



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR1

2017I AR1

GGNS

2017I NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAR1

JPM Title: Determine Primary
Containment Water Level

Facility Number: GJPM-OPS-AUDIT 2015AR2

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 10 min

Prepared By:	Michael Rasch
	Exam Developer Date
Ops Review:	Robert Brinkman
	1 st Validation by Ops Rep or Ops Validation Crew Date
Validated By:	Benny White \ Chase Miller
	2 nd Validation by Ops Validation Crew Date
Approved By:	
	Project Lead or Exam Team Lead Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR1

Determine Primary Containment Water Level

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 10 Min
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Setting: Classroom
Type: RO/SRO
Task: CRO-EP-EMERGENCY-29
K&A: Generic 2.4.21: 4.0/4.6
Safety Function: Generic - Conduct of Operations
PRA Applicability: No
10CFR 55.45(a) (4); (12)
Performance: Perform
Reference(s): 05-S-01-EP-1 Rev. 36, Attachment 29, Primary Containment Water Level Determination
Handout(s): SPDS Display (ATTACHED)
1H13-P601-21B Section (ATTACHED)
05-S-01-EP-1, Attachment 29, Primary Containment Water Level Determination
Manipulations: N/A
Critical Steps: 1
ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- None

Safety Concerns:

- None



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JPM Number: GJPM-OPS-2017IAR1

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- A LOCA has occurred
- Suppression Pool water level indication is off-scale high
- RCIC is shutdown
- RCIC Suction is aligned to the Suppression Pool

Initiating Cue(s):

- Control Room Supervisor has directed you to determine primary containment water level using EP Attachment 29
- Use the given images for current plant indications



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Determine Primary Containment Water Level

Notes to Evaluator:

- None

Task Overview: (Detailed description of task)

Using EP Attachment 29 and the attached images to obtain RCIC Suction Pressure and Containment Pressure, determine Primary Containment Water Level from the Delta Pressure to Ctmt Level Conversion Table, EP Attachment 29 Table 1.

This task would be performed post event when Suppression Pool Level Instruments and Containment Water Level Instruments are not working to determine Primary Containment Water Level.

Tasks: Critical steps are underlined, italicized, and denoted by an (*)

Note: Steps are not sequence critical. Applicant will have to obtain information and complete calculations.

Step 1: 05-S-01-EP-1, Att. 29, Step 2.1 - 2.3

☐ Determines from turnover information that steps 2.1 through 2.3 are complete.

Standard: Determined from turnover information that steps 2.1 through 2.3 are complete.

Cue: None

Notes: None

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Step 2: 05-S-01-EP-1, Att. 29, Step 2.4

- ☐ Obtain RCIC PMP SUCT PRESS (E51-R604 on 1H13-P601).

Standard: Using the given photo of 1H13-P601-21B, applicant located the correct indicator (E51-R604) and determined it is indicating 15 psig. Applicant also records 15 psig on Attachment 29 step 2.4.

Cue: None

Notes: None

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Step 3: 05-S-01-EP-1, Att. 29, Step 2.5

- ☐ Obtain Containment pressure (psig) from SPDS or Post Accident recorders on 1H13-P870.

Standard: Applicant determined Containment Pressure indicated on the SPDS display from image 2 is 2.2 psig and records it on EP Attachment 29 step 2.5.

Cue: None

Notes: None

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Step 4: 05-S-01-EP-1, Att. 29, Step 2.6

☐ Subtract Containment pressure from RCIC suction pressure (Delta Pressure).

Standard: Applicant determined Delta Pressure to be 12.8 psid by subtracting Containment Pressure recorded in step 2.5 from RCIC Pump Suction Pressure recorded in step 2.4 and records it in step 2.6

Cue: None

Notes: 15 psig - 2.2 psig = 12.8 psid

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Step 5: 05-S-01-EP-1, Att. 29, Step 2.7

☐* *Determine Containment level, using pressure obtained in Step 2.6 and Table 1.*

Standard: Applicant determined Primary Containment water level using EP Attachment 29 Table 1 by moving down the Delta Pressure whole number column to 12 and then to the right to the 0.8, Tenths of Pound Delta Pressure column, which lists Containment Level as 35.5 feet.(+/- 0.3 feet)

Cue: None

Notes: None

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Task Standard(s):

Primary Containment water level using containment pressure, RCIC suction pressure and 05-S-01-EP-1 Attachment 29 determined to be **35.5 Feet (± 0.3 Feet)**.

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Remember to record stop time



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Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- A LOCA has occurred
- Suppression Pool water level indication is off-scale high
- RCIC is shutdown
- RCIC Suction is aligned to the Suppression Pool

Initiating Cue(s):

- Control Room Supervisor has directed you to determine primary containment water level using EP Attachment 29
- Use the given images for current plant indications

EP-2	RPV NR LEVEL	-15.0 IN	RPV PRESSURE	+8.2 PSIG	DRYWELL PRESSURE	+5.49 PSIG	SCRAM STATUS	SCRAM	EP-2A ATWS	+0 RODS	REACTOR POWER	+0.0 %	HCTL	HDOL
	SUPP POOL TEMP	+112 F	DRYWELL TEMP	+224 F	CTMT TEMP	+99 F	DRYWELL PRESSURE	+5.49 PSIG	SUPP POOL LEVEL	+25.50 FT	HYDROGEN CONC	NOT HIGH	RPVST	
EP-3	FHA DIFF PRESSURE	NOT HIGH	AREA TEMP	NOT HIGH	HVAC EXH RAD LEVEL	NOT HIHI	AREA RAD LEVEL	NOT HIGH	AREA WATER LEVEL	NOT HIHI	EFFLUENT RAD DATA	AVAILABLE	CSIPL	
													PSP	

NR

WR

RPV PRESS

+8.2 PSIG

RPV LEVEL

-15.0 IN

+60.0 IN

FZ LEVEL

-17.4 IN

RX PWR

+0.0 %

WITHDRAWN

+0 RODS

DRYWELL

+224 F

+5.49 PSIG

+0.0 %H2

+3.3 R/HR

CONTAINMENT

+99 F

+2.20 PSIG

+0.0 %H2

+1.0 R/HR

FW A

+0.0 ML B/HR

FW B

+0.0 ML B/HR

HPCS

+0 GPM

LPCS

+0 GPM

RHR A

+0 GPM

RHR B

+0 GPM

RHR C

+0 GPM

RCIC

+0 GPM

REFRESH SPDS

RESTART SPDS

SUPP POOL

+112 F

+25.50 FT

E5I-R602

E5I-R605

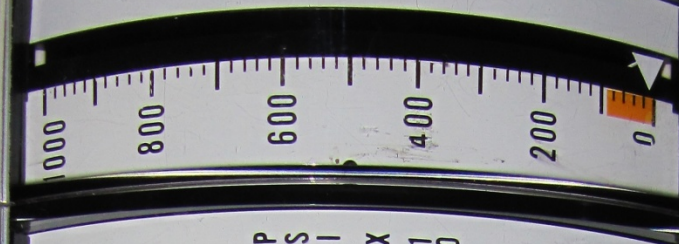
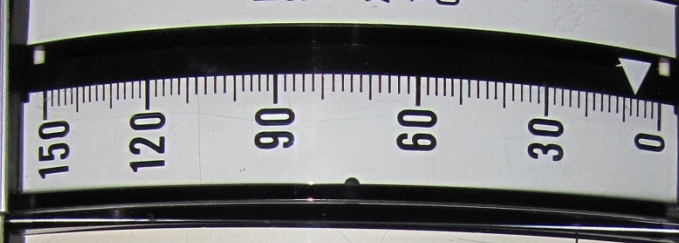
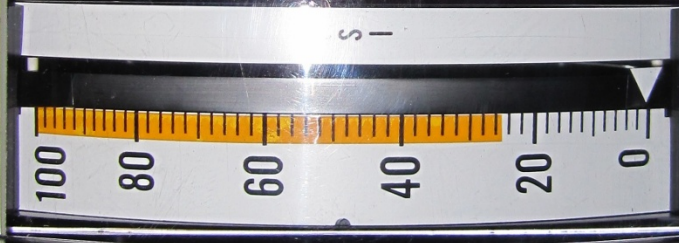
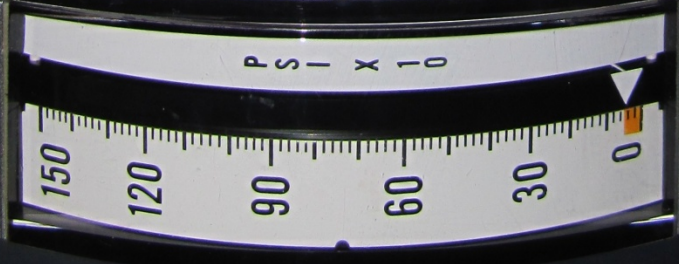
E5I-R603

E5I-R604

E5I-R601

E5I-R606

FLOW



SUPP STM PRESS

RCIC TURB
SPEED

EXH PRESS

SUCT PRESS

RCIC PMP
DISCH PRESS

DISCH FLO



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR2

2017I AR2

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2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAR2

JPM Title: Perform AC Lineup
Surveillance

Facility Number: GJPM-RO-ADM-1A

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input checked="" type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch
	Exam Developer Date
Ops Review:	Robert Brinkman
	1 st Validation by Ops Rep or Ops Validation Crew Date
Validated By:	Benny White \ Chase Miller
	2 nd Validation by Ops Validation Crew Date
Approved By:	
	Project Lead or Exam Team Lead Date



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JPM Number: GJPM-OPS-2017IAR2

Perform AC Lineup Surveillance

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 Min
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Setting: Classroom
Type: RO/ SRO
Task: CRO-R20/27-NORMAL-8
K&A: Generic 2.1.31 (4.6/4.3); 2.2.12 (3.7/4.1); 2.1.20 (4.6/4.6)
Safety Function: Generic - Conduct of Operations
PRA Applicability: No
10 CFR55.45(a) (12); (13)
Performance: Perform
Reference(s): 06-OP-1R20-W-0001 Rev. 109, Plant AC and DC Electrical
Power Distribution Weekly Lineup
Handout(s): 06-OP-1R20-W-0001 marked with Radiation Protection Review
Calculator
Manipulations: N/A
Critical Steps: 1
ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- Setup Simulator in **IC - 1**
- **Place** Division 3 Diesel Generator in Maintenance remote function **p81059**

Safety Concerns:

- None



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JPM Number: GJPM-OPS-2017IAR2

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is operating at rated conditions
- Division 3 Diesel Generator has been declared Inoperable
- LCO has been initiated for Tech Spec 3.8.1 Action B
- Reason for declaring Division 3 Diesel Generator is not a common cause failure

Initiating Cue(s):

- Control Room Supervisor has directed you to perform 06-OP-1R20-W-0001 Attachment II for current conditions
- Contact the evaluator for readings not provided in the control room



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JPM Number: GJPM-OPS-2017IAR2

Perform AC Lineup Surveillance

Notes to Evaluator:

When applicant is contacting Jackson Dispatcher roll play to give applicant the appropriate information. (Listed in JPM)

JPM should be performed in the Simulator which replicates plant conditions.

Task Overview: (Detailed description of task)

This task is performed any time a diesel generator is declared inoperable.

Surveillance 06-OP-1R20-W-0001 Plant AC and DC Electrical Power Distribution Weekly Lineup is performed to verify electrical distribution for Tech Specs 3.8.1; 3.8.2; 3.8.7 and 3.8.8.

Attachment I is the normal full surveillance.

Attachment II is performed to meet Surveillance Requirement SR3.8.1.1.



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Tasks: Critical steps are underlined, italicized, and denoted by an (*)

Sequence of Attachment II is NOT Critical.

Step 1: 06-OP-1R20-W-0001 Attachment II
Data Sheet I

☐* Perform 06-OP-1R20-W-0001 Attachment II Data Sheet I.

Standard: Attachment II Data Sheet I completed

Cue: When contacted as Jackson Dispatcher, cue applicant Entergy Mississippi
Grid voltage is 502.5 KV.

When contacted as Jackson Dispatcher, the grid offsite feeders from Baxter Wilson,
Franklin and 115 KV transmission lines are independently energized.

Notes: Applicant may want to use Dispatcher Phone. Just have the applicant ask
the questions about indications.

SEE EVALUATOR COPY of Attachment II for highlighted Critical readings.

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JPM Number: GJPM-OPS-2017IAR2

Task Standard(s):

Applicable portions of Plant AC Electrical Power Distribution Weekly Lineup Surveillance 06-OP-1R20-W-0001 Attachment II are completed and any discrepancies noted.

(See Evaluator Copy Highlighted sections for critical items)

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Remember to record stop time



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR2

Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- Plant is operating at rated conditions
- Division 3 Diesel Generator has been declared Inoperable
- LCO has been initiated for Tech Spec 3.8.1 Action B
- Reason for declaring Division 3 Diesel Generator is not a common cause failure

Initiating Cue(s):

- Control Room Supervisor has directed you to perform 06-OP-1R20-W-0001 Attachment II for current conditions
- Contact the evaluator for readings not provided in the control room

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Attachment II	Page 2 of 4

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**EVALUATOR
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DATA SHEET I
PLANT AC AND DC ELECTRICAL POWER DISTRIBUTION
WEEKLY LINEUP
SAFETY RELATED

(Step 5.2.2)

Div 1, 2 & 3 Offsite Feeders

	OFFSITE FEEDER	ENERGIZED YES/NO	VOLTAGE INDICATOR (LOCATION)	RECORDED VOLTAGE (ACCEPTANCE CRITERIA)	FREQUENCY INDICATOR (LOCATION)	RECORDED FREQUENCY (ACCEPTANCE CRITERIA)	INITIALS
\$	BAXTER WILSON	* YES	JACKSON DISPATCHER	502.5 kV	500 kV FREQ. SR27-SR-R600 (H13-P807) or Pine Bluff Dispatcher	60.0 Hz	Applicant initials
\$	FRANKLIN	* YES		(496-525kV)***		(58.5-61.8Hz)	
\$	115kV LINE PORT GIBSON	* YES	** 152-1511 152-1611 152-1704	4.25×27.64 = 117.5 kV (120.75- 112.13) kV	(4.06 - 4.36)		Applicant initials

* To determine status of offsite feeders, **CONTACT** load dispatcher. Ensure that the feeders are independently energized from the grid, such that the loss of one feeder would **NOT** result in the loss of another.

** To determine voltage of the Port Gibson 115kV line, record ESF 12 incoming voltage at Bus 15AA, 16AB **OR** 17AC placing the Sync switch for the designated breaker to ON. **MULTIPLY** this reading by 27.64 for equivalent feeder voltage. **RETURN** Sync switch to OFF after taking reading.

*** Allowable Value of minimum voltage is ≥ 491 kV for operability of Offsite Feeders. This value is based on analysis of the Class 1E ESF buses **AND** includes an allowance for instrument uncertainty associated with the voltage measurement in the switchyard. Extended operation beyond the normal continuous operating limits Should be evaluated **AND** caution Should be taken when starting large loads under these conditions.

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DATA SHEET I (Continued)
PLANT AC AND DC ELECTRICAL POWER DISTRIBUTION
WEEKLY LINEUP
SAFETY RELATED

BREAKER	REQUIRED POSITION	ACTUAL POSITION	INITIALS	COMMENTS	INSTRUMENT (LOCATION)	RECORDED VOLTAGE ACCEPTANCE CRITERIA
Service Transformer 11 - Bus 11R to ESF 15AA, 16AB & 17AC						
\$ 552-1105	Closed	CLOSED	Applicant initials		34.5kV Bus 11R Volts	A-B = 35.1 (±0.5)(1) B-C = 35.1 (±0.5)(1) C-A = 35.1 (±0.5)(1)
\$ 552-1104	Closed	CLOSED	Applicant initials		1R25-EI-R603 (H13-P807-1B)	(31.05-37.95kV)
\$ 152-1901	Closed	CLOSED	Applicant initials		Bkr 152-1514 Inc Voltage	* 4250 (±100) (3952-4576)
					Bkr 152-1601 Inc Voltage	* 4150 (±100) (3952-4576)
\$ 152-1902	Closed	CLOSED	Applicant initials		Bkr 152-1706 Inc Voltage	* 4200 (±100) (3952-4576)

* **Note:** For these breakers **VERIFY** voltage is available to the ESF Bus by placing the Sync switch on 1 H13-P864 **OR** 1H13-P601 for the designated breaker to ON **AND RECORDING** incoming voltage. **RETURN** Sync switch to OFF after taking reading.

- (1) Voltage indication from 1R25-EI-R603 is **NOT** required to meet Tech Spec acceptance criteria. Voltage indication is met by acceptable incoming voltage for breakers 152-1514, 152-1601, **AND** 152-1706. **SELECT** phase of bus to be monitored by use of the voltage select switch. **INSURE** voltage select switch is **NOT** left in OFF.

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DATA SHEET I (Continued)
PLANT AC AND DC ELECTRICAL POWER DISTRIBUTION
WEEKLY LINEUP
SAFETY RELATED

(Step 5.2.2)

BREAKER	REQUIRED POSITION	ACTUAL POSITION	INITIALS	COMMENTS	INSTRUMENT (LOCATION)	RECORDED VOLTAGE ACCEPTANCE CRITERIA
Service Transformer 21 - Bus 21R to ESF 15AA, 16AB & 17AC						
\$ 552-2105	Closed	CLOSED	Applicant initials		34.5kV Bus 21R Volt	A-B = 36.0 (±0.5)(1) B-C = 36.0 (±0.5)(1) C-A = 36.0 (±0.5)(1)
\$ 552-2104	Closed	CLOSED	Applicant initials		2R25-EI-R603 (H13-P807-4B)	(31.05-37.95kV)
\$ 152-2901	Closed	CLOSED	Applicant initials		Bkr 152-1501 Inc Voltage	* 4250 (±100) (3952-4576)
					Bkr 152-1614 Inc Voltage	* 4100 (±100) (3952-4576)
\$ 152-2902	Closed	CLOSED			Bkr 152-1705 Inc Voltage	* 4200 (±100) (3952-4576)
115 kV Line to ESF 15AA, 16AB & 17AC						
\$ J3885	Closed	CLOSED	Applicant initials		N/A	N/A
\$ 152-1903	Closed	CLOSED	Applicant initials		Bkr 152-1511 Inc Voltage	* 4250 (±100) (3952-4576)
					Bkr 152-1611 Inc Voltage	* 4100 (±100) (3952-4576)
\$ 152-1904	Closed	CLOSED	Applicant initials		Bkr 152-1704 Inc Voltage	* 4200 (±100) (3952-4576)

* **Note:** For these breakers **VERIFY** voltage is available to the ESF Bus by placing the Sync switch on 1H13-P864 **OR** 1H13-P601 for the designated breaker to ON **AND RECORDING** incoming voltage. **RETURN** Sync switch to OFF after taking reading.

- (1) Voltage indication from 2R25-EI-R603 for Bus 21R is **not** required to meet Tech Spec acceptance criteria. Voltage indication is met by acceptable incoming voltage for breakers 152-1501, 152-1614, **AND** 152-1705. **SELECT** phase of bus to be monitored by use of the voltage select switch. **INSURE** voltage select switch is **NOT** left in OFF.

ACCEPTANCE CRITERIA	REFERENCE TECHNICAL SPECIFICATION REQUIRED ACTION(S) IF ACCEPTANCE CRITERIA NOT MET FOR:
SR 3.8.1.1 - Mode 1, 2, 3 - two of the above circuits between the offsite transmission network AND the onsite Class 1E distribution system are Operable; correct breaker lineup AND power available.	LCO 3.8.1 - Condition A, C, D



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JPM Number: GJPM-OPS-2017IAR3

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2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAR3

JPM Title: Determine Tagging Requirements

Facility Number: GJPM-OPS-AAD04

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 30 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR3

Determine Tagging Requirements

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 30 Min
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Setting: Classroom
Type: RO/SRO
Task: CRO-ADMIN-ADMIN-5
K&A: Generic 2.2.13 (4.1/4.3); 2.2.41 (3.5/3.9)
Safety Function: Generic - Equipment Control Generic
PRA Applicability: No
10CFR 55.45(a) (12)
Performance: Perform
Reference(s): 04-1-01-E21-1 SU, Rev 41
EN-OP-102, Rev 19
EN-OP-102, Rev 11
E1182-007, Rev. 4
M0187, Rev. 34 & M1096, Rev. 22
Handout(s): 04-1-01-E21-1 SU, Rev 41
EN-OP-102, Rev 19
EN-OP-102, Rev 11
GGNS Electrical Drawings (E1182-007)
GGNS Piping & Instrumentation Drawings (M0187 & M1096)
Manipulations: N/A
Critical Steps: 2
ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- None

Safety Concerns:

- None



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JPM Number: GJPM-OPS-2017IAR3

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is in Mode 4
- Low Pressure Core Spray (LPCS) Jockey Pump is to be replaced

Initiating Cue(s):

- Control Room Supervisor directs you to prepare a Tagout Tags Sheet using EN-OP-102-01 Attachment 9.3 (provided) to de-energize and mechanically isolate all water sources to the LPCS Jockey Pump
- For the purpose of this task:
 - Do not include vent and drain path tags (They will be No Tagged.)
 - Do not use the main suction and discharge piping for the LPCS pump (e.g. do not use components on 14 inch piping or greater)
 - Only consider the isolation of the jockey pump when selecting components to tag (e.g. do not rack out the LPCS pump breaker)
 - Double isolations are not required
 - Restoration configuration is not required
 - Next sequential tag serial number is "1"
 - Include Placement sequence
 - Include Placement configuration
 - include Tag type

Complete the shaded sections of Applicant Copy of EN-OP-102-01 Attachment 9.3



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JPM Number: GJPM-OPS-2017IAR3

Determine Tagging Requirements

Notes to Evaluator:

- This is an Administrative JPM and can be performed in a classroom.

Task Overview: (Detailed description of task)

This task is to use facility electrical and mechanical drawings to determine the protective tagging boundaries for a task.

Reactor Operators perform the duties of tagout preparers to determine and review boundaries.



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JPM Number: GJPM-OPS-2017IAR3

Critical steps are underlined, italicized, and denoted by an (*)

Sequence is NOT Critical.

Low Pressure Core Spray System (E21) System Operating Instructions 04-1-01-E21-1 SU
References identify the Electrical Drawings as E-1182 and P&ID as M-1087.

Step 1: E-1182 Electrical Drawings for E21
System

☐ Locate the drawing for LPCS Jockey Pump. (E-1182-007).

Standard: Electrical drawing for LPCS Jockey Pump located.

Cue: None

Notes: E-1182-00 is the Index print for the set of drawings.

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Step 2: E-1182-007 Electrical Drawings for
E21 Jockey Pump E21-C002

- ☐ Identify circuit breaker associated with LPCS Jockey Pump (E21-C002) 52-151108 and control Room handswitch E21-HS-M611.

Standard: Circuit breaker 52-151108 and handswitch E21-HS-M611 identified as electrical isolation boundaries for LPCS Jockey Pump.

Cue: None

Notes:

Applicant may also refer to the 04-1-01-E21-1 System Operating Instruction Electrical lineup checksheet Attachment III for the circuit breaker identification.

There is no space heater associated with this motor.

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Step 3: M-1087 Mechanical Drawings
(P&ID) for E21 System

- ☐ Identify isolation boundaries associated with the piping side of the LPCS Jockey Pump using P&ID M-1087.

Standard: Valve isolation boundaries identified.

Cue: None

Notes: See attached Evaluator Copy of Tagout Tags sheet.

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Step 4: EN-OP-102 5.3(2)(f)/Att. 9.2

☐* The applicant must determine minimum Tagout boundaries to include:

- ☐* E21-F032 (LPCS Jockey Pump Suction)
- ☐* E21-F034 (LPCS Jockey Pump Disch Stop Check)
- ☐* E21-F035 (LPCS Jockey Pump Minimum Flow)
- ☐* E21-FX020 (Supp Pool Level Transmitters Fill)
- ☐* 52-151108 (LPCS JKY PMP circuit breaker)
- ☐* E21-HS M611 (LPCS JKY PMP handswitch)

Standard: Appropriate boundaries determined.

Cue: None

Notes: See Attached Evaluator Copy for details.

Component Noun Name descriptions are not required to be exact.

SAT / UNSAT

Step 5: EN-OP-102 5.3[4]

☐* Complete the Tagout Tags Sheet EN-OP-102-01 Attachment 9.3.

Standard: See Evaluator Copy of EN-OP-102-01 Attachment 9.3.

Cue: None

Notes: EN-OP-102, Attachment 9.2, section 8.0 contains the Tagging Sequence guidance.

JPM is complete when applicant completes the Tagout Tags Sheet EN-OP-102-01, Attachment 9.3.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR3

Task Standard(s):

All required isolations are identified and correctly documented on the Tagout Tags Sheet in accordance with EN-OP-102. **(SEE Evaluator Copy)**

SAT / UNSAT


Remember to record stop time



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR3

Follow-Up Questions & Answers:

Comments:

	NUCLEAR MANAGEMENT MANUAL	NON-QUALITY RELATED	EN-OP-102-01	REV. 11
		INFORMATIONAL USE	PAGE 11 OF 13	

EVALUATOR COPY

Protective and Caution Tagging Forms & Checklist

ATTACHMENT 9.3

TAGOUT TAGS SHEET

 Clearance: MANUAL

 Tagout: XXX

Tag Serial No.	Tag Type	Equipment Equipment Description Equipment Location	Place. Seq.	Placement Configuration	Place. 1st Verif Date/Time	Place. 2nd Verif Date/Time	Rest. Seq.	Restoration Configuration	Rest. 1st Verif Date/Time	Rest. 2nd Verif Date/Time	Placement/ Removal Tag Notes
1	<u>Danger</u> *	* <u>E21-HS-M611</u> LPCS JKY PMP Handswitch 1H13-P601	<u>*1</u>	* <u>NEUT after</u> <u>STOP</u>							
2	<u>Danger</u> *	* <u>52-151108</u> LPCS JKY PMP Circuit breaker E21-C002 15B11	<u>*2</u>	* <u>OPEN</u>							
3	<u>Danger</u> *	* <u>E21-F034</u> LPCS Jockey Pump Disch Stop Check Area 9 Elevation 93'	<u>*3</u>	* <u>CLOSED</u>							
4	<u>Danger</u> *	* <u>E21-F032</u> LPCS Jockey Pump Suction Area 9 Elevation 93'	<u>*4</u>	* <u>CLOSED</u>							
5	<u>Danger</u> *	* <u>E21-F035</u> LPCS Jockey Pump Minimum Flow Area 9 Elevation 93'	<u>*5</u>	* <u>CLOSED</u>							
6	<u>Danger</u> *	* <u>E21-FX020</u> Supp Pool Level Transmitters Fill Area 9 Elevation 93'	<u>*5</u>	* <u>CLOSED</u>							

Give this page to the applicant

Initial Condition(s):

- Plant is in Mode 4
- Low Pressure Core Spray (LPCS) Jockey Pump is to be replaced

Initiating Cue(s):

- Control Room Supervisor directs you to prepare a Tagout Tags Sheet using EN-OP-102-01 Attachment 9.3 (provided) to de-energize and mechanically isolate all water sources to the LPCS Jockey Pump
- For the purpose of this task:
 - Do not include vent and drain path tags (They will be No Tagged.)
 - Do not use the main suction and discharge piping for the LPCS pump (e.g. do not use components on 14 inch piping or greater)
 - Only consider the isolation of the jockey pump when selecting components to tag (e.g. do not rack out the LPCS pump breaker)
 - Double isolations are not required
 - Restoration configuration is not required
 - Next sequential tag serial number is "1"
 - Include Placement sequence
 - Include Placement configuration
 - include Tag type

Complete the shaded sections of Applicant Copy of EN-OP-102-01 Attachment 9.3

[illegible]



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

2017I AR4

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017AR4

JPM Title: Perform Emergency Notifications

Facility Number: N/A

(If Bank or Modified from Bank)

JPM Attributes:

<input checked="checked" type="checkbox"/> New	<input type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Perform Emergency Notifications

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min
--	---	-------------------------

Setting: Classroom
Type: NLO\RO\SRO
Task: AON-EP-EMERGENCY-1
K&A: Generic 2.4.43: 3.2/3.8
Safety Function: Generic - Emergency Plan
PRA Applicability: No
10 CFR 55.45(a) (11); (12)
Performance: Perform
Reference(s): 10-S-01-6 Rev. 55, Notification of Offsite Agencies and Plant On-Call Emergency Personnel
Emergency Notification Form, EPP 06-01, Rev. 26
Handout(s): Completed Emergency Notification Form, EPP 06-01 (ATTACHED)
10-S-01-6 Notification of Offsite Agencies and Plant On-Call Emergency Personnel
Manipulations: N/A
Critical Steps: 3

ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- Operational Hotline (OHL) telephone used for drills in the simulator or a telephone in a secure location NOT connected
- Alternate location may be used as conditions dictate

Safety Concerns:

- None



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant was at rated power
- Toxic gases were sensed in the Main Control Room
- Main Control Room was evacuated
- Control has not been established at the Remote Shutdown Panels
- A Site Area Emergency has been declared
- INFORM is INOP

Initiating Cue(s):

- You are the Communicator
- Review the attached Emergency Notification Form for completeness and identify any errors or omissions (if any)
- Notify State and Local offsite agencies in accordance with 10-S-01-6. Use the telephone designated by the evaluator



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Perform Emergency Notifications

Notes to Evaluator:

- **Begin the JPM by providing the following initial cue:**
- **As the SRO, review the information listed on the Emergency Notification Form with the applicant by reading the information provided in sections 1, 3, 4, 5, 6, 7, 9, and 13, SKIPPING ITEM 8.**

Task Overview: (Detailed description of task)

This task is to identify errors/omissions on an Emergency Notification Form and then make the required notifications to state and local agencies using the Operational Hotline (OHL).

This task will be simulated using a disconnected telephone.

Licensed and Non-Licensed Operators are designated to perform the duties of Control Room Communicator.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Tasks: Critical steps are underlined, italicized, and denoted by an (*)

Note: The sequence of the following steps is critical, unless otherwise noted.

Step 1: 10-S-01-6 Notification form steps A - C

☐* *Reviews the Emergency Notification Form and identifies item 8, Meteorological Data has not been completed.*

Standard: Applicant identified information is missing for item 8, Meteorological Data.

Cue: When asked about item 8, tell the applicant there are no Meteorological Data available at this time and check box NOT AVAILABLE AT THIS TIME under item 8 on the Emergency Notification Form.

Notes: If applicant finds this error and makes correction during the notification, this is acceptable.

If asked, THE NEXT MESSAGE IS EXPECTED TO BE ISSUED 60 MINUTES FROM START OF THIS NOTIFICATION.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Step 2: 10-S-01-6 step 6.3.1o - s; Notification
form steps D - G

- ☐ Initiates ring down of state and local agencies by lifting the receiver of the OHL and allows 30 seconds for the agencies to answer.

Standard: In accordance with 10-S-01-6 steps 6.3.1o through s, applicant lifted the receiver of the OHL and waits 30 seconds for agencies to come on line. (An occasional "Grand Gulf Standby" may be used during this period to let them know that the hotline is in operation). Applicant checked off agencies on the Emergency Notification Form as each responds and may record the time of notification.

Cue: After the applicant has lifted the receiver of the OHL, respond as the various state and local agencies waiting approximately 5 seconds between each individual agency:

- "Governor's Office of Homeland Security/Emergency Preparedness"
- "Claiborne County Sheriff's Office"
- "Tensas Parish Sheriff's Office"

DO NOT respond for Mississippi Emergency Management Agency (MEMA) OR Mississippi Highway Patrol

If the applicant inquires regarding MEMA or Mississippi Highway Patrol, say nothing.

Notes:

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Step 3: 10-S-01-6 step 6.3.1t; Notification form
step H

☐ Performs roll call of state and local agencies using the OHL.

Standard: Applicant announced "THIS IS GRAND GULF NUCLEAR STATION. THIS IS AN EMERGENCY NOTIFICATION. STANDBY FOR AN INITIAL ROLL-CALL PLEASE ACKNOWLEDGE AS YOUR NAME IS CALLED" by depressing the pushbutton on receiver to talk and releasing button to listen to agency responses. Performed Initial roll call in accordance with 10-S-01-6 step 6.3.1t as follows:

- (1) Reads agency names for all agencies not already checked off during initial ring down.
- (2) Check off the responding agencies.
- (3) Record the time of notification on the notification form, if not already done.

Cue: Respond as each agency as the applicant reads the name **but DO NOT** respond as MEMA or Mississippi Highway Patrol.

Notes: None

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Step 4: 10-S-01-6 step 6.3.1.t(4) NOTE;
Notification Form step J

- ☐ Identifies MEMA and Mississippi Highway Patrol did not respond and initiates an attempt to contact them immediately.

Standard: Because MEMA and Mississippi Highway Patrol did not answer, since they are the agencies listed on line 1 of the Emergency Notification Form, the applicant should have another communicator attempt to contact them immediately in accordance with 10-S-01-6 step 6.3.1t(4).

Cue: Tell the applicant another communicator will contact MEMA or Mississippi Highway Patrol via commercial telephone.

Notes: Applicant may identify this after the Notification has been read during Final Roll Call. This is acceptable.

SAT / UNSAT

Step 5: 10-S-01-6 step 6.3.1u; Notification form
step I

- ☐ * Reads required items from the Emergency Notification Form to state and local agencies.

Standard: Applicant read items 1 through 13 from the Emergency Notification Form. Applicant should have read the items slowly and deliberately because the agencies must copy the message word for word.

Critical items that must be read correctly are items 1 through 9.

Cue: None

Notes:

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Step 6: 10-S-01-6 step 6.3.1.v; Notification form
step K

☐ Inquires whether there are any questions.

Standard: Applicant announces, "THIS IS GRAND GULF NUCLEAR STATION, ARE THERE ANY QUESTIONS?"

Cue: Answer as offsite agencies, "There are no questions."

Notes:

SAT / UNSAT

Step 7: 10-S-01-6 step 6.3.1.w; Notification form
step L

☐* Performs final roll call of state and local agencies using the OHL.

Standard: Applicant performs final roll call in accordance with 10-S-01-6 step 6.3.1w as follows:

- (1) Reads all agency names
- (2) Checks off the responding agencies.
- (3) Notes absence of MEMA and Mississippi Highway Patrol.

Cue: Respond as each agency as the applicant reads the name **but DO NOT** respond as MEMA or Mississippi Highway Patrol.

Notes: When the applicant has completed the final roll call, **EVALUATOR TERMINATE THE JPM.**

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAR4

Task Standard(s):

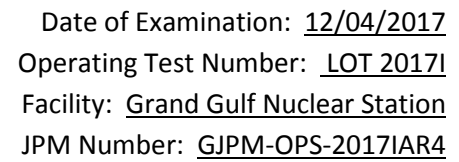
Notification of the Offsite Agencies has been performed per 10-S-01-6.

Absence of the Mississippi Emergency Management (MEMA) and /or Mississippi Highway Patrol noted from final roll call.

Meteorological Data was noted as missing.

SAT / UNSAT

Remember to record stop time



This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]

Give this page to the applicant

Initial Condition(s):

- Plant was at rated power
- Toxic gases were sensed in the Main Control Room
- Main Control Room was evacuated
- Control has not been established at the Remote Shutdown Panels
- A Site Area Emergency has been declared
- INFORM is INOP

Initiating Cue(s):

- You are the Communicator
- Review the attached Emergency Notification Form for completeness and identify any errors or omissions (if any)
- Notify State and Local offsite agencies in accordance with 10-S-01-6. Use the telephone designated by the evaluator

APPLICANT
COPY

EMERGENCY NOTIFICATION FORM

1. THIS IS GRAND GULF NUCLEAR STATION WITH MESSAGE NUMBER 1 THIS IS A DRILL, THIS IS A DRILL
2. TIME _____ DATE _____ B. COMMUNICATOR: _____ C. TEL NO. 601-437- _____

3. EMERGENCY CLASSIFICATION:

- A. ☐ NOTIFICATION OF UNUSUAL EVENT C. ☒ SITE AREA EMERGENCY E. ☐ TERMINATED
B. ☐ ALERT D. ☐ GENERAL EMERGENCY

4. CURRENT EMERGENCY CLASSIFICATION ☒ DECLARATION TIME: NOW DATE: today
☐ TERMINATION TIME: _____ DATE: _____

5. RECOMMENDED PROTECTIVE ACTIONS:

- A. ☒ No Protective Actions Recommended At This Time (Go to item 6).
B. ☐ Consider use of Potassium Iodide in accordance with State Plans.
AND
EVACUATE ALL sectors to 2 miles. EVACUATE sectors _____ to 5 miles.
AND
MONITOR & PREPARE the remainder of the 10 mile EPZ with the exception of areas previously recommended for evacuation.
C. ☐ Consider use of Potassium Iodide in accordance with State Plans.
AND
EVACUATE ALL sectors to 2 miles. EVACUATE sectors _____ to 10 miles.
AND
MONITOR & PREPARE the remainder of the 10 mile EPZ with the exception of areas previously recommended for evacuation.
D. ☐ Consider use of Potassium Iodide in accordance with State Plans and Shelter :

6.a EAL# HS3

6.b INCIDENT DESCRIPTION / UPDATE / COMMENTS _____
Control Room evacuation and plant control cannot be established.

7. REACTOR SHUTDOWN? ☐ NO ☒ YES TIME: NOW DATE: today

8. METEOROLOGICAL DATA: ☐ NOT AVAILABLE AT THIS TIME (Go to item 9)
NOTE: If not available is marked Met Data should be provided as soon as possible on a follow-up Notification Form.

- A. WIND DIRECTION FROM _____ Degrees at _____ MPH
B. SECTORS AFFECTED (A-R) _____ C. STABILITY CLASS (A-G) _____
D. PRECIPITATION: ☐ None ☐ Rain ☐ Sleet ☐ Snow ☐ Hail ☐ Other _____

9. RELEASE INFORMATION:

- A. ☒ NO RELEASE (Go to item 13)
B. ☐ A RELEASE is occurring BELOW federally approved operating limits. (Go to item 9E)
C. ☐ A RELEASE is occurring ABOVE federally approved operating limits. (Go to item 9E)
D. ☐ A RELEASE OCCURRED BUT STOPPED (Go to item 9E)
E. Release started at _____ (time) Release stopped at _____ (time) Release Duration _____ hrs (Actual or Expected)

10. TYPE OF RELEASE:

- A. ☐ Radioactive Gases B. ☐ Radioactive Airborne Particulates C. ☐ Radioactive Liquids (Go to item 13)

11. RELEASE RATE: A. NOBLE GASES _____ Ci/s B. IODINES _____ Ci/s

12. ESTIMATE OF PROJECTED OFF-SITE DOSE:

A. Projections for _____ hours based on: ☐ Field Data ☐ Plant Data

B. TEDE - WB DOSE COMMITMENT (mRem)		C. CDE - THYROID DOSE COMMITMENT (mRem)	
Site Boundary _____ 5 miles _____		Site Boundary _____ 5 miles _____	
2 miles _____ 10 miles _____		2 miles _____ 10 miles _____	

13. MESSAGE APPROVED BY: C. Buckman EMERGENCY DIRECTOR

Return to communicator instructions line J

EPP 06-01 REV. 26 (11/14)

Reviewed		Sections (5,7,8,9,10,11,12)	
Sections (3,4,6)			
EOF Manager	Init	RAC	Init
			PAR Change Time

DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL

EVALUATOR
COPY

EMERGENCY NOTIFICATION FORM

1. THIS IS GRAND GULF NUCLEAR STATION WITH MESSAGE NUMBER 1 THIS IS A DRILL, THIS IS A DRILL
2. TIME _____ DATE _____ B. COMMUNICATOR: _____ C. TEL NO. 601-437- _____

3. EMERGENCY CLASSIFICATION:

- A. ☐ NOTIFICATION OF UNUSUAL EVENT C. ☒ SITE AREA EMERGENCY E. ☐ TERMINATED
B. ☐ ALERT D. ☐ GENERAL EMERGENCY

4. CURRENT EMERGENCY CLASSIFICATION ☒ DECLARATION TIME: NOW DATE: today
☐ TERMINATION TIME: _____ DATE: _____

5. RECOMMENDED PROTECTIVE ACTIONS:

- A. ☒ No Protective Actions Recommended At This Time (Go to item 6).
B. ☐ Consider use of Potassium Iodide in accordance with State Plans.
AND
EVACUATE ALL sectors to 2 miles. EVACUATE sectors _____ to 5 miles.
AND
MONITOR & PREPARE the remainder of the 10 mile EPZ with the exception of areas previously recommended for evacuation.
C. ☐ Consider use of Potassium Iodide in accordance with State Plans.
AND
EVACUATE ALL sectors to 2 miles. EVACUATE sectors _____ to 10 miles.
AND
MONITOR & PREPARE the remainder of the 10 mile EPZ with the exception of areas previously recommended for evacuation.
D. ☐ Consider use of Potassium Iodide in accordance with State Plans and Shelter :

6.a EAL# HS3

6.b INCIDENT DESCRIPTION / UPDATE / COMMENTS _____
Control Room evacuation and plant control cannot be established.

7. REACTOR SHUTDOWN? ☐ NO ☒ YES TIME: NOW DATE: today

8. METEOROLOGICAL DATA: ☐ NOT AVAILABLE AT THIS TIME (Go to item 9)

NOTE: If not available is marked Met Data should be provided as soon as possible on a follow-up Notification Form.

A. WIND DIRECTION FROM _____ Degrees at _____ MPH

B. SECTORS AFFECTED (A-R) _____ C. STABILITY CLASS (A-G) _____

D. PRECIPITATION: ☐ None ☐ Rain ☐ Sleet ☐ Snow ☐ Hail ☐ Other _____

9. RELEASE INFORMATION:

- A. ☒ NO RELEASE (Go to item 13)
B. ☐ A RELEASE is occurring BELOW federally approved operating limits. (Go to item 9E)
C. ☐ A RELEASE is occurring ABOVE federally approved operating limits. (Go to item 9E)
D. ☐ A RELEASE OCCURRED BUT STOPPED (Go to item 9E)
E. Release started at _____ (time) Release stopped at _____ (time) Release Duration _____ hrs (Actual or Expected)

10. TYPE OF RELEASE:

- A. ☐ Radioactive Gases B. ☐ Radioactive Airborne Particulates C. ☐ Radioactive Liquids (Go to item 13)

11. RELEASE RATE: A. NOBLE GASES _____ Ci/s B. IODINES _____ Ci/s

12. ESTIMATE OF PROJECTED OFF-SITE DOSE:

A. Projections for _____ hours based on: ☐ Field Data ☐ Plant Data

B. TEDE - WB DOSE COMMITMENT (mRem)

Site Boundary _____ 5 miles _____
2 miles _____ 10 miles _____

C. CDE - THYROID DOSE COMMITMENT (mRem)

Site Boundary _____ 5 miles _____
2 miles _____ 10 miles _____

13. MESSAGE APPROVED BY: C. Buckman EMERGENCY DIRECTOR

Return to communicator instructions line J

EPP 06-01 REV. 26 (11/14)

DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL

NO METEOROLOGICAL
DATA PROVIDED OR
DENOTED AS NOT
AVAILABLE
SOMETHING MUST BE
MARKED.

DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL DRILL

[illegible]



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

2017I AS1

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAS1

JPM Title: Perform EOOS Risk Assessment

Facility Number: GJPM-OPS-AUDIT 2017AS1

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input checked="" type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 10 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Billy Newman \ Gabriel Hargrove	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Perform EOOS Risk Assessment

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 10 min
--	---	-------------------------

Setting: Classroom
Type: SRO Only
Task: SRO-ADMIN-ADMIN-54
K&A: Generic 2.1.39 (3.6/4.3); 2.1.25 (3.9/4.2); 2.1.19 (3.9/3.8); 2.2.17 (2.6/3.8)
Safety Function: Generic - Conduct of Operations
Performance: Perform
Reference(s): GGNS EOOS Risk Monitor Users' Guide Model 3b
01-S-18-6 rev 18, Risk Assessment of Maintenance Activities
Handout(s): GGNS EOOS Risk Monitor Users' Guide Model 3b
01-S-18-6 rev 18, Risk Assessment of Maintenance Activities
Manipulations: N/A
Critical Steps: 1
ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- Will use Simulator Shift Manager/Control Room Supervisor desktop computer for JPM OR separate computer with EOOS Program installed to run stand alone
- Verify EOOS Program to be used has been cleared out of OOSVC equipment and re-calculated
- Verify component alignment in EOOS is set to normal alignment for power operations

Safety Concerns:

- **DO NOT** utilize actual Plant EOOS Program



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is at 70% power
- Maintenance activities are in progress replacing 1E21-C001 (Low Pressure Core Spray Pump)
- Building Operator reports breaker 152-1503 (1P41-C001A, Standby Service Water Pump A) has a trip flag on 151 phase A; 151G and the 186M device on the circuit breaker is tripped
- There is no apparent damage and no indication of fire
- No other equipment is affected
- EOOS computer program is available
- All other equipment and structures are operable
- It is a clear sunny day

Initiating Cue(s):

- Determine the Plant Safety Index risk COLOR and VALUE using the EOOS computer model
- GGNS EOOS Risk Monitor Users' Guide is available



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Perform EOOS Risk Assessment

Notes to Evaluator:

Simulator desktop computer at the Control Room Supervisor/Shift Manager desk has the EOOS Program. (Stand alone Laptop also has the EOOS Program loaded.)

Task Overview: (Detailed description of task)

This task is performed by shift management on a daily basis when equipment and systems are taken out of service and weather changes to determine plant risk factors.

Applicant uses the EOOS Risk Assessment model computer program to take the required components out of service and run the calculation for EOOS Risk Factor.

1E21-C001 Low Pressure Core Spray (LPCS) Pump and circuit breaker for 1P41-C001A Standby Service Water (SSW A) Pump A out of service, the risk color is Yellow (8.7).

Applicant may elect to take Low Pressure Core Spray System and Standby Service Water A System out of service for calculation.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Tasks: Critical steps are underlined, italicized, and denoted by an (*)

NOTE: LPCS and SSW A are not sequence critical.

Step 1: GGNS EOOS Risk Monitor Users'
Guide sections 6.1.2 & 6.1.3

☐ Login onto a computer with the EOOS Computer Program.

Standard: Applicant logs onto the computer with the EOOS Computer Program.

Cue: If asked, cue applicant to use the Operator portion of the program.

Notes: Log in ID is op. The Password is "whatif".

Login ID and Password are on a placard on the computer.

SAT / UNSAT

Step 2: GGNS EOOS Risk Monitor Users'
Guide section 6.1.4

☐ Click the "Take a component out/Return to service" icon.

Standard: Applicant Click the "Take a component out/Return to service" icon.

Cue: None

Notes: Icon is a red pump symbol in upper left section of program.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Step 3: GGNS EOOS Risk Monitor Users'
Guide section 6.1.4

- ☐ Select the components to be taken out of service 1E21-C001 Low Pressure Core Spray Pump and click right arrow to add to Out of service list.

Standard: Applicant selects 1E21-C001 and places in Out of service column.

Cue: None

Notes: Applicant may select the LPCS System, this is acceptable.

SAT / UNSAT

Step 4: GGNS EOOS Risk Monitor Users'
Guide section 6.1.4

- ☐ Select the components to be taken out of service 1P41-C001A Standby Service Water Pump A and click right arrow to add to Out of service list.

Standard: Applicant selects 1P41-C001A and places in Out of service column.

Cue: None

Notes: Applicant may select the SSW A System, this is acceptable.

152-1503 supplies Standby Service Water Pump A

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Out of Service List:

Group 1 - LPCS System, LPCS Pump, breaker 152-1506 or 1E21-C001

Group 2 - SSW A System, SSW A Pump, breaker 152-1503 or 1P41-C001A

Step 5: GGNS EOOS Risk Monitor Users'
Guide section 6.1.5

☐ Click OK for the Out of Service List on the "Change Active Item List" screen.

Standard: Applicant selects OK on the "Change Active Item List".

Cue: None

Notes:

SAT / UNSAT

Step 6: GGNS EOOS Risk Monitor Users'
Guide section 6.1.6

☐ Click "Review/Change System Alignment" button and verifies configuration.

Standard: Applicant clicks "Review/Change System Alignment" button and verifies configuration.

Cue: None

Notes: Icon looks like two valves in parallel.

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JPM Number: GJPM-OPS-2017IAS1

Section 6.1.7 of guide is not required since there is no environmental impact.

Step 7: GGNS EOOS Risk Monitor Users'
Guide section 6.1.8

☐ Click the "Recalculate Plant Risk Measure" icon.

Standard: Applicant clicks the "Recalculate Plant Risk Measure" icon.

Cue: None

Notes: Icon looks like a calculator.

EOOS computer model will perform the calculation of Risk.

SAT / UNSAT

Step 8: EOOS Computer Model

☐* Determines the Plant Safety Index risk color is 8.7 YELLOW using the EOOS Computer program.

Standard: Applicant determines the combination of 1E21-C001 and 1P41-C001A out of service, the risk color is 8.7 Yellow.

Cue: None

Notes:

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Task Standard(s):

Plant Safety Index is determined using EOOS model to be **8.7 YELLOW** with both 1E21-C001, Low Pressure Core Spray Pump out of service **AND** 1P41-C001A Standby Service Water Pump A out of service.

SAT / UNSAT

Remember to record stop time



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS1

Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- Plant is at 70% power
- Maintenance activities are in progress replacing 1E21-C001 (Low Pressure Core Spray Pump)
- Building Operator reports breaker 152-1503 (1P41-C001A, Standby Service Water Pump A) has a trip flag on 151 phase A; 151G and the 186M device on the circuit breaker is tripped
- There is no apparent damage and no indication of fire
- No other equipment is affected
- EOOS computer program is available
- All other equipment and structures are operable
- It is a clear sunny day

Initiating Cue(s):

- Determine the Plant Safety Index risk COLOR and VALUE using the EOOS computer model
- GGNS EOOS Risk Monitor Users' Guide is available



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

2017I AS2

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAS2

JPM Title: Review Completed Surveillance

Facility Number: N/A

(If Bank or Modified from Bank)

JPM Attributes:

<input checked="checked" type="checkbox"/> New	<input type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Billy Newman \ Gabriel Hargrove	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Review Completed Surveillance

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min
--	---	-------------------------

Setting: Classroom
Type: SRO Only
Task: SRO-ADMIN-ADMIN-54
K&A: Generic 2.1.2 (4.4); 2.1.7 (4.7); 2.2.12 (4.1); 2.2.22 (4.7)
Safety Function: Generic - Conduct of Operations
PRA Applicability: No
10CFR 55.45(a) (1); (12); (13)
Performance: Perform
Reference(s): 06-OP-1B33-V-0005 Rev. 104, Idle Recirculation Loop Startup Surveillance
01-S-06-12 Rev. 112, Surveillance Program Procedure
Handout(s): Completed Applicant copy 06-OP-1B33-V-0005, Attachment II and IV
Calculator
Manipulations: N/A
Critical Steps: 1
ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- None

Safety Concerns:

- None



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is at 40% power
- Maintenance activities have been completed on Reactor Recirculation Pump A Hydraulic Power Unit and the system is prepared to restart Reactor Recirculation Pump A
- BOP operator has completed 06-OP-1B33-V-0005 Attachment II
- Reactor Recirculation Pump B is operating in Fast Speed

Initiating Cue(s):

- Review the completed surveillance to approve continuation of startup of Reactor Recirculation Pump A
- See completed surveillance 06-OP-1B33-V-0005 Attachment II.
- Current time is **1048**



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Review Completed Surveillance

Notes to Evaluator:

Applicant will have completed 06-OP-1B33-V-0005 Attachment II Data Sheets I and II for Reactor Recirculation Loop A startup.

Task Overview: (Detailed description of task)

This task is performed to meet surveillance requirements for idle Reactor Recirculation Pump startup at various power levels.

Senior Reactor Operators (Operations Shift Management) authorize and review completed surveillances to allow startup of idle Reactor Recirculation pumps.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Tasks: Critical steps are underlined, italicized, and denoted by an (*)

Note: The sequence of the following is NOT critical.

Step 1: 06-OP-1B33-V-0005 Attachment II
and 01-S-06-12 section 5.8

☐* Review completed surveillance 06-OP-1B33-V-0005 Attachment II Data Sheets I and II.

Standard: Applicant reviews data on surveillance Data Sheets and determines the following:

- ☐ RPV Coolant temperature calculation from Steam Table is incorrect
Value on surveillance is 538 degrees F should be 540 degrees F
- ☐ Operating Loop flow is above the flow rate value listed.
Value should be < 22300 gpm vice 24300 gpm
- ☐ Elapsed time has exceeded the time from the last readings by greater than 15 minutes
Time of data 1030 current time 1048 > 15 minutes

Cue: None

Notes: The incorrect calculation of the RPV Coolant Temperature will alter the true number for the calculation of RPV Coolant Temperature to Bottom Head Temperature.

Applicant must identify two of the three discrepancies for satisfactory completion of the JPM.

SAT / UNSAT



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Calculation for RPV Coolant Temperature

948.1 psig +14.7 = 962.8 psia Actual Saturation Temperature 540 degrees F

Table Temperatures - 931.17 psia 536 degrees F
962.79 psia 540 degrees F

For 948.1 psia versus correct pressure 962.8 psia

$$\frac{948.1 - 962.79}{962.79 - 931.17} = \frac{X - 536}{540 - 536}$$

$$\frac{16.93}{31.62} = \frac{X - 536}{4}$$

$$67.72 = 31.62(X - 540)$$

$$31.62X = 17016.04$$

$$X = \frac{17016.04}{31.62}$$

Calculated RPV Coolant Temperature for 948.1 psia

X = 538.14 (538 degrees F)

Value placed in Surveillance for 5.3.5b would be the value for an uncorrected pressure of 948.1 psig.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Task Standard(s):

Determined two of three discrepancies:

- RPV Coolant temperature calculation from Steam Table is incorrect
Value on surveillance is 538 degrees F should be 540 degrees F
- Operating Loop flow is above the flow rate value listed.
Value should be < 22300 gpm vice 24300 gpm
- Elapsed time has exceeded the time from the last readings by greater than 15 minutes
Time of data 1030 current time 1048 > 15 minutes

Determined based on review of completed 06-OP-1B33-V-0005 Attachment II that the surveillance is UNSAT and must be completed again to support startup of Reactor Recirculation Loop A.

SAT / UNSAT

Remember to record stop time



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS2

Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- The plant is at 40% power
- Maintenance activities have been completed on Reactor Recirculation Pump A Hydraulic Power Unit and the system is prepared to restart Reactor Recirculation Pump A
- BOP operator has completed 06-OP-1B33-V-0005 Attachment II
- Reactor Recirculation Pump B is operating in Fast Speed

Initiating Cue(s):

- Review the completed surveillance to approve continuation of startup of Reactor Recirculation Pump A
- See completed surveillance 06-OP-1B33-V-0005 Attachment II.
- Current time is 1048

APPLICANT COPY

06-OP-1B33-V-0005	Revision: 104
-------------------	---------------

Attachment II	Page 1 of 5
---------------	-------------

MWO # _____

Title: Idle Recirculation Loop Startup, One Recirc Loop In Operation

Technical Specifications: SR 3.4.11.3, SR 3.4.11.4, SR TR3.4.11.1

1.1 Performance of this procedure has no impact on plant operation.

2.1 Plant Mode is (CIRCLE one): 1 2 3 4 5

2.2 Test Start Time Michael Donovan | Today | 1020
 Performer Date Time

3.1 Test Completion: (CHECK one in each category)

Entire procedure completed	[]	Partial procedure completed	[]
Tech Spec Acceptance Criteria Acceptable	[]	Unacceptable	[]
All other steps/data Acceptable	[]	Unacceptable	[]

3.2 Comments: _____

3.3 Test performed by _____ Date/Time _____ / _____

CR Issued # _____

WR Issued # _____

LCO Entered # _____

Tech Spec Operability Requirements	Acceptable [1	Unacceptable [1
------------------------------------	----------------	------------------

Shift Supervision. _____ Date _____

Comments: _____

Operations Management _____ Date _____

Engineering Review Required

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06-OP-1B33-V-0005	Revision: 104
Attachment II	Page 2 of 5

DATA SHEET I
IDLE RECIRCULATION LOOP STARTUP
IDLE LOOP STARTUP WITH ONE RECIRC LOOP IN OPERATION
SAFETY RELATED

<u>Step</u>	<u>Instructions</u>	<u>Performer</u>	<u>Verifier</u>
4.0	Prerequisites satisfied.	<u>MD</u>	
5.3.1	PERFORM the following for startup of an idle recirculation loop with ONE recirc loop in operation.		
5.3.2 <i>N/A</i>	Delete	<u>N/A</u>	
5.3.3	RECORD idle loop to be restarted: (A) B (circle one)	<u>MD</u>	

NOTE

To meet time requirements of Tech Specs SR 3.4.11.3 **AND** SR 3.4.11.4, idle loop startup **Must** occur **WITHIN** 15 minutes of determination that differential temperatures are **WITHIN** PTLR limits. As a result, all other preparations specified in B33 SOI (Reference 6.1) **Should** be underway before continuing this section.

- ~~5.3.4~~ **PERFORM** the following steps every 15 minutes until the idle loop is started.
- ~~5.3.5~~ **RECORD** the following parameters on Data Sheet II.
- ~~a.~~ Reactor Vessel Steam Dome Pressure from 1C34-PI-R605, 1H13-P680.
 - ~~b.~~ RPV Coolant Temperature (Reactor Vessel Steam Dome) from computer point 1B21NA006. **IF** computer point is unavailable, **THEN** use Attachment IV to **CALCULATE** saturation temperature corresponding to steam dome pressure recorded in Step 5.3.5.a.
 - ~~c.~~ Bottom Head Drain Line Coolant Temperature from computer point B33NA002, alternate 1B21-TR-R643 Point 4, 1H13-P614. **RECORD** N/A **IF** steam dome pressure < 25 psig.

Computer point UN AVAILABLE

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06-OP-1B33-V-0005	Revision: 104
Attachment II	Page 3 of 5

DATA SHEET I
IDLE RECIRCULATION LOOP STARTUP
IDLE LOOP STARTUP WITH ONE RECIRC LOOP IN OPERATION
SAFETY RELATED

Step

Instructions

PerformerVerifier

5.3.5

(Cont'd)

NOTE

Computer points for recirc loop suction temperature are only available above 400 °F.

d. Recirculation Loop Suction Temperatures of operating **AND** idle recirc loops:

Loop A: Computer point B33NA033 OR B33NA034
Alternate 1B33-TR-R643 Point 5, 1H13-P614

Loop B: Computer point B33NA035 OR B33NA036
Alternate 1B33-TR-R643 Point 6, 1H13-P614

e. Operating Loop Flow Rate from 1C51-FR-R614 (A loop BLUE pen, B loop RED pen)

5.3.6

IF steam dome pressure ≥ 25 psig, **THEN CALCULATE** RPV Coolant Temperature minus Bottom Head Drain Line Temperature **AND RECORD** on Data Sheet II.
OTHERWISE, RECORD N/A.

5.3.7

CALCULATE Recirc Loop A Suction Temperature minus Recirc Loop B Suction Temperature.

5.3.8

VERIFY that the differential temperatures **AND** operating recirc loop flow are **WITHIN** the following Acceptance Criteria **AND INITIAL** on Data Sheet II:

\$

a. RPV Coolant Temperature to Bottom Head Temperature, step 5.3.6, $< 100^{\circ}\text{F}$

\$

b. Operating Recirc Loop Temp to Idle Recirc Loop Temp, step 5.3.7, $< 50^{\circ}\text{F}$

\$

c. Operating Recirc Loop Flow, step 5.3.5e $\leq 22,300$ gpm

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Attachment II	Page 4 of 5

DATA SHEET I
IDLE RECIRCULATION LOOP STARTUP
IDLE LOOP STARTUP WITH ONE RECIRC LOOP IN OPERATION
SAFETY RELATED

<u>Step</u>	<u>Instructions</u>	<u>Performer</u>	<u>Verifier</u>
5.3.9	VERIFY that the temperature interlock annunciator for the recirc loop to be started is clear <u>AND INITIAL</u> on Data Sheet II.		
Loop A:	"RECIRC PUMP A TEMP INTLK ACTUATED" 1H13-P680-3A (D-7)		
Loop B:	"RECIRC PUMP B TEMP INTLK ACTUATED" 1H13-P680-3A (E-11)		
5.3.10	PROCEED with startup of the idle loop per Reference 6.1 <u>AND VERIFY</u> that the idle loop is started WITHIN 15 minutes of the last time recorded in Data Sheet II.		
	Record time of recirc loop start: _____		

**EVALUATOR
COPY**

06-OP-1B33-V-0005	Revision: 104
Attachment II	Page 4 of 5

DATA SHEET I
IDLE RECIRCULATION LOOP STARTUP
IDLE LOOP STARTUP WITH ONE RECIRC LOOP IN OPERATION
SAFETY RELATED

<u>Step</u>	<u>Instructions</u>	<u>Performer</u>	<u>Verifier</u>
5.3.9	VERIFY that the temperature interlock annunciator for the recirc loop to be started is clear AND INITIAL on Data Sheet II.		
Loop A:	"RECIRC PUMP A TEMP INTLK ACTUATED" 1H13-P680-3A (D-7)		
Loop B:	"RECIRC PUMP B TEMP INTLK ACTUATED" 1H13-P680-3A (E-11)		
\$ 5.3.10	PROCEED with startup of the idle loop per Reference 6.1 AND VERIFY that the idle loop is started WITHIN 15 minutes of the last time recorded in Data Sheet II.		

Record time of recirc loop start: _____

Current Time given in
JPM is 1048 time of data
is 1030 should be < 15
minutes.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

2017I AS3

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAS3

JPM Title: Determine Impact on Plant
Operations for Failed Relay

Facility Number: GJPM-SRO-2017AS33

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Billy Newman \ Gabe Hargrove	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Determine Impact on Plant Operations for Failed Relay

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 Min
--	---	-------------------------

Setting: Classroom
Type: SRO Only
Task: SRO-NO-NORMAL-015
K&A: Generic 2.2.41 (3.9); 2.2.22 (4.7); 2.2.36 (4.2)
Safety Function: Generic - Equipment Control
PRA Applicability: No
10CFR 55.45(a) (12)
Performance: Perform
Reference(s): 04-1-01-E12-1 SU, Rev. 147
17-S-06-5, Rev. 11, Tech Spec Loop Logic
GGNS Technical Specifications 3.3.6.3 & 3.6.1.7
E1181-063; 067 additionally 026; 037; 041; 043
Handout(s): 04-1-01-E12-1 SU
17-S-06-5, Tech Spec Loop Logic
GGNS Electrical Drawings
GGNS Technical Specifications
Manipulations: N/A
Critical Steps: 2

ADMINISTRATIVE JPM

Previous 2 NRC Exams May 2017 SRO Upgrade randomly selected

Simulator Setup/Required Plant Conditions:

- None

Safety Concerns:

- None



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is operating at rated conditions
- Electrical Maintenance has reported relay 1E12-K93A has a burned up coil (failed)
- No replacement relay is available for 48 hours

Initiating Cue(s):

- You are the Control Room Supervisor
 - Determine the impact of the failure on plant operations
 - Identify any associated Technical Specification impact for the failed relay



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Determine Impact on Plant Operations for Failed Relay

Notes to Evaluator:

This is an Administrative JPM and can be performed in a classroom.

