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ppl™

January 24, 2005

Mr. John Caruso
USNRC Chief Examiner
USNRC Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Susquehanna Learning Center
Proposed Examination Materials
PLA 005859 File A14-13D

Dear Mr. Caruso:

Enclosed for your review and approval are Proposed Examination Materials for the PPL Susquehanna, LLC Initial Licensed Operator Examination scheduled to begin Thursday, February 3, 2005. These materials are submitted in accordance with NUREG 1021, "Operator Licensing Examination Standards for Power Reactors" Revision 9. The following materials are enclosed:

- Form ES-201-3, Examination Security Agreement (Up to Date Copy)
- Form ES-301-3, Operating Test Quality Checklist - Rev. 2 (Signed)
- Form ES-301-4, Simulator Scenario Quality Checklist - Rev. 2 (Signed)
- Form ES-301-5, Transient and Event Checklist - Rev. 2 (Signed)
- Form ES-301-6, Competencies Checklist - Rev.2 (Signed)
- Form ES-D-1, Scenario Outline - Rev. 2
- Examination Scenarios - Rev. 2

All Proposed Examination Materials have been revised to incorporate your feedback comments and revalidated by Licensed Operations personnel in accordance with the guidance provided within NUREG 1021, "Operator Licensing Examination Standards for Power Reactors" Revision 9.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact me at 570-542-3326 or Rich Brooks at 570-542-1891.

Sincerely,

Kenneth M. Roush
Manager-Nuclear Training

Response: No

Enclosures: Listed

cc: R. R. Boesch
R. R. Sgarro
Ops Letter File
Nuc Records-Site

rb revised 45 day letternp1 - 2005

RB/KMR/vah

Facility: **SSES** Scenario No.: **ILO-503A (ATC)** Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Unit 1 at 69% power EOL, Unit 2 in Mode 1.

Turnover: The scenario begins with Unit 1 at 69% power, rod sequence B2/SU step 550 and RX Engineer is finalizing instructions for increasing power. Instrument Air compressor 'B' is out of service for rebuild. SRV 'R' is leaking. Unit 2 is at 100% power. Fuel handling is in progress in Unit 1 Spent Fuel Pool.

Event No.	Malf. No.	Event Type*	Event Description
1		R	Control Rod Drift OUT
2		C	RRP "B" Lower Seal Failure
3		C	"A" RFP High Vibration
4		C	RRP "B" Upper Seal Failure
5		C, M	LOCA Inside Drywell
6		C	HPCI Auto Start Failure/Trip
7		C	D/G Start Failure
8		C, M	Loss Of Offsite Power (LOOP)
9		C	1A201 Bus Lockout
10		M	Rapid Depressurization

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

RO

PP&L–SUSQUEHANNA TRAINING CENTER

SIMULATOR SCENARIO

Scenario Title:	**ILO CERTIFICATION / NRC EXAM SCENARIO**
Scenario Duration:	**90 Minutes**
Scenario Number:	**ILO-503A**
Revision/Date:	**Rev 2, 1/22/2005**
Course:	**PC007/PC008, Initial License RO/SRO Certification Examination** **PC017/PC018, Initial License RO/SRO NRC Examination**

Operational Activities:

1. **Control Rod Drift Out**
2. **RRP 'B' #1 (lower) Seal Failure**
3. **"A" Feedpump High Vibration**
4. **RRP 'B' #2 (upper) Seal Failure**
5. **LOCA Inside Drywell**
6. **HPCI Auto Start Failure / Trip**
7. **Diesel Generator Fail to Start**
8. **Loss Of Offsite Power**
9. **1A201 Bus Lockout**
10. **Rapid Depressurization**

Prepared By:	Instructor	1/22/05 Date
Reviewed By:	Nuclear Operations Training Supervisor	Date
Approved By:	Supervising Manager/Shift Supervisor	Date

OPERATIONS/TRAINING APPROVAL OF INITIAL LICENSE OPERATOR

CERTIFICATION EXAMINATION AND NRC LICENSE EXAMINATION MATERIALS

The Douglas Murphy NRC Re-Examination exam materials have been designed, developed, and validated in accordance with the guidance provided in NTP-31.5, Initial License Operator Certification and NRC License Examination Development. The Validation process of this procedure utilizes extensive Training and Operations subject matter expertise. By utilizing this expertise throughout the design, development, and validation of these materials, Training and Operations management have a high level of confidence that these materials will provide the intended job relevant evaluation.

(Exam Name)

Therefore, Training and Operations management approve these materials for use on the Douglas Murphy NRC Re-Examination Exam.

(Exam Name)

Operations Management	1/30/05 Date	Training Management	1/30/05 Date

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SCENARIO SUMMARY

The scenario begins with Unit 1 at 69% power, rod sequence B2/SU step 550 and RX Engineer is finalizing instructions for increasing power. Instrument Air compressor 'B' is out of service for rebuild. SRV 'R' is leaking. Unit 2 is at 100% power. Fuel handling is in progress in Unit 1 Spent Fuel Pool.

Shortly after the crew assumes shift responsibilities, Control Rod 42-55 will drift out, resulting in a small power change. The crew will respond by implementing ON-155-001, CONTROL ROD PROBLEMS, and applying the appropriate Technical Specification Required Action(s). When notified, the Reactor Engineer will direct the shift to insert three other control rods in order to maintain core symmetry.

When the Rod Drift event has been completed, the Reactor Recirc pump 'B' #1 (lower) seal failure will occur. The crew will monitor Seal Cavity Temperatures and pressures as well as any changes in leakage into the Drywell Equipment Drain Tank.

After the lower seal failure event has been completed, the "A" Reactor Feedwater Pump vibration will occur (3 to 4 mils) which will require removing the RPF from service IAW OP-145-001.

