ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No:A-1 Rev 0

JPM Title: Shutdown margin with inoperable CEA

Approximate Time: 20 minutes Actual Time: _____

Reference(s): K/A 2.1.37 RO Importance 4.3
TDB-V.9, "SHUTDOWN MARGIN WORKSHEET"
TDB-II, "REACTIVITY CURVES"

JPM Prepared by: Jerry Koske Date: 01/31/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No:A-1 Rev 0

JPM Title: Shutdown margin with inoperable CEA

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: TDB, ruler. calculator

Safety Considerations: None

Comments:

JPM No:A-1 Rev 0

JPM Title: Shutdown margin with inoperable CEA

INITIATING CUE: **The plant is operating at 60% power with group 4 CEAs at 110 inches withdrawn. Group A CEA #36 and Group 2 CEA #24 have been declared inoperable (untrippable).**

You have been requested to perform an instantaneous shutdown margin calculation to determine if technical specification requirements for shutdown margin are being met.

The RCS boron concentration is 400 ppm. The burnup is 12000 MWD/MTU

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Obtain a copy of TDB-V.9.	After candidate locates TDB-V.9 in the Technical Data Book, provide a copy of TDB-V.9 Part I. [SAT] [UNSAT]
2	Obtain a copy of TDB section II, Reactivity Curves.	Obtains copy of TDB-II. [SAT] [UNSAT]
3	Determines part I of TDB procedure should be used.	Performs calculation using part 1. [SAT] [UNSAT]
4	Performs calculation of the difference between actual and required shutdown margin.	Difference calculated on line 11 of TDB-V.9, section 1 is +0.7 [between +0.5, +0.9] [SAT] [UNSAT]

JPM No:A-1 Rev 0

JPM Title: Shutdown margin with inoperable CEA

STEP	ELEMENT	STANDARD
5	Determines if SDM is adequate.	Determines Shutdown Margin is inadequate [SAT] [UNSAT]

Termination Criteria: Shutdown Margin determination has been made and TDB V.9, Part One has been filled out.

JPM No: A-1 Rev 0

INITIATING CUE: **The plant is operating at 60% power with group 4 CEAs at 110 inches withdrawn. Group A CEA #36 and Group 2 CEA #24 have been declared inoperable (untrippable).**

You have been requested to perform an instantaneous shutdown margin calculation to determine if technical specification requirements for shutdown margin are being met.

The RCS boron concentration is 400 ppm. The burnup is 12000 MWD/MTU

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-2

JPM Title: Determine Pressurizer Level During Cooldown

Approximate Time: 10 minutes Actual Time: _____

Reference(s): K/A# 2.1.25 RO Importance 3.9

TDB-III.1.a, "TEMPERATURE CORRECTION FOR PRESSURIZER LEVEL INDICATORS LI-101X/Y".

TDB-III.2, "ACTUAL LEVEL IN PRESSURIZER VS. INDICATED LEVEL IN PRESSURIZER.

JPM Prepared by: Jerry Koske Date: 02/01/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-2

JPM Title: Determine Pressurizer Level During Cooldown

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: TDB, Ruler, Steam Tables

Safety Considerations:

Comments:

JPM No: A-2

JPM Title: Determine Pressurizer Level During Cooldown

INITIATING CUE: **The RCS is being cooled down per OP-3A. RCS pressure is at 250 psia.**

A dummy level signal has been placed on pressurizer level channel LI-101X and it is selected as the controlling channel.

The pressurizer level indications are as follows:

LI-101X = 48%
LI-101Y = 50%
LI-106 = 34%

The CRS has asked you to determine that actual pressurizer level using both LI-101Y and LI-106 to determine if the pressurizer heaters need to be turned off?

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Refers to TDB-III.1.a and determines that the actual pressurizer level based on LR-101Y.	Level based on LR-101Y is approximately 40% (35 - 45%) [SAT] [UNSAT]
2	Refers to TDB-III.2 and determines that the actual pressurizer level based on LI-106.	Level based on LI-106 is approximately 40% (35 - 45%) [SAT] [UNSAT]
3	Determines if heaters need to be turned off.	Determines that heaters do not have to be turned off because actual level is above 32% [SAT] [UNSAT]

JPM No: A-2

JPM Title: Determine Pressurizer Level During Cooldown

Termination Criteria:	**Actual level has been determined both channels and a determination has been made on the need to turn off the heaters.**

JPM No:A-2 Rev 0

INITIATING CUE: **The RCS is being cooled down per OP-3A. RCS pressure is at 250 psia.**

A dummy level signal has been placed on pressurizer level channel LI-101X and it is selected as the controlling channel.

The pressurizer level indications are as follows:

LI-101X = 48%
LI-101Y = 50%
LI-106 = 34%

The CRS has asked you to determine that actual pressurizer level using both LI-101Y and LI-106 to determine if the pressurizer heaters need to be turned off?

NAME: _____

Actual Level based on LR-101-Y: _____%

Actual Level based on LI-106: _____%

Do Heaters Need to be turned off: YES NO

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-3 Rev 0

JPM Title: Determine equipment lost by tagout of an MCC.

Approximate Time: 10 minutes Actual Time: _____

Reference(s): K/A# 2.2.15 RO Importance 3.9
P&ID Figure 8.1-1 (File 12234)

JPM Prepared by: Jerry Koske Date: 02/02/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-3 Rev 0

JPM Title: Determine equipment lost by tagout of an MCC.

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: P&ID Books

Safety Considerations:

Comments:

JPM No: A-3 Rev 0

JPM Title: Determine equipment lost by tagout of an MCC.

INITIATING CUE: **Maintenance is requesting that MCC-3B2 be taken out of service for some repairs. The CRS has directed you to determine what equipment would be affected by tagout of MCC-3B2.**

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Refers to P&ID to determine affected equipment.	**Note:** **If candidate requests copy of the ELDL, "Electrical Load Distribution List", Inform him that the ELDL is not available.** Uses P&ID Figure 8.1-1 (File 12234) to determine affected equipment. [SAT] [UNSAT]

JPM No: A-3 Rev 0

JPM Title: Determine equipment lost by tagout of an MCC.

STEP	ELEMENT	STANDARD
2	Provides list of affected equipment.	List includes: • VD-7A • AC-9A • EHC-3A • EE2G-1A • VD-5A • CF-4 • CF-5 • CF-7A • VA-151C • VA-158A,C,E,G,H,K,M • LO-7 • LO-6 • LO-2 • VA-766 [SAT] [UNSAT]

Termination Criteria: List of affected equipment has been provided.

JPM No: A-3 Rev 0

INITIATING CUE: **Maintenance is requesting that MCC-3B2 be taken out of service for some repairs. The CRS has directed you to determine what equipment would be affected by tagout of MCC-3B2.**

Equipment affected:

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-4 Rev 0

JPM Title: RCA Entry and Exit with PCM Alarms

Approximate Time: 12 minutes Actual Time: _____

Reference(s): K/A# 2.3.7 RO Importance 3.5
GET-Radiation Worker Training.
Standing Order G-101, "RADIATION WORKER PRACTICES."

JPM Prepared by: Jerry Koske Date: 02/01/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-4 Rev 0

JPM Title: RCA Entry and Exit with PCM Alarms

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: EAD, TLD, PCM-1, G-M with pancake probe

Safety Considerations:

Comments: Can be conducted in GET trailer or during actual RCA Entry

JPM No: A-4 Rev 0

JPM Title: RCA Entry and Exit with PCM Alarms

INITIATING CUE: **A plant procedure that you are performing requires entry into the RCA.**

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Review the RWP.	Reads RWP. [SAT] [UNSAT]
2	Determine Radiological Conditions.	Checks survey maps or discusses radiological conditions with RP personnel. [SAT] [UNSAT]
3	Obtains Dosimetry.	Obtain TLD and EAD. [SAT] [UNSAT]
4	Sign on to appropriate RWP.	Insert EAD in reader. Scan PID and RWP number. [SAT] [UNSAT]
5	Enter RCA.	RCA Entered. [SAT] [UNSAT]
6		**CUE: Your task is complete, exit the RCA.**

JPM No: A-4 Rev 0

JPM Title: RCA Entry and Exit with PCM Alarms

STEP	ELEMENT	STANDARD
7	Exits RCA.	Returns to RCA access point. [SAT] [UNSAT]
8	Monitor for personnel contamination prior to exiting RCA.	Monitor for contamination using PCM-1. [SAT] [UNSAT] **CUE: After examinee has completed counting on a PCM-1, tell him to assume that the PCM-1 alarmed- zone 6.**
9	Monitor for contamination a second time.	Monitor for contamination again using a different PCM-1. [SAT] [UNSAT] **CUE: After examinee has completed counting on another PCM-1, tell him to assume that this PCM-1 also alarmed- zone 6.**
10	Contact RP.	RP Contacted. [SAT] [UNSAT] **CUE: RP directs that you to monitor for contamination using frisker.**

JPM No: A-4 Rev 0

JPM Title: RCA Entry and Exit with PCM Alarms

STEP	ELEMENT	STANDARD
11	Uses Frisker to monitor for contamination.	Slowly moves pancake probe over hands, shoes and body surface. **CUE: Frisker cpm as read.** [SAT] [UNSAT]

Termination Criteria: RCA has been exited.

JPM No: A-4 Rev 0

JPM Title: RCA Entry and Exit with PCM Alarms

NOTE to RP Tech

As a part of this candidate's NRC license exam, he must enter and exit the RCA.

During RCA exit, he has been given verbal Cues that he has received a zone 6 alarm on two separate PCM-1 monitors.

As a part of this JPM, we would like you to direct him to perform a whole body frisk on himself.

JPM No: A-4 Rev 0

INITIATING CUE: **A plant procedure that you are performing requires entry into the RCA.**

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-5 Rev 0

JPM Title: Review Shutdown Margin Calculation

Approximate Time: 25 minutes Actual Time: _____

Reference(s): K/A 2.1.37 SRO Importance 4.6
TDB-V.9, "SHUTDOWN MARGIN WORKSHEET"
TDB-II, "REACTIVITY CURVES"

JPM Prepared by: Jerry Koske Date: 01/31/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-5 Rev 0

JPM Title: Review Shutdown Margin Calculation

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: TDB, ruler, calculator

Safety Considerations:

Comments:

JPM No: A-5 Rev 0

JPM Title: Review Shutdown Margin Calculation

INITIATING CUE: **The plant is operating at 60% power with group 4 CEAs at 110 inches withdrawn. Group A CEA #36 and Group 2 CEA #24 have been declared inoperable (untrippable).**

The RCS boron concentration is 400 ppm. The burnup is 12000 MWD/MTU.

The STA has performed a shutdown margin calculation and determined that Shutdown Margin is adequate. The Shift Manager has requested that you review the shutdown margin calculation and , if there are any mistakes, correct them.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Note to Examiner: **Provide Shutdown Margin Calculation to candidate with initiating cue.**
1	Reviews shutdown margin calculation.	Determines that there was an error in step 7.a due to reading the value from the wrong row. 5.238 (Shutdown Group A+B worth was entered instead of shutdown group B worth). [SAT] [UNSAT]
2		Determines that in step 8, the 100% power defect was used instead of the 60% power defect. [SAT] [UNSAT]

JPM No: A-5 Rev 0

JPM Title: Review Shutdown Margin Calculation

STEP	ELEMENT	STANDARD
3	Performs calculation of the difference between actual and required shutdown margin using corrected values.	Difference calculated on line 11 of TDB-V.9, section 1 is +0.7 [between +0.5, +0.9]. [SAT] [UNSAT]
4	Determines if SDM is adequate.	Determines Shutdown Margin is inadequate. [SAT] [UNSAT]

Termination Criteria: SRO has determined that shutdown margin is not adequate and has corrected the SDM calculation.

JPM No: A-5 Rev 0

INITIATING CUE: **The plant is operating at 60% power with group 4 CEAs at 110 inches withdrawn. Group A CEA #36 and Group 2 CEA #24 have been declared inoperable (untrippable).**

The RCS boron concentration is 400 ppm. The burnup is 12000 MWD/MTU.

The STA has performed a shutdown margin calculation and determined that Shutdown Margin is adequate. The Shift Manager has requested that you review the shutdown margin calculation and , if there are any mistakes, correct them.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-6 Rev 0

JPM Title: Determine Shift Staffing

Approximate Time: 12 minutes Actual Time: _____

Reference(s): K/A# 2.1.5 SRO Importance 3.9
Technical Specifications Table 5.2-1
SO-O-1, "CONDUCT OF OPERATIONS"
SO-G-52, "PLANT STAFF WORKING HOURS"

JPM Prepared by: Jerry Koske Date: 02/02/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-6 Rev 0

JPM Title: Determine Shift Staffing

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment:

Safety Considerations:

Comments:

JPM No: A-6 Rev 0

JPM Title: Determine Shift Staffing

INITIATING CUE: **The plant is operating at full power. You are the Shift Manager. Your crew consists of yourself, your CRS, your STA (who is also CRS qualified), two RO's, a EONA, a EONT, a AON (who is also Communicator qualified) and a Control Room Communicator.**

Half way through your shift, your CRS and your Control Room Communicator become sick and need to go home.

Your STA suggests that he can serve as both CRS and STA for the remainder of the shift since he is qualified for both positions.

Your AON suggests that he can serve as both AON and Control Room Communicator for the remainder of the shift since he is qualified for both positions.

Determine if each of these suggestions is acceptable. If not, specify what actions must be taken and when they must be taken.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Determine if the STA may fill both the CRS and the STA position for the remainder of the shift.	Refers to Technical Specifications Table 5.2-1 and Standing Order SO-O-1. Determines that 2 SROs and an STA are required and this suggestion is not acceptable. [SAT] [UNSAT]

JPM No: A-6 Rev 0

JPM Title: Determine Shift Staffing

STEP	ELEMENT	STANDARD
2	Determine if the AON may fill both the AON and the Control Room Communicator position for the remainder of the shift.	Refers to Technical Specifications Table 5.2-1 and Standing Order SO-O-1. Determines that 2 NLOs are required and this suggestion is acceptable. [SAT] [UNSAT]
3	Determine what actions must be taken and when these actions must be taken.	Determines that the CRS must turnover to the CRS qualified STA and that immediate action must be taken to call in another qualified STA or another qualified CRS and the called in STA or CRS must be in position within 2 hours. [SAT] [UNSAT]

Termination Criteria: **Candidate has determined shift staffing requirements, actions that must be taken and required time frame for these actions.**

JPM No: A-6 rev 0

INITIATING CUE: **The plant is operating at full power. You are the Shift Manager. Your crew consists of yourself, your CRS, your STA (who is also CRS qualified), your RO's, a EONA, a EONT, a AON (who is also Communicator qualified) and a Control Room Communicator.**

Half way through your shift, your CRS and your Control Room Communicator become sick and need to go home.