Task Overview: (Detailed description of task)

This task is to use facility electrical drawings to determine the effects a failed relay will have on the plant and its associated systems.

This is a required skill for an SRO. SROs use this skill in troubleshooting plant problems, determining proper plant operation, and assessing how a problem affects facility compliance with Tech Specs.

This is an activity performed on a routine basis by SROs during Agastat relay replacement.



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is not critical unless otherwise noted.

Applicant may elect to use the Technical Specification Instrumentation Loop Logic 17-S-06-5.

The Residual Heat Removal System (E12) System Operating Instructions 04-1-01-E12-1

References identify the Electrical Drawings as E-1181.

Step 1: E-1181 Electrical Drawings for E12 System

☐ Locate the Relay Tabulation Print. (E-1181-063).

Standard: Relay Tabulation Print located.

Cue: None

Notes: E-1181-00 is the Index print for the set of drawings.

E-1181 - 063 (GE sheet 2) coordinates F-4

Applicant may reference other drawings than those listed that is acceptable.

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Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Step 2: E-1181 Electrical Drawings for E12
System

☐ Identify which print E12-K93A is located on E-1181-063 (GE sheet 3)

Standard: E12-K93A relay located on drawing table.

Cue: None

Notes:

The relay tabulation lists the relays associated with the system and identifies the print the relay and associated contacts are located on.

SAT / UNSAT



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Step 3: E-1181 Electrical Drawings for E12 System

☐ Identify other affected components associated with E12-K93A.

Standard: E12-K95A and E12-K30A relays are associated with E12-K93A and are located on E-1181 -067 (GE sheet 6).

Cue: None

Notes:

E12-K95A is the timer relay associated with E12-F048A RHR A Heat Exchanger Bypass Valve which keeps E12-F048A open for a time delay following a LOCA signal. (4 minutes) E12-K70A eliminates the 10.85 minute time delay for closing E12-F048A.

E12-K30A is associated with the Containment Spray Automatic Initiation logic.

SAT / UNSAT



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Step 4: E-1181 Electrical Drawings for E12
System

- ☐ * Identify the following affects of E12-K93A remaining de-energized (E-1181-067, GE sheet 6)
E12-K93A is the 10.85 minute timer for Containment Spray Automatic Initiation. E12-K93A energizes to initiate Containment Spray. The relay being failed will prevent automatic initiation of RHR A in Containment Spray mode.

Standard: E12-K93A failed will prevent RHR A Containment Spray from Automatically initiating after 10.85 minutes.

Cue: None

Notes:

May be performed by looking at 17-S-06-5, Att. II, page 41 of 81

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Step 5: GGNS Technical Specifications and Bases and 17-S-06-5 Att. I page 17 of 22 and Att. II page 41 of 81.

☐* Identify the associated Technical Specifications for the loss of E12-K93A.

Standard: Technical specifications associated with E12-K93A failed are:

3.3.6.3 RHR Containment Spray System Instrumentation

3.6.1.7 Residual Heat Removal (RHR) Containment Spray System

Cue: None

Notes:

Critical information is the identification of the associated Technical Specifications.

Tech Spec 3.3.6.3 action A/C will require RHR A Containment Spray Subsystem to be declared Inoperable.

Tech Spec 3.6.1.7 requires the Containment Spray Subsystem to operate automatically and its associated instrumentation to be operable.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Task Standard(s):

- E12-K93A is the 10.85 minute time delay relay
- * E12-K93A remaining de-energized will cause Automatic initiation of RHR 'A' Containment Spray to NOT function
- * RHR Containment Spray 'A' Instrumentation is Inoperable per Tech Spec 3.3.6.3 which makes RHR Containment Spray 'A' Subsystem inoperable per Tech Spec 3.6.1.7

SAT / UNSAT

Remember to record stop time



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS3

Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- Plant is operating at rated conditions
- Electrical Maintenance has reported relay 1E12-K93A has a burned up coil (failed)
- No replacement relay is available for 48 hours

Initiating Cue(s):

- You are the Control Room Supervisor
 - Determine the impact of the failure on plant operations
 - Identify any associated Technical Specification impact for the failed relay



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

2017I AS4
GGNS
2017 NRC Operating Test
Job Performance Measure

JPM Number: GJPM-OPS-2017IAS4 JPM Title: Authorize Emergency Exposure

Facility Number: GJPM-OPS-AUDIT2017AS4

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input checked="" type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 20 min

Prepared By:	<u>Michael Rasch</u> Exam Developer	Date
Ops Review:	<u>Robert Brinkman</u> 1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	<u>Billy Newman \ Gabriel Hargrove</u> 2 nd Validation by Ops Validation Crew	Date
Approved By:	_____ Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Authorize Emergency Exposure

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 20 Min
--	---	-------------------------

Setting: Classroom
Type: SRO Only
Task: SRO-A&E-EMERGENCY-022
K&A: Generic 2.3.4 (3.2/3.7)
Safety Function: Generic - Radiation Control
PRA Applicability: No
10CFR 55.45(a) (10)(11)
Performance: Perform
Reference(s): 10-S-01-17, Rev 19
EN-RP-201, Rev 5
Handout(s): 10-S-01-17, Rev 19
EN-RP-201, Rev 5
Calculator
Manipulations: N/A
Critical Steps: 4

ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- None

Safety Concerns:

- None



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- A Site Area Emergency has been declared
- There are elevated radiation levels in containment
- General area dose rate on elevation 161 ft. Containment is 6,000 mR/hr
- Containment entry is required to manually open Suppression Pool Makeup Valves for adding water to the Suppression Pool
- Task is expected to take approximately 45 minutes to complete
- Only two qualified operators are available to perform the task
- Both are required for the task
 - Operator #1 has a current year-to-date exposure TEDE of 400 mrem
 - Operator #2 has a current year-to-date exposure TEDE of 530 mrem
- Site Emergency Plan has been activated for the current conditions
- This task is NOT to protect large populations
- This task is required for protecting valuable property (fuel)

Initiating Cue(s):

- You are directed by the SM to:
 - determine the current exposure limit
 - determine approval requirements for this task
- Consider only TEDE with respect to exposure and limits
- Determine expected exposure for both Operator #1 and Operator #2



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Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Authorize Emergency Exposure

Notes to Evaluator:

- This is an Administrative JPM and can be performed in a classroom.

Task Overview: (Detailed description of task)

Applicant will evaluate a condition involving abnormally high radiological conditions and determine actions required to administratively control the dose received by determining who authorizes dose extensions in various situations.



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is not critical unless otherwise noted.

Step 1: 10-S-01-17 section 6.1

☐* Determine the exposure limit is 5 to 10 rem TEDE per 10-S-01-17.

Standard: Determines per 10-S-01-17 steps 6.1.2, 6.1.3 and Table 1 that 10CFR20 whole body limit of 5 to 10 rem TEDE is in effect due to Site Area Emergency Classification.

Cue: None

Notes: **6.1.2 Administrative Limits are suspended upon entry into an Alert or Higher.**
 6.1.3 Extends Emergency Response personnel exposure limits to the 10 CFR 20 limits.

TABLE 1 Dose Limits for Emergency Workers for Protecting Valuable Property (FUEL)

Limit is 5 rem up to 10 rem with authorization by the Emergency Director (ED) or Emergency Plant Manger (EPM)

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Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Step 2: Calculation for Operator #1

☐* Determine expected final exposure following the task for Operator #1.

$$\frac{6000 \text{ mrem}}{\text{hr}} \mid \frac{1 \text{ hr}}{60 \text{ min.}} \mid 45 \text{ min} = 4,500 \text{ mrem} + 400 \text{ mrem} = 4900 \text{ mrem}$$

Standard: Determines exposure is less than 5000 mrem.

Cue: None

Notes: NO Extension required.

SAT / UNSAT

Step 3: Calculation for Operator #2

☐* Determine expected final exposure following the task for Operator #2.

$$\frac{6000 \text{ mrem}}{\text{hr}} \mid \frac{1 \text{ hr}}{60 \text{ min.}} \mid 45 \text{ min} = 4,500 \text{ mrem} + 530 \text{ mrem} = 5030 \text{ mrem}$$

Standard: Determines exposure is above 5000 mrem but less than 10 rem.

Cue: None

Notes: Extension required

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Step 4: 10-S-01-17 section 6.1

☐* Determine Operator #2 is required to have extension of limit by the Emergency Director or Emergency Plant Manager.

Standard: Determines per 10-S-01-17 steps 6.1.2 and 6.1.3 that administrative exposure limits are automatically suspended and Emergency Response personnel are automatically extended to 10CFR20 limits for the current emergency classification.

Since Operator #2 will exceed the 10CFR20 limit of 5 rem TEDE, additional approval is required as per Table 1 and determines approval of either Emergency Director or Emergency Plant Manager.

Cue: None

Notes: None

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Task Standard(s):

- Determined the following:
 - **Administrative Dose Limit is suspended due to EAL classification**
 - **Limit is 10 CFR 20 Limit of 5 rem (5000 mrem) TEDE**
 - **Operator #1 estimated to receive 4900 mrem and will NOT exceed the limit that requires approval from the Emergency Director OR Emergency Plant Manager**
 - **Operator #2 estimated to receive 5030 mrem and will exceed the limit and requires approval from the Emergency Director OR Emergency Plant Manager**

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Remember to record stop time



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS4

Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- A Site Area Emergency has been declared
- There are elevated radiation levels in containment
- General area dose rate on elevation 161 ft. Containment is 6,000 mR/hr
- Containment entry is required to manually open Suppression Pool Makeup Valves for adding water to the Suppression Pool
- Task is expected to take approximately 45 minutes to complete
- Only two qualified operators are available to perform the task
- Both are required for the task
 - Operator #1 has a current year-to-date exposure TEDE of 400 mrem
 - Operator #2 has a current year-to-date exposure TEDE of 530 mrem
- Site Emergency Plan has been activated for the current conditions
- This task is NOT to protect large populations
- This task is required for protecting valuable property (fuel)

Initiating Cue(s):

- You are directed by the SM to:
 - determine the current exposure limit
 - determine approval requirements for this task
- Consider only TEDE with respect to exposure and limits
- Determine expected exposure for both Operator #1 and Operator #2



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS5

2017I AS5

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IAS5

JPM Title: Perform Emergency Classification

Facility Number: N/A

(If Bank or Modified from Bank)

JPM Attributes:

<input checked="" type="checkbox"/> New	<input type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input checked="" type="checkbox"/> Time Critical 15 min	<input type="checkbox"/> Alternate Path	Validation Time: 10 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Billy Newman \ Gabriel Hargrove	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS5

Perform Emergency Classification

<input checked="" type="checkbox"/> Time Critical 15 min	<input type="checkbox"/> Alternate Path	Validation Time: 10 min
---	---	-------------------------

Setting: Classroom
Type: SRO Only
Task: SRO-A&E-EMERGENCY-15
K&A: Generic 2.4.41 (4.6)
Safety Function: Generic - Emergency Procedures/Plan
PRA Applicability: No
10CFR55.45(a): (11); (12)
Performance: Perform
Reference(s): 10-S-01-1 Revision 126
05-1-02-II-12, Rev. 12
05-1-02-II-1, Rev. 49
Handout(s): EAL flow charts from 10-S-01-1
10-S-01-1 (available)
05-1-02-II-12
05-1-02-II-1
Manipulations: N/A
Critical Steps: 1
ADMINISTRATIVE JPM

Simulator Setup/Required Plant Conditions:

- None

Safety Concerns:

- None



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS5

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant was operating at rated power
- At 1055, workers spilled a toxic substance which caused the Main Control Room atmosphere to become hazardous
- At 1056, Shift Manager decided to shutdown the reactor and evacuate the Main Control Room
- Control Room personnel obtained SCBAs and evacuated the Main Control Room
- Personnel were attempting to establish control of the plant at the Remote Shutdown Panels
- Control has not been established at the Remote Shutdown Panels

Initiating Cue(s):

- Current time is **1113**
- Classify the event
- This JPM is **TIME CRITICAL**



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS5

Perform Emergency Classification

Notes to Evaluator:

- None

Task Overview: (Detailed description of task)

If a transient occurs or events in progress a Senior Reactor Operator must classify events as an Emergency Director in accordance with the Emergency Preparedness Plan.

10-S-01-1 requires classification based on conditions of EAL HS3 Site Area Emergency.

Emergency classification declaration must be completed within 15 minutes of recognition of an emergency.

This task is Time Critical based on 10CFR 50 Appendix E part IV. C.2 requirements.



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS5

RECORD START TIME _____

Tasks: Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is not critical unless otherwise noted.

Step 1: 10-S-01-1

☐ * Classify the event as a **SITE AREA EMERGENCY** per HS3 Main Control Room Evacuation.

Standard: Per EAL HS3, a SITE AREA EMERGENCY is declared.

Cue: None

Notes: Toxic spill affecting the Main Control Room is in EAL Toxic or Flammable Gas.

When the Main Control Room is evacuated EAL Main Control Room Evacuation is also applicable.

Based on ONEP 05-1-02-II-12; step 3.4 requires evacuation of the Main Control Room to refer to ONEP 05-1-02-II-1 which has personnel man the Remote Shutdown Panel.

Time to evacuate 1056

Current Time 1113

Delta 17 minutes

If control has NOT been established at the Remote Shutdown Panels within 15 minutes, the EAL classification goes to the higher classification of HS3.

A SITE AREA EMERGENCY should be declared per HS3.

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IAS5

Task Standard(s):

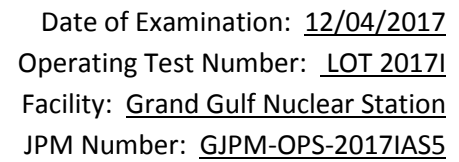
*Within 15 minutes of cue given, classifies the event as an **SITE AREA EMERGENCY** per **EAL HS3:***

- Control Room evacuation has been initiated.
AND
- Control of the plant cannot be established in accordance with 05-1-02-II-1,
Shutdown from the Remote Shutdown Panel within 15 minutes.

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TIME CRITICAL: 15 MINUTE TIME LIMIT

Remember to record stop time



This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]

Give this page to the applicant

Initial Condition(s):

- Plant was operating at rated power
- At 1055, workers spilled a toxic substance which caused the Main Control Room atmosphere to become hazardous
- At 1056, Shift Manager decided to shutdown the reactor and evacuate the Main Control Room
- Control Room personnel obtained SCBAs and evacuated the Main Control Room
- Personnel were attempting to establish control of the plant at the Remote Shutdown Panels
- Control has not been established at the Remote Shutdown Panels

Initiating Cue(s):

- Current time is **1113**
- Classify the event
- This JPM is **TIME CRITICAL**



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017ICR1

2017I CR1

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017ICR1

JPM Title: Bypass a Control Rod in RACS

Facility Number: GJPM-OPS-C11216

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017ICR1

Bypass a Control Rod in RACS

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 Min
--	---	-------------------------

Setting: Control Room
Type: RO/SRO
Task: CRO-C11(2)-OFFNORM-014
K&A: 201005 A2.03 (3.2/3.2); A2.04 (3.2/3.2); A2.06 (3.2/3.2);
A2.07 (3.2/3.2)
Safety Function: 7 - Instrumentation
1 - Reactivity Control
PRA Applicability: No
10CFR 55.45(a) (1); (6)
Performance: Simulate
Reference(s): 04-1-01-C11-2, Rev. 42
Handout(s): 04-1-01-C11-2Precautions & Limitations; Section 5.1; Figure 1b
Manipulations: 6
Critical Steps: 5
Low Power: **YES**
Emergency/Abnormal: No
RCA entry: No
Engineered Safety Function: No

Simulator Setup/Required Plant Conditions:

- **Permission to open Control Room Back Panel Cabinets from the Control Room Supervisor or Shift Manager**

Safety Concerns:

- **Do NOT allow candidate to manipulate Control Room controls**
- **Only point and discuss**
- **Do NOT open access cover to the switches**



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017ICR1

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Reactor startup is in progress
- Rod Pattern Controller is in effect
- Control Rod 20-09 has caused a control rod block due to the rod position out of pattern
- Reactor Engineering has been consulted and concurs with bypassing the control rod
- Requirements of Engineering Procedure 17-S-02-400 have been met
- No other control rods are currently bypassed

Initiating Cue(s):

- Control Room Supervisor (CRS) gives you the key to the RACS cabinets (simulated)
- CRS directs you to position bypass control rod **20-09** in both Rod Action Control Cabinets
- Another operator will complete Attachment V of 04-1-01-C11-2 in parallel with your performing the rod bypass



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017ICR1

Bypass a Control Rod in RACS

Notes to Evaluator:

- All Control Room operations will be on panels P651 and P652 in the Main Control Room Back Panels
- Rod Action Control System (RACS)

Task Overview: (Detailed description of task)

This task is to bypass control rod positions in RACS 1 and 2 to allow Control Rod Movement to place the control rod in a specific position regardless of the Rod Pattern Controller.

Bypassing a control rod in RACS is done when a control rod is out of position with regard to the Rod Pattern Controller to allow the rod to be put in pattern allowing Control Rod Blocks to be cleared.

This task is performed during plant startups as required to support control rod movement when on the Rod Pattern Controller.



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017ICR1

Critical tasks are underlined, italicized, and denoted by an (*)

**NOTE: The sequence of the following steps is critical unless otherwise noted.
Sequence within a division is critical.**

Performance of RACS 1 or 2 first is NOT critical.

(RACS 1)

Step 1: 04-1-01-C11-2, Step 5.1.2 & Figure 1b

☐* Determine the binary address of control rod 20-09.

Standard: Using Figure 1b of 04-1-01-C11-2 determined the binary address of control rod 20-09 is 00110 - 00011.

Cue: None

Notes: Applicant may also use chart in panel RACS 1 P651 (RACS 2 P652).

The binary address of each rod Can be found in the Analyzer Page window on 1H13-P653 OR Figure 1b.

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Step 2: 04-1-01-C11-2, Step 5.1.2

☐ Unlock the cover to the binary switches on RACS 1 panel H13-P651

Standard: Unlocked the cover to the binary switches on panel H13-P651

Cue: Cover is unlocked

Notes: **DO NOT OPEN THE COVER**
 Drawing shows locations of panel

SAT / UNSAT

Evaluator Note: Applicant can use the end column of switches on the right side and identify switches through the glass.



Step 3: 04-1-01-C11-2, Step 5.1.2 a (1)

☐* **PUT the binary address in the following format, looking from top to bottom:**

$X_4 X_3 X_2 X_1 X_0 Y_4 Y_3 Y_2 Y_1 Y_0$

Standard: On a Bypass Card selects binary code (X) 00110 (Y) 00011 placed address switches (from top to bottom, don't count Bypass Switch) 3, 4, 9, and 10 to the right. Switches 1, 2, 5, 6, 7 and 8 should be to the left.

Cue: Switches are in the positions you indicated.

Notes: See attached drawing

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Step 4: 04-1-01-C11-2, Step 5.1.2 a (2)

☐* **PLACE BYPASS switch to BYPASS position AND CHECK that BYPASS LED illuminates.**

Standard: Placed the bypass card bypass switch to the right BYPASS (ON) and observes the red LED illuminates on the top of the card.

Cue: Bypass switch is in position you indicated and red LED on

Notes: Bypass switch is the top switch. The rod is now bypassed in RACS 1 when this step is complete.

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017ICR1

(RACS 2)

Step 5: 04-1-01-C11-2, Step 5.1.2

☐ Unlock the cover to the binary switches on RACS 2 panel H13-P652

Standard: Unlocked the cover to the binary switches on panel H13-P652

Cue: Cover is unlocked

Notes: **DO NOT OPEN THE COVER**
 Drawing shows locations of panel

SAT / UNSAT

Evaluator Note: Applicant can use the end column of switches on the right side and identify switches through the glass.



Step 6: 04-1-01-C11-2, Step 5.1.2 a (1)

☐* **PUT the binary address in the following format, looking from top to bottom:**

$X_4 X_3 X_2 X_1 X_0 Y_4 Y_3 Y_2 Y_1 Y_0$

Standard: On a Bypass Card selects binary code (X) 00110 (Y) 00011 placed address switches (from top to bottom, don't count Bypass Switch) 3, 4, 9, and 10 to the right. Switches 1, 2, 5, 6, 7 and 8 should be to the left.

Cue: Switches are in the positions you indicated.

Notes: See attached drawing

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Step 7: 04-1-01-C11-2, Step 5.1.2 a (2)

☐* **PLACE BYPASS switch to BYPASS position AND CHECK that BYPASS LED illuminates.**

Standard: Placed the bypass card bypass switch to the right BYPASS (ON) and observes the red LED illuminates on the top of the card.

Cue: Bypass switch is in position you indicated and red LED on

Notes: Bypass switch is the top switch. The rod is now bypassed in RACS 2 when this step is complete.

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***When the control rod has been bypassed in both RACS 1 and RACS 2, EVALUATOR will terminate the JPM.**

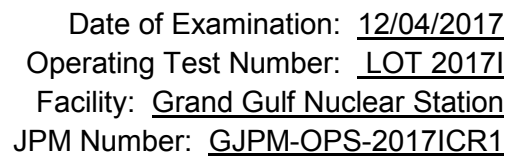
Task Standard(s):

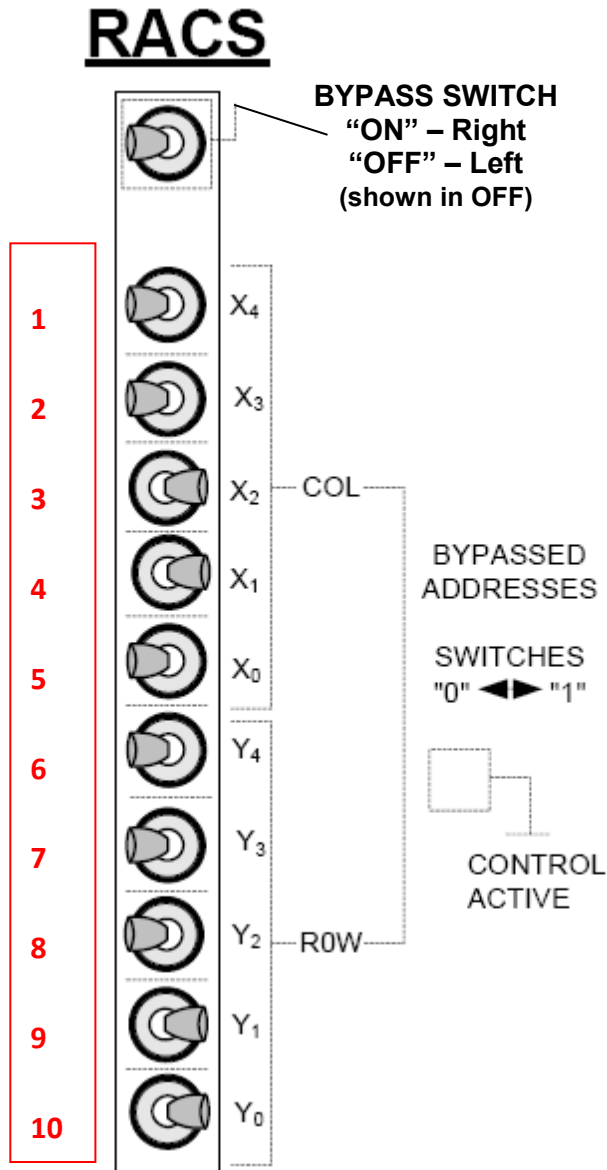
Control Rod 20-09 has been bypassed in RACS 1 and 2 using the appropriate binary code

- Binary address code 00110 00011 determined
- Binary address switches on 1H13-P651 RACS 1 in proper position
- Position Bypass switch in BYPASS
- Binary address switches on 1H13-P652 RACS 2 in proper position
- Position Bypass switch in BYPASS

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Remember to record stop time

[illegible][illegible]



EVALUATOR KEY

Do NOT give this page to Applicant!

**Binary Address
 Depicted for Rod 20-09**

00110 00011

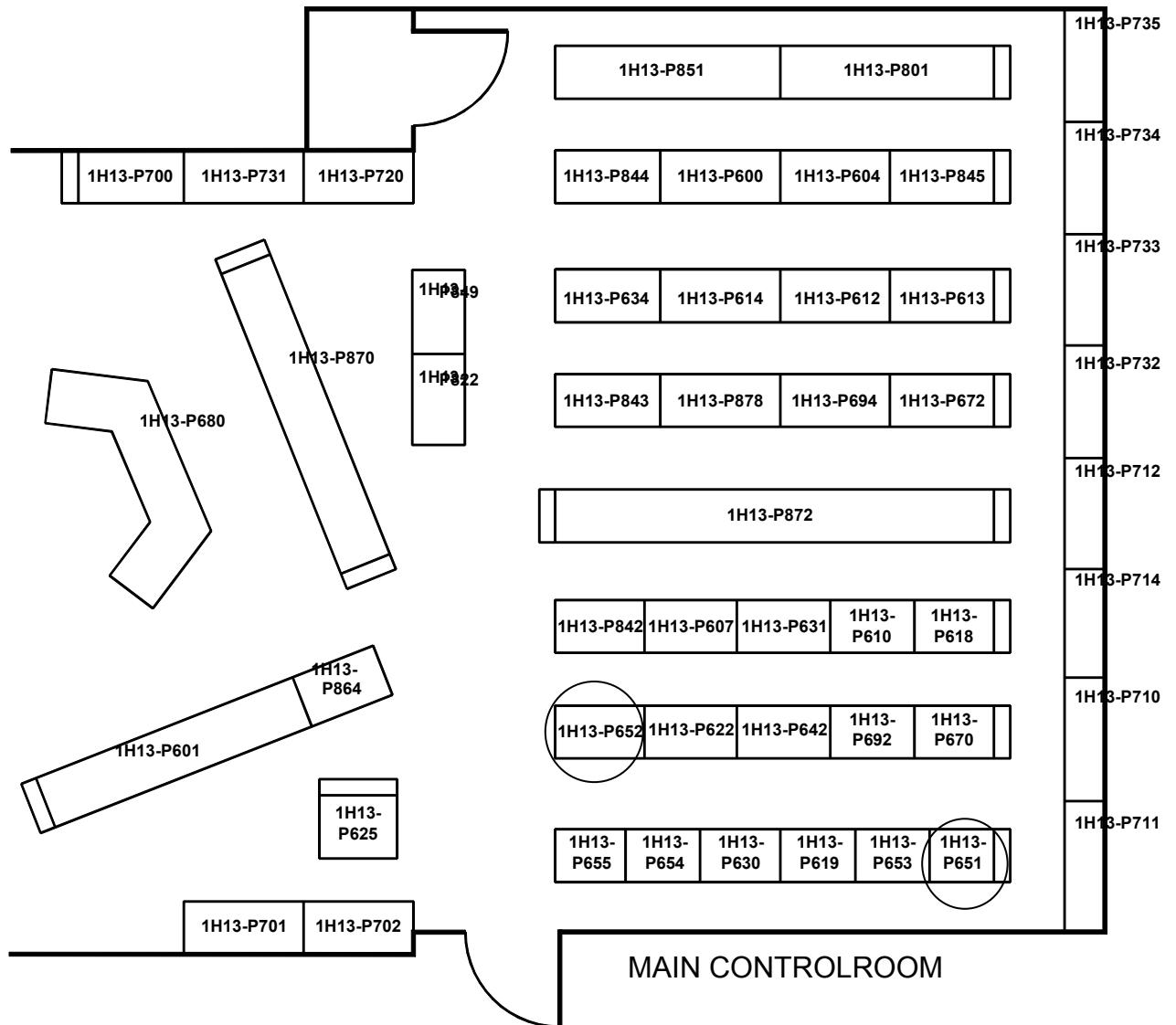


FIGURE 1

Give this page to the applicant

Initial Condition(s):

- Reactor startup is in progress
- Rod Pattern Controller is in effect
- Control Rod 20-09 has caused a control rod block due to the rod position out of pattern
- Reactor Engineering has been consulted and concurs with bypassing the control rod
- Requirements of Engineering Procedure 17-S-02-400 have been met
- No other control rods are currently bypassed

Initiating Cue(s):

- Control Room Supervisor (CRS) gives you the key to the RACS cabinets (simulated)
- CRS directs you to position bypass control rod **20-09** in both Rod Action Control Cabinets
- Another operator will complete Attachment V of 04-1-01-C11-2 in parallel with your performing the rod bypass



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

2017I S1

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS1

JPM Title: Manually Startup RCIC

Facility Number: GJPM-OPS-E5103& E5105

(If Bank or Modified from Bank)

JPM Attributes:

<input checked="" type="checkbox"/> New	<input type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 10 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

Manually Startup RCIC

<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 10 Min
--	--	-------------------------

Setting: Simulator
Type: RO/SRO
Task: GGNS-CRO-E51-EMERGENCY-3
K&A: 217000 A4.03 (3.4/3.3); A4.04 (3.6/3.6)
Safety Function: 2 – Reactor Water Inventory Control
4 – Heat Removal from Reactor Core
PRA Applicability: System Importance to Core Damage Frequency rank 17
10CFR 55.45(a) (3); (4); (7)
Performance: Perform
Reference(s): 04-1-01-E51-1, Rev. 136
EN-OP-200, Rev. 3
Handout(s): 04-1-01-E51-1 Hard Card Attachment VI available to applicant
Manipulations: 8
Critical Steps: 6
Low Power: YES
Emergency/Abnormal: YES
RCA entry: No
Engineered Safety Function: No

Simulator Setup/Required Plant Conditions:

- Reset Simulator to any full power IC
- Run Schedule File **12-2017NRC JPM 2017IS1**
- Insert Malfunction **e22052 HPCS Pump Trip**
- Insert Malfunction **fw070a FW Line A Rupture Outside Containment @ 100%**
- Insert Malfunction **e51043 RCIC Auto Start Failure**
- Insert Malfunction **di_1e51m625d P601/21B RCIC MAN INIT Depress - NORM**
- Insert Malfunction **E51187c**, “Failure of valve E51-F045”
- Based on **E51F095 open - AO_1E51R605 ramp to 1500 rpm over 30 seconds**
- Remove override on **1E51R605 1500 rpm to 0 rpm over 10 seconds** when either:
 - **iodie51m612c(1)=1 RCIC Trip Pushbutton depressed OR**
 - **zdi4(769)=(1) E51F095 H/S to CLOSE OR**
 - **zdi4(385)=(1) RCIC Trip Throttle valve H/S to CLOSE**

Safety Concerns: None.



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- A Loss of Coolant Accident is in progress
- RCIC is in STANDBY mode
- High Pressure Core Spray is unavailable
- RCIC auto start has failed
- Condensate and Feedwater are unavailable for injection

Initiating Cue(s):

Control Room Supervisor directs you to start RCIC and inject to the RPV at maximum rate



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

Manually Startup RCIC

Notes to Evaluator:

- Unless otherwise stated, all control manipulations will be at panel P601 in the Main Control Room.

Task Overview: (Detailed description of task)

With a LOCA in progress RCIC should automatically start when RPV level drops to - 41.6". If RCIC fails to start or as directed by the Control Room Supervisor, RCIC should be started using 04-1-01-E51-1 Att. VI Hard Card.

The Hard Card has two options to start RCIC:

- 1) Preferred method is Manual Initiation Pushbutton
- 2) Controlled Start which is manual realignment of system valves

The faults in this task are:

- 1) Manual initiation will fail to start RCIC
- 2) Failure of the RCIC Steam Supply valve E51-F045 to open
 - RCIC will operate below minimal speed with this valve closed
 - Initial startup speed is generated by open steam bypass valve E51-F095
 - Speed is not enough to develop any significant system flow or pressure



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 04-1-01-E51-1, Att. VI Quick Start section
step 1

☐ IF desired, **ARM AND DEPRESS** RCIC MAN INIT pushbutton.

Standard: RCIC MAN INIT pushbutton armed and depressed. (Recognized failure of RCIC to start from RCIC MAN INIT pushbutton)

Cue: **If applicant reports failure of RCIC Manual Initiation to start RCIC, acknowledge report.**

Notes: **RCIC will not start upon this action.**

Pushbutton is on 1H13-P601 section 21B.

Applicant will have to use "For controlled start" section of the RCIC Manual Start Attachment VI.

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Alternate Path 1 begins with the next step, designated by "AP 1".



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Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

AP 1 Step 2: 04-1-01-E51-1, Att. VI Controlled Start Step 1

- ☐* **SHIFT** RCIC Flo controller to manual **AND REDUCE** output to minimum.
SHIFT RCIC FLO CONT to MANUAL.

Standard: Controller E51-R600, RCIC FLO CONT placed in manual

Cue: None

Notes:

Controller on 1H13-P601 section 21B mode control switch to the left until it snaps into the MAN position.

SAT / UNSAT

AP 1 Step 3: 04-1-01-E51-1, Att. VI Controlled Start Step 1

- ☐* **SHIFT** RCIC Flo controller to manual **AND REDUCE** output to minimum
REDUCE RCIC FLO CONT output to minimum.

Standard: Controller E51-R600's output was set to minimum (0%)

Cue: None

Notes:

Controller on 1H13-P601 section 21B horizontal output meter indicating 0%.

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

AP 1 Step 4: 04-1-01-E51-1, Att. VI Controlled Start Step 2

☐* **OPEN E51-F046**

Standard: E51-F046, RCIC WTR TO TURB LUBE OIL CLR was opened
Indication red light is on, green light is off

Cue: None

Notes:
1H13-P601 section 21C

SAT / UNSAT

AP 1 Step 5: 04-1-01-E51-1, Att. VI Controlled Start Step 3

☐ **START** Gland Seal Compressor.

Standard: RCIC Turbine Gland Seal Compressor was started **USING** RCIC GL
SEAL COMPR handswitch
Indication red light is on, green light is off

Cue: None

Notes:
1H13-P601 section 21C

SAT / UNSAT



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS1

AP 1 Step 6: 04-1-01-E51-1, Att. VI Controlled Start Step 4

☐* **OPEN E51- F095.**

Standard: E51-F095, RCIC STM SPLY BYPASS VLV was opened

Indication red light is on, green light is off

Cue: None

Notes:
1H13-P601 section 21C

SAT / UNSAT



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JPM Number: GJPM-OPS-2017IS1

AP 1 Step 7: 04-1-01-E51-1, Att. VI Controlled Start Step 5

☐* After 6 seconds, **OPEN E51-F045.**

Standard: Approximately six seconds after E51-F095 was opened, E51-F045, RCIC STM SPLY TO RCIC TURB was attempted to open

Indication will be red light is OFF, green light is ON

Cue: If notified by applicant that E51-F045 failed to open and RCIC is not operating above 2000 rpm, cue applicant to take appropriate action.

Notes:

1H13-P601 section 21C

Applicant should recognize a failure of E51-F045 to open and that turbine speed does NOT get above 2000 rpm.

IAW P&L 3.2, the turbine cannot be operated at speeds less than 2000 rpm.

Failure to secure the RCIC turbine will constitute a failure of this JPM.

Completion of any of the following three steps will complete this JPM.

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Alternate Path 2 begins with the next step designated by "AP 2".



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JPM Number: GJPM-OPS-2017IS1

Option 1

**AP 2 Step 8: 04-1-01-E51-1, Att. VI Controlled Start
Reverse Step 4; EN-OP-200 step 4.0[1](c)(1)b**

☐* Close E51-F095 (steam supply to the RCIC turbine)

Standard: E51-F095, RCIC STM SPLY BYPASS VLV was CLOSED by backing out
of procedure used to open E51-F095

Indication red light is off and green light is on

Cue: None

Notes: When the E51-F095 valve is closed, this JPM is complete.

1H13-P601 section 21C

This action would undo the previous action to start RCIC turbine turning.

**This step may be performed as an alternate method of securing steam to
RCIC.**

Allowed by EN-OP-200 section 4.0 [1](c)(1)b

EVALUATOR TERMINATE JPM.

SAT / UNSAT

OR



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Option 2

AP 2 Step 9: 04-1-01-E51-1, Att. VI RCIC Shutdown step 1

☐* RCIC turbine shutdown using RCIC TURB TRIP / THROT VLV handswitch to CLOSE

Standard: RCIC TURB TRIP / THROT VLV handswitch to CLOSE

Green light on, red light off for the RCIC TURB TRIP/THROT SUPV (stem) and RCIC TURB TRIP / THROT VLV, E51-C002 position indications

Cue: None

Notes: 1H13-P601 section 21C

Step 1 of Att. VI RCIC Shutdown is to close Turbine Trip AND Throttle Valve. This action can be accomplished by either taking the RCIC TURB TRIP / THROT VLV handswitch to OR depressing the RCIC TURB TRIP pushbutton.

When the RCIC turbine is tripped or steam supply is closed, this JPM is complete.

EVALUATOR TERMINATE JPM.

SAT / UNSAT

AND/OR



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Option 2 (cont.)

AP 2 Step 10: 04-1-01-E51-1, Att. VI RCIC Shutdown step 1

☐* Trips the RCIC turbine.

Standard: RCIC TURB TRIP pushbutton DEPRESSED and verified the closure of the trip/throttle valve.

Green light on and the red light off for the RCIC TURB TRIP/THROT
SUPV E51-C002 (stem) position indication

Cue: None

Notes: 1H13-P601 section 21C

When the RCIC turbine is tripped, this JPM is complete.

EVALUATOR TERMINATE JPM.

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JPM Number: GJPM-OPS-2017IS1

Task Standard(s):

Completed the following steps:

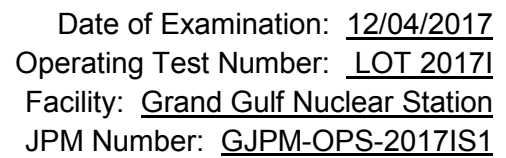
- Shifted RCIC FLO CONT to Manual
- Lowered RCIC FLO CONT output to 0%
- Opened E51-F046
- Opened E51-F095
- Opened E51-F045

When RCIC Steam Supply E51-F045 could not be opened and RCIC speed was less than 2000 rpm:

- RCIC was shutdown with steam supply to the turbine closed **OR** the turbine trip and throttle valve (E51-C002) closed

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Remember to record stop time



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Give this page to the applicant

Initial Condition(s):

- A Loss of Coolant Accident is in progress
- RCIC is in STANDBY mode
- High Pressure Core Spray is unavailable
- RCIC auto start has failed
- Condensate and Feedwater are unavailable for injection

Initiating Cue(s):

Control Room Supervisor directs you to start RCIC and inject to the RPV at maximum rate



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

2017I S2

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS2

JPM Title: Retest MSIV Slow Closure

Facility Number: GJPM-OPS-2015S3

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 10 Min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

Retest MSIV Slow Closure

<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 10 Min
--	--	-------------------------

Setting: Simulator
Type: RO/SRO
Task: CRO-B21-SU/SD-001
K&A: 239001: A2.11 (4.1/4.3); A3.01 (4.2/4.1); A4.01 (4.2/4.0)
Safety Function: 3 - Reactor Pressure Control
PRA Applicability: Accident Type Contribution to Core Damage
Frequency -Break Outside Containment
10CFR 55.45(a) (3); (4); (8)
Performance: Perform
Reference(s): 04-1-01-B21-1, Rev. 52
05-1-02-III-5, Rev. 49
EN-OP-120, Rev. 1
Handout(s): 04-1-01-B21-1 Step 5.4
Manipulations: 11
Critical Steps: 10
Low Power: No
Emergency/Abnormal: **YES**
RCA entry: No
Engineered Safety Function: No

Previous 2 NRC Exams (2015 randomly selected)

Simulator Setup/Required Plant Conditions:

- Reset Simulator to IC-28
- Create event 1 **iodib21m603a(1)==1**
- Insert malfunction **ms066d** to **50.00** - Steam Leak in Aux Bldg Tunnel: MSL D
- Insert remote function **ATT09** to **DONE** - Defeating all MSIV and MSL Drain Isolation Interlocks
- Schedule File **12-2017 NRC JPM 2017IS2**

Safety Concerns:

- None



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JPM Number: GJPM-OPS-2017IS2

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is approximately 58% power during initial startup after refueling outage
- MSIV, B21-F028A, was reworked during the outage

Initiating Cue(s):

- Control Room Supervisor directs you to perform a slow closing of MSIV B21-F028A, using 04-1-01-B21-1, Nuclear Boiler System SOI, section 5.4
- After MSIV B21-F028A reaches full closed, place handswitch for B21-F028A to the CLOSE position for data collection



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

Retest MSIV Slow Closure

Notes to Evaluator:

- All controls and indications for this task are on panel P601

Task Overview: (Detailed description of task)

This task is to perform a slow closure on MSIV B21-F028A.

Following the closure of the MSIV, recognize High - High temperature in Main Steam Tunnel without Group 1 MSIV isolation. Applicant should manually close all remaining MSIVs (7) using handswitches on P601 panel to isolate the steam leak.

At initial power level Main Steam Line Drains should be closed with the exception of B21-F019, INBD MSL DR OTBD DR VLV which has another valve in the line already closed B21-F016, INBD MSL DR INBD DR VLV.



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JPM Number: GJPM-OPS-2017IS2

Critical steps are underlined, italicized, and denoted by an (*).

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 04-1-01-B21-1, Step 5.4.2 a

☐* **PLACE** *associated MSIV handswitch on 1H13-P601 to TEST*

Standard: Placed handswitch for B21-F028A on 1H13-P601 to the TEST position.

Cue: None

Notes: 1H13-P601 section 19C

SAT / UNSAT

Step 2: 04-1-01-B21-1, Step 5.4.2 a

☐* **DEPRESS** *MSIV TEST pushbutton. Holding pushbutton slow closes valve fully.*

Standard: Depressed and held the MSIV TEST pushbutton until B21-F028A indicates full closed, indicated by green light on and red light off.

Cue: None

Notes: 1H13-P601 section 19C

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

Step 3: 04-1-01-B21-1, Step 5.4.2 b

☐* **IF desired, WHEN MSIV is fully CLOSED, PLACE MSIV handswitch from TEST to CLOSE, THEN RELEASE pushbutton.**

Standard: After B21-F028A reaches the full closed position, placed B21-F028A handswitch to the CLOSE position, then releases MSIV TEST P/B.

Cue: None

Notes: When handswitch is placed in the CLOSE position, a steam line break will occur inside the Auxiliary Building Steam Tunnel.

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SIMULATOR OPERATOR - ENSURE EVENT 1 ACTUATES.



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JPM Number: GJPM-OPS-2017IS2

Alternate Path begins with the next step, designated by "AP".

AP Step 4: EN-OP-120, Att. 9.2

☐ Recognize a valid Group 1 MSIV isolation signal.

Standard: Recognized a Group 1 MSIV isolation signal by observing the following four alarms:

- P601-18A(19A)-A3 and A4, MSL PIPE TNL CH-A (B,C,D) TEMP HI/INOP

Cue: **None**

Notes:

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JPM Number: GJPM-OPS-2017IS2

AP Step 5: EN-OP-120, Att. 9.2

☐ Recognize Group 1 MSIV isolation did not occur.

Standard: Recognized all remaining (7) MSIVs are open

- B21-F028B, MSL B CTMT OTBD ISOL
- B21-F028C, MSL C CTMT OTBD ISOL
- B21-F028D, MSL D CTMT OTBD ISOL
- B21-F022A, MSL A DRWL INBD ISOL
- B21-F022B, MSL B DRWL INBD ISOL
- B21-F022C, MSL C DRWL INBD ISOL
- B21-F022D, MSL D DRWL INBD ISOL

Indication of MSIVs open is red lights on, green lights off

Cue: If applicant reports a failure of a Group 1 isolation; respond as the CRS, "I understand failure of Group 1 isolation;"

Also if asked the ATC will place the Mode Switch to shutdown.

Notes:

Applicant may report EP-4 entry condition. If reported EP-4 entry, acknowledge the report.

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

AP Step 6: EN-OP-120, Att. 9.2 & 05-1-02-III-5,
Step 3.3

☐* Place all remaining MSIV handswitches (7) to the CLOSE position.

Standard: Placed the following remaining MSIV handswitches (7) to the CLOSE position:

_____ B21-F028B, MSL B CTMT OTBD ISOL
_____ B21-F028C, MSL C CTMT OTBD ISOL
_____ B21-F028D, MSL D CTMT OTBD ISOL
_____ B21-F022A, MSL A DRWL INBD ISOL
_____ B21-F022B, MSL B DRWL INBD ISOL
_____ B21-F022C, MSL C DRWL INBD ISOL
_____ B21-F022D, MSL D DRWL INBD ISOL

Indication of MSIVs closed is green light on, red light off

Cue: **None**

Notes:

EVALUATOR TERMINATE JPM after all MSIVs (8) MSIVs handswitches are in the closed position.

Only 7 valves are required to be manually closed due to one was closed per the SOI retest.

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Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

AP Step 7: EN-OP-120, Att. 9.2 & 05-1-02-III-5,
Step 3.3

☐ Place the following MSL Drain handswitches to the CLOSE position.

B21-F019, INBD MSL DR OTBD DR VLV

B21-F067A, OTBD MSL A DR VLV (should be closed based on initial power)

B21-F067B, OTBD MSL B DR VLV (should be closed based on initial power)

B21-F067C, OTBD MSL C DR VLV (should be closed based on initial power)

B21-F067D, OTBD MSL D DR VLV (should be closed based on initial power)

B21-F016, INBD MSL DR INBD DR VLV (should be closed based on initial power)

Standard: Placed the following MSL Drain valve handswitches to the CLOSE position:

_____ B21-F019, INBD MSL DR OTBD DR VLV
Indication of MSL Drain Valves closed is green light on,
red light off

Cue: **None**

Notes:

These valves should already be closed due to initial power level. B21-F019 has another valve (B21-F016) in the line closed therefore would NOT be critical.

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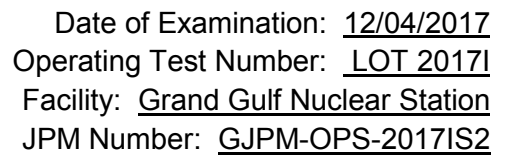
Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS2

Task Standard(s):

- Placed handswitch for B21-F028A on 1H13-P601 to the TEST position
- Depressed and held the MSIV TEST pushbutton until B21-F028A indicates full closed
- Placed B21-F028A handswitch to the CLOSE position, then released MSIV TEST P/B
- Recognized High - High temperature in Main Steam Tunnel without Group 1 MSIV isolation.
- Manually closed the following MSIVs:
 - B21-F028B, MSL B CTMT OTBD ISOL
 - B21-F028C, MSL C CTMT OTBD ISOL
 - B21-F028D, MSL D CTMT OTBD ISOL
 - B21-F022A, MSL A DRWL INBD ISOL
 - B21-F022B, MSL B DRWL INBD ISOL
 - B21-F022C, MSL C DRWL INBD ISOL
 - B21-F022D, MSL D DRWL INBD ISOL
- B21-F028A, MSL A CTMT OTBD ISOL should already be closed

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Remember to record stop time



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Initial Condition(s):

- Plant is approximately 58% power during initial startup after refueling outage
- MSIV, B21-F028A, was reworked during the outage

Initiating Cue(s):

- Control Room Supervisor directs you to perform a slow closing of MSIV B21-F028A, using 04-1-01-B21-1, Nuclear Boiler System SOI, section 5.4
- After MSIV B21-F028A reaches full closed, place handswitch for B21-F028A to the CLOSE position for data collection



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS3

2017I S3

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS3

JPM Title: Startup RHR Shutdown Cooling

Facility Number: GJPM-OPS-E12081

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 20 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS3

Startup RHR Shutdown Cooling

<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 20 Min
--	--	-------------------------

<u>Setting:</u>	Simulator
<u>Type:</u>	RO/SRO
<u>Task:</u>	GGNS-CRO-E12-SU/SD-8
<u>K&A:</u>	205000 A2.10 (2.9/2.9); A3.01 (3.2/3.1); A4.02 (3.6/3.5); A4.01 (3.7/3.7); A4.03 (3.6/3.5); A4.06 (3.8/3.7)A4.09 (3.1/3.1) 2.1.30 (4.4/4.0) 2.1.31 (4.6/4.3)
<u>Safety Function:</u>	4 – Heat Removal from Reactor Core
<u>PRA Applicability:</u>	System Importance to Core Damage Frequency rank 3
<u>10CFR 55.45(a)</u>	(3); (4); (5); (7)
<u>Performance:</u>	Perform
<u>Reference(s):</u>	04-1-01-E12-2, Rev. 123 04-1-02-1H13-P601 20A-E6 Rev. 102 EN-OP-115, Rev. 20 02-S-01-27, Rev. 73 EN-OP-120, Rev. 1
<u>Handout(s):</u>	04-1-01-E12-2 Precautions & Limitations; section 4.1 marked up to section 4.1.2c(6)
<u># Manipulations:</u>	11
<u># Critical Steps:</u>	8
<u>Low Power:</u>	YES
<u>Emergency/Abnormal:</u>	YES
<u>RCA entry:</u>	No
<u>Engineered Safety Function:</u>	No



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JPM Number: GJPM-OPS-2017IS3

Simulator Setup/Required Plant Conditions:

- Reset Simulator to IC-14
- Run Schedule File JPM * E12081 RHR A SDC STARTUP

OR

- Initialize the simulator to Reactor in Mode 4 < 200 degrees F
- Insert Component Override on **E12-F064A handswitch to OPEN**
di_1e12m621aP601/20C RHR A MIN FLO TO SUPP on TRIGGER 1
- Secure the RHR Shutdown Cooling 'A' lineup. Leave the RHR 'A' Room Cooler and Standby Service Water 'A' in operation through RHR Heat Exchanger
- Valve Lineup
 - E12-F008, F009, F006A, F064A, F024A, F053A and B21-F065A **Closed**
 - E12-F003A, F048A, F047A **Open**
- Markup SOI 04-1-01-E12-2 to Step 4.1.2c (6)
- Place Danger tag on 1E12-F037A and 1E12-F037B handswitches
- Place Caution tag on 1B21-F065A handswitch

Safety Concerns:

None



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS3

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is in Mode 4
- Reactor Coolant temperature is 125 ° F
- Radiation Protection and Chemistry personnel have been notified of the startup of RHR 'A' Shutdown Cooling
- Standby Service Water 'A' is in operation with flow through RHR Heat Exchanger
- RWCU F/Ds are in HOLD
- RHR 'A' Room Cooler is in operation
- RHR 'A' is not required to be flushed or warmed
- RHR 'A' was secured for engineering testing 30 minutes ago
- Fill and Vent on RHR 'A' has been verified
- Control Room Supervisor has N/A'd step 4.1.2c(12) because plant is in Mode 4
- ADHR is not in operation

Initiating Cue(s):

- Control Room Supervisor directs you to place RHR A in Shutdown Cooling through E12-F053A, starting at Step 4.1.2c (6) of SOI 04-1-01-E12-2
- Establish RHR flow with E12-F003A and E12-F048A full open



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JPM Number: GJPM-OPS-2017IS3

Startup RHR Shutdown Cooling

Notes to Evaluator:

- All controls will be from panel P601 in the Main Control Room
- Notification of RP and Chemistry was given in the Initial Conditions
- Operation of SSW 'A' and the RHR 'A' Room Cooler was given in the Initial Conditions
- Plant is in Mode 4 so notification of the Refuel Floor is not necessary

Task Overview: (Detailed description of task)

This task is to startup Residual Heat Removal (RHR) A in Shutdown Cooling Mode.

During the evolution, the E12-F064A, RHR A MIN FLO TO SUPP POOL will fail open upon pump start simulating a failure of the time delay relays.

This requires the recognition of the failure and actions to stop draining the Reactor Vessel contents to the Suppression Pool.



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JPM Number: GJPM-OPS-2017IS3

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 04-1-01-E12-2, Step 3.8.18	
<input type="checkbox"/> PLACE RHR A MOV TEST handswitch to TEST	
<p><u>Standard:</u> RHR A MOV TEST handswitch in TEST.</p> <p>Annunciator 1H13-P601 20A-H6 RHR A SYS OOSVC will alarm and associated Status Light RHR A MOV IN TEST STATUS will illuminate</p>	
<u>Cue:</u>	None
<u>Notes:</u>	1H13-P601 section 20B
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS3

Step 2: 04-1-01-E12-2, Step 3.8.18

☐ PLACE Division 1 NSSSS MOV TEST handswitch to TEST

Standard: Division 1 NSSSS MOV TEST handswitch in TEST.

Annunciator 1H13-P601 19A-H3, RX DIV1 ISOL-SYS-OOSVC alarms

Cue: None

Notes: 1H13-P601 section 19B is NSSSS OTBD MOV TEST (Division 1)

Steps 2 and 3 are NOT sequence critical.

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Step 3: 04-1-01-E12-2, Step 3.8.18

☐ PLACE Division 2 NSSSS MOV TEST handswitch to TEST

Standard: Division 2 NSSSS MOV TEST handswitch in TEST.

Annunciator 1H13-P601 19A-H3, RX DIV1 ISOL-SYS-OOSVC alarms

Cue: None

Notes: 1H13-P601 section 18B is NSSSS INBD MOV TEST (Division 2)

Steps 2 and 3 are NOT sequence critical.

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Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS3

Applicant reviews NOTE.

NOTE

To obtain good core circulation, it is recommended that **AT LEAST ONE** Recirculation pump be in operation. **IF** Recirculation Pumps are **NOT** in operation, reactor level is to be maintained above 82 inches.

Step 4: 04-1-01-E12-2, Step 4.1.2c (6)

☐ **ENSURE CLOSED** E12-F064A, RHR A MIN FLO TO SUPP POOL.

Standard: Checked closed E12-F064A, RHR A MIN FLO TO SUPP POOL by observing valve position indication red light off, green light on.

Cue: None

Notes: 1H13-P601 section 20C

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Step 5: 04-1-01-E12-2, Step 4.1.2c (7)

☐ **ENSURE** RHR JOCKEY PUMP A is shutdown.

Standard: Checked RHR Jockey Pump A is shutdown by either dispatching an operator or going to the upper control room to secure the pump.

Cue: Once applicant recognizes that the control switch for this pump is located in the upper control room, CUE applicant that RHR A Jockey pump is secured.

Notes: RHR A Jockey Pump is not in the simulator.

SAT / UNSAT

Step 6: 04-1-01-E12-2, Step 4.1.2c (8)

☐ **ENSURE CLOSED** E12-F082A, RHR A JCKY PMP SUCT ISOL VLV.

Standard: Checked closed E12-F082A, RHR A JCKY PMP SUCT ISOL VLV by either dispatching an operator or going to the upper control room and observing valve position indication.

Cue: Once applicant recognizes that the control switch for this valve is located in the upper control room, CUE applicant that E12-F082A, RHR A JCKY PMP SUCT ISOL VLV is closed.

Notes: Handswitch for the E12-F082A is not in the simulator.

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Step 7: 04-1-01-E12-2, Step 4.1.2c (9)

☐ **ENSURE CLOSED** E12-F428A, PRESSURE LOCK ISOL FOR F024A(Concurrent Verification Required)

Standard: Dispatched an operator to check closed E12-F428A and to obtain a concurrent verification.

Cue: **E12-F428A, PRESSURE LOCK ISOL FOR F024A is closed and the concurrent verification is completed.**

Notes: **E12-F428A is a manual valve not in simulator.**

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Step 8: 04-1-01-E12-2, Step 4.1.2c (10)

☐ **ENSURE CLOSED** E12-F438A, PRESSURE LOCK ISOL FOR F064A. (Concurrent Verification Required).

Standard: Dispatched an operator to check closed E12-F438A and to obtain a concurrent verification.

Cue: **E12-F438A, PRESSURE LOCK ISOL FOR F064A is closed and the concurrent verification is completed.**

Notes: **E12-F438A is a manual valve not in simulator.**

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Step 9: 04-1-01-E12-2, Step 4.1.2c (11)

☐ **ENSURE CLOSED** E12-F004A, RHR A SUCT FM SUPP POOL.

Standard: Checked closed E12-F004A by observing valve position indication red light off, green light on.

Cue: None

Notes: 1H13-P601 section 20C

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Step 10: 04-1-01-E12-2, Step 4.1.2c (12)

☐ **IF** Plant is in mode 5,
THEN ENSURE the 135 psig pressure jumpers are installed per 03-1-01-5 to prevent inadvertent isolations. (This step May be N/A'd by an on-shift SRO.)

Standard: N/A

Cue: None

Notes: Per Initial Conditions, SRO N/A'd step. Plant is in Mode 4.

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Step 11: 04-1-01-E12-2, Step 4.1.2c (13)(a)

☐ **ENSURE OPEN E12-F010 SHUTDN CLG MAN SUCT VLV**

Standard: Observed E12-F010, SHUTDN CLG MAN SUCT VLV is OPEN by observing valve position indication red light on, green light off.

Cue: **Concurrent verification will be requested. ACKNOWLEDGE REQUEST as indicated.**

Notes: **1H13-P601 section 17C**

SAT / UNSAT

Step 12: 04-1-01-E12-2, Step 4.1.2c (13)(b)

☐* **ENSURE OPEN E12-F008 RHR SHUTDN CLG OTBD SUCT VLV**

Standard: OPENED E12-F008, RHR SHUTDN CLG OTBD SUCT VLV by taking handswitch to OPEN as indicated by red light on, green light off.

Cue: **None**

Notes: **1H13-P601 section 20C**

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Step 13: 04-1-01-E12-2, Step 4.1.2c (13)(c)

☐* **ENSURE OPEN E12-F009 RHR SHUTDN CLG INBD SUCT VLV**

- Ensure breaker 52-163137 is in CLOSE position
- Ensure OPEN E12-F009, RHR SHUTDN CLG INBD SUCT VLV

Standard: OPENED E12-F009, RHR SHUTDN CLG INBD SUCT VLV by taking handswitch to OPEN as indicated by red light on, green light off.

Cue: **Concurrent verification will be requested. ACKNOWLEDGE REQUEST as indicated.**

If NLO dispatched to 52-163137, report 52-163137 is closed.

Notes: **1H13-P601 section 17C**

E12-F009 circuit breaker 52-163137 is closed by the valve having indication on 1H13-P601. This portion is NOT Critical.

Opening E12-F009 IS CRITICAL. Applicant may indicate the circuit breaker is closed based on the indication is illuminated.

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Step 14: 04-1-01-E12-2, Step 4.1.2c (13)(d)

☐* **ENSURE OPEN E12-F006A RHR PMP A SUCT FM SHUTDN CLG**

Standard: OPENED E12-F006A, RHR PMP A SUCT FM SHUTDN CLG by taking handswitch to OPEN as indicated by red light on green light off.

Cue: None

Notes:
1H13-P601 section 20C

SAT / UNSAT

Step 15: 04-1-01-E12-2, Step 4.1.2c (13)(e)

☐ **ENSURE OPEN E12-F047A RHR HX A INL VLV**

Standard: Observed E12-F047A RHR HX A INL VLV is OPEN by observing valve position indication red light on, green light off.

Cue: None

Notes:
1H13-P601 section 20C

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Step 16: 04-1-01-E12-2, Step 4.1.2c (13)(f)

☐ **ENSURE OPEN** E12-F048A RHR HX A BYP VLV

Standard: Observed E12-F048A, RHR HX A BYP VLV is OPEN by observing valve position indication on meter E12-R612A HX A BYP VLV F048A POS at 100%.

Cue: None

Notes:
1H13-P601 section 20B
Valve is a throttle valve.

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Step 17: 04-1-01-E12-2, Step 4.1.2c (14)

☐* **CLOSE E12-F003A RHR HX A OUTL VLV**

Standard: CLOSED E12-F003A, RHR HX A OUTL VLV by taking handswitch to CLOSE and hold until position as indicated by E12-R611A, HX A OUTL VLV F003A POS reading 0%.

Cue: None

Notes:
1H13-P601 section 20B
Valve is a throttle valve.

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Step 18: 04-1-01-E12-2, Step 4.1.2c (15)

- ☐ **ENSURE CLOSED** B21-F065A, FW INL SHUTOFF VLV.

HANG a CAUTION tag on OPEN/CLOSE pushbuttons for B21-F065A, FW INL SHUTOFF VLV that states:

“OPENING B21-F065A, FW INL SHUTOFF VLV can cause injection of water into the Reactor Vessel.

PRIOR to opening B21-F065A, FW INL SHUTOFF VLV, ENSURE the status of Shutdown Cooling AND Condensate/Feedwater systems will NOT cause an unintentional introduction of water into Reactor.”

Standard: Verified B21-F065A closed on 1H13-P680 by observing its green light on, red light off.

Cue: **Caution tag has been placed.**

Notes: **Applicant may verify Caution tag is in place. 1H13-P680 section 2C**

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Applicant reviews NOTE.

NOTE

Step 4.1.2c (18) establishes RHR A SDC flow. Three return path options are available:

1. Option 1 - RHR SDC return to Feedwater loops E12-F053A
2. Option 2 - RHR SDC return to Upper Ctmt Pool via E12-F037A
(**IF** using Option 2,
THEN ENSURE all prerequisites for this SDC flowpath are met **BEFORE** establishing flow.)
3. Option 3 - RHR SDC return to LPCI Line via E12-F042A
(**IF** using Option 3,
THEN REFER to EPI 04-1-03-E12-1 to allow data collection **BEFORE** establishing flow.)

E12F04



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Step 19: 04-1-01-E12-2, Step 4.1.2c (16) & (17)

☐ **IF** using Option 2,
THEN PERFORM following:

(a) **ENSURE OPEN** E12-F027A.

(b) **CLOSE** G41-F041A.

IF Option 3 is desired,
THEN PERFORM following:

(a) **ENSURE OPEN** E12-F027A.

(b) **REFER** to EPI 04-1-03-E12-1 before establishing flow.

Standard: **N/A** - Refers to Initiating Cue and determines return flow is through E12-F053A and continues.

Cue: **None**

Notes:
Initiating CUE is to use E12-F053A.

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Applicant reviews CAUTION.

CAUTION

IF greater than 1154 gpm is **NOT** established **WITHIN** 8 seconds of pump start, **THEN** F064A, RHR A MIN FLO TO SUPP POOL automatically opens, establishing flow path from Reactor to Suppression Pool.



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Step 20: 04-1-01-E12-2, Step 4.1.2c (18)

☐ **ENSURE** RWCU F/Ds are in HOLD per 04-1-01-G33-1 SOI.

Standard: Refers to Initial Conditions and determines that RWCU F/Ds are in HOLD.

Cue: None

Notes: Initial Conditions state RWCU F/Ds in HOLD.

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Step 21: 04-1-01-E12-2, Step 4.1.2c (19)

☐* **START RHR PMP A.**

Standard: STARTED RHR PMP A by taking handswitch to START as indicated by pump red light on, green light off.

Cue: None

Notes:
1H13-P601 section 20C

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Simulator Operator NOTE:

When RHR pump is started, verify or activate TRIGGER 1.



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NOTE: STEP 22 should be performed within 8 seconds of Pump Start to establish flow to prevent E12F064A Minimum flow from opening.