Once the "A" RFP is secured and the plant has been stabilized, the Reactor Recirc pump 'B' #2 (upper) seal will fail, resulting in Drywell temperature and pressure increase. The crew will implement ON-164-003 REACTOR RECIRCULATION PUMP DUAL SEAL FAILURE. The crew will evaluate plant conditions and decide to trip Reactor Recirc Pump 'B' or perform an orderly shutdown of the pump. Once the pump is stopped the crew will isolate the pump to reduce leakage. When the crew attempts to close the suction valve F023B, it will fail to close. This will result in an unisolable leak and a continuation of the rise in Drywell temperature and pressure. The crew will be expected to perform ON-100-101 SCRAM, SCRAM IMMINENT and place the Mode Switch to Shutdown.

Condensate and Feedwater will initially be available to maintain RPV water level, but will become unavailable when Plant Auxiliary Load Shed logic is initiated concurrent with Hi Drywell Pressure. HPCI fails during initiation and cannot be recovered. RCIC and CRD can be started for injection. D/G 'C' will fail to auto start on Hi Drywell pressure and will not be available for the remainder of the scenario.

When RCIC has been initiated to restore and maintain RPV water level, A LOOP occurs that results in loss of Division 1 RHR and Core Spray systems. Additionally, a Bus Lockout will occur on the 1A ESS Bus 1A201. Division 2 RHR and Core Spray systems will be available after D/Gs energize the remaining ESS buses. Primary Containment Control will require use of Suppression Chamber Sprays for pressure and temperature control. The leakage rate will eventually increase beyond RCIC and CRD makeup capability and RPV level will decrease below TAF. Rapid Depressurization will be required to recover Adequate Core Cooling using Low Pressure ECCS systems.

The scenario will be terminated when the Reactor is depressurized, Reactor water level is restored to +13 to +54 inches, and EO-100-103 PRIMARY CONTAINMENT CONTROL actions are being addressed.

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SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the licensed operator candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the licensed operator candidates must demonstrate proficiency in the following competencies:

Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings
2. Comply with and use procedures, references, and Technical Specifications
3. Operate the control boards
4. Communicate and interact with other crew members

Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings
2. Comply with and use procedures and references
3. Operate the control boards (N/A to upgrade candidates)
4. Communicate and interact with the crew and other personnel
5. Direct shift operations
6. Comply with and use Technical Specifications

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CRITICAL TASKS

★ **Perform Rapid Depressurization when RPV level drops to –161 inches**

Safety Significance

RPV leakage or loss of injection systems impacts the ability to provide continued adequate core cooling through core submergence based on inventory loss.

Consequences for Failure to Perform Task

Failure to take the EOP actions will result in uncovering the core and breach of the fuel clad due to over heating.

SSES EOP Basis for:

The following steps provide the operating crew guidance to line up injection systems as available to maintain level >-129". If these actions are unsuccessful, the crew receives additional direction when it is determined that level can not be maintained above TAF.

RC/L-4 RESTORE AND MAINTAIN LVL BETWEEN
+13" AND **+54"**
USING TABLE **3** SYSTEMS

RC/L-5 **IF** LVL CANNOT BE RESTORED AND MAINTAINED **> +13"**
MAINTAIN LVL **> -129"** USING TABLE **3** SYSTEMS
AUGMENTING AS DESIRED WITH
TABLE **5** ALTERNATE SUBSYSTEMS

RC/L-10 IRRESPECTIVE OF VORTEX LIMITS
WITH TABLE **3** SYSTEMS
PERFORM ALL
1 LINE UP FOR INJECTION
2 START PUMPS
3 INCREASE INJECTION TO MAX

RC/L-11 **IF** LESS THAN 2 TABLE **4** SUBSYSTEMS CAN BE LINED UP
COMMENCE LINING UP AS MANY AS POSSIBLE
TABLE **5** ALTERNATE SUBSYSTEMS

CRITICAL TASKS

RC/L-13 WITH TABLE **5** ALTERNATE SUBSYSTEMS PERFORM ALL:
1 LINE UP FOR INJECTION
2 START PUMPS
3 INCREASE INJECTION TO MAX

RC/L-16 **WHEN** LVL CANNOT BE RESTORED AND MAINTAINED **> -161"** GO TO RAPID DEPRESS

Rapid Depressurization is not initiated until RPV water level has dropped to -161" (TAF) because:

- *Adequate core cooling exists so long as RPV water level remains above -161" (TAF).*
- *The time required for RPV water level to decrease to -161" (TAF) can best be used to line up and start pumps, attempting to reverse the decreasing RPV water level trend before Rapid Depressurization is required to assure continued adequate core cooling.*

(Reference: SSES-EPG C1-4 and second override before C3-1)

Indications/Cues for Event Requiring Critical Task

Reactor water level trending downward, eventually indicating less than the top of active fuel height on the Fuel Zone Level Indicator.

Performance Criteria

Perform a Rapid Depressurization per EO-100-112 when water level reaches the TAF -161" as read on the Fuel Zone Instrument.

Initiate ADS / Manually Open all 6 ADS valves

Performance Feedback

Initiating a rapid depressurization causes Reactor pressure to lower to the shutoff head of the low pressure injection systems allowing water level to rise on the Fuel Zone and Wide Range level instruments.

Verify ADS valves are open using light red light indication, acoustic monitoring and lowering Reactor pressure and rising reactor water level.

CRITICAL TASKS

★ **Secure Suppression Chamber Sprays before Suppression Chamber pressure drops to 0 psig**

Safety Significance

Operation of drywell / suppression chamber sprays is stopped before drywell / suppression chamber pressure decreases to 0 psig to assure that primary containment pressure is not reduced below atmospheric. A positive primary containment pressure precludes air from being drawn in through a primary containment path (which may have been opened for control of primary containment hydrogen and oxygen). It also assures that a margin to the negative design pressure of the primary containment exists.