Your STA suggests that he can serve as both CRS and STA for the remainder of the shift since he is qualified for both positions.

Your AON suggests that he can serve as both AON and Control Room Communicator for the remainder of the shift since he is qualified for both positions.

Determine if each of these suggestions is acceptable. If not specify what actions must be taken and when they must be taken.

Can the STA serve as both CRS and STA? YES NO

Can the AON serve as both AON and Control Room Communicator YES NO

What action, if any, must be taken? When must it be taken?

Fort Calhoun Station – Operations Training

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-7 Rev 0

JPM Title: Determine RW System Operability

Approximate Time: 12 minutes Actual Time: _____

Reference(s): K/A# 2.2.22 SRO Importance 4.7
TDB VIII, "EQUIPMENT OPERABILITY GUIDANCE"
Technical Specification 2.4
Technical Specification 2.0.1

JPM Prepared by: Jerry Koske Date: 02/02/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-7 Rev 0

JPM Title: Determine RW System Operability

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment:

Safety Considerations:

Comments:

JPM No: A-7 Rev 0

JPM Title: Determine RW System Operability

INITIATING CUE: **The plant is operating at full power.**

It has been determined that RW/CCW Backup Header Isolation Valves, HCV-2893 and HCV-2894, are both inoperable. They are both closed and cannot be opened.

Determine the applicable Technical Specification and required actions, if any, to be taken.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Refers to TDB-VIII.	Enters TDB-VIII. [SAT] [UNSAT]
2	Refers to Table 2-1 to determine applicable LCO.	Determines that T.S. 2.0.1 applies with these conditions. [SAT] [UNSAT]
3	Determines Tech Spec. 2.0.1 required Action Statement.	Plant must be in Hot Shutdown within 6 hours. [SAT] [UNSAT]

Termination Criteria: **Technical Specification 2.0.1 has been entered.**

JPM No: A-7 Rev 0

INITIATING CUE: **The plant is operating at full power.**

It has been determined that RW/CCW Backup Header Isolation Valves, HCV-2893 and HCV-2894, are both inoperable. They are both closed and cannot be opened.

Determine the applicable Technical Specification and required actions, if any, to be taken.

START

Technical Specification Entered, if any:

Required Action, if any:

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-8 Rev 0

JPM Title: Authorize Release of Monitor Tank WD-22B

Approximate Time: 10 minutes Actual Time: _____

Reference(s): K/A# 2.3.6 SRO Importance 3.8
OI-WDL-3, "LIQUID WASTE DSPOSAL RELEASE
FC-211, "WASTE LIQUID TANK RELEASE PERMIT"

JPM Prepared by: Jerry Koske Date: 02/02/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-8 Rev 0

JPM Title: Authorize Release of Monitor Tank WD-22B

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment:

Safety Considerations:

Comments:

JPM No: A-8 Rev 0

JPM Title: Authorize Release of Monitor Tank WD-22B

INITIATING CUE: **You are the Shift Manager. A release of Monitor Tank, WD-22B, is planned. The EONA has brought OI-WDL-3 and a Release Permit to you and asked that you authorize the release. Make any corrections, if required.**

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Reviews partially filled out OI-WDL-3 and associated FC-211 Release Permit.	Examines procedure and Release Permit. [SAT] [UNSAT]
2	Determines that the maximum release rate and administrative release rate recorded on the procedure do not agree with the Release Permit.	Maximum release rate should be 84.6 gpm. Administrative release rate should be 76.1 gpm. [SAT] [UNSAT]
3	Release Authorization.	Does not authorize release as written. Corrects maximum (84.6 gpm) and administrative (76.1 gpm) release rates prior to authorizing release. [SAT] [UNSAT]

Termination Criteria: **Candidate has made correction and authorized release.**

JPM No: A-8 Rev 0

INITIATING CUE: **You are the Shift Manager. A release of Monitor Tank, WD-22B, is planned. The EONA has brought OI-WDL-3 and a Release Permit to you and asked that you authorize the release. Make any corrections, if required.**

START

Fort Calhoun Station – Operations Training

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-9 Rev 0

JPM Title: Emergency Classification and PARs

Approximate Time: 10 minutes Actual Time: _____

Reference(s): K/A# 2.4.41 SRO Importance 4.6
K/A# 2.4.44 SRO Importance 4.4
EPIP-OSC-1, "EMERGENCY CLASSIFICATION"
EPIP-EOF-7, "PROTECTIVE ACTION GUIDELINES
TDB-IV.8, "AREA MONITORING SETPOINTS"

JPM Prepared by: Jerry Koske Date: 1/29/09

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: A-9 Rev 0

JPM Title: Emergency Classification and PARs

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: Blank FC-1188

Safety Considerations: None

Comments: SRO , Time Critical - 15 minutes

JPM No: A-9 Rev 0

JPM Title: Emergency Classification and PARs

INITIATING CUE: **<u>This is a Time Critical JPM - 15 minutes</u>**

A refueling outage is in progress. Spent fuel assemblies were being moved using FH-12 when a fuel assembly fell from FH-12 and landed on a spent fuel rack. High radiation alarms were received on RM-085 and RM-087. RM-085 is reading 1200 mrem/hr and RM-087 is reading 1100 mrem/hr. Radiation levels on RM-052 and RM-062 are also rising.

There is no precipitation.

Your Shift HP has run EAGLE and has provided you with the output.

You are directed to enter the Emergency Plan, classify the event and determine offsite Protective Action Recommendations.

Complete page 1 of form FC-1188.

Critical Steps shown in gray

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Refer to Emergency Plan.	Refer to EPIP-OSC-1 and EPIP-EOF-7. [SAT] [UNSAT]

JPM No: A-9 Rev 0

JPM Title: Emergency Classification and PARs

STEP	ELEMENT	STANDARD
2	Classify the event	This Event should be classified as a SITE AREA EMERGENCY, EAL 7.3, "MAJOR IRRADIATED FUEL ACCIDENT" RM-087 is reading more than 1000 times its normal refueling shutdown value per TDB-IV.8 **MUST be Classified within 15 minutes.** [SAT] [UNSAT]
3	Determine Protective Action Recommendations	The Protective Action Recommendation should be: NONE. [SAT] [UNSAT]

Termination Criteria: **The event has been classified within 15 minutes. PARS have been determined and FC-1188 has been filled out.**

JPM No:A-9 Rev 0

INITIATING CUE: **<u>This is a Time Critical JPM - 15 minutes</u>**

A refueling outage is in progress. Spent fuel assemblies were being moved using FH-12 when a fuel assembly fell from FH-12 and landed on a spent fuel rack. High radiation alarms were received on RM-085 and RM-087. RM-085 is reading 1200 mrem/hr and RM-087 is reading 1100 mrem/hr. Radiation levels on RM-052 and RM-062 are also rising.

There is no precipitation.

Your Shift HP has run EAGLE and has provided you with the output.

You are directed to enter the Emergency Plan, classify the event and determine offsite Protective Action Recommendations.

Complete page 1 of form FC-1188.

JOB PERFORMANCE MEASURE

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

Location: Simulator

Approximate Time: 18 minutes Actual Time: _____

Reference(s): K/A: 001000 A4.03
OP-ST-CEA-0003, "CONTROL ELEMENT ASSEMBLY (CEA) PARTIAL MOVEMENT TEST"

JPM Prepared by: Jerry Koske Date: 1/28/09

JOB PERFORMANCE MEASURE

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations:

Comments: Alternate Path

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

INITIATING CUE: **The plant is operating at full power with all CEAs fully withdrawn.**

You have been directed to perform the CEA Partial Movement Check for group 3 CEAs (2, 3, 4 and 5) using OP-ST-CEA-0003.

All prerequisites have been met.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Record the initial position of each group 3 CEA.	Records position of CEAs 2,3,4 and 5 as 128 inches on OP-ST-CEA-003, attachment 1. [SAT] [UNSAT]
2	Rotate the Mode selector switch to Manual Individual position.	CB-4 Places Mode Selector Switch (M/M) to the Manual Individual Position (M/I). [SAT] [UNSAT]
3	Rotate the Group Selector Switch (M/G) to the group containing the CEA to be moved.	CB-4 Rotate Group Selector Switch (M/G) to the "Group 3" position. [SAT] [UNSAT]

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

STEP	ELEMENT	STANDARD
4	Verify on the DCS display CEA_ALL that the group button is DARK GREY.	CB-4 Ensure CEA-ALL is displayed and that Group 3 is DARK GREY. [SAT] [UNSAT]
5	Rotate the Rod Selector Switch to the CEA to be moved.	CB-4 Rotate Rod Selector Switch to CEA #2 position. [SAT] [UNSAT]
6	Insert CEA a minimum of 6 inches then return to normal position.	CB-4 Push IN-OUT-HOLD switch in until CEA#2 position is 122 inches or less. Then Pull IN-OUT-HOLD switch until CEA #2 is fully withdrawn. [SAT] [UNSAT]
7	Record Information on Attachment 1.	Record inserted and returned to position for CEA#2 on Attachment 1. [SAT] [UNSAT]
8	Rotate the Rod Selector Switch to the CEA to be moved.	CB-4 Rotate Rod Selector Switch to CEA #3 position. [SAT] [UNSAT]

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

STEP	ELEMENT	STANDARD
9	Insert CEA a minimum of 6 inches then return to normal position.	CB-4 Push IN-OUT-HOLD switch in until CEA#3 position is 122 inches or less. Then Pull IN-OUT-HOLD switch until CEA #3 is fully withdrawn. [SAT] [UNSAT]
10	Record Information on Attachment 1.	Record inserted and returned to position for CEA#3 on Attachment 1. [SAT] [UNSAT]
11	Rotate the Rod Selector Switch to the CEA to be moved.	CB-4 Rotate Rod Selector Switch to CEA #4 position. [SAT] [UNSAT]
12	Insert CEA a minimum of 6 inches then return to normal position.	CB-4 Push IN-OUT-HOLD switch in until CEA#4 position is 122 inches or less. Then Pull IN-OUT-HOLD switch until CEA #4 is fully withdrawn. [SAT] [UNSAT] **CEA will continue to insert**
13	Place Mode Selector Switch in OFF.	CB-4 Return Mode Selector Switch to OFF position. Verify CEA motion has stopped. [SAT] [UNSAT]

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

STEP	ELEMENT	STANDARD
		CUE: Electrical Maintenance has repaired the problem with the CRDM circuitry. Continue the test.
14	Rotate the Mode selector switch to Manual Individual position.	CB-4 Places Mode Selector Switch (M/M) to the Manual Individual Position (M/I). [SAT] [UNSAT]
15	Return CEA to normal position.	Then Pull IN-OUT-HOLD switch until CEA #4 is fully withdrawn. [SAT] [UNSAT]
16	Record Information on Attachment 1.	Record inserted and returned to position for CEA#4 on Attachment 1. [SAT] [UNSAT]
17	Rotate the Rod Selector Switch to the CEA to be moved.	CB-4 Rotate Rod Selector Switch to CEA #5 position. [SAT] [UNSAT]
18	Insert CEA a minimum of 6 inches then return to normal position.	CB-4 Push IN-OUT-HOLD switch in until CEA#5 position is 122 inches or less. Then Pull IN-OUT-HOLD switch until CEA #5 is fully withdrawn. [SAT] [UNSAT]

JPM No: J-1 Rev 0

JPM Title: Control Element Assembly Movement Test

STEP	ELEMENT	STANDARD
19	Record Information on Attachment 1.	Record inserted and returned to position for CEA#4 on Attachment 1. [SAT] [UNSAT]
20	Place Mode Selector Switch in OFF.	CB-4 Return Mode Selector Switch to OFF position. [SAT] [UNSAT]
21	Request independent verification of each CEA returned to initial position.	**CUE:** **Independent verification has been performed.**

Termination Criteria: **Partial CEA movement test has been completed for Group 3 CEAs.**

JPM No: J-1 Rev 0

INITIATING CUE: **The plant is operating at full power with all CEAs fully withdrawn.**

You have been directed to perform the CEA Partial Movement Check for group 3 CEAs (2, 3, 4 and 5) using OP-ST-CEA-0003.

All prerequisites have been met.

JOB PERFORMANCE MEASURE

JPM No: J-2 Rev 0

JPM Title: Establish Charging Flow via the HPSI Header

Location: Simulator

Approximate Time: 12 minutes Actual Time: _____

Reference(s): K/A# 004000 A4.08
AOP-33, Attachment B, "CHARGING FROM THE HPSI HEADER."