Step 22: 04-1-01-E12-2, Step 4.1.2c (19)(a)

☐* **IMMEDIATELY FULLY OPEN E12-F053A, RHR A SHUTDN CLNG RTN TO FW.**

Standard: IMMEDIATELY FULLY OPENED E12-F053A, RHR A SHUTDN CLNG RTN TO FW by observing valve position indication red light on, green light off.

Cue: None

Notes:

1H13-P601 section 20C
Flow will be indicated on E12-R603A, RHR PMP A DISCH FLO on 1H13-P601 section 20B.

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Alternate Path begins with the next step designated by "AP".

AP Step 23: 04-1-01-E12-2, Step 4.1.2c;
ARI 04-1-02-1H13-P601 20A-E6 step 3.2

☐ Recognizes E12-F064A RHR A Minimum Flow Valve auto opens.

Standard: Recognized E12-F064A is open as indicated by red light on, green light off and acknowledged and responded to 1H13-P601-20A-E6 (RHR VLVS F006A & F064A OPEN) alarm

Cue: If applicant reports E1-F064A opened but should not have, acknowledge report.

Notes: May attempt to close E12-F064A. Should perform actions of the ARI.

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AP Step 24: 04-1-02-1H13-P601-20A-E6 steps 3.1 & 3.2

- ☐* 3.1 If desired increase shutdown cooling flow to greater than 1154 gpm as indicated on RHR PUMP A FLOW indicator R603A. Check MOV-F064 closes.
- 3.2 If unable to increase pump flow, trip RHR Pump A and then close MOV-F064.

Standard: Tripped RHR Pump A as indicated by red light off and green light on and attempted to close E12-F064A. Recognized that E12-F064A failed to close. If E12-F064A not taken to close but the RHR A pump is secured CRITICAL STEP is MET.

Cue: **If Applicant reports the trip of RHR Pump A and the E12-F064A failure to close when taken to close, then acknowledge the report.**

Notes: **Applicant may make the decision not to attempt to increase flow in an attempt to close the E12-F064A valve and immediately trip RHR Pump A. This is acceptable.**

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AP Step 25: EN-OP-115 step 4.0[2](b)
and 02-S-01-27 step 6.7.15.1

☐ * **CLOSES any or all of the following valves:**

- a) **E12-F006A**
- b) **E12-F008**
- c) **E12-F009**

Standard: Closed any or all of the following valves, E12-F006A, E12-F008, or E12-F009 by turning their handswitches to CLOSE and observing their red lights are off and their green lights are on.

Cue: None

Notes: Closing any one or all three valves will still satisfy the task.

EVALUATOR TERMINATE JPM after RHR A pump is secured and any one of the above valves have been closed.

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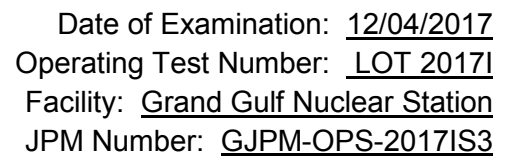
Task Standard(s):

- Opened E12-F008, RHRSHUTDN CLG OTBD SUCT VLV
- Opened E12-F009, RHR SHUTDN CLG INBD SUCT VLV
- Opened E12-F006A, RHR PMP A SUCT FM SHUTDN CLG
- Closed E12-F003A, RHR HX A OUTL VLV
- Started RHR Pump A
- Opened E12-F053A, RHR A SHUTDN CLG RTN TO FW
- RHR A pump is secured
- **Either** E12-F006A, or F008, or F009 is closed

If NO action is taken prior to RPV level reaching the automatic isolation signal for Shutdown Cooling, this constitutes a failure of the JPM.

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Remember to record stop time



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Give this page to the applicant

Initial Condition(s):

- Plant is in Mode 4
- Reactor Coolant temperature is 125 ° F
- Radiation Protection and Chemistry personnel have been notified of the startup of RHR 'A' Shutdown Cooling
- Standby Service Water 'A' is in operation with flow through RHR Heat Exchanger
- RWCU F/Ds are in HOLD
- RHR 'A' Room Cooler is in operation
- RHR 'A' is not required to be flushed or warmed
- RHR 'A' was secured for engineering testing 30 minutes ago
- Fill and Vent on RHR 'A' has been verified
- Control Room Supervisor has N/A'd step 4.1.2c(12) because plant is in Mode 4
- ADHR is not in operation

Initiating Cue(s):

- Control Room Supervisor directs you to place RHR A in Shutdown Cooling through E12-F053A, starting at Step 4.1.2c (6) of SOI 04-1-01-E12-2
- Establish RHR flow with E12-F003A and E12-F048A full open



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2017I S4

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS4

JPM Title: Start, Parallel and Load EDG

Facility Number: GJPM-OPS-P75021

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 25 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS4

Start, Parallel and Load EDG

<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 25 Min
--	--	-------------------------

Setting: Simulator
Type: RO/SRO
Task: CRO-P75-002
K&A: 264000 A4.04 (3.7/3.7)
Generic 2.1.30 (4.4/4.0)
262001 A4.01 (3.4/3.7)
Safety Function: 6 - Electrical
PRA Applicability: System Importance to Core Damage Frequency rank 11
10CFR 55.45(a) (3); (4); (8)
Performance: Perform
Reference(s): 04-1-01-P75-1, Rev 106
Handout(s) 04-1-01-P75-1 Precautions & Limitations and marked up
to step 4.2.2b
Manipulations: 9 or 8
Critical Steps: 8
Low Power: No
Emergency/Abnormal: No
RCA entry: No
Engineered Safety Function: No

Simulator Setup/Required Plant Conditions:

- Reset Simulator to ANY IC
- Run Schedule file GJPM-OPS-P75021

OR

- Any Power IC
- No ECCS Initiations present
- Start up Standby Service Water 'A' and place it through the RHR Heat Exchangers, open P41-F018A
- Place SSW A MOV test switch to **TEST**
- Place Malfunction **p41148a** SSW Pump A trip on **TRIGGER 1**
- **Markup** SOI section complete to step 4.2.2b

Safety Concerns:

- None



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Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Division I Diesel Generator is in Standby per the SOI
- Two Operators are standing by at the Diesel Generator and communications established with one at the PUSH TO STOP pushbutton
- I&C has completed ALL testing required to run the Diesel Generator and verified the crank case manometer
- Diesel Generator will only run for 30 minutes
- Diesel Generator has already been manually barred over and air rolled
- Chemistry has sampled the Jacket Water System and it is ready for operation
- There are NO open work orders on the diesel
- Governor Oil level has been verified satisfactory
- Standby Service Water 'A' is operating in the Chemical Addition Lineup with P41-F018A, SSW INL TO DG 11 WTR CLR open
- The last Diesel Generator run for DG11 was 2 weeks ago
- SSW A MOV Test switch is in TEST
- Another operator will take care of Diesel Generator Start Log

Initiating Cue(s):

- Control Room Supervisor directs you to start Div I Diesel Generator and operate it in parallel with Offsite and load the Diesel to ≈ 3 MWe and ≈ 1.5 MVARs
- All local operations have been performed and begin at step 4.2.2 b



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Start, Parallel and Load EDG

Notes to Evaluator:

- All controls will be from panels P864 in the Main Control Room.

Task Overview: (Detailed description of task)

This task is to start the Division I Diesel Generator, parallel the generator to 15AA bus and load the generator with real and reactive load per the SOI.

With the Diesel connected to the bus loaded, Standby Service Water will be lost requiring the applicant to secure the Diesel Generator to prevent overheating the diesel.



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Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 04-1-01-P75-1, Step 4.2.2 b (1)

- ☐ On Local Pump Control panel **START** Auxiliary Lube Oil pump C007A by **PLACING** its Control switch HS-M031A to CLOSE **AND THEN BACK** to AUTO. After Turbo Oil Press Left Front R014A gage **AND** Turbo Oil Press Right Front R015A gage increase to ≥ 18 psig for Div 1, **STOP** Auxiliary Lube Oil pump by **PLACING** Control switch HS-M031A to TRIP **AND THEN BACK** to AUTO.

Standard: Applicant instructs the local operator to start the Auxiliary Lube Oil Pump and return the control to AUTO and then stop the Auxiliary Lube Oil Pump once Turbo Oil Press Left and Right is > 18 psig.

Cue: **Left and Right Turbo Oil Pressures are 25 psig and the Auxiliary Lube Oil Pump is stopped and in AUTO.**

Notes:

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Step 2: 04-1-01-P75-1, Step 4.2.2 b (2)

☐* **IMMEDIATELY START Standby Diesel Generator 11 by *PRESSING DIV 1 DSL ENG RMT MAN START pushbutton on 1H13-P864***

Standard: Started Division I Diesel Generator depressed and released Pushbutton under cap on 1H13-P864 section 1C.

Observed red light above start pushbutton is on
DIV 1 DSL ENG RMT MAN STOP green light is off
READY TO LOAD status light 1H13-P864 section 1B is on

Cue: If asked, DG Trouble Alarm due to low starting air pressure, the motor driven air compressor is operating.

Notes:

Pushbuttons on 1H13-P864 section 1C

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Simulator operator may use RF-p75064 to reset local alarm.



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Applicant reviews CAUTION.

CAUTION

IF SSW Cooling Water flow is lost, **THEN** Standby Diesel Generator 11 [12] **MUST** be secured **AND** then placed into Maintenance Mode.

Applicant may observe 4.2.2c (1) - (4) on 1H13 -P870 section 1C, this was given in the Initial Conditions as operating.

Step 3: 04-1-01-P75-1, Step 4.2.2 c (5)

☐ Standby Diesel Generator 11 Jacket Water Cooler Inlet Valve 1P41-F018A Opens.

Standard: Checked P41-F018A open as indicated by red light on, green light off and SSW 'A' is operating.

Cue: **None**

Notes: **Indication is on 1H13-P870 section 1C and F018A is already open as an initial condition.**

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Step 4: 04-1-01-P75-1, Step 4.2.2 c (6)

- ☐ IF SSW Cooling Water flow is lost. THEN SECURE Standby Diesel Generator 11 AND PLACE it into Maintenance mode.

Standard: Applicant acknowledges step.

Cue: None

Notes: This will be direction in addition to the CAUTION to secure the diesel generator, if SSW cooling water flow is lost.

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Step 5: 04-1-01-P75-1, Step 4.2.2 c (7)

☐ DG Room O/A Fan 1X77-C001A Starts, 1H13-P864.

- (a) Running in slow speed **IF** inlet temperature is $\leq 70^{\circ}\text{F}$.
- (b) Running in fast speed **IF** inlet temperature is $> 70^{\circ}\text{F}$.
- (c) Damper 1X77-F001A Opens.
- (d) **IF** fan failed to start, **THEN START** per step 5.5.
- (e) **IF** fan **CANNOT** be started, **THEN OPEN** doors **AND USE** temporary fans as needed to prolong diesel operation for critical loads

Standard: Observed DG Room O/A Fan 1X77-C001A is running as indicated by either the Lo or Hi speed red light on and DG 11 RM O/A INTK DMPR open as indicated by red light on, green light off.

Cue: None

Notes: Light is on 1H13-P864 section 1C.

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Step 6: 04-1-01-P75-1, Step 4.2.2 c (8)

☐ DG 11 READY TO LOAD status light on 1H13-P864-1B illuminated for Division 1 DG.

Standard: Checked DG 11 READY TO LOAD status light is on.

Cue: None

Notes: Light is on 1H13-P864 section 1B.

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Applicant reviews NOTE.

NOTE

Oil addition with engine running should be made to bring level back to the black line on sight glass.

IF oil addition is required with engine loaded, oscillations in generator load May occur.

Step 7: 04-1-01-P75-1, Step 4.2.2 c (9)

☐ **CHECK** that governor oil level is stable **AND VISIBLE** in sight glass.

Standard: Contacted local operator to verify governor oil level is stable and visible in sight-glass.

Cue: **Governor oil level is stable at the black line and visible in the sight glass.**

Notes:

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Step 8: 04-1-01-P75-1, Step 4.2.2 c (10)

☐ **IF** DC Fuel Oil Booster pump has started, **THEN STOP** DC Fuel Oil Booster pump by **TAKING** its handswitch HS-M004A to OFF **AND BACK** to AUTO.

Standard: Contacted local operator to verify Fuel Oil Booster Pump status.

Cue: **Fuel Oil Booster pump is not running.**

Notes:

SAT / UNSAT



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Applicant reviews NOTE.

NOTE

IF Aux Lube Oil pump is running, it May be shutdown at this time **IF** conditions of Precaution 3.29 are met.

REFER to Precaution 3.30.

Step 9: 04-1-01-P75-1, Step 4.2.2 c (11)

- ☐ **IF** Aux Lube Oil pump is running, **THEN** shutdown Aux Lube Oil pump by taking its handswitch HS-M031A to TRIP **AND BACK** to AUTO **AFTER REFERRING** to precaution 3.29 **AND** 3.30.

Standard: Contacted local operator to verify Aux Lube Oil Pump status.

Cue: Aux Lube Oil pump is not running.

Notes:

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Step 10: 04-1-01-P75-1, Step 4.2.2 c (12)

- ☐ **IF** Aux Jacket Water Pump C004A is still running, **VERIFY** Jacket water pressure is >35 psi at R050A **AND** >15 psi at R020A with the engine at 450 rpm, **THEN STOP** AUX JACKET WATER PUMP C004A by **PLACING** its handswitch HS-M032A to TRIP **AND THEN BACK** to AUTO.

Standard: Contacted local operator to verify Aux Jacket Water Pump status.

Cue: Aux Jacket Water pump is not running.

Notes:

SAT / UNSAT



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Step 11: 04-1-01-P75-1, Step 4.2.2 d

- ☐ **SELECT** phase of bus voltage to be **MONITORED** with VM 4.16 kV BUS 15AA VOLTMETER handswitch.

Standard: Observed voltmeter is selected to monitor bus 15AA voltage by selected to A-B, B-C, or C-A on handswitch.

Cue: None

Notes: Handswitch in on 1H13-P864 section 1C

Applicant may not change phases monitored this is acceptable

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Step 12: 04-1-01-P75-1, Step 4.2.2 e

- ☐* **PLACE Standby Diesel Generator 11 Output Breaker Synchronizing switch SYN CONT FDR BKR 152-1508 handswitch to ON.**

Standard: Turned on the sync switch for breaker 152-1508 to ON position.

Cue: None

Notes: Synchroscope will turn on and sync scope lights will be going on and off.

Synchroscope on 1H13-P864 section 1B; Sync Switch is on section 1C

SAT / UNSAT



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Step 13: 04-1-01-P75-1, Step 4.2.2 f & f(1)

☐* **PLACE DG 11 PRL CONT handswitch momentarily to PRL (spring return to OFF) to defeat parallel interlock AND PLACES governor in the "DROOP" mode.**

Standard: Placed DG 11 PRL CONT handswitch to PRL
Ensures amber light above Div1 LSS PNL TEST MODE SEL
Switch comes ON.

Cue: None

Notes: This places the Droop Circuit in service for the Diesel Generator.
1H13-P864 section 1C

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JPM Number: GJPM-OPS-2017IS4

Step 14: 04-1-01-P75-1, Step 4.2.2 g

☐* **ADJUST** *Standby Diesel Generator 11 INCOMING VOLTS DIV 1 about 50 volts Above RUNNING VOLTS DIV 1 with DG 11 VR AUTO SET PT CONT handswitch.*

Standard: Adjusted DG output voltage (INCOMING) to indicate ≈ 50 volts above bus 15AA (RUNNING) using DG11 VR AUTO SET PT CONT handswitch. (± 100 volts)

Cue: None

Notes: If voltage is within range, no adjustments are necessary. This is acceptable and this step would be non-critical.

If multiple adjustments are necessary, this is acceptable.

Voltage Regulator handswitch on 1H13-P864 section 1C.
INCM and RUNNING Voltages on 1H13-P864 section 1B.

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Step 15: 04-1-01-P75-1, Step 4.2.2 h

☐* **ADJUST** *Standby Diesel Generator 11 speed to bring frequency within range of bus frequency by **USING** DG 11 GOV MAN CONT so that synchroscope indicator is **ROTATING** Slowly in the FAST direction (clockwise).*

Standard: Adjusted DG speed to get the Synchroscope turning slowly in the FAST (clockwise) direction using DG 11 GOV MAN CONT.

Cue: None

Notes: This is dependent on the comfort of the applicant. Applicant may not have to adjust speed at all. This is acceptable and this step would be non-critical. Multiple adjustments may be necessary, this is acceptable.

**Governor handswitch on 1H13-P864 section 1C.
Synchroscope on 1H13-P864 section 1B.**

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Applicant reviews NOTE.

NOTE

Diesel Generator Output Voltage Should be maintained by Automatic Voltage Regulator, **BUT** a **CHECK** Should be kept on Diesel Generator Output voltage **AND** frequency.



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Step 16: 04-1-01-P75-1, Step 4.2.2 i

- ☐ There May be a need to adjust Diesel Generator speed to obtain proper rotation of synchroscope indicator. Once indicator is rotating in the correct direction (clockwise) ALLOW it to make a few revolutions to ENSURE frequency stability.

Standard: Applicant acknowledges step.

Cue: **None**

Notes:

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Applicant reviews CAUTION.

CAUTION

WHEN synchronizing, do **NOT** close Diesel Generator output breaker with sync scope standing still **IF** there is power available from another source.



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Step 17: 04-1-01-P75-1, Step 4.2.2 j

- ☐* **WHEN Standby Diesel Generator 11 speed is such that the synchroscope indicator is moving Slowly in the FAST direction (clockwise) AND is approximately five minutes before the 12 o'clock position, THEN CLOSE Diesel Generator Output breaker with BUS 15AA FDR FM DG 11 handswitch. IMMEDIATELY** after closing Diesel Generator Output breaker, **OBSERVE BREAKER CLOSING** lights to **ENSURE** breaker is Closed. (IF NOT Closed, **RETURN BREAKER** handswitch to TRIP position).

Standard: Closed DG 11 output breaker 152-1508 as indicated by red light on, green light off.

Cue: None

Notes: Synchroscope should stop and the synchroscope lights are off. If circuit breaker does not close on first attempt, additional attempts are allowed.

152-1508 circuit breaker handswitch on 1H13-P864 section 1C.
Synchroscope on 1H13-P864 section 1B.

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Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS4

Step 18: 04-1-01-P75-1, Step 4.2.2 k

- ☐ **WHEN** loading Diesel Generator to rated load, **THEN MONITOR** all exhaust temps.
IF any temp exceeds 960 deg F, **THEN PERFORM** the following:
Contact Engineering; Consider securing Diesel Generator

Standard: Applicant acknowledges step.

Cue: If asked report all temperatures are < 960 °F.

Notes:

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Step 19: 04-1-01-P75-1, Step 4.2.2 l

- ☐* Standby Diesel Generator 11 load May be raised by going to **RAISE** on DG 11 GOV MAN CONT.

Standard: Real load on the diesel generator raised to ≈3 MWe using the speed control as indicated on meter 1P75-R602A.

Cue: If asked, the local indicators for MWe and MVAR are reading same as the Control Room indication.

Notes: Dependent upon when applicant recognizes the trip of Standby Service Water (SSW) A, the following steps may not be performed and would not be critical.

DG 11 load is indicated on 1P75-R602A, 1H13-P864 section 1B.

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Simulator Operator_When load is raised to >2 MWe, SSW pump A will trip or simulator operator will TRIGGER EVENT 1.

Step 20: 04-1-01-P75-1, Step 4.2.2 m

☐* Standby Diesel Generator 11 VARS loading May be adjusted with DG11 VR AUTO SET PT CONT. **ADJUST VARS per Table.**

Standard: Reactive load on the diesel generator raised to ≈ 1.5 MVAR using the voltage regulator control as indicated on meter 1P75-R603A.

Cue: None

Notes: Applicant may raise load to >2 MWe, causing SSW pump to Trip, before adjusting VARS. If so, this step becomes N/A and is NOT critical.

DG 11 VARS is indicated on 1P75-R603A, 1H13-P864 section 1B.

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JPM Number: GJPM-OPS-2017IS4

Step 21: 04-1-01-P75-1, Step 4.2.2 n

- ☐ As soon as Standby Diesel Generator 11 minimum load has stabilized, **PLACE SYNCHROSCOPE** handswitch to OFF position.

Standard: SYNCHROSCOPE handswitch for breaker 152-1508 placed to OFF position.

Cue: None

Notes:

Dependent upon when applicant recognizes the trip of Standby Service Water (SSW) A, the following steps may not be performed and would not be critical.

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Alternate path begins with the next step, designated by "AP".

AP Step 22: 04-1-01-P75-1, Step 4.2.2.c (6)

☐ Recognizes SSW pump 'A' trip.

Standard: Recognized SSW pump 'A' has tripped on P870.

Cue: If applicant begins to perform actions on SSW 'A', cue the applicant another operator will realign SSW 'A'.

Notes: Indications on 1H13-P870 section 1A, 1B and 1C of SSW A trip - SSW PMP A TRIP alarm (870 1A-A1); SSW A flow and pressure dropping to zero on 1P41-R606A; SSW PMP A handswitch green light on and red light off.

The critical item is to remove the Diesel Generator from the bus and get the load off the machine. Applicant does not have to unload and open output circuit breaker.

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AP Step 23: 04-1-01-P75-1, Step 4.2.2 c (6)

☐* *Trip Division 1 Diesel Generator using the DIV 1 DSL ENG RMT STOP pushbutton on 1H13-P864 panel.*

Standard: Diesel generator tripped using remote stop pushbutton on 1H13-P864 as indicated by red light above DIV 1 DSL ENG RMT MAN START pushbutton is off and READY TO LOAD status light is off.

Cue: **After the Diesel Generator is shutdown inform the applicant that another operator will place the Diesel in Maintenance and secure the Diesel Generator support system.**

Notes: **Applicant may elect to remove the load from the Diesel Generator prior to securing. If the applicant selects this path the load should be removed from the Diesel then the output breaker should be opened prior to depressing the STOP pushbutton.**

Stop pushbutton is on 1H13-P864 section 1C.

Critical step is the securing of the diesel generator.

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EVALUATOR TERMINATE the JPM.



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS4

Task Standard(s):

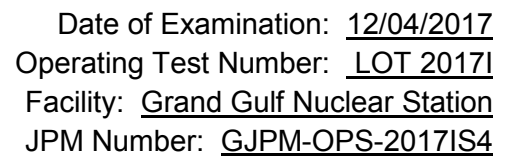
- Started Diesel Generator 11
- Placed Sync Switch for circuit breaker 152-1508 to ON
- Placed DG11 Parallel Control to PRL
- Adjusted Incoming voltage to ≈ 50 volts above Running Voltage (± 100 volts)
- Adjusted DG11 speed to obtain frequency of DG11 slightly higher than 15AA bus
- Closed DG11 output circuit breaker 152-1508
- Raised DG11 load by raising on DG11 GOV MAN CONT

When SSW A pump is tripped:

- Diesel Generator 11 is shutdown

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Remember to record stop time



This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

[illegible]

Give this page to the applicant

Initial Condition(s):

- | |
|--|
| <ul style="list-style-type: none">• Division I Diesel Generator is in Standby per the SOI• Two Operators are standing by at the Diesel Generator and communications established with one at the PUSH TO STOP pushbutton• I&C has completed ALL testing required to run the Diesel Generator and verified the crank case manometer• Diesel Generator will only run for 30 minutes• Diesel Generator has already been manually barred over and air rolled• Chemistry has sampled the Jacket Water System and it is ready for operation• There are NO open work orders on the diesel• Governor Oil level has been verified satisfactory• Standby Service Water 'A' is operating in the Chemical Addition Lineup with P41-F018A, SSW INL TO DG 11 WTR CLR open• The last Diesel Generator run for DG11 was 2 weeks ago• SSW A MOV Test switch is in TEST• Another operator will take care of Diesel Generator Start Log |
|--|

Initiating Cue(s):

- | |
|---|
| <ul style="list-style-type: none">• CRS directs you to start Div I Diesel Generator and operate it in parallel with Offsite and load the Diesel to ≈ 3 MWe and ≈ 1.5 MVARs• All local operations have been performed and begin at step 4.2.2 b |
|---|



Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

2017I S5

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS5

JPM Title: Startup H2 Recombiner

Facility Number: GJPM-OPS-E6102

(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Startup H2 Recombiner

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 Min
--	---	-------------------------

<u>Setting:</u>	Simulator
<u>Type:</u>	RO/SRO
<u>Task:</u>	GGNS-CRO-E61-EMERGENCY-4
<u>K&A:</u>	223001 A4.13 (3.4/3.4)
	500000 EA1.03 (3.4/3.2)
	Generic 2.1.25 (3.9/4.2); 2.1.20 (4.6/4.6)
<u>Safety Function:</u>	5 – Containment Integrity
<u>PRA Applicability:</u>	No
<u>10CFR 55.45(a)</u>	(3); (4); (8)
<u>Performance:</u>	Perform
<u>Reference(s):</u>	04-1-01-E61-1, Rev. 41
<u>Handout(s):</u>	04-1-01-E61-1
<u># Manipulations:</u>	5
<u># Critical Steps:</u>	7 (1 calculation; 1 graph determination)
<u>Low Power:</u>	No
<u>Emergency/Abnormal:</u>	No
<u>RCA entry:</u>	No
<u>Engineered Safety Function:</u>	YES

Simulator Setup/Required Plant Conditions:

- Reset Simulator to any IC

Safety Concerns:

- None.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Combustible Gas Control System in standby
- Electrical is performing a test on Hydrogen Recombiner A

Initiating Cue(s):

Control Room Supervisor directs you to start the A Hydrogen Recombiner per SOI 04-1-01-E61-1 section 5.4.2.a (1) - (10)

Test directs you to assume the following conditions:

Containment pressure is 2.0 psig

Pre-LOCA Containment temperature is 80 degrees F



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Startup H2 Recombiner

Notes to Evaluator:

- All control manipulations will be at panel 1H13-P870 in the Main Control Room.

Task Overview: (Detailed description of task)

This task ensures the applicant can start a hydrogen recombiner for post-LOCA hydrogen removal. The ability to determine the correct power setting based upon containment parameters is also determined.



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Critical steps are underlined, italicized, and denoted by an (*)

NOTE: Sequence of critical steps is critical unless otherwise noted.

Step 1: 04-1-01-E61-1, Step 5.4.2.a (1)

- ☐ **ENSURE** the H₂ RECOMB A PWR ADJ potentiometer is rotated fully counterclockwise to the zero power level.

Standard: Checked the 'A' H₂ RECOMB PWR ADJ potentiometer is turned fully counter-clockwise with its numerical display counter "000".

Cue: None

Notes: 1H13-P870 section 4C

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Step 2: 04-1-01-E61-1, Step 5.4.2.a (2)

- ☐* **START** H₂ RECOMB A by *PLACING the appropriate handswitch on START.*

Standard: Started H₂ RECOMB A
Indicated by red light on, green light off.

Cue: None

Notes:
1H13-P870 section 4C

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Date of Examination: 12/04/2017
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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Step 3: 04-1-01-E61-1, Step 5.4.2.a (3)

- ☐ **DETERMINE** containment pressure by using 1M71-R601A CTMT/DRWL DP RCDR on 1H13-P870-3B.

Standard: Applicant identifies recorder to be utilized. Value is given in Initial Conditions as **2.0 psig**.

Cue: If asked, value is **2.0 psig**.

Notes: Recorder is on 1H13-P870 Section 3B.

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Step 4: 04-1-01-E61-1, Step 5.4.2.a (4)

- ☐ **DETERMINE** the pre-LOCA CTMT temperature by using 1M71-R602A CTMT/DRWL TEMP on 1H13-P870-3B.

Standard: Applicant identifies recorder to be utilized. Value is given in Initial Conditions as **80 degrees F**.

Cue: If asked, value is **80 degrees F**.

Notes: Recorder is on 1H13-P870 Section 3B.

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JPM Number: GJPM-OPS-2017IS5

Applicant reviews NOTE.

NOTE

IF sufficient time has passed since LOCA condition ensued, the pre-LOCA containment temperature May be determined from Daily Ops Logs.

Step 5: 04-1-01-E61-1, Step 5.4.2.a (5)

☐* **DETERMINE** *pressure factor from Recombiner Power Correction Factor vs. Ctmt Pressure Curve (Figure 1).*

Standard: Determined Power Correction Factor using Figure 1 to be 1.12 to 1.16.

Cue: None

Notes: Applicant must add 14.7 psi to 2.0 psig to get 16.7 psia to allow plotting on the graph. Applicant must interpolate Pre-LOCA CTMT Temperature of 80°F to a point approximately halfway between the 50°F line and the 120°F line on Figure 1. See Attached.

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JPM Number: GJPM-OPS-2017IS5

Step 6: 04-1-01-E61-1, Step 5.4.2.a (6)

☐ * To **DETERMINE** the required recombiner power setting, MULTIPLY the pressure factor by a ref. power of 43 KW.

$$\underline{1.12 \times 43 = 48.16 \text{ KW}}$$

$$\underline{1.16 \times 43 = 49.88 \text{ KW}}$$

Standard: Multiplies the derived pressure factor by reference power of 43 KW to arrive at recombiner power setting between 48.1 KW and 49.9 KW.

Cue: None

Notes:

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Applicant reviews CAUTION.

CAUTION

DO NOT exceed a maximum recombiner temperature of 1450°F, **OR** maximum power output of 75 kW.



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Note: H2 RECOMB A PWR ADJ potentiometer is on 1H13-P870 section 4C.

Step 7: 04-1-01-E61-1, Step 5.4.2.a (7)

- ☐* **TURN the H₂ RECOMB A PWR ADJ potentiometer clockwise until 5 kW is obtained on the H2 RECOMB A PWR meter.**

Standard: H₂ RECOMB A PWR ADJ potentiometer adjusted to obtain 5 KW on the H2 RECOMB A PWR meter.

Cue: Once 5KW has been obtained, cue the applicant 10 minutes has elapsed.

Notes:
Power indication is on 1H13-P870 section 4B, E61-R604A H2 RECOMB A PWR.

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Step 8: 04-1-01-E61-1, Step 5.4.2.a (8)

- ☐* **HOLD for 10 minutes, THEN ADVANCE to 10 KW.**

Standard: H₂ RECOMB A PWR ADJ potentiometer adjusted to obtain 10 KW on the H2 RECOMB A PWR meter.

Cue: Once 10 KW has been obtained, cue the applicant 10 minutes has elapsed.

Notes:
Power indication is on 1H13-P870 section 4B, E61-R604A H2 RECOMB A PWR.

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Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Step 9: 04-1-01-E61-1, Step 5.4.2.a (9)

☐* **HOLD for 10 minutes, THEN ADVANCE to 20 KW.**

Standard: H₂ RECOMB A PWR ADJ potentiometer adjusted to obtain 20 KW on the H2 RECOMB A PWR meter.

Cue: Once 20 KW has been obtained, cue the applicant 5 minutes has elapsed.

Notes:
Power indication is on 1H13-P870 section 4B, E61-R604A H2 RECOMB A PWR.

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Step 10: 04-1-01-E61-1, Step 5.4.2.a (10)

☐* ***HOLD for 5 minutes, THEN advance to power setting determined in Step 5.4.2a(6).***

Standard: H₂ RECOMB A PWR ADJ potentiometer adjusted to obtain 48.1 to 49.9 KW is obtained on the H2 RECOMB A PWR meter.

Cue: None

Notes:

Power indication is on 1H13-P870 section 4B, E61-R604A H2 RECOMB A PWR.

When Power is adjusted in band of 48 to 50 KW, Evaluator may terminate the JPM.

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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Task Standard(s):

- Started Hydrogen (H2) Recombiner A
- Using Containment pressure and Pre-LOCA Containment Temperature, determined Pressure Factor from Containment Recombiner Power Correction Factor versus Containment Pressure Figure 1 of 04-1-01-E61-1 (1.12 - 1.16)
- Determined final H2 Recombiner power setting (48.16KW - 49.88KW)
- Raised H2 Recombiner power adjustment to:
 - 5 KW
 - 10 KW
 - 20 KW
- H2 Recombiner A raised to final power setting between 48 KW and 50 KW

SAT / UNSAT

Remember to record stop time



Entergy

Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS5

Follow-Up Questions & Answers:

[illegible]

Comments:

[illegible]

Give this page to the applicant

Initial Condition(s):

- Combustible Gas Control System in standby
- Electrical is performing a test on Hydrogen Recombiner A

Initiating Cue(s):

Control Room Supervisor directs you to start the A Hydrogen Recombiner per SOI 04-1-01-E61-1 section 5.4.2.a (1) - (10)

Test directs you to assume the following conditions:

Containment pressure is 2.0 psig

Pre-LOCA Containment temperature is 80 degrees F



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS6

2017I S6

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS6

JPM Title: Secure Standby Gas Treatment

Facility Number: N/A
(If Bank or Modified from Bank)

JPM Attributes:

<input checked="" type="checkbox"/> New	<input type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS6

Secure Standby Gas Treatment

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 Min
--	---	-------------------------

Setting: Simulator
Type: RO/SRO
Task: CRO-T48-OFFNORM-4
K&A: 261000 A4.03 (3.0/3.0); A4.02 (3.1/3.1)
Generic 2.1.30 (4.4/4.0); 2.1.31 (4.6/4.3)
Safety Function: 9 – Radioactivity Release
PRA Applicability: No
10CFR55.45(a) (2); (3); (5); (8)
Performance: Perform
Reference(s): 04-1-01-T48-1, Rev. 36
Handout(s): 04-1-01-T48-1, Precautions & Limitations and Section 5.3
Manipulations: 11
Critical Steps: 9
Low Power: No
Emergency/Abnormal: No
RCA entry: No
Engineered Safety Function: **YES**

Simulator Setup/Required Plant Conditions:

- Reset Simulator to any IC
- Place the handswitches for Fuel Handling Area and Fuel Pool Sweep Supply and Exhaust Fans to STOP on 1H13-P842
- Manually initiate Standby Gas Treatment (SBGT) Trains A and B
- Allow SBGT trains to stabilize

Safety Concerns:

- None



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS6

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Both Standby Gas Trains are operating following a High-High Fuel Handling Area Radiation signal
- High-High Fuel Handling Area Radiation signal has been cleared and the cause of the High-High Radiation signal secured
- No jumpers have been installed on any control circuits
- Hand switches for Fuel Pool Sweep and Fuel Handling Area Supply and Exhaust fans have been placed to STOP on 1H13-P842
- Attachment VI was not installed and 1T42-B002 and 1T42-B005 Fan Coil Units were not restarted during this evolution

Initiating Cue(s):

- Control Room Supervisor has directed you to place Standby Gas Treatment Train A in STANDBY per 04-1-01-T48-1 section 5.3
- Another operator will maintain the Accumulative Log Book
- Another operator will secure Standby Gas Treatment Train B and restart Fuel Pool Sweep and Fuel Handling Area Supply and Exhaust fans



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Place SBGT Train in Standby with an Auto Start Signal Present

Notes to Evaluator:

- All controls will be from panel P870 in the Main Control Room.

Task Overview: (Detailed description of task)

Standby Gas Treatment System (SBGT) will automatically start on a LOCA signal or High-High Radiation signals in Fuel Handling Exhaust or Fuel Pool Sweep Exhaust ventilation.

When initiating conditions are restored, SBGT is restored to a standby configuration.

Restoring SBGT to standby will reduce differential pressure in the Auxiliary Building thus reducing hazards to personnel entering and exiting the building.

This JPM will evaluate the applicant's ability to place Standby Gas Treatment (SBGT) System in Standby following an Automatic Initiation signal.



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Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 04-1-01-T48-1, Step 5.3.2a(1 - 3)

☐ **IF** Attachment VI was installed to restart 1T42B002 **AND** 1T42B005 fan coil units, **THEN** **PERFORM** the following to restore control circuits to normal:

- (1) **PLACE** handswitch for 1T42B005 (HS-M001) to STOP. (Area 10/185)
- (2) **PLACE** handswitch for 1T42B002 (HS-M002) to STOP. (1H22P178)
- (3) **PERFORM** Attachment VI restoration.

Standard: Step may be N/A'd based on Initial Conditions.

Cue: None

Notes:

SAT / UNSAT



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Step 2: 04-1-01-T48-1, Steps 5.3.2b

☐ **PLACE** SGTS DIV 1 MOV TEST switch in TEST.

- (1) **VERIFY** annunciator "SGTS DIV 1 MOVS IN TEST MODE" is Alarmed.
- (2) **VERIFY** SGTS D1 MOV IN TEST STATUS light is on.

Standard: SGTS DIV 1 MOV TEST switch is in TEST.

SGTS DIV 1 MOVS IN TEST MODE annunciator and SGTS D1 MOV IN TEST STATUS status light are received.

Cue: None

Notes: 1H13-P870 section 2A-G3 for annunciator
1H13-P870 section 2B for switch and status light

SAT / UNSAT



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Step 3: 04-1-01-T48-1, Step 5.3.2c

☐ **PLACE** the following handswitches to STOP on 1H13P842:

1T42C002A FHA EXH FAN A

1T42C004A POOL SWP EXH FAN A

1T42C002B FHA EXH FAN B

1T42C004B POOL SWP EXH FAN B

1T42C001A FHA SPLY FAN A

1T42C003A FP SWP SPLY FAN A

1T42C001B FHA SPLY FAN B

1T42C003B FP SWP SPLY FAN B

Standard: Step may be marked as complete based on Initial Conditions.

Cue: None

Notes:

SAT / UNSAT



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Step 4: 04-1-01-T48-1, Step 5.3.2d (1 - 3)

☐ **IF** one SGTS train is in standby, **THEN PERFORM** the following:

- (1) **PLACE** SGTS DIV 1 MODE SEL keylocked handswitch for Standby filter train to AUTO position.
- (2) **VERIFY** SGTS DIV 1 MODE SEL handswitch white light is lit.
- (3) **VERIFY** SGTS DIV 1 IN STBY MODE annunciator clears.

Standard: Step may be N/A'd based on both subsystems are operating.

Cue: None

Notes:

SAT / UNSAT

Step 5 04-1-01-T48-1, Step 5.3.2e

☐* **TURN SGTS DIV 1 MAN INIT RESET key-locked handswitch to RESET position AND back to NORM, to reset automatic OR manual initiation signal.**

Standard: SGTS DIV 1 MAN INIT RESET key-locked handswitch placed to RESET position **AND** back to NORM.

Cue: None

Notes: 1H13-P870 section 2B

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Step 6: 04-1-01-T48-1, Step 5.3.2 f

☐ **VERIFY** annunciator "SGTS DIV 1 OPER" clears.

Standard: Observed "SGTS DIV 1 OPER" annunciator is clear.

Cue: **None**

Notes: **1H13-P870 section 2A**

SAT / UNSAT

Step 7: 04-1-01-T48-1 step 5.3.2g

☐* **PLACE** *handswitch for SGTS FLTR TR A EXH FAN to STOP.*

Standard: SGTS FLTR TR A EXH FAN handswitch placed to STOP
Indicted by green light on, red light off.

Cue: **None**

Notes: **1H13-P870 section 2C**

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Step 8: 04-1-01-T48-1 step 5.3.2h

☐* **PLACE** *handswitch for ENCL BLDG RECIRC FAN A to STOP.*

Standard: ENCL BLDG RECIRC FAN A handswitch placed to STOP

Indicted by green light on, red light off.

Cue: None

Notes: 1H13-P870 section 2C

SAT / UNSAT

Step 9: 04-1-01-T48-1 step 5.3.2i

☐ **OBSERVE** filter train chart recorders de-energize **AND** Enclosure Building pressure chart recorders transfer to slow speed.

Standard: Observed filter train chart recorders de-energize **AND** Enclosure Building pressure chart recorders transferred to slow speed.

Cue: None

Notes: 1H13-P870 section 2B

SAT / UNSAT



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Step 10: 04-1-01-T48-1 step 5.3.2j

☐ **VERIFY** that all SGTS A dampers on 1H13-P870-2C, are CLOSED

Standard: Verified that all SGTS A dampers on 1H13-P870-2C are CLOSED
Indicted by green light on, red light off for each damper.

Cue: None

Notes: 1H13-P870 section 2C

SAT / UNSAT

Step 11: 04-1-01-T48-1 step 5.3.2k

☐ **VERIFY** "FLTR TR A EXH FAN INL VANE" on 1H13-P870-2C is OPEN

Standard: Verified "FLTR TR A EXH FAN INL VANE" on 1H13-P870-2C is OPEN
Indicted by red light on, green light off.

Cue: None

Notes: 1H13-P870 section 2C

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Step 12: 04-1-01-T48-1 step 5.3.2l

☐ **RECORD** stop time(s) in the Accumulative Log Book.

Standard: Another operator will maintain Accumulative Log Book based on Initiating Cue.

Cue: None

Notes:

SAT / UNSAT

Step 13: 04-1-01-T48-1, Steps 5.3.2m

☐ **PLACE** SGTS DIV 1 MOV TEST switch in NORM.

- (1) **VERIFY** annunciator "SGTS DIV 1 MOV IN TEST MODE" is clear.
- (2) **VERIFY** SGTS D1 MOV IN TEST STATUS light is off.

Standard: SGTS DIV 1 MOV TEST switch is in NORM

SGTS DIV 1 MOV IN TEST MODE annunciator and SGTS D1 MOV IN TEST STATUS status light have cleared.

Cue: None

Notes: 1H13-P870 section 2A-G3 for annunciator
1H13-P870 section 2B for switch and status light

SAT / UNSAT



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Step 14: 04-1-01-T48-1 step 5.3.2n

- ☐* **IF SBT A was secured, THEN OPEN the following dampers:**
- ☐ 1T42F011
- ☐ 1T42F019
- ☐ 1T42F004
- ☐ 1M41F008
- ☐ 1M41F036
- ☐ 1T41F007

Standard: Opened above listed dampers

 Indicated by red light on, green light off.

Cue: None

Notes: 1H13-P870 section 2C

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EVALUATOR NOTE: SBT A Train has been shutdown inform
applicant the JPM is TERMINATED.



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Task Standard(s):

- SGTS DIV 1 initiation signal reset
- T48-D001A, SGTS FLTR TR A EXH FAN secured
- T48-C001A, ENCL BLDG RECIRC FAN A secured
- 1T42F011, FH AREA O/A INTK AUX BLDG INBD ISOL - open
- 1T42F019, FP SWEEP O/A INTK AUX BLDG INBD ISOL - open
- 1T42F004, FH AREA VENT EXH AUX BLDG INBD ISOL - open
- 1M41F008, CTMT CLG O/A INTK AUX BLDG INBD ISOL - open
- 1M41F036, CTMT CLG VENT EXH AUX BLDG INBD ISOL - open
- 1T41F007, AUX BLDG O/A INTK AUX BLDG INBD ISOL - open
- Standby Gas Treatment train A has been placed in Standby

SAT / UNSAT

Remember to record stop time



Date of Examination: 12/04/2017
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Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- Both Standby Gas Trains are operating following a High-High Fuel Handling Area Radiation signal
- High-High Fuel Handling Area Radiation signal has been cleared and the cause of the High-High Radiation signal secured
- No jumpers have been installed on any control circuits
- Hand switches for Fuel Pool Sweep and Fuel Handling Area Supply and Exhaust fans have been placed to STOP on 1H13-P842
- Attachment VI was not installed and 1T42-B002 and 1T42-B005 Fan Coil Units were not restarted during this evolution

Initiating Cue(s):

- Control Room Supervisor has directed you to place Standby Gas Treatment Train A in STANDBY per 04-1-01-T48-1 section 5.3
- Another operator will maintain the Accumulative Log Book
- Another operator will secure Standby Gas Treatment Train B and restart Fuel Pool Sweep and Fuel Handling Area Supply and Exhaust fans



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS7

2017I S7

GGNS

2017 NRC Operating Test

Job Performance Measure

JPM Number: GJPM-OPS-2017IS7

JPM Title: Shift Reactor Recirc Pumps to Fast
Speed

Facility Number: GJPM-OPS-B3306
(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 25 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS7

Shift Reactor Recirc Pumps to Fast Speed

<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 25 Min
--	--	-------------------------

Setting: Simulator
Type: RO/SRO
Task: GGNS-CRO-B33(1)-NORMAL-1.3
K&A: 202001 A4.01 (3.7/3.7)
Safety Function: 1 – Reactivity Control
4 – Heat Removal from Reactor Core
PRA Applicability: No
10CFR 55.45(a) (3); (4); (7)
Performance: Perform
04-1-01-B33-1, Rev. 163
04-1-02-1H13-P680-3A-D9 Rev. 181
04-1-01-R21-12, Rev. 40
05-1-02-III-3 Rev. 115
Handout(s): 04-1-01-B33-1
04-1-01-R21-12
Manipulations: 7
Critical Steps: 4
Low Power: No
Emergency/Abnormal: No
RCA entry: No
Engineered Safety Function: No

Simulator Setup/Required Plant Conditions:

- Reset Simulator to 27% power IC
- Verify plant power between 30% and 32% power
- Verify load line < 75%
- Verify feedwater flow > 4.0 mlbm/hr
- Verify Reactor Recirc Pump 'B' operating in SLOW speed with FCV 97% open
- Verify Reactor Recirc Pump 'A' operating in FAST speed with FCV at min position
- Pull Sheet completed through step 143
- Verify that all prerequisites contained in section 4.2.1 of 04-1-01-B33-1 are satisfied. (Provide applicant with marked up copy of SOI)
- Verify Malfunction **rr196b** (Incomplete Sequence B) in Summary

Safety Concerns: None



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS7

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Plant is in power ascension, at approximately 32% rated thermal power
- Reactor Recirc Pump A is in FAST speed
- Breakers CB-3B and CB-4B are racked in and closed
- Requirements for entry into Controlled Entry Region of Power to Flow Map have been met
- Reactor Recirc Pump B pump and motor temperatures are normal on recorder 1B33-TR-R601
- Chemistry and Radiation Protection personnel have been notified of the Reactor Recirc Pump up shift and crud burst

Initiating Cue(s):

Control Room Supervisor has directed you to shift Reactor Recirc Pump B to FAST speed in accordance with 04-1-01-B33-1 Section 4.2.2.



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Shift Reactor Recirc Pumps to Fast Speed

Notes to Evaluator:

All controls and indication for this task are on panel 1H13-P680. Several parameter verifications must be made prior to transferring a Recirc pump to fast speed. The standard for doing so offers only one source for this instrumentation.

There may be more than one source, so the standard usually states "or equivalent" to let the evaluator know that there may another legitimate way to verify the parameter.

Unless otherwise indicated, all controls and indications for this task are on panel 1H13-P680-3A - 3D.

If asked about monitoring for THI, inform the applicant that another operator will monitor for THI.

This task begins at 04-1-01-B33-1 Step 4.2.2.

Task Overview: (Detailed description of task)

This task shifts the second Reactor Recirculation Pump to fast speed in preparation for power ascension.

The first recirc pump is already in fast speed.

The fault in this task is that RRP fast speed breaker CB-5B fails to close, resulting in an Incomplete Start Sequence and a system shutdown.

The applicant will enter the Reduction in Recirculation System Flow ONEP and close the discharge valve for the B Recirc Pump completing the JPM.

The core must be closely monitored for Thermal Hydraulic Instability (THI). For this task, it will be assumed that another operator will monitor for THI.



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Critical steps are underlined, italicized, and denoted by an (*).

Applicant will review NOTE and CAUTIONS.

04-1-01-B33-1 step 4.2.2 NOTE and CAUTIONS

NOTE

PRIOR to upshift, the respective Recirc Loop FCV should be at the MIN ED Position Interlock as indicated on PDS computer. This will assist in opening of FCV **AFTER** shifting to fast speed **AND** minimize pressure surges on Recirc seal. **IF** using computer point to help **DETERMINE** MIN ED valve position, FCV should be approximately 20 percent. At this FCV position, it is normal for Jet Pump flows **AND** Loop flow in affected Loop to indicate near zero due to flow resistance.

Closing FCV to MIN ED position **WHEN** on LFMG may be done in FAST DETENT **UNTIL** FCV is approximately 20 PERCENT OPEN.

Attachment X, OPERATION OF RECIRCULATION SYSTEM FLOW CONTROL VALVES hard card is available for referencing/use **WHEN** adjusting Recirculation Loop flow rates/Total Core flow rate.

CAUTION

The closure of the Recirculation FCV places the Reactor closer to a region of potential instability. Greater monitoring of the APRMs, LPRMs, SRM Period Meters, **AND** OPRM Computer trends is warranted. **ALSO MINIMIZE** throttling the FCVs **DURING** Recirc fast speed **AND** LFMG operation to discourage pump shaft cracking propagation.

CAUTION

WHEN closing Recirculation FCV, Feedwater flow must be maintained above 3.0 Mlbm/hr to prevent an automatic transfer to slow speed. WITH one Recirculation Pump in fast speed, Jet Pump flow may stall in the slow-speed Loop as the Flow Control Valve is closed to MIN ED position. **IF** Jet Pump stall flow occurs, as indicated by no flow in the loop jet pumps, **THEN** the slow speed loop should be shifted to fast speed **OR** the fast speed loop shifted to slow speed **WITHIN** one hour.

04-1-01-B33-1 step 4.2.2.1

Shift Reactor Recirc Pump B to fast speed as follows:



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Step 1: 04-1-01-B33-1, Step 4.2.2.1(a)(1)

☐* ADJUST Recirc Loop B FCV to MIN ED position as follows:

USING Recirc Loop B FLO CONT on 1H13-P680, THEN CLOSE Recirc Loop B FCV UNTIL MIN ED (approximately 20 percent) is just indicated on B33 Process Diagram OR Computer Point B33N027B.

Standard: Adjusts Recirc Loop B FCV to approximately 20% as indicated on B33 Process Diagram (MIN ED) OR Computer point B33N027B.

Cue: None

Notes: May use FAST Detent.
1H13-P680 section 3D

SAT / UNSAT

Step 2: 04-1-01-B33-1, Step 4.2.2.1(a)(2)

☐ **ALLOW** Computer Point B33K658B.C88 AT LEAST 5 seconds for Computer Point updates.

Standard: Allows at least 5 seconds for computer point B33K658B.C88 to update.

Cue: None

Notes:

SAT / UNSAT



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Step 3: 04-1-01-B33-1, Step 4.2.2.1(a)(3)

- ☐ **IF** sufficient PDS computer points are **NOT** available, a FCV position of approximately ~20% **USING** FEEDS indication may be used to set FCV.

Standard: Determines that sufficient computer points are available and continues.

Cue: **None**

Notes:
Applicant may N/A step.

SAT / UNSAT

Step 4: 04-1-01-B33-1, Step 4.2.2.1(b)(1)

- ☐ **CHECK** Seal Purge flow AND Seal Cavity pressure NORMAL.
Seal Purge flow 1.5 to 2.5 gpm (Local C11-FI-R020B)

Standard: Contacted local operator to verify that seal purge flow on Reactor Recirc Pump B is 1.5 to 2.5 gpm.

Cue: **As local operator, report that seal purge flow on Reactor Recirc pump B is 2.0 gpm.**

Notes:

SAT / UNSAT



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Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IS7

Step 5: 04-1-01-B33-1, Step 4.2.2.1(b)(2)

☐ **CHECK #1** Seal Cavity pressure slightly higher than reactor pressure.

Standard: Checked seal cavity #1 (B33-R603B on P680) pressure is slightly higher than reactor pressure.

Cue: None

Notes: 1H13-P680 section 3B

Reactor pressure may be obtained from multiple locations any one is acceptable.

SAT / UNSAT

Step 6: 04-1-01-B33-1, Step 4.2.2.1(b)(3)

☐ **CHECK #2** Seal Cavity pressure indicates approximately half the value of #1 seal cavity pressure.

Standard: Checked seal cavity # 2 pressure is approximately half the value of the # 1 seal cavity pressure by observing indicators B33-R603B (Seal 1 pressure) and B33-R602B (Seal 2 pressure) on P680.

Cue: None

Notes: 1H13-P680 section 3B

SAT / UNSAT



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JPM Number: GJPM-OPS-2017IS7

Step 7: 04-1-01-B33-1, Step 4.2.2.1(c)

- ☐ **CHECK** pump AND motor temperature normal on Recirc Pump Recorder 1B33-TR-R601 on 1H13-P614.

Standard: Checked pump and motor temperatures normal as indicated on recorder 1B33-R601 (significantly below the posted alarm setpoint and trend is steady).

Cue: None

Notes: Given in Initial Conditions as normal temperatures.
Applicant may decide to look at recorder on V - Panel. This is acceptable.

SAT / UNSAT

Step 8: 04-1-01-B33-1, Step 4.2.2.1(d)

- ☐ **OBSERVE** annunciators associated with Loop B HPU, Seal flow, **AND** Pump temperatures EXTINGUISHED on 1H13-P680-3A.

Standard: Checked all alarms associated with Recirc Loop 'B' HPU, seal flow and pump temperatures on P680-3A are clear.

Cue: None

Notes: 1H13-P680 section 3A

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Step 9: 04-1-01-B33-1, Step 4.2.2.1(e)

- ☐ **DEPRESS** RECIRC PMP B CAV INTLK RESET Pushbutton on 1H13-P680 **AND**
OBSERVE respective status light DEENERGIZES.

Standard: Depressed RECIRC PMP B CAV INTLK RESET pushbutton and
verifies that the white lamp above the switch is de-energized.

Cue: None

Notes: 1H13-P680 section 3C

SAT / UNSAT

Step 10: 04-1-01-B33-1, Step 4.2.2.1(f)

- ☐ **DEPRESS** RX WTR LVL LO INTLK B **RESET** pushbutton on 1H13-P680 **AND**
OBSERVE respective status light DEENERGIZES.

Standard: Depressed the RX WTR LVL LO INTLK B RESET pushbutton and
verifies that the white lamp above the switch is de-energized.

Cue: None

Notes: 1H13-P680 section 3C

SAT / UNSAT



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Applicant will review CAUTION.

CAUTION

The following step is required to minimize 6.9 KV bus voltage drop.

Step 4.2.2.1(g) - RAISE respective BOP Transformer Tap setting to 7.2 kV on Bus 12HE for Pump to be shifted. **REFER** to 04-1-01-R21-12.

Applicant will review Prerequisites and NOTE and determine they are met.

Step 11: 04-1-01-R21-12, Step 5.3.2a

- ☐ **DETERMINE** on 1H13-P807-2C section which transformer is supplying BUS 12HE by **OBSERVING** the RED CLOSED light for bus feeder breakers 252-1201 **AND** 252-1208.

Standard: Determined 12HE bus is being supplied by BOP Transformer 11B via 252-1201.

Indication on 252-1201 is red light on, green light off

Cue: None

Notes: SH13-P807 section 2C

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Step 12: 04-1-01-R21-12, Step 5.3.2a(1) & (1)(a)

- ☐* **IF RED CLOSED light is ON for 252-1201 Bus 12HE is ENERGIZED from XFMR 11B, THEN PLACE AND HOLD HS BOP XFMR 11B X-WDG TO BUS 12HE LTC, to the RAISE position**
OBSERVE R22-R603 6.9 KV Bus 12HE voltage rises to approximately 7.2 KV.

Standard: On panel SH13-P807, raised the tap setting on transformer 11B by turning the BOP XFMR 11B X-WDG TO BUS 12HE LTC clockwise to the "RAISE" position until approximately 7.2 KV is indicated on meter R22-R603.

Cue: None

Notes: SH13-P807 section 1C
Indicator R22-R603 is on SH13-P807 section 2B

Applicant must achieve at least 7.2 KV bus voltage on 12HE.

SAT / UNSAT



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JPM Number: GJPM-OPS-2017IS7

Step 13: 04-1-01-R21-12, Step 5.3.2a(1)(b) & (c)

- ☐ **PLACE** HS BOP XFMR 11B X-WDG TO BUS 12HE LTC, to the AUTO position.

ENSURE R22-R603 6.9 KV BUS 12HE voltage stabilizes at approximately 7.2 KV.

Standard: Placed HS BOP XFMR 11B X-WDG TO BUS 12HE LTC, to the AUTO position. Observed Bus 12HE voltage stable at ≈ 7.2 KV.

Cue: **None**

Notes: **SH13-P807 section 1C**
Indicator R22-R603 is on SH13-P807 section 2B

SAT / UNSAT

Step 14: 04-1-01-B33-1, Step 4.2.2.1(h)

- ☐ **CHEM / R P** **NOTIFY** Chemistry **AND** Radiation Protection of the possibility of a crud burst **AS A RESULT OF** the Recirculation pump speed transfer.[O-24]

Standard: Chemistry and Radiation Protection notified that a Recirc Pump is to be started which may cause a crud burst.

Cue: **RP and Chemistry are notified.**

Notes: **Given in Initial Conditions**

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Applicant will review NOTE.

NOTE

Annunciator RX LVL 40"/32" HI/LO, 1H13-P680-3A-A3 may occur **DURING** upshift of Reactor Recirc Pump.

Step 15: 04-1-01-B33-1, Step 4.2.2.1(i)

- ☐* **DEPRESS START Pushbutton TRANS TO LFMG/START Handswitch on 1H13-P680 for Recirc Pump B AND CHECK** the following.

Standard: Depressed the START pushbutton on the TRANS TO LFMG/START handswitch for RRP 'B' on P680.

Cue: None

Notes: 1H13-P680 section 3C

SAT / UNSAT

Step 16: 04-1-01-B33-1, Step 4.2.2.1(i)(1)

- ☐ CB-2B LFMG B GEN BRKR FDR 252-1205A, OPENS.

Standard: Checks breaker CB-2B LFMG B GEN BRKR FDR 252-1205A opens by observing red light is off, green light is on.

Cue: None

Notes: 1H13-P680 section 3C

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Step 17: 04-1-01-B33-1, Step 4.2.2.1(i)(2)

☐ CB-1B, LFMG B MTR FDR 152-1411 OPENS.

Standard: Checked breaker CB-1B LFMG B MTR FDR 152-1411 opened by observing red light is off, green light is on.

Cue: None

Notes: 1H13-P680 section 3C

SAT / UNSAT

Step 18: 04-1-01-B33-1, Step 4.2.2.1(i)(3)

☐ Recirc Pump B coasts down to less than 360 rpm.

Standard: Verified that B Recirc Pump coasts down to less than 360 rpm by observing the B Recirc Pump speed indication on 1H13-P680 on meter B33-R651B.

Cue: None

Notes: 1H13-P680 section 3B

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Step 19: 04-1-01-B33-1, Step 4.2.2.1(j)

- ☐ **WHEN** pump speed lowers below 360 rpm, **CHECK** that CB-5B, RECIRC PUMP B FDR, 252-1205 CLOSED.

Standard: Observed that breaker CB-5B **DID NOT** close, as indicated by red light off, green light on.

Cue: None

Notes: 1H13-P680 section 3C

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Recirc Pump B has tripped to OFF.



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Alternate Path begins with the next step designated by "AP".

Enters Alarm Response Instruction 04-1-02-1H13-P680

AP Step 20: ARI 04-1-02-1H13-P680-3A-D9

☐ Recognizes Start Sequence Failure on Reactor Recirc Pump B.

Standard: Observed the following:

- 1) CB-5B failed to close as indicated by red status light off, green status light on.
- 2) Annunciator "RECIRC PMP B AUTO XFER INC/CONT PWR LOSS (P680-3A-D9) actuated.
- 3) Breaker CB-2B is open as indicated by red status light off, green status light on.
- 4) Breaker CB-1B is open as indicated by red status light off, green status light on.

Cue: **When applicant reports trip of Recirc Pump B, direct applicant to perform Immediate AND subsequent actions of the appropriate procedure(s)**

Notes:
Alarm Response Instruction Immediate actions will direct entry into ONEP 05-1-02-III-3, Reduction in Recirculation System Flow Rate.

SAT / UNSAT



Enters 05-1-02-III-3, Reduction in Recirculation System Flowrate ONEP

AP Step 21: 05-1-02-III-3 Step 2.1

- ☐ IF ANY of the following conditions of 2.1.1 **OR** 2.1.2 exist, **THEN IMMEDIATELY PLACE** the reactor mode switch in the SHUTDOWN position.

2.1.1 **When** operating in the OPRM Armed Region of Figure 1 or Figure 2, thermal hydraulic instability is detected by:

a. At least 2 of the following 4 alarms:

Annunciators "APRM CH 1(2)(3)(4) UPSC TRIP/OPRM TRIP/INOP"

AND

The corresponding two computer points in alarm: C51NC065 (NC066, NC067, NC068), "APRM 1 (2)(3)(4) OPRM TRIP"

OR

b. Thermal Hydraulic Instability symptoms being observed on neutron instrumentation.

2.1.2 No recirculation loops are in operation with the Reactor Mode switch in RUN position.

Standard: Verified that none of the conditions, listed in the Immediate Operator Actions, exist and placing the mode switch to SHUTDOWN is **NOT** required. Continued to subsequent actions.

Cue: None

Notes:
Continue to Subsequent Actions

SAT / UNSAT



AP Step 22: 05-1-02-III-3, Step 3.1

- ☐ **MONITOR** APRMs, LPRMs, SRM period meters, **AND** OPRM Computer Trends.
 3.1.1 **IF** operating in any region of reduced core flow of Figure 1 **OR** Figure 2, **THEN** the following annunciator alarm is indicative of possible onset of thermal hydraulic instability:

“APRM UPSC/OPRM ALM” (located 1H13-P680-5A-B10)

- 3.1.2 **IF** operating in any region of reduced core flow of Figure 1 or Figure 2 **AND** thermal hydraulic instability is observed, **THEN IMMEDIATELY SCRAM** the Reactor.

Standard: Monitored nuclear instrumentation and IF THI is observed then immediately scrams the reactor. **(THI will not occur.)**

Cue: **As CRS, inform applicant that another operator will have the responsibilities as THI watch, continue with immediate and subsequent actions.**

Notes: Thermal Hydraulic Instability (THI) will not occur.

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Applicant will review **CAUTION**.

CAUTION

Operation in the MELLLA+ region is prohibited in single Recirc pump loop operation.

Step 3.5 is appropriate step.

AP Step 23: 05-1-02-III-3, Step 3.5

☐* **IF** one Recirculation pump has stopped, **THEN PERFORM** the following:
CLOSE RECIRC PMP B DISCH VLV B33-F067B in the affected loop.

Standard: B33-F067B RECIRC PMP B DISCH VLV is closed
Indicated by red light off, green light on.

Cue: JPM has been completed

Notes:

SAT / UNSAT

EVALUATOR CUE APPLICANT JPM IS TERMINATED WHEN B33-F067B IS CLOSED.



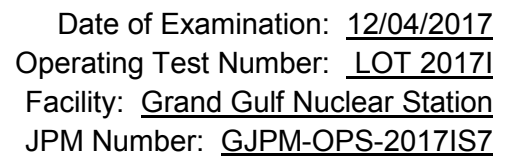
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Task Standard(s):

- Closed Recirc Loop B FCV to MIN ED position
- Raised Bus 12HE voltage to 7.2 KV using BOP Transformer 11B tap changer
- Depressed TRANS TO LFMG/START pushbutton for Reactor Recirc Pump B
- When Recirc Pump B is tripped closed B33-F067B, RECIRC PMP B DISCH VLV.