Consequences for Failure to Perform Task

Potential exists for air to be drawn in through a primary containment path (which may have been opened for control of primary containment hydrogen and oxygen). Could also exceed the negative design pressure of the primary containment.

Indications/Cues for Event Requiring Critical Task

Drywell / Suppression Chamber pressure decreasing toward 0 psig.

Performance Criteria

Secures spray flow to the Drywell / Suppression Chamber IAW OP-149-004.

Performance Feedback

Drywell / Suppression Chamber spray isolation valves indicate closed.
Spray flow to the Drywell / Suppression Chamber indicates 0 gpm.
Drywell / Suppression Chamber pressure > 0 psig and no longer decreasing.

★ Denotes Simulator Critical Task

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SCENARIO REFERENCES

1. CONTROL ROD 42-55 DRIFT

AR-104-H05	ROD DRIFT REV. 21
ON-155-001	CONTROL ROD PROBLEMS REV. 22
TS 3.1.3	CONTROL ROD OPERABILITY AMMEND. 178

2. RRP 'B' #1 (LOWER) SEAL FAILURE

AR-102-G05	RRP 'B' SEAL STAGE HI/LO FLOW, REV. 23
ON-164-003	RRP 'B' DUAL SEAL FAILURE, REV. 16
SO-100-006	SHIFTLY SURVEILLANCE OPERATING LOG, REV. 44

3. "A" RFPT High Vibration

AR-101-A16	"A" RFPT HIGH VIBRATION
OP-145-001	RFP AND RFPT LUBE OIL SYSTEM

4. RRP "B" #2 (UPPER) SEAL FAILURE

AR-102-G04	SEAL LEAKAGE HI/LO, REV. 23
GO-100-009	SINGLE RECIRC LOOP OPERATION, REV. 14
TS 3.4.4	RCS OPERATIONAL LEAKAGE, AMMEND. 178
TS 3.4.1	RECIRCULATION LOOPS OPERATING, AMMEND. 178

5. RRP "B" #1 (LOWER) SEAL FAILURE

ON-164-003	RRP 'B' DUAL SEAL FAILURE, REV. 16
ON-100-101	SCRAM, SCRAM IMMINENT, REV. 12
EO-100-102	RPV CONTROL, REV. 2
EO-100-103	PRIMARY CONTAINMENT CONTROL, REV. 7

6. HPCI AUTO START FAILURE / TRIP

OP-152-001	HPCI SYSTEM, REV. 32

SCENARIO REFERENCES

7. LOSS OF OFFSITE POWER

   ON-104-001 UNIT 1 RESPONSE TO LOSS OF OFFSITE POWER, REV. 13

8. ON-104-201 LOSS OF 4KV ESS BUS 1A (1A201) REV. 5

9. AR-015-D08 4KV BUS 1A BUS LOCKOUT RELAY TRIP, REV. 29

10. RAPID DEPRESSURIZATION

    EO-100-112 RAPID DEPRESSURIZATION, REV. 2

SCENARIO SPECIAL INSTRUCTIONS

1. Initialize simulator to **IC-17**, 69% power.
2. Snapshot to an available IC (currently **IC-114**).
3. Place a Pink Tag on IA Compressor 'B' control switch.
4. Type **restorepref YPP.ILO-503A**; verify the following pre-inserts and Program Button assignments. **Verify the Environment window:**
5. Activate Auto Exercise **OPRMSIS**

MALFS	REMFS	OVRDS	TRIGS
8:8	11	4:4	6

PROGRAM BUTTONS

[P-1] IMF RD1550054255	CONTROL ROD 42-55 DRIFT OUT
[P-2] DMF RD1550054255	DELETE CONTROL ROD 42-55 DRIFT OUT
[P-3] MRF RD1550074255	HYDRAULICALLY DISARM HCU 42-55
[P-4] IMF RR164003B (NONE 0 0) 5 45:45:00 0	"B" #1 (LOWER) SEAL FAILURE
[P-5] IMF FW145007A 4 10 0	RFPT High Vibration to 4 mils over 10 seconds
[P-6] IMF RR164004B 10 10:00 0	'B' RECIRC PUMP #2 (UPPER) SEAL FAILURE
[P-7] MRF RR164041 CLOSE	ISOLATE CRD SEAL PURGE TO 'B' RECIRC PUMP
[P-8] bat DSB.LOOPT21	LOSS OF OFFSITE POWER
[P-9] IMF DS104001A	1A ESS BUS LOCKOUT
[P-10] MMF RR164010 100 4:00 1	INCREASE BOTTOM HEAD DRAIN LINE LEAKAGE
[P-23] bat FWB.101ALARM	FEEDWATER HEATER PANEL ALARM RESET
[P-24] bat FWB.102 ALARM	FEEDWATER HEATER PANEL ALARM RESET
[P-25] bat FWB.103 ALARM	FEEDWATER HEATER PANEL ALARM RESET

SCENARIO SPECIAL INSTRUCTIONS

6. Add the CRC package to the shutdown section.

7. Verify LEFM is selected as the Feedwater flow input to PICSY IAW OI-TA-021.

8. Prepare a turnover sheet indicating:

- Power ascension is on hold until repair of RWCU HX End Bell work completed.
- When RWCU work completed, notify RE, and re-commence power ascension.
- Reactor power at 69%.
- Rod Sequence is B2/SU step 550.
- 1B Instrument Air Compressor O/S for rebuild.
- "E" & "R" SRV's Tailpipe Temperatures are elevated.
- Unit 2 is in MODE 1 at 100%

Common

9. "A" RW Chiller O/S

10. SCC D/G Over-temperature alarm received during manual run. Waiting on parts from procurement.

11. New Fuel Inspection in progress on Refuel Floor 818'. Brian Forge in charge of evolution.

SCENARIO EVENT DESCRIPTION FORM

Initial Conditions: Initialize the Simulator to **IC-114**. Place the Simulator to RUN. Ensure the Program Buttons are assigned as indicated on the Special Instructions sheet via the appropriate Preference File. Assign Shift positions; direct the start of the 5-minute panel walkdown.

