator providing supervision
- Reactivation Activities Performed During the Shift
(The following record is a list of activities in which the licensee was personally involved)

TIME	POSITION	UNIT 1, 2 or 3	ACTIVITY	DATE

- Narrative Log Entry made for completion of shift
(Note: A completed shift must be from turnover thru turnover) _____ (Licensee)
 - Copy of Complete Narrative Logs attached to this form _____ (Licensee)
- Shift Manager has reviewed this form. _____ (Shift Manager)

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT
REQUIREMENTS FOR RETURNING AN INACTIVE LICENSE TO ACTIVE STATUS

Sheet 7 of 7

Form 3
(Completed ONCE per Reactivation)

NAME: _____
Licensee

Date: _____

- Areas discussed with the Shift Manager to Tour _____
As a minimum they should include (Shift Manager)
Review Control Room Logs
Radiological Conditions in the plant
Significant Modifications and major maintenance activities.

- Areas that were toured with another Licensed Operator and discussed with the Shift Manager

- Licensed Operator verified Tour. _____
(Tour Verifier)
- Plant Tour discussed with Shift Manager _____
(Shift Manager)
- Narrative Log Entry made for completion of tour as well as _____
being logged in as break-in for the tour duration. (Licensee)
- Shift Turnover Procedure Reviewed _____
NOTE: ROs CANNOT sign for SROs. (Licensed Operator)
- Required amount of shifts have been completed _____
(5-12 hour or 7-8 hours shifts) (Licensee)
- All Form 2s have been reviewed and are complete along with the Narrative logs attached _____
(Licensee)
- All Form 2s have been reviewed and are complete along with the Narrative logs attached

Operations Superintendent

/_____
Date

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT AUO PROFICIENCY GUIDLINES

Sheet 1 of 4

1.0 PURPOSE

This document is intended to provide guidance in defining the BFN Proficiency requirements and to return a non-licensed individual to a proficient status.

2.0 REFERENCES/BACKGROUND

- 2.1 Non-Licensed Operator (NLO) watch station proficiency is maintained by completing one 12-hour shift on each affected watch station within an 18-month period for on-shift personnel and a 6-month period for off-shift personnel. For proficiency purposes the 12-hour period must include a:
1. Turnover with complete review of turnover information as appropriate for the position.
 2. Complete tour of the plant (round), to ensure the individual is aware of changing plant conditions that have occurred since he/she last held that position.
- 2.2 The requirements for maintaining proficiency are located in Site specific , Non-Licensed Operator Training Requirements; proficiency can be lost by one of the following:
1. Failure of a non-licensed operator (NLO) requalification examination. The NLO is non-proficient until passing a re examination.
 2. Failure to attend non-licensed operator requalification (if two cycles are missed or retraining for one missed cycle is not completed prior to the end of the next scheduled cycle)
 3. Failure to carry any watch station indicated below:
 - For on-shift personnel, the non-licensed operator loses proficiency on any watch station if they fail to carry a shift for that station within any 18-month period (this includes attending turnover and conducting one complete round on that watch station)
 - For off-shift personnel, the non-licensed operator loses proficiency on any watch station if they fail to carry a shift for that station within any 6-month period (this includes attending turnover and conducting one complete round on that watch station)

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT AUO PROFICIENCY GUIDLINES

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3.0 RESPONSIBILITIES

All non-licensed personnel who actively carry shift duties and their supervisors shall comply with these requirements. The Operations Superintendent is responsible for administering the process.

4.0 INSTRUCTIONS

4.1 The following guidelines are to be used when reinstating watch station proficiency:

4.1.1 Operations Training/Scheduling will notify the Operations Superintendent and appropriate Shift Manager of the failure to meet this requirement and subsequent loss of proficiency on that watch station. The following guidance will be followed to reinstate proficiency.

This ensures a non-proficient individual the opportunity to obtain proficiency at his/her watch station.

- a. Complete review of turnover information as appropriate for the position
- b. 3 complete tours of the station, to ensure the individual is aware of changing plant conditions that have occurred since he/she was last proficient.
- c. The individual performing the tours will be accompanied by a proficient non-licensed operator.
- d. For these instances, the completion of Form 4 is required.

4.1.2 For certain individuals, additional requirements may be imposed (such as failure to attend requalification training and meet watch station standing requirements) if directed by the Operations Superintendent and/or Shift Manager. Upon satisfactory completion of the defined requirements and re-evaluation, proficiency will be granted and the NLO returned to shift. The completion of Form 4 is required as documented in 4.1.1 above.

4.1.3 The individual shall make a Narrative log entry at the start of the shift which will include the following at a minimum:

- Name and time of assuming shift
- Watch Station Position (as identified in 4.1.7)

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BROWNS FERRY NUCLEAR PLANT AUO PROFICIENCY GUIDLINES

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- Name of the proficient non-licensed operator providing supervision.

- 4.1.4 The individual shall make a Narrative log entry at the end of the shift indicating they have completed the shift under supervision.
- 4.1.5 The individual shall complete Form 4 for the watch station worked. The appropriate Shift Manager/Unit Supervisor will ensure the Form 4 is properly completed and reviewed, submitted to the Training Department where it will become part of the individuals training record.
- 4.1.6 When possible, the individual shall divide their time between the operating units to ensure adequate break-in of all areas they may be assigned. The amount of time on each unit does not have to be equally split, but should be enough to ensure that the individual will be ready to assume the position on any unit once their proficiency is reestablished.
- 4.1.7 The following watch stations are required to maintain NLO proficiencies:

Browns Ferry

• Reactor Building	• Turbine Building
• Control Bay	• Outside
• Radwaste	

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License Status - Active/Inactive License

BROWNS FERRY NUCLEAR PLANT AUO PROFICIENCY GUIDLINES

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FORM 4
(NLO DOCUMENT FOR RETURN TO PROFICIENT STATUS)

NAME: _____ Date: _____
Licensee

NLO DOCUMENT FOR RETURN PROFICIENT STATUS

Employee ID Number: _____

Shift and position: _____

1 Narrative Log Entry made including the following:

Name and time assuming shift

Shift Position assumed under direction

Name of Proficient Non-Licensed Operator providing supervision

(Complete the following for proficiency documentation)				
TIME	POSITION	UNIT 1, 2 or 3	Name of <u>Proficient</u> Non-Licensed Operator Providing Supervision	DATE

Browns Ferry Appropriate ATIS Tracking Numbers are per watch station are:

Reactor Bldg: OPN118.501

Turbine Bldg: OPN118.502

Control Bay: OPN118.503

Outside: OPN118.504

Radwaste: OPN118.505

1 Narrative Log Entry made for completion of all tours: (init) _____

2 Shift Turnover Procedure Reviewed: (init) _____

3 Tour Areas Discussed with Shift Manager: (init) _____

Operations Superintendent/Shift Manager _____ DATE _____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 120F

TITLE: PERFORM 2-SR-3.4.2.1 JET MISMATCH AND
OPERABILITY (OPERATION)

ALTERNATE PATH YES X NO

SUBMITTED BY: *Robert M. Green* DATE: 1/3/08

VALIDATED BY: *James C. Mart* DATE: 1/4/08

APPROVED: *3 Robert L. Sullivan* DATE: 1/5/08
TRAINING

PLANT CONCURRENCE: *Carl Schramm* DATE: 1/4/08
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval
and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	06/03/07	All	New Procedure
1	12/22/07	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO ____ SRO ____

DATE: _____

JPM NUMBER: 120F

TASK NUMBER: U-068-SU-05

TASK TITLE: PERFORM JET PUMP MISMATCH AND OPERABILITY SR OPERATION)

K/A NUMBER: 202001G13 K/A RATING: RO 3.6 SRO: 3.4

TASK STANDARD: COMPLETE AN IN-PROGRESS SURVEILLANCE REQUIREMENT
ON REACTOR RECIRCULATION SYSTEM JET PUMP MISMATCH
AND OPERABILITY

LOCATION OF PERFORMANCE: SIMULATOR X PLANT ____ CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: 2-SR-3.4.2.1, REVISION 21

VALIDATION TIME: CONTROL ROOM: 30:00 LOCAL: ____

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

PERFORMANCE TIME: ____ CONTROL ROOM ____ LOCAL ____

COMMENTS: THE SR SHOULD BE COMPLETED UP TO STEP 7.2 BEFORE IT
IS GIVEN TO THE PERFORMER.

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

SIGNATURE: _____ DATE: _____

EXAMINER

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

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. Ensure you indicate to me when you understand your assigned task and when you have completed the assigned task.

INITIAL CONDITIONS: You are a Unit 2 Operator. Unit 2 is operating at 100% power for 280 Days on line, 2-SR-3.4.2.1, Jet Pump Mismatch and Operability, is in progress and complete up to Step 7.2[1]. Applicant should contact Evaluator for any necessary feedback or info and or to indicate task completion.

INITIATING CUES: The Unit Supervisor directs you to continue with 2-SR-3.4.2.1. starting with Step 7.2[1].

START TIME_____

**NOTE FOR EXAMINER ,THIS JPM can be used as an ADMIN OR SIMULATOR
IF performed as ADMIN, give student the handout (last page)**

**IF performed on the simulator , then enter reset to IC 28 and enter
BAT LOR/JPM120f**

**NOTE: ALL OF THE FOLLOWING STEPS WILL REQUIRE DATING EACH
PAGE OF THE SR AND INITIALING/"N/A"ING AS APPROPRIATE.**

Performance Step:

Critical___ Not Critical_X

7.2 Data Collections

7.2.1 Core Power and Flow Readings

- [1] **RECORD** the Core thermal power from Core Power and Flow
Log. (N/A if ICS is not available) Point CALC002 **3456**
CMWT.

Standard:

RECORDS ICS point CALC002 (From Data Sheet).

SAT_UNSAT_N/A_ COMMENTS:_____

Performance Step:

Critical__ Not Critical X

- [2] **RECORD** the Core plate differential pressure from ICS point 68-52 or 2-XR-68-50 (Green Pen). (N/A if not available).
Core Press Drop 68-52 14.4 PSID

Standard:

RECORDS Core plate differential pressure from ICS point 68-52 or 2 XR-68-50 (From Data Sheet).

SAT__UNSAT__N/A__ COMMENTS:_____

Performance Step:

Critical__ Not Critical X

- [3] **RECORD** the Total Core flow.

Total Core Flow (Red Pen) 2-XR-68-50
<u>87.0</u> Mlb/hr

Standard:

RECORDS Total Core Flow 2-XA-68-50 (From Data Sheet).

SAT__UNSAT__N/A__ COMMENTS:_____

NOTES

- 1) If 2-SIT-68-59/71 (RB. EI 565 R-9 S-line - Local Panel) is used log the reason in post test Remarks.
- 2) Use the 2-SI-96-61 (or ICS PT 96-61) if both 2-SI-68-59 and 2-SIT-68-59 are not available for the 2A Pump Motor and log the reason in post test Remarks.
- 3) Use the 2-SI-96-73 (or ICS PT 96-73) if both 2-SI-68-71 and 2-SIT-68-71 are not available for the 2B Pump Motor and log the reason in post test Remarks.
- 4) If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

Performance Step:

Critical_ Not Critical X

7.2.2 Recirculation Pump Loops

- [1] **RECORD** the Recirc Pump 2A and 2B Mtr Speeds for operating Recirc Pumps and circle instrumentation used.

Pump Mtr 2A	Pump Mtr 2B
2-SI-68-59 or 2-SIT-068-0059 or 2-SI-96-61	2-SI-68-71 or 2-SIT-068-0071 or 2-SI-96-73
<u>1313</u> RPM	<u>1313</u> RPM

- [2] **RECORD** the Recirc Pump Discharge flows.

Loop 2A 2-FI-68-5	Loop 2B 2-FI-68-81
<u>41.0</u> gpm X 1000	<u>44.0</u> gpm X 1000

- [3] **RECORD** the Recirc loop 2A and 2B Jet Pump Flow.

Loop 2A 2-FI-68-46	Loop 2B 2-FI-68-48
<u>46</u> Mlb/hr	<u>45</u> Mlb/hr

Standard:

RECORDS Data in steps [1],[2], and [3] (From Data Sheet).

SAT_UNSAT_N/A_ COMMENTS: _____

NOTE

If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

Performance Step:

Critical__ Not Critical X

7.2.3 Jet Pump Loops

[1] **RECORD** the following Differential Pressure readings below:

Loop 2A			Loop 2B		
INSTRUMENT	JET PUMP	PSID	INSTRUMENT	JET PUMP	PSID
2-PDI-68-38	11	9.0	2-PDI-68-15	1	9.0
2-PDI-68-39	12	9.0	2-PDI-68-18	2	9.5
2-PDI-68-40	13	9.5	2-PDI-68-19	3	9.0
2-PDI-68-42	14	9.0	2-PDI-68-21	4	9.5
2-PDI-68-43	15	8.5	2-PDI-68-22	5	10.0
2-PDI-68-07	16	9.0	2-PDI-68-25	6	9.5
2-PDI-68-08	17	9.0	2-PDI-68-26	7	10.0
2-PDI-68-10	18	9.5	2-PDI-68-28	8	10.5
2-PDI-68-11	19	8.5	2-PDI-68-29	9	9.5
2-PDI-68-13	20	9.5	2-PDI-68-30	10	9.5

Standard:

RECORDS Jet Pump Differential Pressure readings (From Data Sheet)

SAT__UNSAT__N/A__ COMMENTS:_____

NOTES

- 1) Section 7.3 is performed when both Recirculation Pumps are in service. This section should be N/A'ed when in Single Loop Operation.
- 2) To satisfy procedure Acceptance Criteria, either Step 7.3[3] or Step 7.3[4] must be satisfied.

Performance Step:

Critical__ Not Critical X

**7.3 Tech Spec 3.4.1.1 - Recirculation Loop Mismatch Verification
With Both Recirculation Loops In Operation Checks**

- [1] **CALCULATE** percent of rated core flow (%WT) using data obtained in Section 7.2.1[3] as follows.

(Step 7.2.1[3] ÷ 102.5) X 100 =	% Core Flow
(<u>87</u> ÷ 102.5) X 100 =	<u>84.88</u>

- [2] **CALCULATE** the absolute value for Recirculation Loop Jet Mismatch using data obtained in Section 7.2.2[3] as follows.

2-FI-68-46 - 2-FI-68-48 = Mismatch

46 Mlb/hr - 45 Mlb/hr = 1 Mlb/hr

Standard:

PERFORMS CALCULATION in Steps [1] and [2] (2 Mlb/hr mismatch).

SAT__UNSAT__N/A__ COMMENTS:_____

Performance Step:

Critical__ Not Critical X

- [3] IF %WT is < 70% as recorded in Step 7.3[1], THEN
VERIFY Recirculation Loop Jet Pump Flow Mismatch recorded
in Step 7.3[2] is ≤ 10.25 Mlb/hr. (Otherwise N/A) _____(AC)
- [4] IF %WT is $\geq 70\%$ as recorded in Step 7.3[1], THEN
VERIFY Recirculation Loop Jet Pump Flow Mismatch recorded
in Step 7.3[2] is ≤ 5.12 Mlb/hr. (Otherwise N/A) _____(AC)

Standard:

MARKS Step [3] N/A due to > 70% AND **Initials** steps [4].

SAT_UNSAT_N/A_ COMMENTS: _____

NOTES

- 1) Section 7.4 should be marked as N/A if RTP is $\leq 25\%$.
- 2) Jet Pump Operability is not required to be performed until 4 hours after associated recirculation loop is in operation and then only within 24 hours after RTP is > 25%.

Performance Step:

Critical X Not Critical

**7.4 Tech Spec 3.4.2.1 - Part A -Recirculation Pump and Jet Pump
Flow to Recirculation Pump Speed:**

7.4.1 Jet Pump Loop 2A

- [1] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the
2A Pump Flow recorded in Step 7.2.2[2]:

CHECK that the plot falls between the two bold lines on
Illustration 1 and **RECORD** below.

Plot falls between the bold lines Yes ☒ No ☐

- [2] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the
2A Jet Pump Flow in Step 7.2.2[3]:

CHECK that the plot falls between the two bold lines on
Illustration 2 and **RECORD** below.

Plot falls between the bold lines Yes ☐ No ☒

- [3] Using Steps 7.4.1[1] and 7.4.1[2] from above:

DETERMINE if the Jet Pump Loop 2A criteria is satisfied by
marking below if both steps are marked as Yes.

Jet Pump Loop 2A criteria is satisfied Yes ☐ No ☒

Standard:

MARKS Steps [1] **YES**, [2] and [3] **NO** after verifying **CHECKING** the plot does **NOT** fall
between the bold lines on Illustration 2.

SAT__UNSAT__N/A__ COMMENTS:_____

Performance Step:

Critical X Not Critical

7.4.2 Jet Pump Loop 2B

- [1] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2B Pump Flow recorded in Step 7.2.2[2]:

CHECK that the plot falls between the two bold lines on Illustration 3 and **RECORD** below.

Plot falls between the bold lines	Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/>
-----------------------------------	-----	-----------------------------	-------------------------------------

- [2] Using the 2B Pump Speed recorded in Step 7.2.2[1] and the 2B Jet Pump Flow in Step 7.2.2[3]:

CHECK that the plot falls between the two bold lines on Illustration 4 and **RECORD** below.

Plot falls between the bold lines	Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/>
-----------------------------------	-----	--	--------------------------

- [3] Using Steps 7.4.2[1] and 7.4.2[2] from above:

DETERMINE if the Jet Pump Loop 2B criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2B criteria is satisfied	Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/>
--	-----	-----------------------------	-------------------------------------

Standard:

MARKS Steps [1] **NO**, [2] **YES**, and [3] **NO** after verifying CHECKING the plot does **NOT** fall between the bold lines on Illustration 3 for step 7.4.2[1].