SAT / UNSAT

Remember to record stop time

[illegible][illegible]

Give this page to the applicant

Initial Condition(s):

- Plant is in power ascension, at approximately 32% rated thermal power
- Reactor Recirc Pump A is in FAST speed
- Breakers CB-3B and CB-4B are racked in and closed
- Requirements for entry into Controlled Entry Region of Power to Flow Map have been met
- Reactor Recirc Pump B pump and motor temperatures are normal on recorder 1B33-TR-R601
- Chemistry and Radiation Protection personnel have been notified of the Reactor Recirc Pump up shift and crud burst

Initiating Cue(s):

Control Room Supervisor has directed you to shift Reactor Recirc Pump B to FAST speed in accordance with 04-1-01-B33-1 Section 4.2.2.



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2017I P1
GGNS
2017 NRC Operating Test
Job Performance Measure

JPM Number: GJPM-OPS-2017IP1 JPM Title: Align SP Cooling from RSP
Facility Number: GJPM-OPS-C6101 rev 6
(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 20 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



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JPM Number: GJPM-OPS-2017IP1

Align SP Cooling from RSP

<input type="checkbox"/> Time Critical	<input checked="" type="checkbox"/> Alternate Path	Validation Time: 20 Min
--	--	-------------------------

Setting: Plant
Type: RO/SRO
Task: CRO-C61-OFFNORM-1
CRO-C61-OFFNORM-1.9
CRO-E12-NORMAL-19
CRO-P41-NORMAL-1
K&A: 219000 A4.01 (3.8/3.7); A4.02 (3.7/3.5); A4.05 (3.4/3.4)
295016 AK2.01 (4.4/4.5); AK3.03 (3.5/3.7)
295013 AA1.01 (3.9/3.9)
Safety Function: 5 – Containment Integrity
PSA Applicability: Operator Action Importance to Core Damage Frequency rank 9
Performance: Simulate
Reference(s): 05-1-02-II-1, rev. 49 Attachment IX & X
Handout(s): 05-1-02-II-1 Attachment IX & not given initially X
Manipulations: 20
Critical Steps: 16
Low Power: **YES**
Emergency/Abnormal: **YES**
RCA entry: No
Engineered Safety Function: No

Previous 2 NRC exams May 2017 Backup JPM not used during exam

Simulator Setup/Required Plant Conditions:

- Remote Shutdown Panel is accessible

Safety Concerns:

- Wear appropriate personal protective equipment
- DO NOT bump OR operate controls on the Remote Shutdown Panels



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Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Control Room evacuated due to noxious fumes
- Control of the plant established at the Remote Shutdown Panels
- An SRO is controlling operations at the Remote Shutdown Panel
- Another operator is assigned for radio communications and monitoring reactor level and pressure
- Other actions in section 3.2 of the Shutdown from the Remote Shutdown Panel ONEP will be performed by other operators
- A Non-Licensed Operator is stationed in the Auxiliary Building if needed
- RSD room cabinet at the Remote Shutdown Panel is unlocked
- Reactor is shutdown
- RPV water level is within band of +50" to -30" on wide range level
- RPV pressure is within band of 800 to 1060 psig using SRVs
- Division 1 & 2 RHR Transfer switches have been placed in EMERG position per step 3.2.6 of the Shutdown from the Remote Shutdown Panel ONEP
- Standby Service Water A & B are **NOT** running and are in Standby lineup per the P41 SOI
- RCIC will be started after RHR A is placed in suppression pool cooling mode
- No ECCS initiation signals are present

Initiating Cue(s):

- You have been directed to place RHR A in Suppression Pool Cooling per Attachment IX of the Shutdown from the Remote Shutdown Panel ONEP



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Align SP Cooling from RSP

Notes to Evaluator:

- Do not allow applicant to operate any plant equipment.
- Remote Shutdown Panels are located on the 111' elevation of the Control Building.
- Division 1 Remote Shutdown Panel is H22-P150.
- Division 2 Remote Shutdown Panel is H22-P151.
- This JPM will have a failure of RHR A to properly operate in Suppression Pool Cooling requiring the use of RHR B

Task Overview: (Detailed description of task)

This task is to startup RHR A in Suppression Pool Cooling from the Remote Shutdown Panel per the ONEP.

RHR A Test Return Valve E12-F024A will fail to operate.

Failure of E12-F024A will require the operator to utilize the RHR B for Suppression Pool Cooling.

Suppression Pool Cooling is required to support operation of RCIC.

This task includes starting up SSW A and B.

Operation of the plant from the Remote Shutdown Panels is only allowed after the plant is shutdown.



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Align SP Cooling from RSP

ONLY GIVE THE APPLICANT ATTACHMENT IX FOR RHR A.

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 05-1-02-II-1 Att. IX, Step a (1)

☐ **CHECK OPEN/OPEN** 1P41-F068A SSW OUTL FM RHR HX A VLV [SSD] (HS-M008A).

Standard: Checked open P41-F068A, SSW OUTL FM RHR HX A VLV.

Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P150

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Step 2: 05-1-02-II-1 Att. IX, Step a (2)

☐* **START 1P41-C001A, SSW PMP A [SSD] (HS-M001A).**

Standard: Started SSW Pump A.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P150

SAT / UNSAT

Step 3: 05-1-02-II-1 Att. IX, Step a (3)

☐* **OPEN 1P41-F001A SSW PMP A DISCH VLV [SSD] (HS-M002A).**

Standard: Opened P41-F001A, SSW PMP A DISCH VLV.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P150

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Step 4: 05-1-02-II-1 Att. IX, Step a (4)

☐* **OPEN 1P41-F014A SSW INL TO RHR HX A VLV [SSD] (HS-M007A).**

Standard: Opened P41-F014A SSW INL TO RHR HX A VLV.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P150

SAT / UNSAT

Step 5: 05-1-02-II-1 Att. IX, Step a (5)

☐* **OPEN 1P41-F005A SSW Loop A RTN TO CLG TWR A [SSD] (HS-M010A).**

Standard: Opened P41-F005A, SSW Loop A RTN TO CLG TWR A.
Handswitch is held in OPEN position until indication red light on,
green light off

Cue: Red light on, green light off.

Notes: This is a JOG handswitch.
1H22-P150

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Step 6: 05-1-02-II-1 Att. IX, Step a (6)

☐* **VERIFY CLOSED/CLOSE 1P41-F006A SSW PMP A RECIRC VLV (HS-M004A).**

Standard: Closed P41-F006A, SSW PMP A RECIRC VLV.
Indication green light on, red light off

Cue: Green light on, red light off.

Notes: 1H22-P150

SAT / UNSAT

Step 7: 05-1-02-II-1 Att. IX, Step a (7)

☐ **START 1P41-C003A, SSW CLG TWR FAN A [SSD]. (HS-M011A)**

Standard: Started SSW Cooling Tower Fan A.
Indication red light on, green light off

Cue: Red light on, green light off

Notes: if not performed, Cooling Tower Fans will auto start when RHR A pump started.

1H22-P150

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Step 8: 05-1-02-II-1 Att. IX, Step a (8)

☐ **START** 1P41-C003B, SSW CLG TWR FAN B [SSD]. (HS-M012A)

Standard: Started SSW Cooling Tower Fan B.
Indication red light on, green light off

Cue: **Red light on, green light off.**

Notes: if not performed, Cooling Tower Fans will auto start when RHR A pump started.

1H22-P150

SAT / UNSAT

Step 9: 05-1-02-II-1 Att. IX, Step b

☐ **OPEN OR CHECK OPEN** the following valves:

- (1) 1E12-F004A RHR PMP A SUCT FM SUPP POOL [SSD]. (HS-M202A)
- (2) 1E12-F047A RHR HX A INL VLV [SSD]. (HS-M206A)
- (3) 1E12-F003A RHR HX A OUTL VLV [SSD]. (HS-M207A)

Standard: Observed the above listed valves are open.
Indication red light on, green light off

Cue: **All of the valves indicate Red light on, green light off.**

Notes: These valves are already in their normal lineup.

1H22-P150

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Step 10: 05-1-02-II-1 Att. IX, Step c

☐* **CLOSE 1E12-F048A RHR HX A BYP VLV [SSD]. (HS-M208A)**

Standard: Closed E12-F048A, RHR HX A BYP VLV.
Handswitch is held in CLOSE position until held Indication green light on, red light off

Cue: Green light on, red light off.

Notes: This is a JOG handswitch.

1H22-P150

SAT / UNSAT

Step 11: 05-1-02-II-1 Att. IX, Step d

☐* **START 1E12-C002A, RHR PMP A [SSD] (HS-M200A)**

Standard: Started RHR Pump A.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P150

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Step 12: 05-1-02-II-1 Att. IX, Step e

☐* **OPEN 1E12-F024A RHR A TEST RTN TO SUPP POOL [SSD] (HS-M222A).**

Standard: Opened E12-F024A, RHR A TEST RTN TO SUPP POOL.

Cue: **Red AND Green lights are OFF.** This is the CUE of the fault on the valve and its failure to operate.

When asked to investigate the circuit breaker for E12-F024A (circuit breaker 52-153122), as the Non-Licensed operator in the Auxiliary Building report the circuit breaker is in the Trip Free position and requires electrical investigation.

IF ASKED, Cue the applicant E12F024A RHR A TEST RTN TO SUPP POOL is full closed.

Notes: Applicant should inform the SRO, RHR A cannot be placed in Suppression Pool Cooling.

CUE the applicant to establish Suppression Pool Cooling by an alternate means.

Another operator will secure RHR A.

1H22-P150

SAT / UNSAT

BEGIN ALTERNATE PATH

Alternate Path begins with the next step, designated by "AP"

When applicant identifies use of RHR B, GIVE THE APPLICANT ATTACHMENT X FOR RHR B.



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AP Step 13: 05-1-02-II-1 Att. X, Step a (1)

☐ **CHECK OPEN/OPEN** 1P41-F068B SSW OUTL FM RHR HX B VLV [SSD] (HS-M008B).

Standard: Checked open P41-F068B, SSW OUTL FM RHR HX B VLV
Indication red light on, green light off.

Cue: **Red light on, green light off.**

Notes: **1H22-P151**

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JPM Number: GJPM-OPS-2017IP1

AP Step 14: 05-1-02-II-1 Att. X, Step a (2)

☐* **START 1P41-C001B, SSW PMP B (HS-M001B).**

Standard: Started SSW Pump B.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P151

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AP Step 15: 05-1-02-II-1 Att. X, Step a (3)

☐* **OPEN 1P41-F001B SSW PMP B DISCH VLV (HS-M002B).**

Standard: Opened P41-F001B, SSW PMP B DISCH VLV.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: 1H22-P151

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AP Step 16: 05-1-02-II-1 Att. X, Step a (4)

☐* **OPEN 1P41-F014B SSW INL TO RHR HX B VLV (HS-M007B).**

Standard: Opened P41-F014B, SSW INL TO RHR HX B VLV.
Indication red light on, green light off

Cue: **Red light on, green light off.**

Notes: **1H22-P151**

SAT / UNSAT

AP Step 17: 05-1-02-II-1 Att. X, Step a (5)

☐* **OPEN 1P41-F005B SSW Loop B RTN TO CLG TWR B (HS-M010B).**

Standard: Opened P41-F005B, SSW Loop B RTN TO CLG TWR B.
Handswitch is held in OPEN position until indication red light on, green light off

Cue: **Red light on, green light off.**

Notes: **This is a JOG handswitch.**

1H22-P151

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AP Step 18: 05-1-02-II-1 Att. X, Step a (6)

☐* **VERIFY CLOSED/CLOSE 1P41-F006B SSW PMP B RECIRC VLV (HS-M004B).**

Standard: Closed P41-F006B, SSW PMP B RECIRC VLV.
Indication green light on, red light off

Cue: Green light on, red light off.

Notes: 1H22-P151

SAT / UNSAT

AP Step 19: 05-1-02-II-1 Att. X, Step a (7)

☐ **START 1P41-C003C, SSW CLG TWR FAN C. (HS-M011B)**

Standard: Started SSW Cooling Tower Fan C.
Indication red light on, green light off

Cue: Red light on, green light off

Notes: If not performed, Cooling Tower Fans will auto start when RHR B pump started.

1H22-P151

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AP Step 20: 05-1-02-II-1 Att. X, Step a (8)

☐ **START** 1P41-C003D, SSW CLG TWR FAN D. (HS-M012B)

Standard: Started SSW Cooling Tower Fan D.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes: If not performed, Cooling Tower Fans will auto start when RHR B pump started.

1H22-P151

SAT / UNSAT

AP Step 21: 05-1-02-II-1 Att. X, Step b

☐ **OPEN OR CHECK OPEN** the following valves:

- (1) 1E12-F004B RHR PMP B SUCT FM SUPP POOL. (HS-M202B)
- (2) 1E12-F047B RHR HX B INL VLV. (HS-M206B)
- (3) 1E12-F003B RHR HX B OUTL VLV. (HS-M207B)

Standard: Observed the above listed valves are open.
Indication red light on, green light off

Cue: All of the valves indicate Red light on, green light off.

Notes: These valves are already in their normal lineup

1H22-P151

SAT / UNSAT



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AP Step 22: 05-1-02-II-1 Att. X, Step c

☐* **CLOSE 1E12-F048B RHR HX B BYP VLV. (HS-M208B)**

Standard: Closed E12-F048B, RHR HX B BYP VLV.
Handswitch is held in CLOSE position until held Indication green light on, red light off

Cue: Red light off, green light on.

Notes: This is a JOG handswitch.

1H22-P151

SAT / UNSAT

AP Step 23: 05-1-02-II-1 Att. X, Step d

☐* **START 1E12-C002B, RHR PMP B (HS-M200B)**

Standard: Started RHR Pump B.
Indication red light on, green light off

Cue: Red light on, green light off.

Notes:

1H22-P151

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AP Step 24: 05-1-02-II-1 Att. X, Step e

☐* **OPEN 1E12-F024B, RHR B TEST RTN TO SUPP POOL (HS-M222B).**

Standard: Opened E12-F024B, RHR B TEST RTN TO SUPP POOL.
Indication red light on, green light off

Cue: Red light on, Green light off.

SRO in charge desires to maintain this RHR suppression pool cooling loop with maximum flow through the heat exchanger.

Notes: Applicant should leave E12-F048B closed and E12-F003B full open.

Therefore steps f and g will not be performed.

Applicant should report RHR B is in Suppression Pool Cooling with Maximum flow.

1H22-P151

SAT / UNSAT

EVALUATOR TERMINATE THE JPM.



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JPM Number: GJPM-OPS-2017IP1

Task Standard(s):

Suppression Pool Cooling A

- **START** 1P41-C001A, SSW PMP A
- **OPEN** 1P41-F001A SSW PMP A DISCH VLV
- **OPEN** 1P41-F014A SSW INL TO RHR HX A VLV
- **OPEN** 1P41-F005A SSW Loop A RTN TO CLG TWR A
- **CLOSE** 1P41-F006A SSW PMP A RECIRC VLV
- **CLOSE** 1E12-F048A RHR HX A BYP VLV
- **START** 1E12-C002A, RHR PMP A
- **OPEN** 1E12-F024A RHR A TEST RTN TO SUPP POOL

Suppression Pool Cooling B

- **START** 1P41-C001B, SSW PMP B
- **OPEN** 1P41-F001B SSW PMP B DISCH VLV
- **OPEN** 1P41-F014B SSW INL TO RHR HX B VLV
- **OPEN** 1P41-F005B SSW Loop B RTN TO CLG TWR B
- **CLOSE** 1P41-F006B SSW PMP B RECIRC VLV
- **CLOSE** 1E12-F048B RHR HX B BYP VLV
- **START** 1E12-C002B, RHR PMP B
- **OPEN** 1E12-F024B RHR B TEST RTN TO SUPP POOL

RHR B is in Suppression Pool Cooling.

SAT / UNSAT

Remember to record stop time



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP1

Follow-Up Questions & Answers:

Comments:

Give this page to the applicant

Initial Condition(s):

- Control Room evacuated due to noxious fumes
- Control of the plant established at the Remote Shutdown Panels
- An SRO is controlling operations at the Remote Shutdown Panel
- Another operator is assigned for radio communications and monitoring reactor level and pressure
- Other actions in section 3.2 of the Shutdown from the Remote Shutdown Panel ONEP will be performed by other operators
- A Non-Licensed Operator is stationed in the Auxiliary Building if needed
- RSD room cabinet at the Remote Shutdown Panel is unlocked
- Reactor is shutdown
- RPV water level is within band of +50" to -30" on wide range level
- RPV pressure is within band of 800 to 1060 psig using SRVs
- Division 1 & 2 RHR Transfer switches have been placed in EMERG position per step 3.2.6 of the Shutdown from the Remote Shutdown Panel ONEP
- Standby Service Water A & B are **NOT** running and are in Standby lineup per the P41 SOI
- RCIC will be started after RHR A is placed in suppression pool cooling mode
- No ECCS initiation signals are present

Initiating Cue(s):

- You have been directed to place RHR A in Suppression Pool Cooling per Attachment IX of the Shutdown from the Remote Shutdown Panel ONEP



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

2017I P2
GGNS
2017 NRC Operating Test
Job Performance Measure

JPM Number: GJPM-OPS-2017IP2 JPM Title: Install N2 Bottles on ADS Air
Supply
Facility Number: GJPM-OPS-EOP07
(If Bank or Modified from Bank)

JPM Attributes:

<input type="checkbox"/> New	<input type="checkbox"/> Modified	<input checked="" type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 25 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Install N2 Bottles on ADS Air Supply

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 25 Min
--	---	-------------------------

Setting: Plant (Inside RCA)
Type: NLO/RO/SRO
Task: GGNS-AON-EP-EMERGENCY-2
K&A: 218000 A2.03 (3.4/3.6)
295019 AA1.01 (3.5/3.3)
Safety Function: 3 – Reactor Pressure Control
PSA Applicability: Operator Action Importance to Core Damage Frequency Rank
4
Performance: Simulate
Reference(s): 05-S-01-EP-1/Att. 7 Rev. 36
Handout(s): 05-S-01-EP-1/Att. 7 marked up to with step 2.4.1 complete
Manipulations: 6
Critical Steps: 6
Low Power: YES
Emergency/Abnormal: YES
RCA entry: YES
Engineered Safety Function: No

Previous 2 NRC exams December 2014 for RO Applicants (not in Previous 2 NRC Exams for SRO Applicants)

Plant Industry Experience 2003 Reactor Scram due to loss of grid

Simulator Setup/Required Plant Conditions:

- Area 9, elevation 139' and area 9, elevation 166' are accessible

Safety Concerns:

- Wear appropriate personal protective equipment
- NO CLIMBING. Point up or down while you explain what you are going to do
- Beware of radiological areas
- Area 9 elevation 139' is a high noise area - hearing protection required



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- Emergency Procedures have been entered
- Valves P53-F001, F007, F026A and F026B are open.
- Four nitrogen bottles are installed at the connection downstream of P53-FA01, with the regulators attached.
- B21-R702A and B indicate < 125 psig

Initiating Cue(s):

- Control Room Supervisor directs you to perform steps 2.4.1 and 2.4.2 of EP Attachment 7
- Another operator will complete the remaining steps of this attachment when directed



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Install N2 Bottles on ADS Air Supply

Notes to Evaluator:

- Valve P53-FA01 is located in Area 9, El. 139'. Valves P53-FA02 and P53-F043 are located in Area 9, El. 166'.
- DO NOT linger in Radiation Areas.
- Stand outside High Radiation Areas to just point out valves inside the boundary.
- Areas around Plant Chillers are High Noise Areas.

Task Overview: (Detailed description of task)

This task provides a back-up source of Safety/relief valve operating air when the normal air source is either isolated or otherwise unavailable.

This is a PRA Operator Action.

Supplying Nitrogen to ADS valve actuators was used following a loss of grid and reactor scram in 2003 to allow use of ADS valves for RPV pressure Control.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 05-S-01-EP-1 Att. 7, Step 2.4.1 a

☐ **CLOSE OR CHECK CLOSED** P53F003 (1H13-P870-3C).

Standard: Control Room contacted to verify 1P53-F003 is closed.

Cue: Report as Control Room that 1P53-F003 is closed.

Notes: Valve is located in High Radiation Area but is visible from outside the boundary.

SAT / UNSAT

Step 2: 05-S-01-EP-1 Att. 7, Step 2.4.1 b

☐ **CLOSE OR CHECK CLOSED** 1P53FA02 (Area 9, El.166).

Standard: Checked closed valve 1P53-FA02 by turning the valve's hand wheel in the clockwise direction.

Cue: For valve 1P53-FA02, resistance is felt in the clockwise direction.

Notes: Area 9, 166 ft. elevation

Valve is located in High Radiation Area but is visible from outside the boundary.

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Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

**Upon arriving in area 9, 139' elevation,
CUE Applicant four gas bottles are installed in area 9 with the Manifold installed**

Step 3: 05-S-01-EP-1 Att. 7, Step 2.4.1 c

☐ **CLOSE OR CHECK CLOSED** the ADS Nitrogen bottles Manifold Isolation Valves (Area 9/139')

- V1
- V2
- V3
- V4

Standard: Checks closed manifold isolation valves V1, V2, V3 and V4 by turning the valve's handle in the clockwise direction.

Cue: For ALL FOUR VALVES, resistance is felt in the clockwise direction.

Notes: Manifold is at the toolbox in area 9, 139 ft. elevation

Equipment is located in High Noise Area.

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Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Step 4: 05-S-01-EP-1 Att. 7, Step 2.4.2 a

☐* ***OPEN (1) gas cylinder valve AND ADJUST gas cylinder regulator for that Nitrogen bottle to approximately 125 psig output pressure.***

Standard: Rotates gas cylinder outlet valve in the counter-clockwise direction until resistance is felt.
Adjust gas cylinder regulator by rotating the regulator pressure adjustment valve in the clockwise direction until pressure is approximately 125 psig.

Cue: **Resistance is felt in the counter-clockwise direction on gas cylinder valve.**
Use pen or finger to indicate Gas cylinder regulator is indicating 126 psig.

Notes: Area 9, 139' elevation

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Step 5: 05-S-01-EP-1 Att. 7, Step 2.4.2 b

☐* **OPEN (1) ADS Nitrogen bottle Manifold Isolation Valve for the *in-service* Nitrogen bottle. Only OPEN (1) Manifold valve. (Area 9/139')**

- V1
- V2
- V3
- V4

Standard: Opens manifold isolation valve V1, V2, V3 or V4 by turning the valve's handle in the counter-clockwise direction.

Cue: For manifold isolation valve V1, V2, V3 or V4, resistance is felt in the counter-clockwise direction.

Notes: Area 9, 139' elevation

SAT / UNSAT

Step 6: 05-S-01-EP-1 Att. 7, Step 2.4.2 c

☐* **OPEN P53-FA01. (Area 9/139')**

Standard: Opens valve 1P53-FA01 by turning the valve's hand wheel in the counter-clockwise direction.

Cue: For valve 1P53-FA01, resistance is felt in the counter-clockwise direction.

Notes: Area 9, 139 ft. elevation

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Step 7: 05-S-01-EP-1 Att. 7, Step 2.4.2 d

☐* **UNLOCK AND OPEN P53-FX004 to valve in the local pressure gauge.**

Standard: Removes the tie-wrap from valve 1P53-FX004 and opens the valve by turning its hand wheel in the counter-clockwise direction.

Cue: For valve 1P53-FX004, tie wrap is removed and resistance is felt in the counter-clockwise direction.

Notes: Area 9, 166 ft. elevation near 1P53-F003

Valve is located in High Radiation Area but is visible from outside the boundary.

SAT / UNSAT

Applicant reviews CAUTION.

CAUTION

Allowing ADS Receiver pressure to exceed 165 psig May cause relief valves on ADS receivers to lift.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

Step 8: 05-S-01-EP-1 Att. 7, Step 2.4.2 e

☐* **UNLOCK AND Slowly OPEN 1P53F043** (Area 9, El. 166), **OBSERVING** pressure on P53-R028.

Standard: Removes the tie-wrap from valve 1P53-F043 and opens the valve by turning its hand wheel in the counter-clockwise direction, while monitoring pressure on 1P53-PI-R028.

Cue:

- For valve 1P53-F043, resistance is felt in the counter-clockwise direction.
- Pressure on 1P53-PI-R028 is 126 psig.

Notes: Area 9, 166' elevation

Valve is located in High Radiation Area but is visible from outside the boundary.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP2

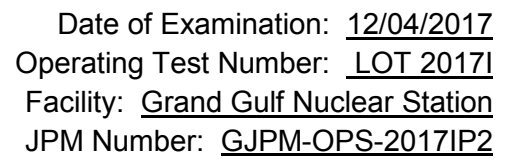
Task Standard(s):

- **OPEN (1)** gas cylinder valve
- **ADJUST** gas cylinder regulator for that Nitrogen bottle to approximately 125 psig output pressure
- **OPEN (1)** ADS Nitrogen bottle Manifold Isolation Valve for the **in-service** Nitrogen bottle
- **OPEN** P53-FA01
- **OPEN** P53-FX004
- **OPEN** 1P53F043

Nitrogen is being supplied to ADS valve actuators per Attachment 7.

SAT / UNSAT

Remember to record stop time



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Give this page to the applicant

Initial Condition(s):

- Emergency Procedures have been entered
- Valves P53-F001, F007, F026A and F026B are open.
- Four nitrogen bottles are installed at the connection downstream of P53-FA01, with the regulators attached.
- B21-R702A and B indicate < 125 psig

Initiating Cue(s):

- Control Room Supervisor directs you to perform steps 2.4.1 and 2.4.2 of EP Attachment 7
- Another operator will complete the remaining steps of this attachment when directed



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

2017I P3
GGNS
2017 NRC Operating Test
Job Performance Measure

JPM Number: GJPM-OPS-2017IP3 JPM Title: Locally Initiate ATWS ARI
Facility Number: N/A
(If Bank or Modified from Bank)

JPM Attributes:

<input checked="checked" type="checkbox"/> New	<input type="checkbox"/> Modified	<input type="checkbox"/> Direct from bank
<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 min

Prepared By:	Michael Rasch	
	Exam Developer	Date
Ops Review:	Robert Brinkman	
	1 st Validation by Ops Rep or Ops Validation Crew	Date
Validated By:	Benny White \ Chase Miller	
	2 nd Validation by Ops Validation Crew	Date
Approved By:		
	Project Lead or Exam Team Lead	Date



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Locally Initiate ATWS ARI

<input type="checkbox"/> Time Critical	<input type="checkbox"/> Alternate Path	Validation Time: 15 Min
--	---	-------------------------

Setting: Plant (Inside RCA)
Type: NLO\RO\SRO
Task: GGNS-CRO-C11(1)-EMERGENCY-13
K&A: 295037 EA1.03 (4.1/4.1)
Safety Function: 1 – Reactivity Control
10CFR55.45(a) (6); (8)
PRA Applicability: No
Performance: Simulate
Reference(s): 04-1-01-C11-1 Rev. 154
Handout(s): 04-1-01-C11-1 Precautions & Limitations and section 6.4
Manipulations: 5
Critical Steps: 4
Low Power: No
Emergency/Abnormal: **YES**
RCA entry: **YES**
Engineered Safety Function: No

Simulator Setup/Required Plant Conditions:

- ESF Switchgear Room 1A308 area 8, elevation 139' is accessible

Safety Concerns:

- Wear appropriate personal protective equipment
- Review RWP radiological areas
- DO NOT operate equipment on panel 1H22-P076



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Name: _____ Time Start: _____ Time Stop: _____

Initial Condition(s):

- An ATWS is in progress
- Emergency Procedures have been entered
- Attempt to manually initiate ATWS ARI/RPT from 1H13-P680 has failed
- DC buses E and K have power

Initiating Cue(s):

- Control Room Supervisor directs you to locally initiate ATWS ARI/RPT per SOI 04-1-01-C11-1 section 6.4.2c to insert control rods



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Locally Initiate ATWS ARI

Notes to Evaluator:

- Operations will be simulated on local ATWS ARI Test Panel 1H22-P076 located in Area 8, El. 139'.
- DO NOT linger in Radiation Areas.
- Verify Protected Trains and obtain CRS/Shift Manager permission to enter room as necessary.

Task Overview: (Detailed description of task)

This task provides performs a local manual initiation of ATWS ARI system from the Local panel in area 8, 139 ft. elevation per the abnormal operations of Manual Initiation of ATWS ARI/RPT in System Operating Instruction 04-1-01-C11-1.

Local operation is an alternate method of initiation of ATWS ARI in the event controls from 1H13-P680 fail to operate.



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Critical steps are underlined, italicized, and denoted by an (*)

NOTE: The sequence of the following steps is critical unless otherwise noted.

Step 1: 04-1-01-C11-1 Step 6.4.2.c (1)

☐* **PLACE** the *ARI/RPT TEST PERMISSIVE/SELECT* switch to the *TEST CH 1* position.

Standard: ATWS ARI/RPT TEST switch placed to the TEST CH 1 position.

ATWS ARI/RPT IN TEST CHANNEL 1 light illuminated

Cue: Switch is to the LEFT. (TEST CH 1 position), ATWS ARI/RPT IN TEST CHANNEL 1 light illuminated

Notes: Panel 1H22-P076 is located in room 1A308 Area 8, 139 ft. Auxiliary Building. See Building map and drawing of panel.

SAT / UNSAT

Step 2: 04-1-01-C11-1 Step 6.4.2.c (2)

☐* **DEPRESS** the *TRIP TEST CHANNEL 1* push-button.

Standard: TRIP TEST CHANNEL 1 push-button depressed.
ATWS ARI/RPT CH. 1 LOGIC INITITATE light illuminated

Cue: Pushbutton is depressed, ATWS ARI/RPT CH. 1 LOGIC INITITATE light illuminated

Notes: See panel drawing

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Step 3: 04-1-01-C11-1 Step 6.4.2.c (3)

☐ **VERIFY** C11-F162B, C11-F162D, **AND** C11-164A indicate open.

Standard: Observed C11-F162B, C11-F162D, **AND** C11-F164A indicate OPEN
C11-F162B red light ON and green light OFF
C11-F162D red light ON and green light OFF
C11-F164A red light ON and green light OFF

Cue: **F-162B red light ON, green light OFF**
F-162D red light ON, green light OFF
F-164A red light ON, green light OFF

Notes: **Lights are above TRIP TEST CHANNEL 1 pushbutton.**
These are the Outboard string of valves.
Red and Green Lights are reversed from normal convention.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Step 4: 04-1-01-C11-1 Step 6.4.2.c (4)

☐* **PLACE the ARI/RPT TEST PERMISSIVE/SELECT switch to the TEST CH 2 position.**

Standard: ATWS ARI/RPT TEST switch placed to the TEST CH 2 position.

ATWS ARI/RPT IN TEST CHANNEL 2 light illuminated

Cue: Switch is to the RIGHT. (TEST CH 2 position), ATWS ARI/RPT IN TEST CHANNEL 2 light illuminated

Notes: See drawing of panel.

SAT / UNSAT

Step 5: 04-1-01-C11-1 Step 6.4.2.c (5)

☐* **DEPRESS the TRIP TEST CHANNEL 2 push-button.**

Standard: TRIP TEST CHANNEL 2 push-button depressed.
ATWS ARI/RPT CH. 2 LOGIC INITITATE light illuminated

Cue: Pushbutton is depressed, ATWS ARI/RPT CH. 2 LOGIC INITITATE light illuminated.

Notes: See panel drawing

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Step 6: 04-1-01-C11-1 Step 6.4.2.c (6)

☐ **PLACE** the ARI/RPT TEST PERMISSIVE/SELECT switch to NORMAL.

Standard: ATWS ARI/RPT TEST switch placed to NORMAL.

Cue: Switch is to the CENTER. (NORMAL position)

Notes: See drawing of panel.

SAT / UNSAT



Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Step 7: 04-1-01-C11-1 Step 6.4.2.c (7)

☐ **VERIFY** C11-F162A, C11-F162C, **AND** C11-F160 indicate OPEN **AND** that C11-F164B indicates CLOSED.

Standard: Observed C11-F162A, C11-F162C, **AND** C11-F160 indicate OPEN **AND** that C11-F164B indicates CLOSED.

C11-F162A red light ON and green light OFF

C11-F162C red light ON and green light OFF

C11-F160 red light ON and green light OFF

C11-F164B red light OFF and green light ON

Cue: F-162A red light ON, green light OFF

F-162C red light ON, green light OFF

F-160 red light ON, green light OFF

F-164B red light OFF, green light ON

Notes: Lights are above TRIP TEST CHANNEL 1 pushbutton.

These are the Inboard string of valves and TEST BYPASS valve.

Red and Green Lights are reversed from normal convention.

ATWS ARI has been initiated and the valves energized to vent the Scram Air Header.

The applicant should report ATWS ARI/RPT is initiated.

SAT / UNSAT

The JPM is complete.



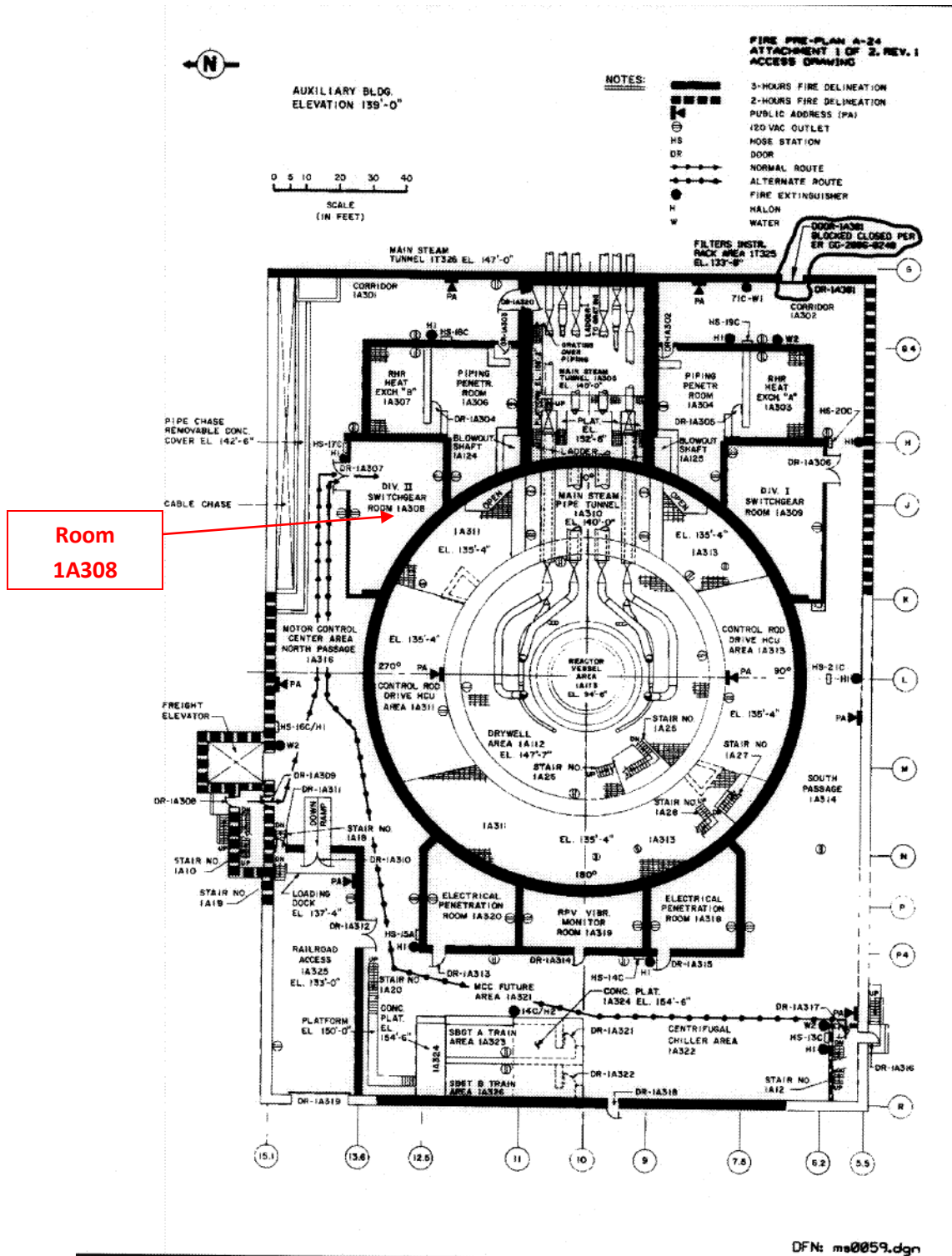
Date of Examination: 12/04/2017
Operating Test Number: LOT 2017I
Facility: Grand Gulf Nuclear Station
JPM Number: GJPM-OPS-2017IP3

Task Standard(s):

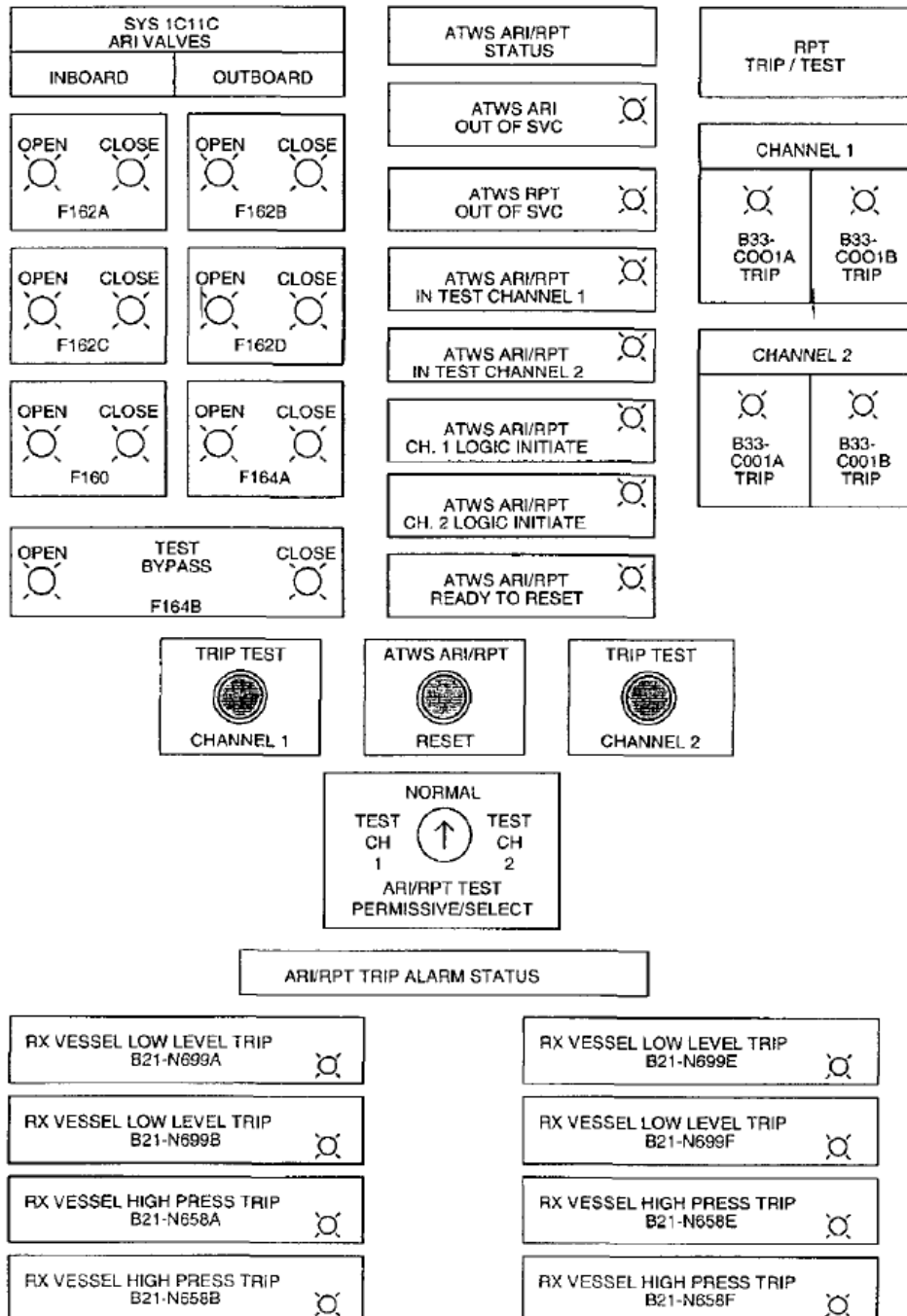
- ATWS ARI/RPT TEST switch placed to the TEST CH 1 position
- Depressed TRIP TEST CHANNEL 1 push-button
- ATWS ARI/RPT TEST switch placed to the TEST CH 2 position
- Depressed TRIP TEST CHANNEL 2 push-button
- ATWS ARI has been initiated locally at 1H22-P076
 - C11-F-162A open
 - C11-F-162B open
 - C11-F-162C open
 - C11-F-162D open
 - C11-F-164A open
 - C11-F-164B closed
 - C11-F-160 open

SAT / UNSAT

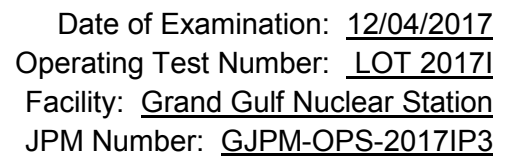
Remember to record stop time



GFIG-OPS-C111A



H22-P076 ARI/RPT Indications and Controls
 Figure 12



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Initial Condition(s):

- An ATWS is in progress
- Emergency Procedures have been entered
- Attempt to manually initiate ATWS ARI/RPT from 1H13-P680 has failed
- DC buses E and K have power

Initiating Cue(s):

- Control Room Supervisor directs you to locally initiate ATWS ARI/RPT per SOI 04-1-01-C11-1 section 6.4.2c to insert control rods

Facility: Grand Gulf Nuclear Station Scenario No.: 1 Op-Test No.: GGNS 12-2017

Examiners: _____ Operators: _____

Event No.	Malf. No.	Event Type †	Event Description
1	N/A	TS (CRS) N (BOP,CRS)	Start RHR A in Suppression Pool Cooling
2	e21645	TS (CRS) C (BOP,CRS)	LPCS Jockey Pump trip
3	fw272a	I(ATC,CRS)	Seal Steam Regulator failure
4	c11028b	C(BOP,CRS) A (CREW) TS(CRS)	CRD Pump B trip with HCU 32-17 accumulator fault
5	n19f042a_f n19f040a_f fw232j	C (BOP,CRS) R (ATC) A (CREW)	LP FW HTR 4A tube leak with a failure to isolate
6	e51050 e51187a e51187b	M (CREW)	Unisolable RCIC steam line break
7	c11164 rr071	M (CREW)	Low Power ATWS < 5% power * (CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A * (CT-3) When emergency depressurization is required, crew terminates and prevents all RPV injection, except RCIC, CRD, and Boron, prior to emergency depressurizing the RPV
8	r21133b	C (ATC,CRS)	HPCS Service Water Pump trip
9	ttt41n048_d	I (CREW)	Main Steam Tunnel steam leak * (CT-2) When two areas exceed their max safe radiation levels, emergency depressurize the RPV before exiting EP-4

† (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec

* **Critical Task** (As defined in NUREG 1021 Appendix D)

CREW notation for Abnormal (A) and Major (M) events denotes ATC, BOP, and CRS are credited.

Objectives: To evaluate the applicants' ability to operate the facility in response to the following evolutions:

1. Start RHR A in Suppression Pool Cooling.
2. Respond to a LPCS Jockey Pump trip.
3. Respond to a Seal Steam Regulator failure.
4. Respond to a CRD Pump B trip with HCU 32-17 accumulator fault.
5. Respond to a Low Pressure Feedwater 4A tube leak with a failure to isolate.
6. Respond to an unisolable RCIC Steam Line break.
7. Respond to a low power ATWS (<5%).
8. Respond to a HPCS Service Water Pump trip.
9. Respond to a Main Steam Tunnel steam leak.

Initial Conditions: Plant is operating at approximately 100% power. Average Suppression Pool temperature is 85°F due to weeping SRVs. SSW A is running for chemical addition.

Inoperable Equipment: None

Turnover:

Planned activities for this shift are:

- Start RHR A in Suppression Pool Cooling to lower Suppression Pool temperature to less than 80°F.

Scenario Notes:

This scenario is a NEW Scenario.

Validation Time: 60 minutes

Quantitative Attributes Table			
Attribute	E3-304-1 Target	Actual	Description
Malfunctions after EOP entry	1-2	2	<ul style="list-style-type: none"> HPCS Service Water Pump trip Main Steam Tunnel steam leak
Abnormal Events	2-4	2	<ul style="list-style-type: none"> CRD Pump B trip with HCU 32-17 accumulator fault (Control Rod/Drive Malfunctions ONEP) LP FW HTR 4A leak with a failure to isolate (Feedwater Malfunctions ONEP)
Major Transients	1-2	2	<ul style="list-style-type: none"> Unisolable RCIC steam line break ATWS < 5% power
EOP entries requiring substantive action	1-2	2	<ul style="list-style-type: none"> EP-4 EP-2
EOP contingencies requiring substantive action	0-2	2	<ul style="list-style-type: none"> EP-2A ATWS EP-2A Emergency Depressurization
EOP based Critical Tasks	2-3	3	<ul style="list-style-type: none"> (CT-1) When control rods fail to scram, crew inserts control rods before exiting EP-2A. (CT-2) When two areas exceed their max safe temperatures, emergency depressurize the RPV before exiting EP-4 (CT-3) When emergency depressurization is required, crew terminates and prevents all RPV injection, except RCIC, CRD, and Boron, prior to emergency depressurizing the RPV
Normal Events	N/A	1	<ul style="list-style-type: none"> Start RHR A in Suppression Pool Cooling
Reactivity Manipulations	N/A	1	<ul style="list-style-type: none"> Lower core flow to 70 mlbm/hr using Recirculation Flow Control Valves
Instrument / Component failures	N/A	6	<ul style="list-style-type: none"> LPCS Jockey Pump trip Seal Steam Regulator failure CRD Pump B trip with HCU 32-17 accumulator fault LP FW HRT 4A tube leak with failure to isolate HPCS Service Water Pump trip Main Steam Tunnel steam leak
Total Malfunctions	N/A	8	<ul style="list-style-type: none"> LPCS Jockey Pump trip Seal Steam Regulator failure CRD Pump B trip with HCU 32-17 accumulator fault LP FW HRT 4A tube leak with failure to isolate RCIC steam line break with a failure to isolate ATWS < 5% power HPCS Service Water Pump trip Main Steam Tunnel steam leak

Top 10 systems and operator actions important to risk that are tested:

ADS (Event 7)

RPS (Event 7)

Condensate (Event 4)

Failure to manually depressurize with ADS/SRVs (Event 7)

SCENARIO ACTIVITIES:

Plant is operating at 100% power. Average Suppression Pool temperature is 85°F due to weeping SRVs. SSW A is running for chemical addition.

Event 1 – Start RHR A in Suppression Pool Cooling

After the crew assumes the shift, the BOP will start RHR A in Suppression Pool Cooling mode. The CRS will enter Tech Spec 3.5.1 Condition A when E12-F024A, RHR A Test Return valve, is opened and LCO TR6.8.2 while the RHR A MOV TEST switch is in TEST.

Event 2 – LPCS Jockey Pump trip (Triggered by Lead Examiner)

When RHR A is aligned in Suppression Pool Cooling mode and Tech Specs are addressed, the LPCS Jockey Pump will trip. The CRS will enter TS 3.5.1 Condition C and may direct BOP to place RHR A in standby. If E12-F024A, RHR A Test Return valve, is closed, CRS will exit Tech Spec 3.5.1 Condition C and determine Tech Spec 3.5.1 Condition A is still applicable. CRS will enter Tech Spec 3.3.6.4, Condition C, LCO 3.3.3.1, Condition A, LCO 3.3.3.2, Condition A and TR3.6.2.2, Condition A.

Event 3 – Seal Steam Regulator fails closed (Triggered by Lead Examiner)

After RHR A has been returned to standby and Tech Specs addressed, the Seal Steam Regulator will fail closed. Crew will respond using ARI 04-1-02-1H13-P680-10A-E7, TURB SS PRESS LOW, and take manual control of the Seal Steam Regulator or Seal Steam Regulator bypass valves and restore Seal Steam pressure.

Event 4 – CRD Pump B trip with HCU 32-17 accumulator fault (Triggered by Lead Examiner)

After Seal Steam header pressure has been restored, CRD Pump B will trip. HCU TROUBLE alarm and accumulator fault on HCU 32-17 will occur after 10 seconds. The CRS will enter 05-1-02-IV-1, Control Rod/Drive Malfunctions, and direct the BOP to start the standby CRD pump. BOP will start the standby CRD pump IAW SOI 04-1-01-C11-1, Attachment VIII. Crew will dispatch plant operator to investigate HCU fault on HCU 32-17. Plant operator will report HCU 32-17 accumulator pressure is 1660 psig. CRS will direct plant operator to drain the HCU instrument block IAW SOI 04-1-01-C11-1, Control Rod Drive Hydraulic System, and enter LCO TR 3.1.5, Condition A and Condition B, while the HCU TROUBLE alarm is in.

Event 5 – Low Pressure Feedwater Heater 4A Tube Leak with a failure to isolate (Triggered by Lead Examiner)

After HCU 32-17 accumulator fault has cleared and Tech Specs addressed, a tube leak in Low Pressure Feedwater Heater 4A will occur. The heater isolation valves, N19-F040A and N19-F042A will fail to automatically close on the HI-HI level. The BOP will manually close the isolation valves to isolate the heater. The CRS enter 05-1-02-V-5, Loss of Feedwater Heating ONEP, and direct the ATC to lower core flow to 70 mlbm/hr using Recirc Flow Control Valves in slow detent. The CRS will enter 05-1-02-III-3, Reduction in Recirculation System Flow Rate ONEP.

Event 6 – Unisolable RCIC steam line break (Triggered by Lead Examiner)

After LPFW Heater 4A has been isolated and actions of Loss of Feedwater Heating ONEP have been performed, a RCIC steam line break will occur. BOP will attempt to isolate RCIC by closing the RCIC Steam Isolation valves. RCIC steam isolation valves will lose power. CRS will enter EP-4 and direct the ATC to manually scram the reactor.

Event 7 – Low Power ATWS (<5% power) (Triggered automatically)

When the reactor is scrammed, an ATWS occurs due to a hydraulic block of both scram discharge volumes with failed fuel. CRS will enter EP-2A via EP-2. Reactor power is below 5% rated thermal power. The crew will install the necessary attachments to bypass RPS and RC&IS interlocks and insert control rods manually via RC&IS **(CT-1)**. RPV level will be maintained in the normal band of +11.4" to +53.5" narrow range. Bypass valves will control reactor pressure during this event. Feedwater is available for RPV level control. The crew may decide to lower RPV pressure to 450 to 600 psig to reduce the driving head of the leak using manual Bypass Valves control.

Event 8 – HPCS Service Water Pump trip (Triggered automatically)

When High Pressure Core Spray is initiated, the HPCS Service Water Pump will trip. The crew will secure the High Pressure Core Spray Diesel Generator due to lack of cooling water.

Event 9 – Main Steam Tunnel steam leak (Triggered by Lead Examiner before control rods are inserted)

Main Steam Tunnel temperature will start to rise, resulting in a closure of the Main Steam Isolation Valves (MSIVs). The CRS will direct the ATC to maintain reactor pressure within band using SRVs.

When two areas (RCIC Room and Main Steam Tunnel) exceed the max safe temperature levels of EP-4, the CRS will direct the ATC and BOP to terminate and prevent all injection into the RPV (except RCIC, CRD and BORON) **(CT-3)** and emergency depressurize the RPV **(CT-2)**. When RVP pressure has lowered to Minimum Steam Cooling Pressure of 206 psig, the CRS will direct the crew to slowly commence injection into the RPV with available systems to restore and maintain RPV level between 11.4" and 53.5" narrow range.

After the crew has emergency depressurized the RPV and inserted at least 5 gangs of control rods, or at the discretion of the Lead Examiner, the control rods are allowed to be fully inserted with the next scram. The CRS transitions from EP-2A to EP-2 and RPV level restoration is directed.

The exercise ends when control rods are inserted and RPV water level is being maintained between +11.4 inches and +53.5 inches narrow range.

Critical Task	(CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A	(CT-2) When two areas exceed their max safe temperatures, emergency depressurize the RPV before exiting EP-4
EVENT	7	9
Safety Significance	Failure to effect shutdown of the reactor when a RPS setting has been exceeded would unnecessarily extend the level of degradation of the safety of the plant. This could further degrade into damage to the principle fission product barriers if left unmitigated. The crew is authorized by Conduct of Operations to take mitigating actions when automatic safety systems fail to perform their intended function. Action to shut down the reactor is required when RPS and control rod drive systems fail.	If secondary containment radiation levels continue to increase and exceed their maximum safe operating values in more than one area, the RPV must be depressurized. RPV depressurization places the primary system in its lowest possible energy state, rejects heat to the suppression pool in preference to outside the containment, and reduces the driving head and flow of primary systems that are unisolated and discharging into the secondary containment.
Cueing	Manual scram is initiated and numerous control rods indicate beyond position 02. Reactor power indicating > 0% rated thermal power.	EP-4 max safe indication on PDS computer points. Radiation levels exceeding max safe values on area radiation instrumentation on panel P844.
Performance Indicator	Operator selects control rod gangs by depressing the respective pushbuttons on panel P680 and inserts the rods by depressing the IN-TIMER SKIP pushbutton. Operator resets reactor scram signal with key-locked switches on panel P680 and inserts manual reactor scram using scram pushbuttons on panel P680.	Manipulation of seven of the eight ADS/SRVs on panel P601: B21-F041K B21-F047L B21-F041F B21-F047A B21-F051C B21-F041D B21-F051A B21-F051B
Performance Feedback	Operator selecting and inserting control rods indicated by rod position decreasing to 00 for selected rods on panel P680 Control rod movement on subsequent reactor scrams.	Crew will observe ADS/SRV light indication go from green to red and reactor pressure lowering on SPDS and panel P601 indications.
Justification for the chosen performance limit	There is no time limit for effecting complete reactor shutdown via control rod insertion. For the timeframe of this scenario, containment limits are not challenged and power oscillations are not experienced. However, if the failure to scram EP were to be exited, other procedures would not provide the guidance necessary to achieve reactor shutdown. Before exiting EP-2A ensures guidance to effect reactor shutdown is not removed.	There is no time frame for performing the emergency depressurization of the RPV when two area radiation levels exceed their max safe values. However, if the emergency depressurization is not performed before EP-4 is exited, other procedures would not provide the guidance necessary to direct the depressurization. Before exiting EP-4 ensures this guidance to emergency depressurize the RPV is not removed.
BWR Owners Group Appendix	App. B, step RC/Q-7	App. B, step SC/R-2.2
License Bases Documents	02-S-01-40, EP Technical Bases, Attachment V, Step Q-1 UFSAR Chapter 15.8	02-S-01-40, EP Technical Bases, Attachment VII, Step 10 UFSAR Chapter 15.8

Critical Task	(CT-3) When emergency depressurization is required, crew terminates and prevents all RPV injection, except RCIC, CRD, and Boron, prior to emergency depressurizing the RPV	
EVENT	9	
Safety Significance	Injection into the RPV is terminated and prevented while emergency RPV depressurization proceeds, in order to prevent uncontrolled injection of large amounts of cold water as RPV pressure decreases below the shutoff head of operating system pumps. Injection from boron injection systems and CRD need not be terminated since the flowrates are relatively small and the systems may be needed to shut down the reactor. RCIC injection need not be terminated since its flowrate is also relatively small, turbine operation helps to depressurize the RPV, and RPV depressurization is not expected to result in significant flow variations.	
Cueing	EP-4 indications on PDS computer points in more than one area. Radiation levels exceeding max safe values on more than one area radiation instruments on panel P844. Manual scram is initiated and numerous control rods indicate beyond position 02.	
Performance Indicator	Operator manipulates Div 1 and Div 2 ECCS and HPCS manual initiation switches and associated pump and injection valve handswitches on panel P601. Operator manipulates Master Level Controller or Startup Level Controller in MANUAL and lowers output to 0%. Operator ensures N21-F009A and B and N21-F040 closed.	
Performance Feedback	Green light on and red light extinguished on ECCS pump and injection valve handswitches on panel P601. ECCS pump and valve overridden annunciators on panel P601. Feedwater flow indicating 0 mlbm/hr on panel P680 instruments. Master Level Controller/Startup Level Controller output indicating 0%. Green light on and red light extinguished on N21-F009A, F009B and F040 handswitches and CLOSE pushbuttons depressed on panel P680.	
Justification for the chosen performance limit	Injection into the RPV is terminated and prevented while emergency RPV depressurization proceeds, in order to prevent uncontrolled injection of large amounts of cold water as RPV pressure decreases below the shutoff head of operating system pumps. Performance of this task before emergency depressurizing the RPV ensures that RPV injection sources are secured prior to RPV pressure lowers below the shutoff head of the associated pumps.	
BWR Owners Group Appendix	App. B, Contingency 5, step C5-5.1	
License Bases Documents	02-S-01-40, EP Technical Bases, Attachment V, Step ED-3 UFSAR Chapter 15.8	

Simulator Setup:

A. Initialization

1. Log off all simulator PDS and SPDS computers (PDS and SPDS must come up after the simulator load for proper operation).
2. Startup the simulator using Simulator Instructor's Job Aid section 7.3.

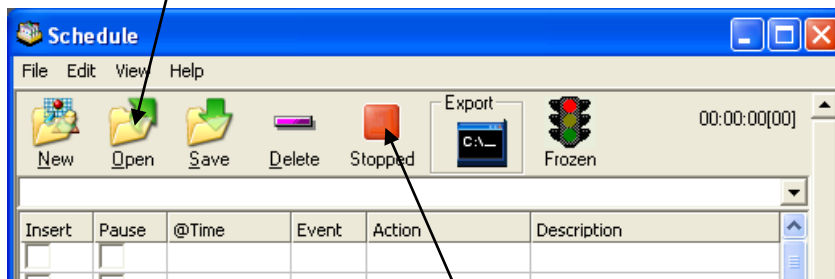
Note:

Prior to running the Schedule File, ensure no Event Files are Open. If an existing Event File is Open prior to running the Schedule File, then any associated Event Files will not automatically load.

3. Open Schedule.exe and Director.exe by clicking on the Icon in the Thunder Bar.

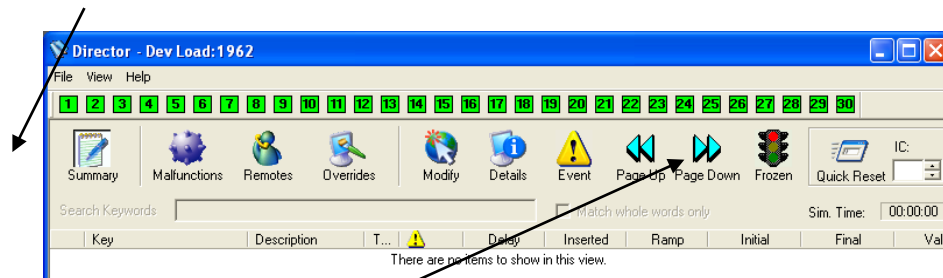


4. Set the Simulator to **IC-100** and perform switch check (Using Quick Reset in Director).
5. Click on **“Open”** in the Schedule window and Open Schedule File **“12-2017 NRC Exam Scenario 1.sch”** (in the Schedule Directory)



6. In Schedule window, click on the **“Stopped”** red block. The red block will change to a green arrow and indicate the scenario is active (**“Running”**).

7. Click the Summary tab in the Director window. Verify the schedule files are loaded and opened per Section B below. (Note: Any actions in the schedule file without a specific time will not load into the director until triggered.)



8. Take the simulator out of freeze.
9. Log on to all simulator PDS and SPDS computers.
10. Verify or perform the following:
- IC-100
 - Ensure Suppression Pool temperature is approximately 85°F
 - Ensure SSW A is operating with flow through the RHR A Heat Exchanger
 - Ensure all procedures are marked as indicated for turnover conditions
 - Advance all chart recorders and ensure all pens are inking properly
 - Clear any graphs and trends off PDS and SPDC
11. Run through any alarms and ensure alarms are on. (**Note: On T-Rex, to verify alarms are ON, the indicator will indicate “Alarms On”**).
12. Place the simulator in Freeze.