EVENT	TIME	DESCRIPTION
1		CONTROL ROD 42-55 DRIFT
2		RRP 'B' #1 (LOWER) SEAL FAILURE
3		RFPT HIGH VIBRATION TO 4 MILS OVER 10 SECONDS
4		RRP 'B' #2 (UPPER) SEAL FAILURE / DUAL SEAL FAILURE
5		LOCA INSIDE DRYWELL
6		HPCI AUTO START FAILURE / TRIP LOSS OF OFFSITE POWER
7, 8, 9		LOSS OF OFFSITE POWER 1A ESS BUS LOCKOUT D/G FAILS TO START
10		RAPID DEPRESSURIZATION

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SCENARIO EVENT FORM

Event No: 1
Brief Description: **Control Rod 42-55 Drift Out**

POSITION	TIME	STUDENT ACTIVITIES
PCOM		Recognizes/reports ROD DRIFT alarm AR-104-H05 Monitors Reactor Power for power increase. Restores power to previous level if necessary using Recirc Flow.
PCOM		Performs ROD DRIFT AR-104-H05 Operator Actions: • Selects "Display Rods Drifting" to determine rod 42-55 is drifting. • Selects Control Rod 42-55 via Rod Select Matrix to determine rod is drifting out. • Promptly insert Rod to 00. • Reports rod staying at position 00 after being hydraulically disarmed
US		Direct performance of ON-155-001 CONTROL ROD PROBLEMS • Refer to TS 3.1.3 CONTROL ROD OPERABILITY (Condition C) • Declares Control Rod Inoperable. • Notify Reactor Engineer • Contacts Work Week Manager for assistance/investigation
PCOM/PCOP		• Perform ON-155-001, CONTROL ROD PROBLEMS Section 3.4. • Directs NPO to Hydraulically Disarm HCU 42-55.
US		When instructed by reactor engineering, direct the crew to insert the 3 symmetrical control rods 18-55, 18-07, 42-07 to position 00.
PCOM/PCOP		When directed by Reactor Engineer, Insert rods 18-55, 18-07, 42-07 to 00

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 1
Brief Description: **Control Rod 42-55 Drift Out**

INSTRUCTOR ACTIVITY:

Once the crew assumes shift duties, or upon Evaluator direction, cause Control Rod 42-55 to Drift out by depressing:
[P-1] IMF RD1550054255 CONTROL ROD 42-55 DRIFT OUT

After PCOM has begun inserting that control rod, delete the malfunction by depressing:
[P-2] DMF RD1550054255 DELETE CONTROL ROD 42-55 DRIFT OUT

When directed to hydraulically disarm HCU 42-55, depress:
[P-3] MRF RD1550074255 HYDRAULICALLY DISARM HCU 42-55

ROLE PLAY:

1. As Work Week Manager/I&C dispatched to investigate, wait 10 minutes and report as I&C:

"There appears to be a failure in the HCU Transponder Card, and it will take at least an hour to get a replacement. After replacement we'll have to perform some checks before we can feel certain that the Transponder card is the only problem with the HCU.

2. As NPO dispatched to the HCU, report no unusual conditions at the HCU if asked.
   As NPO dispatched to the HCU, report HCU Hydraulically Disarmed following activation of [P-3]

3. As Reactor Engineer, report no problems with the current rod pattern, but direct crew to insert the following 3 control rods to position 00 for the purposes of core symmetry: 18-55, 18-07, 42-07

SCENARIO EVENT FORM

Event No: 2
Brief Description: **RRP 'B' #1 (LOWER) SEAL FAILURE**

POSITION	TIME	STUDENT ACTIVITIES
PCOM		Recognizes/reports AR-102-G05 Recirc Pump B SEAL STAGE HI-LO FLOW
		Monitors seal cavity pressures on SIP PANEL 1C652 and diagnoses #1 (lower) seal failed
		Monitors seal cavity temperature for trend on 1C614
		Monitors DWEDT level recorder for a change in leakage rate on 1C601
		Monitors Containment radiation levels on Panel 1C693
US		Directs continuous monitoring for changes in leakage rate and containment parameters
		Refers to ON-164-003, RRP DUAL SEAL FAILURE, and briefs crew on actions if second stage seal failure and potential for single loop operations
		Notifies Work Week Manager and System Engineer of Recirc pump seal failure

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 2
Brief Description: RRP 'B' #1 (LOWER) SEAL FAILURE

INSTRUCTOR ACTIVITY:

After the 3 symmetrical rods have been inserted, initiate the RRP 'B' #1 (lower) seal failure malfunction by depressing:

[P-4]IMF RR164003B (NONE 0 0) 5 45:00 0 RRP 'B' #1 (LOWER) SEAL FAILURE

Monitor seal parameters on **RR4**.