SAT__UNSAT__N/A__ COMMENTS:_____

Performance Step:

Critical X Not Critical

7.4.3 Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification:

- [1] Using the individual 2A Jet Pump DP's recorded in Step 7.2.3[1]

CHECK that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 5 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2A Individual DP's are between the bold lines. Yes ☒ No ☐

- [2] Using the individual 2B Jet Pump DP's recorded in Step 7.2.3[1]

CHECK that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 6 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2B Individual DP's are between the bold lines. Yes ☐ No ☒

- [3] Using Steps 7.4.3[1] and 7.4.3[2]

DETERMINE whether the Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied Yes ☐ No ☒

Standard:

MARKS Steps [1] **YES**, [2] **NO**, and [3] **NO** after VERIFYING DP is **NOT** between the two lines on Illustration 6 for step 7.4.3[2].

SAT_ UNSAT_ N/A_ COMMENTS: _____

CAUTION

An Engineering Judgment/Review may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

Performance Step:

Critical X Not Critical

7.4.4 Operability Determination

[1] **IF** any of the following conditions apply:

☐ Following Refueling Outage. (See Caution above)

OR

☐ The Reactor is in Single Loop Operation (See Caution above)

OR

☒ If Steps 7.4.1[3], 7.4.2[3] and 7.4.3[3] fall outside the
bolded lines, to determine if the graphs need updating

THEN

PERFORM Attachment 2, Engineering Judgment/Review:
(Otherwise N/A if not required.) _____

Standard:

The UNIT has been running for 280 days , Both recirc loops are I/S but Steps 7.4.2[3] and 7.4.3[3] do not fall within the lines on the graphs, SO this Step should be **initialed** and Attachment 2 completed.

SAT_ UNSAT_ N/A_ COMMENTS: _____

Performance Step:

Critical X Not Critical

Attachment 2

Engineering Judgement/Review

Date: _____

CAUTION

Engineering Judgment Evaluation may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

- [1] Mark the condition that applies:

Following Refueling Outage.	<input type="checkbox"/>
The Reactor is in Single Loop Operation	<input type="checkbox"/>
Steps 7.4.1[3], 7.4.2[3] and 7.4.3[3] fall outside the bolded lines	<input checked="" type="checkbox"/>

- [2] **REQUEST** System Engineering to perform an Engineering Judgement/Review. _____

- [3] **IF** the Engineering Judgment/Review was performed following a Refueling Outage or during Single Loop Operation, **THEN**

DETERMINE if the Jet Pump Criteria is satisfied and no significant abnormalities which could indicate a jet pump failure are indicated and **RECORD** the results below. (Otherwise N/A)

Jet Pump Criteria Satisfied. Yes ☐ No ☐

N/A

- [4] **IF** the Engineering Judgment/Review was performed to determine if the graphs needs updated, **THEN**

REQUEST a System Engineering to: (Otherwise N/A)

A. **SUPPLY** Operations with new graphs to Operations Procedures. _____

B. **RECORD** below if Jet Pump Criteria is satisfied.

Jet Pump Criteria Satisfied. Yes ☐ No ☐

Standard:

MARKS third box on [1] & signs, Signs [2], N/A's [3], and sends to engineering. **CUE: Engineer N/A's 4A and signs 4B after marking NO (See cue - below)**

SAT_UNSAT_N/A_ COMMENTS: _____

CUE: Attachment 2 has come back from Engineering marked NO – i.e. N/A 4A, check NO on 4B and initial and give back to student.

Performance Step:

Critical X Not Critical

- [2] **MARK** the appropriate criteria results for the following.
(N/A any criteria not performed.)

Steps	Criteria Results	Yes	No	N/A
7.4.1[3] and 7.4.2[3]	Both Jet Pump Loops steps are marked as YES	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7.4.3[3]	Jet Pump DP to criteria is marked as YES.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Attachment 2	Engineering Evaluation is marked as YES.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Standard:

MARKS Steps 7.4.1[3] and 7.4.2[3] **NO**, Step 7.4.3[3] **NO** and ATT 2 **NO (after cue)**.

SAT_ UNSAT_ N/A_ COMMENTS: _____

Performance Step:

Critical X Not Critical

- [3] Using the Criteria Results in Step 7.4.4[2]

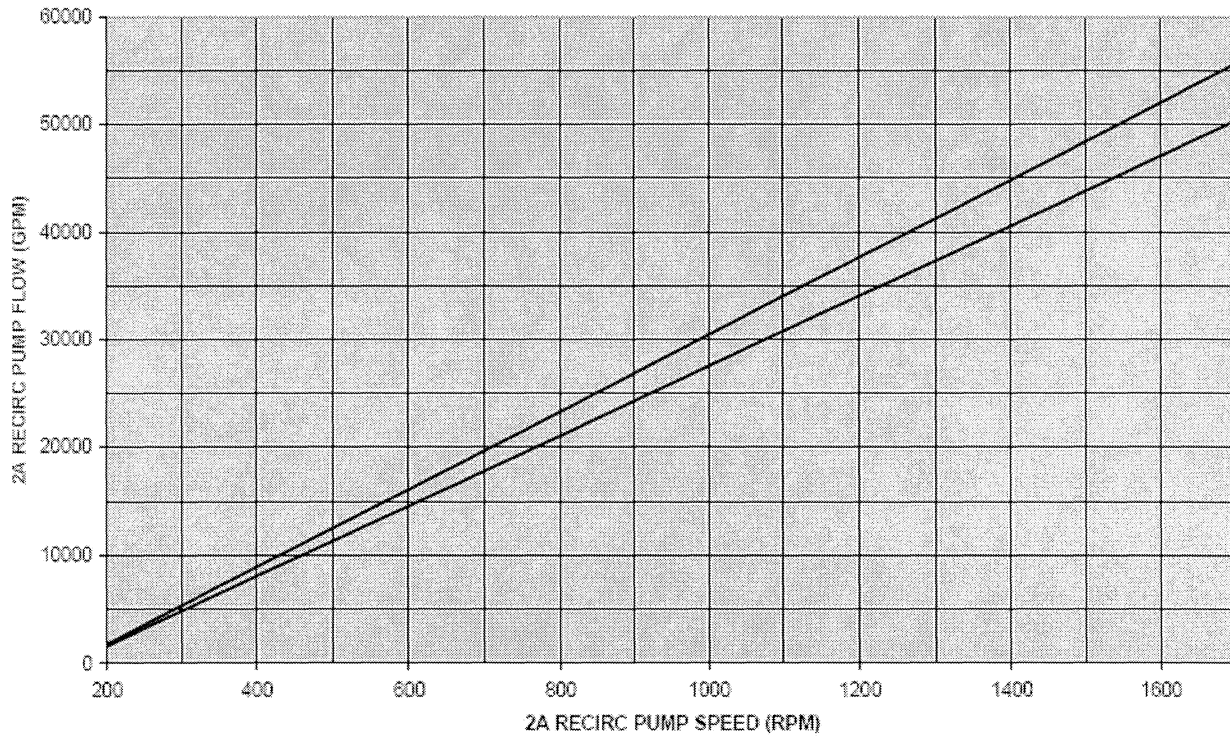
VERIFY at least one Criteria Results is satisfied and marked as YES. _____(AC)

Standard:

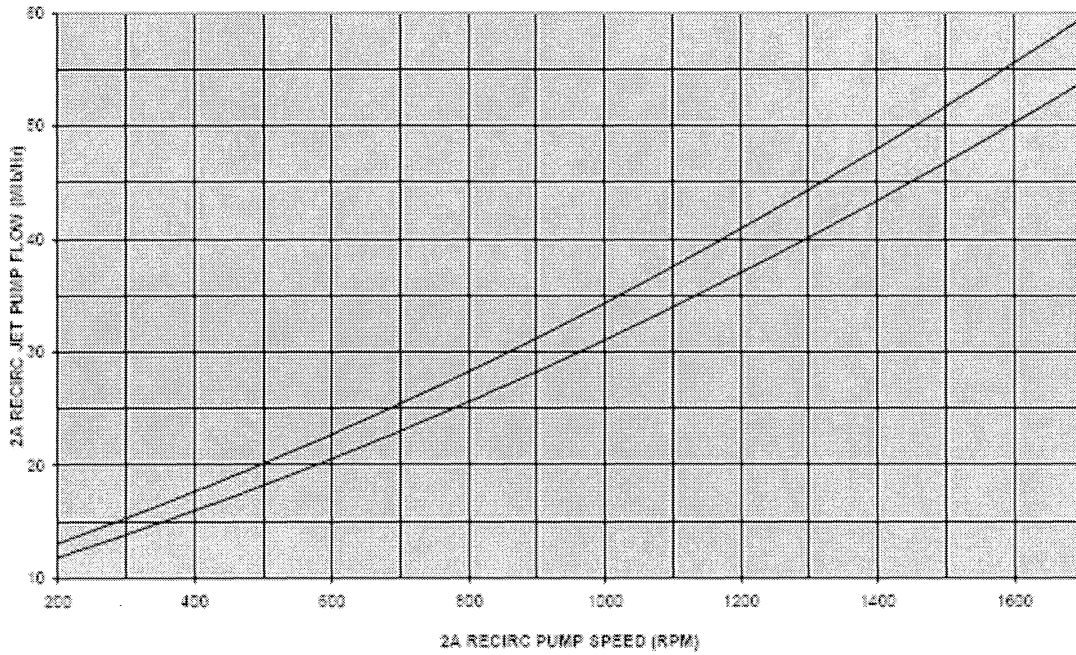
DOES NOT SIGN OFF Step 7.4.4[3] (**Critical**) and NOTIFIES US OF FAILURE (Not Critical)

SAT_ UNSAT_ N/A_ COMMENTS: _____

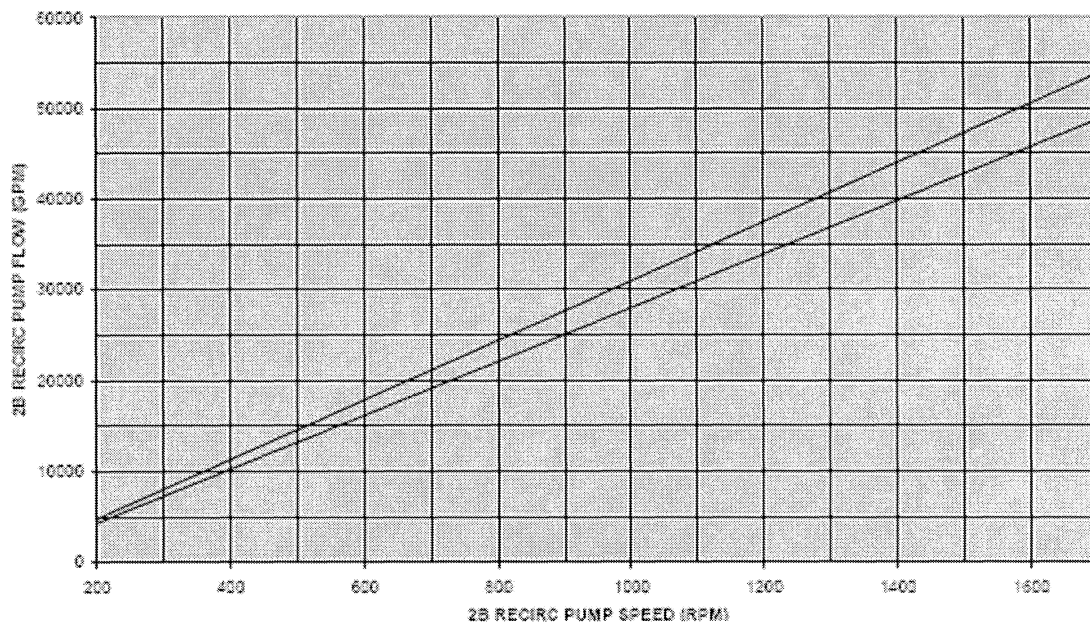
**2A RECIRC PUMP SPEED VS PUMP FLOW
TWO LOOP OPERATION**



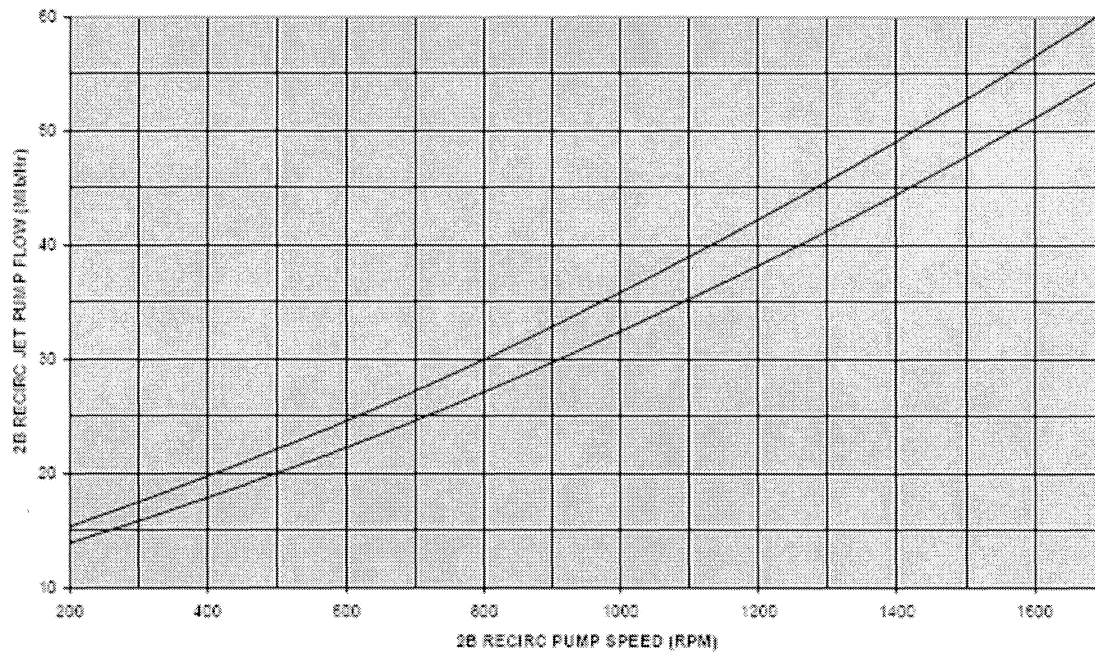
**2A RECIRC SPEED VS JET PUMP FLOW
TWO LOOP OPERATION**



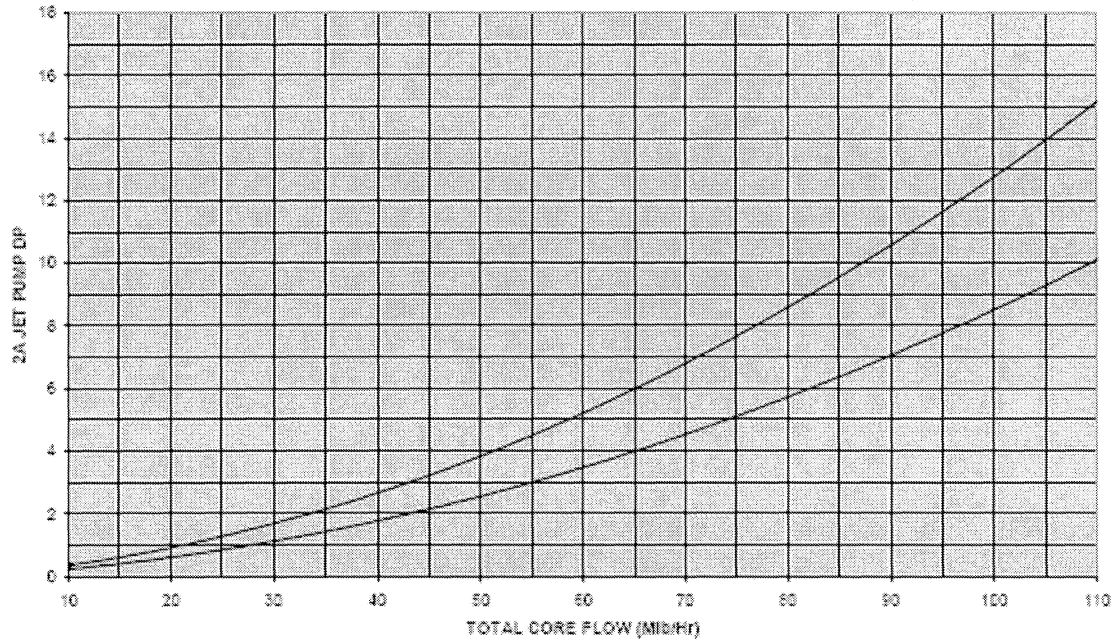
**2B RECIRC PUMP SPEED VS PUMP FLOW
TWO LOOP OPERATION**



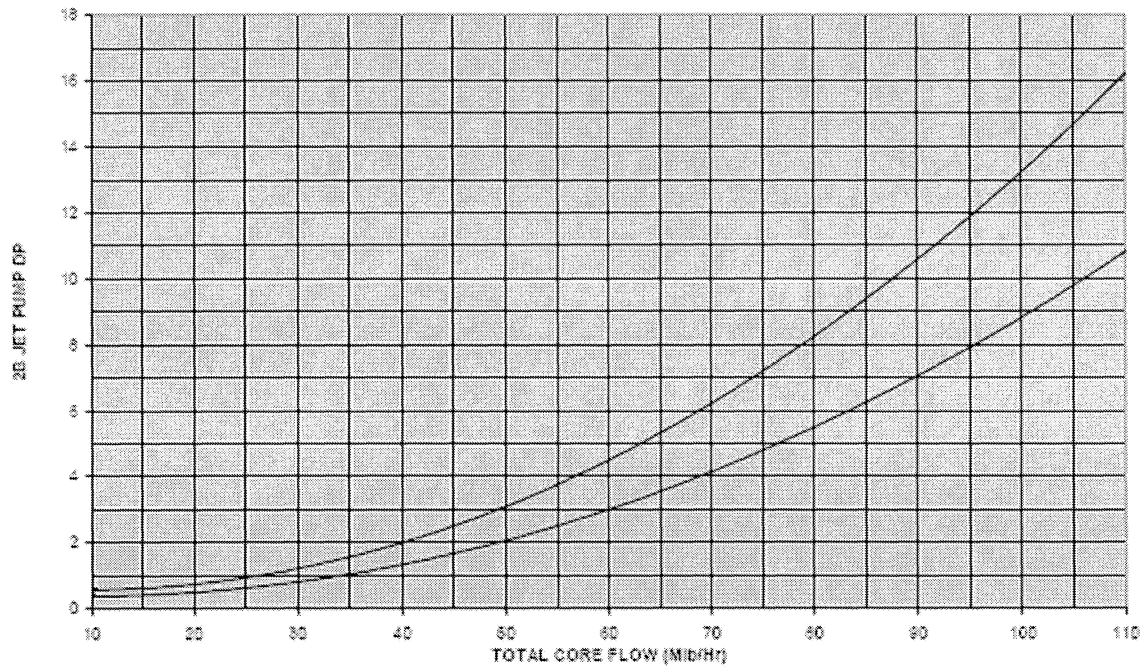
2B RECIRC PUMP SPEED VS JET PUMP FLOW
TWO LOOP OPERATION



**2A TOTAL CORE FLOW VS JET PUMP DP
TWO LOOP OPERATION**



**2B TOTAL CORE FLOW VS JET PUMP DP
TWO LOOP OPERATION**



Performance Step:

Critical__Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION (Standard is subjective and instructor must evaluate the need for additional training on 3-WAY COMMUNICATION to maintain plant standards).