JPM Prepared by: Jerry Koske Date: 1/28/09

JPM No: J-2 Rev 0

JPM Title: Establish Charging Flow via the HPSI Header

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations:

Comments:

JPM No: J-2 Rev 0

JPM Title: Establish Charging Flow via the HPSI Header

INITIATING CUE: **AOP-33 has been entered due to a leak in the charging header. Charging and letdown have been isolated.**

The CRS has directed you to reestablish charging pump flow via the HPSI header using HPSI loop injection valve, HCV-318 per AOP-33, Attachment B.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Close CH-194, "CHARGING PUMPS CH-1A/B/C DISCHARGE HEADER CONTAINMENT OUTBOARD ISOLATION VALVE" (Room 13).	Direct EONA to close CH-194. [SAT] [UNSAT] **CUE: EONA reports that CH-194 is closed.**
2	Open HCV-308, Charging Pump HPSI Header Isolation Valve.	CB-1,2,3 Hold HCV-308 Control Switch in OPEN until GREEN light goes OFF. Then Release and allow it to return to NORM. Verify RED light ON and GREEN light OFF. [SAT] [UNSAT]
3	Ensure HCV-2987, HPSI Header Isolation Valve, is open.	CB-1,2,3 Hold HCV-2987 Control Switch in OPEN until RED light is ON and GREEN light is OFF. [SAT] [UNSAT]

JPM No: J-2 Rev 0

JPM Title: Establish Charging Flow via the HPSI Header

STEP	ELEMENT	STANDARD
4	Ensure HCV-307, HPSI Header Isolation Valve, is open.	AI-30B Key Switch to OPEN. RED light ON. GREEN light OFF. [SAT] [UNSAT]
5	Ensure HCV-305, SI-2A and SI-2C Discharge Cross-Connect Valve, is open.	AI-30B Key Switch to OPEN. RED light ON. GREEN light OFF. [SAT] [UNSAT]
6	Ensure HCV-304, SI-2B and SI-2C Discharge Cross-Connect Valve, is open.	AI-30A Key Switch to OPEN. RED light ON. GREEN light OFF. [SAT] [UNSAT]
7	Ensure HCV-306, HPSI Header Isolation Valve, is open.	AI-30A Key Switch to OPEN. RED light ON. GREEN light OFF. [SAT] [UNSAT]
8	Close the SI Tank Leakage Cooler Pressure Control Valves on the loop in which the HPSI valve(s) will be opened, PCV-2949.	AI-30A Adjust PCV-2949 Controller such that needle indicates 100% (full right). GREEN light ON. RED light OFF. [SAT] [UNSAT]

JPM No: J-2 Rev 0

JPM Title: Establish Charging Flow via the HPSI Header

STEP	ELEMENT	STANDARD
9	Open HCV-318 (Loop 2A).	AI-30B HCV-318 Control Switch to OPEN. RED light ON, GREEN light OFF. (Note: may also PULLOUT switch, but not required) [SAT] [UNSAT]
10	Ensure a charging pump suction source is available.	CB-1,2,3 Ensure LCV-218-2 open RED light ON and VCT level indicated on chart or indicator. OR Ensure LCV-218-3 open RED light ON. [SAT] [UNSAT]
11	Operate any available Charging Pumps as necessary to maintain PZR level within 4% of programmed level.	CB-1,2,3 Start at least one charging pump, CH-1A/B/C by taking Control switch out of Pull-To-Lock, taking to AFTER-START and verifying RED light ON. [SAT] [UNSAT]

Termination Criteria: A charging pump is supplying water to the RCS via the HPSI header.

JPM No: J-2 Rev 0

INITIATING CUE: **AOP-33 has been entered due to a leak in the charging header. Charging and letdown have been isolated.**

The CRS has directed you to reestablish charging pump flow via the HPSI header using HPSI loop injection valve HCV-318 per AOP-33, Attachment B.

JOB PERFORMANCE MEASURE

JPM No: J-3 Rev 0

JPM Title: Simultaneous Hot and Cold Leg Injection

Location: Simulator

Approximate Time: 15 minutes Actual Time: _____

Reference(s): K/A# 006000 A1.11
EOP/AOP Attachment 9, "SIMULTANEUOS HOT AND COLD LEG INJECTION"
EOP/AOP Attachment 10, SIMULTANEUOS HOT AND COLD LEG INJECTION WITHOUT INSTRUMENT AIR"

JPM Prepared by: Jerry Koske Date: 1/28/09

JPM No: J-3 Rev 0

JPM Title: Simultaneous Hot and Cold Leg Injection

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments: Alternate Path

JPM No: J-3 Rev 0

JPM Title: Simultaneous Hot and Cold Leg Injection

INITIATING CUE: **A LOCA occurred 5.5 hours ago. HPSI pumps, SI-2A and SI-2B, are operating. There are no signs of containment sump blockage.**

The Control Room Supervisor has directed you to initiate Simultaneous Hot and Cold Leg Injection.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Note to Examiner: **Do Not provide Attachment 10 to candidate until he makes the transition prior to step 4.**
1	Open at least one of the Charging Pumps HPSI Header Isolation Valves: • HCV-308. • HCV-2988.	CB-1,2,3 At least one valve's control switch to OPEN with RED light ON. [SAT] [UNSAT]
2	Open at least one of the following PZR Auxiliary Spray Isolation Valves: • HCV-240. • HCV-249.	CB-1,2,3 At least one valve's control switch to OPEN with RED light ON. [SAT] [UNSAT]

JPM No: J-3 Rev 0

JPM Title: Simultaneous Hot and Cold Leg Injection

STEP	ELEMENT	STANDARD
3	Ensure **ALL** of the following Charging Isolation Valves are closed: • HCV-238. • HCV-239. • HCV-247. • HCV-248.	CB-1,2,3 For each valve: GREEN light ON. RED light OFF. [SAT] [UNSAT]
4	**IF** HPSI Pump, SI-2A, is operating,**THEN** close HCV-305, SI-2A and SI-2C Discharge Cross-Connect Valve.	AI-30B Key Switch to CLOSE. GREEN light ON. RED light OFF. **Determines that HCV-305 will not close. Goes to EOP/AOP Attachment 10.** [SAT] [UNSAT]
5	Close **ALL** of the following HPSI Loop Injection Valves: • HCV-315. • HCV-318. • HCV-312. • HCV-321.	AI-30A/B Control Switches to CLOSE (pull out, counter-clockwise) until GREEN lights ON. [SAT] [UNSAT]
6	Close HCV-2987, HPSI Header Isolation Valve.	AI-30A/B Control Switch to CLOSE. GREEN light ON. RED light OFF. [SAT] [UNSAT]

JPM No: J-3 Rev 0

JPM Title: Simultaneous Hot and Cold Leg Injection

STEP	ELEMENT	STANDARD
7	**IF** evidence of containment sump blockage does **NOT** exist, **THEN** throttle the HPSI Loop Injection Valves until **ALL** of the following criteria are satisfied: • Charging flow is greater than180 gpm (FIA-236). • Total HPSI flow is greater than 200 gpm.	AI-30A/B Throttle one or more of the following valves: • HCV-314. • HCV-317. • HCV-311. • HCV-311. Verify greater than 200 gpm total flow on FI-313, FI-316, FI-319 and FI-322. CB-1,2,3 Verify greater than 180 gpm flow on FIA-236. Note: Plant computer may also be used to verify flows. [SAT] [UNSAT]

Termination Criteria: **Simultaneous Hot and Cold Leg Injection has been established with greater than 180 gpm flow through charging (Hot Leg) and greater than 200 gpm flow through the HPSI Header (Cold Legs).**

JPM No: J-3 Rev 0

INITIATING CUE: **A LOCA occurred 5.5 hours ago. HPSI pumps, SI-2A and SI-2B, are operating. There are no signs of containment sump blockage.**

The Control Room Supervisor has directed you to initiate Simultaneous Hot and Cold Leg Injection.

JOB PERFORMANCE MEASURE

JPM No: J-4 Rev 0

JPM Title: Start a Reactor Coolant Pump

Location: Simulator

Approximate Time: 7 minutes Actual Time: _____

Reference(s): K/A# 003000 A4.06
OI-RC-9, "REACTOR COOLANT PUMP OPERATION"

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: J-4 Rev 0

JPM Title: Start a Reactor Coolant Pump

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments: Alternate Path

JPM No: J-4 Rev 0

JPM Title: Start a Reactor Coolant Pump

INITIATING CUE: **A plant startup is in progress. RC-3C is running. You are directed to place RC-3A in service. All prerequisites are met.**

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Simulator Operator fail 90% speed switch for RC-3A
1	Setup ERF Display for RC-3A.	ERF Type [440] [DSP] RC-3A Page displays. [SAT] [UNSAT]
2	Station operator to respond to vibration alarms.	**CUE: Operator is at AI-270.** [SAT] [UNSAT]
3	Verify controlled Bleed-off flow.	ERF page 342 Verify positive bleed-off flow. [SAT] [UNSAT]
4	Ensure RCP NPSH.	Use Figure TDB III.25. [SAT] [UNSAT]
5	Ensure 86/RC-3A reset.	CB-1/2/3 86/RC-3A AMBER light ON. [SAT] [UNSAT]

JPM No: J-4 Rev 0

JPM Title: Start a Reactor Coolant Pump

STEP	ELEMENT	STANDARD
6	Verify RCP Reverse rotation is cleared.	CB-1/2/3 ANN A-6, D-5 clear. [SAT] [UNSAT]
7	Start RC-3A oil lift pump.	CB-1/2/3 RC-3A-1 in START and RED light ON. [SAT] [UNSAT]
8	Verify AARD oil flow for RC-3A.	ERF Page 342. [SAT] [UNSAT]
		CUE: The oil lift pump has been running for two minutes
9	Start RC-3A.	CB-1/2/3 RC-3A CS in AFTER START and RED light ON. [SAT] [UNSAT]
10	Verify oil pump stops.	CB-1/2/3 RC-3A-1 GREEN light lit **NOTE: Pump will not stop automatically and GREEN light will not come on due to 90% speed switch failure** [SAT] [UNSAT]

JPM No: J-4 Rev 0

JPM Title: Start a Reactor Coolant Pump

STEP	ELEMENT	STANDARD
11	Trip RC-3A oil lift pump.	CB-1/2/3 RC-3A-1 in STOP and GREEN light lit. [SAT] [UNSAT]
12	Monitor Amps.	Ammeter on CB-1/2/3 drops below 425 amps within 17 seconds. [SAT] [UNSAT]
13	Verify Controlled Bleedoff flow.	ERF Page 342 [SAT] [UNSAT]
14	Monitor RCP parameters.	ERF Computer Display [SAT] [UNSAT]

Termination Criteria: RC-3A is running normally

JPM No: J-4 Rev 0

INITIATING CUE: **A plant startup is in progress. RC-3C is running. You are directed to place RC-3A in service. All prerequisites are met.**

JOB PERFORMANCE MEASURE

JPM No: J-5 Rev 0

JPM Title: Initiate AFW to SGs via the AFW nozzles using FW-10

Location: Simulator

Approximate Time: 10 minutes Actual Time: _____

Reference(s): K/A# 061000 A2.04
EOP-06, "LOSS OF ALL FEEDWATER"

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: J-5 Rev 0

JPM Title: Initiate AFW to SGs via the AFW nozzles using FW-10

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments: Alternate Path

JPM No: J-5 Rev 0

JPM Title: Initiate AFW to SGs via the AFW nozzles using FW-10

INITIATING CUE: **A reactor trip has occurred following a rupture of the Condensate Pumps' common discharge header. FW-54 is out of service. The CRS has entered EOP-6.**

You have been directed to feed both steam generators from FW-10, via the AFW Nozzles.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		NOTE to Examiner: If the candidate requests an EONT or other In-plant Operator to take any actions during the performance of this JPM, inform him that the EONT is not available.
1	Start FW-10.	AI-66B Place YCV-1045 switch in OPEN, verify RED light ON Verify YCV-1045A and /or YCV-1045B OPEN -RED light ON. [SAT] [UNSAT]
2	Verify FW-10 Recirculation Flow.	AI-66B Verify FCV-1369 is OPEN. RED light ON. Verify FIC-1369 indicates flow. [SAT] [UNSAT]

JPM No: J-5 Rev 0

JPM Title: Initiate AFW to SGs via the AFW nozzles using FW-10

STEP	ELEMENT	STANDARD
3	Ensure HCV-1384 is closed.	CB-10,11 Control Switch in AFTER CLOSE, GREEN light ON. [SAT] [UNSAT]
4	Place Control Switches for **BOTH** of the following AFW Isolation Valves in "CLOSE": • HCV-1107B. • HCV-1108B.	AI-66A/B Place switches in CLOSE. GREEN LIGHT ON. RED light OFF. [SAT] [UNSAT]
5	Open **BOTH** of the following AFW Isolation Valves: • HCV-1107A. • HCV-1108A.	AI-66A/B Place switches in OPEN. RED LIGHT ON. GREEN light OFF. [SAT] [UNSAT]
6	Manually control **BOTH** of the following AFW Isolation Valves: • HIC-1107B. • HIC-1108B.	CB-10,11 Adjust controllers to open valves. Determines that valves will not open and that he must establish AFW flow via the feed ring. [SAT] [UNSAT]
7	Ensure **BOTH** of the Feed Reg Block Valves are closed: • HCV-1103. • HCV-1104.	CB-10,11 GREEN lights ON. [SAT] [UNSAT]

JPM No: J-5 Rev 0

JPM Title: Initiate AFW to SGs via the AFW nozzles using FW-10

STEP	ELEMENT	STANDARD
8	Open HCV-1384, AFW/FW Header Cross-Connect Valve.	CB-10,11 Control Switch to OPEN. RED light ON. GREEN light OFF. [SAT] [UNSAT]
9	Ensure **BOTH** of the Feed Header Isolation Valves are open: • HCV-1386. • HCV-1385.	CB-10,11 RED lights ON [SAT] [UNSAT]
10	Manually control feed flow via **BOTH** of the Feed Reg Bypass Valves: • HCV-1105. • HCV-1106.	CB-10,11 DCS Panel Manually open HCV-1105 and HCV-1106 to establish flow. [SAT] [UNSAT]
11	Verify AFW Flow established to both S/Gs.	CB-10,11 or ERF Flow indicated on meters or ERF computer. [SAT] [UNSAT]

Termination Criteria: Flow established from FW-10 to both Steam Generators

JPM No: J-5 Rev 0

INITIATING CUE: **A reactor trip has occurred following a rupture of the Condensate Pumps' common discharge header. FW-54 is out of service. The CRS has entered EOP-6.**

You have been directed to feed both steam generators from FW-10, via the AFW Nozzles.