File loaded verification:

Schedule - 12-2017 NRC Scenario 1.sch

File Edit View Help

New Open Save Delete Stopped Export Frozen 00:00:00[00]

Insert	Pause	@Time	Event	Action	Description
				^ 12-2017 NRC Scenario 1	
				^ Event 1 - NORMAL - Start RHR A in Supp Pool Cooling	^ TS 3.5.1.A - One ECCS INOP
				^ Event 2 - COMPONENT - LPCS Jockey Pump trip	^ TS 3.5.1.C until RHR A secured from Supp Cooling - then TS 3.5.1.A
		00:00:00		Insert remote e21645 to OPEN on event 2	LPCS Jockey Pump Breaker
		00:00:00		Insert remote e21643 to OUT on event 10	LPCS PUMP BREAKER
		00:00:00		Insert remote e21646 to OPEN on event 11	LPCS Fill from P11-F025
				^ Event 3 - Seal Steam Regulator Failure (C-ATC)	
		00:00:00		Insert malfunction ms094 on event 3	Turbine Gland Seal Regulator Failure
				^ Close N33-F019A (Event 5)	
		00:00:00		Create event 20 xal2p870_6a_a_1 == 1	LPFW HTR 4A HI-HI LEVEL alarm
		00:00:00		Insert malfunction n33f019a_d on event 20	AOV JACK CLOSE N33-F019A
				^ Event 4 - COMPONENT - CRD Pump B Trip	
		00:00:00		Insert malfunction c11028b on event 4	CRD Hydraulic Pump B Trip
		00:00:00		Insert malfunction z024024_32_17 after 10 on event 4	Control Rod 32-17 Accumulator Trouble
				^Event 5 - COMPONENT-RX - LPFW Htr 4A Leak	ABNORMAL (Loss FW Heating)
		00:00:00		Insert malfunction n19f042a_f	override (open coil (oc) initiation)
		00:00:00		Insert malfunction n19f040a_f	override (open coil (oc) initiation)
		00:00:00		Insert malfunction fw232j to 80 on event 5	FW Heater 4A Tube Rupture
				^ Adjust FW HTR LEAK	
		00:00:00		Create event 29 XAL1P680_2A_A_6 == 1	FW HTR 4A LVL HI alarm
			29	Modify malfunction fw232j to 58.75000	
				^ Delete LP HRT 4A Isolation Valve malfunction when handswitches to	
		00:00:00		Create event 28 iodin19m610a(1) == 1	N19-F042A HS in CLOSE
			28	Delete malfunction n19f042a_f	override (open coil (oc) initiation)
		00:00:00		Create event 27 iodin19m611a(1) == 1	N19-F040A HS in CLOSE
			27	Delete malfunction n19f040a_f	override (open coil (oc) initiation)

Ready NUM

Schedule - 12-2017 NRC Scenario 1.sch

File Edit View Help

New Open Save Delete Stopped Export Frozen

00:00:00[00]

Insert	Pause	@Time	Event	Action	Description
				^ Event 6 - MAJOR - RCIC Steam Line Break w/failure to isolate	
		00:00:00		Insert malfunction e51050 to 8.50000 on event 6	RCIC Steam Leak (VAR) Upstream of E51-F045
		00:00:00		Insert malfunction e51187a	E51F063 POWER LOSS ON STROKE SIGNAL
		00:00:00		Insert malfunction e51187b	E51F064 POWER LOSS ON STROKE SIGNAL
		00:00:00		Insert remote ATT03 to DONE	Defeating all RCIC Isolation and Non-Mechanical Trip Interlocks
		00:00:00		Insert remote fireCP_626 after 20 to ALARM on event 6	119 AUX BLDG SMK DET-FIRE: ZN 2-04, TRM, 119 AUX,
				^ Event 7 - MAJOR - ATWS	
		00:00:00		Insert malfunction c11164 to 15.0000	CRD HYDRAULIC BLOCK
		00:00:00		Create event 7 zdl1(645) == 1	Mode Switch in SHUTDOWN
		00:00:00		Set C11KPCT = 20	Set ATWS rod density
				^ Event 8 - COMPONENT - SSW C Pump Trip	
		00:00:00		Insert malfunction p41149 after 15 on event 8	HPCS Standby Service Water Pump Trip
		00:00:00		Create event 8 zlo3(947) == 1	
				^Modify RCIC Steam Leak when RCIC Rm Cooler started	
		00:00:00		Create event 26 zlo3(585) == 1	
			26	Modify malfunction e51050 to 9.50000	
			7	Modify malfunction e51050 in 180 to 25.0000	
				^ EP Attachments	
		00:00:00		Insert remote ATT08 to INSTALL on event 13	Defeating MSIV and MSL Drain RPV Level 1 Isolation Interlocks
		00:00:00		Insert remote ATT12 to INSTALL on event 14	Defeating RHR SDC Injection Valve Isolation
		00:00:00		Insert remote ATT18 to INSTALL on event 15	Defeating ARI/RPT Logic Trips
		00:00:00		Insert remote ATT19 to INSTALL on event 16	Defeating RPS Logic Trips
		00:00:00		Insert remote ATT20 to INSTALL on event 17	Defeating RC&IS Control Rod Drive Blocks
				^ Main Steam Tunnel Temperature rise	
		0		Insert malfunction tt41n048_d after 300 to 270.00000 in 480 on event 7	override (variable failure)
				^ Modify control rod malfunction	
			9	Delete malfunction c11164	CRD HYDRAULIC BLOCK
			10	Delete malfunction z024024_32_17	Control Rod 32-17 Accumulator Trouble

Ready

NUM

Director - Dev Load:1962

File View Help

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Summary Malfunctions Remotes Overrides Modify Details Event Page Up Page Down Running Quick Reset IC: 100

Search Keywords Match whole words only Sim. Time: 00:01:29

Key	Description	T...	Delay	Inserted	Ramp	Initial	Final	Value
✓ p870_6a_e_2	CNDSR VAC BRKR LVL LO		00:00:00	00:00:00	00:00:00		FAIL OFF	FAIL OFF
ms094	Turbine Gland Seal Regulator Failure		3	00:00:00	00:00:00		Active	InActive
n33f019a_d	ADV JACK CLOSE		20	00:00:00	00:00:00		Active	InActive
c11028b	CRD Hydraulic Pump B Trip		4	00:00:00	00:00:00		Active	InActive
z024024_32_17	Control Rod 32-17 Accumulator Trouble		4	00:00:10	00:00:00		Active	InActive
✓ n19f042a_f	override [open coil (oc) initiation]		00:00:00	00:00:01	00:00:00		Active	Active
✓ n19f040a_f	override [open coil (oc) initiation]		00:00:00	00:00:01	00:00:00		Active	Active
fw232j	FW Heater 4A Tube Rupture		5	00:00:00	00:00:00		80	0
e51050	RCIC Steam Leak (VAR) Upstream of E51-F045		6	00:00:00	00:00:00		8.5	0
✓ e51187a	E51F063 POWER LOSS ON STROKE SIGNAL		00:00:00	00:00:01	00:00:00		Active	Active
✓ e51187b	E51F064 POWER LOSS ON STROKE SIGNAL		00:00:00	00:00:01	00:00:00		Active	Active
✓ c11164	CRD HYDRAULIC BLOCK		00:00:00	00:00:01	00:00:00		15	15
p41149	HPCS Standby Service Water Pump Trip		8	00:00:15	00:00:00		Active	InActive
ttt41n048_d	override [variable failure]		7	00:05:00	00:08:00		270	103.908
e21645	LPCS Jockey Pump Breaker		2	00:00:00	00:00:00		OPEN	CLOSED
e21643	LPCS PUMP BREAKER		10	00:00:00	00:00:00		OUT	IN
e21646	LPCS Fill from P11-F025		11	00:00:00	00:00:00		OPEN	CLOSED
✓ ATT03	Defeating all RCIC Isolation and Non-Mechanical Trip Interlocks		00:00:00	00:00:01	00:00:00		DONE	DONE
fireCP_626	119 AUX BLDG SMK DET-FIRE: ZN 2-04, TRM, 119 AUX,		6	00:00:20	00:00:00		ALARM	CLEAR
ATT08	Defeating MSIV and MSL Drain RPV Level 1 Isolation Interlocks		13	00:00:00	00:00:00		INSTALL	00:00:00
ATT12	Defeating RHR SDC Injection Valve Isolation		14	00:00:00	00:00:00		INSTALL	00:00:00
ATT18	Defeating ARI/RPT Logic Trips		15	00:00:00	00:00:00		INSTALL	00:00:00
ATT19	Defeating RPS Logic Trips		16	00:00:00	00:00:00		INSTALL	00:00:00
ATT20	Defeating RCJS Control Rod Drive Blocks		17	00:00:00	00:00:00		INSTALL	00:00:00

Ready NUM

Procedures that may be used in this scenario:

<u>Procedure No.</u>	<u>Rev</u>	<u>Procedure Title</u>
03-1-01-2	170	Power Operations
04-1-01-C11-1	154	Control Rod Drive Hydraulic System
04-1-01-E12-1	147	Residual Heat Removal System
04-1-01-E21-1	41	Low Pressure Core Spray System
04-1-01-N21-1	74	Feedwater System
04-1-01-N23-1	66	Heater Vents and Drains N23/Extraction Steam N36
04-1-02-1H13-P601	161	Alarm Response Instruction Panel No.: 1H13-P601
04-1-02-1H13-P680	233	Alarm Response Instruction Panel No.: 1H13-P680
04-1-02-1H13-P870	154	Alarm Response Instruction Panel No.: 1H13-P870
05-1-02-I-1	130	Reactor Scram
05-1-02-I-2	37	Turbine and Generator Trips
05-1-02-III-3	115	Reduction In Recirculation System Flow Rate
05-1-02-IV-1	117	Control Rod / Drive Malfunctions
05-1-02-V-5	117	Loss of Feedwater Heating
05-S-01-EP-1	36	Emergency / Severe Accident Procedure Support Documents
05-S-01-EP-2	45	RPV Control
05-S-01-EP-3	29	Containment Control
05-S-01-EP-4	29	Auxiliary Building Control
Tech Spec 3.3.3.1		
Tech Spec 3.3.3.2		
Tech Spec 3.3.6.4		
Tech Spec 3.5.1		
Tech Spec TR3.1.5		
Tech Spec TR3.6.2.2		
Tech Spec TR6.8.2		

SCENARIO ACTIVITIES:

- Start SBT report and any other required recording devices.

Op-Test No: <u>NRC LOT 12-2017</u>		Scenario No: <u>1</u>	Event No: <u>1</u>
Event Description: Start RHR A (or B) in Suppression Pool Cooling mode.			
TIME	Position	Applicant's Actions or Behavior	
	BOOTH	Role Play: If directed to perform pre-start checks of RHR A pump, wait 2 minutes and report pre-start checks are satisfactory.	
	BOP	<p>Starts RHR A in Suppression Pool Cooling mode IAW SOI 04-1-01-E12-1, Section 5.2.2.a:</p> <p>Place RHR A MOV TEST SWITCH to TEST position. (This is performed IAW Precaution and Limitation 3.14.)</p> <p>(1) NOTE to Examiners: Step is N/A since SSW A is already operating with flow through the RHR A Heat Exchangers.</p> <p>(2) Start RHR RM A FAN COIL UNIT on 1H13-P870.</p> <p>(3) Open OR Check Open F003A, HX A OUTL VLV.</p> <p>NOTE - Opening of F024A causes LPCI A Mode of RHR to be inoperable.</p> <p>(4) Start RHR A PMP.</p> <p>(5) Open F024 A, RHR A TEST RTN TO SUPP POOL.</p> <p>Reports to CRS that F024A, RHR A TEST RTN TO SUPP POOL, is open.</p> <p>(6) Throttle F048A, HX A BYP VLV, as needed for suppression pool cooling.</p> <p>(7) Check F064A is still Closed, or has Closed when RHR PMP A FLO exceeded 1154 gpm.</p> <p>Place RHR A MOV TEST SWITCH to NORM.</p>	
	CRS TS	<p>Enters LCO 3.5.1, Condition A and declares RHR A inoperable due to E12-F024A, RHR A TEST RTN TO SUPP POOL, being open. Required action is to return RHR A to operable status with a Completion Time of 7 days.</p> <p>Enters LCO 6.8.2, Condition A due to RHR A MOV TEST SWITCH in TEST position. Required action is to bypass the thermal overload protection with a completion time of 8 hours.</p>	
		END OF EVENT	
	Notes		
	Lead Examiner: Cue to proceed to the next event.		

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 2Event Description: **LPCS Jockey Pump trip****At the direction of the lead evaluator, trigger Event 2 to cause the LPCS Jockey Pump to trip.**

TIME	Position	Applicant's Actions or Behavior
	BOP	Recognizes and reports LPCS Jockey Pump trip by the following indications: <ul style="list-style-type: none"> • P601-21A-C7 LPCS PMP DISCH PRESS ABNORMAL • P601-21A-H8 LPCS SYS OOSVC • JKY PMP OVERLD/PWRLOSS status light lit • LPCS JKY PMP handswitch amber light lit and red and green light extinguished
	CREW	Dispatches plant operator/electrical maintenance to investigate breaker 52-151108.
	BOOTH	<u>Role Play:</u> If asked to investigate, wait 3 minutes and report as operator or electrical maintenance that breaker 52-151108 is in the trip free position and a Work Request will be required to investigate.
	CRS TS	Enters LCO 3.5.1, Condition C. Required action is to return one ECCS subsystem to operable status with a Completion Time of 72 hours. Enters LCO 3.3.6.4, Condition C. Required action is to restore channel to operable status with a Completion Time of 24 hours. Enters LCO 3.3.3.1, Condition A. Required action is to restore channel to operable status with a Completion Time of 30 days. Enters LCO 3.3.3.2, Condition A. Required action is to restore channel to operable status with a Completion Time of 30 days. Enters LCO TR3.6.2.2, Condition A. Required action is to restore channel to functional status with a Completion Time of 7 days.
	CRS	Directs BOP to secure Suppression Pool Cooling and return RHR A to LPCI Standby lineup. Directs plant operator to rack out LPCS Pump breaker 152-1506. May direct plant operator to open E21-F025 to maintain LPCS system pressurized IAW SOI 04-1-01-E21-1, Section 5.1.
	BOOTH	<u>Role Play:</u> If directed to rack out breaker 152-1506, wait 2 minutes and insert Trigger 10 and report breaker 152-1506, LPCS Pump breaker, is racked out. If directed to open E21-F025, wait 3 minutes and insert Trigger 11 and report that E21-F025, LPCS Flush Water Supply, is open.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 2 (cont.)Event Description: **LPCS Jockey Pump trip (cont.)**

	BOP	<p>Secures Suppression Pool Cooling IAW SOI 04-1-01-E12-1, Section 5.2.2.c:</p> <ol style="list-style-type: none"> (1) NOTE to Examiners: Step is N/A since Suppression Pool temperature is below the Tech Spec limit. (2) Close F024A, RHR A TEST RTN TO SUPP POOL. Reports to CRS that E12-F024A, RHR A TEST RTN TO SUPP POOL, is closed. (3) When flow decreases below 1154 gpm after applicable time delay, then verify that F064A, RHR A MIN FLO VLV opens. (4) Stop RHR PMP A. (5) Open F048A, HX A BYP VLV. (6) Open F003A, HX A OUTL VLV. (7) Open or check open F064A. <p>Directs plant operator to perform Steps 5.2.2.c (8) – (12) of SOI 04-1-01-E12-1.</p> <p>Note to evaluator: Steps 5.2.2.c (8) – (12) are for filling and venting the RHR A piping. These steps require extensive time to complete and do not need to be completed before the next event.</p>
	CRS TS	<p>When E12-F024A, RHR A TEST RTN TO SUPP POOL, is closed, exits LCO 3.5.1 Condition C.</p> <p>Recognizes that LCO 3.5.1 Condition A is still applicable.</p>
		END OF EVENT
	NOTES	
		Lead Examiner: Cue to proceed to the next event.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 3Event Description: **Seal Steam Regulator failure****At the direction of the lead evaluator, trigger Event 3 to cause a Seal Steam Regulator failure.**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Responds to and reports annunciator P680-10A-E7, TURB SS PRESS LO.</p> <p>Recognizes the following:</p> <ul style="list-style-type: none"> TURB SSS HDR PRESS, N33-R606, is full upscale > 40"wc. TURB SSS CONT DEV, N33-R614 is full downscale. N33-F505A and B are full closed. <p>Recognizes that Seal Steam Controller has malfunctioned and notifies CRS.</p>
	CRS	<p>Directs ATC to restore SS Header pressure via ARI TURB SS PRESS LO, 04-1-02-1H13-P680-10A-E7.</p> <p>May direct ATC to open MN TURB SSCV BYP VLV F105 using its JOG OPEN pushbutton.</p> <p>Directs BOP to monitor condenser vacuum.</p>
	ATC	<p>Performs action via ARI TURB SS PRESS LO, 04-1-02-1H13-P680-10A-E7:</p> <p>Check for MN TURB SS CONT FAULT light illuminated on 1H13-P680-10C. If FAULT light is illuminated, place seal steam controller in MANUAL by depressing MN TURB SS CONTR OFF pushbutton on 1H13-P680-10C. Manually operate seal steam controller via RAISE pushbutton to increase seal steam header pressure to normal operating value of 19.6 in WC.</p>
	BOP	Monitors and reports condenser vacuum.
	CREW	May dispatch plant operator to N33-R016 to locally monitor Seal Steam header pressure.
	BOOTH	<p>If directed to locally monitor Seal Steam header pressure, using INSIGHT, enter MSPPN33PTN013. The number given is in psia, convert to inches of water using the following:</p> <p>$(X - 14.7) \times 2.768 = \text{inches of WC}$ (x = local indication)</p>
		END OF EVENT
	NOTES	
		Lead Examiner: Cue to proceed to the next event.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 4Event Description: **CRD Pump B trip with HCU 32-17 accumulator fault****At the direction of the lead evaluator, trigger Event 4 to cause the 'B' CRD Pump to trip.**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Recognize and report CRD Pump B trip:</p> <ul style="list-style-type: none"> • P601-22A-A3, CRD CHRG WTR PRESS LO • P601-22A-C3, CRD PMP A/B AUTO TRIP <p>Performs immediate operator actions IAW Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1:</p> <p>2.1.2 If running CRD pump trips, then start standby CRD pump as follows:</p> <p>2.1.2.a Step is N/A.</p> <p>2.1.2.b Place CRD SYS FLO CONT in MANUAL and reduce output to zero.</p> <p>2.1.2.c Start standby CRD pump.</p> <p>2.1.2.d If no scram signal is present, then slowly adjust CRS SYS FLO CONT to 54-66 gpm after charging pressure is normal.</p> <p>2.1.2.e Return CRD SYS FLO CONT to AUTO with tapeset at 54-66 gpm.</p> <p>Reports to CRS that standby CRD pump is running.</p>
	CRS	<p>Enters Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1.</p> <p>Verifies BOP performs immediate operator actions.</p>
	CRS	Directs ATC to monitor for control rod drifts.
	ATC	<p>Monitors for control rod drifts.</p> <p>Recognize and report HCU 32-17 accumulator fault.</p>
	CREW	<p>Dispatch plant operator to perform post-start check on CRD Pump A and investigate CRD Pump B trip.</p> <p>Dispatch plant operator/electrical maintenance to investigate CRD Pump B breaker 152-1605.</p> <p>Dispatch plant operator to investigate HCU 32-17 accumulator trouble.</p>
	BOOTH	<p>Role Play: If asked to investigate, wait 3 minutes and report as plant operator that CRD Pump B is not running and there is no indication of why it tripped.</p> <p>If asked to investigate, wait 2 minutes and report as plant operator/electrical maintenance the breaker 152-1605 is tripped on instantaneous overcurrent. A Work Request will be needed to troubleshoot.</p> <p>If asked to investigate, wait 4 minutes and report HCU 32-17 accumulator pressure is 1660 psig.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 4 (cont.)Event Description: **CRD Pump B trip (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Directs plant operator to drain HCU instrument block on HCU 32-17 accumulator IAW SOI 04-1-01-C11-1, Control Rod Drive Hydraulic System, Section 4.3.
	CRS TS	Enters LCO TR 3.1.5, Condition A and B. Required action is to verify affected accumulator pressure ≥ 1520 psig once per 24 hours and verify affected accumulator water drained once per 48 hours.
	BOOTH	Role Play: When directed to drain instrument block on HCU 32-17 accumulator, after 2 minutes insert Trigger 10 to remove HCU 32-17 accumulator fault. After HCU TROUBLE alarm clears, report to CRS using Plant Pager that HCU 32-17 accumulator has been blown down.
	CRS	Exits LCO TR 3.1.5 Condition A and B.
		END OF EVENT
	NOTES	
	Lead Examiner: Cue to proceed to the next event.	

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 5Event Description: **LP FW HTR 4A tube leak****At the direction of the lead evaluator, trigger Event 5 to cause the Low Pressure Feedwater 4A tube leak.**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Recognize and reports alarm: P680-2A-A6 FW HTR 4A LVL HI</p> <p>3.1 Check that heater 4A dump valve N23-LV-F502A is controlling level by observing heater 4A level and dump valve demand using computer points or N23 process diagram.</p> <p>Dispatch plant operator to check operation of LPFW Heater 4A drain and dump valve controllers on 1H22-P172.</p> <p>Recognize and report tube leak in LPFW Heater 4A.</p>
	BOOTH	<u>Role Play:</u> Use RNI Draw drawing P172-4 to report LPFW HTR 4A drain and dump valve positions after 2 minutes. Both should be 100% open. If asked to report level, multiply indicated VAR reading by 15.
		NOTE to Examiners: The following actions may be taken by the crew before the LPFW HTR HI-HI level is received (alarm is approximately 5 minutes after Event 5 is triggered)
	CRS	<p>Determines actions required to isolate LPFW Heater 4A IAW SOI 04-1-01-N23-1, Section 6.2:</p> <p>6.2.1.a Verify first and second stage MSR Reheaters in service.</p> <p>6.2.2.a Reduce core flow to approximately 70 mlbm/hr per IOI 03-1-01-2.</p>
	CRS	<p>Enters IOI 03-1-01-2, Attachment VIII, Temporary Downpower.</p> <p>12.1 Make notifications of power reduction.</p> <p>Contacts Shift Manager to make notifications for power reduction.</p>
	BOOTH	<u>Role Play:</u> If contacted, as Shift Manager inform CRS that you will make the required notifications.
	CRS	<p>12.3 Lower reactor power by gradually closing the Recirculation Loop Flow Control Valves until desired power or core flow of approximately 62.2% (70 mlbm/hr) is reached per the direction of the STA or Reactor Engineer.</p> <p>Directs ATC to lower core flow to 70 mlbm/hr using Recirculation Flow Control Valves A and B in slow detent.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 5 (cont.)Event Description: **LP FW HTR 4A tube leak (cont.)**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Lowers core flow to 70 mlbm/hr using Recirculation Flow Control Valves A and B in slow detent.</p> <p>Determines and reports to CRS reactor is operating in the MELLA+ region of Power-To-Flow map and is monitoring for THI with no concurrent duties.</p>
	CRS	<p>12.7 If reactor power is changed by more than 15% in one hour, then notify Chemistry department to perform required surveillances.</p> <p>Inform Chemistry to perform required surveillances for downpower.</p>
	BOOTH	Role Play: If contacted, as Chemistry inform CRS that required surveillances will be performed.
	CRS	<p>Informs ATC that concurrent duties are allowed.</p>
	CRS	<p>Enters Loss of Feedwater Heating ONEP, 05-1-02-V-5.</p> <p>3.1 NOTE to Examiners: Step is N/A since reactor scram has not been initiated.</p> <p style="text-align: center;"><u>NOTE</u></p> <p>If Control Rods are inserted by the following step, then they should be inserted per the approved shutdown sequence.</p> <p style="text-align: center;">CAUTION</p> <p>Operation with Feed Water Heating Out Of Service in the MELLA+ region is prohibited.</p> <p>3.2 Monitor core thermal power and maintain margin to preconditioned envelope, thermal limits, and power-to flow map by control rod insertion per STA/Reactor Engineer recommendations.</p> <p>Recognize reactor operating point is in MELLA+ region.</p> <p>Direct ATC to perform Step 1 of Shutdown Sequence to lower reactor operating point to exit the MELLA+ region.</p>
	ATC	<p>Performs Step 1 of Shutdown Sequence to insert one gang of control rods to lower reactor power.</p> <p>Re-plots reactor operating point on Power-To-Flow map and determines reactor operating point is below the MELLA+ region in the OPRM Armed Region of the Power-To-Flow map.</p>
	CRS	<p>Directs BOP to isolate LP FW Heater String A IAW Section 6.2 of SOI 04-1-01-N23-1, Heater Vents and Drains, starting at Step 6.2.2.c.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 5 (cont.)Event Description: **LP FW HTR 4A tube leak (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p>3.3 Determine Feedwater temperature and core thermal power and refer to Attachment 1 of Loss of Feedwater Heating ONEP.</p> <p>3.3.1 If point is in Region 1, then no further action is required.</p> <p>3.3.2 If point is in Region 2, then initiate action to reduce thermal power to <21% within 4 hours.</p> <p>Determines operation in Region 1 of 05-1-02-V-5, Attachment 1.</p>
	BOP	<p>Isolates LP FW Heater String A IAW SOI 04-1-01-N23-1, Section 6.2:</p> <p>6.2.2.c Close N19-F042A, LP FW HTR STRING A FW INL VLV on 1H13-P870.</p> <p>6.2.2.d Close N19-F040A, LP FW HTR STRING A FW OUTL VLV on 1H13-P870.</p> <p>6.2.2.e Check that applicable Drain and Dump valves on isolated string operate properly.</p> <p>Dispatch plant operator to check operation of LP FW HTR STRING A drain and dump valve controllers.</p>
	BOOTH	<u>Role Play: Use RNI Draw drawing P172-4 to report LPFW HTR STRING A drain and dump valve positions after 2 minutes. Valves should be in mid position after string is isolated.</u>
		<p>NOTE to Examiners: The following actions will be taken by the crew if the LPFW HTR HI-HI level is received.</p> <p>Some of the actions may have already been performed by the crew in the previous section.</p>
	BOP	<p>Recognize and reports alarm:</p> <p>P870-6A-A1 FW HTR 4A LVL HI-HI</p> <p>Check automatic actions have occurred. (Spurious 4A Hi-Hi alarm, without the 4A Hi alarm, will not cause any automatic actions to occur.)</p> <ul style="list-style-type: none"> LP Heater String A condensate outlet valve 1N19-F040A closes. LP Heater String A condensate inlet valve 1N19-F042A closes. Seal Steam Generator Drain Tank drain to heater 4A valve 1N33-F019A closes. <p>Recognize and report N19-F040A and N19-F042A did not automatically close.</p> <p>Places handswitch for N19-F040A and N19-F042A to CLOSE and verify valves close.</p> <p>Report to CRS that LP FW HTR String A inlet and outlet valves are closed.</p>
	ATC	Check that heater 4A bypass drain valve 1N23-LV-F502A is open using computer points.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 5 (cont.)Event Description: **LP FW HTR 4A tube leak (cont.)**

TIME	Position	Applicant's Actions or Behavior
	ATC	Checks that seal steam generator drain tank emergency drain 1N33-LV-F503 is open using computer point.
	CRS	<p>Enters Loss of Feedwater Heating ONEP, 05-1-02-V-5.</p> <p>2.1 Reduce Core Flow to 70 mlbm/hr.</p> <p>Directs ATC to lower core flow to 70 mlbm/hr using Recirculation Flow Control Valves A and B in slow detent.</p> <p>Directs BOP to ensure LP FW HTR String A isolation valves close.</p>
	ATC	<p>Lowers core flow to 70 mlbm/hr using Recirculation Flow Control Valves A and B in slow detent.</p> <p>Determines and reports reactor is operating in the MELLA+ region on Power-To-Flow map and assumes THI watch with no concurrent duties.</p>
	CRS	<p style="text-align: center;">NOTE</p> <p>If Control Rods are inserted by the following step, then they should be inserted per the approved shutdown sequence.</p> <p style="text-align: center;">CAUTION</p> <p>Operation with Feed Water Heating Out Of Service in the MELLA+ region is prohibited.</p> <p>3.2 Monitor core thermal power and maintain margin to preconditioned envelope, thermal limits, and power-to flow map by control rod insertion per STA/Reactor Engineer recommendations.</p> <p>Recognize reactor operating point is in MELLA+ region.</p>
	CRS	Direct BOP to perform Step 1 of Shutdown Sequence to lower reactor operating point to exit the MELLA+ region.
	BOP	<p>Inserts Step 1 of Shutdown Sequence to lower reactor operating point to exit the MELLA+ region.</p> <p>Re-plots reactor operating point on Power-To-Flow map.</p> <p>Determines and reports to CRS that reactor operating point is below the MELLA+ region, in the OPRM Armed Region of the Power-To-Flow map.</p>
	CRS	<p>3.3 Determine Feedwater temperature and core thermal power and refer to Attachment 1.</p> <p>3.3.1 If point is in Region 1, then no further action is required.</p> <p>3.3.2 If point is in Region 2, then initiate action to reduce thermal power to <21% within 4 hours.</p> <p>Determines operation in Region 1 of 05-1-02-V-5, Attachment 1.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 5 (cont.)Event Description: **LP FW HTR 4A tube leak (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Enters Reduction in Recirculation Flow ONEP, 05-1-02-III-3. 3.1 Monitor APRMs, LPRMs, SRM period meters, and OPRM Computer Trends. Directs ATC to monitor APRMs and LPRMs for hydraulic instability. Directs ATC that THI Watch with concurrent duties is allowed.
	ATC	Monitors for hydraulic instability by observing APRM and LPRM indications.
	CRS	3.4 If operation is determined to be in OPRM Armed Region, perform the following: 3.4.1. Verify that at least 3 OPRM channels are not bypassed (i.e. are enabled) per TS 3.3.1.1-1, Item 2.f. Direct ATC to verify at least 3 OPRM channels are not bypassed.
	ATC	Verifies at least 3 OPRM channels are not bypassed: <ul style="list-style-type: none"> Computer points C51NC085, 86, 87, 88 OPRM ENABLED alarmed on PDS. Computer points C51NC075, 76, 77, 78 OPRM INOP not alarmed on PDS. Reports all OPRM channels are operable.
	CRS	3.7 If both loops are operating, then perform the following: 3.7.1 NOTE to Examiners: Step is N/A. Recirculation pumps are in FAST speed. 3.7.2 At less than 78.7 mlbm/hr core flow, balance loop flows to within 4460 gpm. 3.7.2 NOTE to Examiners: Step is N/A. Core flow was lowered to 70 mlbm/hr. Directs ATC to balance Recirculation Loop flows to within 4460 gpm.
	ATC	Reports Recirculation Loop flows and adjusts Recirculation Loop flows, if necessary, using Recirculation Flow Control Valves A and B to within 4460 gpm.
		END OF EVENT
	NOTES	
		Lead Examiner: Cue to proceed to the next event.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 6Event Description: **RCIC Steam line break with a failure to isolate**

At the direction of the lead evaluator, trigger Event 6 to cause a RCIC Steam Line break with a failure of the steam isolation valves to close.

TIME	Position	Applicant's Actions or Behavior
NOTE to Examiners: The following alarms will annunciate within 2 minutes after Event 6 is triggered.		
	BOP	<p>Recognize and report steam leak in RCIC Room:</p> <ul style="list-style-type: none"> • P601-21A-H2 RCIC PIPE/EQUIP AMBIENT TEMP HI • P601-21A-H3 RCIC EQUIP AREA ΔT HI • P601-21A-G3 RCIC EQUIP AREA TEMP HI (EP-4) <p>3.1 Check that automatic actions occur.</p> <p>2.1 E51-F064 closes</p> <p>2.2 E51-F063 closes</p> <p>2.3 E51-F031 closes</p> <p>2.4 RCIC Turbine trips</p> <p>2.5 E51-F013 closes</p> <p>2.6 E51-F076 closes</p> <p>Recognize and report E51-F063 and E51-F064 failed to automatically close.</p> <p>Place handswitch for E51-F063 and E51-F064 to CLOSE.</p> <p>Recognize and report E51-F063 and E51-F064 power loss.</p>
	CRS	Enters EP-4, Auxiliary Building Control and transitions to Temperature/Radiation Control.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 6 (cont.)Event Description: **RCIC Steam line break with a failure to isolate (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p style="text-align: center;">EP-4</p> <p>The flowchart for EP-4 is as follows:</p> <ul style="list-style-type: none"> TEMPERATURE / RADIATION (circled in red) <ul style="list-style-type: none"> Operate area coolers and HVAC as necessary to maintain area temperatures below their operating limits (Table SC-1). IF Any area temperature above its operating limit (Table SC-1) OR Any area radiation level above its operating limit (Table SC-1) THEN Go to 21 (circled in red). WATER LEVELS <ul style="list-style-type: none"> Operate sump pumps as necessary to restore and maintain area water levels below their operating limits (Table SC-1). IF Any area water level cannot be restored and maintained below its operating limit (Table SC-1) THEN Go to 21 (circled in red). EXECUTE CONCURRENTLY <ul style="list-style-type: none"> Evacuate affected areas. (circled in red) Isolate all systems through a break. A discharge of A Declaration of is expected due release dose c 21 (circled in red) <ul style="list-style-type: none"> Isolate all systems discharging outside the CTMT through a break, passive systems needed for: <ul style="list-style-type: none"> Damage control EP actions IF A system that cannot be isolated from the RPV is discharging outside the CTMT THEN Go to 22 (circled in red). <ul style="list-style-type: none"> IF 2 or more area temperatures, radiation levels, or water levels are above max safe values (Table SC-1) THEN Shut down the reactor (IOI 03-1-01-2). 22 (circled in red) <ul style="list-style-type: none"> BEFORE Any area temperature, radiation level, or water level reaches its max safe value (Table SC-1). Enter EP-2 (circled in red). 10 <ul style="list-style-type: none"> Operate all area coolers and sump pumps to restore and maintain area temperatures and water levels below their operating limits (Table SC-1). IF 2 or more area temperatures, radiation levels, or water levels are above max safe values (Table SC-1) THEN EMERGENCY DEPRESSURIZATION IS REQUIRED: Exit EP-2/2A Pressure → Enter Emergency Depressurization.
	CRS	<p>Directs evaluation of RCIC area in Auxiliary Building.</p> <p>Directs BOP to start RCIC Room Cooler.</p> <p>Direct BOP to monitor EP-4 parameters.</p>
	BOP	<p>Starts RCIC Room Cooler by placing its handswitch to START on 1H13-P870-1C.</p> <p>Monitors and reports EP-4 parameters.</p>
	CRS	<p>Recognize system that cannot be isolated from the RPV is discharging outside the CTMT and RCIC EQUIP AREA TEMP is above its max safe temperature of 212°F.</p> <p>Enters EP-2 from EP-4 and directs ATC to scram the reactor.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 6 (cont.)Event Description: **RCIC Steam line break with a failure to isolate (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p>Directs ATC to scram the reactor.</p> <p>Enters Reactor Scram ONEP, 05-1-02-I-1, and Turbine and Generator Trips ONEP, 05-1-02-I-2.</p> <p>Directs all personnel to evacuate Containment due to reactor scram.</p>
	ATC	<p>Places Reactor Mode Switch to SHUTDOWN.</p> <p>Recognize and report all control rods not inserted due to hydraulic block ATWS.</p> <p>Recognize and report reactor power < 5%.</p>
		END OF EVENT
	Notes	
	<p>Proceed to the next event for scram and ATWS.</p> <p>NOTE to Examiners:</p> <p>CRS actions start on the next page of the Scenario Guide.</p> <p>ATC actions start on Page 34 of the Scenario Guide.</p> <p>BOP actions start on Page 38 of the Scenario Guide.</p>	

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7/9Event Description: **Low Power ATWS (< 5% power) / HPCS Service Water Pump trip****ATWS Malfunction is already active. HPCS Service Water will trip when it starts.**

TIME	Position	Applicant's Actions or Behavior
	CRS	Transitions from EP-2, RPV Control, to EP-2A, ATWS RPV Control. Verifies ATC performed immediate actions of Reactor Scram ONEP, 05-1-01-I-1 for ATWS < 5%.
	CREW	Recognize and report HPCS Service Water Pump trip.
	CRS	Directs ATC to trip HPCS Diesel Generator.

EP-2

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1 Verify the Rx Mode Switch in SHUTDOWN.

↓

2 Evacuate affected areas.

↓

While in this procedure:

IF	THEN
Any control rod is withdrawn past position 02, AND The reactor will <u>not</u> remain subcritical under all conditions without boron	ATWS: Exit this procedure → Enter EP-2A
RPV level is unknown	FLOOD THE RPV: Exit this procedure → Enter EP-5
3 Aux Building isolates	Restore the Aux Building.

↓

EP-2A

↓

START

↓

1

1. Verify Rx recirc pumps transferred to LFMG.
2. Verify ARI/RPT initiation.
3. Inhibit ADS.
4. Override HPCS injection.

↓

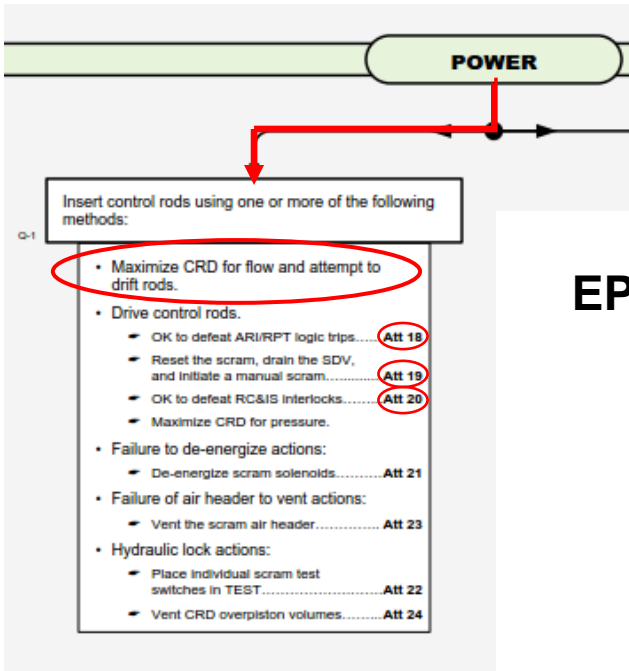
While in this procedure:

IF	THEN
All control rods are inserted to or beyond position 02, OR The reactor will remain subcritical under all conditions without boron	1. Terminate boron injection. 2. Exit this procedure → Enter EP-2
RPV level is unknown	FLOOD THE RPV: Exit this procedure → Enter EP-5A
2 Aux Building isolates	Restore the Aux Building.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p>EP-2A</p> <p>Table L-3 Preferred ATWS Injection Systems</p> <ul style="list-style-type: none"> Condensate/Feedwater CRD <ul style="list-style-type: none"> Maximize CRD for flow. RCIC <ul style="list-style-type: none"> Use CST suction if available. OK to defeat isolations and interlocks. Att 1, 3 RHR through shutdown cooling return <ul style="list-style-type: none"> Inject through the HX as soon as possible. OK to defeat isolations. Att 12 SLC boron tank
	CRS	<p>Directs BOP to maintain RPV water level between +11.4" to 53.5" narrow range using Startup Level Control Valve.</p> <p>Directs I&C to install EP Attachment 12 for RHR injection through feedwater sparger.</p> <p>Directs I&C to install EP Attachment 8 for MSIVs.</p>
	BOOTH	<p>Role Play: When directed to install Attachments, trigger the following Events as each Attachment is directed:</p> <p>Attachment 8 – Event 13</p> <p>Attachment 12 – Event 14</p> <p>Notify CRS as each Attachment indicates DONE.</p>

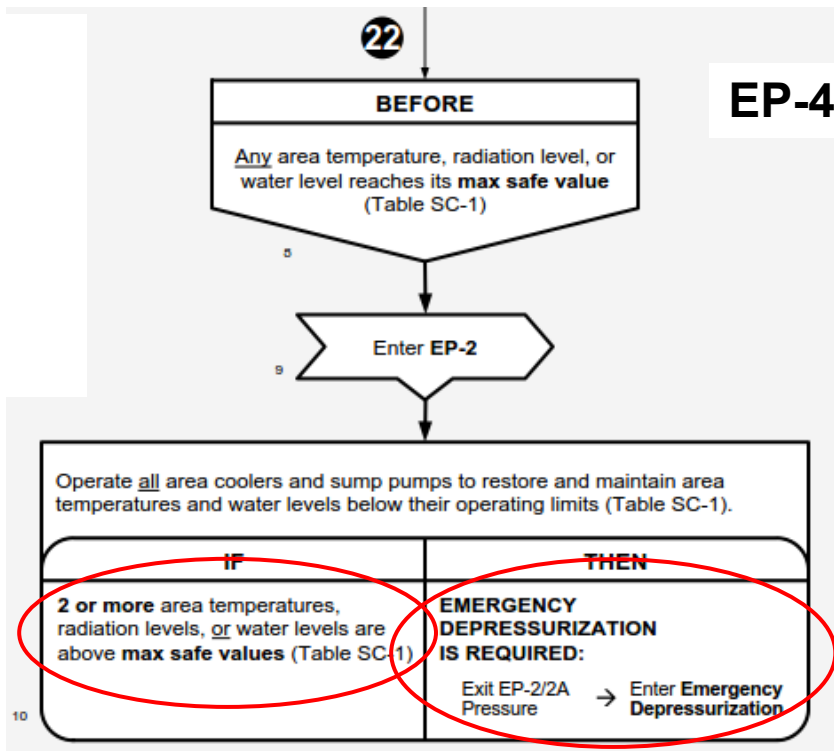
Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	
		 <p>EP-2A</p>
	CRS	<p>Directs ATC to maximize CRD for flow.</p> <p>Directs I&C to install EP Attachment 18, 19, and 20 to defeat RC&IS interlocks and RPS scram signals.</p>
	BOOTH	<p>Role Play: When directed to install Attachments, trigger the following Events as each Attachment is directed:</p> <p>Attachment 18 – <u>Event 15</u></p> <p>Attachment 19 – <u>Event 16</u></p> <p>Attachment 20 – <u>Event 17</u></p> <p>Notify CRS as each Attachment indicates DONE.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	
	CRS	<p style="text-align: right;">EP-2A</p> <p>Direct ATC to maintain RPV pressure between 800 and 1060 psig using Bypass Valves.</p> <p>NOTE to Examiners: CRS may direct a pressure band of 450 to 600 psig due to steam leak in RCIC piping.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 9Event Description: **MainSteam Tunnel steam leak**

TIME	Position	Applicant's Actions or Behavior
	CREW	Recognize and report MSIVs closed.
	CRS	Direct ATC to maintain pressure in directed band using SRVs.
	CREW	Recognize and report RCIC Room and Main Steam Tunnel temperatures have exceeded their EP-4 max safe temperatures.
	CRS	
	CRS	Exits EP-2A pressure leg and enters EP-2A Emergency Depression Leg.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 9 (cont.)Event Description: **Main Steam Tunnel steam leak (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p style="text-align: right;">EP-2A</p> <pre> graph TD Start([EMERGENCY DEPRESSURIZATION]) --> Decision1{IF RVP depressurization will result in loss of RCIC AND RCIC is required for adequate core cooling} Decision1 -- Yes --> Action1[THEN Terminate RPV depressurization AND Control RPV pressure as low as possible using one or more Table P-2 systems while maintaining RCIC injection. • OK to exceed release rate limits. • OK to defeat isolations and interlocks.] Action1 --> Decision2{Is SP level above 10.5 ft?} Decision2 -- No --> Decision1 Decision2 -- Yes --> Action2[Terminate and prevent all RPV injection except: • Boron injection • CRD • RCIC • OK to defeat interlocks.] Action2 --> Action3[Open 8 ADS/SRVs. • OK to exceed 100°F/hr cooldown. • OK to defeat isolations and restore air... Att 7] Action3 --> End([Return to Level at 10]) </pre>
	CRS	<p>Verify Suppression Pool level is greater than 10.5 ft. using SPDS.</p> <p>Direct BOP to terminate Feedwater flow to the reactor.</p> <p>Direct ATC to verify low pressure ECCS is terminated and prevented.</p>
(CT-3) When emergency depressurization is required, crew terminates and prevents all RPV injection, except RCIC, CRD, and Boron, prior to emergency depressurizing the RPV.		
	CRS	<p>Direct ATC to open 8 ADS/SRVs.</p> <p>Direct BOP to monitor reactor pressure and report when RPV pressure lowers to 206 psig.</p> <p>When RPV pressure lowers to 206 psig, directs BOP to maintain reactor level between 11.4" and +53.5" wide range, not to exceed 2 mlbm/hr flow.</p>
(CT-2) When two areas exceed their max safe temperatures, emergency depressurize the RPV before exiting EP-4.		

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CREW	Recognize and report Attachment 18, 19, and 20 installed.
	CRS	Directs ATC to maximize CRD for pressure. Direct ATC to reset reactor scram and scram and drive control rods.

(CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A.

	BOOTH	Role Play: When control rod movement is reported to CRS, at the direction of the Lead Examiner, trigger Event 9 to allow all control rods to insert.
	CRS	When all control rods are inserted, exits EP-2A, ATWS RPV Control, and enters EP-2, RPV Control.
	CRS	<pre> graph TD START([START]) --> Steps[1. Verify Rx recirc pumps transferred to LFMG. 2. Verify ARI/RPT initiation. 3. Inhibit ADS. 4. Override HPCS injection.] Steps --> While[While in this procedure:] subgraph WhileBox [While in this procedure:] direction TB subgraph IF_THEN [] direction LR IF[IF All control rods are inserted to or beyond position 02, OR The reactor will remain subcritical under all conditions without boron RPV level is unknown Aux Building isolates] THEN[THEN 1. Terminate boron injection. 2. Exit this procedure -> Enter EP-2 FLOOD THE RPV: Exit this procedure -> Enter EP-5A Restore the Aux Building.] end end WhileBox --> End([END]) </pre>
	CRS	Directs BOP to restore and control RPV level between +11.4" to +53.5" narrow range.
	BOP	Restores and maintains RPV water level between +11.4" and +53.5" narrow range using 1C34-LK-R602, RX WTR LVL SU CONT.

NOTE to Examiners: Scenario objectives have been met when the crew has inserted all control rods and level is being raised in a controlled manner to restore it to +11.4" to +53.5" narrow range.

Op-Test No: <u>NRC LOT 12-2017</u>		Scenario No: <u>1</u>	Event No: <u>7 (cont.)</u>
Event Description: <u>Low Power ATWS (< 5% power) (cont.)</u>			
TIME	Position	Applicant's Actions or Behavior	
END OF SCENARIO			
	Notes		
	BOOTH	When directed by the Lead Examiner, place the simulator in freeze and tell the crew to stop operating.	

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7/8Event Description: **Low Power ATWS (< 5% power) / HPCS Service Water Pump trip****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Performs immediate operator actions of Reactor Scram ONEP, 05-1-01-I-1:</p> <p>2.1 Confirm all Control Rods are fully inserted.</p> <p>Recognize and report all not inserted due to a hydraulic block ATWS.</p> <p>2.2 Confirm reactor power decreasing.</p> <p>Report reactor power is less than 5%.</p> <p>2.3 NOTE to Examiners: Step is N/A because Mode Switch is already in SHUTDOWN.</p> <p>2.4 NOTE to Examiners: Step is N/A because ATWS is due to hydraulic block of both Scram Discharge Volumes.</p> <p>2.5 If an ATWS occurs, the perform the following:</p> <p>2.5.1 Verify Reactor Recirc Pumps are transferred to LFMGs.</p> <p>2.5.2 Initiate ARI/RPT.</p> <p>Arms and depresses ATWS ARI/RPT Channel 1 and Channel 2 pushbuttons</p> <p>2.5.3 Inhibit ADS.</p> <p>Places ADS A and ADS B MANUAL INHIBIT switches to INHIBIT position.</p> <p>2.5.4 Initiate and override HPCS.</p> <p>While holding 1E22F004, HPCS INJ SHUTOFF VLV handswitch in CLOSE position, arm and depress manual system initiation pushbutton for HPCS.</p> <p>After indication of pump start, then trip HPCS Pump.</p> <p>Ensure HPCS Pump and 1E22F004, HPCS INJ SHUTOFF VLV override alarms are sealed in.</p> <p>Recognizes and reports HPCS Service Water Pump trip and HPCS Diesel Generator is running with no cooling water.</p> <p>Trips HPCS Diesel Generator by depressing the HPCS DSL ENG EMERG STOP pushbutton.</p> <p>Reports to CRS that HPCS Diesel Generator is shutdown.</p> <p>Report to CRS that Reactor Scram immediate operator actions are complete.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Maximizes CRD for flow IAW 04-1-01-C11-1, Attachment VIII, by performing the following:</p> <ol style="list-style-type: none"> (1) Ensure oil pump is running on the non-running CRD Pump. (2) With one CRD pump already running, then start standby CRD PUMP. (3) Place CRD SYS FLO CONT C11-R600 in MANUAL (4) Using CRD SYS FLO CONT C11-R600, fully open C11-F002A(B), CRD FLO CONT VLV (5) If maximizing CRD for flow, then fully open C11-F003, CRD DRIVE WTR PRESS CONT VLV
	ATC	Verifies that Turbine Pressure Control system and Bypass Valves are maintaining reactor pressure between 800 psig and 1060 psig.
	ATC	Maintains reactor pressure between 800 psig and 1060 psig by opening and closing SRVs.
	ATC	<p>Terminates and prevents low pressure ECCS systems by performing the following.</p> <ul style="list-style-type: none"> • Arms and depresses LPCS/RHR A MAN INIT pushbuttons • After indication of LPCS and RHR A pump starts, then trip the pumps • Close associated injection valves • Ensure associated pump and valve override alarms are sealed in • Arms and depresses RHR B/RHR C MAN INIT pushbuttons • After indication of LPCS and RHR A pump starts, then trip the pumps • Close associated injection valves • Ensure associated pump and valve override alarms are sealed in <p>Reports low pressure ECCS terminated and prevented.</p>

(CT-3) When emergency depressurization is required, crew terminates and prevents all RPV injection, except RCIC, CRD, and Boron, prior to emergency depressurizing the RPV.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Open 8 ADS/SRVs by placing the key-locked handswitch for the following valves to OPEN:</p> <ul style="list-style-type: none"> • B21-F041K • B21-F047L • B21-F041F • B21-F047A • B21-F051C • B21-F041D • B21-F051A • B21-F051B
(CT-2) When two areas exceed their max safe radiation levels, emergency depressurize the RPV before exiting EP-4.		
	ATC	<p>Maximizes CRD for pressure IAW 04-1-01-C11-1, Attachment VIII, by performing the following:</p> <p>IF no CRD pumps are initially running, then a CRD pump must be started per ONEP 05-1-02-IV-1 prior to performing the following steps.</p> <p>Per ONEP 05-1-02-IV-1 to restart 1st pump:</p> <ul style="list-style-type: none"> • IF running CRD pump trips, then start standby CRD pump as follows: <ul style="list-style-type: none"> a. IF required, re-energize MCC's 15B42 AND 16B42 on 1H13-P864. b. Place CRD SYS FLO CONT in MANUAL and reduce output to zero. c. Start standby CRD pump. d. IF no scram signal is present, then slowly adjust CRD SYS FLO CONT to 54-66 gpm after charging pressure is normal. e. Return CRD SYS FLO CONT to AUTO with tapeset at 54-66 gpm. <p>Per 04-1-01-C11-1, Control Rod Drive SOI, Attachment VIII:</p> <ol style="list-style-type: none"> 1. Ensure oil pump is running on the non-running CRD Pump A(B). 2. With one CRD pump already running, then start standby CRD PMP A(B). 3. Place CRD SYS FLO CONT C11-R600 in MANUAL. 4. Using CRD SYS FLOW CONT C11-R600, fully open C11-F002A(B), CRD FLO CONT VLV. 5. NOTE to Examiner: Step is N/A 6. If maximizing CRD for pressure, then fully close C11-F003, CRD DRIVE WTR PRESS CONT VLV, to maximize drive water pressure.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Scram control rods by performing the following:</p> <ul style="list-style-type: none"> • Reset scram signal (only one division required) • Allow Scram Discharge Volume to drain • Arm and depress Manual Scram Pushbuttons for reset division <p>Drive control rods by performing the following:</p> <ul style="list-style-type: none"> • Reset scram signal (only one division required) • Select control rod • Select gang drive mode • Depress INTIMER SKIP pushbutton until control rods indicate 00 <p>Reports to CRS when all control rods are fully inserted.</p>
<p>(CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A.</p>		
	BOOTH	<p><u>Role Play:</u> When control rod movement is reported to CRS, <u>at the direction of the Lead Examiner</u>, trigger <u>Event 10</u> to allow all control rods to insert.</p>
	Notes	
		Return to Page 33 for completion of ATC actions.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7Event Description: **Low Power ATWS (< 5% power)****BOP ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Transfers to Startup Level Control IAW SOI 04-1-01-N21-1, Attachment VII, by performing the following:</p> <ol style="list-style-type: none"> Perform the following: <ul style="list-style-type: none"> Minimize the output of 1C34-LK-R602, RX WTR LVL SU CONT, to close N21-F513 Minimize the output of 1N21-HC-R609, FW CU RECIRC VLV to close N21-F150 Depress the CLOSE pushbutton for the N21-F040, FW SU BYP VLV, and ensure valve is closed. Open the following valves: <ul style="list-style-type: none"> N21-F001, SU FCV OUTL ISOL VLV N21-F010A, HP FW HTR STRNG A SU OUTL VLV N21-F010B, HP FW HTR STRNG B SU OUTL VLV Select MAN on FW LVL MASTER CONT (1C34-LK-R600). Close the following valves: <ul style="list-style-type: none"> N21-F009A, FW HTR 6A OUTL VLV N21-F009B, FW HTR 6B OUTL VLV Step is N/A. If using a RFPT, then place a RFPT in SPEED AUTO with respective discharge pressure approximately 250 psid above reactor pressure. Ensure open RFP A(B) DISCH VLV N21-F014A(B) for RFPTs that are operating or as needed to establish a flow path for Condensate. Adjust 1C34-LK-R602, RX WTR LVL SU CONT, as necessary in MAN or AUTO to control N21-F513 to maintain desired reactor level. N21-F040 and N21-F009A(B) may be OPENED/CLOSED as necessary to augment flow. <p>Places 1C34-LK-R602, RX WTR LVL SU CONT in AUTO with setpoint at 36 inches.</p>
	BOP	<p>Terminate feedwater injection into the reactor vessel by performing the following:</p> <ul style="list-style-type: none"> Close 1N21F513 by placing 1C34-LK-R602, RX WTR LVL SU CONT, in MAN and lower output to -5.00. Verify 1N21F040 closed by ensuring CLOSE pushbutton depressed. Verify 1N21F009A and F009B closed by ensuring CLOSE pushbuttons depressed.

(CT-3) When emergency depressurization is required, crew terminates and prevents all RPV injection, except RCIC, CRD, and Boron, prior to emergency depressurizing the RPV.

Op-Test No: NRC LOT 12-2017Scenario No: 1Event No: 7 (cont.)Event Description: **Low Power ATWS (< 5% power) (cont.)****BOP ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	BOP	Monitor reactor pressure and report when pressure lowers to 206 psig.
	BOP	When reactor pressure lowers to 206 psig, slowly restore feedwater injection to restore and maintain reactor level 11.4" to 53.5" narrow range, not to exceed 2 mlbm/hr flowrate.
	Notes	
		Return to Page 33 for completion of BOP actions.

INITIAL CONDITIONS

- A. Plant Status: 100% power, middle of cycle
- B. Tech. Spec. Limitations in effect: None
- C. Significant problems/abnormalities:
 - Average Suppression Pool temperature is 85°F due to weeping SRVs.
 - SSW A is running for chemical addition.
- D. Integrated Risk: Green
- E. Division Work Week: Division 1
- F. Evolutions/maintenance for the up-coming shift :
 - Start RHR A in Suppression Pool Cooling to lower Suppression Pool temperature to less than 80°F.

Facility: <u>Grand Gulf Nuclear Station</u> Scenario No.: <u>2</u> Op-Test No.: <u>GGNS 12-2017</u>			
Examiners: _____ _____ _____		Operators: _____ _____ _____	

Event No.	Malf. No.	Event Type †	Event Description
1	N/A	N (BOP,CRS)	Transfer ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12
2	(r) fw211	C (ATC,CRS) TS (CRS)	Narrow Range Level C instrument oscillations
3	r21134h n41141c	TS (CRS) C (BOP,CRS) A (CREW)	ESF Transformer 12 Lockout with HPCS Diesel Generator auto start failures
4	z022021_24_53	C(ATC,CRS) A(CREW)	Control Rod 24-53 drifting in
5	z022022_24_53	R (ATC) C(BOP,CRS) A(CREW) TS (CRS)	Control Rod 24-53 stuck at position 32.
6	z021021_32_37	M(CREW)	Control Rod 32-27 drifting in. Reactor scram due to two controls drifting in
7	c11164	M(CREW)	Hydraulic Block ATWS > 5% RTP (EP-2, 2A) * (CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A * (CT-2) Inhibit ADS prior to automatic ADS valves opening during ATWS * (CT-3) During failure to scram conditions with power > 5% RTP, terminate and prevent all injection from all sources (except boron, CRD, and RCIC) as necessary to lower RPV level to below -70" wide range prior to exiting EP-2A
8	fw123a(b)	C(BOP,CRS)	Reactor Feedwater Pump trip. *(CT-4) Restores injection using Condensate/Feedwater to restore/maintain RPV level above -191" CFZ before exiting EP-2A
9	c41263	C(ATC,CRS)	ESF Bus 15AA power loss

†	(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec
*	Critical Task (As defined in NUREG 1021 Appendix D)

Objectives: To evaluate the applicant's ability to operate the facility in response to the following evolutions:

1. Transfer ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12.
2. Respond to Narrow Range C level transmitter oscillations.
3. Respond to an ESF Transformer 12 Lockout with failure of HPCS Diesel Generator to automatically start.
4. Respond to a control rod drifting in.
5. Respond to a stuck control rod.
6. Respond to a second control rod drifting in, resulting in a manual reactor scram.
7. Respond to a Hydraulic Block ATWS with power > 5% RTP.
8. Respond to a Reactor Feed Pump trip.
9. Respond to an ESF Bus 15AA power loss.

Initial Conditions: Plant is operating at 100% power.

Inoperable Equipment: None

Planned activities for this shift are:

- Transfer Bus 17AC from ESF Transformer 21 to ESF Transformer 12 in preparation for red-tagging breaker 152-1705, 17AC FDR FM ESF 21, for preventative maintenance

Scenario Notes:

This scenario is a NEW Scenario.

Validation Time: 60 minutes

Quantitative Attributes Table

Attribute	E3-304-1 Target	Actual	Description
Malfunctions after EOP entry	1-2	2	<ul style="list-style-type: none"> Reactor Feed Pump trip ESF Bus 15AA power loss
Abnormal Events	2-4	3	<ul style="list-style-type: none"> ESF Transformer 12 lockout with a failure of HPCS Diesel Generator to automatically start (Loss of AC Power ONEP) Control Rod 24-53 drifting in (Control Rod/Drive Malfunctions ONEP) Control Rod 24-53 stuck at position 32 (Control Rod/Drive Malfunctions ONEP)
Major Transients	1-2	2	<ul style="list-style-type: none"> Control Rod 32-37 drifting in Hydraulic block ATWS with power > 5% RTP
EOP entries requiring substantive action	1-2	2	<ul style="list-style-type: none"> EP-2 EP-3
EOP contingencies requiring substantive action	0-2	1	<ul style="list-style-type: none"> EP-2A
EOP based Critical Tasks	2-3	4	<ul style="list-style-type: none"> (CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A (CT-2) Inhibit ADS prior to automatic ADS valve opening during ATWS (CT-3) During failure to scram conditions with power > 5% RTP, terminate and prevent all injection from all sources (except boron, CRD, and RCIC) as necessary to lower RPV level to below -70" wide range prior to exiting EP-2A (CT-4) Restores injection using Condensate/Feedwater to restore/maintain RPV level above -191" CFZ before exiting EP-2A
Normal Events	N/A	1	<ul style="list-style-type: none"> Transfer ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12
Reactivity Manipulations	N/A	1	<ul style="list-style-type: none"> Lower core flow to 70 mlbm/hr using Reactor Recirc Flow Control Valves
Instrument / Component failures	N/A	6	<ul style="list-style-type: none"> Narrow Range C level transmitter oscillations ESF Transformer 12 lockout with a failure of HPCS Diesel Generator to automatically start Control Rod 24-53 drifting in Control Rod 24-53 stuck Reactor Feed Water Pump A(B) trip ESF Bus 15AA power loss
Total Malfunctions	N/A	8	<ul style="list-style-type: none"> Narrow Range C level transmitter oscillations ESF Transformer 12 lockout with a failure of HPCS Diesel Generator to automatically start Control Rod 24-53 drifting in Control Rod 24-53 stuck Control Rod 32-37 drifting in Hydraulic block ATWS with power > 5% RTP Reactor Feed Water Pump A(B) trip ESF Bus 15AA power loss

Top 10 systems and operator actions important to risk that are tested:

RPS (Event 6)

ESF Power (Event 3)

Condensate (Event 8)

Failure to align alternate power to 4.16 KV or 6.9 KV buses (Event 3)

SCENARIO ACTIVITIES:

The plant is operating at 100% power.

Event 1 - Transfer ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12

After crew assumes the shift, BOP will transfer ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12 per System Operating Instruction 04-1-01-R21-17, ESF BUS 17AC, Section 4.2.

Event 2 – Narrow Range C Level instrument oscillations (Triggered by Lead Examiner)

When ESF Bus 17AC has been transferred to ESF Transformer 12, Narrow Range C Level transmitter will begin oscillating. Crew will respond using ARI 04-1-02-1H13-P680-4A2-A2, RX WTR LVL SIG FAIL HI/LO, and manually select Narrow Range Level A or B. CRS will enter LCO TRM 6.3.7.

Event 3 - ESF Transformer 12 Lockout with HPCS Diesel Generator auto start failure (Triggered by Lead Examiner)

After Narrow Range Level A or B channel is selected and Tech Specs addressed, ESF Transformer 12 will lockout due to sudden pressure, causing a loss of power to ESF Bus 17AC. HPCS Diesel Generator will fail to start. BOP will recognize the failure of HPCS Diesel Generator to auto start and restore ESF Bus 17AC power from ESF Transformer 21 per 05-1-02-I-4, Loss of AC Power ONEP. CRS will enter 05-1-02-I-4, Loss of AC Power ONEP, and TS 3.8.1.B for HPCS Diesel Generator inoperable.

Event 4 - Control Rod 24-53 drifting in (Triggered by Lead Examiner)

After ESF Bus 17AC power has been restored and Tech Specs addressed, Control Rod 24-53 will begin drifting in. ATC will select Control Rod 24-53 and apply a continuous insert signal per 05-1-02-IV-1, Control Rod/Drive Malfunctions ONEP. CRS will enter 05-1-02-IV-1, CRD Malfunctions ONEP.

Event 5 - Control Rod 24-53 stuck at position 32 (automatically triggered)

When Control Rod 24-53 reaches position 32, it will become stuck. ATC will recognize and report Control Rod 24-53 has stopped inserting. CRS will direct ATC to lower core flow to 70 mlbm/hr IAW Control Rod/Drive Malfunctions ONEP. ATC will lower core flow to 70 mlbm/hr with Recirc Flow Control Valves in fast detent. CRS will enter and direct actions from Reduction in Recirculation System Flow Rate ONEP, 05-1-02-III-3. After actions of Reduction in Recirculation System Flow Rate ONEP have been completed, CRS will direct actions to raise CRD drive water pressure and attempt to insert Control Rod 24-53 IAW Control Rod/Drive Malfunctions ONEP. When CRD Drive water pressure is raised to greater than 325 psig, Event 6 will automatically be triggered.

NOTE: Due to the amount of time required to complete the actions associated with the stuck control rod, a follow up question should be asked concerning the stuck rod and Technical Specification requirements (TS 3.1.3, Condition A).

Event 6 - Control Rod 32-27 drifting in (automatically triggered)

When CRD Drive Water pressure is raised above 325 psid, Control Rod 32-37 will begin to drift in. ATC will insert a manual scram per Control Rod/Drive Malfunctions ONEP. CRS will enter Reactor Scram ONEP, 05-1-02-I-1, and Turbine Generator Trip ONEP, 05-1-02-I-2.

Event 7 - Hydraulic Block ATWS > 5% RTP (No trigger required)

When reactor is scrammed, an ATWS occurs due to a hydraulic block of both scram discharge volumes, and EP-2A is entered via EP-2. Reactor power will be above 5% RTP. SLC will fail to inject. Crew will install the necessary attachments to bypass RPS and RC&IS interlocks and insert controls rods via manual scrams and RC&IS **(CT-1)**. ADS is inhibited to prevent automatic operation **(CT-2)**. Terminate and Prevent is required because reactor power is above 5% RTP. RPV level is intentionally lowered below -70 inches wide range in order to lower core inlet subcooling and lower reactor power **(CT-3)**. Bypass valves will control reactor pressure during this event. Feedwater is available for RPV level control.

Event 8 - Reactor Feedwater Pump trip (Triggered by the Lead Examiner after reactor water level is stabilized below -70 inches wide range)

When reactor level lowers below -70 inches wide range, the in-service Reactor Feed Pump will trip. BOP will restore Feedwater injection to the RPV by starting the standby Reactor Feed Pump **(CT-4)**. An alternate success path would be CRS directing ATC to lower reactor pressure to 450 to 600 psig to allow RPV injection with Condensate Booster Pumps **(CT-4)**.

Event 9 – ESF Bus 15AA power loss (Triggered by Lead Examiner before controls rods are inserted)

After the running Reactor Feed Pump has tripped and RPV level has been stabilized, breaker 152-1514, ESF BUS 15AA FDR FM XFMR 11, to trip. Division 1 Diesel Generator will automatically restore power to ESF Bus 15AA. The ATC will recognize the loss of override function for LPCS and RHR A and override the associated pumps and injection valves. CRS will direct the ATC to restore Instrument Air to Containment. ATC will restore Instrument Air to Containment by opening P53-F001.