SAT__UNSAT__N/A__COMMENTS_____

END OF TASK

STOP TIME_____

EVALUATOR's Data Sheet

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

INITIAL CONDITIONS: You are a Unit 2 Operator. Unit 2 is operating at 100% power for 280 Days on line,.
2-SR-3.4.1, Jet Pump Mismatch and Operability, is in progress and complete up to Step 7.2[1].

INITIATING CUES: The Unit Supervisor directs you to continue with 2-SR-3.4.2.1. starting with Step 7.2[1].

Point CALC002	3456	CMWT
2-XR-68-50, CORE PRESSURE DROP (Green pen)	14.4	PSID
2-SI-68-59, RECIRC PUMP 2A MOTOR SPEED	1313	RPM
2-SI-68-71, RECIRC PUMP 2B MOTOR SPEED	1313	RPM
2-FI-68-5, RECIRC PUMP 2A DISCHARGE FLOW	41.0	gpm x 1000
2-FI-68-81, RECIRC PUMP 2B DISCHARGE FLOW	44.0	gpm X 1000 (out of bounds)
2-FI-68-46, RECIRC LOOP 2A JET PUMP FLOW	46	Mlb/hr (out of bounds)
2-FI-68-48, RECIRC LOOP 2B JET PUMP FLOW	45	Mlb/hr
2-XR-68-50, TOTAL CORE FLOW (Red pen)	87.0	Mlb/hr
2-PDI-68-38 JET PUMP 11 LOOP 2A	9.0	PSID
2-PDI-68-39 JET PUMP 12	9.0	PSID
2-PDI-68-40 JET PUMP 13	9.5	PSID
2-PDI-68-42 JET PUMP 14	9.0	PSID
2-PDI-68-43 JET PUMP 15	8.5	PSID
2-PDI-68-07 JET PUMP 16	9.0	PSID
2-PDI-68-08 JET PUMP 17	9.0	PSID
2-PDI-68-10 JET PUMP 18	9.5	PSID
2-PDI-68-11 JET PUMP 19	8.5	PSID
2-PDI-68-13 JET PUMP 20	9.5	PSID
2-PDI-68-15 JET PUMP 1 LOOP 2B	9.0	PSID
2-PDI-68-18 JET PUMP 2	9.5	PSID
2-PDI-68-19 JET PUMP 3	9.0	PSID
2-PDI-68-21 JET PUMP 4	9.5	PSID
2-PDI-68-22 JET PUMP 5	10.0	PSID
2-PDI-68-25 JET PUMP 6	9.5	PSID
2-PDI-68-26 JET PUMP 7	10.0	PSID
2-PDI-68-28 JET PUMP 8	10.5	PSID (out of bounds)
2-PDI-68-29 JET PUMP 9	9.5	PSID
2-PDI-68-30 JET PUMP 10	9.5	PSID

STUDENT HANDOUT

BROWNS FERRY NUCLEAR PLANT JOB PERFORMANCE MEASURE

INITIAL CONDITIONS: You are a Unit 2 Operator. Unit 2 is operating at 100% power for 280 Days on line,. 2-SR-3.4.1, Jet Pump Mismatch and Operability, is in progress and complete up to Step 7.2[1].

INITIATING CUES: The Unit Supervisor directs you to continue with 2-SR-3.4.2.1. starting with Step 7.2[1].

Point CALC002	3456	CMWT
2-XR-68-50, CORE PRESSURE DROP (Green pen)	14.4	PSID
2-SI-68-59, RECIRC PUMP 2A MOTOR SPEED	1313	RPM
2-SI-68-71, RECIRC PUMP 2B MOTOR SPEED	1313	RPM
2-FI-68-5, RECIRC PUMP 2A DISCHARGE FLOW	41.0	gpm x 1000
2-FI-68-81, RECIRC PUMP 2B DISCHARGE FLOW	44.0	gpm X 1000
2-FI-68-46, RECIRC LOOP 2A JET PUMP FLOW	46	Mlb/hr
2-FI-68-48, RECIRC LOOP 2B JET PUMP FLOW	45	Mlb/hr
2-XR-68-50, TOTAL CORE FLOW (Red pen)	87.0	Mlb/hr
2-PDI-68-38 JET PUMP 11 LOOP 2A	9.0	PSID
2-PDI-68-39 JET PUMP 12	9.0	PSID
2-PDI-68-40 JET PUMP 13	9.5	PSID
2-PDI-68-42 JET PUMP 14	9.0	PSID
2-PDI-68-43 JET PUMP 15	8.5	PSID
2-PDI-68-07 JET PUMP 16	9.0	PSID
2-PDI-68-08 JET PUMP 17	9.0	PSID
2-PDI-68-10 JET PUMP 18	9.5	PSID
2-PDI-68-11 JET PUMP 19	8.5	PSID
2-PDI-68-13 JET PUMP 20	9.5	PSID
2-PDI-68-15 JET PUMP 1 LOOP 2B	9.0	PSID
2-PDI-68-18 JET PUMP 2	9.5	PSID
2-PDI-68-19 JET PUMP 3	9.0	PSID
2-PDI-68-21 JET PUMP 4	9.5	PSID
2-PDI-68-22 JET PUMP 5	10.0	PSID
2-PDI-68-25 JET PUMP 6	9.5	PSID
2-PDI-68-26 JET PUMP 7	10.0	PSID
2-PDI-68-28 JET PUMP 8	10.5	PSID
2-PDI-68-29 JET PUMP 9	9.5	PSID
2-PDI-68-30 JET PUMP 10	9.5	PSID



Browns Ferry Nuclear Plant

Unit 2

Surveillance Procedure

2-SR-3.4.2.1

Jet Pump Mismatch and Operability

Revision 0021

Quality Related

Level of Use: Continuous Use

Effective Date: 05-19-2007

Responsible Organization: OPS, Operations

Prepared By: Keith Smith

Approved By: James McCrary

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 2 of 28
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Current Revision Description

Type of Change: ENHANCEMENTS Tracking Number: 022

PCR's 07002058

PER, DCN, TACF None

Steps 4.0[4] corrected the greater than 25% RTP sign.

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1.0 INTRODUCTION

1.1 Purpose

- This pump operability test is performed to verify recirculation loop jet pump flow mismatch for the Recirculation loops which are in service in conformance with the requirements specified in Technical Specification 3.4.1.1 for dual Recirculation loop operation.
- Also this test will determine the integrity of the jet pumps of the Reactor Recirculation System in conformance with the requirements specified in Technical Specifications 3.4.2.1.

1.2 Scope

- This SR is designed to verify jet pump mismatch and to detect significant degradation in jet pump performance that precedes jet pump failure.
- This SR is required to be performed only when the loop has forced recirculation flow.
- The jet pump failure of concern is complete mixer displacement due to jet pump beam failure. Jet pump plugging is also of concern since it adds flow resistance to the recirculation loop.
- This procedure satisfies both SR 3.4.1.1 and SR 3.4.2.1 for dual Recirculation loop operation.
- This procedure satisfies only SR 3.4.2.1 for single Recirculation loop operation.
- The procedure 2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation, satisfies Technical Specification 3.4.1 during single Recirculation loop operation.

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NOTES

- 1) SR 3.4.1.1 is not REQUIRED TO BE PERFORMED UNTIL 24 HOURS AFTER BOTH RECIRCULATION LOOPS ARE IN OPERATION.
- 2) SR 3.4.2.1 is not required to be performed until:
 - 4 hours after associated recirculation loop is in operation.

OR

 - 24 hours after > 25% RTP

1.3 Frequency

- A. Recirculation Loop Jet Pump Flow Mismatch (SR 3.4.1.1) if both Recirculation loops are in operation.
 1. Once per 24 hours
- B. Jet Pump Operability (SR 3.4.2.1)
 1. Once per 24 hours

1.4 Applicability

Modes 1 and 2.

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 5 of 28
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2.0 REFERENCES

2.1 Technical Specifications

Sections 3.4.1, Recirculation Loops Operating

Sections 3.4.2, Jet Pumps

2.2 Final Safety Analysis Report

Sections 3.3.4, Description (Reactor Vessel Internals Mechanical Design)

Sections 4.3, Reactor Recirculation System

Sections 7.8.5, Description (Reactor Vessel Instrumentation)

Sections 14.6.3, Loss of Coolant Accident (LOCA)

2.3 Plant Instructions

2-OI-68, Reactor Recirculation System

2-GOI-100-1A, Rx Startup from Cold Shutdown to Power Operations (Unit Startup and Power Operation)

2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation.

2-SR-3.4.1(DLO), Reactor Recirculation System Dual Loop Operation.

2.4 TVA Drawings

2-47E610-68 Series, Mechanical Control Diagram, Reactor Water Recircn System

2-47E817-1 & 2, Flow Diagram, Reactor Water Recirculation

2-47E600-60, Mechanical Instruments and Controls

2.5 Miscellaneous Documents

General Electric SIL 330 and SIL 330 Addenda - Jet Pump Beam Cracks

NUREG/CR - 3052, Closeout of IE Bulletin 80-07: BWR Jet Pump Assembly Failure

Technical Specification Change No. 387, Single Loop Operation (SLO)

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3.0 PRECAUTIONS AND LIMITATIONS

3.1 General Precautions

- A. No Recirc pump speed changes or Control Rod manipulations are to be made during the performance of this procedure.
- B. Improper instrument calibration can severely affect the data and cause unnecessary failures of the test in this SR.
- C. Refueling activities such as fuel assembly replacement or shuffle, modifications to fuel support, orifice size or core plate bypass flow can affect the relationship between core flow and recirculation loop flow. These relationships may need to be re-established each cycle. During initial weeks of operation under such conditions, while baselining new "established patterns," engineering judgment of daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.

3.2 Operability and LCO's

- A. Technical Specification SR 3.4.2.1 criteria c will not be used in this instruction (Each jet pump flow differs by $\leq 10\%$ from established patterns). This criteria use individual jet pump flows which is not available at BFN. Criteria b is used for plants with differential pressure instrumentation.

3.3 Equipment

- A. The Robicon VFD for each pump and displayed on 2-SI-96-61 (Pump 2A) and 2-SI-96-73 (Pump 2B) or ICS points 96-61 and 96-73. The VFD control system calculates speed indications using the VFD output frequency and motor (pump) load. Based on these parameters the actual motor speed for any output frequency and load can be calculated. Since the speeds are calculated they should be used only if the two actual speed indications provide by the Bentley-Nevada system cannot be obtained.

3.4 Initiation/Isolation/Trips

None

3.5 Interlocks

None

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3.6 Performance Testing

- A. Turbulence in the Jet Pump diffuser causes the differential pressure signal to be noisy when the pump is in operation. The proper method for recording differential pressure is to take the average of the high and low readings.
- B. Browns Ferry has not operated in single loop for a significant period of time. Therefore, not enough single loop operating data has been obtained. Until operation under such conditions and a baseline data has been obtained the engineering judgment of daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure.
- C. System Engineering should be notified to create new graphs when conditions are such that the end of the plotted area is reached.
- D. The illustration graphs in this procedure are created using the data from the computer. During the Operation Cycle, the graphs used in the Illustrations of this procedure changes based upon the core's life.
 - 1. As this occurs an Engineering Judgment/Review should be performed when the graphs fall outside the illustrations to meet the Acceptance Criteria.
 - 2. The Engineering Judgment/Review should establish new graphs to be incorporated into the procedure as time permits.
- E. Step 4.0[4] is used to ensure the Current graphs are updated on a regular basis.
- F. System Engineering should be notified prior to the "Good Thru Date" on any Illustration being exceeded. This will allow System Engineering time to generate new graphs. This date represents 8 months from the date the graphs were created. The graphs can still be used if the "Good Thru Date" is exceeded. The Eight (8) months is used as a guideline and the graphs can be updated on a more frequently if desired.
- G. During startup following a Refueling Outage, the Illustrations are used as a guideline and when enough data is obtained System Engineering will create new Illustrations. The graphs should be used in conjunction with the Engineering Judgment/Review processes.

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Date: _____

4.0 PREREQUISITES

- [1] **VERIFY** that this procedure is the most current revision. _____
- [2] **VERIFY** Reactor recirculation system is in operation in accordance with 2-OI-68, Reactor Recirculation System. _____
- [3] **VERIFY** the listed qualified Personnel are available to perform this surveillance procedure. _____

UO 1 _____

- [4] Using the following Illustration graphs:
- Illustration 1 - 2A Recirculation Loop Pump Speed VS Recirculation Pump Flow
 - Illustration 2 - 2A Recirculation Pump Speed VS Jet Pump Flow
 - Illustration 3 - 2B Recirculation Loop Pump Speed VS Recirculation Pump Flow
 - Illustration 4 - 2B Recirculation Pump Speed VS Jet Pump Flow
 - Illustration 5 - 2A Jet Pump Differential Pressure VS Total Core Flow
 - Illustration 6 - 2B Jet Pump Differential Pressure VS Total Core Flow

PERFORM the following:

- [4.1] **IF** RTP is > 25% or Section 7.4 is required to be performed, **THEN**

VERIFY the graphs on the Illustrations are good as follows: (Otherwise N/A)

- **VERIFY** the "Good Thru Date" on all Illustrations has not been exceeded.

OR

- **IF** the "Good Thru Date" is exceeded on any Illustrations, **THEN**

NOTIFY System Engineering to provide updated Illustration graphs to Operations Procedure. _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 9 of 28
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5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 ACCEPTANCE CRITERIA

- A. 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.
- B. Recirculation loop jet pump flow mismatch with both recirculation loops in operation shall be verified by the following criteria [2-SR-3.4.1(SLO), Reactor Recirculation System Single Loop Operation, satisfies Technical Specification 3.4.1 during single Recirculation loop operation]:
 - 1. $\leq 10\%$ of rated core flow when operating at $< 70\%$ of rated core flow (≤ 10.25 Mlb/hr).
 - 2. $\leq 5\%$ of rated core flow when operating at $\geq 70\%$ of rated core flow (≤ 5.12 Mlb/hr).

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6.0 ACCEPTANCE CRITERIA (continued)

NOTE

If either condition in Step 6.0C.1, 6.0C.2 or 6.0C.3 exists, the Tech Spec Acceptance Criteria would be satisfied. However, failure of either Step 6.0C.1 or 6.0C.2 of the criteria may be an indication of jet pump degradation and shall be immediately reported to the Unit Supervisor.

- C. Jet pump operation shall be checked by verifying that at least one of the following criteria (6.0C.1 or 6.0C.2) is satisfied for each of the operating recirculation loops:
 1. Recirculation pump flow to speed ratio differs by $\leq 5\%$ from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by $\leq 5\%$ from established patterns.
 2. Each jet pump diffuser to lower plenum differential pressure differs by $\leq 20\%$ from established patterns.
 3. Since refueling activities such as fuel assembly replacement or shuffle, modifications to fuel support, orifice size or core plate bypass flow can affect the relationship between core flow, and recirculation loop flow, these relationships may need to be re-established each cycle.
 - a. During initial weeks of operation under such conditions, while baselining new "established patterns," an engineering evaluation of daily surveillance results may be used to meet the Acceptance Criteria for conditions Steps 6.0C.1 and 6.0C.2 above.
 - b. This evaluation is to conclude that daily surveillance results do not indicate significant abnormalities or Jet Pump failure.
 4. After the new baselining has been completed and new "Established Patterns" have been set, methodology for determining the acceptance criteria as being Completed Satisfactorily, as stipulated in Step 6.0C.3 will not be allowed.
- D. Steps which determine the above criteria are designated by (AC) next to the initials blank.

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Date: _____

7.0 PROCEDURE STEPS

7.1 Initial Conditions

[1] **PERFORM** the following checks:

- **CHECK** that all Precautions and Limitations in Section 3.0 have been reviewed. _____
- **CHECK** that all Prerequisites listed in Section 4.0 are satisfied. _____

[2] **OBTAIN** permission from the Unit Supervisor to perform this test. _____

US

[3] [NRC/C] **NOTIFY** the Unit Operator (UO) that this test is commencing. [RPT 82-16, LER 259/8232] _____

[4] **RECORD** the date & time started, plant conditions and any pre-test remarks on Attachment 1, Surveillance Procedure Review Form. _____

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Date: _____

7.2 Data Collections

7.2.1 Core Power and Flow Readings

- [1] **RECORD** the Core thermal power from Core Power and Flow Log. (N/A if ICS is not available)

Point CALC002 _____ CMWT _____

- [2] **RECORD** the Core plate differential pressure from ICS point 68-52 or 2-XR-68-50 (Green Pen). (N/A if not available).