JOB PERFORMANCE MEASURE

JPM No: J-6 Rev 0

JPM Title: Operate the Containment Hydrogen Analyzer

Location: Simulator

Approximate Time: 15 minutes Actual Time: _____

Reference(s): K/A 028000 A1.01
EOP/AOP Attachment 16, "CONTAINMENT HYDROGEN ANALYZER STARTUP"

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: J-6 Rev 0

JPM Title: Operate the Containment Hydrogen Analyzer

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: J-6 Rev 0

JPM Title: Operate the Containment Hydrogen Analyzer

INITIATING CUE: **A LOCA has occurred and an analysis for hydrogen concentration is required. You are directed to place the Hydrogen analyzers in service per the EOP/AOP Attachments and sample the upper level of containment via HCV-820C and HCV-883C.**

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Open HCV-820C.	AI-65A/B Control switch to OPEN. RED light ON. [SAT] [UNSAT]
2	Open HCV-883C.	AI-65A/B Control switch to OPEN. RED light ON. [SAT] [UNSAT]
3	Place all of the following switches in Override: • HCV-820A/821A. • HCV-883A/884A. • HCV-820B/821B. • HCV-883B/884B.	AI-43A/B Control switches to O'RIDE. RED lights ON. [SAT] [UNSAT]
4	Place recorders, HR-81A/B in service.	AI-65A/B Turn recorders on. [SAT] [UNSAT]

JPM No: J-6 Rev 0

JPM Title: Operate the Containment Hydrogen Analyzer

STEP	ELEMENT	STANDARD
5	Ensure Range Selector switches are in "0-10%."	AI-65A/B Selector switch in "0-10%" position. [SAT] [UNSAT]
6	Place the Hydrogen Analyzer Power On Selector Switches to "ANALYZE."	AI-65A/B Switches to "ANALYZE" position. [SAT] [UNSAT]
7	Ensure the Function Selector Switches are in "SAMPLE."	AI-65A/B Switches in "SAMPLE" position. [SAT] [UNSAT]
8	Press "REMOTE" selector pushbuttons.	AI-65A/B Depress pushbuttons. [SAT] [UNSAT]
9	Verify the following: • Containment H_2 Sampling System Remote/Local Off Normal Annunciator in Alarm. • 0-10% Range Amber indicating light is ON. • The Sample Indicating light is ON.	AI-65A/B Alarm Window ON. AMBER light ON. Light is ON. [SAT] [UNSAT]

JPM No: J-6 Rev 0

JPM Title: Operate the Containment Hydrogen Analyzer

STEP	ELEMENT	STANDARD
10	Press Alarm Reset Push buttons.	AI-65A/B Depress push buttons. [SAT] [UNSAT]
		CUE: 5 minutes have elapsed
11	Obtain hydrogen concentration reading.	AI-65A/B Report reading from meters. [SAT] [UNSAT]

Termination Criteria: Containment hydrogen concentration has been determined

JPM No: J-6 Rev 0

INITIATING CUE: **A LOCA has occurred and an analysis for hydrogen concentration is required. You are directed to place the Hydrogen analyzers in service per the EOP/AOP Attachments and sample the upper level of containment via HCV-820C and HCV-883C.**

JOB PERFORMANCE MEASURE

JPM No: J-7 Rev 0

JPM Title: 4160V Buses 1A3 and 1A4 from 345KV to 161 KV

Location: Simulator

Approximate Time: 8 minutes Actual Time: _____

Reference(s): K/A 000062 A4.01
AOP-31,Section II, "ALL 4160 V BUSES FED FROM 22 KV."
OI-EE-1, Attachment 1, "FEED VITAL/NON-VITAL BUSES FROM 161 KV."

JPM Prepared by: Jerry Koske Date: 02/03/09

JOB PERFORMANCE MEASURE

JPM No: J-7 Rev 0

JPM Title: 4160V Buses 1A3 and 1A4 from 345KV to 161 KV

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: J-7 Rev 0

JPM Title: 4160V Buses 1A3 and 1A4 from 345KV to 161 KV

INITIATING CUE: **A loss of 161 KV has occurred due to a grid problem. Busses 1A3 and 1A4 transferred to 345 KV. AOP-31, section II has been entered and appropriate actions taken The 161 KV grid problem has been fixed and 161 KV is available.**

You are directed to restore normal power to busses 1A3 and 1A4 beginning with AOP-31, section II, step 10.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Ensure Lockout Relay 86/161 is reset.	AI-22 86 Relay RESET. [SAT] [UNSAT]
2	Ensure all of the following Lockout Relays are reset: • 86-1/T1A-4. • 86-2/T1A-4. • 86-1/T1A-3. • 86-2/T1A-3. • 86X/FT161.	AI-24, AI-25, AI-46 Relays RESET. [SAT] [UNSAT]
3	Synchronize and Close at least one of the following breakers: • Breaker 110. • Breaker 111.	CB-20 Insert Sync switch handle and turn to ON. Breaker switch to AFTER CLOSE. RED light ON. [SAT] [UNSAT]
4	Enter OI-EE-1, Attachment 1.	**CUE: Provide copy of OI-EE-1, Attachment 1**

JPM No: J-7 Rev 0

JPM Title: 4160V Buses 1A3 and 1A4 from 345KV to 161 KV

STEP	ELEMENT	STANDARD
5	Ensure both fast Transfer switches in manual: • 43/1A1-1A3. • 43/1A2-1A4.	CB-20 Both switches in MANUAL. [SAT] [UNSAT]
6	Turn 1A33 Synchroscope ON.	CB-20 Insert Sync switch handle and turn to ON. [SAT] [UNSAT]
7	Verify incoming and running voltages are matched.	CB-20 Verify voltages within 25 volts. [SAT] [UNSAT]
8	Verify Synchroscope at 12 o,clock.	CB-20 Indicator at 12 o,clock. [SAT] [UNSAT]
9	Close Breaker 1A33.	CB-20 Breaker 1A33 in AFTER CLOSE, RED light ON. [SAT] [UNSAT]
10	Open Breaker 1A13	CB-20 Breaker 1A13 in AFTER TRIP. GREEN light ON [SAT] [UNSAT]
11	Turn Off Synchroscope.	CB-20 Sync switch handle to OFF Verify loads still energized [SAT] [UNSAT]

JPM No: J-7 Rev 0

JPM Title: 4160V Buses 1A3 and 1A4 from 345KV to 161 KV

STEP	ELEMENT	STANDARD
12	Turn 1A44 Synchroscope ON.	CB-20 Insert Sync switch handle and turn to ON. [SAT] [UNSAT]
13	Verify incoming and running voltages are matched.	CB-20 Verify voltages within 25 volts. [SAT] [UNSAT]
14	Verify Synchroscope at 12 o,clock.	CB-20 Indicator at 12 o,clock. [SAT] [UNSAT]
15	Close Breaker 1A44.	CB-20 Breaker 1A44 in AFTER CLOSE, RED light ON. [SAT] [UNSAT]
16	Open Breaker 1A24.	CB-20 Breaker 1A24 in AFTER TRIP. GREEN light ON. [SAT] [UNSAT]
17	Turn Off Synchroscope.	CB-20 Sync switch handle to OFF Verify loads still energized. [SAT] [UNSAT]

JPM No: J-7 Rev 0

JPM Title: 4160V Buses 1A3 and 1A4 from 345KV to 161 KV

STEP	ELEMENT	STANDARD
18	Verify conditions for fast transfer met: • Lock-out relays amber lights on. • Appropriate 4160V breakers not in pull-to-lock. • Power is available.	CB-20 • AMBER lights ON(vertical panel). • Control Switches not in PULL-TO-LOCK. • Voltmeters show proper voltages. [SAT] [UNSAT]
19	Place Fast Transfer switches in AUTO • 43/1A1-1A3. • 43/1A2-1A4.	CB-20 Both Switches in AUTO. [SAT] [UNSAT]

Termination Criteria: Busses 1A3 and 1A4 powered from 161 KV

JPM No: J-7 Rev 0

INITIATING CUE: **A loss of 161 KV has occurred due to a grid problem. Busses 1A3 and 1A4 transferred to 345 KV. AOP-31, section II has been entered and appropriate actions taken The 161 KV grid problem has been fixed and 161 KV is available.**

You are directed to restore normal power to busses 1A3 and 1A4 beginning with AOP-31, section II, step 10.

JOB PERFORMANCE MEASURE

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

Location: Simulator

Approximate Time: 12 minutes Actual Time: _____

Reference(s): K/A# 012000 A4.02
OP-ST-RPS-0005,

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: RPS Trip Unit Bypass Keys 1, 9 and 12

Safety Considerations: None

Comments:

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

INITIATING CUE: **The plant is operating at full power. XC-105 is valid and indicates the reactor is operating at 1497.5 MWt.**

You have been directed to perform OP-ST-RPS-0005, "RPS POWER ADJUSTMENT", AND ADJUST ANY CHANNELS THAT NEED ADJUSTMENT.

The Scaling Amp offsets on the Power Range Safety Drawers have been verified to be correct.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Record all four (4) Channel ΔT Scaling Amp Offsets from the RPS Scaling Amplifier Offset Measurement Record (Control Room File drawer) on Test Data Sheet 1 and verify the Scaling Amp Offset values on the Power Range Safety Drawers.	AI-31A/B/C/D Records Channel ΔT Scaling Amp Offsets for all channels on test data sheet 1. [SAT] [UNSAT]
2	Record all four (4) Channel NI Scaling Amp Offsets from the RPS Scaling Amplifier Offset Measurement Record (Control Room File drawer) on Test Data Sheet 1 and verify the Scaling Amp Offset values on the Power Range Safety Drawers.	AI-31A/B/C/D Records Channel NI Scaling Amp Offsets for all channels on test data sheet 1 [SAT] [UNSAT]

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

STEP	ELEMENT	STANDARD
3	Record all four (4) channels Initial ΔT Power readings from RPSCIP DVM on Test Data Sheet 1.	AI-31A/B/C/D Records Initial ΔT Power readings for all channels on test data sheet 1. [SAT] [UNSAT]
4	Record all four (4) channels Initial NI Power readings from RPSCIP DVM on Test Data Sheet 1.	AI-31A/B/C/D Records Initial NI Power readings for all channels on test data sheet 1. [SAT] [UNSAT]
5	Subtract the Scaling Amp Offset from Initial ΔT Power reading for all four (4) channels and record on Test Data Sheet 1.	AI-31A/B/C/D Records Initial ΔT Power readings - scaling amp offset for all channels on test data sheet 1. [SAT] [UNSAT]
6	Subtract the Scaling Amp Offset from the Initial NI Power reading for all four (4) channels and record on Test Data Sheet 1.	AI-31A/B/C/D Records Initial NI Power readings - scaling amp offset for all channels on test data sheet 1. [SAT] [UNSAT]
7	Record all four (4) channels Initial ΔT Pwr Calibrate and Nuclear Pwr Calibrate dial (Power Range Monitor Drawer) settings on Test Data Sheet 1.	AI-31A/B/C/D Records Initial ΔT Pwr Calibrate and Nuclear Pwr Calibrate dial settings for all channels on test data sheet 1. [SAT] [UNSAT]

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

STEP	ELEMENT	STANDARD
8	Determine Channel that need adjustment.	Determines Channel "D" differs with XC-105 by more than 1% and must be adjusted. [SAT] [UNSAT]
9	Place RPSCIP DVM Meter Input Switch to METER INPUT position.	AI-31D Places DVM Meter Input Switch to METER INPUT position. [SAT] [UNSAT]
10	Push +10V pushbutton and verify DVM reads +9.800 to +10.200V.	AI-31D Pushes +10V pushbutton and verifies reading. [SAT] [UNSAT]
11	Push -10V pushbutton and verify DVM reads -9.800 to -10.200V.	AI-31D Pushes -10V pushbutton and verifies reading. [SAT] [UNSAT]
12	Push ZERO pushbutton and verify DVM reads -0.200 to +0.200V.	AI-31D Pushes ZERO pushbutton and verifies reading. [SAT] [UNSAT]
13	Enter Technical Specification Limiting Condition for Operation 2.15, Table 2-2, Items 2, 3 and 9 for RPS Trip Units 1, 9 and 12.	**CUE: Another Operator has logged into Technical Speciifications.** [SAT] [UNSAT]

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

STEP	ELEMENT	STANDARD
14	Bypass trip units 1, 9 and 12.	**CUE: Provide TU bypass keys to candidate.** AI-31D Inserts Keys in Trip Units 1, 9 and 12 and turns to BYPASS position. [SAT] [UNSAT]
15	Place the DVM selector switch to NUCLEAR PWR.	AI-31D Selects NUCLEAR PWR on DVM selector switch [SAT] [UNSAT]
16	Adjust the Power Range Monitor NUCLEAR PWR CALIBRATE potentiometer until the DVM equals the Thermal Power plus the NI Scaling Amp Offset.	AI-31D Adjusts Potentiameter such that DVM reading equals 99.8 plus the NI scaling amp offset. [SAT] [UNSAT]
17	Place the DVM selector switch to ΔT PWR.	AI-31D Selects ΔT PWR on DVM selector switch [SAT] [UNSAT]
18	Adjust ΔT PWR CALIBRATE potentiometer until the NUCLEAR PWR-ΔT PWR (%) sigma meter is nulled (0 deviation).	AI-31D Adjusts Potentiometer such that zero deviation indicated on sigma meter. [SAT] [UNSAT]

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

STEP	ELEMENT	STANDARD
19	Verify trip units are RESET, then remove the Bypass Keys for Trip Units 1, 9 and 12.	AI-31D Trip Units 1, 9 and 12 not bypassed with keys removed. [SAT] [UNSAT]
20	Exit Technical Specification LCO 2.15, for trip units 1, 9 and 12.	**CUE: Another Operator has logged out of the Technical Specification.** [SAT] [UNSAT]
21	Record all four (4) channels Final NUCLEAR PWR CALIBRATE Dial settings on Test Data Sheet 1.	AI-31A/B/C/D Record Final NUCLEAR PWR CALIBRATE Dial settings for all four channels. [SAT] [UNSAT]
22	Record all four (4) channels Final ΔT PWR CALIBRATE Dial settings on Test Data Sheet 1.	AI-31A/B/C/D Record Final ΔT PWR CALIBRATE Dial settings for all four channels. [SAT] [UNSAT]
23	Record all four (4) channels FINAL ΔT Power readings on Test Data Sheet 1.	AI-31A/B/C/D Record Final ΔT Power readings for all four channels. [SAT] [UNSAT]
24	Record all four (4) channels FINAL NI Power readings on Test Data Sheet 1.	AI-31A/B/C/D Record Final ΔT Power readings for all four channels. [SAT] [UNSAT]

JPM No: J-8 Rev 0

JPM Title: RPS Power Adjustment

Termination Criteria: **RPS channel 'D" NI Power and ΔT Power have been adjusted to agree with XC-105 per OP-ST-RPS-0005.**

JPM No: J-8 Rev 0

INITIATING CUE: **The plant is operating at full power. XC-105 is valid and indicates the reactor is operating at 1497.5 MWt.**

You have been directed to perform OP-ST-RPS-0005, "RPS POWER ADJUSTMENT", AND ADJUST ANY CHANNELS THAT NEED ADJUSTMENT.