After crew has begun inserting control rods, at direction of the Lead Examiner, the control rods are allowed to be fully inserted with the next scram. CRS transitions from EP-2A to EP-2 and RPV level restoration is directed.

The exercise ends when controls rods are inserted and RPV water level is being maintained between +11.4 inches and +53.5 inches narrow range.

Critical Task	(CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A	(CT-2) Inhibit ADS prior to automatic ADS valve opening during ATWS
EVENT	7	7
Safety Significance	<p>Failure to effect shutdown of the reactor when a RPS setpoint has been exceeded would unnecessarily extend the level of degradation of the safety of the plant. This could further degrade into damage to the principle fission product barriers if left unmitigated. The crew is authorized by Conduct of Operations to take mitigating actions when automatic safety systems fail to perform their intended function. Action to shut down the reactor is required when RPS and control rod drive systems fail IAW EP-2A.</p>	<p>Steps in EP-2A may intentionally lower RPV water level below the ADS setpoint to reduce reactor power. Permitting automatic ADS initiation may be undesirable for the following reasons:</p> <ul style="list-style-type: none"> • ADS actuation can impose a severe thermal transient on the RPV and may complicate efforts to control RPV water level • If only RCIC is available for injection, ADS actuation may directly lead to loss of adequate core cooling and subsequent core damage • The conditions assumed in the design of the ADS actuation logic may not exist when the specified actions are being carried out • The operating crew can draw on much more information than available to ADS logic and can better judge, based on instructions contained in procedure, when and how to depressurize the RPV • Subsequent steps provide explicit and detailed instructions for RPV water level control and identify the specific conditions when RPV blowdown is required • Rapid, uncontrolled injection of relatively cold, unborated water could occur as RPV pressure decreases. If reactor is not shutdown or if shutdown margin is small, this could add sufficient positive reactivity to cause power excursion large enough to damage the core <p>Automatic initiation of ADS is therefore inhibited upon entry of EP-2A.</p>
Cueing	<p>Manual scram is initiated and numerous control rods indicate beyond position 02.</p> <p>Reactor power indicating > 5% RTP on APRMs on panel P680.</p> <p>APRM downscale lights on panel P680 extinguished.</p>	ADS Timer initiated alarm on P601
Performance Indicator	<p>Operator selects control rod gangs by depressing the respective pushbuttons on panel P680 and inserts the rods by depressing the IN-TIMER SKIP pushbutton.</p> <p>Operator resets reactor scram signal with key-locked switches on panel P680 and inserts manual reactor scram using scram pushbuttons on panel P680.</p>	Manipulation of ADS A and ADS B MANUAL INHIBIT switches on panel P601 vertical section.
Performance Feedback	<p>Operator selecting and inserting control rods indicated by rod position decreasing to 00 for selected rods on panel P680.</p> <p>Control rod movement on subsequent reactor scrams.</p> <p>Reactor power lowering.</p>	<p>Inhibit switches click into INHIBIT position on panel P601 vertical section.</p> <p>White indicating light on ADS A and ADS B MANUAL INHIBIT switches illuminate.</p> <p>Receipt of ADS/SRV A and ADS/SRV B OOSVC alarms on panel P601/18A-H2 and P601/19A-H2.</p>
Justification for the chosen performance limit	<p>There is no time limit for effecting complete reactor shutdown via control rod insertion. For the timeframe of this scenario, containment limits are not challenged and power oscillations are not experienced. However, if the failure to scram EP were to be exited, other procedures would not provide the guidance necessary to achieve reactor shutdown. Before exiting EP-2A ensures guidance to effect reactor shutdown is not removed.</p>	<p>The 105 second ADS timer allows sufficient time for the crew to recognize and override automatic operation of the system. As long as ADS is inhibited before ADS valves open, reactor pressure will not be reduced to the shutoff heads of high volume, cold water systems.</p>

BWR Owners Group Appendix	App. B, step RC/Q6, RC/Q-7	App. B, step RC/Q-6
Licensed Bases Documents	02-S-01-40, EP Technical Bases, Attachment V, Step Q-1 UFSAR Chapter 15.8	02-S-01-40, EP Technical Bases, Attachment V, Step 1 UFSAR Chapter 15.8

Critical Task	(CT-3) During failure to scram conditions with power > 5%, terminate and prevent all injection from all sources (except boron, CRD, and RCIC) as necessary to lower RPV level to below -70" wide range prior to exiting EP-2A	(CT-4) Restores injection using Condensate/Feedwater to restore/maintain RPV level above -191" CFZ before exiting EP-2A
EVENT	7	8
Safety Significance	<p>Regarding lowering level below -70" wide range, to prevent or mitigate the consequences of any large irregular neutron flux oscillations induced by neutronic/thermal-hydraulic instabilities. RPV water level is lowered sufficiently below the elevation of the feedwater sparger nozzles. This places the feedwater spargers in the steam space providing effective heating of the relatively cold feedwater and eliminating the potential for high core inlet subcooling. For conditions that are susceptible to oscillations, the initiation and growth of oscillations is principally dependent upon the subcooling at the core inlet; the greater the subcooling, the more likely oscillations will commence and increase in magnitude.</p> <p>24" below the lowest nozzle in the feedwater sparger has been selected as the upper bound of the RPV water level control band. This water level is sufficiently low that steam heating of the injected water will be at least 65% to 75% effective (i.e., the temperature of the injected water will be increased to 65% to 75% of its equilibrium value in the steam environment). This water level is sufficiently high that most plants without the capability to readily defeat the low RPV water level MSIV isolation should be able to control RPV water level with feedwater pumps to preclude the isolation.</p>	If RPV water level cannot be restored and maintained above the Minimum Steam Cooling RPV Water Level (-191" CFZ), emergency RPV depressurization is performed to maximize injection flow. Emergency depressurization is undesirable under ATWS conditions since the core response is difficult to predict and the risk of power excursions is increased.
Cueing	Manual scram is initiated and numerous control rods indicate beyond position 02 and reactor power is > 5% on panel P680 indications and SPDS and RPV level is > -70" wide range on SPDS and PDS.	Reactor Feed Pump trip annunciators and Feedwater flow and RPV level lowering on indicators on panel P680 and PDS and SPDS.
Performance Indicator	<p>Operator manipulates the Master Level Controller in MANUAL on panel P680 and lowers output to 0% to stop feedwater injection until RPV water level lowers below -70" wide range.</p> <p>Operator manually initiates High Pressure Core Spray and Division 1 and Division 2 ECCS on panel P601, then stops the respective pumps and overrides the associated injection valves closed using their respective handswitches on panel P601.</p>	<p>Operator manipulates switches on panel P680 panel to start the standby Reactor Feed Pump</p> <p>Alternately, operator lowers RPV pressure using Bypass Valves or SRVs to allow injection with Condensate Booster Pumps.</p>
Performance Feedback	<p>Feedwater flow indication on panel P680 and SPDS indicate zero.</p> <p>Master Level Controller output indicates 0% on panel P680.</p> <p>High Pressure Core Spray, Low Pressure Core Spary, RHR A, RHR B, and RHR C pump and injection valve override annunciators illuminated on panel P601.</p>	Feedwater flow and RPV level rising on panel P680 and PDS and SPDS.

Justification for the chosen performance limit	<p>Applicability for this CT is during EP-2A conditions where it is necessary to lower level to control power with no high energy input into the primary containment. There is no time limit for this lowering level, but it establishes margin to conditions where fuel damaging power oscillations may theoretically occur. Before exiting EP-2A was chosen because other procedures would not provide the guidance necessary to establish margin for power oscillation mitigation. Before exiting EP-2A ensures guidance to effect this control is not removed.</p> <p>NOTE – This critical task must be evaluated carefully based on the level changes. If power is reduced significantly below 5%, reactor water level may continue to rise above -70" with only CRD and SLC while driving control rods. This would not result in an UNSAT on this critical task.</p>	<p>The Minimum Steam Cooling RPV Water Level (-191" CFZ) is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. Maintaining RPV water level above the Minimum Steam Cooling RPV Water Level thus ensures that the core remains adequately cooled.</p>
BWR Owners Group Appendix	App. B, Contingency #5 Step C5-4	App. B, Contingency #5 Step C5-4
Licensed Bases Documents	02-S-01-40, EP Technical Bases, Attachment V, Step L-7 UFSAR Chapter 15.8	02-S-01-40, EP Technical Bases, Attachment V, Step L-9 UFSAR Chapter 15.8

Simulator Setup:

A. Initialization

1. Log off all simulator PDS and SPDS computers (PDS and SPDS must come up after the simulator load for proper operation).
2. Startup the simulator using Simulator Instructor's Job Aid section 7.3.

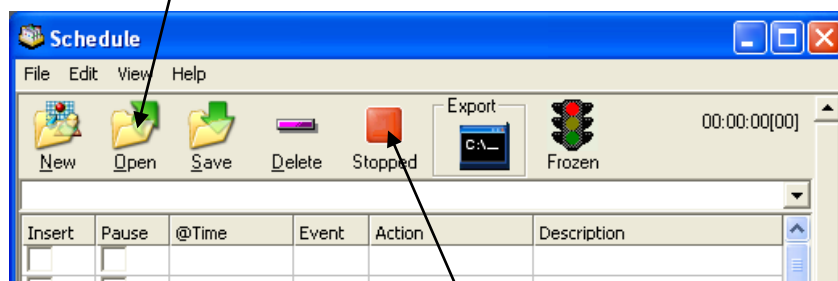
Note:

Prior to running the Schedule File, ensure no Event Files are Open. If an existing Event File is Open prior to running the Schedule File, then any associated Event Files will not automatically load.

3. Open Schedule.exe and Director.exe by clicking on the Icon in the Thunder Bar.

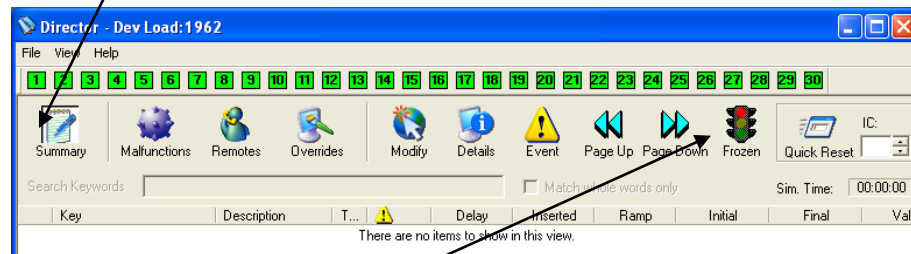


4. Set the Simulator to **IC-101** and perform switch check (Using Quick Reset in Director).
5. Click on "**Open**" in the Schedule window and Open Schedule File "**12-2017 NRC Exam Scenario 2.sch**" (in the Schedule Directory)



6. In Schedule window, click on the "**Stopped**" red block. The red block will change to a green arrow and indicate the scenario is active ("**Running**").

7. Click the Summary tab in the Director window. Verify the schedule files are loaded and opened per Section B below. (Note: Any actions in the schedule file without a specific time will not load into the director until triggered.)



8. Take the simulator out of freeze.
9. Log on to all simulator PDS and SPDS computers.
10. Verify or perform the following:
- IC-101
 - Ensure all procedures are marked as indicated for turnover conditions
 - Advance all chart recorders and ensure all pens are inking properly
 - Clear any graphs and trends off PDS and SPDS
11. Run through any alarms and ensure alarms are on. (**Note: On T-Rex, to verify alarms are ON, the indicator will indicate “Alarms On”**).
12. Place the simulator in Freeze.

File loaded verification:

Schedule - 12-2017 NRC Scenario 2.sch

File Edit View Help

New Open Save Delete Stopped Export Frozen 00:00:00[00]

Insert	Pause	@Time	Event	Action	Description
				^ 12-2017 NRC Scenario 2	
				^ Event 1 - NORMAL - Transfer 17 Bus to ESF 12	
				^ Event 2 - Narrow Range C Oscillations (C-ATC)	
		00:00:00		Insert remote fw209 to -4.08	C34-LT-N004B TRANSMITTER OFFSET
		00:00:00		Insert remote fw210 to -1.08	C34-LT-N004C TRANSMITTER OFFSET
			2	Schedule Oscillation.sch	
				^ Event 3 - COMPONENT - ESF 12 Lockout with failure of Div 3 DG	
		00:00:00		Insert malfunction r21134h on event 3	ESF Transformer 12 Lockout
		00:00:00		Insert malfunction n41141c on event 3	Emergency Diesel Generator C Trip
				^ Event 4 - COMPONENT - Control Rod 24-53 Drift	ABNORMAL (CRD Malfunctions)
		00:00:00		Insert malfunction z021021_24_53 on event 4	Control Rod 24-53 Drift In
				^ Event 5 - RX - COMPONENT - Control Rod 24-53 Stuck	TS 3.1.3
		00:00:00		Create event 28 xcr4c91sa167 == 32	
		00:00:00		Insert malfunction z022022_24_53 on event 28	Control Rod 24-53 Stuck
				^ Event 6 - Component - Control Rod 32-37 Drift	
		00:00:00		Insert malfunction z021021_32_37 on event 25	Control Rod 32-37 Drift In
		00:00:00		Create event 25 xcr4c11n008 >= 325	CRD Drive Water DP >= 325 psig
				Event 7 - MAJOR - ATWS > 5%	
		00:00:00		Insert malfunction c11164 to 25	CRD HYDRAULIC BLOCK
				^ Event 8 - COMPONENT - Running RFPT trip	
		00:00:00		Insert malfunction fw123a on event 8	Feedwater Pump Turbine A Overspeed Trip
		00:00:00		Insert malfunction fw123b on event 9	Feedwater Pump Turbine B Overspeed Trip

Ready NUM

Schedule - 12-2017 NRC Scenario 2.sch

File Edit View Help

New Open Save Delete Stopped Export Frozen

00:00:00[0]

Insert	Pause	@Time	Event	Action	Description
				^ EP Attachments	
		00:00:00		Insert remote ATT01 to INSTALL on event 11	Defeating RCIC High Supp. Pool Water Level Suction Transfer
		00:00:00		Insert remote ATT03 to INSTALL on event 12	Defeating all RCIC Isolation and Non-Mechanical Trip Interlocks
		00:00:00		Insert remote ATT08 to INSTALL on event 13	Defeating MSIV and MSL Drain RPV Level 1 Isolation Interlocks
		00:00:00		Insert remote ATT12 to INSTALL on event 14	Defeating RHR SDC Injection Valve Isolation
		00:00:00		Insert remote ATT18 to INSTALL on event 15	Defeating ARI/RPT Logic Trips
		00:00:00		Insert remote ATT19 to INSTALL on event 16	Defeating RPS Logic Trips
		00:00:00		Insert remote ATT20 to INSTALL on event 17	Defeating RC&IS Control Rod Drive Blocks
				^ Allow all rods to insert	
			10	delete malfunction c11164	CRD HYDRAULIC BLOCK
			10	Delete malfunction z022022_24_53 on event 24	Control Rod 24-53 Stuck
				^ SLC INOP	
		00:00:00		Insert malfunction c41263 to 15.00000	SLC Piping Rupture (VAR)
				^ Event 9 - Bus 15AA trip	
		00:00:00		Insert override DI_1R21M606A to TRIP on event 20	P864/01C BUS 15AA FDR FM ESF XFMR 11:152-1514

Ready

NUM

Director - Dev Load:1962

File View Help

Summary Malfunctions Remotes Overrides Modify Details Event Page Up Page Down Running Quick Reset IC: 100

Search Keywords Match whole words only Sim. Time: 00:01:19

Key	Description	T...	Delay	Inserted	Ramp	Initial	Final	Value
p870_6a_e_2	CNDSR VAC BRKR LVL LO		00:00:00	00:00:00	00:00:00	FAIL OFF	FAIL OFF	
r21134h	ESF Transformer 12 Lockout	3	00:00:00		00:00:00	Active	InActive	
n41141c	Emergency Diesel Generator C Trip	3	00:00:00		00:00:00	Active	InActive	
z021021_24_53	Control Rod 24-53 Drift In	4	00:00:00		00:00:00	Active	InActive	
z022022_24_53	Control Rod 24-53 Stuck	28	00:00:00		00:00:00	Active	InActive	
z021021_32_37	Control Rod 32-37 Drift In	25	00:00:00		00:00:00	Active	InActive	
c11164	CRD HYDRAULIC BLOCK		00:00:00	00:00:08	00:00:00	25	25	
fw123a	Feedwater Pump Turbine A Overspeed Trip	8	00:00:00		00:00:00	Active	InActive	
fw123b	Feedwater Pump Turbine B Overspeed Trip	9	00:00:00		00:00:00	Active	InActive	
c41263	SLC Piping Rupture (VAR)		00:00:00	00:00:08	00:00:00	15	15	
fw209	C34-LT-N0048 TRANSMITTER OFFSET		00:00:00	00:00:08	00:00:00	-4.08	-4.08	
fw210	C34-LT-N004C TRANSMITTER OFFSET		00:00:00	00:00:08	00:00:00	-1.08	-1.08	
ATT01	Defeating RCIC High Supp. Pool Water Level Suction Transfer	11	00:00:00		00:00:00	INSTALL	00:00:00	
ATT03	Defeating all RCIC Isolation and Non-Mechanical Trip Interlocks	12	00:00:00		00:00:00	INSTALL	00:00:00	
ATT08	Defeating MSIV and MSL Drain RPV Level 1 Isolation Interlocks	13	00:00:00		00:00:00	INSTALL	00:00:00	
ATT12	Defeating RHR SDC Injection Valve Isolation	14	00:00:00		00:00:00	INSTALL	00:00:00	
ATT18	Defeating ARI/RPT Logic Trips	15	00:00:00		00:00:00	INSTALL	00:00:00	
ATT19	Defeating RPS Logic Trips	16	00:00:00		00:00:00	INSTALL	00:00:00	
ATT20	Defeating RC&IS Control Rod Drive Blocks	17	00:00:00		00:00:00	INSTALL	00:00:00	
DI_1R21M606A	P864/01C BUS 15AA FDR FM ESF XFMR 11:152-1514	20	00:00:00		00:00:00	TRIP	NORM	

Ready

NUM

Procedures that may be used in this scenario:

Procedure No.	Rev	Procedure Title
04-1-01-C11-1	154	Control Rod Drive Hydraulic System
04-1-01-C41-1	123	Standby Liquid Control System
04-1-01-E12-1	147	Residual Heat Removal System
04-1-01-N21-1	74	Feedwater System
04-1-01-N32-2	33	Turbine Generator Control
04-1-01-R21-17	10	ESF Bus 17AC
04-1-02-1H13-P601	161	Alarm Response Instruction Panel No.: 1H13-P601
04-1-02-1H13-P680	233	Alarm Response Instruction Panel No.: 1H13-P680
04-1-02-1H13-P864	31	Alarm Response Instruction Panel No.: 1H13-P864
04-1-02-1H13-P870	154	Alarm Response Instruction Panel No.: 1H13-P870
04-S-02-SH13-P807	32	Alarm Response Instruction Panel No.: SH13-P807
05-1-02-I-1	130	Reactor Scram
05-1-02-I-2	37	Turbine and Generator Trips
05-1-02-I-4	51	Loss of AC Power
05-1-02-III-3	115	Reduction In Recirculation System Flow Rate
05-1-02-III-5	49	Automatic Isolations
05-1-02-IV-1	117	Control Rod / Drive Malfunctions
05-S-01-EP-1	36	Emergency / Severe Accident Procedure Support Documents
05-S-01-EP-2	45	RPV Control
Tech Spec 3.1.3		
Tech Spec 3.8.1		
Tech Spec TR6.3.7		

SCENARIO ACTIVITIES:

- Start SBT report and any other required recording devices.

Op-Test No: <u>NRC LOT 12-2017</u>		Scenario No: <u>2</u>	Event No: <u>1</u>
Event Description: <u>Transfer Bus 17AC from ESF Transformer 21 to ESF Transformer 12.</u>			
TIME	Position	Applicant's Actions or Behavior	
	BOP	<p>Transfers ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12 IAW SOI 04-1-01-R21-17, ESF Bus 17AC, Section 4.2:</p> <p>4.2.2.a Ensure XFMR ESF 12 energized up to Bus Feeder 152-1704 as follows:</p> <p>(1) Check closed J3885, 115kV FDR to XFMR ESF 12.</p> <p>(2) Check closed 152-1904, FDR FRM XFMR ESF 12.</p> <p>(3) Check ENERGIZED status light is ON.</p> <p>4.2.2.b Turn ON the Sync switch for 152-1704, Bus 17AC FDR FRM XFMR ESF 12.</p> <p>4.2.2.c Check that the sync scope comes up to 12 o'clock $\pm 10^\circ$.</p> <p>4.2.2.d If sources are in phase, then attempt to close 152-1704, Bus 17AC FDR FRM XFMR ESF 12</p> <p>If 152-1704 closes and the original feed breaker trips, then the bus is energized and transfer is complete</p> <p>Report to CRS that Bus 17AC has been transferred to ESF Transformer 12</p>	
		END OF EVENT	
	Notes		
		Lead Examiner: Cue to proceed to the next event.	

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 2Event Description: **Narrow Range C Level instrument oscillations****At the direction of the lead Evaluator, trigger Event 2 to cause Narrow Range C Level transmitter oscillations.**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Responds to and reports Narrow Range Level C oscillations:</p> <ul style="list-style-type: none"> • P680-2A-C9, DFCS TROUBLE • P680-4A2-A2, RX WTR LVL SIG FAIL HI/LO • P680-3A-A3, RX LVL 40"/32" HI/LO <p>Monitors and reports Narrow Range C Level indication and RPV level readings and trends</p>
	BOP	<p>Determines required actions by performing immediate actions of ARI 04-1-01-1H13-P680-4A2-A2:</p> <p>3.3 If feedwater control system is in AUTO LEVEL SELECT and is not maintaining desired reactor water level, manually select desired level signal by depressing the LEVEL A, LEVEL B, or LEVEL C narrow range transmitter on Feedwater Control insert on 1H13-P680-C2</p>
	CRS	Directs ATC to select Narrow Range A or B level signals on Feedwater Control system
	ATC	<p>Selects Narrow Range Level A or B level signal by depressing LEVEL A or LEVEL B pushbutton on Feedwater Control insert on 1H13-P680-2C</p> <p>Verifies Narrow Range Level A or B level signal is selected by:</p> <ul style="list-style-type: none"> • Level A or B SELECTED pushbutton backlight should be energized • AUTO LEVEL SELECT pushbutton backlight should de-energize • RPV level should stabilize in the normal band
	CREW	Dispatch I&C to investigate Narrow Range Level C instrument oscillation
	CRS TS	Enters LCO TRM 6.3.7. Required action is restore the channel to OPERABLE status within 7 days
	BOOTH	If dispatched, as I&C report after 3 minutes that a Condition Report will be required for troubleshooting Narrow Range Level C oscillations
		END OF EVENT
	NOTES	
		Lead Examiner: Cue to proceed to the next event.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 3

Event Description: **ESF Transformer 12 Lockout with failure of HPCS Diesel Generator to auto start**
At the direction of the Lead Examiner, trigger Event 3 to cause an ESF Transformer 12 lockout.

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Recognize and report ESF Transformer 12 lockout:</p> <ul style="list-style-type: none"> • P807-4A-B3, ESF XFMR 12 LOCKOUT TRIP • P807-4A-F4, ESF XFMR 12 TROUBLE • ESF XFMR #12 ENERGIZED status light OFF on ESF Bus 17AC <p>Recognize and report HPCS Diesel Generator trip:</p> <ul style="list-style-type: none"> • P601-16A-A1, HPCS GEN TRIP/LOCKOUT • P601-16A-A2, HPCS DSL ENG TRIP <p>Recognize and report Bus 17AC loss of power:</p> <ul style="list-style-type: none"> • P601-16A-F2, HPCS SYS UNDERVOLT • P601-16A-G1, 480V MCC 17B01 UNDERVOLT
	CRS	<p>Enters Loss of AC Power ONEP, 05-1-02-I-4</p> <p>2.1 Directs BOP to restore Bus 17AC power from ESF Transformer 21</p>
	BOP	Restores power to Bus 17AC from ESF Transformer 21 by closing breaker 152-1705 IAW Loss of AC Power ONEP, 05-1-02-I-4
	CRS TS	<p>Enters LCO 3.8.1.B. Required actions are:</p> <ul style="list-style-type: none"> • Perform SR 3.8.1.1 for OPERABLE required offsite circuits within one hour and every 8 hours thereafter • Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable within 4 hours of discovery of Condition B with inoperability of redundant required feature(s) • Determine OPERABLE DG(s) are not inoperable due to common cause failures within 24 hours or perform SR 3.8.1.2 for OPERABLE DG(s) within 24 hours • Restore required DG to OPERABLE status within 72 hours
	CREW	<p>Dispatch plant operator/electrical maintenance to investigate HPCS Diesel Generator trip</p> <p>Dispatch electrical maintenance to investigate ESF Transformer 12 lockout</p>
	BOOTH	<p>Role Play: If asked to investigate, wait 3 minutes and report as plant operator that HPCS Diesel Generator has tripped due to overspeed. A Condition Report will be required to troubleshoot.</p> <p>If asked to investigate, wait 5 minutes and report as plant operator/electrical maintenance the ESF Transformer 12 has a sudden pressure lockout. A Condition Report will be required to troubleshoot.</p>

Op-Test No: <u>NRC LOT 12-2017</u>			Scenario No: <u>2</u>			Event No: <u>3 (cont.)</u>		
Event Description: <u>ESF Transformer 12 Lockout with failure of HPCS Diesel Generator to auto start (cont.)</u>								
TIME	Position	Applicant's Actions or Behavior						
		END OF EVENT						
	NOTES							
Lead Examiner: Cue to proceed to the next event.								

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 4/5Event Description: **Control Rod 24-53 drifting in/stuck at position 32**

At the direction of the Lead Examiner, trigger Event 4 to cause Control Rod 24-53 to begin drifting in. Control Rod 24-53 will stick when it reaches position 32.

TIME	Position	Applicant's Actions or Behavior
	ATC	Respond to alarm P680-4A2-E4 CONT ROD DRIFT and report Control Rod 24-53 drifting in to CRS Performs immediate operator actions IAW Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1 2.2.1 Apply continuous insert signal until Control Rod reaches zero
	CRS	Enters and directs actions of Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1, Section 2.2 for single control rod drift Directs ATC to monitor for additional control rod drifts
	ATC	Recognize and reports Control Rod 24-53 stops moving at position 32
	CRS	Directs ATC to lower core flow to 70 mlbm/hr using Recirc Flow Control Valves A and B in fast detent
	ATC	Lowers core flow to 70 mlbm/hr using Recirculation Flow Control Valves A and B using fast detent Determines and reports reactor is operating in the OPRM Armed region of Power-To-Flow map Assumes THI Watch with no concurrent duties until directed by CRS
	CRS	Enters and directs actions of Reduction in Recirculation Flow ONEP, 05-1-02-III-3 Directs ATC to monitor APRMs and LPRMs for thermal hydraulic instability
	CRS	Directs ATC that THI Watch with concurrent duties is allowed after feedwater temperature is stable Direct BOP to verify at least 3 OPRM channels are not bypassed
	BOP	Verifies and reports all OPRM channels are operable
	CRS	Directs ATC to balance Recirculation Loop flows to within 4460 gpm
	ATC	Reports Recirc Loop A and B loop flows and verifies flows within 4460 gpm

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 4/5 (cont.)Event Description: **Control Rod 24-53 drifting in/stuck at position 32 (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Directs actions of Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1, Section 3.5 for inability to drive control rods Directs BOP to verify CRD drive water pressure is equal to or greater than 260 psid
	BOP	Verifies CRD drive water pressure is equal to or greater than 260 psig NOTE: BOP may adjust CRD drive water pressure by opening or closing C11-F003, CRD DRIVE WTR PRESS CONT VLV.
	CRS	Direct BOP to verify stabilizing valves are operating properly
	BOP	Verifies CRD stabilizing valves are operating properly by observing CRD DRIVE WTR HDR FLO A, B, C and D on panel P601
	CRS	Contact plant operator to verify in-service CRD FCV is operating properly
	BOOTH	Role Play: If asked to verify in-service CRD FCV is operating properly, wait 3 minutes and report using Plant Pager as plant operator that CRD FCV A appears to operating properly
	CRS	Direct BOP to verify CRD suction flow path is adequate
	BOP	Verify CRD suction flow path is adequate by observing CRD system parameters on panel P601
	CRS	Contact Reactor Engineering to determine if Control Rod 24-53 has been identified as having excessive friction due to channel bow and to perform analysis for Control Rod 24-53 drifting in
	BOOTH	If contacted, as Reactor Engineering report that Control Rod 24-53 HAS NOT been identified as having excessive friction due to channel bow and analysis will be done concerning Control Rod 24-53 drifting in
	CRS	Direct crew to raise CRD drive water pressure in 25 psid increments up to 350 psid and attempt to insert Control Rod 24-53 after each CRD drive water pressure adjustment
	CREW	Raises CRD drive water pressure in 25 psid increments and attempts to insert Control Rod 24-53 after each CRD drive water pressure adjustment

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 4/5 (cont.)Event Description: **Control Rod 24-53 drifting in/stuck at position 32 (cont.)**

TIME	Position	Applicant's Actions or Behavior
NOTE to Examiners: Due to the next event automatically triggering when CRD drive water pressure is raised to 325 psid, a follow up question should be asked concerning the stuck control rod and Technical Specification requirements.		
	CRS TS	<p>Enters LCO 3.1.3, Condition A. Required actions are:</p> <ul style="list-style-type: none"> • Verify stuck control rod separation criteria are met immediately • Disarm the associated control rod drive (CRD) within 2 hours • Perform SR 3.1.3.3 (insert each withdrawn control rod at least one notch) for each withdrawn OPERABLE control rod within 24 hours (thermal power is greater than the low power setpoint) • Perform SR 3.1.1.1 (verify shutdown margin) within 72 hours
		END OF EVENT
	Notes	
NOTE To Examiners: When CRD drive water pressure is raised to 325 psid, the next event will automatically trigger, causing a second control rod to begin drifting in. At the discretion of the Lead Examiner, the next event can be manually triggered before CRD drive water pressure reaches 325 psid.		

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 6Event Description: **Control Rod 32-37 drifting in (second control rod drift)****When CRD drive water pressure is raised to 325 psid, Control Rod 32-37 will begin drifting in.**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Recognize and report second control rod drift</p> <p>Performs immediate operator actions IAW Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1</p> <p>2.3.1 Manually scram the reactor</p> <p>Places Reactor Mode Switch to SHUTDOWN position</p> <p>Recognize and report all control rods not inserted due to a hydraulic block ATWS</p>
	CRS	<p>Directs ATC to insert a manual scram IAW Control Rod/Drive Malfunctions ONEP, 05-1-02-IV-1, immediate operator actions</p> <p>Enters Reactor Scram ONEP, 05-1-02-I-1, Turbine and Generator Trips ONEP, 05-1-02-I-2, and EP-2, RPV Control</p> <p>Directs all personnel to evacuate Containment due to reactor scram</p>
		END OF EVENT
	Notes	

NOTE to Examiners: The next event (ATWS) is already active.**CRS actions start on the next page of the Scenario Guide.****ATC actions start of Page 32 of the Scenario Guide.****BOP actions start on Page 37 of the Scenario Guide.**

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7Event Description: **Hydraulic Block ATWS (> 5% power)****ATWS Malfunction is already active.**

TIME	Position	Applicant's Actions or Behavior																
	CRS	<p>Transitions from EP-2, RPV Control, to EP-2A, ATWS RPV Control</p> <p>Verifies ATC performed immediate actions of Reactor Scram ONEP, 05-1-02-I-1 for ATWS > 5%</p> <p>Directs all personnel to evacuate Containment due to reactor scram</p>																
	CRS	<div style="border: 1px solid black; padding: 10px;"> <p>EP-2</p> <p>1. Verify the Rx Mode Switch in SHUTDOWN.</p> <p>2. Evacuate affected areas.</p> <p>While in this procedure:</p> <table border="1"> <thead> <tr> <th>IF</th><th>THEN</th></tr> </thead> <tbody> <tr> <td>Any control rod is withdrawn past position 02, AND The reactor will <u>not</u> remain subcritical under all conditions without boron</td><td>ATWS: Exit this procedure → Enter EP-2A</td></tr> <tr> <td>RPV level is unknown</td><td>FLOOD THE RPV: Exit this procedure → Enter EP-5</td></tr> <tr> <td>Aux Building isolates</td><td>Restore the Aux Building.</td></tr> </tbody> </table> <p>3.</p> </div> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>EP-2A</p> <p>START</p> <p>1. Verify Rx recirc pumps transferred to LFMG. 2. Verify ARI/RPT initiation. 3. Inhibit ADS. 4. Override HPCS injection.</p> <p>1.</p> <p>While in this procedure:</p> <table border="1"> <thead> <tr> <th>IF</th><th>THEN</th></tr> </thead> <tbody> <tr> <td>All control rods are inserted to or beyond position 02, OR The reactor will remain subcritical under all conditions without boron</td><td>1. Terminate boron injection. 2. Exit this procedure → Enter EP-2</td></tr> <tr> <td>RPV level is unknown</td><td>FLOOD THE RPV: Exit this procedure → Enter EP-5A</td></tr> <tr> <td>Aux Building isolates</td><td>Restore the Aux Building.</td></tr> </tbody> </table> <p>2.</p> </div>	IF	THEN	Any control rod is withdrawn past position 02, AND The reactor will <u>not</u> remain subcritical under all conditions without boron	ATWS: Exit this procedure → Enter EP-2A	RPV level is unknown	FLOOD THE RPV: Exit this procedure → Enter EP-5	Aux Building isolates	Restore the Aux Building.	IF	THEN	All control rods are inserted to or beyond position 02, OR The reactor will remain subcritical under all conditions without boron	1. Terminate boron injection. 2. Exit this procedure → Enter EP-2	RPV level is unknown	FLOOD THE RPV: Exit this procedure → Enter EP-5A	Aux Building isolates	Restore the Aux Building.
IF	THEN																	
Any control rod is withdrawn past position 02, AND The reactor will <u>not</u> remain subcritical under all conditions without boron	ATWS: Exit this procedure → Enter EP-2A																	
RPV level is unknown	FLOOD THE RPV: Exit this procedure → Enter EP-5																	
Aux Building isolates	Restore the Aux Building.																	
IF	THEN																	
All control rods are inserted to or beyond position 02, OR The reactor will remain subcritical under all conditions without boron	1. Terminate boron injection. 2. Exit this procedure → Enter EP-2																	
RPV level is unknown	FLOOD THE RPV: Exit this procedure → Enter EP-5A																	
Aux Building isolates	Restore the Aux Building.																	

(CT-2) Inhibit ADS prior to automatic ADS valve opening during ATWS.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: Hydraulic Block ATWS (> 5% power) (cont.)

TIME	Position	Applicant's Actions or Behavior																		
	CRS	<div><p>LEVEL</p><p>Initiate each of the following which should have initiated but did not:</p><ul style="list-style-type: none">• Isolations• Emergency diesel generators<p>IF CTMT pressure cannot be maintained below 22.4 psig THEN Terminate RPV injection from external sources not needed for core cooling or to shut down the reactor.</p><p>Any MSL open?</p><p>No → Yes → Maintain the main condenser as a heat sink. OK to defeat MSL isolations. Art 7, 8</p><p>IF Reactor power is above 5% or unknown AND SP temperature is above 110°F AND Any SRV is open OR DW pressure is above 1.23 psig AND RPV level is above -167 in. THEN Go to ⑥</p><p>IF RPV level is above -70 in. THEN Go to ⑦</p><p>Using only Table L-3 systems, maintain RPV level between -191 in. and 53.5 in.</p><p>OK to initiate and override ECCS.</p><table border="1"><thead><tr><th>IF</th><th>AND</th><th>THEN</th></tr></thead><tbody><tr><td>RPV level cannot be restored and maintained above -191 in. using Table L-3 systems</td><td>Emergency Depressurization has not been performed</td><td>EMERGENCY DEPRESSURIZATION IS REQUIRED: Exit Level and Pressure → Enter Emergency Depressurization</td></tr><tr><td></td><td>Emergency Depressurization has been performed</td><td>1. Use Table L-3 and Table L-4 and Table L-2 systems. 2. IF RPV level and cannot be restored and maintained above -191 in., THEN... Exit all EPs → Enter all SAPs</td></tr></tbody></table><p>Lower level to reduce subcooling:</p><ol style="list-style-type: none">1. Terminate and prevent all RPV injection except:<ul style="list-style-type: none">• Boron injection• CRD• RCIC2. Let level drop to -70 in. (Wide Range).<p>Lowered level: -70 in.</p><p>Nominal Band: -70 in. to -130 in. Maximum Band: -70 in. to -191 in.</p><p>Lower level to reduce power:</p><ol style="list-style-type: none">1. Terminate and prevent all RPV injection except:<ul style="list-style-type: none">• Boron injection• CRD• RCIC2. Let level drop until:<ul style="list-style-type: none">• Power is below 5%OR• Level drops to -167 in. (Compensated Fuel Zone)OR• All SRVs stay closed and DW pressure stays below 1.23 psig.<p>Lowered level: -191 in. to lowered level</p><p>Using only Table L-3 systems, maintain RPV level between -191 in. and the lowered level recorded at ⑦ or ⑧.</p><table border="1"><thead><tr><th>IF</th><th>AND</th><th>THEN</th></tr></thead><tbody><tr><td>RPV level cannot be restored and maintained above -191 in. using Table L-3 systems</td><td>Emergency Depressurization has not been performed</td><td>EMERGENCY DEPRESSURIZATION IS REQUIRED: Exit Level and Pressure → Enter Emergency Depressurization</td></tr><tr><td></td><td>Emergency Depressurization has been performed</td><td>1. Use Table L-3 and Table L-4 and Table L-2 systems. 2. IF RPV level and cannot be restored and maintained above -191 in., THEN... Exit all EPs → Enter all SAPs</td></tr></tbody></table></div>	IF	AND	THEN	RPV level cannot be restored and maintained above -191 in. using Table L-3 systems	Emergency Depressurization has not been performed	EMERGENCY DEPRESSURIZATION IS REQUIRED: Exit Level and Pressure → Enter Emergency Depressurization		Emergency Depressurization has been performed	1. Use Table L-3 and Table L-4 and Table L-2 systems. 2. IF RPV level and cannot be restored and maintained above -191 in., THEN... Exit all EPs → Enter all SAPs	IF	AND	THEN	RPV level cannot be restored and maintained above -191 in. using Table L-3 systems	Emergency Depressurization has not been performed	EMERGENCY DEPRESSURIZATION IS REQUIRED: Exit Level and Pressure → Enter Emergency Depressurization		Emergency Depressurization has been performed	1. Use Table L-3 and Table L-4 and Table L-2 systems. 2. IF RPV level and cannot be restored and maintained above -191 in., THEN... Exit all EPs → Enter all SAPs
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EP-2A**Table L-3**
Preferred ATWS Injection Systems

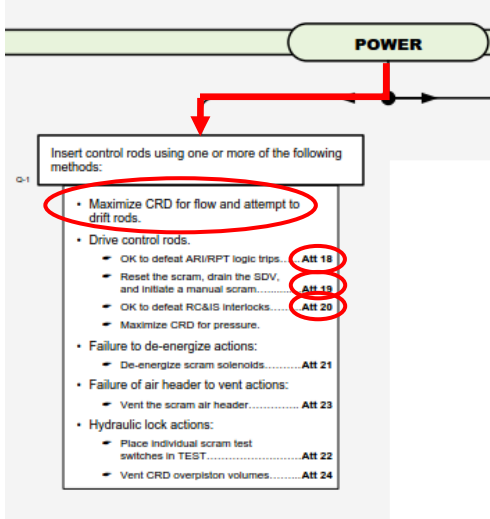
- Condensate/Feedwater
- CRD
 - Maximize CRD for flow.
- RCIC
 - Use CST suction if available.
 - OK to defeat isolations and interlocks. **Art 1, 3**
- RHR through shutdown cooling return
 - Inject through the HX as soon as possible.
 - OK to defeat isolations. **Art 12**
- SLC boron tank

③ ④

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Directs BOP to terminate feedwater injection to the reactor vessel Verifies Feedwater flow is terminated Directs BOP to maintain RPV water level between -70" and -130" wide range
	CRS	Directs I&C to install EP Attachment 8 for MSIVs Directs I&C to install EP Attachment 12 for RHR injection through feedwater sparger Directs I&C to install EP Attachments 1 and 3 for RCIC

(CT-3) During failure to scram conditions with power > 5%, terminate and prevent all injection from all sources (except boron, CRD, and RCIC) as necessary to lower RPV level to below -70" wide range prior to exiting EP-2A

	CRS	 <p style="text-align: right;">EP-2A</p>
	CRS	<p>Directs ATC to maximize CRD for flow</p> <p>Directs I&C to install EP Attachment 18, 19, and 20 to defeat RC&IS interlocks and RPS scram signals</p> <p>When RPV level lowers below -41.6" wide range, directs ATC to verify Level 2 initiations, isolations and diesel generators and restore the Auxiliary Building</p>
	BOOTH	<p>Role Play: When directed to install Attachments, trigger the following Events as each Attachment is directed:</p> <p>Attachment 1 – Event 11</p> <p>Attachment 3 – Event 12</p> <p>Attachment 8 – Event 13</p> <p>Attachment 12 – Event 14</p> <p>Attachment 18 – Event 15</p> <p>Attachment 19 – Event 16</p> <p>Attachment 20 – Event 17</p> <p>Notify CRS as each Attachment indicates DONE.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<div><pre>graph TD POWER[POWER] --> Q2{Is reactor power above 5%?} Q2 -- Yes --> Q3{SP temperature reaches 110°F} Q2 -- No --> Q3 Q3 --> I1((1)) I1 --> I1_1[Inject boron into the RPV using both SLC pumps.] I1_1 --> I1_2[IF Boron cannot be injected using SLC] I1_2 --> I1_3[THEN Inject boron using RCIC or HPCS....Att 28] I1_3 --> Q5{{WHEN SLC tank level drops to 2000 gal}} Q5 --> Q6{Are both SLC pumps running?} Q6 -- No --> Q7[Trip one SLC pump.] Q6 -- Yes --> Q7 Q7 --> Q8{{WHEN SLC tank level drops to 0 gal}} Q8 --> Q9[Trip the running SLC pump.]</pre><p>EP-2A</p></div>

Op-Test No: NRC LOT 12-2017

Scenario No: 2

Event No: 7 (cont.)

Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p>Directs ATC to verify SLC is injecting into the reactor</p> <p>When SLC reported not injecting, contacts Work Control to install Attachment 28 for Alternate SLC injection</p>
	CRS	<p>EP-2A</p>
	CRS	<p>Direct ATC to maintain RPV pressure between 800 and 1060 psig using Bypass Valves</p> <p>Directs ATC to maximize Suppression Pool Cooling</p>

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 8Event Description: **Reactor Feed Pump trip**

When reactor level has been lowered below -70" wide range and stable, at the direction of the Lead Examiner trigger Event 8 if RFPT A is being used for level control or Event 9 if RFPT B is being used.

TIME	Position	Applicant's Actions or Behavior
	BOP	Recognize and report Reactor Feed Pump trip
	CRS	Directs BOP to start the standby Reactor Feed Pump
	CREW	Dispatch plant operator/maintenance to investigate Reactor Feed Pump trip

NOTE to Examiners: CRS may direct a reactor pressure reduction as follows to allow RPV injection with Condensate Booster Pumps instead of starting the standby Reactor Feed Pump.

	CRS	Directs ATC to lower reactor pressure to 450 – 600 psig using Bypass Jack
--	-----	---

(CT-4) Restores injection using Condensate/Feedwater to restore/maintain RPV level above -191" CFZ before exiting EP-2A.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 9Event Description: **ESF Bus 15AA power loss****Before control rods are inserted, at the direction of the Lead Examiner, trigger Event 20 to trip feeder breaker 152-1514, BUS 15AA FDR FM ESF XFMR 11, causing a loss of power to ESF Bus 15AA.**

TIME	Position	Applicant's Actions or Behavior
	ATC	Recognize and report ESF Bus 15AA power loss Recognize and report Division 1 ECCS system overrides lost Recognize and report Instrument Air isolation to Containment
	CRS	Directs ATC to override LPCS and RHR A pumps and valves
	CRS	Directs ATC to restore Instrument Air to Containment
	CRS	Directs ATC to start CRD Pump A

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	When Attachments 18, 19, and 20 are installed, directs ATC to maximize CRD for pressure and scram and drive control rods
	ATC	<p>Maximizes CRD for pressure IAW 04-1-01-C11-1, Attachment VIII, by performing the following:</p> <p>6. If maximizing CRD for pressure, then fully close C11-F003, CRD DRIVE WTR PRESS CONT VLV, to maximize drive water pressure</p> <p>Scram control rods by performing the following:</p> <ul style="list-style-type: none"> Reset scram signal (only one division required) Allow Scram Discharge Volume to drain Arm and depress Manual Scram Pushbuttons for reset division <p>Drive control rods by performing the following:</p> <ul style="list-style-type: none"> Reset scram signal (only one division required) Select control rod Select gang drive mode Depress INTIMER SKIP pushbutton until control rods indicate 00
(CT-1) When control rods fail to scram, crew inserts all control rods to position 02 or beyond before exiting EP-2A.		
	BOOTH	When control rod movement is reported to CRS, <u>at the direction of the Lead Examiner</u>, trigger <u>Event 10</u> to allow all control rods to insert.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<pre> graph TD START([START]) --> Steps[1. Verify Rx recirc pumps transferred to LFMG. 2. Verify ARI/RPT initiation. 3. Inhibit ADS. 4. Override HPCS injection.] Steps --> DecisionTable subgraph DecisionTable [While in this procedure:] direction TB IF[IF All control rods are inserted to or beyond position 02, OR RPV level is unknown OR Aux Building isolates] THEN[THEN 1. Terminate boron injection. 2. Exit this procedure -> Enter EP-2A FLOOD THE RPV: Exit this procedure -> Enter EP-5A Restore the Aux Building.] end DecisionTable --> End([END]) </pre>
	CRS	When all control rods are inserted, exits EP-2A, ATWS RPV Control, and re-enters EP-2, RPV Control
	CRS	Directs BOP to restore and control RPV level between +11.4" to +53.5" narrow range
	BOP	Restores and maintains RPV water level between +11.4" and +53.5" narrow range using 1C34-LK-R602, RX WTR LVL SU CONT
NOTE to Examiners: Scenario objectives have been met when the crew has inserted all control rods to position 02 or beyond and level is being raised in a controlled manner to restore it to +11.4" to +53.5" narrow range.		
END OF SCENARIO		
	Notes	
	BOOTH	When directed by the Lead Examiner, place the simulator in freeze and tell the crew to stop operating.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7Event Description: **Hydraulic Block ATWS (> 5% power)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	Performs immediate operator actions of Reactor Scram ONEP, 05-1-02-I-1: 2.1 Confirm all Control Rods are fully inserted Recognize and report all not inserted due to a hydraulic block ATWS 2.2 Confirm reactor power decreasing Report reactor power is greater than 5%
	ATC	2.5 If an ATWS occurs, the perform the following: 2.5.1 Verify Reactor Recirc Pumps are transferred to LFMGs 2.5.2 Initiate ARI/RPT Arms and depresses ATWS ARI/RPT Channel 1 and Channel 2 pushbuttons
	ATC	2.5.3 Inhibit ADS. Places ADS A and ADS B MANUAL INHIBIT switches to INHIBIT position
	ATC	2.5.4 Initiate and override HPCS. While holding 1E22F004, HPCS INJ SHUTOFF VLV handswitch in CLOSE position, arm and depress manual system initiation pushbutton for HPCS After indication of pump start, then trip HPCS Pump Ensure HPCS Pump and 1E22F004, HPCS INJ SHUTOFF VLV override alarms are sealed in
(CT-2) Inhibit ADS prior to automatic ADS valve opening during ATWS.		
(CT-3) During failure to scram conditions with power > 5%, terminate and prevent all injection from all sources (except boron, CRD, and RCIC) as necessary to lower RPV level to below -70" wide range		

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>2.5.5 If ATWS is greater than 5% power, then perform the following:</p> <p>a. Initiate Standby Liquid Control.</p> <p>Places SLC PMP A and SLC PMP B key-locked switches to START</p>
		<p>b. Initiate and override low pressure ECCS by performing the following:.</p> <p>Arms and depresses LPCS/RHR A MAN INIT pushbutton</p> <p>After indication of LPCS and RHR A pump starts, then trip the pumps</p> <p>Place associated injection valves handswitches to CLOSE position</p> <p>Ensure associated pump and valve override alarms are sealed in</p> <p>Arms and depresses RHR B/RHR C MAN INIT pushbutton</p> <p>After indication of RHR B and RHR C pump starts, then trip the pumps</p> <p>Close associated injection valves</p> <p>Ensure associated pump and valve override alarms are sealed in</p> <p>Ensure associated Division 1 and 2 diesel generators are running with cooling water</p>
		Report to CRS that Reactor Scram immediate operator actions are complete except for maximizing Suppression Pool Cooling
	ATC	<p>Verifies SLC injection into reactor IAW SOI 04-1-01-C41-1, Attachment VI by performing the following:</p> <p>1. Verify system initiation by observing the following:</p> <p>a. F004A and F004B squib valves fired:</p> <ul style="list-style-type: none"> White SQUIB VALVE READY light OFF Annunciator SBLC SYS A and B OOSVC Amber status light SQUIB A and B LOSCONT or PWR LOSS is ON <p>b. C41-F001A and F001B TANK OUTLET VALVES are OPEN</p> <p>c. SBLC PUMPS A and B running</p> <p>d. RWCU isolates:</p> <ul style="list-style-type: none"> G33-F004 closed (SLC A initiated) G33-F001 and F251 closed (SLC B initiated) <p>e. Verify SLC is injecting into the RPV by observing the following:</p> <ul style="list-style-type: none"> SBLC pump discharge pressure exceeds reactor pressure SBLC tank level lowering Nuclear Instrumentation lowering <p>Recognize low SLC discharge pressure and reports SLC is not injecting into RPV</p>

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Maximize Suppression Pool Cooling IAW SOI 04-1-01-E12-1, Attachment VI:</p> <p>(1) Ensure SSW is in service by observing the following:</p> <ul style="list-style-type: none"> SSW A and SSW B Pumps running P41-F001A and F001B, SSW PMP A and B DISCH VLV are open P41-F005A and F005B, SSW LOOP A and B RTN TO CLG TWR A and B are open P41-F014A and F014B, SSW INL TO RHR HX A and B are open P41-F006A and F006B, SSW PMP A and B RECIRC VLV are closed. <p>(2) Verify open E12-F003A and F003B, RHR HX A and B OUTL VLV</p> <p>(3) NOTE to Examiners: Step 3 is N/A because CTMT Spray has not initiated.</p> <p>(4) Start RHR PMP A and RHR PMP B</p> <p>(5) Open E12-F024A and F024B, RHR A and RHR B TEST RTN TO SUPP POOL</p> <p>(6) Close E12-F048A and F048B, RHR HX A and B BYP VLV</p> <p>(7) Verify E12-F064A and F064B, RHR A and RHR B MIN FLO TO SUPP POOL, close when flow exceeds 1154 gpm on the respective pumps</p>
	ATC	<p>Maximizes CRD for flow IAW SOI 04-1-01-C11-1, Attachment VIII, by performing the following:</p> <p>Start CRD PUMP A IAW ONEP 05-1-02-IV-1, Control Rod/Drive Malfunctions ONEP, immediate operator actions:</p> <p>2.1.2 If running CRD pump trips, then start standby CRD pump as follows:</p> <p>2.1.2.a If required, re-energize MCCs 15B42 and 16B42 on 1H13-P864. Start CRD PUMP A AUX OIL PUMP.</p> <p>2.1.2.b Place CRD SYS FLO CONT in MANUAL and reduce output to zero.</p> <p>2.1.2.c Start CRD pump A</p> <p>Per SOI 04-1-01-C11-1, Attachment VIII:</p> <p>(1) Start CRD Pump B oil pump</p> <p>(2) Start CRD Pump B</p> <p>(3) Place CRD SYS FLO CONT C11-R600 in MANUAL</p> <p>(4) Using CRD SYS FLO CONT C11-R600, fully open C11-F002A(B), CRD FLO CONT VLV</p> <p>(5) If maximizing CRD for flow, then fully open C11-F003, CRD DRIVE WTR PRESS CONT VLV</p> <p>Reports to CRS that CRD is maximized for flow</p>

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7 (cont.)Event Description: **Hydraulic Block ATWS (> 5% power) (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Verifies and reports Level 2 isolations complete using the isolation status board as a quick reference and verifying the following alarms:</p> <ul style="list-style-type: none"> • P870-3A-A4, CTMT-DRWL ISOL DIV 1 OPER annunciator sealed in • P870-3A-B3, AUX BLDG ISOL DIV 1 OPER annunciator sealed in • P870-9A-A4, CTMT-DRWL ISOL DIV 2 OPER annunciator sealed in • P870-9A-B3, AUX BLDG ISOL DIV 2 OPER annunciator sealed in
	ATC	Verifies RCIC automatic initiation and injecting 800 gpm into reactor.
	ATC	Verifies that Turbine Pressure Control system and Bypass Valves are maintaining reactor pressure between 800 psig and 1060 psig
NOTE to Examiners: The following step will be performed if CRS directs RPV pressure lowered to 450 to 600 psig.		
	ATC	<p>Lowers RPV pressure to 450 to 600 psig IAW SOI 04-1-01-N32-2, Attachment V, by performing the following:</p> <ul style="list-style-type: none"> • Energize Manual Bypass Controller by simultaneously depressing MANUAL BYPASS CONTROL RELEASE pushbutton and MANUAL BYPASS VALVE CONTROLLER ON pushbutton until ON pushbutton becomes illuminated • Lowers reactor pressure by depressing RAISE pushbutton to adjust Main Turbine Bypass Valves the desired amount OPEN

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 9Event Description: **ESF Bus 15AA power loss****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	Recognize and report ESF Bus 15AA power loss Recognize and report Division 1 ECCS system overrides lost Recognize and report Instrument Air isolation to Containment
	ATC	Overrides LPCS and RHR A pumps by placing their respective handswitches to STOP Places associated injection valve handswitches to CLOSE position Ensure associated pump and valve override alarms are sealed in
	ATC	Restores Instrument Air to Containment by opening P53-F001, INST AIR SPLY HDR TO CTMT
	ATC	Starts CRD Pump A by performing the following IAW SOI 04-1-01-C11-1, Attachment VIII: <ul style="list-style-type: none"> • Energize MCC 15B42 by placing MCC 15B42 FDR FM LCC 15BA4 handswitch to CLOSE • Start CRD PMP A AUX OIL PMP • Start CRD PUMP A
	Notes	
		Return to Page 30 for completion of ATC actions.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 7Event Description: **Hydraulic Block ATWS (> 5% power)****BOP ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Performs immediate operator actions of Reactor Scram ONEP, 05-1-02-I-1 for ATWS > 5%:</p> <p>2.5.5.c If directed to "Terminate and Prevent Feedwater Injection", then:</p> <p>2.5.5.c.1 Put 1C34-LK-R600, FW LVL MASTER CONT in manual mode by depressing MAN pushbutton</p> <p>2.5.5.c.2 Lower 1C34-LK-R600, FW LVL MASTER CONT setpoint by depressing the OUT↓ pushbutton until OUTPUT is at -5.00 percent</p>
	BOP	<p>Transfers to Startup Level Control IAW SOI 04-1-01-N21-1, Attachment VII, by performing the following:</p> <ol style="list-style-type: none"> Perform the following: <ul style="list-style-type: none"> Minimize the output of 1C34-LK-R602, RX WTR LVL SU CONT, to close N21-F513 Minimize the output of 1N21-HC-R609, FW CU RECIRC VLV to close N21-F510 Depress the CLOSE pushbutton for the N21-F040, FW SU BYP VLV, and ensure valve is closed Open the following valves: <ul style="list-style-type: none"> N21-F001, SU FCV OUTL ISOL VLV N21-F010A, HP FW HTR STRNG A SU OUTL VLV N21-F010B, HP FW HTR STRNG B SU OUTL VLV Select MAN on FW LVL MASTER CONT (1C34-LK-R600). Close the following valves: <ul style="list-style-type: none"> N21-F009A, FW HTR 6A OUTL VLV N21-F009B, FW HTR 6B OUTL VLV NOTE to Examiner: Step is N/A because both RFPTs are in service If using a RFPT, then place a RFPT in SPEED AUTO with respective discharge pressure approximately 250 psid above reactor pressure Ensure open RFP A(B) DISCH VLV N21-F014A(B) for RFPTs that are operating or as needed to establish a flow path for Condensate Adjust 1C34-LK-R602, RX WTR LVL SU CONT, as necessary in MAN or AUTO to control N21-F513 to maintain desired reactor level. N21-F040 and N21-F009A(B) may be OPENED/CLOSED as necessary to augment flow <p>When reactor level lowers to -70" wide range level, injects with Feedwater using 1C34-LK-R602, RX WTR LVL SU CONT, to maintain reactor water level between -70" and -130" wide range level</p>

(CT-3) During failure to scram conditions with power > 5%, terminate and prevent all injection from all sources (except boron, CRD, and RCIC) as necessary to lower RPV level to below -70" wide range prior to exiting EP-2A.

Op-Test No: NRC LOT 12-2017Scenario No: 2Event No: 8Event Description: **Reactor Feed Pump trip****BOP ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	BOP	Recognize and report Reactor Feed Pump trip
	BOP	<p>Starts the standby Reactor Feed Pump IAW 04-1-01-N21-1, Feedwater System, Attachment VI, by performing the following:</p> <ol style="list-style-type: none"> 1. Restore one Reactor Feed Pump to operation as follows: <ol style="list-style-type: none"> a. Ensure RFPT A(B) CONTROLS "MANUAL" pushbutton is backlit b. Ensure an AC lube oil pump is running for the RFPT to be restarted. c. Ensure Instrument Air is available. d. NOTE to Examiners: Step is N/A because RFPTs did not trip of low condenser vacuum e. NOTE to Examiners: Step is N/A because RFPT discharge valve is open on RFPT being started f. NOTE to Examiners: Step is N/A because RFPT being started is not tripped g. To place RFP in service, perform the following: <ul style="list-style-type: none"> • If Turbine is ONLINE, then raise pump speed using the RAISE pushbutton as required to obtain discharge pressure approx. 250 psig above reactor pressure • If fine control of the RFPT is required, then select SPEED AUTO <p>Adjust 1C34-LK-R602, RX WTR LVL SU CONT, as necessary in MAN to control N21-F513 to maintain RPV level between -70" and -130" wide range. N21-F040 and N21-F009A(B) may be OPENED/CLOSED as necessary to augment flow</p>
NOTE to Examiners: IF CRS directs a reactor pressure reduction to allow injection of Condensate into the reactor instead of starting the standby Reactor Feed Pump, BOP will perform the following:		
	BOP	Adjust 1C34-LK-R602, RX WTR LVL SU CONT, as necessary in MAN to control N21-F513 to maintain RPV level between -70" and -130" wide range. N21-F040 and N21-F009A(B) may be OPENED/CLOSED as necessary to augment flow
(CT-4) Restores injection using Condensate/Feedwater to restore/maintain RPV level above -191" CFZ before exiting EP-2A.		
	Notes	
		Return to Page 31 for completion of BOP actions.

INITIAL CONDITIONS

- A. Plant Status: 100% power, middle of cycle
- B. Tech. Spec. Limitations in effect: None
- C. Significant problems/abnormalities: None
- D. Integrated Risk: Green
- E. Division Work Week: Division 3
- F. Evolutions/maintenance for the up-coming shift :
 - Transfer ESF Bus 17AC from ESF Transformer 21 to ESF Transformer 12 in preparation for red-tagging breaker 152-1705, 17AC FDR FM ESF 21, for preventative maintenance.

Facility: <u>Grand Gulf Nuclear Station</u> Scenario No.: <u>3</u> Op-Test No.: <u>GGNS 12-2017</u>			
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	

Event No.	Mal. No.	Event Type [†]	Event Description
1	N/A	N (BOP,ATC,CRS)	Transfer RPS Bus B from normal to alternate power supply
2	p864_2a_d_2	TS (CRS) C (BOP,CRS)	Division 2 Diesel Generator lube oil leak
3	ltb21n091b ltb21n091f	I (ATC,BOP,CRS) A(CREW) TS (CRS)	Division 2 ECCS initiation on spurious RPV low level signal
4	fw163c	R (ATC,CRS) A(CREW)	Loss of condenser vacuum
5	r21135 rr063b	M(CREW)	LOP/LOCA (EP-2, 3) * (CT-1) Inhibit ADS prior to automatic ADS valve opening during a LOCA * (CT-2) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ. (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)
6	e22052	C(ATC,BOP,CRS)	HPCS Pump trip
7	rr040a rr041a	C(ATC,CRS)	Failure of Division 1 ECCS to automatically initiate * (CT-3) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually initiates ECCS systems for injection prior to RPV pressure lowering below 300 psig

[†] (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec
 * **Critical Task** (As defined in NUREG 1021 Appendix D)

CREW notation for Abnormal (A) and Major (M) events denotes ATC, BOP, and CRS are credited.

Objectives: To evaluate the applicants' ability to operate the facility in response to the following evolutions:

1. Transfer RPS Bus B from normal to alternate power supply.
2. Respond to a Division 2 Diesel Generator lube oil leak.
3. Respond to a Division 2 ECCS initiation on spurious RPV low level signal.
4. Respond to a loss of condenser vacuum.
5. Respond to a loss of Offsite Power / LOCA
6. Respond to a HPCS Pump trip.
7. Respond to a failure of Division 1 ECCS to automatically initiate.

Initial Conditions: Plant is operating at 100% power.

Inoperable Equipment:

- TBCW Pump C is tagged out for motor oil replacement.
- CRD Pump B is tagged out of service for oil replacement in the speed increaser.

Turnover:

Planned activities for this shift are:

- Transfer RPS Bus B from normal to alternate power supply in preparation for maintenance on the RPS B Motor Generator.
- No scram or isolation surveillances are in progress or planned for this shift.

Scenario Notes:

This scenario is a NEW Scenario.