Core Press Drop 68-52 _____ PSID _____

- [3] **RECORD** the Total Core flow.

Total Core Flow (Red Pen) 2-XR-68-50
_____ Mlb/hr

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 13 of 28
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Date: _____

NOTES

- 1) If 2-SIT-68-59/71 (RB. EI 565 R-9 S-line - Local Panel) is used log the reason in post test Remarks.
- 2) Use the 2-SI-96-61 (or ICS PT 96-61) if both 2-SI-68-59 and 2-SIT-68-59 are not available for the 2A Pump Motor and log the reason in post test Remarks.
- 3) Use the 2-SI-96-73 (or ICS PT 96-73) if both 2-SI-68-71 and 2-SIT-68-71 are not available for the 2B Pump Motor and log the reason in post test Remarks.
- 4) If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

7.2.2 Recirculation Pump Loops

- [1] **RECORD** the Recirc Pump 2A and 2B Mtr Speeds for operating Recirc Pumps and circle instrumentation used.

Pump Mtr 2A	Pump Mtr 2B
2-SI-68-59 or 2-SIT-068-0059 or 2-SI-96-61	2-SI-68-71 or 2-SIT-068-0071 or 2-SI-96-73
_____ RPM	_____ RPM

- [2] **RECORD** the Recirc Pump Discharge flows.

Loop 2A 2-FI-68-5	Loop 2B 2-FI-68-81
_____ gpm X 1000	_____ gpm X 1000

- [3] **RECORD** the Recirc loop 2A and 2B Jet Pump Flow.

Loop 2A 2-FI-68-46	Loop 2B 2-FI-68-48
_____ Mlb/hr	_____ Mlb/hr

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 14 of 28
-----------------------	--	---

Date: _____

NOTE

If a Recirculation Pump is not in service then the associated instrumentations can be marked as N/A.

7.2.3 Jet Pump Loops

[1] **RECORD** the following Differential Pressure readings below:

Loop 2A			Loop 2B		
INSTRUMENT	JET PUMP	PSID	INSTRUMENT	JET PUMP	PSID
2-PDI-68-38	11		2-PDI-68-15	1	
2-PDI-68-39	12		2-PDI-68-18	2	
2-PDI-68-40	13		2-PDI-68-19	3	
2-PDI-68-42	14		2-PDI-68-21	4	
2-PDI-68-43	15		2-PDI-68-22	5	
2-PDI-68-07	16		2-PDI-68-25	6	
2-PDI-68-08	17		2-PDI-68-26	7	
2-PDI-68-10	18		2-PDI-68-28	8	
2-PDI-68-11	19		2-PDI-68-29	9	
2-PDI-68-13	20		2-PDI-68-30	10	

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 15 of 28
-----------------------	--	---

Date: _____

NOTES

- 1) Section 7.3 is performed when both Recirculation Pumps are in service. This section should be N/A'ed when in Single Loop Operation.
- 2) To satisfy procedure Acceptance Criteria, either Step 7.3[3] or Step 7.3[4] must be satisfied.

7.3 Tech Spec 3.4.1.1 - Recirculation Loop Mismatch Verification With Both Recirculation Loops In Operation Checks

- [1] **CALCULATE** percent of rated core flow (%WT) using data obtained in Section 7.2.1[3] as follows.

(Step 7.2.1[3] ÷ 102.5) X 100 =	% Core Flow
(_____ ÷ 102.5) X 100 =	_____

- [2] **CALCULATE** the absolute value for Recirculation Loop Jet Mismatch using data obtained in Section 7.2.2[3] as follows.

2-FI-68-46	-	2-FI-68-48	=	Mismatch
------------	---	------------	---	----------

_____ Mlb/hr	-	_____ Mlb/hr	=	_____ Mlb/hr
--------------	---	--------------	---	--------------

- [3] **IF** %WT is < 70% as recorded in Step 7.3[1], **THEN**

VERIFY Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is ≤ 10.25 Mlb/hr. (Otherwise N/A) _____(AC)

- [4] **IF** %WT is ≥ 70% as recorded in Step 7.3[1], **THEN**

VERIFY Recirculation Loop Jet Pump Flow Mismatch recorded in Step 7.3[2] is ≤ 5.12 Mlb/hr. (Otherwise N/A) _____(AC)

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 16 of 28
-----------------------	--	---

Date: _____

NOTES

- 1) Section 7.4 should be marked as N/A if RTP is $\leq 25\%$.
- 2) Jet Pump Operability is not required to be performed until 4 hours after associated recirculation loop is in operation and then only within 24 hours after RTP is $> 25\%$.

7.4 Tech Spec 3.4.2.1 - Part A -Recirculation Pump and Jet Pump Flow to Recirculation Pump Speed:

7.4.1 Jet Pump Loop 2A

- [1] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Pump Flow recorded in Step 7.2.2[2]:

CHECK that the plot falls between the two bold lines on Illustration 1 and **RECORD** below.

Plot falls between the bold lines Yes ☐ No ☐ _____

- [2] Using the 2A Pump Speed recorded in Step 7.2.2[1] and the 2A Jet Pump Flow in Step 7.2.2[3]:

CHECK that the plot falls between the two bold lines on Illustration 2 and **RECORD** below.

Plot falls between the bold lines Yes ☐ No ☐ _____

- [3] Using Steps 7.4.1[1] and 7.4.1[2] from above:

DETERMINE if the Jet Pump Loop 2A criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2A criteria is satisfied Yes ☐ No ☐ _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 17 of 28
-----------------------	--	---

Date: _____

7.4.2 Jet Pump Loop 2B

- [1] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Pump Flow recorded in Step 7.2.2[2]:

CHECK that the plot falls between the two bold lines on Illustration 3 and **RECORD** below.

Plot falls between the bold lines	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----------------------------------	-----	--------------------------	----	--------------------------

- [2] Using the 2B Pump Speed recorded in Step 7.2.2[1] and 2B Jet Pump Flow recorded in Step 7.2.2[3]:

CHECK that the plot falls between the two bold lines on Illustration 4 and **RECORD** below.

Plot falls between the bold lines	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----------------------------------	-----	--------------------------	----	--------------------------

- [3] Using Steps 7.4.2[1] and 7.4.2[2] from above:

DETERMINE if the Jet Pump Loop 2B criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Loop 2B criteria is satisfied	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
--	-----	--------------------------	----	--------------------------

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 18 of 28
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Date: _____

7.4.3 Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification:

- [1] Using the individual 2A Jet Pump DP's recorded in Step 7.2.3[1]

CHECK that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 5 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2A Individual DP's are between the bold lines.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
--	------------------------------	-----------------------------	-------

- [2] Using the individual 2B Jet Pump DP's recorded in Step 7.2.3[1]

CHECK that each individual Jet Pump DP recorded fall between the two bold lines on Illustration 6 for the recorded Total Flow in step 7.2.1[3] and **RECORD** results below.

2B Individual DP's are between the bold lines.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
--	------------------------------	-----------------------------	-------

- [3] Using Steps 7.4.3[1] and 7.4.3[2]

DETERMINE whether the Recirculation Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied by marking below if both steps are marked as Yes.

Jet Pump Diffuser to Lower Plenum Differential Pressure Verification criteria is satisfied	Yes <input type="checkbox"/>	No <input type="checkbox"/>	_____
--	------------------------------	-----------------------------	-------

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 19 of 28
-----------------------	--	---

Date: _____

CAUTION

An Engineering Judgment/Review may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

7.4.4 Operability Determination

[1] **IF** any of the following conditions apply:

- Following Refueling Outage. (See Caution above)

OR

- The Reactor is in Single Loop Operation (See Caution above)

OR

- If Steps 7.4.1[3], 7.4.2[3] and 7.4.3[3] fall outside the bolded lines, to determine if the graphs need updating

THEN

PERFORM Attachment 2, Engineering Judgment/Review:
(Otherwise N/A if not required.)

[2] **MARK** the appropriate criteria results for the following.
(N/A any criteria not performed.)

Steps	Criteria Results	Yes	No	N/A
7.4.1[3] and 7.4.2[3]	Both Jet Pump Loops steps are marked as YES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4.3[3]	Jet Pump DP to criteria is marked as YES.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attachment 2	Engineering Evaluation is marked as YES.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[3] Using the Criteria Results in Step 7.4.4[2]

VERIFY at least one Criteria Results is satisfied and marked as YES.

_____(AC)

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 20 of 28
-----------------------	--	---

Date: _____

7.5 Notification and completions

- [1] **IF** an Engineering Judgment/Review was performed, **THEN**
VERIFY the Engineering Judgment/Review documentation is
attached to this SR. (Otherwise N/A) _____
- [2] **COMPLETE** Attachment 1, Surveillance Procedure Review
Form, up to Unit Supervisor review. _____
- [3] **NOTIFY** the Unit Supervisor that this test is complete. _____

8.0 ILLUSTRATIONS/ATTACHMENTS

- Attachment 1 - Surveillance Procedure Review Form
- Attachment 2 - Engineering Judgment/Review
- Illustration 1 - 2A Recirculation Loop Pump Speed VS Recirculation
Pump Flow
- Illustration 2 - 2A Recirculation Pump Speed VS Jet Pump Flow
- Illustration 3 - 2B Recirculation Loop Pump Speed VS Recirculation
Pump Flow
- Illustration 4 - 2B Recirculation Pump Speed VS Jet Pump Flow
- Illustration 5 - 2A Jet Pump Differential Pressure VS Total Core
Flow
- Illustration 6 - 2B Jet Pump Differential Pressure VS Total Core
Flow

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 21 of 28
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**Attachment 1
(Page 1 of 1)**

Surveillance Procedure Review Form

REASON FOR TEST:

- ☐ Scheduled Surveillance
☐ System Inoperable (Explain in Remarks)
☐ Maintenance (WO No. _____)
☐ Other (Explain in Remarks)

DATE/TIME STARTED _____

DATE/TIME COMPLETED _____

PLANT CONDITIONS _____

PRE-TEST REMARKS: _____

PERFORMED BY:

Initials

Name (Print)

(Test Dir/Lead Perf)

Name (Signature)

(Test Dir/Lead Perf)

Delays or Problems (If yes, explain in POST-TEST REMARKS)?

☐ Yes

☐ No

Acceptance Criteria Satisfied?

☐ Yes

☐ No

If the above answer is no, the Unit Supervisor shall
determine if an LCO exists.

LCO

☐ Yes

☐ No

UNIT SUPERVISOR _____

Date _____

INDEPENDENT REVIEWER (OPS) _____

Date _____

SCHEDULING COORDINATOR _____

Date _____

POST-TEST REMARKS: _____

BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 22 of 28
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**Attachment 2
(Page 1 of 1)**

Engineering Judgment/Review

Date: _____

CAUTION

Engineering Judgment Evaluation may only be utilized until relationships between core flow, jet pump flow, and Recirculation loop flow have been established following a refueling outage or during the initial weeks of extended single loop operation. Engineering judgment of the daily surveillance results is used to detect significant abnormalities which could indicate a jet pump failure. (Reference SR 3.4.2.1 bases)

[1] **MARK** the condition that applies:

• Following Refueling Outage.	<input type="checkbox"/>
• The Reactor is in Single Loop Operation	<input type="checkbox"/>
• Steps 7.4.1[3], 7.4.2[3] and 7.4.3[3] fall outside the bolded lines	<input type="checkbox"/>

[2] **REQUEST** System Engineering to perform an Engineering Judgment/Review.

[3] **IF** the Engineering Judgment/Review was performed following a Refueling Outage or during Single Loop Operation, **THEN**

DETERMINE if the Jet Pump Criteria is satisfied and no significant abnormalities which could indicate a jet pump failure are indicated and **RECORD** the results below. (Otherwise N/A)

Jet Pump Criteria is satisfied. Yes ☐ No ☐ _____

[4] **IF** the Engineering Judgment/Review was performed to determine if the graphs needs updated, **THEN**

REQUEST a System Engineering to: (Otherwise N/A)

A. **SUPPLY** Operations with new graphs to Operations Procedures.

B. **RECORD** below if Jet Pump Criteria is satisfied.

Jet Pump Criteria is satisfied. Yes ☐ No ☐ _____

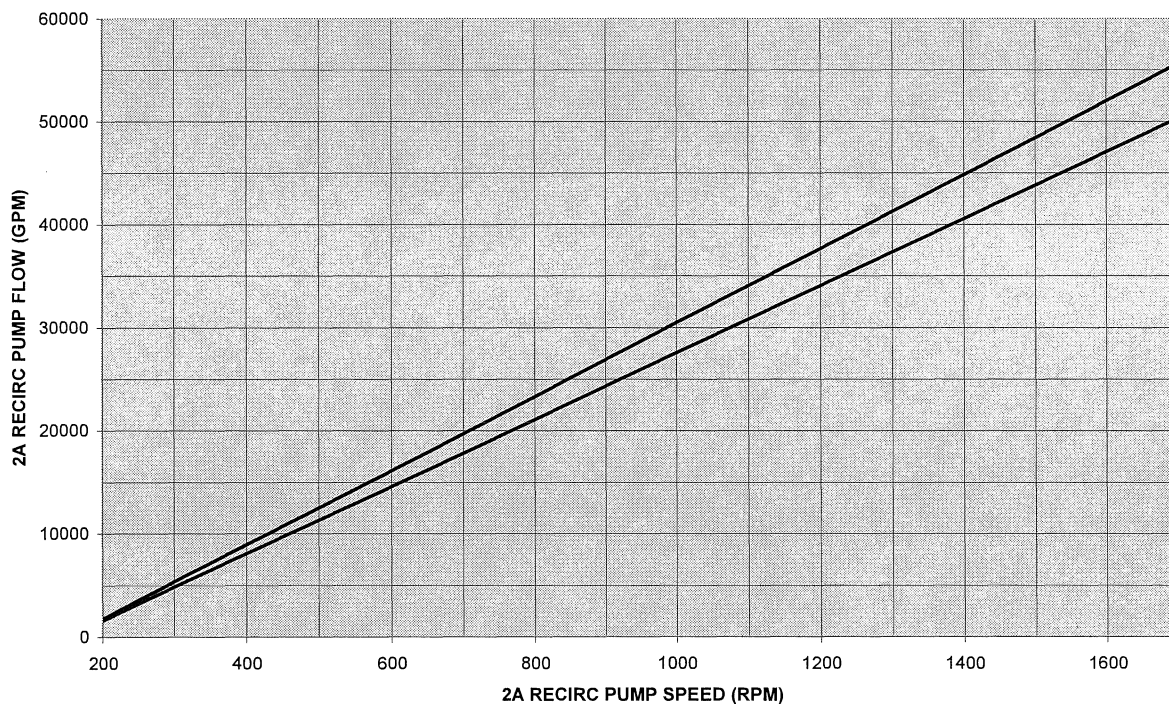
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 23 of 28
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**Illustration 1
(Page 1 of 1)**

**2A Recirculation Loop Pump Speed VS Recirculation Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008**

Date: _____

**2A RECIRC PUMP SPEED VS PUMP FLOW
TWO LOOP OPERATION**

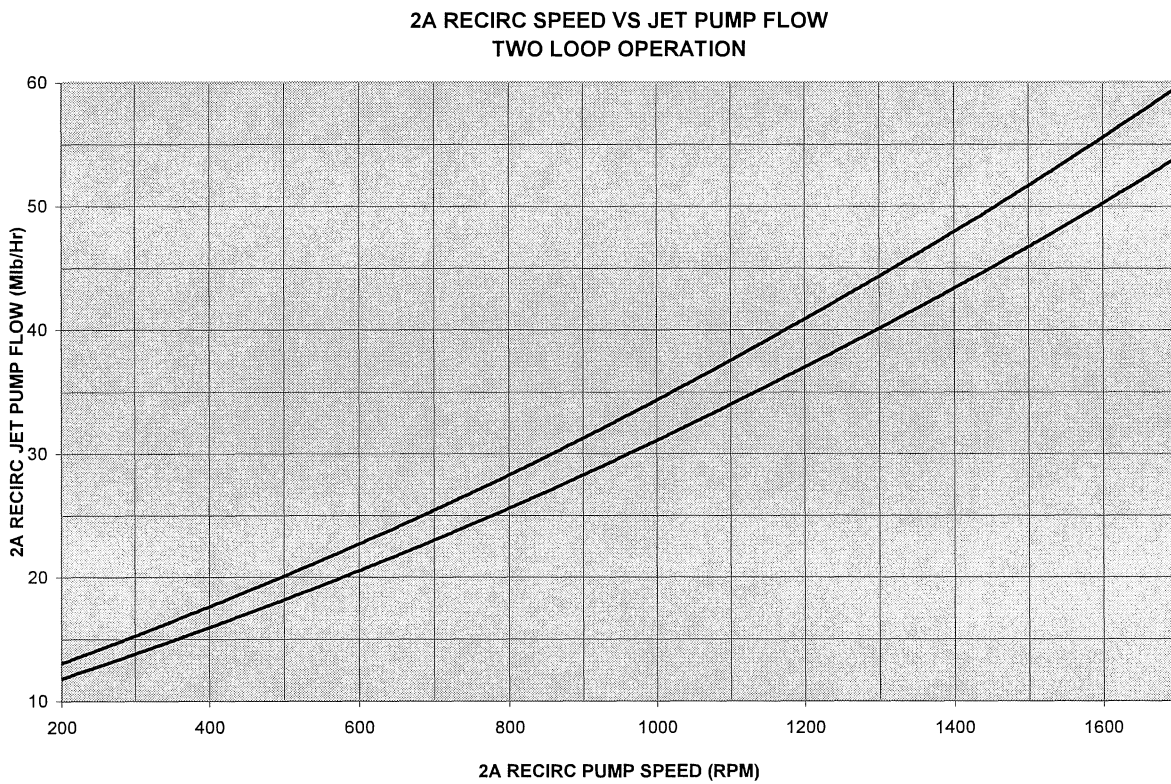


<p>BFN Unit 2</p>	<p>Jet Pump Mismatch and Operability</p>	<p>2-SR-3.4.2.1 Rev. 0021 Page 24 of 28</p>
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Illustration 2
(Page 1 of 1)