The Scaling Amp offsets on the Power Range Safety Drawers have been verified to be correct.

JOB PERFORMANCE MEASURE

JPM No: P-9 Rev 0

JPM Title: Provide Raw Water backup cooling to Containment Coolers

Location: Auxiliary Building Room 68 (RCA)

Approximate Time: 15 minutes Actual Time: _____

Reference(s): K/A 022000 A2.05
AOP-11, "LOSS OF COMPONENT COOLING WATER"
OI-AOV-1, "AIR OPERATED VALVE MANUAL OPERATION"

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: P-9 Rev 0

JPM Title: Provide Raw Water backup cooling to Containment Coolers

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: This JPM requires entry into the RCA

Comments:

JPM No: P-9 Rev 0

JPM Title: Provide Raw Water backup cooling to Containment Coolers

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INITIATING CUE: **The reactor has tripped from full power. A total loss of all CCW pumps has occurred. You are directed, by the CRS, to establish Raw water Backup to containment cooling per AOP-11 and OI-AOV-1.**

VA-3A and VA-3B are both in operation. VA-7A and VA-7B are NOT in operation.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Obtain copies of AOP-11 and OI-AOV-1.	**Cue: Provide copies of AOP-11 and OI-AOV-1**. [SAT] [UNSAT]
2	Place "CNTMT CLG COIL VA-1A AC VLVS CONTROL SW HCV-400B/D" in "CLOSE".	**CUE: Control Room Operator reports that HCV-400B/D is in CLOSE.** [SAT] [UNSAT]
3	Unlock and release the hand-jacks from **BOTH** of the following RW Interface Valves: • HCV-400E, "CNTMTVA-1A COOLING COIL RAW WATER INLET VALVE." • HCV-400F, "CNTMTVA-1A COOLING COILBACK-UP RAW WATER OUTLET VALVE."	<u>Room-69</u> Remove the locking mechanisms and covers from BOTH HCV-400E and HCV-400F. Use the ratchet to release the handjacks by turning the locking nut CLOCKWISE until it reaches the bottom. [SAT] [UNSAT]

JPM No: P-9 Rev 0

JPM Title: Provide Raw Water backup cooling to Containment Coolers

STEP	ELEMENT	STANDARD
4	Locally open both VA-1A RW Interface Valves, HCV-400E/F by placing the following valves to "OPEN": • IA-HCV-400E-TV, "4-WAY MANUAL CONTROL VALVE." • IA-HCV-400F-TV, "4-WAY MANUAL CONTROL VALVE."	Room-69 IA-HCV-400E-TV 4-way manual control valve in OPEN. IA-HCV-400F-TV 4-way manual control valve in OPEN. [SAT] [UNSAT]
5	Place "CNTMT CLG COIL VA-1B AC VLVS CONTROL SW HCV-401B/D" in "CLOSE".	**CUE: RO reports that HCV-401B/D is in CLOSE.** [SAT] [UNSAT]
6	Unlock and release the hand-jacks from **BOTH** of the following RW Interface Valves: • HCV-401E, "CNTMTVA-1B COOLING COIL BACK-UP RAW WATERINLET VALVE." • HCV-401F, "CNTMTVA-1B COOLING COIL BACK-UP RAW WATER OUTLET VALVE."	Room-69 Remove the locking mechanisms and covers from BOTH HCV-401E and HCV-401F. Use the ratchet to release the handjacks by turning the locking nut CLOCKWISE until it reaches the bottom. [SAT] [UNSAT]
7	Locally open both VA-1B RW Interface Valves, HCV-401E/F by placing the following valves in "OPEN": • IA-HCV-401E-TV, "4-WAY MANUAL CONTROL VALVE." • IA-HCV-401F-TV, "4-WAY MANUAL CONTROL VALVE."	Room-69 IA-HCV-401E-TV 4-way manual control valve in OPEN. IA-HCV-401F-TV 4-way manual control valve in OPEN. [SAT] [UNSAT]

JPM No: P-9 Rev 0

JPM Title: Provide Raw Water backup cooling to Containment Coolers

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Termination Criteria: **Raw Water Backup Cooling is being provided to Containment Coolers , VA-1A and VA-1B.**

JPM No: P-9 Rev 0

INITIATING CUE: **The reactor has tripped from full power. A total loss of all CCW pumps has occurred. You are directed, by the CRS, to establish Raw water Backup to containment cooling per AOP-11 and OI-AOV-1.**

VA-3A and VA-3B are both in operation. VA-7A and VA-7B are NOT in operation.

JOB PERFORMANCE MEASURE

JPM No: P-10 Rev 0

JPM Title: Energize 480 volt buses from 13.8 KV

Location: Switchgear Rooms

Approximate Time: 20 miutes Actual Time: _____

Reference(s): K/A 000055 EA1.07
EOP/AOP Attachment 5

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: P-10 Rev 0

JPM Title: Energize 480 volt buses from 13.8 KV

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: Be careful not to bump equipment in switchgear rooms

Comments:

JPM No: P-10 Rev 0

JPM Title: Energize 480 volt buses from 13.8 KV

INITIATING CUE: **A station blackout has occurred. Both 161 KV and 345 KV supplies to the station have been lost. Both Diesel Generators have failed to start.**

Energy Marketing reports that 13.8 KV power is available to the plant. You have been directed to energize 480 volt buses 1B3C, 1B3C-4C and 1B4C using EOP/AOP attachment 5. The Control Room Operators have completed steps 1 and 2.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Trip **ALL** of the following 480 V breakers : • 1B3C, "T1B-3C MAIN SECONDARY FEED TO 480 VAC BUS 1B3C." • 1B3C-2, "MCC-3C2 AUX BUILDING (CORR. 26)." • 1B3C-7, "TURBINE BUILDING CRANE HE-3." • 1B3C-6, "CONTAINMENT SPRAY PUMP SI-3A." • 1B3C-3, "OUTDOOR LIGHTING XFMR T1C-3B." • 1B3C-5, "MCC-3C3 SERVICE BLDG (3RD FLOOR)." • 1B3C-8, "AIR COMPRESSORCA-1A FEED TO LOCAL CONTACTOR."	<u>East Switchgear room</u> Trip breakers. Verify breaker position indicators display "OPEN." [SAT] [UNSAT]

JPM No: P-10 Rev 0

JPM Title: Energize 480 volt buses from 13.8 KV

STEP	ELEMENT	STANDARD
2	Trip **ALL** of the following 480 V breakers: • 1B3C-4C-2, "BREAKER UNIT MCC-3C4C-2 TURBINE BLDG (MEZZANINE)." • 1B3C-4C-3, "BREAKER UNIT CONTAINMENT COOLING FAN VA-7C." • 1B3C-4C-4, "BREAKER UNIT COMPONENT COOLING WATER PUMP AC-3C."	<u>East Switchgear room</u> Trip breakers. Verify breaker position indicators display "OPEN." [SAT] [UNSAT]
3	Trip **ALL** of the following 480 V breakers : • 1B4C, "T1B-4C MAIN SECONDARY FEED TO 480 VAC BUS 1B4C." • 1B4C-8, "CONTAINMENT COOLING & FILTER FAN VA-3B." • 1B4C-3, "MCC-4C2 AUX BLDG (CORR 4)." • 1B4C-4, "MCC-4C3 TURB BLDG (MEZZANINE)." • 1B4C-7, "MCC-4C4 INTAKE STRUCTURE." • 1B4C-5, "HI PRESS SAFETY INJ. PUMP SI-2B." • 1B4C-2, "MCC-4C1 ELECT PENET. AREA (RM 57W)." • 1B4C-1, "MCC-4C5 MCC TURBINE BUILDING."	<u>West Switchgear room</u> Trip breakers. Verify breaker position indicators display "OPEN." [SAT] [UNSAT]

JPM No: P-10 Rev 0

JPM Title: Energize 480 volt buses from 13.8 KV

STEP	ELEMENT	STANDARD
4	Place **ALL** of the following breakers in "OFF" • MCC-3C1-A01, "PCV-102-1 PZR POWER OPERATED RELIEF VALVE." • MCC-3C1-A2R, "AUX BLDG ROOF-DS, AUX BLDG ROOF STRESS TEST DISC SWITCH." • MCC-3C1-A3L, "MPP-58/EE-98 MOTOR PROTECTION PANEL TRANSFORMER." • MCC-3C1-A3R, "HE-12-DS/STRESS GALL-DS, ROOM 66 HOIST & STRESS GALLERY TEST DISC SWITCHES." • MCC-3C1-A4L, "SPARE." • MCC-3C1-A4R, "EE-4Q INVERTER "C" EE-8K BYPASS TRANSFORMER." • MCC-3C1-A05, "TRANSFORMER T1B-3C COOLING FANS."	<u>East Upper Electrical Penetration Room</u> MCC breakers placed in OFF position. [SAT] [UNSAT]
5	Obtain the circuit breaker handle from the Shift Manager or the AOP-06 Cabinet.	**CUE: You have obtained the circuit breaker handle** [SAT] [UNSAT]

JPM No: P-10 Rev 0

JPM Title: Energize 480 volt buses from 13.8 KV

STEP	ELEMENT	STANDARD
6	Close breaker 1B3C-4, "EMERG. FEED TO BUS 1B3C FROM 13.8KV/480V XFMR T1B-3C-1."	East Switchgear room Close breaker 1B3C-4 and verify breaker position indicators display CLOSED. [SAT] [UNSAT]
7	Check that Bus 1B3C is energized.	**CUE: Bus 1B3C bus voltage is 480 Volts.** [SAT] [UNSAT]
8	Close BT-1B3C, "BUS TIE 1B3C & 1B3C-4C NORMALLY CLOSED."	East Switchgear room Close breaker BT-1B3C and verify breaker position indicators display CLOSED. [SAT] [UNSAT]
9	Close BT-1B4C, "BUS TIE 1B4C & 1B3C-4C NORMALLY OPEN."	West Switchgear room Close breaker BT-1B4C and verify breaker position indicators display CLOSED. [SAT] [UNSAT]
		CUE: Another Operator will place Battery Charger #3 in service and transfer DC control power.

Termination Criteria: 480 volt buses 1B3C, 1B3C-4C and 1B4C are energized from 13.8 KV.

JPM No: P-10 Rev 0

INITIATING CUE: **A station blackout has occurred. Both 161 KV and 345 KV supplies to the station have been lost. Both Diesel Generators have failed to start.**

Energy Marketing reports that 13.8 KV power is available to the plant. You have been directed to energize 480 volt buses 1B3C, 1B3C-4C and 1B4C using EOP/AOP attachment 5. The Control Room Operators have completed steps 1 and 2.

JOB PERFORMANCE MEASURE

JPM No: P-11 Rev 0

JPM Title: Emergency Start of the Diesel Fire Pump

Location: Intake Structure

Approximate Time: 10 minutes Actual Time: _____

Reference(s): K/A# 086000 A2.04
OI-FP-1, Attachment 3, "FP-1B, DIESEL FIRE PUMP AND FP-6B DIESEL FIRE PUMP STRANER OPERATION."

JPM Prepared by: Jerry Koske Date: 1/29/09

JPM No: P-11 Rev 0

JPM Title: Emergency Start of the Diesel Fire Pump

Operators' Name: _____ Employee # _____

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: _____ Date: _____

Reason, if unsatisfactory:

Tools & Equipment:	None
Safety Considerations:	Potential tripping hazards. Do Not operate any controls.
Comments:	Alternate Path

JPM No: P-11 Rev 0

JPM Title: Emergency Start of the Diesel Fire Pump

INITIATING CUE: **The electric fire pump is out of service. Transformer deluge has activated due to a fire but the diesel fire pump did not start automatically.**

You are directed to perform an emergency manual start of the diesel fire pump.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Note to Examiner: Provide candidate with a copy of OI-FP-1, Attachment 3.
1	Ensure the following are on: • AI-183-CB1, Fire Pump FP-1B Batt 1 Switch. • AI-183-CB2, Fire Pump FP-1B Batt 2 Switch.	AI-183 Battery 1 is ON. Battery 2 is ON. [SAT] [UNSAT]
2	Place HC/FP-1B-MS control switch to Manual 1.	AI-183 Select Manual #1. [SAT] [UNSAT]
3	Press HC/FP-1B-1, Crank 1 start button.	AI-183 Push Crank 1 pushbutton. [SAT] [UNSAT] **CUE: Engine did not turn over or start**

JPM No: P-11 Rev 0

JPM Title: Emergency Start of the Diesel Fire Pump

STEP	ELEMENT	STANDARD
4	Place HC/FP-1B-MS control switch to Manual 2.	AI-183 Select Manual #2. [SAT] [UNSAT]
5	Press HC/FP-1B-1, Crank 2 start button.	AI-183 Push Crank 2 pushbutton. [SAT] [UNSAT] **CUE: Engine turned over but did not start**
6	Open FO-169, Fuel Oil Solenoid Valve.	South side of Engine Turn Knob clockwise to full-in position. [SAT] [UNSAT]
7	Open FP-161, Pressure control valve bypass valve.	South side of Engine Cooling water bypass valve to OPEN. [SAT] [UNSAT]

JPM No: P-11 Rev 0

JPM Title: Emergency Start of the Diesel Fire Pump

STEP	ELEMENT	STANDARD
8	Engage the starter using either of the two starter contactors.	<u>North side of Engine</u> Raise lever knob on either: • YS/FP-1B-1. • YS/FP-1B-1. **CUE: Engine has started and is running.** Release lever. [SAT] [UNSAT]

Termination Criteria: Diesel Fire Pump has been started

JPM No: P-11 Rev 0

INITIATING CUE: **The electric fire pump is out of service. Transformer deluge has activated due to a fire but the diesel fire pump did not start automatically.**

You are directed to perform an emergency manual start of the diesel fire pump.