Validation Time: 75 minutes

Quantitative Attributes Table			
Attribute	E3-304-1 Target	Actual	Description
Malfunctions after EOP entry	1-2	2	<ul style="list-style-type: none"> • HPCS Pump trip • Failure of Division 1 ECCS to automatically initiate
Abnormal Events	2-4	2	<ul style="list-style-type: none"> • Spurious Division 2 ECCS initiation (Loss of One or Both RPS Buses ONEP and Automatic Isolations ONEP) • Loss of condenser vacuum (Loss of Condenser Vacuum ONEP)
Major Transients	1-2	2	<ul style="list-style-type: none"> • LOP • LOCA
EOP entries requiring substantive action	1-2	2	<ul style="list-style-type: none"> • EP-2 • EP-3
EOP contingencies requiring substantive action	0-2	2	<ul style="list-style-type: none"> • EP-2 Alternate Level Control • EP-2 Emergency Depressurization
EOP based Critical Tasks	2-3	3	<ul style="list-style-type: none"> • (CT-1) Inhibit ADS prior to automatic ADS valve opening during a LOCA • (CT-2) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ. (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task) • (CT-3) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually initiates ECCS systems for injection prior to RPV pressure lowering below 300 psig
Normal Events	N/A	1	<ul style="list-style-type: none"> • Transfer RPS Bus B from normal to alternate power supply
Reactivity Manipulations	N/A	1	<ul style="list-style-type: none"> • Lower core flow to 70 mlbm using Reactor Recirc Flow Control Valves
Instrument / Component failures	N/A	5	<ul style="list-style-type: none"> • Division 2 Diesel Generator lube oil leak • Spurious Division 2 ECCS initiation • Loss of vacuum • HPCS Pump trip • Failure of Division 1 ECCS to automatically initiate
Total Malfunctions	N/A	6	<ul style="list-style-type: none"> • Division 2 Diesel Generator lube oil leak • Spurious Division 2 ECCS initiation • Loss of vacuum • LOP/LOCA • HPCS Pump trip • Failure of Division 1 ECCS to automatically initiate

Top 10 systems and operator actions important to risk that are tested:

- Div 1 & 2 EDGs (Event 2)
- ADS (Event 5)
- Offsite Power (Event 5)
- Failure to manually depressurize with ADS/SRVs (Event 5)

SCENARIO ACTIVITIES:

The plant is operating at 100% power. TBCW Pump C is tagged out of service. CRD Pump B is tagged out of service.

Event 1 – Transfer RPS Bus B from normal to alternate power supply

After the crew assumes the shift, the BOP will transfer RPS Bus B from normal to alternate power supply per 04-1-01-C71-1, Reactor Protection System SOI, Section 5.1. The ATC will reset the half-scam.

Event 2 - Division 2 Diesel Generator lube oil leak (Triggered by Lead Examiner)

After RPS Bus B is transferred to alternate power, annunciator “DIV 2 DSL GEN TROUBLE” will alarm. BOP will dispatch plant operator to investigate. After 3 minutes, the plant operator will report lube oil spraying out from the Division 2 Lube Oil Circulating Pump discharge piping and lube oil sump level is 20” below the top of the sump, which is less than 350 gallons. The BOP will place Division 2 Diesel Generator in the MAINTENANCE Mode. The CRS will enter LCO 3.8.3.E and LCO 3.8.1.B.

Event 3 - Division 2 ECCS initiation on spurious RPV low level signal (Triggered by Lead Examiner)

When Tech Specs have been addressed, a spurious Division 2 ECCS initiation on low RPV level will occur. The BOP will verify the initiation is spurious by two independent means and recover from the Division 2 ECCS initiation using 04-1-01-E12-1, Residual Heat Removal System SOI, Attachment 9 hardcard. The ATC will recognize the Division 2 half-scam due to RPS Bus B loss of power. CRS will enter 05-1-02-III-2, Loss of One or Both RPS Buses ONEP. BOP will restore RPS Bus B to normal power supply and the ATC will reset the Division 2 half-scam. The CRS will enter LCO 3.3.5.1.B, 3.3.5.1.F, 3.3.6.1.A, B, and F, 3.3.6.3.B and 3.3.6.4.B.

Event 4 - Loss of condenser vacuum (Triggered by Lead Examiner)

When Division 2 ECCS initiation has been reset, systems have been secured and Tech Specs have been addressed, a main condenser leak will result in a slow loss of condenser vacuum. The CRS will enter 05-1-02-V-8, Loss of Condenser Vacuum ONEP. The ATC will lower core flow to 70 mlbm/hr using Recirc Flow Control Valves in fast detent. When condenser vacuum continues to lower, the ATC will insert a manual scram.

Event 5/6 - LOP/LOCA/HPCS Pump trip (Automatically triggered)

When the reactor is scrammed, a total loss of offsite power occurs, followed by a small recirculation pipe break after 5 minutes. HPCS pump will trip when it is initiated (**Event 6**). The CRS enters EP-2 and EP-3. RPV level will lower due to the leak being greater than the capacity of RCIC. When the CRS determines there are insufficient high pressure injection sources to maintain RPV level above -160” wide range, enters Alternate Level Control contingency of EP-2. Crew will inhibit ADS to prevent automatic operation (**CT-1**). When RPV level lowers to -160” wide range, the crew will emergency depressurize the RPV using ADS/SRVs (**CT-2**) and restore RPV level with Division 1 ECCS systems.

Event 7 - Failure of Division 1 ECCS to automatically initiate (Automatically triggered)

Division 1 ECCS will fail to automatically initiate on either high drywell pressure or low RPV level. The crew will manually initiate Division 1 ECCS using the lock-collared pushbutton (**CT-3**).

The exercise ends when emergency depressurization is complete and RPV level restoration is being controlled.

Critical Task	(CT-1) Inhibit ADS prior to automatic ADS valve opening during a LOCA	(CT-2) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)
EVENT	5	5
Safety Significance	<p>Permitting automatic ADS initiation may be undesirable for the following reasons:</p> <ul style="list-style-type: none"> • ADS actuation can impose a severe thermal transient on the RPV and may complicate efforts to control RPV water level. • If only steam-driven systems are available for injection, ADS actuation may directly lead to loss of adequate core cooling and subsequent core damage. • The conditions assumed in the design of the ADS actuation logic (e.g., no operator action for 115 seconds after event initiation) may not exist when the actions specified in this step are being performed. • The operating crew can draw on much more information than is available to the ADS logic (e.g., equipment out of service for maintenance, operating experience with certain systems, probability of restoration of off-site power, etc.) and can better judge, based on instructions contained in the EPGs/SAGs, when and how to depressurize the RPV. <p>Defeating the logic relieves the operating crew of the task of detecting timer initiation during execution of the more complex steps of Contingency #1 and precludes unnecessary and unwanted automatic initiations. Subsequent steps provide explicit and detailed instructions for controlling RPV water level and specify when emergency depressurization is appropriate.</p>	<p>The MSCWL is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. When water level decreases below MSCWL with injection, clad temperatures may exceed 1500°F.</p>
Cueing	Step L-5 of EP-2, RPV CONTROL, Alternate Level Control Contingency	Wide range indication (SPDS and PDS) falls to -160" and lowering trend continues, and, before -160" wide range is reached, initial conditions, field reports, and control room indications convey that adequate high pressure injection cannot be restored before level falls below -191" CFZ.
Performance Indicator	Manipulation of ADS A and ADS B MANUAL INHIBIT switches on panel P601 vertical section.	Manipulation of seven of the eight ADS/SRVs on panel P601: B21-F041K B21-F047L B21-F041F B21-F047A B21-F051C B21-F041D B21-F051A B21-F051B
Performance Feedback	<p>Inhibit switches click into INHIBIT position on panel P601 vertical section.</p> <p>White indicating light on ADS A and ADS B MANUAL INHIBIT switches illuminate.</p> <p>Receipt of ADS/SRV A and ADS/SRV B OOSVC alarms on panel P601/18A-H2 and P601/19A-H2.</p>	Crew will observe ADS/SRV light indication go from green to red, reactor pressure lowering on SPDS and panel P601 indications.

Justification for the chosen performance limit	The 115 second ADS timer allows sufficient time for the crew to recognize and override automatic operation of the system. As long as ADS is inhibited before ADS valves open, reactor pressure will not be reduced.	The MSCWL (-191" CFZ) is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. Emergency depressurization is allowed when level goes below TAF (-160" wide range) and should be performed, if in the judgment of the CRS, level cannot be maintained above -191" CFZ. Since it is intended for the scenario supporting this CT to, early in the event, clearly indicate no high pressure injection systems can be made available to reverse the lowering level trend, the crew will have time to communicate and opens at least seven ADS/SRVs before -191" CFZ.
BWR Owners Group Appendix	App. B, step C1-1	App. B, Contingency #1 Step C1-4
License Bases Documents	02-S-01-40, EP Technical Bases, Attachment IV, Step L-5 UFSAR Chapter 15A.6.3.1	02-S-01-40, EP Technical Bases, Attachment IV, Step L-7 – through L-13 UFSAR Chapter 15A.6.3.1

Critical Task	(CT-3) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually initiates or aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig	
EVENT	6	
Safety Significance	Failure to recognize the auto initiation not occurring, and failure to take manual action per Conduct of Ops will result in unavailability of safety-related equipment necessary to provide adequate core cooling, otherwise resulting in core damage and a large offsite release.	
Cueing	Indication of ECCS systems not initiating with initiation conditions present: <ul style="list-style-type: none"> • Indication of Drywell pressure ≥ 1.39 psig or RPV level ≤ -150.3" wide range • White light on LPCS/RHR A INIT RESET pushbutton extinguished on panel P601 • Green light on and red light extinguished on LPCS and RHR A pump handswitches on panel P601 	
Performance Indicator	Operator manually initiates Division 1 ECCS by rotating the arming collar and depressing the LPCS/RHR A MAN INIT pushbutton on panel P601.	
Performance Feedback	Red light on and green light extinguished on LPCS and RHR A pump handswitches on panel P601. Rising level trend on indications on panel P601, PDS and SPDS. Rising flow rate on LPCS and/or RHR A flow indicators on panel P601, PDS, and SPDS.	
Justification for the chosen performance limit	Attempting to align high pressure ECCS systems must be performed to determine their availability by the time TAF is reached in order to properly implement EP-2 decision steps regarding restoring and maintaining RPV level. Attempting to align low pressure ECCS systems can only be done once RPV pressure falls below the injection valve RPV pressure permissive and will only be effective once RPV pressure falls below the shutoff head of the respective ECCS pump. The reduction in RPV pressure will normally be via Emergency Depressurization, which is a separate critical task bounded by a minimum RPV level.	
BWR Owners Group Appendix	App. B, Contingency 1, step C1-3	
License Bases Documents	02-S-01-40, EP Technical Bases, Attachment IV, Step L-14 UFSAR Chapter 15A.6.3.1	

Simulator Setup:

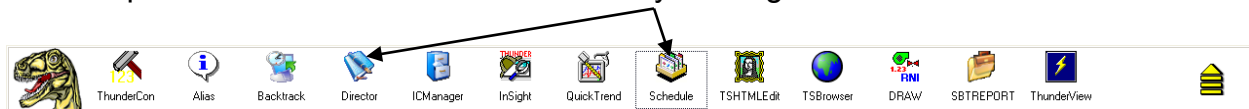
A. Initialization

1. Log off all simulator PDS and SPDS computers (PDS and SPDS must come up after the simulator load for proper operation).
2. Startup the simulator using Simulator Instructor's Job Aid section 7.3.

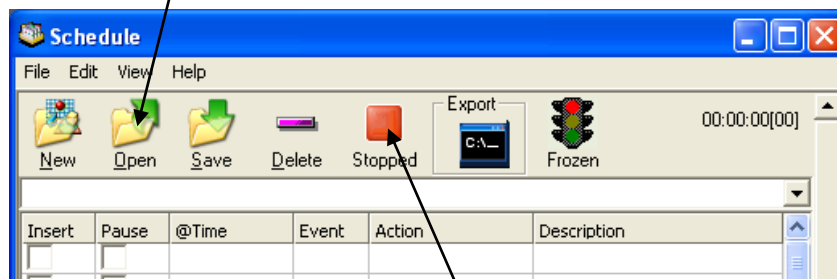
Note:

Prior to running the Schedule File, ensure no Event Files are Open. If an existing Event File is Open prior to running the Schedule File, then any associated Event Files will not automatically load.

3. Open Schedule.exe and Director.exe by clicking on the Icon in the Thunder Bar.

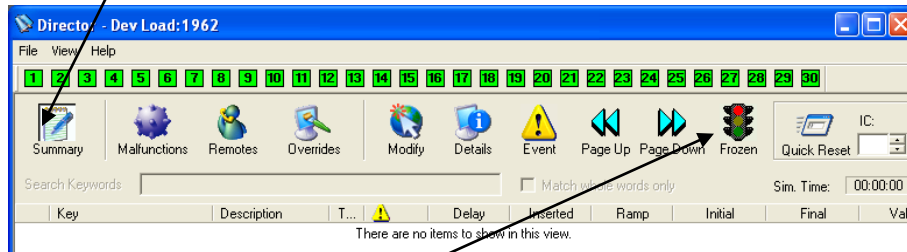


4. Set the Simulator to **IC-102** and perform switch check (Using Quick Reset in Director).
5. Click on "**Open**" in the Schedule window and Open Schedule File "**12-2017 NRC Exam Scenario 3.sch**" (in the Schedule Directory)



6. In Schedule window, click on the "**Stopped**" red block. The red block will change to a green arrow and indicate the scenario is active ("**Running**").

7. Click the Summary tab in the Director window. Verify the schedule files are loaded and opened per Section B below. (Note: Any actions in the schedule file without a specific time will not load into the director until triggered.)



8. Take the simulator out of freeze.
9. Log on to all simulator PDS and SPDS computers.
10. Verify or perform the following:
- IC-102
 - Place red tag on TBCW C pump handswitch
 - Place red tag on CRD PMP B and CRD PUMP B AUX OIL PUMP handswitches
 - Ensure all procedures are marked as indicated for turnover conditions
 - Advance all chart recorders and ensure all pens are inking properly
 - Clear any graphs and trends off PDS and SPDC
11. Run through any alarms and ensure alarms are on. (**Note: On T-Rex, to verify alarms are ON, the indicator will indicate "Alarms On"**).
12. Place the simulator in Freeze.

File loaded verification:

Schedule - 12-2017 NRC Scenario 3.sch

File Edit View Help

New Open Save Delete Stopped Export Frozen

00:00:00[00]

Insert	Pause	@Time	Event	Action	Description
				^ 12-2017 NRC Scenario 3	
				^ Event 1 - NORMAL - Place RPS B on ALT PWR source	
				^ Event 2 - COMPONENT - Div 2 DG lube oil leak	TS 3.8.1.B - Place DG in MAINTENANCE
		00:00:00		Insert malfunction p864_2a_d_2 to ON on event 2	DIV 2 DSL GEN TROUBLE
		00:00:00		Create event 28 dlo2(913) == 1	Div 2 DG running
		00:00:00		Insert malfunction n41141b after 120 on event 28	Emergency Diesel Generator B Trip
		00:00:00		Insert malfunction p864_2a_c_1 to OFF on event 28	DG 12 GROUND OVERCURRENT
		00:00:00		Insert remote p75058 to MAINT on event 9	DG DIV 2 MAINTENANCE MODE
				^ Event 3 - COMPONENT - Spurious Div 2 ECCS Initiation	
		00:00:00		Insert malfunction ltb21n091b_b on event 3 delete in 1	override (falls low)
		00:00:00		Insert malfunction ltb21n091f_b on event 3 delete in 1	override (falls low)
				^ Event 4 - RX - Loss of Vacuum	
		00:00:00		Insert malfunction fw163c from 6.00000 to 15.00000 in 600 on event 4	Loss of Condenser C Vacuum (variable)
				^ Event 5 - MAJOR - Loss of Power / LOCA	
		00:00:00		Create event 5 zdl1(645) == 1	Mode Switch in SHUTDOWN
		00:00:00		Insert malfunction r21135 on event 5	Switchyard Fault (500 and 115KV)
		00:00:00		Insert malfunction e22052	High Pressure Core Spray Pump Trip
		00:00:00		Insert malfunction rr063b after 300 to 2.00000 on event 5	Recirc Loop B Non-Isolable Suction Rupture
				^ Event 6 - COMPONENT - Failure of Div 1 ECCS to initiate	Loss of Condenser C Vacuum (variable)
		00:00:00		Insert malfunction rr040a to 0	DW Press Xmtr B21-N094A Falls (VAR)
		00:00:00		Insert malfunction rr040e to 0	DW Press Xmtr B21-N094E Falls (VAR)
		00:00:00		Create event 29 xalt_level_wr == -55	Reactor level at -55 inches
		00:00:00		Insert malfunction rr041a to 50.00000 on event 29	RPV Level Xmtr B21-N091A Falls (VAR)
		00:00:00		Insert malfunction rr041e to 50.00000 on event 29	RPV Level Xmtr B21-N091E Falls (VAR)

Execute: Insert malfunction c41263 to 15.00000
Execute: Insert remote ATT20 to INSTALL on event 17
Execute: Insert remote ATT19 to INSTALL on event 16
Execute: Insert remote ATT18 to INSTALL on event 15
Execute: Insert remote ATT12 to INSTALL on event 14

Ready NUM

Schedule - 12-2017 NRC Scenario 3.sch

File Edit View Help

New Open Save Delete Stopped Export Frozen

00:00:00[00]

Insert	Pause	@Time	Event	Action	Description
				^ TBCW Pump C Tagged Out	
		00:00:00		Insert override DI_1P43M600C to STOP	P870/05C TBCW PMP C : P43-C001C
		00:00:00		Insert override LO_1P43M600C_G to FALSE	P870/05C TBCW PMP C:P43-C001C - DF
		00:00:00		Insert override LO_1P43M600C_R to FALSE	P870/05C TBCW PMP C:P43-C001C - DF
				^ CRD Pump B tagged OOS	
		00:00:00		Insert remote c11646 to OUT	CRD PUMP B BREAKER
		00:00:00		Insert override DI_1C11M609B to STOP	P601/22C CRD PMP B AUX OIL PMP
		00:00:00		Insert override LO_1C11M609B_G to FALSE	P601/22C CRD PMP B AUX OIL PMP:C11-C001B - DF
		00:00:00		Insert override LO_1C11M609B_R to FALSE	P601/22C CRD PMP B AUX OIL PMP:C11-C001B - DF
		00:00:05		Set xallismbutton = 5	
		00:00:10		frz	
				^ EP Attachments	
		00:00:00		Insert remote ATT01 to INSTALL on event 10	Defeating RCIC High Supp. Pool Water Level Suction Transfer
		00:00:00		Insert remote ATT03 to INSTALL on event 11	Defeating all RCIC Isolation and Non-Mechanical Trip Interlocks
		00:00:00		Insert remote ATT12 to INSTALL on event 12	Defeating RHR SDC Injection Valve Isolation

Execute: Insert malfunction c41263 to 15:00:00
Execute: Insert remote ATT20 to INSTALL on event 17
Execute: Insert remote ATT19 to INSTALL on event 16
Execute: Insert remote ATT18 to INSTALL on event 15
Execute: Insert remote ATT12 to INSTALL on event 14

Ready NUM

Director - Dev Load:1962

File View Help

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Summary Malfunctions Remotes Overrides Modify Details Event Page Up Page Down Frozen Quick Reset IC: 102

Search Keywords Match whole words only Sim. Time: 00:00:11

Key	Description	T...	Delay	Inserted	Ramp	Initial	Final	Value
p864_2a_d_2	DIV 2 DSL GEN TROUBLE	2	00:00:00		00:00:00		ON	NORMAL
n41141b	Emergency Diesel Generator B Trip	28	00:02:00		00:00:00		Active	InActive
p864_2a_c_1	DG 12 GROUND OVERCURRENT	28	00:00:00		00:00:00		OFF	NORMAL
ltb21n091b_b	override (fails low)	3	00:00:00		00:00:00		Active	InActive
ltb21n091f_b	override (fails low)	3	00:00:00		00:00:00		Active	InActive
fw163c	Loss of Condenser C Vacuum (variable)	4	00:00:00		00:10:00	6	15	0
r21135	Switchyard Fault (500 and 115KV)	5	00:00:00		00:00:00		Active	InActive
e22052	High Pressure Core Spray Pump Trip		00:00:00	00:00:00	00:00:00		Active	Active
rr063b	Recirc Loop B Non-Isolable Suction Rupture	5	00:05:00		00:00:00		2	0
rr040a	DW Press Xmtr B21-N094A Fails (VAR)		00:00:00	00:00:00	00:00:00		0	0
rr040e	DW Press Xmtr B21-N094E Fails (VAR)		00:00:00	00:00:00	00:00:00		0	0
rr041a	RPV Level Xmtr B21-N091A Fails (VAR)	29	00:00:00		00:00:00		50	0
rr041e	RPV Level Xmtr B21-N091E Fails (VAR)	29	00:00:00		00:00:00		50	0
p75058	DG DIV 2 MAINTENANCE MODE	9	00:00:00		00:00:00		MAINT	OPER
c11646	CRD PUMP B BREAKER		00:00:00	00:00:00	00:00:00		OUT	OUT
ATT01	Defeating RCIC High Supp. Pool Water Level Suction Transfer	10	00:00:00		00:00:00		INSTALL	00:00:00
ATT03	Defeating all RCIC Isolation and Non-Mechanical Trip Interlocks	11	00:00:00		00:00:00		INSTALL	00:00:00
ATT12	Defeating RHR SDC Injection Valve Isolation	12	00:00:00		00:00:00		INSTALL	00:00:00
DI_1P43M600C	P870/05C TBCW PMP C : P43-C001C		00:00:00	00:00:00	00:00:00		STOP	STOP
LO_1P43M600C_G	P870/05C TBCW PMP C:P43-C001C - DF		00:00:00	00:00:00	00:00:00		FALSE	TRUE
LO_1P43M600C_R	P870/05C TBCW PMP C:P43-C001C - DF		00:00:00	00:00:00	00:00:00		FALSE	FALSE
DI_1C11M609B	P601/22C CRD PMP B AUX OIL PMP		00:00:00	00:00:00	00:00:00		STOP	STOP
LO_1C11M609B_G	P601/22C CRD PMP B AUX OIL PMP:C11-C001B - DF		00:00:00	00:00:00	00:00:00		FALSE	TRUE
LO_1C11M609B_R	P601/22C CRD PMP B AUX OIL PMP:C11-C001B - DF		00:00:00	00:00:00	00:00:00		FALSE	FALSE

Ready NUM

Procedures that may be used in this scenario:

Procedure No.	Rev	Procedure Title
04-1-01-C11-1	154	Control Rod Drive Hydraulic System
04-1-01-C41-1	123	Standby Liquid Control System
04-1-01-C71-1	35	Reactor Protection System
04-1-01-E12-1	147	Residual Heat Removal System
04-1-01-E30-1	25	Suppression Pool Makeup System
04-1-01-E51-1	136	Reactor Core Isolation Cooling System
04-1-01-E61-1	41	Combustible Gas Control System
04-1-01-P75-1	106	Standby Diesel Generator System
04-1-02-1H13-P601	161	Alarm Response Instruction Panel No.: 1H13-P601
04-1-02-1H13-P680	233	Alarm Response Instruction Panel No.: 1H13-P680
04-1-02-1H13-P864	31	Alarm Response Instruction Panel No.: 1H13-P864
04-1-02-1H13-P870	154	Alarm Response Instruction Panel No.: 1H13-P870
04-S-02-SH13-P807	32	Alarm Response Instruction Panel No.: SH13-P807
04-1-02-1H22-P401	118	Alarm Response Instruction Panel No.: 1H22-P401
05-1-02-I-1	130	Reactor Scram
05-1-02-I-2	37	Turbine and Generator Trips
05-1-02-I-4	51	Loss of AC Power
05-1-02-III-2	26	Loss of One or Both RPS Buses
05-1-02-III-3	115	Reduction In Recirculation System Flow Rate
05-1-02-III-5	49	Automatic Isolations
05-1-02-V-1	24	Loss of Component Cooling Water
05-1-02-V-8	24	Loss of Condenser Vacuum
05-S-01-EP-1	36	Emergency / Severe Accident Procedure Support Documents
05-S-01-EP-2	45	RPV Control
05-S-01-EP-3	29	Containment Control
Tech Spec 3.3.5.1		
Tech Spec 3.3.6.1		
Tech Spec 3.3.6.3		
Tech Spec 3.3.6.4		
Tech Spec 3.8.1		
Tech Spec 3.8.3		

SCENARIO ACTIVITIES:

- Start SBT report and any other required recording devices.

Op-Test No: <u>NRC LOT 12-2017</u>		Scenario No: <u>3</u>	Event No: <u>1</u>
Event Description: <u>Transfer RPS Bus B from normal to alternate power supply</u>			
TIME	Position	Applicant's Actions or Behavior	
	BOP	<p>Transfers RPS Bus B from normal to alternate power supply IAW SOI 04-1-01-C71-1, Section 5.1 by performing the following:</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Before transferring power on an energized RPS bus, ENSURE NO SCRAM OR ISOLATION surveillances are in progress <u>AND ALL</u> MSIV solenoids are energized. (MSIV solenoids <u>Can</u> be verified energized by all MSIV solenoid lights energized <u>AND</u> all pilot solenoids indicate amperage on 1H13-P622 and 1H13-P623).</p> <p>Verifies MSIV solenoids are energized by verifying all MSIV solenoid lights are energized and all pilot solenoids indicate amperage on 1H13-P622 and 1H13-P623.</p> <p>NOTE to Examiner: Applicant should use Video Wall to verify status of MSIV solenoids.</p> <p>5.1.2.a Check GENERATOR B ALTERNATE FEED AVAILABLE lights are lit on 1H13-P610.</p> <p>5.1.2.b Place handswitch MG SET B TRANSFER handswitch on 1H13-P610 to ALT B.</p>	
	ATC	<p>Resets Division 2 half-scrum IAW SOI 04-1-01-C71-1, Section 5.1 by performing the following:</p> <p>5.1.2.c Place SCRAM RESET handswitches for tripped channels in RESET on 1H13-P680.</p>	
	BOP	Report to CRS that RPB Bus B has been transferred to alternate power supply.	
		END OF EVENT	
	Notes		
Lead Examiner: Cue to proceed to the next event.			

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 2Event Description: **Division 2 Diesel Generator lube oil leak**

At the direction of the Lead Evaluator, trigger Event 2 to cause a Division 2 Diesel Generator Trouble annunciator.

TIME	Position	Applicant's Actions or Behavior
	BOP	Responds to alarm P864-2A-D2, DIV 2 DSL GEN TROUBLE. Dispatch plant operator to investigate Division 2 Diesel Generator trouble alarm.
	BOOTH	Role Play: If asked to investigate, wait 3 minutes and report as plant operator that oil is spraying out of a break in the discharge of the Lube Oil Circulation Pump. The pump has been secured, but oil is still draining out the pipe. Report that annunciator P401-1A-B2, LOW LEVEL LUBE TANK is in alarm and lube oil tank level indication on P401 is approximately 1/8. If asked level of oil in tank, report level is approximately 20" below the top of the sump fill hole. If asked amount of oil in tank, report that according to ARI, there is less than 350 gallons of oil in tank.
	BOP	Determine amount of oil in Division 2 Diesel Generator Lube Oil Tank is less than 350 gallons using ARI 04-1-02-1H22-P401-1A-B2, LOW LEVEL LUBE TANK. Report to CRS that per ARI Tech Spec 3.8.3 should be entered.
	CRS	Direct BOP to place Division 2 Diesel Generator in MAINTENANCE mode.
	CRS TS	Enters LCO 3.8.3.E and declares Division 2 Diesel Generator inoperable. Enters LCO 3.8.1.B. Required actions are: <ul style="list-style-type: none"> • Perform SR 3.8.1.1 for OPERABLE required offsite circuits within one hour and every 8 hours thereafter • Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable within 4 hours of discovery of Condition B with inoperability of redundant required feature(s) • Determine OPERABLE DG(s) are not inoperable due to common cause failure within 24 hours OR perform SR 3.8.1.2 for OPERABLE DG(s) within 24 hours. • Restore required DG to OPERABLE status within 14 days NOTE to Evaluators: If Division 2 Diesel Generator is not placed in MAINTENANCE mode, the diesel generator will auto start on the next event and will trip after 2 minutes.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 2 (cont.)Event Description: **Division 2 Diesel Generator lube oil leak (cont.)**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Places Division 2 Diesel Generator in MAINTENANCE IAW SOI 04-1-01-P75-1, Standby Diesel Generator System, Attachment VI:</p> <ol style="list-style-type: none"> Place Standby Diesel Generator 12 in MAINTENANCE mode by simultaneously depressing Remote 1H13-P864 and Local 1H22-P401 MAINTENANCE MODE SELECT pushbuttons. LOCAL pushbutton must be RELEASED first for Diesel to remain in MAINTENANCE mode. Verify: <ul style="list-style-type: none"> The UNIT TRIPPED red light on 1H22-P401 remains on. Alarm DIESEL GENERATOR IN MAINTENANCE on 1H22-P401 actuates following a one-minute time delay after Diesel is in MAINTENANCE mode.
	BOOTH	<p><u>Role Play:</u> If asked, inform Control Room you are ready to place Division 2 Diesel Generator in MAINTENANCE mode.</p> <p>When directed to depress the local Division 2 Diesel Generator MAINTENANCE MODE SELECT pushbutton, trigger <u>Event 9</u>.</p> <p>After 2 minutes, report Division 2 Diesel Generator is in MAINTENANCE mode.</p>
		END OF EVENT
	Notes	
	Lead Examiner: Cue to proceed to the next event.	

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 3Event Description: **Division 2 ECCS initiation on spurious RPV low level signal****At the direction of the Lead Evaluator, trigger Event 3 to cause a Division 2 initiation on spurious RPV low level signal.**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Recognize and report Division 2 ECCS initiation signal on RPV low level.</p> <p>Verify and report RPV low level signal is spurious by two independent indications.</p> <ul style="list-style-type: none"> • No CTMT or Drywell isolation signals present • Wide range RPV level in normal band • Narrow range RPV level in normal band
	CRS	<p>Direct BOP to recover from the Division 2 ECCS initiation signal IAW SOI 04-1-01-E12-1, Residual Heat Removal System, Attachment IX.</p> <p>Enters ONEP 05-1-02-I-4, Loss of AC Power.</p>
	BOP	<p>Recovers from Division 2 ECCS initiation signal IAW 04-1-01-E12-1, Residual Heat Removal System, Attachment IX.</p> <p>RECOVER from a Division 2 ECCS Initiation as follows:</p> <ol style="list-style-type: none"> 1. VERIFY Reactor Level is > 150.3 inches. 2. VERIFY Drywell Pressure is < 1.39 psig. 3. IF an inadvertent initiation has occurred, THEN VERIFY all trip units causing initiation have been reset OR bypassed. 4. DEPRESS the RHR B/C INIT RESET pushbutton. IF white light over pushbutton stays out, THEN the initiation signal is Reset. 5. DEPRESS the DIV 2 LSS PNL RESET pushbutton on panel 1H13-P864. ENSURE ALL LSS system annunciators on 1H13-P864 are clear AND ENSURE all the following LSS panel lights are on AND all other lights are off: <ul style="list-style-type: none"> • ESF POWER ON • BOP POWER ON • DIV 2 LSS PNL RESET white light illuminates on 1H13-P864 6. RESET the Div 2 CGCS logic by PLACING the CGCS DIV 2 MAN INIT RESET keylock switch to RESET. 7. STOP the DRWL PURGE COMPR B. 8. CLOSE E61-F003B. <p>Re-energizes MCC 16B42 IAW ONEP 05-1-02-I-4, Loss of AC Power.</p>
	ATC	<p>Recognize and report a Division 2 half-scam.</p> <ul style="list-style-type: none"> • H13-P680-7A-A2 RX SCRAM TRIP alarm • Division 2 RPS scram solenoid lights out on P680-5C1
	BOP	<p>Recognize and report loss of RPB Bus B alternate power supply.</p> <p>Recognize and report CCW Pump B power loss and CCW Pump C automatically started.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 3 (cont.)Event Description: **Division 2 ECCS initiation on spurious RPV low level signal (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<p>Enters ONEP 05-1-02-III-2, Loss of One or Both RPS Buses.</p> <p>Directs BOP to transfer RPB Bus B to normal power supply.</p> <p>Contacts Work Control to stop all work on RPS MG B.</p> <p>May enter ONEP 05-1-02-V-1, Loss of Component Cooling Water.</p>
	BOP	<p>Transfers RPS Bus B to RPS MG B IAW ONEP 05-1-02-III-2, Loss of One or Both RPS Buses:</p> <p>3.1.3 IF "B" RPS Bus is de-energized THEN PLACE MG SET B TRANSFER switch on Panel 1H13-P610 to available power source.</p> <p>Places MG SET B TRANSFER switch to MG B.</p> <p>Reports to CRS that RPS Bus B is transferred to normal power supply.</p>
	CRS	Directs ATC to reset Division 2 half-scam IAW ONEP 05-1-02-III-2, Loss of One or Both RPS Buses.
	ATC	<p>Resets Division 2 half-scam IAW ONEP 05-1-02-III-2, Loss of One or Both RPS Buses:</p> <p>3.1.4 RESET Half-Scram using EITHER HS M601A AND C OR HS-M601B AND D on Panel 1H13-P680 by PLACING switches momentarily to reset.</p> <p>Places HS-M601B and D on Panel 1H13-P680 to RESET.</p> <p>Verifies Division 2 half-scam reset:</p> <ul style="list-style-type: none"> • H13-P680-7A-A2 RX SCRAM TRIP alarm cleared • Division 2 RPS scram solenoid lights energized on P680-5C1
	BOP	<p>3.1.5 ENSURE all MSIV solenoids are energized AND all MSIV pilot solenoids indicate amperage on panels 1H13-P622 AND 1H13-P623.</p> <p>Verifies MSIV solenoids are energized by verifying all MSIV solenoid lights are energized and all pilot solenoids indicate amperage on 1H13-P622 and 1H13-P623.</p> <p>NOTE to Examiner: Applicant should use Video Wall to verify status of MSIV solenoids.</p>
	CRS	Dispatch I&C to investigate spurious low RPV level initiation of Division 2 ECCS.
	BOOTH	Role Play: If dispatched, after 4 minutes report as I&C that no trip units are sealed in, but trip units B21-N691B and B21-N691F voltage output is erratic and unstable.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 3 (cont.)Event Description: **Division 2 ECCS initiation on spurious RPV low level signal (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS TS	<p>Enters LCO 3.3.5.1.B. Required actions are:</p> <ul style="list-style-type: none"> • Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable within 1 hour of discovery of loss of initiation capability for feature(s) in both divisions • Place channel in trip within 24 hours. <p>Enters LCO 3.3.5.1.F. Required actions are:</p> <ul style="list-style-type: none"> • Declare ADS valves inoperable within 1 hour from discovery of loss of ADS initiation capability in both trip systems • Place channel in trip within 96 hours from discovery of inoperable channel concurrent with HPCS or reactor core isolation cooling (RCIC) inoperable AND 8 days <p>Enters LCO 3.3.6.1.A. Required action is to place channel in trip within 24 hours.</p> <p>Enters LCO 3.3.6.3.B. Required actions are:</p> <ul style="list-style-type: none"> • Declare associated RHR Containment Spray subsystem inoperable within 1 hour from discovery of loss of RHR Containment Spray initiation capability in both trip system • Place channel in trip within 24 hours <p>Enters LCO 3.3.6.4.B. Required actions are:</p> <ul style="list-style-type: none"> • Declare associated SPMU subsystem inoperable within 1 hour of discovery of loss of SPMU initiation capability in both trip systems • Place channel in trip within 24 hours
		END OF EVENT
	Notes	
	Lead Examiner: Cue to proceed to the next event.	

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 4Event Description: **Loss of condenser vacuum****At the direction of the Lead Examiner, trigger Event 4 to cause a loss of condenser vacuum.**

TIME	Position	Applicant's Actions or Behavior
	ATC	Recognize and report condenser vacuum lowering: <ul style="list-style-type: none"> • Generator megawatts lowering • Offgas flow rising • LP Condenser C pressure rising on N19-R604C indicator on Panel 1H13-P680
	CRS	Enters ONEP 05-1-02-V-8, Loss of Condenser Vacuum. Directs ATC to lower core flow to 70 mlbm/hr in using Recirculation FCVs in fast detent. Directs BOP to monitor condenser vacuum.
	BOP	Monitors and reports condenser vacuum indication and trend.
	ATC	Lowers core flow to 70 mlbm/hr using Recirculation Flow Control Valves A and B in fast detent. Determines and reports reactor is operating in the OPRM Armed Region of the Power-To-Flow map. Assumes THI Watch with no concurrent duties.
	CRS	Enters Reduction in Recirculation Flow ONEP, 05-1-02-III-3. 3.1 Monitor APRMs, LPRMs, SRM period meters, and OPRM Computer Trends. Directs ATC to monitor for hydraulic instability. 3.5 NOTE to Examiners: Step is N/A. No recirculation pumps have tripped. 3.6 NOTE to Examiners: Step is N/A. Both recirculation pumps are operating.
	CRS	Directs ATC that THI Watch with concurrent duties is allowed.
	CRS	3.4 If operation is determined to be in OPRM Armed Region, perform the following: 3.4.1. Verify that at least 3 OPRM channels are not bypassed (i.e. are enabled) per TS 3.3.1.1-1, Item 2.f. Directs ATC to verify at least 3 OPRM channels are not bypassed.
	ATC	Verifies at least 3 OPRM channels are not bypassed: <ul style="list-style-type: none"> • Computer points C51NC085, 86, 87, 88 OPRM ENABLED alarmed on PDS. • Computer points C51NC075, 76, 77, 78 OPRM INOP not alarmed on PDS. Reports all OPRM channels are operable.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 4 (cont.)Event Description: **Loss of condenser vacuum (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	3.7 If both loops are operating, then perform the following: 3.7.2 At less than 78.7 mlbm/hr core flow, balance loop flows to within 4460 gpm. Directs ATC to balance Recirculation Loop flows to within 4460 gpm.
	ATC	Reports Recirculation Loop flows and adjusts Recirculation Loop flows, if necessary, using Recirculation Flow Control Valves A and B to within 4460 gpm.
	CREW	Dispatch plant operators to investigate condenser leaks.
	CRS	Recognize condenser vacuum is still lowering and directs ATC to insert a manual scram. Directs all personnel to evacuate Containment due to reactor scram.
	ATC	Places Reactor Mode Switch to SHUTDOWN. Verifies all control rods are inserted.
	CRS	Enters Reactor Scram ONEP, 05-1-02-I-1, Turbine and Generator Trips ONEP, 05-1-02-I-2 and EP-2.
		END OF EVENT
	Notes	
<p>Proceed to the next event for LOP/LOCA.</p> <p>NOTE to Examiners:</p> <p>CRS actions start on the next page of the Scenario Guide.</p> <p>BOP actions start on Page 30 of the Scenario Guide.</p> <p>ATC actions start on Page 31 of the Scenario Guide.</p>		

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7Event Description: **LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate****LOP will occur when Reactor Mode Switch is taken to SHUTDOWN. LOCA will occur after 5 minutes. HPCS Pump trip and failure of Division 1 ECCS to initiate is already active.**

TIME	Position	Applicant's Actions or Behavior
	CREW	Recognize and report loss of offsite power. Recognize and report 16AB failed to re-energize due to loss of Division 2 Diesel Generator. Recognize and report MSIVs closed. Recognize and report loss of all Reactor Feed Pumps.
	CRS	Enters ONEP 05-1-02-I-4, Loss of AC Power. Directs ATC to initiate Standby Gas Treatment System A.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)

TIME	Position	Applicant's Actions or Behavior
	CRS	<p style="text-align: right;">EP-2</p> <p>Table L-1 Preferred Injection Systems</p> <ul style="list-style-type: none"> • Condensate/Feedwater • CRD <ul style="list-style-type: none"> ➤ Maximize CRD for flow. • RCIC <ul style="list-style-type: none"> ➤ Use CST suction if available. ➤ OK to defeat isolations and interlocks..... Att 1, 3 • HPCS <ul style="list-style-type: none"> ➤ Use CST suction if available. ➤ OK to defeat interlocks..... Att 4 • LPCS • LPCI <ul style="list-style-type: none"> ➤ Inject through the HX as soon as possible. • RHR through shutdown cooling return <ul style="list-style-type: none"> ➤ Inject through the HX as soon as possible. ➤ OK to defeat isolations..... Att 12 <p>Direct BOP to initiate RCIC and maintain RPV level between 11.4" and 53.5" wide range level.</p>
	CRS	Directs I&C to install Attachment 1 and 3 for RCIC.
	BOOTH	<p>Role Play: When directed to install Attachments, trigger the following Events as each Attachment is directed:</p> <p>Attachment 1 – Event 10</p> <p>Attachment 3 – Event 11</p> <p>Inform CRS when each Attachment indicates DONE.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)

TIME	Position	Applicant's Actions or Behavior
	CRS	<p style="text-align: center;">EP-2</p> <p style="text-align: center;">Table P-2 RPV Depressurization Systems</p> <ul style="list-style-type: none"> • Main turbine bypass valves.....Att 9 • MSL drains.....Att 9 • SRVs... <u>only when</u> SP level is above 10.5 ft.....Att 7 <ul style="list-style-type: none"> ➤ OK to defeat isolations and restore air.....Att 7 • SJAES.....Att 9 • Seal steam generator.....Att 9 • Offgas preheater.....Att 9 • RFPTs.....Att 6, 9 • RCIC <ul style="list-style-type: none"> ➤ Use CST suction if available. ➤ OK to defeat isolations and interlocks.....Att 1, 3 • RWCU recirc mode <ul style="list-style-type: none"> ➤ Bypass regen HXs and F/Ds.....Att 11 ➤ OK to defeat isolations.....Att 11 • RWCU blowdown mode (SOI 04-1-01-G33-1) • RPV head vents (B21-F001 and B21-F002) • SRVs from outside the Control Room ... <ul style="list-style-type: none"> ...<u>only when</u> SP level is above 10.5 ft.....FSG-007 ➤ OK to defeat isolations and restore air.....Att 7 <p>Directs ATC to maintain RPV pressure between 800 and 1060 psig using SRVs.</p>
	CREW	Recognize and report high drywell pressure, LOCA in Drywell.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)

TIME	Position	Applicant's Actions or Behavior
	CRS	Re-enters EP-2, RPV Control.
		<p>EP-2</p> <p>Table L-1 Preferred Injection Systems</p> <ul style="list-style-type: none"> Condensate/Feedwater <ul style="list-style-type: none"> CRD <ul style="list-style-type: none"> Maximize CRD for flow. RCIC <ul style="list-style-type: none"> Use CST suction if available. OK to defeat isolations and interlocks. Att 1, 3 HPCS <ul style="list-style-type: none"> Use CST suction if available. OK to defeat interlocks. Att 4 LPCS <ul style="list-style-type: none"> LPCI <ul style="list-style-type: none"> Inject through the HX as soon as possible. RHR through shutdown cooling return <ul style="list-style-type: none"> Inject through the HX as soon as possible. OK to defeat isolations. Att 12 <p>Directs ATC to verify high drywell pressure initiations, isolations and emergency diesel generators.</p> <p>Direct BOP to monitor and report RPV water level and maximize CRD for flow.</p> <p>Directs I&C to install Attachment 12 for RHR.</p>
	CREW	<p>Recognize and report HPCS Pump trip.</p> <p>Recognize and report failure of Division 1 ECCS to initiate.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: **LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Directs ATC to manually initiate Division 1 ECCS.
(CT-3) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually initiates or aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig		
	CREW	Dispatch plant operator / electrical maintenance to investigate HPCS Pump trip.
	BOOTH	<u>Role Play:</u> If dispatched, as plant operator/electrical maintenance report after 3 minutes that HPCS pump breaker, 152-1702, is tripped and electrical is investigating. When directed to install Attachments, trigger Event 12 and inform CRS when Attachment indicates DONE.
	CRS	Recognize RPV level lowering and enters Alternate Level Control leg of EP-2.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)

TIME	Position	Applicant's Actions or Behavior
		<p>Alternate Level Control</p> <p>IF CTMT pressure cannot be maintained below 22.4 psig RPV level can be restored and maintained above -160 in.</p> <p>THEN Terminate RPV injection from external sources not needed for core cooling. Go to ①</p> <p>Inhibit ADS.</p> <p>Restore and maintain RPV level above -160 in. using one or more Table L-1 systems. Use Table L-2 systems if necessary.</p> <p>IF Less than 2 Injection Subsystems can be lined up</p> <p>THEN Commence lining up as many Table L-2 systems as possible.</p> <p>Table L-2 Alternate Injection Systems</p> <ul style="list-style-type: none"> RHR Service Water Crosstie Condensate Transfer..... Att 25 Fire System..... Att 26 ECCS jockey pumps SLC test tank..... Att 27 SLC boron tank Portable pumps..... FSG-003 RCIC using suction from the UCP..... FSG-002 RCIC from outside the Control Room..... FSG-007 <p>Injection Subsystems</p> <ul style="list-style-type: none"> Condensate HPCS LPCS RHR-A (LPCI or SDCI) RHR-B (LPCI or SDCI) LPCI-C <p>WHEN RPV level drops to -160 in.</p> <p>Any Injection Subsystem lined up with a pump running?</p> <p>Yes</p> <p>BEFORE RPV level drops to -191 in.</p> <p>EMERGENCY DEPRESSURIZATION IS REQUIRED: Exit Pressure → Enter Emergency Depressurization</p> <p>Direct ATC to inhibit ADS.</p> <p>Direct ATC to initiate SLC A.</p> <p>Direct BOP to verify LPCS and RHR A are available for injection.</p>

(CT-1) Inhibit ADS prior to automatic ADS valve opening during a LOCA

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)

TIME	Position	Applicant's Actions or Behavior
	CRS	Enters EP-3, Containment Control.
	CRS	<p>EP-3</p> <p>Monitors HCTL on SPDS. May direct ATC to initiate Division 1 Suppression Pool Makeup System.</p>
	CRS	<p>EP-3</p> <p>Directs ATC to verify CTMT and DW hydrogen analyzers operating and energize Division 1 igniters.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)

TIME	Position	Applicant's Actions or Behavior
	CRS	When RPV level lowers to -160 inches wide range, exits EP-2 Pressure leg and enters Emergency Depressurization leg of EP-2.
	CRS	<p>EP-2</p> <p>Verifies Suppression Pool level is greater than 10.5 ft using SPDS.</p> <p>Directs ATC to open 8 ADS/SRVs.</p> <p>Directs BOP to monitor for ECCS injection.</p>

(CT-2) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ. (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6/7 (cont.)Event Description: **LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)**

TIME	Position	Applicant's Actions or Behavior
	BOP	Monitors P601 panel indications for ECCS injection into the RPV: <ul style="list-style-type: none"> • E21-F005, LPCS INJ SHUTOFF VLV, open indication • E21-F006, LPCS TESTABLE CHK VLV, open indication • E21-R600, LPCS PMP DISCH FLO, indication rising • E12-F042A, RHR A INJ SHUTOFF VLV, open indication • E12-F041A, RHR A TESTABLE CHK VLV, open indication • E12-R603A, RHR PMP A DISCH FLO, indication rising
	CRS	Direct BOP to monitor RPV level and report when level is greater than TAF (-160 inches wide range).
	BOP	Monitors RPV level and reports to CRS when RPV level is greater than TAF (-160 inches wide range).
	CRS	Directs BOP to restore and maintain RPV level between -30 inches and +50 inches wide range with ECCS systems.
	BOP	Controls injection from LPCS and RHR A by throttling valves and/or cycling pumps to raise and maintain RPV level -30 inches to +50 inches wide range.
NOTE to Examiners: Scenario objectives have been met when the crew has depressurized the RPV and level is being raised in a controlled manner to restore it to -30" to +50" wide range.		
END OF SCENARIO		
	Notes	
	BOOTH	When directed by the Lead Examiner, place the simulator in freeze and tell the crew to stop operating.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6 (cont.)Event Description: **LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)****BOP ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	BOP	Recognize and report Reactor Feed Pumps tripped.
	BOP	<p>Manually initiates RCIC IAW 04-1-01-E51-1, Reactor Core Isolation Cooling System, Attachment VI:</p> <ol style="list-style-type: none"> 1. IF desired, ARM AND DEPRESS RCIC MAN INIT pushbutton. 2. VERIFY SSW A is running with adequate flow path. <p>Manually controls RCIC flow to maintain RPV water level between 11.4 inches and 53.5 inches wide range level.</p>
	BOP	Monitors and report RPV level.
	BOP	<p>Maximizes CRD for flow IAW SOI 04-1-01-C11-1, Attachment VIII, by performing the following:</p> <p>Re-start CRD PUMP A IAW ONEP 05-1-02-IV-1, Control Rod/Drive Malfunctions ONEP, immediate operator actions:</p> <ol style="list-style-type: none"> 2.1.2 If running CRD pump trips, then start standby CRD pump as follows: <ol style="list-style-type: none"> 2.1.2.a If required, re-energize MCCs 15B42 and 16B42 on 1H13-P864. Start CRD PUMP A AUX OIL PUMP. 2.1.2.b Place CRD SYS FLO CONT in MANUAL and reduce output to zero. 2.1.2.c Start CRD pump A <p>Per SOI 04-1-01-C11-1, Attachment VIII:</p> <ol style="list-style-type: none"> (1) NOTE to Examiners: Step is N/A because oil pump for CRD Pump A is already running. (2) NOTE to Examiners: Step is N/A because CRD Pump B is tripped. (3) Place CRD SYS FLO CONT C11-R600 in MANUAL (4) Using CRD SYS FLO CONT C11-R600, fully open C11-F002A(B), CRD FLO CONT VLV (5) If maximizing CRD for flow, then fully open C11-F003, CRD DRIVE WTR PRESS CONT VLV <p>Reports to CRS that CRD is maximized for flow to extent possible.</p>
	BOP	<p>Verifies LPCS and RHR A are available for injection:</p> <ul style="list-style-type: none"> • LPCS and RHR A pumps running • LPCS and RHR A injection valves green lights energized
	Notes	
		Return to Page 29 for completion of BOP actions.

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6 (cont.)Event Description: **LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	Verifies SRVs are controlling RPV pressure between 800 to 1060 psig on Lo-Lo Set.
	ATC	Manually initiates Standby Gas Treatment System A by depressing SGTS DIV 1 MAN INIT pushbuttons A and C.
	ATC	<p>Verifies ECCS initiations and recognizes and reports to CRS Division 1 ECCS fails to initiate.</p> <p>Recognizes and reports to CRS that HPCS Pump is tripped.</p> <p>Recognizes and reports to CRS that ESF Bus 16AB is de-energized.</p> <p>Manually initiates Division 1 ECCS by arming and depressing LPCS/RHR A INIT pushbutton.</p> <p>Verifies and reports high drywell pressure isolations complete.</p> <p>Provides ECCS Status report to CRS.</p>
(CT-3) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually initiates or aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig		
	ATC	Inhibits ADS by ADS A and ADS B MANUAL INHIBIT switches to INHIBIT position.
(CT-1) Inhibit ADS prior to automatic ADS valve opening during a LOCA		
	ATC	<p>Initiates SLC A by placing the SLC PMP A key-locked switch to START.</p> <p>Verifies SLC injection into reactor IAW SOI 04-1-01-C41-1, Attachment VI by performing the following:</p> <ol style="list-style-type: none"> 1. Verify system initiation by observing the following: <ol style="list-style-type: none"> a. F004A squib valve fired: <ul style="list-style-type: none"> • White SQUIB VALVE READY light OFF • Annunciator SBLC SYS A OOSVC • Amber status light SQUIB A LOSCONT or PWR LOSS is ON b. C41-F001A TANK OUTLET VALVE is OPEN c. SBLC PUMPS A d. RWCU isolates: <ul style="list-style-type: none"> • G33-F004 closed (SLC A initiated) e. Verify SLC is injecting into the RPV by observing the following: <ul style="list-style-type: none"> • SBLC pump discharge pressure exceeds reactor pressure • SBLC tank level lowering • Nuclear Instrumentation lowering <p>Report to CRS that SLC A has been initiated and is injecting into the RPV.</p>

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6 (cont.)Event Description: **LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>If directed, manually initiates Division 1 Suppression Pool Makeup IAW 04-1-01-E30-1, Suppression Pool Makeup System, Attachment V:</p> <ul style="list-style-type: none"> Place the Division 1 SPMU MODE SEL handswitch to AUTO Place the Division 1 SPMU DUMP TEST switch in TEST Depress both Division 1 SPMU MAN INIT pushbuttons <p>Verify suppression pool level is increasing.</p> <p>Report to CRS Division 1 Suppression Pool Makeup has been initiated.</p>
	ATC	<p>Verify Division 1 CTMT and DW hydrogen analyzers are operating and energize hydrogen igniters IAW 04-1-01-E61-1, Combustible Gas Control System, Attachment V:</p> <ol style="list-style-type: none"> VERIFY Running A CTMT AND A DW H2 Analyzers OR Start by PLACING handswitch to START. VERIFY the amber light ON for the 0 – 10% scale on recorder 1E61-R602A. ENSURE A CTMT AND A DW H2 Analyzers have been in service for > 60 sec. Verify A CTMT AND A DW H2 Concentration is < 2.9% AND THEN <ul style="list-style-type: none"> ENERGIZE Div 1 H2 Igniters by PLACING H2 IGNITER SYS A handswitch to ON. <p>Reports to CRS that Division 1 CTMT and DW hydrogen igniters are energized.</p>
	ATC	<p>Open 8 ADS/SRVs by placing the key-locked handswitch for the following valves to OPEN:</p> <ul style="list-style-type: none"> B21-F041K B21-F047L B21-F041F B21-F047A B21-F051C B21-F041D B21-F051A B21-F051B

(CT-2) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ. (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)

Op-Test No: NRC LOT 12-2017Scenario No: 3Event No: 5/6 (cont.)Event Description: LOP/LOCA/HPCS Pump Trip/Division 1 ECCS fails to automatically initiate (cont.)**ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	Notes	
		Return to Page 29 for completion of ATC actions.

INITIAL CONDITIONS

- A. Plant Status: 100% power, middle of cycle
- B. Tech. Spec. Limitations in effect: None
- C. Significant problems/abnormalities:
 - 1. TBCW Pump C is tagged out for motor oil replacement.
 - 2. CRD Pump B is tagged out of service for oil replacement in the speed increaser.
- D. Integrated Risk: Green
- E. Division Work Week: Division 2
- F. Evolutions/maintenance for the up-coming shift :
 - 1. Transfer RPS Bus B from normal to alternate power supply in preparation for maintenance on the RPS B Motor Generator.
 - 2. No scram or isolation surveillances are in progress or planned for this shift.

Facility: Grand Gulf Nuclear Station Scenario No.: 4 Op-Test No.: GGNS 12-2017

Examiners: _____ Operators: _____

Event No.	Malf. No.	Event Type [†]	Event Description
1	N/A	N (ATC,CRS)	Withdraw control rods to 10% Bypass Valve position
2	fw115a	C (ATC,CRS) A (CREW)	Condensate Pump B trip
3	pte22n654c_a	TS (CRS) I (BOP,CRS)	HPCS CST Level Lo trip unit failing high
4	fw124	C(ATC,CRS) A(CREW)	Startup Level Control controller failing downscale (Feedwater Malfunctions ONEP)
5	(or) di_r21m606a r21142u	TS (CRS) C(BOP,CRS) A (CREW)	ESF Transformer 11 trip with failure of 15BA4 to re-energize (Loss of AC Power ONEP)
6	ms066a ms183a ms184a	M (CREW)	Main Steam Tunnel steam leak with failure of one steam line to isolate * (CT-1) When MSIVs fail to isolate, manually scram the reactor and close the MSIVs prior to Steam Tunnel temperature exceeding 250°F (Max Safe Temperature)
7	b21f065b_i fw171b	M (CREW)	Feedwater Line B line break inside Drywell with B21-F065B power loss
8	e22052	C (ATC,CRS)	HPCS Pump Trip * (CT-2) Inhibit ADS prior to automatic ADS valve opening during a LOCA * (CT-3) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)
9	r21219	C (BOP,CRS)	LPSC logic power failure * (CT-4) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig
[†] (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (A)bnormal (TS) Tech Spec * Critical Task (As defined in NUREG 1021 Appendix D)			

CREW notation for Abnormal (A) and Major (M) events denotes ATC, BOP, and CRS are credited.

Objectives: To evaluate the applicants' ability to operate the facility in response to the following evolutions:

1. Withdraw control rods to 10% Bypass Valve position
2. Respond to Condensate Pump B trip.
3. Respond to a HPCS CST Level LO trip unit failing high.
4. Respond to a Startup Level Control controller failing downscale.
5. Respond to an ESF Transformer 11 trip with a failure of 15BA4 to re-energize.
6. Respond to an Main Steam Tunnel steam leak with failure of one steam line to isolate.
7. Respond to a Feedwater Line B line break inside the Drywell with B21-F065B power loss.
8. Respond to a HPCS Pump trip.
9. Respond to a LPCS logic power failure.

Initial Conditions:

- Reactor power is approximately 4% power
- Reactor pressure is 750 psig

Inoperable Equipment: None

Turnover:

- Reactor startup is in progress:
 - Step 45 of IOI 03-1-01-1, Attachment XV
 - Step 96 of Control Rod Movement Sequence is complete
 - SJAE B is in service
- Condensate System is lined up as follows:
 - Condensate Pumps A and C in service
 - Condensate Booster Pump C in service
 - Reactor Feed Pump A in service at approximately 950 psig discharge pressure
 - CFFF is in service
 - 4 Deep-Bed Condensate Demineralizers are in service
- Annunciators P680-4A2-C5, CONT ROD WITHDRAWAL BLOCK, and P680-4A1-A7, CRD DRIVE WTR TO RX ΔP HI, are flagged as expected annunciators

Planned activities for this shift are:

- Withdraw control rods until 10% Bypass Valve position on the lagging valve, then continue raising TURB STM PRESSURE DEMAND setpoint to 935 psig per step 45 of IOI 03-1-01-1, Attachment XV

Scenario Notes:

This scenario is a NEW Scenario.

Validation Time: 60 minutes

Quantitative Attributes Table

Attribute	E3-304-1 Target	Actual	Description
Malfunctions after EOP entry	1-2	2	<ul style="list-style-type: none"> • HPCS Pump Trip • LPCS Logic power failure
Abnormal Events	2-4	3	<ul style="list-style-type: none"> • Condensate Pump C trip (Feedwater Malfunctions ONEP) • Startup Level Control Controller fails downscale (Feedwater Malfunctions ONEP) • ESF Transformer 11 trip with failure of 15BA4 to re-energize (Loss of AC Power ONEP)
Major Transients	1-2	2	<ul style="list-style-type: none"> • Main Steam Tunnel steam leak with failure of one steam line to isolate • Feedwater Line B line break inside the Drywell with B21-F065B power loss
EOP entries requiring substantive action	1-2	3	<ul style="list-style-type: none"> • EP-4 • EP-2 • EP-3
EOP contingencies requiring substantive action	0-2	2	<ul style="list-style-type: none"> • EP-2 Alternate Level Control • EP-2 Emergency Depressurization
EOP based Critical Tasks	2-3	4	<ul style="list-style-type: none"> • (CT-1) When MSIVs fail to isolate, manually scram the reactor and close the MSIVs prior to Steam Tunnel temperature exceeding 250°F (Max Safe Temperature) • (CT-2) Inhibit ADS prior to automatic ADS valve opening during a LOCA • (CT-3) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ. (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task.) • (CT-4) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig
Normal Events	N/A	1	<ul style="list-style-type: none"> • Withdraw control rods to 10% Bypass Valve position
Reactivity Manipulations	N/A	0	<ul style="list-style-type: none"> • N/A
Instrument / Component failures	N/A	6	<ul style="list-style-type: none"> • Condensate Pump C trip • HPCS CST Level LO trip unit failing high • Startup Level Control controller failing downscale • ESF Transformer 11 trip with failure of 15BA4 to re-energize • HPCS Pump trip • LPCS logic power failure

Total Malfunctions	N/A	8	<ul style="list-style-type: none">• Condensate Pump C trip• HPCS CST Level LO trip unit failing high• Startup Level Control controller failing downscale• ESF Transformer 11 trip with failure of 15BA4 to re-energize• Main Steam Tunnel steam leak with failure of one steam line to isolate• Feedwater Line B line break inside the Drywell with a B21-F065B power loss• HPCS pump trip• LPCS logic power failure
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Top 10 systems and operator actions important to risk that are tested:

ADS (Event 7)

RHR (Event 9)

ESF Power (R20) (Event 5)

Condensate (Event 2)

Failure to manually depressurize with ADS/SRVs (Event 8)

Failure to align alternate power to 4.16 KV or 6.9KV buses (Event 5)

SCENARIO ACTIVITIES:

The plant is operating at 4% power during a reactor startup.

Event 1 - Withdraw control rods to 10% Bypass Valve position

After the crew assumes the shift, the ATC will withdraw control rods in accordance with Control Rod Movement Sequence.

Event 2 – Condensate Pump C trip (Triggered by Lead Examiner)

At the direction of the Lead Examiner, Condensate Pump C will trip. CRS will enter 05-1-02-V-7, Feedwater System Malfunctions ONEP, and direct ATC to start Condensate Pump B IAW SOI 04-1-01-N19-1.

Event 3 - HPCS CST Level Lo trip unit failing upscale (Triggered by Lead Examiner)

After actions of Condensate Pump C trip are complete, HPCS CST Level LO trip unit, E22-N654C, will fail high. CRS will direct BOP to transfer HPCS suction from CST to Suppression Pool. CRS will enter LCO 3.3.5.1 Condition A and, using Table 3.3.5.1-1, enter LCO 3.3.5.1 Condition D.

Event 4 - Startup Level Control controller failing downscale (Triggered by Lead Examiner)

After HPCS Pump suctions are swapped and Tech Specs addressed, the Startup Level Control Controller will begin failing low, resulting in RPV level lowering. ATC will take manual control of the Startup Level Controller and restore RPV level to normal band. CRS will enter 05-1-02-V-7, Feedwater System Malfunctions ONEP.

Event 5 – ESF Transformer 11 trip with failure of 15BA4 to re-energize (Triggered by Lead Examiner)

After RPV level is stabilized, ESF Transformer 11 will trip. Division 1 Diesel Generator will start and re-energize ESF Bus 15AA. CRS will enter 05-1-02-I-4, Loss of AC Power ONEP, 05-1-02-III-5, Automatic Isolations ONEP and 05-1-02-III-1, Inadequate Decay Heat Removal ONEP. BOP will restore Instrument Air to CTMT by opening P53-F001. BOP will recognize the failure of 15BA4 to re-energize. CRS will enter LCO 3.8.7, Condition A, for LCC 15BA4 failure.

NOTE: CRS is not expected to formulate plans for recovery of Fuel Pool Cooling and Cleanup or Reactor Water Cleanup systems within the time frame of this scenario.

Event 6 - Main Steam Tunnel steam leak with failure of one steam line to isolate (Triggered by Lead Examiner)

When ESF Bus 15AA has been re-energized and Tech Specs addressed, a steam leak in the Auxiliary Building Main Steam Tunnel will occur. The 'A' Steam Line will fail to isolate. The CRS will enter EP-4 and direct the ATC to manually scram the reactor and the BOP to manually close B21-F022A, INBD MSIV, and B21-F028A, OTBD MSIV (**CT-1**). When the reactor is scrammed, the CRS will enter EP-2.