2A Recirculation Pump Speed VS Jet Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____



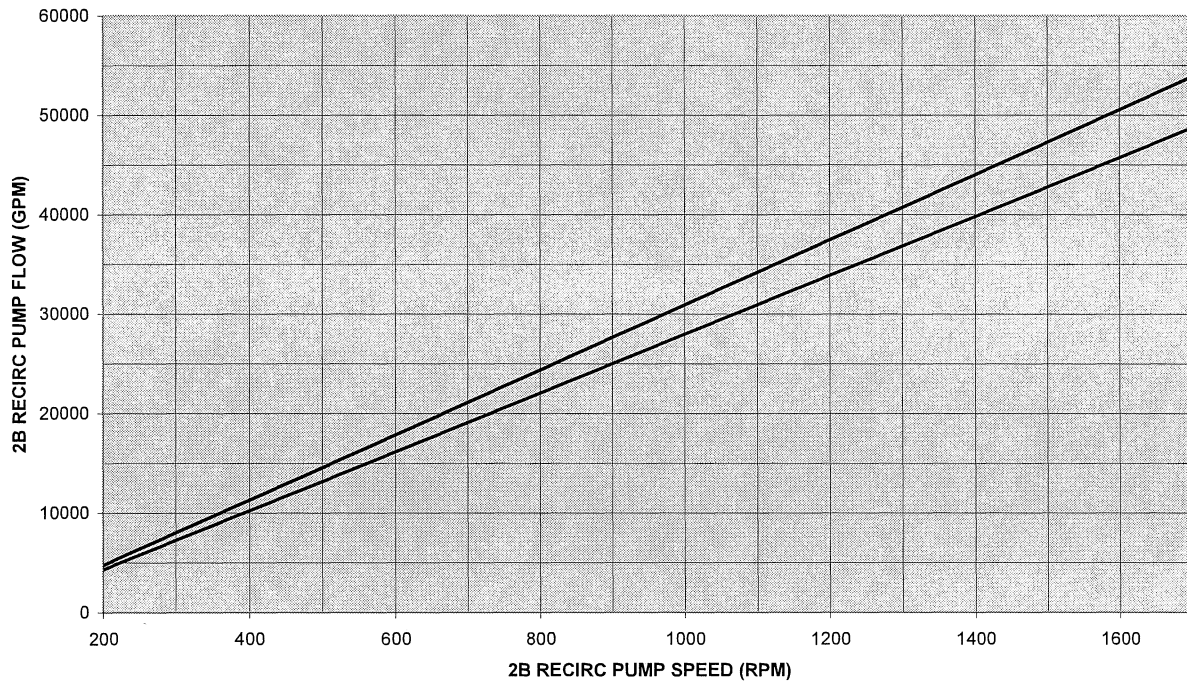
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 25 of 28
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Illustration 3
(Page 1 of 1)

2B Recirculation Loop Pump Speed VS Recirculation Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____

2B RECIRC PUMP SPEED VS PUMP FLOW
TWO LOOP OPERATION



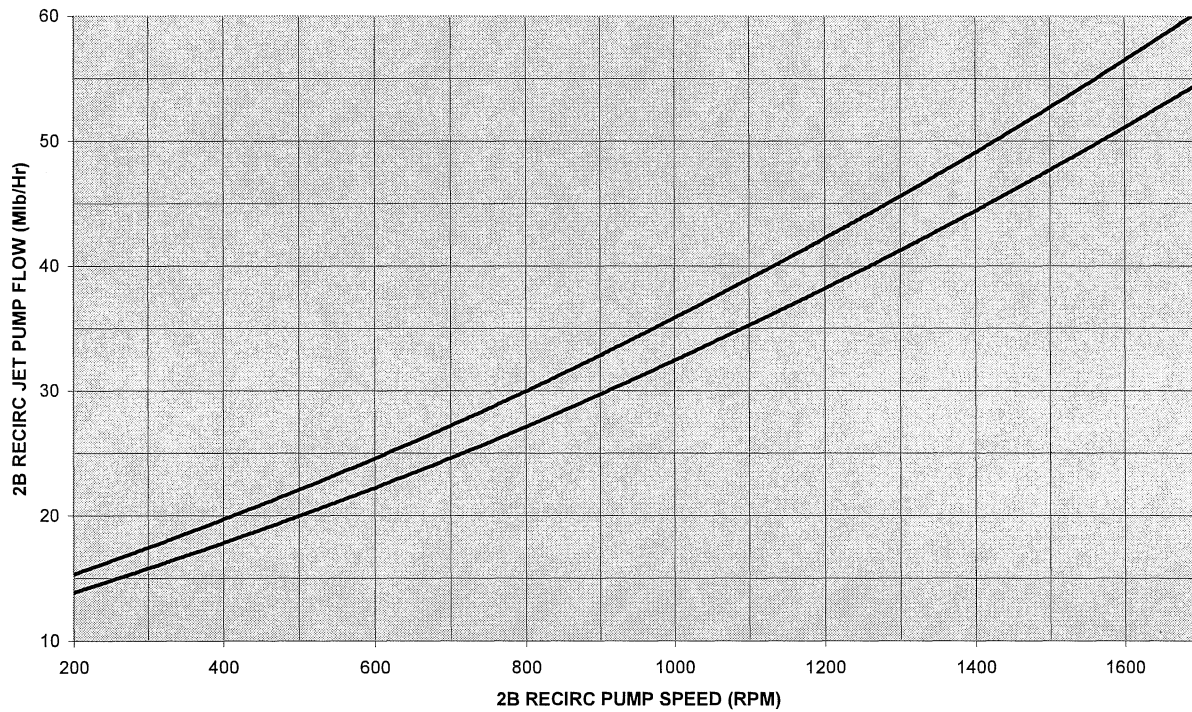
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 26 of 28
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Illustration 4
(Page 1 of 1)

2B Recirculation Pump Speed VS Jet Pump Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____

2B RECIRC PUMP SPEED VS JET PUMP FLOW
TWO LOOP OPERATION



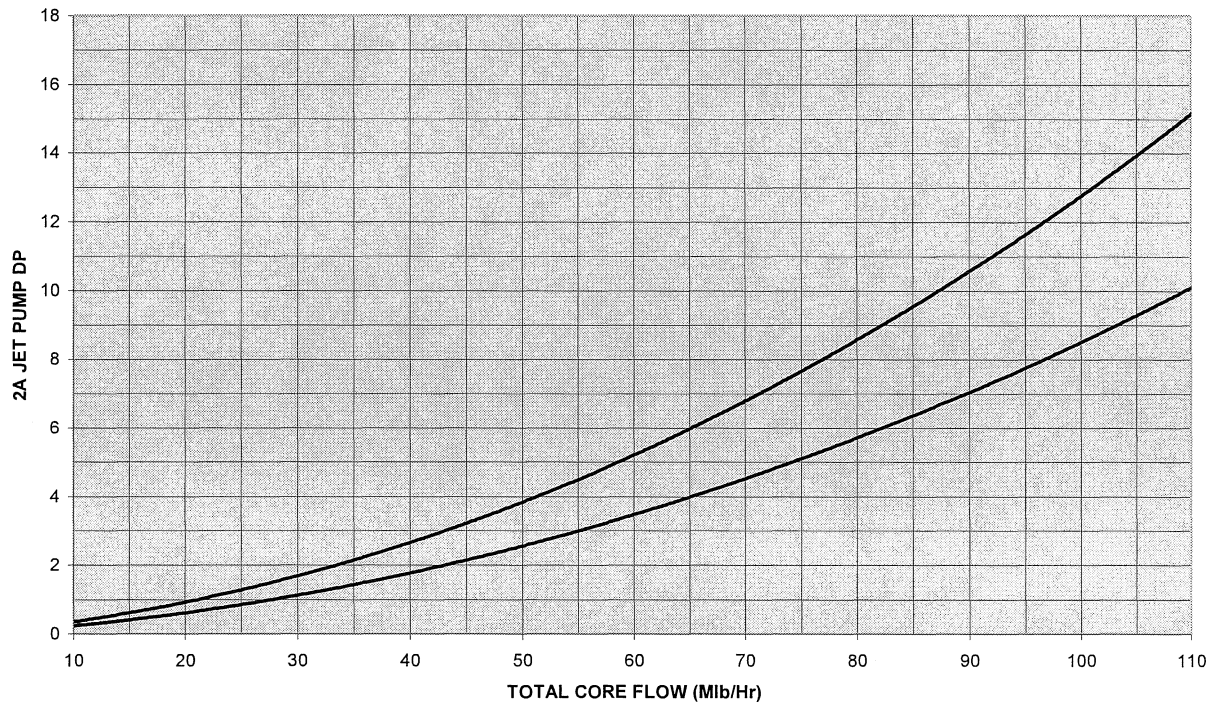
BFN Unit 2	Jet Pump Mismatch and Operability	2-SR-3.4.2.1 Rev. 0021 Page 27 of 28
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Illustration 5
(Page 1 of 1)

2A Jet Pump Differential Pressure VS Total Core Flow
Unit 2 Cycle 15
Good Thru 01-07-2008

Date: _____

2A TOTAL CORE FLOW VS JET PUMP DP
TWO LOOP OPERATION



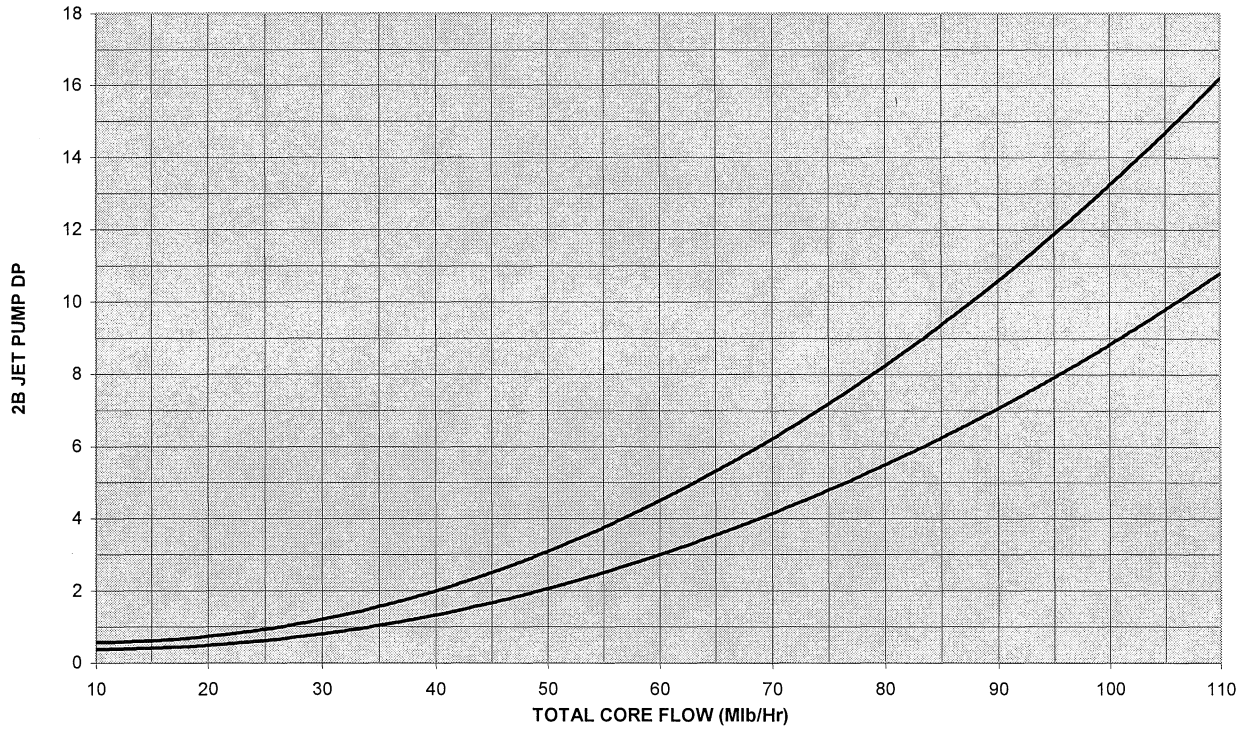
<p>BFN Unit 2</p>	<p>Jet Pump Mismatch and Operability</p>	<p>2-SR-3.4.2.1 Rev. 0021 Page 28 of 28</p>
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**Illustration 6
(Page 1 of 1)**

**2B Jet Pump Differential Pressure VS Total Core Flow
Unit 2 Cycle 15
Good Thru 01-07-2008**

Date: _____

**2B TOTAL CORE FLOW VS JET PUMP DP
TWO LOOP OPERATION**



BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 511
TITLE: RADCON DOSE LIMITS
TASK NUMBER: ADMINISTRATIVE

SUBMITTED BY: Rustall Sen DATE: 1/3/08
VALIDATED BY: James C. Mart DATE: 1/4/08
APPROVED: 2 Robert Sui DATE: 1/5/08
PLANT CONCURRENCE: Carly French DATE: 1/4/08
TRAINING
OPERATIONS

* Examination JPMs Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	10/31/02	All	New
1	9/1/05	3	New Revision
2	01/02/08	All	General Revision

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO ____ SRO ____

DATE: _____

JPM NUMBER: 511

TASK NUMBER: Administrative

TASK TITLE: RADCON DOSE LIMITS

K/A NUMBER: GEN 2.3.4 K/A RATING: RO 2.6 SRO: 3.1

TASK STANDARD: Given circumstances, determine the dose limitation for declared and undeclared pregnant female employees and their eligibility for overtime.

LOCATION OF PERFORMANCE: SIMULATOR ____ PLANT ____ CONTROL ROOM ____

REFERENCES/PROCEDURES NEEDED: SPP-5.1, Radiological Controls Rev 5, 10 CFR 20

VALIDATION TIME: CONTROL ROOM: ____ LOCAL: ____

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

PERFORMANCE TIME: ____ CONTROL ROOM ____ LOCAL ____

COMMENTS: _____

Additional comment sheets attached? YES ____ NO ____

RESULTS: SATISFACTORY ____ UNSATISFACTORY ____

EXAMINER SIGNATURE: _____ DATE: _____

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

IN PLANT OR 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 the Shift Manager (SRO) in charge for the current shift OR You are the Unit 1 Operator making the Callout (RO).

Two AUO overtime slots are available on the next shift and the first two eligible individuals are female employees. The overtime slot involves a high exposure area of the turbine building, RADCON reports the job will require approximately 100 mrem for each of the two employees. One of the two individual (AUO 1) reports that she is pregnant and has just found out. She wishes to declare her pregnancy and request counseling by RADCON. She also informs you that "the other female AUO (AUO 2) is also pregnant" but you need to talk with her because of a reluctance to declare her pregnancy because she needs the money. When you talk with her (AUO 2), she confirms she is pregnant and does not wish to participate in the RADCON program for pregnant women.

INITIATING CUES: The examiner will ask a series of questions about the situation above, (provide participant handout.)

EXAMINER COPY KEY
DO NOT HANDOUT TO STUDENT

You are the Shift Manager or Unit 1 Unit Operator for the current shift. Two AUO overtime slots are available on the next shift and the first two eligible individuals are female employees. The overtime slot involves a high exposure area of the turbine building, RADCON reports the job will require approximately 100 mrem for each of the two employees. One of the two individual (AUO 1) reports that she is pregnant and has just found out. She wishes to declare her pregnancy and request counseling by RADCON. She also informs you that "the other female AUO (AUO 2) is also pregnant" but you need to talk with her because of a reluctance to declare her pregnancy because she needed the money. When you talk with her (AUO 2), she confirms she is pregnant and does not wish to participate in the RADCON program for pregnant women.

What will be the dose limit for AUO1?

500 mrem / 9 month gestation

50 mrem / month

Given the situation, can AUO1 be hired for the expected job?

No, she may be hired for another job but the exposure would be too high on the job she would be expected to do i.e., exceed the monthly limit.

What will be the dose limit for AUO2?

Normal exposure limits apply

Given the situation, can AUO2 be hired for the expected job?

Yes

NOTE to Examiner: May have to ask directed question to assess the knowledge items above especially for the 9 month and monthly limits on the first question, 3 of the 4 are required for successful completion. The source of this requirement is SPP 5.1 and 10CFR20, Prenatal Exposure and Declaration of Pregnancy definition. Exact wording not required.

Handout to Applicant

You are the Shift Manager or the Unit 1 Unit Operator for the current shift. Two AUO overtime slots are available on the next shift and the first two eligible individuals are female employees. The overtime slot involves a high exposure area of the turbine building, RADCON reports the job will require approximately 100mrem for each of the two employees. One of the two individual (AUO 1) reports that she is pregnant and has just found out. She wishes to declare her pregnancy and request counseling by RADCON. She also informs you that “the other female AUO (AUO 2) is also pregnant” but you need to talk with her because of a reluctance to declare her pregnancy because she needs the money. When you talk with her (AUO 2), she confirms she is pregnant and does not wish to participate in the RADCON program for pregnant women.

What will be the dose limit for AUO1?

Given the situation, can AUO1 be hired for the expected job?

What will be the dose limit for AUO2?

Given the situation, can AUO2 be hired for the expected job?