Facility: Fort Calhoun	Scenario No: 2009-1	Revision: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: 100% Power. FW-54 is out of service. CA-1C is out of service.

Turnover: Transfer Letdown Control Valves from LCV-101-1 to LCV-101-2. After that rotate running EHC Pumps.

Event No.	Malf No.	Event Type*	Event Description
1 (2 min)		N-ATCO	Transfer Letdown Flow Control Valves.
2 (14 min)		N-BOPO	Rotate EHC Pumps.
3 (20 min)		I-ATCO	Power Range NI Channel B fails - **Tech Spec Entry.**
4 (26 min)		C-BOPO	Running Bearing Water Pump, "AC-9A" trips.
5 (30 min)		I-ATCO	Hot Leg RTD Fails High - **Tech Spec Entry.**
6 (40 min)		C-All	Loss of Instrument Air.
7 (45 min)		M-All	Manual Reactor Trip Required.
8 (50 min)		M-All	Steam Generator Safety Valve Fails Open.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	5
2. Malfunctions after EOP entry (1–2)	1
3. Abnormal events (2–4)	2
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Scenario No: 2009-1	Revision: 1	Event No.: 1	Page 2 of 10
Event Description: Transfer Letdown Flow Control Valves			

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the ATCO to transfer letdown control valves from LCV-101-1 to LCV-101-2.
	ATCO	Enter OI-CH-1, Attachment 1, "STARTUP OF CHARGING AND LETDOWN."
	ATCO	Place HC-101-3, Limiter Bypass Switch, in BYPASS.
	ATCO	Place HIC-101-1/101-2 Letdown Throttle Valve Controller in MANUAL.
	ATCO	Close LCV-101-1.
	ATCO	Select LCV-101-2 on HC-101-2 selector switch
	ATCO	Place PIC-210, Letdown Pressure Controller, in MANUAL.
	ATCO	Throttle PIC-210 to approximately 10% open.
	ATCO	Use HIC-101-1/101-2 to initiate letdown flow while adjusting PCV-210 to maintain approximately 300 psig.
	ATCO	Balance charging and letdown flow.
	ATCO	Place HC-101-3, Limiter Bypass Switch, in NORMAL.
	ATCO	Go to OI-RC-8, Attachment 3. and ensure pressurizer level matches programmed level and PIC-210 200-400 psia.
	ATCO	Adjust bias on HIC-101-1/101-2 until top scale indicates 50%.
	ATCO	Place HIC-101-1/101-2 transfer switch to BAL, then to AUTO.
	ATCO	Place PIC-210 to AUTO.
	ATCO	Make adjustments to HIC-101-1/101-2 as needed.

Scenario No: 2009-1 Revision: 1 Event No.: 2 Page 3 of 10		
Event Description: Rotate EHC Pumps		
Time	**Position**	**Applicant's Actions or Behavior**
	CRS	Direct BOPO to rotate EHC Pumps.
	BOPO	Enters OI-ST-12, Attachment 7, "NORMAL ROTATION OF ELECTROHYDRAULIC PUMPS."
	BOPO	Start standby EHC Pump, EHC-3B.
	BOPO	Ensure EHC system pressure is stable on PI-2101.
	BOPO	Ensure EHC-3B motor current is approximately 40 to 50 amps.
	BOPO	Direct EONT to verify local parameters: • PI-5116 pressure approximately equal to PI-2101pressure. • PI-5116 pressure approximately equal to PI-2101pressure. • No bubbles visible in EHC-3B suction strainer.
	BOPO	Stop EHC pump, EHC-3A. Ensure pump control switch in AFTERSTOP.
	BOPO	Verify adequate EHC pressure being maintained.

Scenario No: 2009-1 Revision: 1 Event No.: 3 Page 4 of 10		
Event Description: Power Range NI Channel B fails - **Tech Spec Entry**		
Time	**Position**	**Applicant's Actions or Behavior**
	ATCO	Identify the failure from the "Nuclear Instrumentation Inoperable" and other alarms. May enter ARP.
	ATCO	Determine that Power Range NI Channel B Upper Detector has failed.
	CRS	Enter AOP-15.
	CRS	Enter Technical Specification 2.15. (RPS channel "B" trip units 1, 9 and 12 must be placed in bypass within 1 hour. Since this is a detector failure, they may remain in bypass for up to 7 days. If detector operability is not restored by the end of the 7 days, the reactor must be placed in hot shutdown within 24 hours).
	CRS	Notify Manager – FCS, Manager – Operations or Supervisor – Operation of RPS trip unit bypass.
	CRS	Obtain the keys and direct the ATC operator to place the 1, 2, 9, 10 and 12 trip units on channel "B" in bypass.
	ATCO	Bypass trip units 1, 2, 9, 10 and 12 on RPS channel "B."
	ATCO or BOPO	Enter channel bypass information in control room log.
	CRS	Inform Work Week Manager of NI Channel Failure.

Scenario No: 2009-1	Revision: 1	Event No.: 4 Page 5 of 10
Event Description: Running Bearing Water Pump, AC-9A trips		

Time	Position	Applicant's Actions or Behavior
	BOPO	Respond to "Cooling water Pressure Low" alarm (CB-10,11 A11 B6U).
	BOPO	Report that AC-9A has tripped.
	CRS	Direct BOPO to start AC-9B.
	BOPO	Start AC-9B.
	CRS	Direct BOPO to verify status of Instrument Air System.
	BOPO	Ensure that air compressor is operating and instrument air pressure normal or restoring.
	CRS	May enter AOP-20.

Scenario No: 2009-1	Revision: 1	Event No.: 5	Page 6 of 10
Event Description: Hot Leg RTD Fails High - **Tech Spec Entry**			

Time	Position	Applicant's Actions or Behavior
	ATCO	Responds to numerous alarms on CB-4, panel A-20 and CB-1,2,3, panel A4. Reports that trip units 1, 9 and 12 on channel "A" are tripped.
	ATCO/ BOPO	Reviews ARP.
	ATCO	Checks power, pressure and temperature indications and determines that the alarm is caused by failed T-hot channel (A/T122H).
	CRS	Enters Tech Spec 2.15 : Because trip units 1, 9 and 12 are already bypassed on RPS channel "B". The 1, 9 and 12 trip units on channel "A" must be placed in the tripped condition within one hour. One of the channels must be repaired within 48 hours or else the plant must be placed in hot shutdown within the following 12 hours. With NI channel "B" trip units bypassed and Delta-T channel "A" trip units tripped, power must be reduced to less than 70% (no time limit).
	CRS	Either direct the ATC to use the Channel "A" Power Trip Test Interlock to place the trip units in the tripped condition by placing the "Test Enable" switch in "ENABLE" and the "Test Select" switch in "CAL MID" or else notify I&C to trip the trip units with one hour.
	ATCO	If directed, use the channel "A" PTTI to trip the trip units on channel "A" by placing the "Test Enable" switch in "ENABLE" and the "Test Select" switch in "CAL MID."
	CRS	Notifies Plant or Operations Management and the Work Week Manager or I&C of the failure.

Scenario No: 2009-1	Revision: 1	Event No.: 6 Page 7 of 10
Event Description: Loss of Instrument Air		

Time	Position	Applicant's Actions or Behavior
	BOPO	Identify and communicate lowering air pressure.
	CRS	Direct BOPO to verify STBY compressor operation.
	CRS	Enter AOP-17, "LOSS OF INSTRUMENT AIR."
	CRS	Caution BOPO of possible feed reg. Valve failure.
	CRS/ BOPO	Direct EONT to verify compressor and air dryer operations, Direct all available operators to help locate the leak.
	CRS/ BOPO	Direct EONT to verify PCV-1753 closure when instrument air pressure drops to less than 80 psig.
	CRS/ BOPO	Direct EONT to verify PCV-1752 opens when instrument air pressure drops to less than 78 psig.
	CRS	Direct BOPO to isolate instrument air to containment.
	BOPO	Close PCV-1849A/B and after verifying air pressure continues to drop, reopen PCV-1849A/B.
	ATCO	Monitor primary parameters.
	CRS	Direct manual reactor trip of when air pressure drops to 50 psig.
	ATCO	Manually trip reactor within 5 minutes of instrument air pressure going below 50 psig.
	CRS	Direct BOPO to trip all Main Feedwater Pumps.
	BOPO	Trip all Main Feedwater Pumps.

Scenario No: 2009-1 Revision: 1 Event No.: 7 Page 8 of 10

Event Description: Manual Reactor Trip Required

Time	Position	Applicant's Actions or Behavior
	CRS	Enters EOP-00. Directs ATCO and BOPO to perform standard post trip actions.
	ATCO	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate. • Monitors for uncontrolled Cooldown.
	BOPO	• Verify turbine and generator trip.
	BOPO	• Verify electrical status – 4160, D/G, instrument power, 125V DC. • Verify Instrument air status - Reports instrument air pressure is low and continuing to lower.
	ATCO	• Verify CCW and Raw water status. • Verify RCS inventory control. • Verify RCS pressure control - reports RCS pressure. • Verify core heat removal.
	BOPO	• Verify S/G feed - establish auxiliary feedwater flow to the nozzles. • Verify S/G pressure and T-cold - Reports that steam dump and bypass valves are closed.
	ATCO	• Verify containment conditions.

Scenario No: 2009-1 Revision: 1 Event No.: 8 Page 9 of 10		
Event Description: Steam Generator Safety Valve Fails Open		
Time	**Position**	**Applicant's Actions or Behavior**
	ATCO	Reports RCS cooldown in progress.
	BOPO	Reports S/G pressure is lowering.
	CRS	Directs ATCO to perform emergency boration.
	ATCO	Performs Emergency Boration: • Ensure FCV-269X/Y Closed. • Open HCV-268/265/258. • Start Boric Acid Pumps, CH-4A/B. • Start all charging pumps, CH-1A/B/C. • Close LCV-218-2/3 and HCV-257/264.
	CRS	Perform diagnostic actions and transition to EOP-20, FUNCTIONAL RECOVERY PROCEDURE, due to a loss of instrument air and an excessive heat removal event.
	CRS	Within EOP-20, go to success path MVA-IA and implement (continue to implement) AOP-17, LOSS OF INSTRUMENT AIR.
		Note: Water Plant Operator Reports Instrument air leak in the intake structure.
	CRS	Direct Water Plant Operator to isolate leak.
	CRS	Direct BOPO to monitor instrument Air Pressure.
	BOPO	Reports that Instrument air pressure is now increasing.
	CRS	Within EOP-20, go to success path HR-3.
	CRS	Direct ATCO or BOPO to verify PPLS.
	ATCO or BOPO	Verify PPLS: • Ensure emergency boration in progress. • Ensure acceptable SI flow per EOP/AOP Attachment 3. • Verify 2 HPSI, 2 LPSI and all available charging pumps running.

Scenario No: 2009-1 Revision: 1 Event No.: Page 10 of 10		
Event Description: Steam Generator Safety Valve Fails Open, continued		
Time	**Position**	**Applicant's Actions or Behavior**
	CRS BOPO	Identify Affected Steam Generator.
	BOPO	Reports that RC-2B is the affected Steam Generator.
	BOPO	If SGIS actuates, verify MSIVs, MSIV bypass valves, Feed Reg Bypass valves, Feed Reg block valves and Feed Header Isolation Valves have closed.
	CRS	Direct BOPO to isolate Steam Generator, RC-2B.
	BOPO	Isolate S/G RC-2B by closing or ensuring closed: • MSIV, HCV-1042A. • MSIV Bypass, HCV-1042C. • Air assisted S.G Safety Valve, MS-292. • Feed Reg Valve, FCV-1102 (may need to reset due to low instrument air pressure). • Feed Reg Bypass valve, HCV-1106. • Feed Header Isolation Valve, HCV-1385. • Feed Reg Block valve, HCV-1104. • Blowdown Isolation Valves, HCV-1387A/B. • AFW Isolation valves, HCV-1108A/B. • Direct EONT to close Packing leakoff line isolation valve, MS-298. • Override and close steam to AFW pump-FW-10, YCV-1045B.
	BOPO	Establish Steam Flow from RC-2A prior to Wide Range Level on Steam Generator RC-2B falling to 27% by one of the following: • Opening Air assisted safety valve, MS-291. (OR) • Ensure MSIV, HCV-1041A or MSIV Bypass,HCV-1041C is open and use steam dump and bypass valves. (OR) • Ensure MSIV, HCV-1041A or MSIV Bypass,HCV-1041C is open and open atmospheric dump valve, HCV-1040.
	BOPO	Ensure Auxiliary Feedwater is being supplied to S/G, RC-2A.
		Scenario ends with S/G RC-2B isolated and heat removal established using S/G RC-2A.

Facility: Fort Calhoun	Scenario No: 2009-2	Revision: 1
Examiners: _____ _____ _____	Operators: _____ _____ _____	
Initial Conditions: 100% Power DG-1 Out of Service, Generator Voltage Control On Backup for maintenance.		
Turnover: Reestablish normal main generator voltage control then rotate Containment Cooling Units.		

Event No.	Malf No.	Event Type*	Event Description
1 (2 min)		N-BOPO	Reestablish normal main generator voltage control.
2 (10 min)		N-ATCO	Rotate Containment Cooling Units.
3 (16 min)		C-ATCO C-BOPO	Dropped CEA - **Tech Spec Entry.**
4		R-ATCO N-BOPO	AOP-05 shutdown to 70% Power.
5 (28 min)		I-ATCO	Controlling Pressurizer Pressure Transmitter, PT-103Y, Fails High.
6 (35 min)		C-BOPO	Loss of 161 KV - **Tech Spec Entry.**
7 (48 min)		C-ATCO M-ALL	Another Dropped CEA - Manual Reactor Trip Required.
8		C-BOPO M-ALL	Circulating Water Pump, CW-1C, Breaker fails to open preventing DG from loading onto bus 1A4 - Station Blackout.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	5
2. Malfunctions after EOP entry (1–2)	1
3. Abnormal events (2–4)	3
4. Major transients (1–2)	2
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Scenario No: 2009-2	Revision: 1	Event No.: 1	Page 2 of 10

Event Description: Reestablish normal main generator voltage control.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct the BOPO to return Main Generator Voltage control to AUTO.
	BOPO	Check the Transfer Voltage Meter (TVM) indication.
	BOPO	Operate the AC Voltage Control (90P) until the indication on the TVM is "nulled."
	BOPO	Place the voltage regulator transfer switch in AUTO.
	BOPO	Monitor the TVM and generator field voltage.