ROLE PLAY:

As necessary

SCENARIO EVENT FORM

Event No: 3
Brief Description: **"A" Reactor Feedpump High Vibration**

POSITION	TIME	STUDENT ACTIVITIES
PCOM		• Respond to High Vibration alarm, AR-101-A16 • Observe A RFP parameters by changing panel display to A feed pump. • Determine A RFP vibration at 4 mils
US NOTE 1		• Directs entry into OP-145-001 to remove the 1A RFP from service.
PCOM		• Enters OP-145-001, Section 2.6 • Directs Shift Technical Advisor to SELECT Feedwater venturies as input to PICSY Core Thermal Power Heat Balance • Directs removal of Hydrogen Injection String IAW OP-145-002 • Places A RFP speed control in manual • Slowly Adjusts RX FEED PUMP A RECIRC FLOW FIC-10604A in MANUAL to ~ 40% demand • Lowers A RFP Speed using speed controller (SIC-C32-1R601) until RFP discharge pressure is 100 psig below RPV pressure • Throttles FV-10604A using RX FEED PUMP A RECIRC FLOW FIC-10604A in MANUAL to maintain RFP A FLOW FI-10604A indication greater RFP A MIN FLOW SET PT FI-10612A indication. • Monitors RPV water level. • Close Disch Isol Valve (HV-10603A). • Close Startup Isol Valve (HV10651A) • Lower Speed to LLS Trip the A RFP
NOTE 2		After the feed pump is tripped, proceed to the next event.

★ Denotes Critical Task

NOTES:	
(1) Ensure the Surrogate US directs Murphy to remove the RFPT from service.	
(2) After the feed pump is tripped, proceed to the next event.	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 3
Brief Description: **"A" REACTOR FEEDPUMP HIGH VIBRATION.**

AFTER the lower seal failure has been addressed, initiate a vibration of 4 mils on the A" Reactor Feedpump by depressing:

[PB 5]: IMF FW145007A 4 10 0 "A" RFP High Vibration (4 mils ramped over 10 seconds)

Note: As A RFP speed is lowered, vibration may be modified 3 mils, but returned to 4 in order to force the crew to remove the pump from service.

ROLE PLAY:

As the NPO dispatched to the A Feedwater Pump observe the following:

Feed Pump sounds a lot noisier than usual, but all other indications are normal.

As FUS, report vibrations are real, and highly recommend removal of RFPT promptly to prevent any further damage

SCENARIO EVENT FORM
SCENARIO EVENT FORM

Event No: 4
Brief Description: RRP 'B' #2 (UPPER) SEAL FAILURE / DUAL SEAL FAILURE

POSITION	TIME	STUDENT ACTIVITIES
PCOM		Recognizes/reports RECIRC PUMP B SEAL LEAKAGE HI FLOW
		Refers to AR-102-G04, reports RECIRC PUMP B SEAL LEAKAGE HI FLOW
		Refers to AR-102-G03, reports RECIRC PUMP MOTOR HI TEMPERATURE
US		Directs implementation of ON-164-003, RRP DUAL SEAL FAILURE
		Directs PCOP to monitor Drywell parameters
		Directs PCOP to calculate RCS leakage
		Directs the shutdown and isolation of RRP 'B'
		Refers to TS 3.4.4, RCS Operational Leakage
		Notifies Reactor Engineering and Plant Management of intent to S/D and isolate RRP 'B'
		Complies with COLR Section 8.0 Limits in TRM
		Complies with Tech Spec LCOs 3.4.1
PCOM NOTE 1 NOTE 2		Refers to ON-164-003, RRP DUAL SEAL FAILURE: 1. Trips Recirculation Pump 1P401A(B) 2. Plots position on Power/Flow Map, Form NDAP-QA-0338-10 3. Verifies operating pump speed to 80% rated pump speed (80% = 1344 rpm) 4. Isolates Recirc pump 1P401A(B) by closing following valves in the specified order: • RECIRC PUMP B SUCT HV-143-F023B • RWCU SUCT LOOP B HV-144-F106 • Place MOV OL BYPS to TEST • RECIRC PUMP B DSCH HV-143-F031B • RECIRC PUMP B DSCH BYPS HV-143-F032B • CRD WTR SUPPLY TO RRP B SEAL WATER ISO VLV 143F008B 5. Recognizes/reports the loss of position indication on suction valve HV-143-F023B 6. After 2 minutes, returns MOV OL BYPS HV-143-F031B keyswitch to NORMAL

★ Denotes Critical Task

NOTES:	(1) The crew should continue with isolation of RRP 'B' as directed in ON-164-003.
	(2) Per AR-102-G03, if Seal Cavity temperature reaches 200°F, the pump should be tripped.

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 4
Brief Description: RRP 'B' #2 (UPPER) SEAL FAILURE / DUAL SEAL FAILURE

INSTRUCTOR ACTIVITY:

1. When the crew has completed tripping of "A" RFP, insert the RRP 'B' #2 (upper) seal failure by depressing:

   [P-6] IMF RR164004B 10 10:00 0 B' RECIRC PUMP #2 (UPPER) SEAL FAILURE 10 GPM

NOTE: Inserting the previous malfunction will slowly raise Drywell pressure and eventually require a manual reactor scram.

2. When the RO attempts to close Recirc suction valve HV-143F023B, verify trigger **E5** initiates:

   MMF RR164004B 50 1:00 RRP 'B' #2 (UPPER) SEAL FAILURE 50 GPM
   IMF MV01:HV143F023B (NONE 30 0) LOSS OF POWER TO 1F023B MOV

3. When directed, close CRD WTR SUPPLY TO RRP B SEAL WATER ISO VLV 143F008B by depressing:
   [P-7] MRF RR164041 CLOSE ISOLATE CRD SEAL PURGE TO 'B' RECIRC PUMP

4. Monitor Instructor Display **RR4** for Seal Purge Valve position.

ROLE PLAY:

As Plant Operator sent to check the status of the Recirc suction valve breaker (**1B246011**), report the breaker is tripped. If directed to reset the breaker, report the breaker will not reset.