Tennessee Valley Authority TVAN STANDARD PROGRAMS AND PROCESSES	TITLE RADIOLOGICAL CONTROLS	SPP-5.1 Rev. 5 Page 1 of 33 <hr/> Quality Related <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No PORC Required <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 10CFR50.59 Review <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <hr/> Effective Date <u>11/12/2003</u>				
RESPONSIBLE PEER TEAM: <u>Radiological and Chemistry Control</u> <i>Organization</i>						
CONCURRENCES						
<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border-bottom: 1px solid black;"> Conrad Ottenfeld <i>* Primary Sponsor</i> </td> <td style="width: 40%; text-align: center; border-bottom: 1px solid black;"> 10/21/03 <i>Date</i> </td> </tr> <tr> <td style="text-align: center; border-bottom: 1px solid black;"> Ashok S. Bhatnagar <i>Peer Team Mentor</i> </td> <td style="text-align: center; border-bottom: 1px solid black;"> 10/29/03 <i>Date</i> </td> </tr> </table>			Conrad Ottenfeld <i>* Primary Sponsor</i>	10/21/03 <i>Date</i>	Ashok S. Bhatnagar <i>Peer Team Mentor</i>	10/29/03 <i>Date</i>
Conrad Ottenfeld <i>* Primary Sponsor</i>	10/21/03 <i>Date</i>					
Ashok S. Bhatnagar <i>Peer Team Mentor</i>	10/29/03 <i>Date</i>					
APPROVAL						
For Nuclear Assurance Sponsored SPPs <table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border-bottom: 1px solid black;"> N/A <i>General Manager, NA</i> </td> <td style="width: 40%; text-align: center; border-bottom: 1px solid black;"> <i>Date</i> </td> </tr> </table>			N/A <i>General Manager, NA</i>	 <i>Date</i>		
N/A <i>General Manager, NA</i>	 <i>Date</i>					
<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border-bottom: 1px solid black;"> Karl W. Singer <i>* Senior Vice President, Nuclear Operations</i> </td> <td style="width: 40%; text-align: center; border-bottom: 1px solid black;"> 10/29/03 <i>Date</i> </td> </tr> </table>			Karl W. Singer <i>* Senior Vice President, Nuclear Operations</i>	10/29/03 <i>Date</i>		
Karl W. Singer <i>* Senior Vice President, Nuclear Operations</i>	10/29/03 <i>Date</i>					
<i>* Site-specific changes are approved by Site Sponsor and Site Vice President (see PCF)</i>						

- F. The RADCON Superintendent or designee shall prepare a report for the TVA Chief Nuclear Officer and Executive Vice President for submittal to INPO's Radiological Protection and Emergency Preparedness Division and the NRC (10 CFR 20.2105) if a regulatory limit is exceeded or a Planned Special Exposure (PSE) is used.
- G. Any worker who exceeds a regulatory dose limit shall not be permitted to enter any RCA until all investigations surrounding the event are completed. The RADCON Superintendent/RSO or designee must approve reentry.
- H. Any personnel exposure received which is in excess of the limits of 10 CFR 20.1201 shall be reported by the RADCON Superintendent/RSO to Radiation Effects Advisory Group (REAG) and the appropriate area chief physician for an examination. A medical examination and authorization from the Chief Nuclear Officer and Executive Vice President are required before resumption of duties in RCAs for individuals who have received five times the annual limit of 10 CFR 20.1201.
- I. Prenatal Exposure Program

Information regarding a woman's participation in the Prenatal Exposure Program is maintained pursuant to and in accordance with the Privacy Act of 1974, 5 U.S.C. 552a and TVA's Privacy Act regulations (18 CFR 1301 Subpart B). They are designated as TVA-23.

TVAN shall ensure that the dose equivalent to the embryo/fetus during the entire pregnancy, due to the occupational exposure to radiation from licensed and unlicensed radiation sources under the control of the licensee of a declared pregnant woman, does not exceed 500 mrem.

The dose equivalent to the embryo/fetus is the sum of the deep dose equivalent to the declared pregnant woman, the dose equivalent to the embryo/fetus resulting from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

If the dose equivalent to the embryo/fetus is found to have exceeded 500 mrem, or is within 50 mrem of this dose, by the time the woman declares the pregnancy to TVAN, TVAN shall be deemed to be in compliance with paragraph (a) of this section if the additional dose equivalent to the embryo/fetus does not exceed 50 mrem during the remainder of the pregnancy.

1. Education

It is the recommendation of RADCON and the RSO's that prenatal radiation exposure will be controlled to ensure that the embryo/fetus is not subjected to any undue risk. Accordingly, all individuals who may be exposed to radiation during their employment with TVA

will be given information on the potential hazards to the embryo/fetus from radiation exposure based on the best current scientific knowledge and on the current exposure limits recommended for pregnant women and women who intend to become pregnant. This information will be provided in the standard RADCON training provided to all employees and will be provided in all required updates of such training. Records will be maintained on the attendance of employees at this training. These records shall be maintained in such a fashion as to allow timely retrieval of an individual's attendance record.

In addition, counseling on the potential radiation hazard to an embryo/fetus will be provided by RADCON (or RSO) to any woman who requests it apart from the standard training sessions. A written record of this counseling shall be made and maintained as an "Individual Radiation Exposure History Record" in accordance with the provisions of the Radiological Control records management program.

2. Voluntary Prenatal Exposure Program

This program is strictly voluntary. It is available to women who are pregnant or are planning to become pregnant, at their sole discretion. Request to participate in the program shall be in writing. In addition, women who elect to participate in this program may choose to leave the program at any time by submitting a written statement to the effect. Such a withdrawal statement will be maintained as an "Individual Radiation Exposure History Record" in accordance with the provisions of the Radiological Control records management program.

Participants in this program will be provided with counseling by RADCON (or RSO). The counseling will be the same as that discussed above in the section on Education, with records of participation made and maintained in the same manner.

The following actions shall be implemented to ensure prenatal radiation exposure is kept to a minimum for those women who have declared their pregnancy or their intent to become pregnant and have requested to participate in this program:

- a. The deep dose equivalent to the embryo/fetus because of occupational exposure of a woman who has declared that she is pregnant shall:
 - (1) Be maintained ALARA by the pregnant individual, by the individual's supervisor, and by the facility's RADCON Superintendent or equivalent.
 - (2) Be limited to a value that would not let the woman exceed 50 mrem in a single month.

- (3) The total effective dose equivalent received by the declared pregnant woman shall be controlled to ensure compliance with dose equivalent limits for the embryo/fetus.
 - (4) Further, a declared pregnant worker shall be excluded from Planned Special Exposure activities.
- b. For the case of a woman who has voluntarily declared her intent to become pregnant:
 - (1) Her occupational radiation exposure should be maintained ALARA by the individual, by the individual's supervisor, and by the facilities RADCON Superintendent/RSO or designee.
 - (2) The RADCON Superintendent/RSO or designee should limit the woman to a value that would not let her exceed 50 mrem total effective dose equivalent in a single month.
 - (3) The Radiological and Chemistry Control Manager/RSO or designee will inform the woman that she will confirm her intent to become pregnant in writing every two months until she either declares her pregnancy, states she no longer intends to become pregnant, or chooses to leave the program.
- c. Women participating in the prenatal radiation exposure program shall be monitored by a NVLAP accredited dosimeter if they enter or work in an area where they could exceed a deep dose equivalent of 100 mrem in a year at TVA.
- d. Because of the uncertainties in assigning dose to the embryo/fetus due to the uptake of radionuclides, women participating in the prenatal radiation exposure program should not enter surface contamination or airborne activity areas.

- e. Reasonable efforts will be made by management to retain participants in the program in their current job status, subject to the needs of the facility and the provisions of the applicable negotiated agreement. Retention of current job status cannot be guaranteed.

Any exception to the above exposure recommendations for a woman who has declared pregnancy or her intent to become pregnant and has requested to participate in this program shall be forwarded to the Chair, Radiation Effects Advisory Group (REAG).

- J. Employees shall report to their local TVA medical facility and the site RADCON organization (or RSO) whenever they receive medical external radiation therapy or internal radionuclides for diagnosis or treatment. Routine diagnostic X-rays need not be reported. RADCON (or RSO) may suspend access, if necessary, to the restricted area or radiologically controlled area if radiological control of these areas would be compromised by entry of these persons. Additionally, access may be suspended if consultations regarding additional exposure are pending.

- K. The ADLs for individuals receiving therapeutic medical radiation exposures and individuals with radiologically-related medical restrictions should be evaluated on a case-by-case basis. It is recommended that the opinion and recommendations of the individual's treating specialist be solicited. The treating specialist would be most aware of the individual diagnosis, specific therapy, the attendant risks, as well as any unusual susceptibility or precautions necessary regarding workplace radiation exposure. The individual and his or her supervisor will be counseled by Medical Services. A written record of this counseling shall be made and maintained along with all other supporting documentation. For individuals receiving therapeutic medical radiation exposures the individual should have risks clearly explained and be encouraged, but not required, to be placed on a lower ADL.

If the individual chooses to be placed on a lower ADL, the individual shall be informed that reasonable accommodations will be made to retain him/her in his/her present job status.

However, his/her present job status cannot be guaranteed. An annual ADL of 500 mrem for the whole body appears to be a reasonable limit, absent other circumstances which warrant a higher or lower ADL. For individuals with radiologically-related medical restrictions, Medical Services, in consultation with the RADCON Superintendent/RSO or designee, will determine if occupational exposure should be administratively restricted.

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BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

JPM NUMBER: 487TCF
TITLE: CLASSIFY THE EVENT PER THE REP (PRIMARY SYS.
LEAKAGE (Torus Pressure) exceeding PSP curve)
TASK NUMBER: S-000-EM-21

SUBMITTED BY: *Ron M. Ze* DATE: 1/3/08

VALIDATED BY: *Jamie C. Maut* DATE: 1/4/08

APPROVED: *2 Robert Sullivan* DATE: 1/5/08

PLANT CONCURRENCE: *[Signature]* DATE: 1/4/08
TRAINING
OPERATIONS

* Examination JPMS Require Operations Training Manager or Designee Approval and Plant Concurrence

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision
0	01/02/08	All	New Procedure

BROWNS FERRY NUCLEAR PLANT
JOB PERFORMANCE MEASURE

OPERATOR: _____

RO _____ SRO X _____ DATE: _____

JPM NUMBER: 487TCF

TASK NUMBER: S-000-EM-21 (SRO ONLY)

TASK TITLE: CLASSIFY THE EVENT PER THE REP (PRIMARY SYS.
LEAKAGE (Torus press) exceeding PSP curve)

K/A NUMBER: 2.4.38 K/A RATING: RO 2.2 SRO: 4.0

TASK STANDARD: CLASSIFY THE EVENT AS A SITE AREA EMERGENCY AND
PERFORM ACTIONS OF EPIP 4. MAKE NOTIFICATIONS SUCH THAT (TIME
NOTIFY ODS) - (TIME DECLARED) IS LESS THAN 5 MINUTES AND (TIME
NOTIFIED NRC) - (TIME DECLARED) IS LESS THAN 15 MINUTES.

LOCATION OF PERFORMANCE: SIMULATOR X PLANT _____ CONTROL ROOM _____

REFERENCES/PROCEDURES NEEDED: EPIP 1, REV 42; EPIP 4, REV 30

VALIDATION TIME: _____ CONTROL ROOM: 15 MIN. LOCAL: N/A

MAX. TIME ALLOWED: 15/60 (Completed for Time Critical JPMs only)

PERFORMANCE TIME: _____ CONTROL ROOM _____ LOCAL N/A

COMMENTS: _____

Additional comment sheets attached? YES _____ NO _____

RESULTS: SATISFACTORY _____ UNSATISFACTORY _____

SIGNATURE: _____ DATE: _____
EXAMINER

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 the SHIFT MANAGER. Unit 3 was operating at 100% (BOL) when the Unit 3 UNIT SUPERVISOR received a call from the Security Chief of a tornado warning in the vicinity of Browns Ferry Nuclear Plant. The UNIT 2 SUPERVISOR has implemented 0-AOI-100-7 Tornado. A few minutes later the plant lost "All Offsite Power" due to the tornado hitting the switchyard. 0-AOI-57-1A is in progress due to the loss of All Offsite Power. 480V Shutdown Board 3B has also been lost due to overcurrent conditions. EOI 1 and 2 are in progress due an unidentified leak in the Drywell causing High Drywell pressure that is trending upwards. The Operators are venting the TORUS per EOI-2. (Unit 1 and 2 also scrambled from 100% power and are responding normally.)

INITIATING CUES: The Unit 3 UNIT SUPERVISOR has informed you of the leak in the Drywell and the Loss of "All Offsite Power". MSIV's are closed and SRV's are being utilized to maintain reactor pressure between 800-1000 psig. Drywell Pressure/Temperature and Torus Pressure/Temperature are trending upwards. The crew has been unable to get a Drywell or Torus spray system to operate. Using the following parameters provided to you by the control room operating crew, **CLASSIFY THE EVENT** according to the EPIPs and perform any required actions. (NOTE: Unit 3 conditions are deteriorating.)

Reactor Level	-25 on Emergency Range
Reactor Pressure	885 psig
DW Pressure	30 psig and rising (unable to Spray due to multiple valve failures.)
DW Radiation	RR-90-256 slowly rising (prior to isolation)
DW Leakage Rate	unknown at this time
DW Temperature	242 degrees F and slowly rising
Torus Temperature	245 degrees F
Torus Pressure	30 psig and rising
Torus Level	15 feet
Wind Speed	5 mph from the SW
Venting Torus	per APP 12

START TIME: _____

Performance Step : Critical X Not Critical _____

Refers to EPIP 1 to classify emergency event.

Standard:

SHIFT MANAGER refers to EPIP 1, Section 2.0, Primary Containment, Drywell Internal Leakage and declares an Site Area Emergency 2.1-S based on Torus pressure not being able to be maintained within the safe area of curve 2.1-S.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

RECORD TIME DECLARED _____

Performance Step : Critical X Not Critical _____

Implements EPIP-4 Site Area Emergency

Standard:

SHIFT MANAGER recognizes/implements a Site Area Emergency per EPIP-4.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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3.0 EMERGENCY CLASSIFICATION ACTIONS

This section of the procedure is utilized for actions to be taken when the initial Alert emergency classification is originating from the Control Room. If the Technical Support Center is operational, utilize the instructions found in Appendix E of this procedure for actions to be taken upon the Alert emergency classification being declared.

3.1 Activation of the Emergency Response Organization (ERO)

CAUTION

Ongoing or anticipated security events may present a danger to normal staffing of the Emergency Response Organization. Select the "Staging Area" option when events are ongoing or anticipated that may present a danger to normal ERO staffing as determined by the SED and/or Nuclear Security.

NOTE

Normally Appendix B, "Unit Operator Notifications", is conducted by a Unit 1, Unit Operator, Depending upon the affected unit, this action may be delegated to a Unit Operator on an unaffected unit.

TIME EVENT DECLARED _____

Performance Step : Critical X Not Critical _____

3.1.1 NOTIFY...a Unit Operator of the Site Area Emergency

Classification

AND

3.1.2 DIRECT...the Unit Operator to implement Appendix B,
activating the paging system using option

- DRILL
- EMERGENCY
- STAGING AREA (See caution note above)

Standard:

DIRECTS Unit Operator to make notifications per Appendix B.

SAT _____ UNSAT _____ N/A _____ COMMENTS: _____

CUE: NUCLEAR SECURITY INFORMS YOU THAT THE TORNADO WHICH DAMAGED THE SWITCHYARD HAS PASSED THROUGH AND THE WEATHER IS NOW CLEAR.

3.2 Operations Duty Specialist (ODS) Notification / State of Alabama Notification

NOTE

Note: The ODS should be notified within 5 minutes after the emergency has been declared.

Performance Step :

Critical X Not Critical

3.2.1 Complete Appendix A (Initial Notification Form)

Standard:

COMPLETES APPENDIX A with EAL Designator 2.1-S SITE AREA EMERGENCY status. Unidentified leak in Unit 3 Drywell with level at -25 on the Emergency Range, reactor pressure 885 psig, DW pressure 30 psig and slowly rising, DW temperature 242 degrees F and slowly rising, Torus Temperature 245 degrees F and Torus Pressure 30 psig with a Torus Level of 15 feet. EOI 1 and 2 are in progress. Venting the TORUS per EOI-2 is also in progress. Unit 3 conditions are deteriorating. Wind speed is 5 mph from the SW. **(INFORMATION GIVEN IN INITIAL CONDITIONS & INITIATING CUES EXCEPT EAL DESIGNATOR) NOTE: THIS IS GENERIC INFORMATION FOR DESCRIPTION OF EVENT--ALL THIS EXACT INFORMATION IS NOT REQUIRED FOR ACCEPTANCE UNDER BRIEF DESCRIPTION OF EVENT.**

SAT__UNSAT__N/A__ COMMENTS:_____

<u>Performance Step</u>	:	Critical	X	Not Critical	_____
-------------------------	---	----------	---	--------------	-------

3.2.2 **NOTIFY**...the ODS, utilizing the “Direct Ring-Down” telephone or at extension 5-751-1700 or 5-751-2495.

AND

REPORT...to the ODS the information recorded on Appendix A.

AND

FAX...a copy of Appendix A to the ODS for confirmation of information at 5-751-8620.

CUE: ENSURE SIMULATOR OPERATOR DOES NOT ANSWER THE ODS
PHONE CALL. IF EXAMINEE SENDS FAX, FAXING TO THE ODS WILL
BE SIMULATED.

Standard:

RECOGNIZES the ODS cannot be contacted and continues to step 3.2.3

SAT	UNSAT	N/A	COMMENTS:

Performance Step : Critical___ Not Critical X

3.2.3 IF... the ODS was contacted,

THEN... the State of Alabama notification action is
complete.

AND

RE-ENTER at Step 3.3. Otherwise continue.

Standard:

Continues to step 3.2.4, since ODS was NOT notified.

SAT___ UNSAT___ N/A___ COMMENTS: _____

Performance Step :	Critical	X	Not Critical
1. The project manager is responsible for the project's success or failure.			
2. The project manager is responsible for the project's budget.			
3. The project manager is responsible for the project's schedule.			
4. The project manager is responsible for the project's quality.			
5. The project manager is responsible for the project's risk.			
6. The project manager is responsible for the project's communication.			
7. The project manager is responsible for the project's stakeholder management.			
8. The project manager is responsible for the project's team management.			
9. The project manager is responsible for the project's resource management.			
10. The project manager is responsible for the project's procurement management.			