Event 7 - Feedwater Line B line break inside Drywell with B21-F065B power loss (Triggered automatically)

When the reactor is scrammed, an unisolable Feedwater Line 'B' break in the Drywell will occur. The BOP will secure all Condensate Pumps and close B21-F065B, FW INL SHUTOFF VLV. B21-F065B will not close due to a power loss when its CLOSE handswitch is depressed.

Event 8 – HPCS Pump Trip (Triggered automatically)

When Drywell pressure reaches 1.39 psig, HPCS Pump will trip and ESF Bus 16AB will lockout after 5 minutes. When CRS determines there are insufficient high pressure injection sources to maintain RPV level above -160" wide, enters Alternate Level Control contingency of EP-2. Crew will inhibit ADS to prevent automatic operation **(CT-2)**. When RPV level lowers to -160" wide range, the crew will emergency depressurize the RPV using ADS/SRVs **(CT-3)** and restore RPV level with Division 1 ECCS systems.

Event 9 - LPCS logic power failure (Triggered automatically)

When Drywell pressure rises to 1.39 psig, a LPCS logic power failure will occur. Crew will respond using ARI 04-1-02-1H13-P601-21A-H8, LPCS SYS OOSVC, and manually align Div 1 ECCS systems for injection to the RPV **(CT-4)**.

The exercise ends when emergency depressurization is complete and RPV level restoration is being controlled.

Critical Task	(CT-1) When MSIVs fail to isolate, manually scram the reactor and close the MSIVs prior to Steam Tunnel temperature exceeding 250°F (Max Safe Temperature)	(CT-2) Inhibit ADS prior to automatic ADS valve opening during a LOCA
EVENT	6	8
Safety Significance	<p>If a primary system is discharging into the secondary containment when this step of the procedure is reached, one of three conditions must exist:</p> <ul style="list-style-type: none"> • A primary system break cannot be isolated because system operation is required to assure adequate core cooling or to shut down the reactor. • No isolation valves exist upstream of a primary system break, or if isolation valves do exist, they cannot be closed because of some mechanical/ electrical/pneumatic failure. • The source of the discharge cannot be determined. <p>Since the RPV is the only significant source of heat, other than a fire, which might cause area temperatures to increase to their maximum safe operating values, the action of manually scrambling the reactor should terminate increasing secondary containment temperatures.</p> <p>If temperatures in any one of the areas listed in Table SC-1 of the Secondary Containment Control guideline approach their maximum safe operating value, adequate core cooling, containment integrity, safety of personnel, or continued operability of equipment required to perform EPG actions can no longer be assured.</p>	<p>Permitting automatic ADS initiation may be undesirable for the following reasons:</p> <ul style="list-style-type: none"> • ADS actuation can impose a severe thermal transient on the RPV and may complicate efforts to control RPV water level. • If only steam-driven systems are available for injection, ADS actuation may directly lead to loss of adequate core cooling and subsequent core damage. • The conditions assumed in the design of the ADS actuation logic (e.g., no operator action for 115 seconds after event initiation) may not exist when the actions specified in this step are being performed. • The operating crew can draw on much more information than is available to the ADS logic (e.g., equipment out of service for maintenance, operating experience with certain systems, probability of restoration of off-site power, etc.) and can better judge, based on instructions contained in the EPGs/SAGs, when and how to depressurize the RPV. <p>Defeating the logic relieves the operating crew of the task of detecting timer initiation during execution of the more complex steps of Contingency #1 and precludes unnecessary and unwanted automatic initiations. Subsequent steps provide explicit and detailed instructions for controlling RPV water level and specify when emergency depressurization is appropriate.</p>
Cueing	<p>Main Steam Tunnel temperature rising on PDS.</p> <p>Main Steam Tunnel temperature alarms on panel P601.</p> <p>MSIV open position indication on panel P601 and panel P858.</p>	Step L-5 of EP-2, RPV CONTROL, Alternate Level Control Contingency
Performance Indicator	<p>Operator places the Reactor Mode Switch to SHUTDOWN on panel P680.</p> <p>Operator manipulates switches for MSIVs for Steam Line 'A' to CLOSE on panel P601.</p>	Manipulation of ADS A and ADS B MANUAL INHIBIT switches on panel P601 vertical section.
Performance Feedback	<p>RPS Group lights de-energized on panel P680.</p> <p>Control Rod full –in indication on panel P680.</p> <p>Reactor power trend on nuclear instrumentation on panel P680.</p> <p>Green light indication energized and red light indication off for MSIVs for Steam Line 'A' on panel P601 and P858.</p>	<p>Inhibit switches click into INHIBIT position on panel P601 vertical section.</p> <p>White indicating light on ADS A and ADS B MANUAL INHIBIT switches illuminate.</p> <p>Receipt of ADS/SRV A and ADS/SRV B OOSVC alarms on panel P601/18A-H2 and P601/19A-H2.</p>
Justification for the chosen performance limit	If temperatures in any one of the areas listed in Table SC-1 of the Secondary Containment Control guideline approach their maximum safe operating value, adequate core cooling, containment integrity, safety of personnel, or continued operability of equipment required to perform EPG actions can no longer be assured.	The 115 second ADS timer allows sufficient time for the crew to recognize and override automatic operation of the system. As long as ADS is inhibited before ADS valves open, reactor pressure will not be reduced.
BWR Owners Group Appendix	App. B, step SC/T-4 and SC/T-4.1	App. B, step C1-1

Licensed Bases Documents	02-S-01-40, EP Technical Bases, Attachment VII, Step 8 through 10 UFSAR Chapter 15.6.4	02-S-01-40, EP Technical Bases, Attachment IV, Step L-5 UFSAR Chapter 15A.6.5.3
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Critical Task	(CT-3) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)	(CT-4) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig
EVENT	8	9
Safety Significance	The MSCWL is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. When water level decreases below MSCWL with injection, clad temperatures may exceed 1500°F.	Failure to recognize the auto initiation not occurring, and failure to take manual action per Conduct of Ops will result in unavailability of safety-related equipment necessary to provide adequate core cooling, otherwise resulting in core damage and a large offsite release.
Cueing	Wide range indication (SPDS and PDS) falls to -160" and lowering trend continues, and, before -160" wide range is reached, initial conditions, field reports, and control room indications convey that adequate high pressure injection cannot be restored before level falls below -191" CFZ.	Indication of ECCS systems not initiating with initiation conditions present: <ul style="list-style-type: none"> • Indication of Drywell pressure ≥ 1.39 psig or RPV level ≤ -150.3" wide range • White light on LPCS/RHR A INIT RESET pushbutton extinguished on panel P601 • Green light on and red light extinguished on LPCS and RHR A pump handswitches on panel P601 • LPCS SYS OOSVC annunciator on panel P601
Performance Indicator	Manipulation of seven of the eight ADS/SRVs on panel P601: B21-F041K B21-F047L B21-F041F B21-F047A B21-F051C B21-F041D B21-F051A B21-F051B	Operator manually manipulates switches for Div 1 ECCS pumps and directs operators to manually open Div 1 ECCS injection valves from Division 1 Remote Shutdown Panel (RHR A) and locally (LPCS).
Performance Feedback	Crew will observe ADS/SRV light indication go from green to red, reactor pressure lowering on SPDS and panel P601 indications.	Red light on and green light extinguished on LPCS and/or RHR A pump and valve handswitches on panel P601. Rising level trend on indications on panel P601, PDS and SPDS. Rising flow rate on LPCS and/or RHR A flow indicators on panel P601, PDS, and SPDS
Justification for the chosen performance limit	The MSCWL (-191" CFZ) is the lowest RPV water level at which the covered portion of the reactor core will generate sufficient steam to preclude any clad temperature in the uncovered portion of the core from exceeding 1500°F. Emergency depressurization is allowed when level goes below TAF (-160" wide range) and should be performed, if in the judgment of the CRS, level cannot be maintained above -191" CFZ. Since it is intended for the scenario supporting this CT to, early in the event, clearly indicate no high pressure injection systems can be made available to reverse the lowering level trend, the crew will have time to communicate and open 7 of 8 ADS/SRVs before -191" CFZ.	Attempting to align high pressure ECCS systems must be performed to determine their availability by the time TAF is reached in order to properly implement EP-2 decision steps regarding restoring and maintaining RPV level. Attempting to align low pressure ECCS systems can only be done once RPV pressure falls below the injection valve RPV pressure permissive and will only be effective once RPV pressure falls below the shutoff head of the respective ECCS pump. The reduction in RPV pressure will normally be via Emergency Depressurization, which is a separate critical task bounded by a minimum RPV level.
BWR Owners Group Appendix	App. B, Contingency #1 Step C1-4	App. B, Contingency 1, step C1-3
Licensed Bases Documents	02-S-01-40, EP Technical Bases, Attachment IV, Step L-7 – through L-13 UFSAR Chapter 15A.6.5.3	02-S-01-40, EP Technical Bases, Attachment IV, Step L-14 UFSAR Chapter 15A.6.5.3

Simulator Setup:

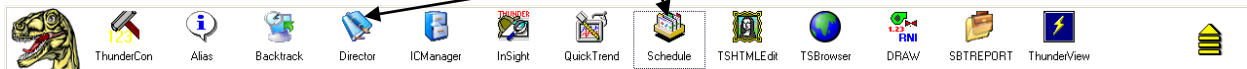
A. Initialization

1. Log off all simulator PDS and SPDS computers (PDS and SPDS must come up after the simulator load for proper operation).
2. Startup the simulator using Simulator Instructor's Job Aid section 7.3.

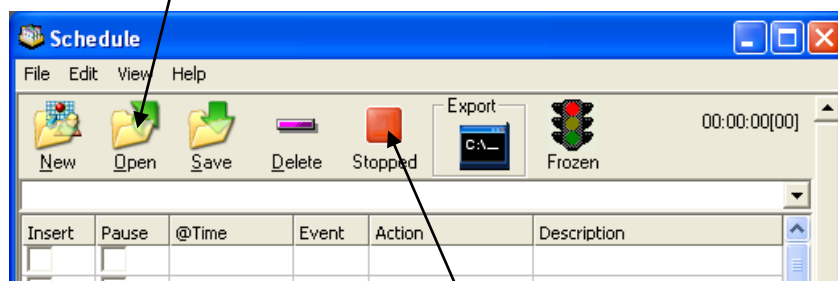
Note:

Prior to running the Schedule File, ensure no Event Files are Open. If an existing Event File is Open prior to running the Schedule File, then any associated Event Files will not automatically load.

3. Open Schedule.exe and Director.exe by clicking on the Icon in the Thunder Bar.

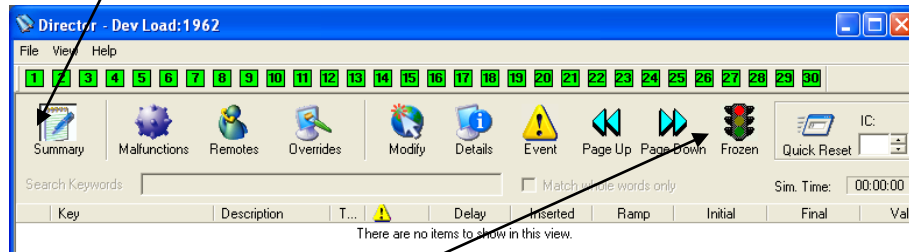


4. Set the Simulator to **IC-103** and perform switch check (Using Quick Reset in Director).
5. Click on "**Open**" in the Schedule window and Open Schedule File "**12-2017 NRC Exam Scenario 4.sch**" (in the Schedule Directory)



6. In Schedule window, click on the "**Stopped**" red block. The red block will change to a green arrow and indicate the scenario is active ("**Running**").

7. Click the Summary tab in the Director window. Verify the schedule files are loaded and opened per Section B below. (Note: Any actions in the schedule file without a specific time will not load into the director until triggered.)



8. Take the simulator out of freeze.
9. Log on to all simulator PDS and SPDS computers.
10. Verify or perform the following:
- IC-103
 - Ensure the correct rod movement sequence available at the P680 and marked up through Step 96 complete
 - Ensure all procedures are marked as indicated for turnover conditions
 - Set IRM recorder scales
 - Advance all chart recorders and ensure all pens inking properly
 - Clear any graphs and trends off of SPDS
 - Place a tape flag on annunciator P680-4A2-C5, CONT ROD WITHDRAWAL BLOCK
 - Place a tape flag on annunciator P680-4A1-A7, CRD DRIVE WTR TO RX ΔP HI
 - Place red tag on Generator Disconnect pushbutton
11. Run through any alarms and ensure alarms are on. (**Note: On T-Rex, to verify alarms are ON, the indicator will indicate “Alarms On”**).
12. Place the simulator in Freeze.

File loaded verification:

Schedule - 12-2017 NRC Scenario 4.sch

File Edit View Help

New Open Save Delete Running Export Running

00:00:09[00]

Insert	Pause	@Time	Event	Action	Description
				^ 12-2017 NRC Scenario 4	
				^Event 1 - NORMAL - Withdraw Control Rods to 10% Bypass Valve Po	
				^ Event 3 - INSTRUMENT - CST Level LO trip unit fails upscale	TS 3.3.5.1.D
✓		00:00:03		Insert malfunction PTE22N654C_a on event 3	override (falls high)
				^ Event 2 - COMPONENT - Condensate Pump C Trip	ABNORMAL (FW Malfunction)
✓		00:00:03		Insert malfunction fw115c on event 2	Condensate Pump C Trip
				^ Event 5 - COMPONENT - ESF 11 Lockout	ABNORMAL (Loss of AC & Isolation ONEP) TS 3.8.7.A
✓		00:00:03		Insert malfunction r21133a on event 5	Service Transformer 11 Lockout
✓		00:00:03		Insert malfunction r21142u on event 5	480 V Bus 15BA4 Overcurrent Trip
✓		00:00:03		Insert malfunction n41140a on event 5	Emergency Diesel Generator A Fail to Start
				^ Event 4 - COMPONENT - Startup Level Controller fails low	ABNORMAL (FW Malfunctions)
✓		00:00:03		Insert malfunction fw274 to 4.5 in 180 on event 4	Feedwater Startup level Controller Fails Open (0-100%)
				^ Event 6 - MAJOR - Aux Strm Tunnel leak with MSIVs fail to close	
✓		00:00:03		Insert malfunction ms066a to 0.50000 on event 6	Steam Leak in Aux Bldg Tunnel: MSL A
✓		00:00:03		Insert malfunction ms183a	INBD MSIV 1B21-F022A, OVER-RIDE (fail as is)
✓		00:00:03		Insert malfunction ms184a	OTBD MSIV 1B21-F028A, OVER-RIDE (fail as is)
✓		00:00:03		Create event 29 iodb21m601a(1) == 1	INBD MSIV F022A HS to CLOSE
			29	Delete malfunction ms183a	INBD MSIV 1B21-F022A, OVER-RIDE (fail as is)
✓		00:00:03		Create event 28 iodb21m602a(1) == 1	OTBD MSIV F028A HS to CLOSE
			28	Delete malfunction ms184a	OTBD MSIV 1B21-F028A, OVER-RIDE (fail as is)
				^ Small Recirc Line Break LOCA - MAJOR	
✓		00:00:03		Insert malfunction rr063a to 2.00000 on event 7	Recirc Loop A Non-Isolable Suction Rupture
				^ Event 7 - COMPONENT - FW Line Break in DW w/F065B power loss	
✓		00:00:03		Insert malfunction b21F065b_j	override (loss of power when stroke)
✓		00:00:03		Insert malfunction fw171b to 50.00000 on event 7	Feedwater Line B ruptures inside Drywell.

Execute: Insert remote c11647 to RESET on event 8
Execute: Create event 24 zd1(645) == 1
Execute: Create event 25 xcr441n048 > 160
Execute: Insert malfunction e22052 on event 26
Execute: Insert malfunction r21139f after 300 on event 26

Schedule - 12-2017 NRC Scenario 4.sch

File Edit View Help

New Open Save Delete Running Export Running

00:01:12[00]

Insert	Pause	@Time	Event	Action	Description
				^ Event 8 - COMPONENT - LPCS Logic Power Failure	
✓		00:00:03		Create event 26 xapt_dw_press > 1.39	
✓		00:00:03		Insert remote r21219 to OPEN on event 26	DC TO LPCS BKR 72-11A18 CONTROL
				^ 16 Bus Lockout	
✓		00:00:03		Insert malfunction r21139f after 300 on event 26	4160 V Bus 16AB Overcurrent Trip
				^Event 8 - HPCS Pump trip	
✓		00:00:03		Insert malfunction e22052 on event 26	High Pressure Core Spray Pump Trip
				^ Modify Steam Leak after alarm	
✓		00:00:03		Create event 25 xcr4t41n048 > 160	MN STM TNL AMBIENT TEMP HI alarm setpoint
			25	Modify malfunction ms066a to 0.30000	Steam Leak in Aux Bldg Tunnel: MSL A
				^ Modify Steam Leak after scram	
✓		00:00:03		Create event 24 zdl1(645) == 1	
			24	Modify malfunction ms066a to 0.80000 in 120	Steam Leak in Aux Bldg Tunnel: MSL A
				^ Reset RC&IS	
✓		00:00:03		Insert remote c11647 to RESET on event 8	RC&IS Reset
				^ Manually opening E21-F005 LPCS INJ VLV	
			9	Ramp E22VFM(1) to 1 in 90	
			10	Ramp E22VFM(1) to 0 in 90	

Execute: Insert remote c11647 to RESET on event 8
Execute: Create event 24 zdl1(645) == 1
Execute: Create event 25 xcr4t41n048 > 160
Execute: Insert malfunction e22052 on event 26
Execute: Insert malfunction r21139f after 300 on event 26

Ready

Director - Dev Load:1962

File View Help

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Summary Malfunctions Remotes Overrides Modify Details Event Page Up Page Down Running Quick Reset IC: 103

Search Keywords Match whole words only Sim. Time: 00:02:48

Key	Description	T...	Delay	Inserted	Ramp	Initial	Final	Value
PTE22N654C_a	override (fails high)	3	00:00:00		00:00:00		Active	InActive
fw115c	Condensate Pump C Trip	2	00:00:00		00:00:00		Active	InActive
r21133a	Service Transformer 11 Lockout	5	00:00:00		00:00:00		Active	InActive
r21142u	480 V Bus 15BA4 Overcurrent Trip	5	00:00:00		00:00:00		Active	InActive
n41140a	Emergency Diesel Generator A Fail to Start	5	00:00:00		00:00:00		Active	InActive
fw274	Feedwater Startup level Controller Fails Open (0-100%)	4	00:00:00		00:03:00		4.5	34.0008
ms066a	Steam Leak in Aux Bldg Tunnel: MSL A	6	00:00:00		00:00:00		0.5	0
ms183a	INBD MSIV 1821-F022A, OVER-RIDE (fail as is)		00:00:00	00:00:03	00:00:00		Active	Active
ms184a	OTBD MSIV 1821-F028A, OVER-RIDE (fail as is)		00:00:00	00:00:03	00:00:00		Active	Active
rr063a	Recirc Loop A Non-Isolable Suction Rupture	7	00:00:00		00:00:00		2	0
b21f065b_i	override (loss of power when stroke)		00:00:00	00:00:03	00:00:00		Active	Active
fw171b	Feedwater Line B ruptures inside Drywell.	7	00:00:00		00:00:00		50	0
r21139f	4160 V Bus 16AB Overcurrent Trip	26	00:05:00		00:00:00		Active	InActive
e22052	High Pressure Core Spray Pump Trip	26	00:00:00		00:00:00		Active	InActive
r21219	DC TO LPCS BKR 72-11A18 CONTROL	26	00:00:00		00:00:00		OPEN	CLOSE
c11647	RCIS Reset	8	00:00:00		00:00:00		RESET	NORM

Ready

Procedures that may be used in this scenario:

Procedure No.	Rev	Procedure Title
03-1-01-IOI-1	172	Cold Shutdown To Generator Carrying Minimum Load
04-1-01-C11-1	154	Control Rod Drive Hydraulic System
04-1-01-C41-1	123	Standby Liquid Control System
04-1-01-E12-1	147	Residual Heat Removal System
04-1-01-N21-1	74	Feedwater System
04-1-01-N32-2	33	Turbine Generator Control
04-1-01-R21-17	10	ESF Bus 17AC
04-1-02-1H13-P601	161	Alarm Response Instruction Panel No.: 1H13-P601
04-1-02-1H13-P680	233	Alarm Response Instruction Panel No.: 1H13-P680
04-1-02-1H13-P864	31	Alarm Response Instruction Panel No.: 1H13-P864
04-1-02-1H13-P870	154	Alarm Response Instruction Panel No.: 1H13-P870
04-S-02-SH13-P807	32	Alarm Response Instruction Panel No.: SH13-P807
05-1-02-I-1	130	Reactor Scram
05-1-02-I-2	37	Turbine and Generator Trips
05-1-02-I-4	51	Loss of AC Power
05-1-02-III-3	115	Reduction In Recirculation System Flow Rate
05-1-02-III-5	49	Automatic Isolations
05-1-02-IV-1	117	Control Rod / Drive Malfunctions
05-S-01-EP-1	36	Emergency / Severe Accident Procedure Support Documents
05-S-01-EP-2	45	RPV Control
Tech Spec 3.1.3		
Tech Spec 3.8.1		
Tech Spec TR6.3.7		

SCENARIO ACTIVITIES:

- Start SBT report and any other required recording devices.

Op-Test No: <u>NRC LOT 12-2017</u>		Scenario No: <u>4</u>	Event No: <u>1</u>
Event Description: <u>Withdraw control rods to 10% Bypass Valve position</u>			
NOTE to Examiner: Obtaining 10% Bypass Valve position is not required to satisfy this event. Next event can be triggered when Examiner is satisfied with the applicants' performance.			
TIME	Position	Applicant's Actions or Behavior	
	ATC	Withdraw control rods IAW the approved Control Rod Movement Sequence, starting at Step 97, and 04-1-01-C11-2, Rod Control and Information System, until all Main Turbine Bypass Valves are 10% open	
		4.3.2.a SELECT either INDIVIDUAL OR GANG DRIVE mode USING DRIVE MODE pushbutton on OCM AND CHECK that SELECTED DRIVE mode indicating comes ON	
		4.3.2.b SELECT rod/rod gang to be moved by DEPRESSING corresponding ROD SELECT pushbuttons on Rod Select panel on 1H13-P680	
		4.3.2.c CHECK rod position(s) is displayed for selected rod/rod gang on RDM	
		4.3.2.d CHECK that selected rod/rod gang is allowed to be withdrawn by RPC BY: <ul style="list-style-type: none"> • OBSERVING WITHDRAW BLOCK light is OFF OR • DEPRESSING WITHDRAW OK pushbutton on OCM OR • OBSERVING a green status light on RDM for that rod/rod gang 	
		4.3.2.e MOMENTARILY DEPRESS WITHDRAW pushbutton AND OBSERVE the following: <ol style="list-style-type: none"> (1) The IN light energizes momentarily, THEN goes Off (2) The DATA FAULT light <u>May</u> flash On, THEN Off IF RAW DATA is selected (3) The OUT light <u>Will</u> come On, THEN go Off (4) SETTLE light comes On for approximately 6.0 seconds (5) ROD/GANG position on RDM shows new ROD/GANG position (6) MONITOR nuclear instrumentation for changes in indication 	
		4.3.2.g WITHDRAW each rod/rod gang in accordance with selected sequence provided by Reactor Engineering	
	ATC	Monitors position of Bypass Control Valves during control rod movement	
	BOP	Peer checks Control Rod selection while monitoring reactor parameters	

Op-Test No: <u>NRC LOT 12-2017</u>			Scenario No: <u>4</u>			Event No: <u>1 (cont.)</u>		
Event Description: <u>Withdraw control rods to 10% Bypass Valve position (cont.)</u>								
TIME	Position	Applicant's Actions or Behavior						
		END OF EVENT						
	Notes							
	Lead Examiner: Cue to proceed to the next event.							

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 2Event Description: **Condensate Pump C trip****At the direction of the Lead Examiner, trigger Event 2 to cause the Condensate Pump C to trip.**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Respond to alarm P680-1A-A3, CNDS PMP C TRIP and report to CRS</p> <p>3.2 Start an idle Condensate pump, if available</p> <p>3.3 Monitor N19-R609, CNDS BST PMP SUCT HDR PRESS, on 1H13-P680-1B</p> <p>3.4 Reduce Reactor Power as necessary to maintain Condensate Booster pump suction pressure > 100 psig or to stabilize Feedwater flow</p> <p>3.5 Refer to ONEP 05-1-02-V-7, Feedwater System Malfunctions</p> <p>4.1 Close 1N19-F024C, CNDS PMP C DISCH VLV, on 1H13-P680</p> <p>4.2 Identify and correct cause of pump trio</p>
	CRS	<p>Enters ONEP 05-1-02-V-7, Feedwater Malfunctions</p> <p>3.5 START standby Condensate, Condensate Booster, AND Reactor Feed Pumps as necessary per applicable SOI</p> <p>Directs ATC to start Condensate Pump B IAW SOI 04-1-01-N19-1, Section 4.3</p>
	ATC	<p>Starts Condensate Pump B IAW SOI 04-1-01-N19-1, Section 4.3:</p> <p>4.3.2.a(3) To prevent damaging Condensate Pump discharge pressure indicator (PI-R002B), CLOSE the Instrument Isolation valve for the pressure indicator associated with the Condensate pump to be started</p> <p>Dispatch plant operator to close Condensate Pump B discharge pressure indicator, PI-R002B, Instrument Isolation valve</p> <p>NOTE to Examiners: Step 4.3.2.a(3) may be N/A'd by the CRS.</p> <p>4.3.2.a(4) START Condensate Pump C003B by DEPRESSING CNDS PMP B START pushbutton</p> <p>4.3.2.a(5) AFTER a five-second time delay, Condensate Pump Discharge Valve F024B <u>Will</u> open</p> <p>(a) IF it did NOT OPEN, THEN OPEN valve by DEPRESSING CNDS PMP B DISCH VLV-JOG OPEN pushbutton</p> <p>4.3.2.a(6) CHECK discharge pressure is approximately 250 psig on CNDS PMP DISCH HDR PRESS indicator, PI-R607</p> <p>4.3.2.a(7) CHECK total condensate flow by observing CNDS PMPS MIN FLO indicator FI-R621, for minimum pump flow indication ≥ 5.0 mlbm/hr for 2-pump operation OR ≥ 7.5 mlbm/hr for 3-pump operation</p> <p>4.3.2.a(9) OPEN Condensate Pump discharge pressure indicator (PI-R002B) Instrument Isolation valve, which was closed in Step 4.3..2.a(3)</p>

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 2 (cont.)Event Description: **Condensate Pump C trip (cont.)**

TIME	Position	Applicant's Actions or Behavior
	BOOTH	<p>If contacted to close Condensate Pump B discharge pressure indicator, PI-R002B, Instrument Isolation valve, after 2 minutes report as plant operator that valve is closed</p> <p>If contacted to open Condensate Pump B discharge pressure indicator, PI-R002B, Instrument Isolation valve, after 1 minutes report as plant operator that valve is open</p>
	CREW	<p>Dispatch plant operator / electrical maintenance to investigate Condensate Pump C trip</p> <p>Dispatch plant operator to perform post-start checks on Condensate Pump B</p>
	BOOTH	<p>If contacted, after 3 minutes report as plant operator that breaker 152-1409 for Condensate Pump C has tripped on timed overcurrent and electrical maintenance is investigating</p> <p>If contacted, after 2 minutes report as plant operator that post-start checks on Condensate Pump B are satisfactory</p>
		END OF EVENT
	Notes	
	Lead Examiner: Cue to proceed to the next event	

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 3Event Description: **HPCS CST Level Lo trip unit failing upscale****At the direction of the Lead Examiner, trigger Event 3 to cause the HPCS CST Level Lo trip unit to fail upscale**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Respond to alarm P601-16A-H5, HPCS SYS OOSVC and report to CRS</p> <p>3.1 IDENTIFY the problem from the amber status lights</p> <p>Report TRIP UNIT IN CAL/GR FAIL status light energized on P601-16B</p> <p>3.2 ATTEMPT to determine the cause of the status alarm</p> <p>Checks status of HPCS trip units on panel P625 and determine trip unit E22-N654C, CST LEVEL LO, is in gross fail high</p> <p><i>May reset gross fail on trip unit, but trip unit will still indicate upscale high</i></p>
	CREW	Contacts I&C to troubleshoot problem with trip unit E22-N654C, CST LEVEL LO
	BOOTH	If contacted, as I&C report that trip unit E22-N654C is failed full upscale and a Condition Report will be required to troubleshoot
	CRS TS	<p>Enters LCO 3.3.5.1, Condition A</p> <ul style="list-style-type: none"> One or more required channels inoperable <p>References Table 3.3.5.1-1 and enters LCO 3.3.5.1, Condition D. Required actions are:</p> <p style="text-align: center;">NOTE</p> <p>Only applicable if HPCS pump suction is not aligned to the suppression pool</p> <p>D.1 Declare HPCS inoperable within 1 hour from discovery of loss of HPCS initiation capability</p> <p>AND</p> <p>D.2.1 – Place trip unit E22-N654C, CST LEVEL LO, in trip condition within 24 hours</p> <p style="text-align: center;">OR</p> <p>D.2.2 – Align the HPCS pump suction to the suppression pool within 24 hours.</p>
	CRS	Directs BOP to align HPCS pump suction to the suppression pool

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 3 (cont.)Event Description: **HPCS CST Level Lo trip unit failing upscale (cont.)**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Aligns HPCS pump suction to the suppression pool per SOI 04-1-01-E22-1, Section 5.4:</p> <p>5.4.2.a PLACE HPCS MOV TEST handswitch on 1H13-P601-16B to TEST position</p> <p>5.4.2.b VERIFY that "HPCS SYS OOSVC" annunciator (1H13-P601-16A-H5) alarms</p> <p>5.4.2.c VERIFY that status light HPCS MOV IN TEST STATUS (1H13-P601-16B) comes On</p> <p>5.4.2.d CHECK E22-F001, HPCS PMP SUCT FM CST, is OPEN</p> <p>5.4.2.e CHECK E22-F015, HPCS PMP SUCT FM SUPP POOL, is CLOSED</p> <p>5.4.2.f OPEN E22-F015, HPCS PMP SUCT FM SUPP POOL</p> <p>5.4.2.g WHEN E22-F015 was OPENED, THEN ENSURE E22-F001, HPCS PMP SUCT FM SUPP POOL, CLOSED</p> <p>5.4.2.h PLACE HPCS MOV TEST handswitch on 1H13-P601-16B to NORM position</p> <p>5.4.2.i VERIFY that "HPCS SYS OOSVC" annunciator (1H13-P601-16A-H5) clears</p> <p>5.4.2.j VERIFY that status light HPCS MOV IN TEST STATUS (1H13-P601-16B) goes OFF</p> <p>NOTE to Examiners: HPCS SYS OOSVC annunciator will not clear unless trip unit gross fail is reset</p>
		END OF EVENT
	Notes	
	Lead Examiner: Cue to proceed to the next event	

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 4Event Description: **Startup Level Control controller failing downscale****At the direction of the Lead Examiner, trigger Event 4 to cause the Startup Level Control controller to begin failing downscale**

TIME	Position	Applicant's Actions or Behavior
	BOP	Recognize and report Startup Level Control Valve controller failing downscale
	CRS	<p>Enters ONEP 05-1-02-V-7, Feedwater Malfunctions</p> <p>2.2 IF Feedwater System Controller malfunction has occurred, THEN PLACE affected controller in MANUAL AND OPERATE as necessary to control reactor water level</p> <p>Directs ATC to place Startup Level Control controller in MANUAL and control RPV level between +32 inches and + 42 inches narrow range</p>
	ATC	Places Startup Level Control controller in MANUAL and operates as necessary in MANUAL to control RPV level between +32 inches and +42 inches narrow range IAW ONEP 05-1-02-V-7, Feedwater Malfunctions
	CREW	Contacts Work Control/I&C to investigate failure of Startup Level Control Valve controller
	BOOTH	If contacted, as I&C report after 3 minutes that Startup Level Control Valve controller will require a Condition Report for troubleshooting
		END OF EVENT
	Notes	
	Lead Examiner: Cue to proceed to the next event	

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 5

Event Description: **ESF Bus 15AA feeder breaker trip with failure of 15BA4 to re-energize**
At the direction of the Lead Examiner, trigger Event 5 to cause a ESF Bus 15AA feeder breaker trip and 15BA4 failure to re-energize

TIME	Position	Applicant's Actions or Behavior
	BOP	Respond and report ESF Transformer 11 trip and loss of power to ESF Bus 15AA Verifies Division 1 Diesel Generator has started is supplying ESF Bus 15AA Verifies that ESF Bus 15AA voltage returns to normal
	CRS	Enters ONEP 05-1-02-I-4, Loss of AC Power Enters ONEP 05-1-02-III-5, Automatic Isolations Directs BOP to perform applicable subsequent actions of 05-1-02-I-4, Loss of AC Power ONEP Directs BOP to recover systems per 05-1-02-III-5, Automatic Isolations ONEP
	CREW	Dispatch plant operator / electrical maintenance to investigate trip of ESF Transformer 11. Dispatch plant operator to monitor operation of Division 1 Diesel Generator.
	ATC	Recognize and report RC&IC Channel 1 inoperative Recognize and report loss of Fuel Pool Cooling and Cleanup system Recognize and report loss of Reactor Water Cleanup system
	CRS	Enters Inadequate Decay Heat Removal ONEP, 05-1-02-III-1, for loss of spent fuel pool cooling NOTE to Examiners: The CRS may direct frequent monitoring of spent fuel pool temperature but is not expected to formulate plans for recovery of FPCCU or RWCU within the time frame of this scenario
	CREW	Contacts I&C to reset RC&IS Channel 1
	BOOTH	If contacted as I&C to reset RC&IS, after 3 minutes trigger Event 7, then report to Control Room that RC&IS is reset If dispatched, as operator, after 3 minutes, report that ESF Transformer 11 has tripped on sudden pressure. Electrical Maintenance is generating a Condition Report to troubleshoot

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 5 (cont.)Event Description: **ESF Bus 15AA feeder breaker trip with failure of 15BA4 to re-energize (cont.)**

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Performs applicable subsequent actions of 05-1-02-I-4, Loss of AC Power ONEP</p> <p>3.1.2 IF the affected bus is re-energized, THEN RECOVER systems as follows:</p> <p>a. RESTORE Instrument Air and Plant Service Water per Attachment II of ONEP 05-1-02-III-5, Automatic Isolations</p> <p>Per Attachment II of ONEP 05-1-02-III-5, Automatic Isolations:</p> <p>Restore Auxiliary Building Isolations as follows:</p> <p>1) IF Plant Air Compressors are available, THEN OPEN/CHECK OPEN the following Instrument Air valves on 1H13-P870:</p> <p><u>Section 3C</u></p> <ul style="list-style-type: none"> P53-F001 (After 30 sec T.D.) <p>2) N/A</p> <p>3) N/A</p> <p>4) The following valves <u>Will NOT</u> close due to being gagged open. As time permits, give these valves an <u>OPEN</u> signal to lift actuator off of gag</p> <p><u>Section 3C</u></p> <ul style="list-style-type: none"> P53-F026A <p>b. RESTORE other systems per ONEP 05-1-02-III-5, Automatic Isolations</p> <p>Restores system from isolations due to loss of Div 1 power per 05-1-02-III-5, Automatic Isolations ONEP Attachment I and subsequent actions and respective system SOIs</p> <p>Systems include:</p> <ul style="list-style-type: none"> P45, Floor and Equipment Drains System P11, Condensate and Refueling Water Transfer System T41, Auxiliary Building Ventilation System T42, Fuel Pool Ventilation System P52, Service Air System P21, Makeup Water Treatment System P66, Domestic Water System <p>NOTE to Examiners: Not all systems will be restored during the timeframe of this scenario</p>

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 5 (cont.)Event Description: **ESF Bus 15AA feeder breaker trip with failure of 15BA4 to re-energize (cont.)**

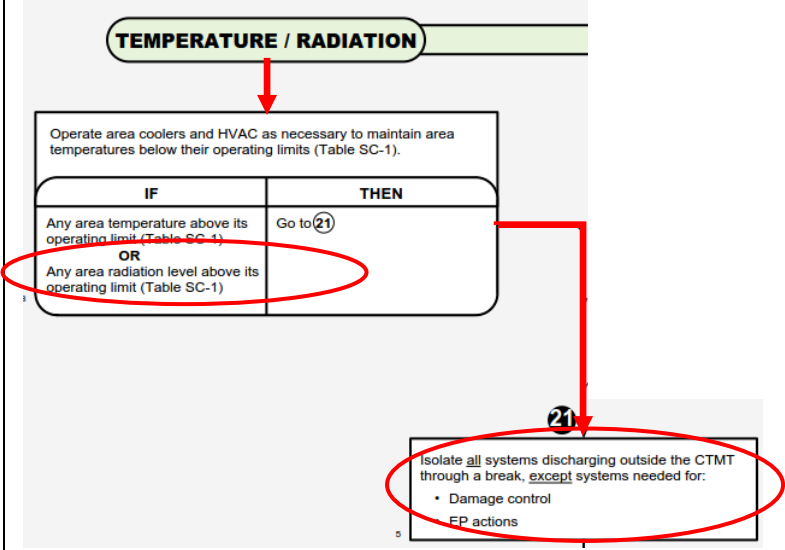
TIME	Position	Applicant's Actions or Behavior
	BOP	<p>3.1.5 IF Aux building isolation dampers closed on loss of power, THEN DEPRESS SGTS DIV 1(2) MAN INIT pushbuttons (A AND C for Division 1, B AND D for Division 2)</p> <p>3.1.7 IF a diesel generator is running, THEN periodically MONITOR the emergency diesel generator locally</p> <p>Dispatch plant operator to monitor Division 1 Diesel Generator</p> <p>3.1.8 On 1H13-P601, RESET respective DIV 1(2) NSSSS isolation logic, IF possible</p> <p>3.1.12 NOTIFY Chemistry to ensure SGTS Sping AND AXM Radiation Monitors are functioning correctly after loss of power</p>
	BOP	Recognizes and reports failure of MCC 15BA4 to re-energize
	CRS	<p>Directs BOP to evaluate Control Room panels to determine what equipment is affected by the loss of 15BA4</p> <p>Uses SOI 04-1-01-R21-15 to determine what equipment is affected by the loss of 15BA4</p>
	BOP	<p>Evaluates Control Room panels to determine what equipment is affected by the loss of 15BA4</p> <p>Affected systems included:</p> <ul style="list-style-type: none"> • Div 1 Drywell Cooling fans and coolers • CRD A Oil Pump • CCW and SSW to Fuel Pool Cooling and Cleanup Heat Exchangers • Standby Gas Treatment A • SLC Operating & Mixing Heaters • Drywell Purge Compressor Aux Oil Pump • LPCS Room Cooler Fan • ESF Room Cooler Fans • SSW Cooling to Drywell Purge Compressor A

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 5 (cont.)Event Description: **ESF Bus 15AA feeder breaker trip with failure of 15BA4 to re-energize (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CREW	Dispatch operator to investigate trip of breaker 52-15401, LCC 15BA4 Feeder Breaker Dispatch Electrical Maintenance to investigate trip of breaker 52-15401, LCC 15BA4 Feeder Breaker
	BOOTH	If dispatched, as operator report after 3 minutes that breaker 52-15401 is tripped free If dispatched, as Electrical Maintenance after 5 minutes that breaker 52-15401 has tripped and a Condition Report will be required to troubleshoot
	CRS TS	Enters LCO 3.8.7, Condition A, with a required action to restore the AC power distribution subsystem to OPERABLE status within 8 hours
		END OF EVENT
	Notes	
	Lead Examiner: Cue to proceed to the next event.	

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 6

Event Description: **Main Steam Tunnel steam leak with failure of one steam line to isolate**
At the direction of the Lead Examiner, trigger Event 6 to cause a steam leak in the Aux Steam Tunnel with a failure of one steam line to isolate

TIME	Position	Applicant's Actions or Behavior																								
	BOP	<p>Recognize and report Main Steam Tunnel high temperature</p> <p>Identifies and reports to CRS alarm is an EP-4 entry condition</p> <p>Reports Main Steam Tunnel temperature and trend to CRS using EP-4 Operating Guide</p>																								
	CREW	Recognize and report 'A' Main Steam Line failed to isolate																								
	CRS	<p>Enters EP-4, Auxiliary Building Control</p>  <p>Table SC-1 Aux Building Area Parameters</p> <table border="1"> <thead> <tr> <th>Area</th><th>Operating Limit</th><th>Max Safe Value</th></tr> </thead> <tbody> <tr> <td colspan="3">TEMPERATURE</td></tr> <tr> <td>MSL PIPE TUNNEL TEMP</td><td>185°F (P601-19A/18A-A3/A4)</td><td>250°F (E31-N604A,B,C,D,E,F)</td></tr> <tr> <td>RHR-A EQUIP AREA TEMP</td><td>165°F (P601-20A-B1)</td><td>225°F (E31-N608A, N610A)</td></tr> <tr> <td>RHR-B EQUIP AREA TEMP</td><td>165°F (P601-20A-B1)</td><td>225°F (E31-N608B, N610B)</td></tr> <tr> <td>RCIC EQUIP AREA TEMP</td><td>185°F (P601-21A-G3)</td><td>212°F (E31-N602A/B)</td></tr> <tr> <td>RWCU-PUMP ROOM 1 TEMP</td><td>170°F (P680-11A-A1)</td><td>NA</td></tr> <tr> <td>RWCU-PUMP ROOM 2 TEMP</td><td>170°F (P680-11A-A2)</td><td>NA</td></tr> </tbody> </table> <p>Directs ATC to place the Mode Switch to SHUTDOWN</p> <p>Directs BOP to isolate the 'A' Main Steam Line</p>	Area	Operating Limit	Max Safe Value	TEMPERATURE			MSL PIPE TUNNEL TEMP	185°F (P601-19A/18A-A3/A4)	250°F (E31-N604A,B,C,D,E,F)	RHR-A EQUIP AREA TEMP	165°F (P601-20A-B1)	225°F (E31-N608A, N610A)	RHR-B EQUIP AREA TEMP	165°F (P601-20A-B1)	225°F (E31-N608B, N610B)	RCIC EQUIP AREA TEMP	185°F (P601-21A-G3)	212°F (E31-N602A/B)	RWCU-PUMP ROOM 1 TEMP	170°F (P680-11A-A1)	NA	RWCU-PUMP ROOM 2 TEMP	170°F (P680-11A-A2)	NA
Area	Operating Limit	Max Safe Value																								
TEMPERATURE																										
MSL PIPE TUNNEL TEMP	185°F (P601-19A/18A-A3/A4)	250°F (E31-N604A,B,C,D,E,F)																								
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RCIC EQUIP AREA TEMP	185°F (P601-21A-G3)	212°F (E31-N602A/B)																								
RWCU-PUMP ROOM 1 TEMP	170°F (P680-11A-A1)	NA																								
RWCU-PUMP ROOM 2 TEMP	170°F (P680-11A-A2)	NA																								

(CT-1) When MSIVs fail to isolate, manually scram the reactor and close the MSIVs prior to Steam Tunnel temperature exceeding 250°F (Max Safe Temperature)

Op-Test No: <u>NRC LOT 12-2017</u>		Scenario No: <u>4</u>	Event No: <u>6 (cont.)</u>
Event Description: <u>Main Steam Tunnel steam leak with failure of one steam line to isolate (cont.)</u>			
TIME	Position	Applicant's Actions or Behavior	
	ATC	Places Mode Switch to SHUTDOWN Perform immediate operator actions of ONEP 05-1-02-I-1, Reactor Scram: 2.1 CONFIRM all Control Rods are fully inserted 2.2 CONFIRM Reactor power decreasing	
	BOP	Isolate 'A' Main Steam Line by placing B21-F022A, MSL A DRWL INBD ISOL, and B21-F028A, MSL A CTMT OTBD ISOL, handswitches to CLOSE Verify and report to CRS that 'A' Main Steam Line is isolated	
(CT-1) When MSIVs fail to isolate, manually scram the reactor and close the MSIVs prior to Steam Tunnel temperature exceeding 250°F (Max Safe Temperature)			
	CRS	Enters ONEP 05-1-02-I-1, Reactor Scram Enters EP-2, RPV Control	
		END OF EVENT	
	Notes		
<u>NOTE: Next Event will automatically trigger when Mode Switch is placed in SHUTDOWN.</u> NOTE to Examiners: CRS actions start on the next page of the Scenario Guide ATC actions start on Page 34 of the Scenario Guide BOP actions start on Page 38 of the Scenario Guide			

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss**

When the Mode Switch is placed in SHUTDOWN, Event 7 will automatically trigger to cause a Feedwater Line B break inside the Drywell with B21-F065B power loss. (A small recirc break is also added to represent a leak downstream of the feedwater check valve)

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Recognize and report Feedwater Line B break inside Drywell</p> <p>Trips running Condensate and Condensate Booster Pumps</p> <p>Closes B21-F065B, FW INL SHUTOFF VLV</p> <p>Recognize and reports B21-F065B, FW INL SHUTOFF VLV, power loss</p>
	CREW	Recognize and report high drywell pressure
	CRS	<p>Enters EP-2, RPV Control</p> <p>Table L-1 Preferred Injection Systems</p> <ul style="list-style-type: none"> • Condensate/Feedwater • CRD <ul style="list-style-type: none"> ➤ Maximize CRD for flow. • RCIC <ul style="list-style-type: none"> ➤ Use CST suction if available. ➤ OK to defeat isolations and interlocks.....Att 1, 3 • HPSCS <ul style="list-style-type: none"> ➤ Use CST suction if available. ➤ OK to defeat interlocks.....Att 4 • LPCS • LPCI <ul style="list-style-type: none"> ➤ Inject through the HX as soon as possible. ➤ RHR through shutdown cooling return ➤ Inject through the HX as soon as possible. ➤ OK to defeat isolations.....Att 12 <p>Directs BOP to monitor and report RPV level</p> <p>Directs ATC to verify high drywell pressure initiations, isolations and emergency diesel generators</p>

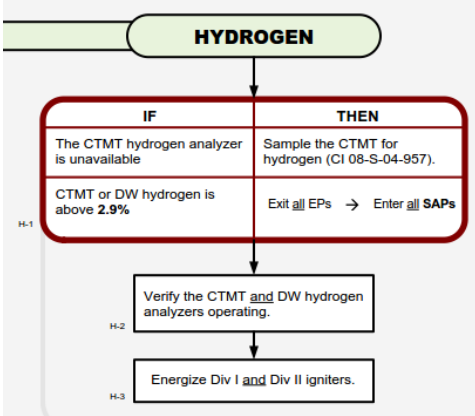
Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 8/9Event Description: **HPCS Pump trip / LPCS logic power failure**

TIME	Position	Applicant's Actions or Behavior
	CREW	Recognize and report HPCS Pump trip Recognize and report LPCS Logic Power failure Recognize and report ESF Bus 16AB lockout
	CRS	Direct ATC to take actions for LPCS logic power failure IAW ARI 04-1-02-1H13-P601-21A-H8, LPCS OOSVC Direct BOP to maximize CRD for flow Directs I&C to install Attachment 12 for RHR Direct ATC to restore the Auxiliary Building
	CREW	Dispatch plant operator/electrical maintenance to investigate HPCS pump trip Dispatch plant operator/electrical maintenance to investigate ESF Bus 16AB lockout
	BOOTH	<u>Role Play:</u> If dispatched, as plant operator/electrical maintenance report after 3 minutes that HPCS pump breaker, 152-1702, is tripped and electrical maintenance is investigating If dispatched, as plant operator/electrical maintenance report after 5 minutes that ESF Bus 16AB has an overcurrent lockout and electrical maintenance is investigating When directed to install Attachment 12, trigger <u>Event 12</u> and inform CRS when Attachment indicates DONE

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8 (cont.)Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss/HPCS Pump trip (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Recognize RPV level lowering and enters Alternate Level Control leg of EP-2
		<p>Direct ATC to inhibit ADS</p> <p>Direct ATC to initiate SLC A and B</p> <p>Direct BOP to verify ECCS systems are available for injection</p>
(CT-2) Inhibit ADS prior to automatic ADS valve opening during a LOCA		

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8 (cont.)Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPSCS Pump trip (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Directs Work Control to install Attachment 26 using HPSCS piping
	CRS	Enters EP-3, Containment Control
	CRS	 <p style="text-align: right;">EP-3</p> <p>Directs ATC to verify CTMT and DW hydrogen analyzers operating and energize Division 1 igniters</p>
	BOOTH	Role Play: If dispatched, as plant operator/electrical maintenance report after 3 minutes that ESF Bus 16AB is locked out on timed overcurrent. Electrical maintenance is investigating
	CRS	When RPV level lowers to -160 inches wide range, exits EP-2 Pressure leg and enters Emergency Depressurization leg of EP-2

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8/9 (cont.)

Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	<div style="display: flex; align-items: center;"> <div style="margin-left: 20px;"> <p>EP-2</p> </div> </div> <p>Verifies Suppression Pool level is greater than 10.5 ft using SPDS</p> <p>Directs ATC to open 8 ADS/SRVs</p> <p>Directs BOP to inject with Division 1 ECCS systems</p>
<p>(CT-3) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)</p>		
<p>(CT-4) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig</p>		

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8/9 (cont.)

Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure (cont.)**

TIME	Position	Applicant's Actions or Behavior
	CRS	Direct BOP to monitor RPV level and report when level is greater than TAF (-160 inches wide range)
	CRS	Directs BOP to restore and maintain RPV level between -30 inches and +50 inches wide range with available ECCS systems
	BOP	Controls injection from LPCS and RHR A by throttling valves and/or cycling pumps to raise and maintain RPV level -30 inches to +50 inches wide range
	BOOTH	<p>When directed to close E12-F042A, RHR A INJ SHUTOFF VLV from Remote Shutdown Panel, using RNI DRAW drawing P150-1C-3 and perform the following:</p> <ul style="list-style-type: none"> • Modify RHR A INJ SHUTOFF switch to CLOSE • Modify RHR A INJ SHUTOFF switch to AUTO <p>When directed to close E21-F005, LPCS INJ VLV, trigger <u>Event 10</u></p>
<p>NOTE to Examiners: Scenario objectives have been met when the crew has depressurized the RPV and level is being raised in a controlled manner to restore it to -30" to +50" wide range</p>		
END OF SCENARIO		
	Notes	
	BOOTH	When directed by the Lead Examiner, place the simulator in freeze and tell the crew to stop operating

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8/9Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Verifies and reports Division 2 and Division 3 ECCS initiated</p> <p>Recognize and report HPCS Pump trip</p> <p>Recognize and report LPCS logic power failure</p> <p>Verifies and reports high drywell pressure isolations complete</p> <p>Verifies and reports Division 2 and Division 3 Diesel Generators running with cooling water</p>
	ATC	<p>Performs actions for LPCS logic power failure IAW ARI 04-1-02-1H13-P601-21A-H8, LPCS OOSVC:</p> <p>4.6 Manually starts LPCS pump</p> <p>4.6.2 Manually starts RHR A pump</p> <p>4.6.3 Dispatch plant operator to Remote Shutdown Panel and standby to open E12-F042A, RHR A INJ SHUTOFF VLV</p> <p>4.6.6 Dispatch plant operator to standby locally at E21-F005, LPCS INJ SHUTOFF VLV</p>
	CREW	Recognize and report ESF Bus 16AB lockout
	ATC	<p>Restores the Auxiliary Building IAW ONEP 05-1-02-III-5, Automatic Isolations, Attachment II</p> <p>1) <u>IF</u> Plant Air compressors are available, <u>THEN OPEN/CHECK OPEN</u> the following Instrument Air valves on 1H13-P870:</p> <p><u>Section 3C</u></p> <ul style="list-style-type: none"> • P53-F001 (After 30 sec T.D.) <p><u>Section 9C</u></p> <ul style="list-style-type: none"> • P53-F007 (After 30 sec T.D.) <p>NOTE to Examiners: ESF Bus 16AB will lockout 5 minutes after Drywell pressure reaches 1.39 psig. Division 2 isolation valves will fail as is and may not be able to be manipulated if applicant attempts to restore Aux Building after the bus lockout</p>

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8/9Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure****ATC ACTIONS**

TIME	Position	Applicant's Actions or Behavior
	ATC	<p style="text-align: center;"><u>CAUTION</u></p> <p><u>IF</u> Drywell Chilled Water is restored after isolation when Drywell temperature exceeds 200°F, <u>THEN</u> a water hammer <u>MAY</u> occur <u>AND</u> rupture Drywell cooler tubes due to voiding in piping. <u>IF</u> Drywell temperatures exceed 200°F (CRD Cavity temperatures excluded), <u>THEN</u> Drywell Chilled Water <u>Should NOT</u> be unisolated until controlled startup <u>Can</u> be performed per SOI 04-1-01-P72-1 <u>OR</u> Drywell temperature has returned to < 200°F</p> <p>2) <u>IF</u> all Drywell temperatures are less than 200°F (CRD Cavity temperatures excluded) <u>AND</u> Drywell Chillers are available, <u>THEN RESTORE</u> Drywell Chilled Water as follows:</p> <p>a. <u>IF</u> required, <u>RE-ENERGIZE</u> MCC's 15B42 AND 16B42 on 1H13-P864</p> <p>b. <u>AFTER</u> a 30 second time delay, <u>OPEN</u> the following valves on 1h13-P870:</p> <p style="padding-left: 40px;"><u>Section 3C</u></p> <ul style="list-style-type: none"> • P72-F121 • P72-F122 • P72-F125 <p style="padding-left: 40px;"><u>Section 9C</u></p> <ul style="list-style-type: none"> • P72-F123 • P72-F126 • P72-F124 <p>c. <u>ENSURE</u> at least one Drywell Chilled Water pump is running</p> <p>d. <u>ENSURE</u> Drywell Coolers are in operation</p> <p>3) Step is N/A</p> <p>4) The following valves <u>Will NOT</u> close due to being gagged open. As time permits, give these valves an <u>OPEN</u> signal to lift actuator off of gag.</p> <p style="padding-left: 40px;"><u>Section 3C</u></p> <ul style="list-style-type: none"> • P53-F026A <p style="padding-left: 40px;"><u>Section 9C</u></p> <ul style="list-style-type: none"> • P53-F026B <p>NOTE to Examiners: ESF Bus 16AB will lockout 5 minutes after Drywell pressure reaches 1.39 psig. Division 2 isolation valves will fail as is and may not be able to be manipulated if applicant attempts to restore Aux Building after the bus lockout</p>

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8/9

Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure**

ATC ACTIONS

TIME	Position	Applicant's Actions or Behavior
	ATC	Inhibits ADS by ADS A and ADS B MANUAL INHIBIT switches to INHIBIT position
(CT-2) Inhibit ADS prior to automatic ADS valve opening during a LOCA		
	ATC	<p>Initiates SLC A and SLC B by placing the SLC PMP A and SLC B key-locked switches to START</p> <p>Verifies SLC injection into reactor IAW SOI 04-1-01-C41-1, Attachment VI by performing the following:</p> <ol style="list-style-type: none"> 1. VERIFY system initiation by OBSERVING the following: <ol style="list-style-type: none"> a. F004A AND F004B SQUIB VALVES FIRED: <ul style="list-style-type: none"> • White SQUIB VALVE READY light OFF • Annunciator SBLC SYS A OOSVC • Amber status light SQUIB A LOSCONT or PWR LOSS is ON b. C41-F001A AND F001B TANK OUTLET VALVE are OPEN c. SBLC PUMPS A AND B RUNNING d. RWCU isolates: <ul style="list-style-type: none"> • G33-F004 CLOSED (SLC A Initiated) • G33-F001 AND F251 CLOSED (SLC B Initiated) e. VERIFY SLC is INJECTING INTO the RPV by observing the following: <ul style="list-style-type: none"> • SBLC pump discharge pressure exceeds reactor pressure • SBLC tank level lowering • Nuclear Instrumentation lowering <p>Report to CRS that SLC A has been initiated and is injecting into the RPV</p> <p>NOTE to Examiners: ESF Bus 16AB will lockout 5 minutes after Drywell pressure reaches 1.39 psig. SLC B may not be available when the applicant initiates SLC</p>

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 7/8/9

Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure**

ATC ACTIONS

TIME	Position	Applicant's Actions or Behavior
	ATC	<p>Verify Division 1 and Division 2 CTMT and DW hydrogen analyzers are operating and energize hydrogen igniters IAW 04-1-01-E61-1, Combustible Gas Control System, Attachment V:</p> <ol style="list-style-type: none"> 1. VERIFY Running A(B) CTMT AND A(B) DW H2 Analyzers OR Start by PLACING handswitch(es) to START 2. VERIFY the amber light ON for the 0 – 10% scale on recorder 1E61-R602A(B) 3. ENSURE A(B) CTMT AND A(B) DW H2 Analyzers have been in service for > 60 sec 4. Verify A(B) CTMT AND A(B) DW H2 Concentration is < 2.9% AND THEN <ul style="list-style-type: none"> • ENERGIZE Div 1 H2 Igniters by PLACING H2 IGNITER SYS A handswitch to ON. • ENERGIZE Div 1 H2 Igniters by PLACING H2 IGNITER SYS A handswitch to ON. <p>Reports to CRS that Division 1 CTMT and DW hydrogen igniters are energized. NOTE to Examiners: ESF Bus 16AB will lockout 5 minutes after Drywell pressure reaches 1.39 psig. Division 2 hydrogen analyzers and igniters may not be available when the applicant performs these actions</p>
	ATC	<p>Open 8 ADS/SRVs by placing the key-locked handswitch for the following valves to OPEN:</p> <ul style="list-style-type: none"> • B21-F041K • B21-F047L • B21-F041F • B21-F047A • B21-F051C • B21-F041D • B21-F051A • B21-F051B
<p>(CT-3) When RPV level lowers to -160" wide range and cannot be maintained above -191" CFZ (MSCWL) and insufficient high pressure injection systems are available to restore level, crew begins to Emergency Depressurize by opening at least seven SRVs before RPV level lowers below -191" CFZ (Momentary shrink below -191" due to automatic SRV closure does not constitute failure of this critical task)</p>		
	Notes	
Return to Page 33 for completion of ATC actions		

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 78/9

Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure**

BOP ACTIONS

TIME	Position	Applicant's Actions or Behavior
	BOP	Monitors and reports RPV level and trend
	BOP	<p>Maximizes CRD for flow IAW SOI 04-1-01-C11-1, Attachment VIII, by performing the following:</p> <p>Re-start CRD PUMP A IAW ONEP 05-1-02-IV-1, Control Rod/Drive Malfunctions ONEP, immediate operator actions:</p> <p>2.1.2 If running CRD pump trips, then start standby CRD pump as follows:</p> <p style="padding-left: 40px;">2.1.2.a If required, re-energize MCCs 15B42 and 16B42 on 1H13-P864</p> <p style="padding-left: 40px;">2.1.2.b Place CRD SYS FLO CONT in MANUAL and reduce output to zero</p> <p style="padding-left: 40px;">2.1.2.c Start CRD pump A</p> <p>Per SOI 04-1-01-C11-1, Attachment VIII:</p> <ol style="list-style-type: none"> (1) ENSURE oil pump is running on the non-running CRD pump A(B). (2) With one CRD pump already running, THEN START standby CRD PMP A(B) (3) PLACE CRD SYS FLO CONT C11-R600 in MANUAL (4) USING CRD SYS FLO CONT C11-R600, fully OPEN C11-F002A(B), CRD FLO CONT VLV (5) If maximizing CRD for flow, THEN FULLY OPEN C11-F003, CRD DRIVE WTR PRESS CONT VLV <p>Reports to CRS that CRD is maximized for flow to extent possible</p>
	CREW	Recognize and report ESF Bus 16AB lockout
	BOP	<p>Reports ECCS systems available:</p> <ul style="list-style-type: none"> • LPCS with manual opening of E21-F005, LPCS INJ SHUTOFF VLV. • RHR A with E12-F042A, RHR A INJ SHUTOFF VLV, control from Remote Shutdown Panel

Op-Test No: NRC LOT 12-2017Scenario No: 4Event No: 78/9 (cont.)

Event Description: **Feedwater Line B line break inside Drywell with B21-F065B power loss / HPCS Pump trip / LPCS logic power failure (cont.)**

BOP ACTIONS

TIME	Position	Applicant's Actions or Behavior
	BOP	<p>Directs plant operator to manually open E21-F005, LPCS INJ SHUTOFF VLV</p> <p>Directs plant operator to manually open E12-F042A, RHR A INJ SHUTOFF VLV from Remote Shutdown Panel</p>
(CT-4) When operating injection systems cannot maintain RPV level and ECCS systems fail to automatically initiate, crew manually initiates or aligns ECCS systems for injection prior to RPV pressure lowering below 300 psig		
	BOOTH	<p>When directed to manually open E210F005, LPCS INJ SHUTOFF VLV, trigger Event 9</p> <p>When directed to open E12-F042A, RHR A INJ SHUTOFF VLV from Remote Shutdown Panel, using RNI DRAW drawing P150-1C-3 and perform the following:</p> <ul style="list-style-type: none"> Set RHR A INJ DISABLE switch to ENABLE Set RHR A INJ SHUTOFF switch to OPEN Modify RHR A INJ SHUTOFF switch to AUTO <p>If directed to manually close E21-F005, LPCS INJ SHUTOFF VLV, trigger Event 10</p>
	BOP	<p>Monitors P601 panel indications for ECCS injection into the RPV:</p> <ul style="list-style-type: none"> E21-F005, LPCS INJ SHUTOFF VLV, open indication E21-F006, LPCS TESTABLE CHK VLV, open indication E21-R600, LPCS PMP DISCH FLO, indication rising E12-F042A, RHR A INJ SHUTOFF VLV, open indication E12-F041A, RHR A TESTABLE CHK VLV, open indication E12-R603A, RHR PMP A DISCH FLO, indication rising
	BOP	Monitors RPV level and reports to CRS when RPV level is greater than TAF (-160 inches wide range)
	Notes	
Return to Page 33 for completion of BOP actions		

INITIAL CONDITIONS

A. Plant Status:

- Reactor startup is in progress with power at approximately 4%:
 - Step 45 of IOI 03-1-01-1, Attachment XV
 - Step 96 of Control Rod Movement Sequence is complete
 - SJAE B is in service
- Condensate System is lined up as follows:
 - Condensate Pumps A and C in service
 - Condensate Booster Pump C in service
 - Reactor Feed Pump A in service at approximately 950 psig discharge pressure
 - CFFF is in service
 - 4 Deep-Bed Condensate Demineralizers are in service
- Annunciators P680-4A2-C5, CONT ROD WITHDRAWAL BLOCK, and P680-4A1-A7, CRD DRIVE WTR TO RX Δ P HI, are flagged as expected annunciators

B. Tech. Spec. Limitations in effect: None

C. Significant problems/abnormalities: None

D. Integrated Risk: High

E. Division Work Week: Division 2

F. Evolutions/maintenance for the up-coming shift :

1. Withdraw control rods until 10% Bypass Valve position on the lagging valve, then continue raising TURB STM PRESSURE DEMAND setpoint to 935 psig per step 45 of IOI 03-1-01-1, Attachment XV.