Scenario No: 2009-2 Revision: 1 Event No.: 2 Page 3 of 10

Event Description: Rotate Containment Cooling Units.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct ATCO to place VA-3B in service and shutdown VA-3A.
	ATCO	Obtain a copy of OI-VA-1, Attachment 1.
	ATCO	Momentarily place HCV-401B/D to OPEN.
	ATCO	Ensure HCV-401C is closed.
	ATCO	Momentarily place HCV-401A/C to CIRC.
	ATCO	Throttle open HCV-401C maintaining CCW discharge header pressure at least 70 psig.
	ATCO	Monitor: • FI-417, VA-1B flow. • TIC-421, VA-1B temperature. • PI-499, CCW Discharge Header Pressure. • TIC-2800, CCW Discharge header temperature. • TI-717 Fan VA-3B outlet temperature.
	ATCO	Start VA-3B and monitor: • VA-3B Current. • PIC-701, Fan VA-3B filter DP. • PIC-709, Fan VA-3B Cooling Coil DP. • TI-717 Fan VA-3B outlet temperature.
	ATCO	Stop VA-3A.
	ATCO	Close HCV-400C maintaining CCW discharge header pressure less than 125 psig.
	ATCO	Verify CC WATER FROM VA-1A NO FLOW (CB-1,2,3,A1,A1-U) in alarm.
	ATCO	Momentarily place HCV-400A/C to ISOL.
	ATCO	Momentarily place HCV-400B/D to CLOSE.

Scenario No: 2009-2 Revision: 1 Event No.: 3 Page 4 of 10

Event Description: Dropped CEA - **Tech Spec Entry.**

Time	Position	Applicant's Actions or Behavior
	ATCO	Identify event from "Dropped Rod" and other alarms (CB-4 A20 E6, CB-4 A8 A5L, B1U, B1L, B2L, B5L, C1U, C2U, C5L).
	ATCO	Determine that only one rod has dropped (rod #1, grp 4).
	CRS	Enter AOP-02 (CEDM Malfunction).
	CRS	Direct BOP Operator to adjust turbine load to match reactor power.
	BOPO	Reduce turbine load to match reactor power using T-cold indication.
	CRS	Direct ATC to control pressurizer pressure and level.
	ATCO	Monitor pressurizer pressure and level.
	CRS	Direct ATC Operator to reset rod drop bistables.
	ATCO	Reset rod drop bistables.
	CRS	Notify Work Week Manager or Reactor Engineer.
	CRS	Enter Tech Spec Section 2.10.2. Reactor power must be reduced to less than 70% within one hour. The CEA must be realigned or declared inoperable within one hour following the power reduction. If the CEA is declared inoperable, the reactor must be in hot shutdown within an additional 5 hours.
	CRS	Inform ATC and BOP operators that Tech Specs require a power reduction to less than 70% within one hour.
	CRS	Notify energy marketing of the impending power reduction.

Scenario No: 2009-2 Revision: 1 Event No.: 4 Page 5 of 10

Event Description: AOP-05 shutdown to 70% Power.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct ATCO and BOPO to commence a power reduction using AOP-05 or OP-4.
	CRS	Direct ATCO on method of boration to use. Options are: • Normal boration. • Aligning charging pumps suction to SIRWT.
	ATCO	Begin boration using method directed by CRS.
	BOPO	Reduce turbine load using potentiometer as needed to control RCS T-cold.
	ATCO	Monitor and control RCS parameters during power reduction.
	BOPO	Monitor and control secondary parameters.
	CRS	Direct the shift chemist to sample the RCS due to the power reduction.
	ATCO	May contact the Aux Building Operator to verify sufficient tank capacity for power reduction.

Scenario No: 2009-2 Revision: 1 Event No.: 5 Page 6 of 10

Event Description: Controlling Pressurizer Pressure Transmitter, PT-103Y, Fails High.

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to "Pressurizer Pressure Off-Normal HI/LO Channel Y Alarm."
	ATCO	Identify and report high indication on controlling channel and lowering pressure on other channel.
	ATCO/ BOPO	Refer to ARP.
	CRS	Direct ATCO to transfer pressurizer pressure control to channel "X" or take manual control of pressurizer pressure.
	ATCO	Transfer pressurizer pressure control to channel "X" or take manual control of pressurizer pressure, as directed.
	ATCO	Monitor and control pressurizer pressure.

Scenario No: 2009-2 Revision: 1 Event No.: 6 Page 7 of 10

Event Description: Loss of 161 KV - **Tech Spec Entry.**

Time	Position	Applicant's Actions or Behavior
	BOPO	Identify loss of 161 KV from numerous alarms on CB-20. (CB-20 A15 A1, A2, A3) (CB-20 A17 A2, C4, D2) Determine and report that busses 1A3 and 1A4 have fast transferred and are powered.
	CRS	Enter AOP-31, section II "All 4160 busses fed from 22 KV" Direct BOPO to verify 1 FW pump, 1 Condensate pump and 1Heater drain pump operating.
	BOPO	Verify 1 FW pump, 1 Condensate pump and 1, Heater drain pump operating.
	CRS	Direct BOPO to verify 480 bus voltages greater than 430 volts.
	BOPO	Verify voltages.
	CRS	Direct BOPO to match flags on breakers 110, 111, 1A31, 1A33, 1A42, 1A44.
	BOPO	Match flags on breakers 110, 111, 1A31, 1A33, 1A42, 1A44 (step 5 of AOP-31).
	CRS	Direct that signs be placed at entrances to switchgear rooms Review EOP-02, EOP-07 and EOP-20.
	CRS	Enter Tech Spec 2.7. Due to the loss of 161 KV and D/G-1 being inoperable, Tech Spec 2.0.1 must be entered which requires that the plant be placed in hot shutdown within 6 hours. However, taking the main generator off-line will result a loss of offsite power. The NRC Operations center must be notified within four hours due to the loss of 161 KV.
	CRS	Report situation to station management.

Scenario No: 2009-2 Revision: 1 Event No.: 7 Page 8 of 10

Event Description: Another Dropped CEA - Manual Reactor Trip Required.

Time	Position	Applicant's Actions or Behavior
	ATCO	Report that another CEA has fallen into the core.
	CRS	Direct ATCO to trip the reactor.
	ATCO	Manually trip the reactor.
	CRS	Direct the ATCO and BOPO to perform EOP-00, "STANDARD POST-TRIP ACTIONS."

Scenario No: 2009-2 Revision: 1 Event No.: 8 Page 9 of 10

Event Description: Circulating Water Pump, CW-1C, Breaker fails to open preventing DG from loading onto bus 1A4 - Station Blackout.

Time	Position	Applicant's Actions or Behavior
	ATCO	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate.
	BOPO	• Verify turbine and generator trip.
	BOPO	• Verify electrical status – 4160, D/G, instrument power, 125V DC. Report that all 4160V busses are deenergized. D/G #2 is running at 900 RPM but it's breaker has not closed. • Verify Instrument air status.
	ATCO	• Verify CCW and Raw water status. • Verify RCS inventory control. • Verify RCS pressure control. • Verify core heat removal - Report no reactor coolant pumps running.
	BOPO	• Verify S/G feed - initiate auxiliary feedwater flow. • Verify S/G pressure and T-cold - report steam dump and bypass valves not operating. • Verify containment conditions.
	BOPO	Report that CW-1C breaker failed to trip within 15 minutes of reactor trip. (This prevents D/G-2 breaker from closing) Direct EONT to manually trip the breaker for CW-1C. (NOTE: EONT will trip breaker 2.5 minutes after being directed).
	CRS	If bus 1A4 is repowered, then enter EOP-02. If bus 1A4 is not powered, then enter EOP-07.
	CRS	When D/G-2 output breaker closes, Direct BOPO to verify bus 1A4 voltage.
		Continued on next page

Scenario No: 2009-2	Revision: 1	Event No.:	Page 10 of 10

Event Description: Circulating Water Pump, CW-1C, Breaker fails to open preventing DG from loading onto bus 1A4 - Station Blackout, continued.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct ATCO and BOPO to ensure the following: • One CCW Pump running. • One Raw Water Pump running. • One Bearing Water Pump running. • One Air Compressor running. • One Charging Pump running. • One AFW pump running.
	ATCO	Start: • One CCW Pump. • One Raw Water Pump. • One Charging Pump.
	BOPO	Start: • One Bearing Water Pump. • One Air Compressor. • One AFW pump.
	CRS	May direct EONT to supply air compressor cooling with potable water.
	ATCO	Monitor for establishment of natural circulation: • Delta-T less than 50°F. • Difference between CETs and T-hot less than 10°F. • T-hot and T-cold stable or lowering. • At least 20°F subcooling.
	ATCO	Monitor and control pressurizer level and pressure.
	BOPO	Monitor and control S/G steam flow and AFW flow.
		Scenario ends with Diesel Generator #2 supplying bus 1A4 and all Safety Functions Satisfied.

Facility: Fort Calhoun	Scenario No: 2009-3	Revision: 1
Examiners: _____ _____ _____	Operators: _____ _____ _____	
Initial Conditions: Plant at 50% Power FW-4A and FW-4C are OOS. Two CW Pumps are running. Low pressure alarm is in on Safety Injection Tank, SI-6B.		
Turnover: Increase pressure in Safety Injection Tank, SI-6B. Then start Circulating Water Pump, CW-1C.		

Event No.	Malf No.	Event Type*	Event Description
1 (2 min)		N-ATCO	Raise Pressure in Safety Injection Tank, SI-6B.
2 (10 min)		N-BOPO	Start Circulating Water Pump, CW-1C.
3 (16 min)		C-ATCO TS-CRS	Control Room HVAC Fan Trips - **Tech Spec Entry.**
4 (25 min)		I-BOPO	Steam header pressure transmitter, PT-910 Fails High.
5 (31 min)		TS-CRS	Volume Control Tank Level Instrument Fails Low **- Tech Spec Entry.**
6 (40 min)		I-ATCO	Controlling Pressurizer Level Channel Fails Low.
7 (46 min)		C - BOPO	Turbine high vibration.
8 (55 min)		M-ALL	Turbine Trip, Reactor Fails to Trip - ATWS.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	6
2. Malfunctions after EOP entry (1–2)	1
3. Abnormal events (2–4)	3
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Scenario No: 2009-3 Revision: 1 Event No.: 1 Page 2 of 10

Event Description: Raise Pressure in Safety Injection Tank, SI-6B.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct ATCO to increase pressure in SI-6B to clear alarm.
	ATCO	Obtain a copy of OI-SI-1, Attachment 27.
	ATCO or BOPO	Open HCV-2603A and HCV-2603B.
	ATCO	Open HC-2631.
	ATCO	Monitor pressure in Safety Injection Tank, SI-6B.
	ATCO	When pressure is restored, close HC-2631.
	ATCO or BOPO	Close HCV-2603A and HCV-2603B.

Scenario No: 2009-3 Revision: 1 Event No.: 2 Page 3 of 10

Event Description: Start Circulating Water Pump, CW-1C.

Time	Position	Applicant's Actions or Behavior
	CRS	Direct BOPO to start Circulating Water Pump, CW-1C.
	BOPO	Obtain a copy of OI-CW-1, Attachment 2.
	BOPO	Direct Water Plant to ensure CW-1C Pump Suction Sluice gate, CW-15C is open.
	BOPO	Contact Security to be present at Screen F Enclosure.
	BOPO	Direct Water Plant Operator to ensure Screen Inlet Sluice gates CW-14E and CW-14F are open.
	BOPO	Direct Water Plant Operator to: • Verify CW Pumps seal water pressure is at least 10 psig. • Verify SW-223/224 are open and SW-225 throttled and seal water has been in service for at least 15 minutes. • Ensure VD-249 is open. • Open VD-266. • Verify oil in all CW-1C bearings. • Ensure CW-1C Cooling Air Damper to upper bearings is open.
	BOPO	Start CW-1C.
	BOPO	When CW-1C's Discharge Check Valve starts to open, then open CW-1C's Pump Discharge Valve.
	BOPO	Verify CW Discharge pressure on PI-1910A/B/C (17-21 psig).
	BOPO	Notify security they are no longer required at screen F enclosure.
	BOPO	Monitor upper bearing temperature on ERF computer.

Scenario No: 2009-3 Revision: 1 Event No.: 3 Page 4 of 10

Event Description: Control Room HVAC Fan Trips - **Tech Spec Entry.**

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to "CONTROL ROOM A/C VA-46A AUTO TRIP" alarm on AI-106A.
	ATCO	Check for Fire Detection alarm or toxic gas alarm. Neither is present.
	ATCO	Direct EONT to check VA-46A breaker for trip.
	ATCO	Obtain a copy of OI-VA-3 to start VA-46B.
	ATCO	Direct maintenance to verify: • Power has been applied to VA-46B at least 24 hours. • Compressor isolation Valves are open.
	ATCO	Ensure: • Both Filter Fan Control Switches are in the same position. • Third stage cooling VIAS override switch in NORMAL. • Refrigeration suction pressure less than 75% of liquid line pressure.
	ATCO	Start VA-46B.
	ATCO	Verify the following are open: • PCV-841B. • PCV-841A-1. • PCV-841A-2. • HCV-2899A. • HCV-2899B.
	CRS	Enter Technical Specification 2.12. Log into a 30 day LCO. The inoperable train of control room HVAC must be restored to operable status within 30 days. If still inoperable after 30 days then place the plant in hot shutdown within 6 hours and cold shutdown within the following 36 hours.

Scenario No: 2009-3 Revision: 1 Event No.: 4 Page 5 of 10

Event Description: Steam header pressure transmitter, PT-910 Fails High.