NOTE

- The State of Alabama should be contacted within 15 minutes of the emergency classification.

3.2.4 IF...the ODS cannot be contacted within 10 minutes,

THEN...NOTIFY the State of Alabama at:

24 Hours

Primary: 9-1-205-280-2310

Backup: 9-1-800-843-0699

Backup: 9-1-334-324-0076

AND

REPORT... the information recorded on Appendix A.

 /
Init time

N/A if ODS was contacted

AND

FAX...a copy of Appendix A to the State of Alabama for confirmation of information at 9-1-205-280-2495.

CUE: FAXING TO THE STATE WILL BE SIMULATED.

Standard:

Contacts the State of Alabama **within 15 minutes** of declaring the event and simulates sending fax.

SAT	UNSAT	N/A	COMMENTS:

TIME STATE NOTIFIED

Performance Step : Critical___ Not Critical X

3.3

ODS State of Alabama Notification Confirmation

Receive a confirmation call from the ODS verifying that the notification of the State of Alabama was completed. Do this concurrently with the implementation of this procedure.

INIT Time
N/A if state
was contacted

CUE: (3 minutes after fax) REQUEST SIMULATOR CONSOLE OPERATOR TO CALL AND CONFIRM THAT THE STATE HAS RECEIVED THE FAX.

Standard:

Continues in procedure until conformation call is received and acknowledges receipt.

SAT___ UNSAT___ N/A___ COMMENTS:_____

3.4 NOTIFICATION OF SITE PERSONNEL

CAUTION

Ongoing or anticipated security events may present a danger to site personnel. Do not conduct the notification of site personnel PA message during an ongoing or anticipated security event. All pertinent site personnel PA messages will be conducted per AOI-100-8 for security events.

Performance Step : Critical___ Not Critical X

CONDUCT a Plant PA announcement similar to the following:
(Dial 687 to obtain the Plant PA)

Let me have your attention please.
This is (name) _____.
A Site Area Emergency Classification has been declared.
We are currently implementing EPIP-4.
If you have not already done so, please report to your
assigned emergency center at this time.

Standard:

MAKES P. A. announcement giving name, SAE status on Unit 3 and **DIRECTS**
Plant Personnel to report to their assigned Emergency Center, if not already done.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CAUTION

Do not initiate Assembly / Accountability when:

1. A severe weather condition exists or is projected on-site, such as a Tornado.
2. An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

Performance Step : Critical___ Not Critical X

3.5 **Assembly / Accountability**

3.5.1 IF... Assembly /Accountability has not been conducted,

THEN... **IMPLEMENT** EPIP-8, Appendix C concurrently with this procedure. This action may be delegated.

3.5.2 IF... an order to evacuate non-emergency responders Has not been issued,

THEN...upon completion of Assembly/Accountability, INITIATE the order to "Evacuate Non-Emergency Responders, " through implementation of EPIP-8, Appendix F, concurrently with this procedure.

3.5.3 IF...Conditions exist that do not allow for an Assembly/ Accountability or Evacuation at this time,

THEN... **CONTINUE** to assess the situation, implementing EPIP-8 when necessary.

CUE: The STA is Implementing EPIP-8 Appendix C and F.

Standard:

SHIFT MANAGER/SED addresses ACCOUNTABILITY and acknowledges the STA is performing EPIP-8.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step : Critical___ Not Critical X

3.6 Dose Assessment

EVALUATE...the need for dose assessment.

IF...dose assessment is needed,

THEN...**CONTACT**, if operational, the Central Emergency Control Center (CECC) at 5-751-1614.

OR

IF...the CECC is not operational,

THEN...**CONTACT**, the Radiological Protection Shift Supervisor or designee at 7865 and request the implementation of EPIP-13 for dose assessment.

CUE: CECC IS NOT OPERATIONAL AT THIS TIME.

Standard:

Examinee acknowledges that the CECC is not staffed and contacts the Radiological Protection Shift Supervisor and request the implementation of EPIP-13

SAT___ UNSAT___ N/A___ COMMENTS:___

Critical X Not Critical

RECORD TIME NOTIFIED NRC

Performance Step : Critical___ Not Critical X

3.8 Review of Procedure

Review this procedure to ensure that all steps and actions have been completed and all place keeping blocks have been checked or denoted as instructed. This action may be delegated.

CUE: NO-ONE IS AVAILABLE TO REVIEW THE PROCEDURE FOR YOU.

Standard:

SHIFT MANAGER/SED reviews procedure to ensure all steps and actions have been completed, placekeeping blocks checked as instructed.

SAT___ UNSAT___ N/A___ COMMENTS:_____

CUE: THE ASSISTANT PLANT MANAGER (DUTY SED, SRO) IS HERE TO RELIEVE YOU. THAT WILL BE ALL FOR NOW.

END OF TASK

STOP TIME: _____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of SELF CHECKING during this JPM.

Standard:

PERFORMER verified applicable components by utilizing SELF CHECKING in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

Performance Step: Critical___ Not Critical X

PERFORMER demonstrated the use of 3-WAY COMMUNICATION during this JPM.

Standard:

PERFORMER utilized 3-WAY COMMUNICATION in accordance with plant standards.

SAT___ UNSAT___ N/A___ COMMENTS:_____

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 the SHIFT MANAGER. Unit 3 was operating at 100% (BOL) when the Unit 3 UNIT SUPERVISOR received a call from the Security Chief of a tornado warning in the vicinity of Browns Ferry Nuclear Plant. The UNIT 2 SUPERVISOR has implemented 0-AOI-100-7 Tornado. A few minutes later the plant lost "All Offsite Power" due to the tornado hitting the switchyard. 0-AOI-57-1A is in progress due to the loss of All Offsite Power. 480V Shutdown Board 3B has also been lost due to overcurrent conditions. EOI 1 and 2 are in progress due an unidentified leak in the Drywell causing High Drywell pressure that is trending upwards. The Operators are venting the TORUS per EOI-2. (Unit 1 and 2 also scrambled from 100% power and are responding normally.)

INITIATING CUES: The Unit 3 UNIT SUPERVISOR has informed you of the leak in the Drywell and the Loss of "All Offsite Power". MSIV's are closed and SRV's are being utilized to maintain reactor pressure between 800-1000 psig. Drywell Pressure/Temperature and Torus Pressure/Temperature are trending upwards. The crew has been unable to get a Drywell or Torus spray system to operate. Using the following parameters provided to you by the control room operating crew, **CLASSIFY THE EVENT** according to the EPIPs and perform any required actions. (**NOTE: Unit 3 conditions are deteriorating.**)

Reactor Level	-25 on Emergency Range
Reactor Pressure	885 psig
DW Pressure	30 psig and rising (unable to Spray due to multiple valve failures.)
DW Radiation	RR-90-256 slowly rising (prior to isolation)
DW Leakage Rate	unknown at this time
DW Temperature	242 degrees F and slowly rising
Torus Temperature	245 degrees F
Torus Pressure	30 psig and rising
Torus Level	15 feet
Wind Speed	5 mph from the SW
Venting Torus	per APP 12

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP-1

EMERGENCY CLASSIFICATION PROCEDURE

REVISION 42

PREPARED BY: RANDY WALDREP

PHONE: 2038

RESPONSIBLE ORGANIZATION: EMERGENCY PREPAREDNESS

APPROVED BY: TONY ELMS

DATE: 04/06/2007

EFFECTIVE DATE: 04/06/2007

LEVEL OF USE: REFERENCE USE

QUALITY-RELATED

C

C

C

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT

EMERGENCY PLAN IMPLEMENTING PROCEDURE

EPIP- 4

SITE AREA EMERGENCY

REVISION 30

PREPARED BY: RANDY WALDREP

PHONE: 2038

RESPONSIBLE ORGANIZATION: EMERGENCY PREPAREDNESS

APPROVED BY: TONY ELMS

DATE: 04/11/2007

EFFECTIVE DATE: 04/12/2007

LEVEL OF USE: REFERENCE USE

QUALITY-RELATED

HISTORY OF REVISION / REVIEW

<u>REV. NO.</u>	<u>REVISE D PAGES</u>	<u>REASON FOR CURRENT REVISION</u>	
28	7,8,11	IC-35	EPIP-4, rev. 28 is being conduct to standardize record retention (page7) and revise the notification forms to include NRC Terminology from RIS 2002-16 for normal and abnormal releases (page 8 & 11). Additionally the revision will provide a place to document the time and EAL Designation when centers are staffed (page 2).
29	ALL	IC-36	EPIP-4 rev. 29 reflects formatting changes to increase ease of use. The guidance for monitoring/re-evaluating the event was moved to Appendix C. The follow-up information form became Appendix D (previously Attachment C). The instructions for TSC implementation of EPIP-4 was moved to Appendix E. A flow illustration was added as Appendix F. Additionally, the revision incorporates identified changes resulting from annual review, standardization issues, areas for improvements identified by users, cautions regarding onsite protective actions (RIS 2004-15) as well as other editorial changes.
30	11,21	IC-37	Converted document from W95 to XP. Corrected typo in Appendix F to EPIP-4 from EPIP-5. Added caution statement to Appendix B for Unit Operator actions prior to steps 3-6.

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BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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1.0 INTRODUCTION

1.1 Purpose

The purpose of this procedure is to provide for the timely notification of appropriate individuals or organizations when the Shift Manager or the Site Emergency Director (SED) has determined through the use of EPIP-1 that an event has occurred which is classified as an Site Area Emergency. Additionally, this procedure provides for periodic evaluation of the current situation by the Shift Manager/SED to determine whether the Site Area Emergency should be terminated, continued, or upgraded to a higher emergency classification.

This procedure is initiated by implementation of EPIP-1, "Emergency Classification Procedure." Initial classifications are conducted from the body of this instruction. Classifications that are made following the Technical Support Center becoming operational is accomplished from an appendix of this procedure.

2.0 REFERENCES

2.1 Industry Documents

- A. NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"
- B. 10 CFR 50.47, Code of Federal Regulations
- C. 10 CFR 72.75, Code of Federal Regulations

2.2 Plant Instructions

- A. TVA Radiological Emergency Plan
- B. EPIP - 1, "Emergency Classification Procedure"
- C. EPIP - 2, "Notification of Unusual Event"
- D. EPIP - 3, "Alert"
- E. EPIP - 5, "General Emergency"

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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3.0 EMERGENCY CLASSIFICATION ACTIONS

This section of the procedure is utilized for actions to be taken when the initial Site Area Emergency classification is originating from the Control Room. If the Technical Support Center is operational, utilize the instructions found in Appendix E of this procedure for actions to be taken upon the Site Area Emergency classification being declared.

3.1 Activation of the Emergency Response Organization (ERO)

CAUTION

Ongoing or anticipated security events may present a danger to normal staffing of the Emergency Response Organization. Select the "Staging Area" option when events are ongoing or anticipated that may present a danger to normal ERO staffing as determined by the SED and/or Nuclear Security.

NOTE

Normally Appendix B, "Unit Operator Notifications", is conducted by a Unit 1, Unit Operator. Depending upon the affected unit, this action may be delegated to a Unit Operator on an unaffected unit.

3.1.1 **NOTIFY**...a Unit Operator of the Site Area Emergency
Emergency Classification,

☐

AND

3.1.2 **DIRECT**...the Unit Operator to implement Appendix B,
activating the paging system using option.

- ☐ DRILL
- ☐ EMERGENCY
- ☐ STAGING AREA (See caution note above)

3.2 Operations Duty Specialist (ODS) Notification / State of Alabama Notification

NOTE

- The ODS should be notified within 5 minutes after the emergency has been declared.

3.2.1 **COMPLETE** Appendix A (Initial Notification Form) ☐

3.2.2 **NOTIFY**...the ODS, utilizing the "Direct Ring-Down" telephone or at extension 5-751-1700 or 5-751-2495.

AND

REPORT...to the ODS the information recorded on Appendix A.

____ / ____
Initials Time

AND

FAX...a copy of Appendix A to the ODS for confirmation of information at 5-751-8620. ☐

3.2.3 IF... the ODS was contacted,

THEN... the State of Alabama notification action is complete.

AND

RE-ENTER at Step 3.3. Otherwise continue.

<p style="text-align: center;"><u>NOTE</u></p> <ul style="list-style-type: none"> The State of Alabama should be contacted within 15 minutes of the emergency classification.

3.2.4 IF...the ODS cannot be contacted within 10 minutes,

THEN... **NOTIFY** the

State of Alabama at:

☐

24 Hours

Primary: 9-1-205-280-2310

Backup: 9-1-800-843-0699

Backup: 9-1-334-324-0076

AND

REPORT... the information recorded on Appendix A.

AND

FAX...a copy of Appendix A to the State of Alabama for confirmation of information at 9-1-205-280-2495.

_____/_____
Initials Time
(N/A this step if the
ODS was contacted
directly)

☐

3.3 ODS State of Alabama Notification Confirmation

Receive a confirmation call from the ODS verifying that the notification of the State of Alabama was completed. Do this concurrently with the implementation of this procedure.

_____/_____
Initials Time
(N/A this step if
State was
contacted directly)

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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3.4 Notification of Site Personnel

CAUTION

Ongoing or anticipated security events may present a danger to site personnel. Do not conduct the notification of site personnel PA message during an ongoing or anticipated security event. All pertinent site personnel PA messages will be conducted per AOI-100-8 for security events.

CONDUCT a Plant PA announcement similar to the following: ☐
(Dial 687 to obtain the Plant PA)

Let me have your attention please.
This is (name) _____.
A Site Area Emergency, Emergency Classification has
been declared.
We are currently implementing EPIP-4.
If you have not already done so, please report to your
assigned emergency center at this time.

3.5 Assembly / Accountability

CAUTION

Do not initiate Assembly / Accountability when:

1. A severe weather condition exists or is projected on-site, such as a Tornado.
2. An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

3.5.1 IF... Assembly / Accountability has not been conducted, ☐

THEN... **IMPLEMENT** EPIP-8, Appendix C concurrently
with this procedure. This action may be delegated.

3.5.2 IF... an order to evacuate non-emergency responders has
not been issued, ☐

THEN... upon completion of Assembly / Accountability,
INITIATE the order to "Evacuate Non-Emergency
Responders," through implementation of EPIP-8,
Appendix F, concurrently with this procedure.

3.5.3 IF... conditions exist that do not allow for an Assembly /
Accountability or Evacuation at this time, ☐

THEN... **CONTINUE** to assess the situation, implementing
EPIP-8 as applicable.

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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3.6 Dose Assessment

EVALUATE...the need for dose assessment. ☐

IF...dose assessment is needed,

THEN...**CONTACT**, if operational, the Central Emergency Control Center (CECC) at 5-751-1614.

OR

IF...the CECC is not operational,

THEN...**CONTACT**, the Radiological Protection Shift Supervisor or designee at 7865 and request the implementation of EPIP-13 for dose assessment.

3.7 Notification of the Nuclear Regulatory Commission (NRC)

NOTE

If possible, when making notifications to the NRC, utilize the Emergency Notification System (ENS). Dial the first number listed on the sticker affixed to the ENS telephone by dialing 9-1- "The Ten Digit Number Listed on the ENS Telephones". If the number is busy, then select in order, the alternate numbers until a connection is achieved. No access codes should be required.

NOTIFY...the NRC immediately but no later than one hour after the emergency has been declared. ☐

IF...**REQUESTED** by the NRC to maintain an open and continuous line of communications,

THEN... **MAINTAIN** an open and continuous line of communications as directed by NRC.

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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3.8 Review of Procedure

Review this procedure to ensure that all steps and actions have been completed and all place keeping blocks have been checked or denoted as instructed. This action may be delegated. ☐

3.9 Monitor / Re-evaluate the Event

Monitoring and reevaluation of plant events along with communicating significant changes should be performed continuously as a function of the emergency response. Methods used to communicate significant changes are not formalized and may vary depending upon staffing levels as well as availability of personnel or equipment. Appendix C provides a systematic approach to monitor/re-evaluate and communicate significant changes in plant conditions.

Utilize Appendix C to monitor/re-evaluate and communicate plant conditions and significant changes. Significant changes in plant conditions are at a minimum when other EAL conditions exist indicating the current emergency classification.

4.0 DOCUMENTATION

4.1 Emergency Records

The records generated due to declaration of an emergency classification are considered Lifetime Retention Non-QA records. These records shall be forwarded to the BFN EP Manager. The records necessary to demonstrate performance are then submitted to the Corporate EP Manager for storage.

4.2 Drill and Exercise Records

The records deemed necessary to demonstrate performance of key actions during drills are considered Non-QA records. These records shall be forwarded to the BFN EP Manager. The BFN EP Manager shall retain records necessary to demonstrate six-year plan requirements for six years. The BFN EP Manager shall retain other records in this category for three years.

5.0 ILLUSTRATIONS /APPENDICES

Appendix A - Site Area Emergency Initial Notification Form

Appendix B - Unit Operator Notifications

Appendix C - Monitor / Re-Evaluate Event

Appendix D - Site Area Emergency Follow-up Information Form

Appendix E - Technical Support Center Site Area Emergency Classification Instruction

Appendix F - EPIP-4 Procedure Flow Illustration

LAST TEXT

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX A

Page 1 of 1

SITE AREA EMERGENCY INITIAL NOTIFICATION FORM

1. ☐ This is a Drill ☐ This is an Actual Event - Repeat - This is an Actual Event

2. This is _____, **Browns Ferry** has declared a **Site Area Emergency**
affecting: ☐ Unit 1 ☐ Unit 2 ☐ Unit 3 ☐ Common

3. **EAL Designator(s):** _____

4. **Brief Description of the Event:**

5. **Radiological Conditions:** (Check one under both Airborne and Liquid column.)