SCENARIO EVENT FORM

Event No: 5, 6
Brief Description: LOCA INSIDE DRYWELL / HPCI AUTO START FAILURE/TRIP

POSITION	TIME	STUDENT ACTIVITIES
PCOP		Reports DW pressure is increasing at a faster rate
US		May Enter ON-100-101 SCRAM, SCRAM IMMINENT and directs scram imminent actions before scramming
		Directs manual Reactor scram before Drywell pressure reaches 1.72
		Enters EO-100-102, RPV CONTROL
PCOP		May Transfer Aux Buses 11A and 11B to Tie Bus if Scram Imminent actions were entered.
PCOM		Manually scrams Reactor: 1. Places Mode Switch to SHUTDOWN 2. Verifies/reports all rods fully inserted
		Inserts SRMs and IRMs
		Aligns FW for Startup Level Control
PCOP		Reports Drywell pressure >1.72 psig
		Recognizes/reports HPCI failed to start, attempts component by component start of HPCI and reports HPCI trips on start up and cannot be recovered.
		Recognizes/reports D/G 'C' has failed to start; selects Isoch and presses start pushbutton, recognizes reports D/G 'C' starts then trips
		Verifies ESW cooling to D/Gs
		Initiates RCIC injection to maintain +13" to +54" if Feed and Condensate trip on Plant Aux Load Shed
US		Directs RPV water level control +13" to +54" with RCIC and CRD
		Directs RPV pressure control <1087 psig with Bypass Valves

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 5, 6
Brief Description: LOCA INSIDE DRYWELL / HPCI AUTO START FAILURE/TRIP

INSTRUCTOR ACTIVITY:

NOTE: After the reactor scram Drywell pressure increases more rapidly as leakage rate increases.

1. When the Mode Switch is placed in shutdown, ensure trigger **E6** actuates to insert the bottom head drain line leak:

   IMF RR164010 1 30 BOTTOM HEAD DRAIN LINE LEAK

2. When HPCI is started component by component, ensure trigger **E1** actuates to insert a HPCI turbine trip when flow is greater than 2000 gpm:

   IMF HP152015

3. If/When requested to attempt a local start of 'C' D/G, wait ≈2 minutes then transfer D/G 'C' to LOCAL by inserting **IOR QDI43CMC LOCAL** D/G 'C' TO LOCAL

ROLE PLAY:

1. As NPO sent to D/G 'C' to attempt a local start, after transferring to local call the control room and report the local start was not successful.

2. As Electrical Maintenance dispatched to D/G 'C', wait ≈5 minutes and report no cause for the failure can be located and we will continue to investigate.

SCENARIO EVENT FORM

Event No: 7, 8, 9
Brief Description: D/G FAILS TO START / LOSS OF OFFSITE POWER / 1A201 BUS LOCKOUT

POSITION	TIME	STUDENT ACTIVITIES
US		Directs local start of D/G 'C'
		Directs cooldown at <100°F/hr
		Enters EO-100-103, Primary Containment Control
		Directs placing one loop of RHR in Suppression Chamber Spray
		Contacts Work Week manager to investigate failure of D/G 'C'
		Ensure Murphy assists in PCOP activities as can be reasonably performed
PCOP		Dispatches NPO to attempt local start of D/G 'C'
		Recognizes/reports Loss of Offsite Power
		Recognizes 4KV Bus 1A201 BUS LOCKOUT
		Reports 4KV Buses 1B and 1D are energized
US		Directs a 1C601 walk down for Isolations, ECCS Initiations, and D/G starts
		Directs restarting CRD pump 'B'
		Directs maintaining RPV pressure <1087 psig with SRVs
		Contacts TCC and Electrical Maintenance to investigate the loss of power
PCOP		Starts CRD pump 'B' as directed
		Maintains RPV pressure <1087 psig with SRVs
		Verifies available low pressure ECCS pumps start when level drops below -129"
		Transitions to Fuel Zone Level indication when wide range level drops below -145"
		Reports corrected Fuel Zone RPV level is < -161"

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: **7, 8, 9**
Brief Description: **D/G FAILS TO START / LOSS OF OFFSITE POWER / 1A201 BUS LOCKOUT**

INSTRUCTOR ACTIVITY:

After Drywell pressure exceeds 1.72 psig and RCIC has been initiated to restore and maintain RPV level, insert a LOOP and a 1A BUS LOCKOUT by depressing:

[P-8] bat DSB.LOOPT21 LOSS OF OFFSITE POWER

[P-9] IMF DS104001A 1A ESS BUS LOCKOUT

When the crew completes the assessment of the electric plant lineup, increase the leakage from the RPV.

[P-10] MMF RR164010 100 4:00 1 INCREASE BOTTOM HEAD DRAIN LINE LEAKAGE to 100%

ROLE PLAY:

As TCC contacted for offsite power information, report a breaker failure in the Montour switchyard is responsible for loss of the 230 KV line.

The 230-500 KV tie line has Supervisory Information that indicates a fault on AutoTransformer T-21. Hazleton Dispatch reports sending a crew to the 230 KV switchyard to investigate why the 230 KV breakers 1W and 1T failed to auto re-close.