Time	Position	Applicant's Actions or Behavior
	BOPO	Identify rapid decrease in RCS T-cold (VOPT ANN will alarm if uncorrected).
	ATCO/ BOPO	If VOPT annunciator alarms, refer to ARP.
	BOPO	Determine cause as turbine bypass valve, PCV-910, being open (red light on CB-1,2,3).
	CRS	Direct BOP to take manual control of PCV-910 and close it.
	BOPO	Monitor RCS T-cold.
	ATCO	Monitor and control RCS parameters.
	CRS	Notify Work Week Manager or I&C of the failure of PT-910.

Scenario No: 2009-3 Revision: 1 Event No.: 5 Page 6 of 10

Event Description: Volume Control Tank Level Instrument, LT-219, Fails Low **- Tech Spec Entry**

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to alarm.
	ATCO	Report VCT Level Transmitter, LT-219 has failed low.
	ATCO	Check that LCV-218-1 VCT inlet valve is aligned to the VCT.
	ATCO	Verify Pressurizer Level.
	CRS	Enter Technical Specification 2.15. Enter a 7 day LCO because LI-219 on AI-185 is inoperable and there are no operable VCT channels on Alternate Shutdown Panel AI-185. This is a 7 day LCO or else be in hot shutdown within 12 hours.
	CRS	Report Instrument Failure to the Work Week Manager.

Scenario No: 2009-3 Revision: 1 Event No.: 6 Page 7 of 10

Event Description: Controlling Pressurizer Level Channel Fails Low.

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to "PZR Pressure Off Normal Hi-Lo Channel Y" alarm on CB-1,2,3 A4.
	ATCO or BOPO	Refer to ARP.
	ATCO	Identify deviation between pressurizer pressure channels.
	CRS	Direct PRI to swap controlling channels or to take manual control of pressurizer pressure.
	ATCO	Switch controlling channel to channel 103X or take manual control of pressurizer pressure.
	ATCO	Monitor and maintain proper pressurizer pressure.

Scenario No: 2009-3 Revision: 1 Event No.: 7 Page 8 of 10

Event Description: Turbine high vibration.

Time	Position	Applicant's Actions or Behavior
	ATCO or BOPO	Respond to plant computer alarm for high turbine vibration.
	BOPO	Report recorder indication of rising vibration on bearing #6, 7 mills and rising.
	CRS	Enter AOP-26.
	BOPO	Report vibration greater than 8 mills.
	CRS	Direct power reduction.
	BOPO	Reduce turbine load.
	ATCO	Control reactivity during load reduction.
	BOPO	Report turbine vibration rising.
	CRS	May direct ATCO to trip the reactor.
	ATCO	Trip Reactor, if directed.

Scenario No: 2009-3	Revision: 1	Event No.: 8	Page 9 of 10

Event Description: Turbine Trip, Reactor Fails to Trip - ATWS.

Time	Position	Applicant's Actions or Behavior
	ATCO	Report that Reactor did not trip.
	ATCO and BOPO	Manually trip the reactor at: • CB-4. • AI-31. • AI-66A/B. • Open breakers at AI-57. Within 60 seconds after determining reactor did not trip.
	CRS	Enter EOP-00 and direct ATCO and BOPO to perform Standard Post Trip Actions.
	ATCO	Report that two CEAs have not inserted.
	CRS	Direct Emergency Boration.
	ATCO	Performs Emergency Boration: • Ensure FCV-269X/Y Closed. • Open HCV-268/265/258. • Start Boric Acid Pumps, CH-4A/B. • Start all charging pumps, CH-1A/B/C. • Close LCV-218-2/3 and HCV-257/264. Complete steps within 3 minutes of determining two CEAs have not inserted.
	ATCO	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate. • Monitors for uncontrolled Cooldown.
	BOPO	• Verify turbine and generator trip.
	BOPO	• Verify electrical status – 4160, D/G, instrument power, 125V DC. • Verify Instrument air status.
		Continued on next page

Scenario No: 2009-3 Revision: 1 Event No.: 8, cont. Page 10 of 10

Event Description: Turbine Trip, Reactor Fails to Trip - ATWS, continued

Time	Position	Applicant's Actions or Behavior
	ATCO	• Verify CCW and Raw water status. • Verify RCS inventory control. • Verify RCS pressure control - reports RCS pressure. • Verify core heat removal.
	BOPO	• Verify S/G feed . • Verify S/G pressure and T-cold.
	ATCO	• Verify containment conditions.
		Scenario ends with Standard Post Trip Actions completed and Emergency Boration in progress.

Facility: Fort Calhoun	Scenario No: 2009-4	Revision: 1
Examiners: _____ _____ _____	Operators: _____ _____ _____	
Initial Conditions: 50% Power, FW-54 Out of Service, FW-4A and FW-4C Out of Service.		
Turnover: Maintain 50% operation.		

Event No.	Malf No.	Event Type*	Event Description
1 (2 min)		N-ATCO	Rotate CCW Pumps.
2 (10 min)		N-BOPO	Rotate Auxiliary Building Supply Fans.
3 (17 min)		I-ATCO TS-CRS	Pressurizer Pressure Safety Channel fails Low - **Tech Spec Entry.**
4 (25 min)		I - ATCO	Letdown Temperature Transmitter, TT-2897 fails low.
5 (34 min)		C - ATCO TS-CRS	RCP Seal Cooler Leak - **Tech Spec Entry.**
6 (45 min)		C - BOPO M-ALL	Feedwater Pump Trips, Reactor Trip.
7		C-BOPO	Blowdown fails to isolate automatically.
8 (52 min)		C-BOPO M - ALL	Pipe from EFWST to FW-6 and FW-10 breaks. Total Loss of Feedwater.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	6
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	2
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	2
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Scenario No: 2009-4 Revision: 1 Event No.: 1 Page 2 of 9

Event Description: Rotate CCW Pumps.

Time	Position	Applicant's Actions or Behavior
	CRS	Directs ATCO to switch operating CCW pump from Pump AC-3A to Pump AC-3C.
	ATCO	Obtains and reviews Procedure OI-CC-1, Attachment 2.
	ATCO	Directs EONT to Room 69.
	ATCO	Starts pump AC-3C and directs closure of Valve AC-102 (Pump AC-3A discharge valve).
	ATCO	Stops pump AC-3A and takes hand switch to pull-to-lock.
	ATCO	Ensures proper operation of pump AC-3C. Directs EONT to reopen Valve AC-102.

Scenario No: 2009-4 Revision: 1 Event No.: 2 Page 3 of 9

Event Description: Rotate Auxiliary Building Supply Fans

Time	Position	Applicant's Actions or Behavior
	CRS	Direct BOPO to rotate AB Controlled area supply fans. Start VA-35B and shutdown VA-35A.
	BOPO	Obtain a copy of OI-VA-2 Attachment 1C.
	BOPO	Place HC-828A, Supply Fan VA-35B Mode Selector Switch to MANUAL.
	BOPO	Place HC-827A, Supply Fan VA-35A Mode Selector Switch to MANUAL.
	BOPO	Using HC-827B raise/lower pushbuttons, lower VA-35A fan speed to 0%. (Note: this step and the next step can be performed simultaneously.)
	BOPO	Using HC-828B raise/lower pushbuttons, raise VA-35B fan speed until building pressure matches setpoint.
	BOPO	Place HC-828A to AUTO.
	BOPO	Verify the building pressure stabilizes at a nominal -0.2 inches of water or desired setpoint.

Scenario No: 2009-4 Revision: 1 Event No.: 3 Page 4 of 9

Event Description: Pressurizer Pressure Safety Channel fails Low - **Tech Spec Entry**

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to "PRESSURIZER SAFETY INJ SIGNAL LO-LO PRESSURE C/P102Y" alarm.
	ATCO or BOPO	Refer to ARP.
	ATCO	Check redundant channels and report instrument failure.
	CRS	Enter Technical Specification 2.15. The Thermal Margin/ Low Pressure channel must be bypassed within one hour. The channel may be bypassed for up to 48 hours, after that it must be placed in the tripped position.
	CRS	Direct the ATCO to bypass channel "C" TM/LP trip unit.
	ATCO	Place channel "C" TM/LP trip unit in bypass.

Scenario No: 2009-4 Revision: 1 Event No.: 4 Page 5 of 9

Event Description: Temperature Transmitter, TT-2897 fails low.

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to "Letdown Heat Exchanger Tube Outlet Temp HI" Alarm.
	ATCO	Determine that TCV-211-2 has repositioned to bypass demineralizers.
	ATCO	Determine high temperature due to reduced CCW flow to letdown heat exchanger following closure of TCV-2897.
	CRS	Direct ATCO to manually control CCW flow to letdown HX using TCV-2897.
	ATCO	Manually control TCV-2897to restore letdown temperature.
	SRO	May direct ATCO to reposition TCV-211-2 and maintain 100°F – 120°F.
	ATCO	Reposition TCV-211-2 if directed.
	ATCO	Monitor primary parameters.
	BOPO	Monitor secondary parameters.

Scenario No: 2009-4 Revision: 1 Event No.: 5 Page 6 of 9

Event Description: RCP Seal Cooler Leak - **Tech Spec Entry.**

Time	Position	Applicant's Actions or Behavior
	ATCO	Respond to "Water from Seal Cooler RC-3B Seal Cooler Temperature High" alarm.
	ATCO	Identify and communicate lowering pressurizer level and pressure and lowering letdown flow.
	ATCO	Report RM-053 (CCW HI RAD) in alarm. Report CCW surge tank level and pressure rising.
	ATCO	Enter ARP. Check CCW temperature from RC-3B seal cooler. Adjust CCW flow as needed.
	CRS	Enter AOP-22. Direct Shift Chemist to perform a rapid activity analysis.
	CRS/ ATCO	Determine the RCS leak rate to be approximately 15 gpm.
	CRS	Direct Shift Chemist to verify primary to secondary leakrate.
	CRS	Enter Technical Specification 2.1.4. Identified RCS leakage is greater than 10 gpm. Reduce leakage to within limits within 4 hours or else be in hot shutdown within an additional 6 hours and be in cold shutdown within 36 hours.
	CRS	May direct ATCO to isolate letdown and charging.
	ATCO	Isolate letdown and charging, if directed, and check leakage rate.
	CRS/ ATCO	Restore charging and letdown if isolated.
	CRS	Refer to Attachment A, Leak Location Guide, determine leak is to CCW.
	CRS	Direct plant shutdown using either OP-5 or AOP-05.

Scenario No: 2009-4 Revision: 1 Event No.: 6, 7 Page 7 of 9

Event Description: Feedwater Pump Trips, Reactor Trip, Blowdown fails to isolate automatically.

Time	Position	Applicant's Actions or Behavior
	BOPO	Detrmine that the running Feedwater Pump has tripped.
	CRS	Direct the ATCO to manually trip the reactor.
	ATCO	Manually Trip the reactor.
	CRS	Enter EOP-00, "STANDARD POST TRIP ACTIONS" and direct ATCO and BOPO to perform Standard Post Trip Actions.
	ATCO	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate. • Monitors for uncontrolled Cooldown.
	BOPO	• Verify turbine and generator trip.
	BOPO	• Verify electrical status – 4160, D/G, instrument power, 125V DC. • Verify Instrument air status .
	ATCO	• Verify CCW and Raw water status. • Verify RCS inventory control. • Verify RCS pressure control - reports RCS pressure. • Verify core heat removal.
	BOPO	Determines DCS has not throttled blowdown flow, manually isolates blowdown by closing HCV-1387A/B and HCV-1388A/B within 15 minutes of feedwater pump trip.
	BOPO	• Verify S/G feed - Initiate AFW flow. • Verify S/G pressure and T-cold.
	ATCO	• Verify containment conditions.
	CRS	Performs diagnostic actions and enters EOP-03, "LOSS OF COOLANT ACCIDENT."

Scenario No: 2009-4 Revision: 1 Event No.: 8 Page 8 of 9

Event Description: Pipe from EFWST to FW-6 and FW-10 breaks. Total Loss of Feedwater.

Time	Position	Applicant's Actions or Behavior
	BOPO	Reports loss of AFW Flow.
	CRS	Transitions to EOP-20, "FUNCTIONAL RECOVERY PROCEDURE."
	CRS	Directs ATCO to trip all Reactor Coolant Pumps.
	ATCO	Trips all Reactor Coolant Pumps within 10 minutes of a total loss of feedwater being diagnosed.
	ATCO	Monitor for establishment of natural circulation: • Delta-T less than 50°F. • Difference between CETs and T-hot less than 10°F. • T-hot and T-cold stable or lowering. • At least 20°F subcooling.
	CRS	Direct BOPO to establish Condensate pump feed to the Steam Generators.
	BOPO	Establish condensate pump feed to the Steam Generators: • Place all FW Pump Control Switches in Pull-To-Lock. • Direct EONT to open All FW Pump discharge valves. • Ensure FW Pump Recirc valves are closed. • Start All FW Pump Lube Oil Pumps. • Reduce Steam Generator Pressure. • Direct EONT to ensure FCV-1172 is closed.
	ATCO	Maintain pressurizer pressure and level.
	BOPO	When S/G pressure is less than 550 psig: • Block SGLS. • Ensure HCV-1385 and HCV-1386 are open. • Ensure HCV-1103 and HCV-1104 are closed. • Reduce pressure to achieve flow through FW bypass Valves, HCV-1105 and HCV-1106.
		Continued on next page

Scenario No: 2009-4 Revision: 1 Event No.: 8, cont Page 9 of 9

Event Description: Pipe from EFWST to FW-6 and FW-10 breaks. Total Loss of Feedwater, continued:

Time	Position	Applicant's Actions or Behavior
		NOTE: The next two steps are expected only if Wide Range Level in both Steam Generators falls below 27%.
	CRS	IF WR Level in both S/Gs falls below 27%, THEN go to EOP-20, HR-4 and initiate Once through Cooling.
	BOPO	IF directed to initiate Once through cooling then: • Deenergize all pressurizer heaters. • Initiate PPLS using test switches. • Ensure HPSI pumps running and injection valves open. • Ensure PORV Block valves are open. • Open both PORVs.
		Scenario ends with the Steam Generators being fed by the Condensate Pumps or with Once Through Cooling Established.