<p><u>Airborne Releases Offsite</u></p> <p><input type="checkbox"/> Minor releases within federally approved limits¹</p> <p><input type="checkbox"/> Releases above federally approved limits¹</p> <p><input type="checkbox"/> Release information not known</p>	<p><u>Liquid Releases Offsite</u></p> <p><input type="checkbox"/> Minor releases within federally approved limits¹</p> <p><input type="checkbox"/> Releases above federally approved limits¹</p> <p><input type="checkbox"/> Release information not known</p>
---	---

(¹Tech Specs) (¹Tech Specs)

6. **Event Declared:** Time: _____ Date: _____

7. **Provide Protective Action Recommendation:** ☐ None

8. Please repeat the information you have received to ensure accuracy.

9. Fax to ODS at 5-751-8620 or State of Alabama at 9-1-205-280-2495 per Section 3.2

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX B

Page 1 of 3

UNIT OPERATOR NOTIFICATIONS

NOTE

- The Emergency Paging System (EPS) consists of a dedicated touch screen CRT. Activation of any screen feature requires the user place their fingertip within the boundary of the select button and leave it there for at least 1 second. The CRT Screen will normally display a large rectangle that indicates that the paging system is available but currently inactive.
- If the EPS fails to operate, contact the SM/SED immediately. Request that the ODS be contacted to initiate the system from his location. If the system fails to operate from the ODS area, then utilize the Weekly Duty List and Call-Out List to manually staff each emergency responder position, implementing this attachment at step E.

1. **Activate** the Emergency Paging System (EPS)

- A. **PRESS** the EPS CRT screen once to activate the paging options. ☐
- B. **PRESS** the appropriate option as instructed by the SED. ☐
- PAGER TEST
 - DRILL
 - EMERGENCY
 - STAGING AREA
 - ABORT
- C. **PRESS** the **START** button to initiate the option or **ABORT** to deny the option request ☐

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX B
Page 2 of 3

UNIT OPERATOR NOTIFICATIONS

D. **MONITOR** the Paging System Terminal Display

☐

NOTE

Monitor ERO positions through OSC Document Control. Positions below OSC Document Control are courtesy pages and are not subject to call-out.

1. **IF...** A "NO" response is observed,
OR

The position being paged has not responded within approximately 20 minutes,

THEN... Utilize the Weekly Duty List and attempt to contact the position representative with available information. (No Fitness for Duty question is required.)

2. **IF...** The individual cannot be reached utilizing the Weekly Duty List,

THEN... Utilize the Call-Out List and attempt to contact an alternate position representative. (Fitness for Duty question is required when utilizing the Call-Out List.)

E. **Manual Call-Out**

☐

1. Utilize the current Weekly Duty List and contact positions as listed. (No Fitness for Duty question is required.)
2. If a position can not be reached from the current Weekly Duty list, then refer to the Call-out List as applicable to fill all vacant positions. (Fitness for Duty question is required when utilizing the Call-Out List.)

F. **CONTINUE** until all positions have been filled.

☐

2. **Notify** Unit Supervisors on shift of the emergency.

☐

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX B
Page 3 of 3

UNIT OPERATOR NOTIFICATIONS

CAUTION

Ongoing or anticipated security events may present a danger to site personnel. If the SITE AREA EMERGENCY has been declared due to security related events, DELAY making the following notifications in steps 3-6 until verification has been received from the Shift Manager that there is no danger to site personnel.

3. **Notify** Nuclear Security Shift Supervisor and state "A SITE AREA EMERGENCY HAS BEEN DECLARED" and direct to activate EPIP-11, "Security and Access Control". ☐
 - Plant Extension 3238 or 2219
4. **Notify** the Chemistry Lab and state "A SITE AREA EMERGENCY HAS BEEN DECLARED" and direct to implement the applicable TI-331, "Post Accident Sampling Procedure" and CI-900 series, "Analysis Procedures". ☐
 - Plant Extension 2367 or 2368
5. **Notify** the RP Lab and state "A SITE AREA EMERGENCY HAS BEEN DECLARED" and direct to activate EPIP-14, "Radiological Control Procedure". ☐
 - Plant Extension 7865 or 3104
6. **Notify** the "On-Call" NRC Resident and state "A SITE AREA EMERGENCY HAS BEEN DECLARED". ☐
 - Plant Extension 2572 (Secretary) or from Weekly Duty List

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX C
Page 1 of 2

MONITOR / RE-EVALUATE THE EVENT

1.0 IF...conditions warrant upgrading to a higher emergency classification, /
INITIALS / Time
THEN...**INITIATE**, as applicable EPIP-5, "General Emergency" and exit
this procedure. Otherwise N/A this step.

2.0 IF... significant changes in plant conditions such as other EAL
conditions supporting the Site Area Emergency or significant
changes in radiological conditions,

THEN... **COMPLETE** Appendix D /
INITIALS / Time

AND

COMMUNICATE the "Follow-Up" information to:

On-Site Emergency Centers ☐

Plant Personnel through PA announcements (if
applicable) ☐

CECC (5-751-1614) ☐

ODS (5-751-1700 or 5-751-2495) ☐

State of Alabama ☐

24 Hours

Primary: 9-1-205-280-2310

Backup: 9-1-800-843-0699

Backup: 9-1-334-324-0076

Nuclear Regulatory Commission (refer to Note in Step
3.7 in body of procedure) ☐

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX C
Page 2 of 2

MONITOR / RE-EVALUATE THE EVENT

CAUTION

Do not initiate Assembly / Accountability when:

1. A severe weather condition exists or is projected on-site, such as a Tornado.
2. An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

3.0 IF... conditions warrant the activation of Assembly / Accountability or Evacuation, _____ / _____
Initials Time

THEN... **ENTER**, EPIP-8, and implement accordingly. Otherwise N/A this step.

4.0 IF... conditions warrant termination of the emergency classification, _____ / _____
Initials Time

THEN... **ENTER**, EPIP-16, "Termination and Recovery Procedure" and exit this procedure. Otherwise N/A this step.

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX D

Page 1 of 1

SITE AREA EMERGENCY FOLLOW-UP INFORMATION FORM

1.	<input type="checkbox"/> THIS IS A DRILL	<input type="checkbox"/> THIS IS AN ACTUAL EVENT
2.	There has been a SITE AREA EMERGENCY declared at Browns Ferry affecting <input type="checkbox"/> Unit 1 <input type="checkbox"/> Unit 2 <input type="checkbox"/> Unit 3 <input type="checkbox"/> Common	
3.	Reactor Status: Unit 1: <input type="checkbox"/> Shutdown <input type="checkbox"/> At Power <input type="checkbox"/> Refueling <input type="checkbox"/> N/A Unit 2: <input type="checkbox"/> Shutdown <input type="checkbox"/> At Power <input type="checkbox"/> Refueling <input type="checkbox"/> N/A Unit 3: <input type="checkbox"/> Shutdown <input type="checkbox"/> At Power <input type="checkbox"/> Refueling <input type="checkbox"/> N/A	
4.	Additional EAL Designator(s) _____	
5.	Significant changes in plant conditions: _____ _____ _____	
6.	Significant changes in Radiological Conditions: _____ _____ _____	
7.	Offsite Protective Action Recommendations: <input type="checkbox"/> None	
8.	Onsite Protective Actions: Assembly/Accountability <input type="checkbox"/> No <input type="checkbox"/> Initiated <input type="checkbox"/> Completed Site Evacuation <input type="checkbox"/> No <input type="checkbox"/> Initiated <input type="checkbox"/> Completed	
9.	The Meteorological Conditions are Wind Speed: _____ m.p.h. (Use 91 meter data on the Met Tower) Wind Direction is from: _____ degrees	
10.	Please repeat the information you have received to ensure accuracy.	
11.	Fax to applicable contact after reporting following-up information: CECC (5-751-1682), ODS (5-751-8620) or State of Alabama (9-1-205-280-2495).	
Completed by: _____, Date/Time _____		

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX E

Page 1 of 6

TECHNICAL SUPPORT CENTER SITE AREA EMERGENCY CLASSIFICATION INSTRUCTION

1.0 Notification of the CECC and/or State of Alabama of Site Area Emergency Classification

1.1 CECC Notification ☐

1.1.1 **COMPLETE** in the following information:

- SAE Classification EAL Designator: _____
- SAE Classification declared at time: _____
- Site Emergency Director: (name) _____

AND

CONTACT the CECC Director and communicate the information recorded in step 1.1, utilizing the CECC "Direct Ring-Down" telephone or at extension 5-751-1614.

_____/_____
Initials Time

1.1.2 IF... the CECC Director was contacted,

Then... the State of Alabama notification action is complete.

AND

RE-ENTER this appendix at Step 2.0.
Otherwise continue in this appendix.

APPENDIX E

Page 2 of 6

TECHNICAL SUPPORT CENTER
SITE AREA EMERGENCY CLASSIFICATION INSTRUCTION

1.2 ODS Notification

NOTE

- The ODS should be contacted within 5 minutes of the emergency classification.

1.2.1 IF... the CECC Director was not contacted,

THEN ... **COMPLETE** Appendix A (Initial
Notification Form)

☐

AND

NOTIFY...the ODS, at extension 5-751-1700 or
5-751-2495.

AND

REPORT...to the ODS the information recorded on
Appendix A.

_____/_____
Initials Time

AND

FAX...a copy of Appendix A to the ODS for
confirmation of information at 5-751-8620.

☐

1.2.2 IF... the ODS was contacted,

☐

Then... the State of Alabama notification action is
complete.

AND

RE-ENTER this appendix at Step 2.0. Otherwise
continue in this appendix.

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX E

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TECHNICAL SUPPORT CENTER
SITE AREA EMERGENCY CLASSIFICATION INSTRUCTION

1.3 State of Alabama Notification

NOTE

- The State of Alabama should be contacted within 15 minutes of the emergency classification.

1.3.1 IF...the ODS cannot be contacted within 10 minutes,

THEN... **NOTIFY** the

State of Alabama at:

24 Hours

Primary: 9-1-205-280-2310

Backup: 9-1-800-843-0699

Backup: 9-1-334-324-0076

AND

REPORT... the information recorded on Appendix A.

AND

FAX... a copy of Appendix A to the State of Alabama for confirmation of information at 9-1-205-280-2495.

_____/_____
Initials Time

(N/A this step if the
ODS was contacted
directly)

☐

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX E

Page 4 of 6

TECHNICAL SUPPORT CENTER SITE AREA EMERGENCY CLASSIFICATION INSTRUCTION

2.0 CECC or ODS State of Alabama Notification Confirmation

Receive a confirmation call from the CECC or the ODS verifying that the notification of the State of Alabama was completed. Do this concurrently with the implementation of this procedure.

_____/_____
Initials Time
(N/A this step if
State was
contacted directly)

3.0 Notification of Site Personnel

CAUTION

Ongoing or anticipated security events may present a danger to site personnel. Do not conduct the notification of site personnel PA message during an ongoing or anticipated security event. All pertinent site personnel PA messages will be conducted per AOI-100-8 for security events.

CONDUCT a Plant PA announcement similar to the following:
(Dial 687 to obtain the Plant PA)



Let me have your attention please.

This is (name) _____.

A Site Area Emergency Classification has been declared.

We are currently implementing EPIP-4.

If you have not already done so, please report to your assigned emergency center at this time.

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX E

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TECHNICAL SUPPORT CENTER
SITE AREA EMERGENCY CLASSIFICATION INSTRUCTION

4.0 **Assembly / Accountability**

CAUTION

Do not initiate Assembly / Accountability when:

1. A severe weather condition exists or is projected on-site, such as a tornado.
2. An on-site security risk condition exists that may present a danger to site personnel during the Assembly / Accountability process as determined by SED/Nuclear Security.

4.1 IF... Assembly / Accountability has not been conducted, ☐

THEN... **IMPLEMENT** EPIP-8, Appendix C concurrently with this procedure. This action may be delegated.

4.2 IF... an order to evacuate non-emergency responders has not been issued, ☐

THEN... upon completion of Assembly / Accountability, **INITIATE** the order to "Evacuate Non-Emergency Responders," through implementation of EPIP-8, Appendix F, concurrently with this procedure.

4.3 IF... conditions exist that do not allow for an Assembly / Accountability or Evacuation at this time, ☐

THEN... **CONTINUE** to assess the situation, implementing EPIP-8 as applicable.

5.0 **Dose Assessment**

EVALUATE...the need for dose assessment. ☐

IF...dose assessment is needed,

THEN...**CONTACT**, if operational the Central Emergency Control Center (CECC) at 5-751-1614.

OR

IF...the CECC is not operational,

THEN...**REQUEST**, the Radiological Protection Manager conduct a dose assessment utilizing EPIP-13.

BROWNS FERRY	SITE AREA EMERGENCY	EPIP-4
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APPENDIX E

Page 6 of 6

TECHNICAL SUPPORT CENTER SITE AREA EMERGENCY CLASSIFICATION INSTRUCTION

6.0 Notification of the Nuclear Regulatory Commission (NRC)

NOTE

- If possible, when making notifications to the NRC utilize the Emergency Notification System (ENS). Dial the first number listed on the sticker affixed to the ENS telephone by dialing 9-1- "The Ten Digit Number Listed on the ENS Telephones". If the number is busy, then select in order, the alternate numbers until a connection is achieved. No access codes should be required.
- This action may be delegated to the TSC NRC Coordinator.

NOTIFY...the NRC immediately but no later than one hour after the emergency has been declared. ☐

IF...**REQUESTED** by the NRC to maintain an open and continuous line of communications,

THEN... **MAINTAIN** an open and continuous line of communications as directed by NRC.

7.0 Review of Procedure

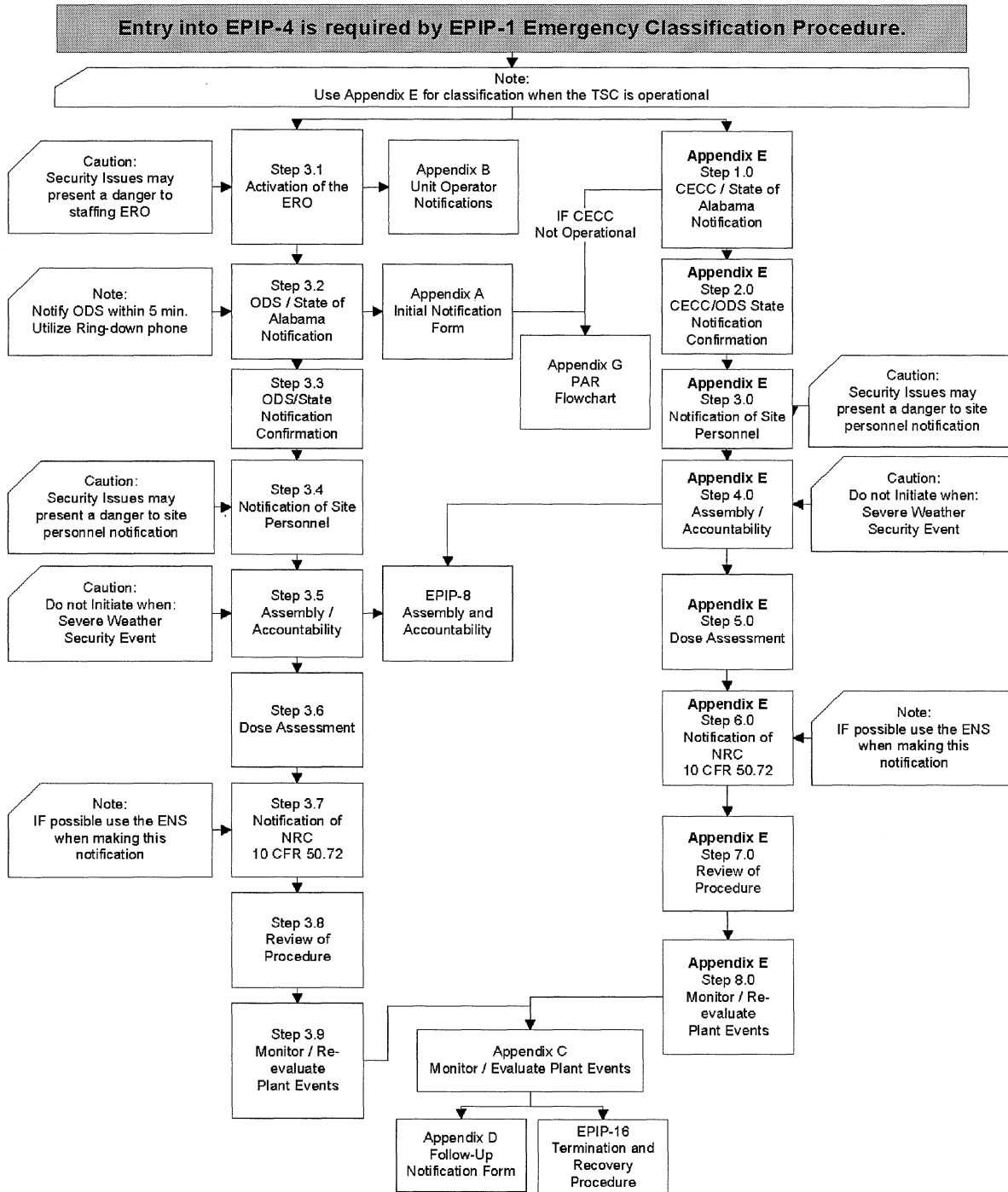
Review this procedure to ensure that all steps and actions have been completed and all place keeping blocks have been checked or denoted as instructed. ☐

8.0 Monitor / Re-evaluate the Event

Monitoring and reevaluation of plant events along with communicating significant changes should be performed continuously as a function of the emergency response. Methods used to communicate significant changes are not formalized and may vary depending upon staffing levels as well as availability of personnel or equipment. Appendix C provides a systematic approach to monitor/re-evaluate and communicate significant changes in plant conditions.

Utilize Appendix C to monitor/re-evaluate and communicate plant conditions and significant changes. Significant changes in plant conditions are at a minimum when other EAL conditions exist indicating the current emergency classification.

APPENDIX F
EPIP-4 Flow Illustration



LAST PAGE