SCENARIO EVENT FORM

Event No: 10
Brief Description: **RAPID DEPRESSURIZATION**

POSITION	TIME	STUDENT ACTIVITIES
★ US ***Surrogate SRO Directs Murphy to Perform Rapid Depressurization***		**Directs Rapid Depressurization when RPV level drops to –161 inches.** 1. Enters EO-100-112, RAPID DEPRESSURIZATION. 2. Directs preventing uncontrolled Condensate injection. 3. Verifies Suppression Pool level > 5 feet. 4. Directs opening all ADS SRVs. 5. Verifies all ADS SRVs are open. 6. Directs maximizing ECCS injection to restore RPV level > -161"
US ★ PCOP/M		**Performs Rapid Depressurization by opening all ADS SRVs.** 1. Arms and depresses Division 1 and/or Division 2 ADS manual pushbuttons and verifies 6 red lights lit for ADS solenoids, or 2. Places individual control switch to open for each ADS SRV (G, J, K, L, M, & N) and verifies red light lit and amber light not lit for each valve solenoid. 3. Verifies 6 ADS SRVs are open: • Observes 6 ADS SRVs open on acoustic monitor status light indication. • Observes RPV pressure decrease. • Observes elevated tail pipe temperatures on TRS-B21-1R614. 4. Verifies Core Spray and LPCI injection valves open when RPV pressure decreases to <420 psig. 5. Reports Core Spray and LPCI injection flow to the RPV. 6. Restores RPV level above -161" with low-pressure ECCS injection systems.
		Transfers to wide range level indication when fuel zone indication is >-110"

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 10
Brief Description: **RAPID DEPRESSURIZATION**

INSTRUCTOR ACTIVITY:

As necessary

ROLE PLAY:

As necessary

SCENARIO EVENT FORM

Event No: 8
Brief Description: **RAPID DEPRESSURIZATION**

POSITION	TIME	STUDENT ACTIVITIES
US		Directs throttling injection to restore and maintain RPV level +13" to +54"
		Directs Core Spray injection for RPV level control
		Directs placing 'B' loop of RHR in Suppression Chamber Spray
PCOP		Places one loop of RHR in Suppression Chamber Spray IAW OP-149-004, RHR CONTAINMENT SPRAY. 1. Places ESW in service. 2. Places LOCA OVERRIDE MANUAL OVERRIDE switch to OVERRIDE. 3. Closes LPCI injection valve HV-151-F017B. 4. Opens Suppression Chamber test valve HV-151-F028B. 5. Starts RHR pump 1P202B(D). 6. Throttles open Suppression Chamber spray valve HV-151-F027B to maintain ≤ 500 gpm as indicated on FI-15120B. 7. Places RHRSW in service to RHR heat exchanger B.
★ **US** **NOTE: 1**		**Directs securing Suppression Chamber sprays before Suppression Chamber pressure drops to 0 psig.**
★ **PCOP**		**Secures Suppression Chamber sprays before Suppression Chamber pressure drops to 0 psig.** Throttles closed Suppression Chamber spray valve HV-151-F027B.
US		***After the scenario is complete, classifies the event as a SITE AREA EMERGENCY under EAL FS1 due to a Potential Loss of the Fuel Clad Barrier and a Loss of the RCS Barrier.***

★ Denotes Critical Task

NOTES:	(1) Depending on the timing sequence of operator actions, it is possible to exceed the SAT curve, and require RPV flooding. If this occurs, the 2nd critical task will be to establish ≥ 81 psid flooding pressure. (1 of 3 crews that validated this scenario crossed the SAT curve and required RPV flooding).

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 10
Brief Description: RAPID DEPRESSURIZATION

INSTRUCTOR ACTIVITY:
N/A

ROLE PLAY:

As necessary

TERMINATION CUE:

The Reactor is depressurized, RPV level is restored +13" to +54", and containment control actions are being addressed in accordance with EO-100-103 PRIMARY CONTAINMENT CONTROL.

EVENT CLASSIFICATION:

After the Scenario is complete, have the US classify the scenario for the HIGHEST EAL. Provide the US with any requested information needed to perform the classification.

Facility: **SSES** Scenario No.: **ILO-502A (SRO)** Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Unit 1 at 51% power EOL, Unit 2 is at 100% power..

Turnover: Startup Bus 10 is currently supplied from Startup Bus 20 with Tie Breaker 0A10502 closed The shift will be directed to restore the electric plant lineup to normal by transferring Startup Bus 10 to Startup Transformer 10. Following restoration of the electric plant lineup, the crew will continue with power ascension by pulling control rods and raise power ≈10%. Standby Liquid Control Pump 1B is inoperable while maintenance investigates a high motor vibration.

Event No.	Malf. No.	Event Type*	Event Description
1		N	Transfer SUB 10 to SUT 10
2		R, N	Increase Reactor Power
3		C	Loss of 1Y125 Instrument Bus
4		I	Steam Leak Detection Failure / HPCI Isolation
5		C	Loss of Instrument Air
6		C, M	Recirc Loop B Suction Line Break
7		C	Auto ADS Logic Failure
8		M	Rapid Depressurization
9		C	LPCI Injection Valve HV-F015B Fails to Auto-Open
10		M	RPV Flooding

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

SR 0

PP&L–SUSQUEHANNA TRAINING CENTER

SIMULATOR SCENARIO

Scenario Title:	**ILO CERTIFICATION / NRC EXAM SCENARIO**
Scenario Duration:	**90 Minutes**
Scenario Number:	**ILO-502A**
Revision/Date:	**Rev. 2, 1/22/2005**
Course:	**PC007/PC008, Initial License RO/SRO Certification Examination** **PC017/PC018, Initial License RO/SRO NRC Examination**

Operational Activities:

1. **Transfer SUB 10 to SUT 10**
2. **Increase Reactor Power**
3. **Loss of Instrument Bus 1Y125**
4. **Steam Leak Detection Failure / HPCI Isolation**
5. **Loss of Instrument Air**
6. **Recirc Loop B Suction Line Break**
7. **Auto ADS Logic Failure**
8. **Rapid Depressurization**
9. **LPCI Injection Valve HV-F015B Fails to Auto-Open**
10. **RPV Flooding**

Prepared By:	Instructor	01/22/05 Date
Reviewed By:	Nuclear Operations Training Supervisor	Date
Approved By:	Supervising Manager/Shift Supervisor	Date

OPERATIONS/TRAINING APPROVAL OF INITIAL LICENSE OPERATOR

CERTIFICATION EXAMINATION AND NRC LICENSE EXAMINATION MATERIALS

The Douglas Murphy NRC Re-Examination exam materials have been designed, developed, and validated in accordance with the guidance provided in NTP-31.5, Initial License Operator Certification and NRC License Examination Development. The Validation process of this procedure utilizes extensive Training and Operations subject matter expertise. By utilizing this expertise throughout the design, development, and validation of these materials, Training and Operations management have a high level of confidence that these materials will provide the intended job relevant evaluation.

(Exam Name)

Therefore, Training and Operations management approve these materials for use on the Douglas Murphy NRC Re-Examination Exam.

(Exam Name)

Operations Management	1/30/05 Date	Training Management	1/30/05 Date

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SCENARIO SUMMARY

Unit 1 is approximately 51% power and Unit 2 is at 100% power. Power ascension was suspended to allow Electrical Maintenance to perform an inspection of Startup Transformer 10 following a report of a small oil leak. Startup Bus 10 is currently supplied from Startup Bus 20 with Tie Breaker 0A10502 closed. Electrical Maintenance has successfully completed the repair and inspection of Startup Transformer 10. The shift will be directed to restore the electric plant lineup to normal by transferring Startup Bus 10 to Startup Transformer 10.

Standby Liquid Control Pump 1B is inoperable while maintenance investigates a high motor vibration.

Following restoration of the electric plant lineup, the crew will continue with power ascension by pulling control rods to raise power approximately 10%.

After Reactor power has been raised with Control Rods, breaker 1D624030 will trip open, resulting in a loss of power to Inverter 1D125 which subsequently provides power to Instrument Bus 1Y125. This will require the crew to implement ON-117-001, LOSS OF INSTRUMENT BUS 1Y125, section 3.10. The crew will be directed to transfer instruments to ALTERNATE Instrument power. The crew may augment their investigation through the use of ON-145-004 RPV WATER LEVEL ANOMALY in order to determine the power source for the instruments. Technical Specifications for PAM Instrumentation will have to be addressed due to the loss of Division 2 of SPOTMOS and RPV Water Level instruments.

When ALTERNATE power has been re-established for the 1Y125 Instruments, a failure in the HPCI Steam Leak Detection System causes the HPCI Steam Supply Outboard Isolation Valve HV-155-F003 to automatically close, making the HPCI system inoperable. HPCI will not be restored for the remainder of the scenario. Technical Specifications for HPCI INOPERABLE as well as PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION will have to be addressed.

After the Steam Leak Detection problem, the Instrument Air header will develop a leak. The leak will be unisolable and worsen over time. The crew will implement ON-118-001, Loss of Instrument Air and manually scram the Reactor before Instrument Air header pressure reaches 65 psig. Due to the design of the Condensate and Feedwater valves, the loss of IA prevents feed to the RPV and recirculates flow back to the main Condenser. Additionally, RPV pressure control will be limited to the SRVs. Main Turbine BPV will be available until the air-operated outboard MSIVs fail closed. MSL drains may be used to augment pressure control up to the point when RPV level reaches -129". At that point MSL drains will auto isolate.

Following the manual scram and stabilization of plant parameters, a small Recirc loop suction line break will occur requiring the crew to implement EO-100-103, PRIMARY CONTAINMENT CONTROL. Shortly after the crew initiates Suppression Chamber Spray, the leak will increase in size and will eventually require the crew to perform EO-100-112 RAPID DEPRESSURIZATION due to water level reaching TAF. The combination of high Drywell temperature and low RPV pressure causes violation of the RPV Saturation Temperature Curve, requiring the crew to perform EO-100-114, RPV FLOODING. Additionally, Fuel Zone water level may decrease below the useable value limit of –290" which also requires entry into RPV Flooding. The injection valve on the 'B' loop of RHR will fail to auto-open, requiring the crew to manually open the valve in order to achieve flooding pressure.

The scenario will be terminated when the crew has established RPV pressure $\geq$ 81 psid above Suppression Chamber Pressure.

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SCENARIO OBJECTIVES

The objective of this scenario is to evaluate the licensed operator candidate's ability to respond to the scenario events. These events will require each candidate to demonstrate the following:

- Knowledge of integrated plant operations
- Ability to diagnose abnormal plant conditions
- Ability to work together as a team
- Ability to mitigate plant transients that exercise their knowledge and use of ONs and EOPs
- Ability to utilize Technical Specifications (SRO Only)

To meet this objective, the licensed operator candidates must demonstrate proficiency in the following competencies:

Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings
2. Comply with and use procedures, references, and Technical Specifications
3. Operate the control boards
4. Communicate and interact with other crew members

Senior Reactor Operator Candidates:

1. Interpret/diagnose events and conditions based on alarms, signals, and readings
2. Comply with and use procedures and references
3. Operate the control boards (N/A to upgrade candidates)
4. Communicate and interact with the crew and other personnel
5. Direct shift operations
6. Comply with and use Technical Specifications

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CRITICAL TASKS

★ **Perform Rapid Depressurization when RPV level drops to –161 inches**

Safety Significance

RPV leakage or loss of injection systems impacts the ability to provide continued adequate core cooling through core submergence based on inventory loss.

Consequences for Failure to Perform Task

Failure to take the EOP actions will result in uncovering the core and breach of the fuel clad due to over heating.

SSES EOP Basis for:

The following steps provide the operating crew guidance to line up injection systems as available to maintain level >-129". If these actions are unsuccessful, the crew receives additional direction when it is determined that level can not be maintained above TAF.

RC/L- 4 RESTORE AND MAINTAIN LVL BETWEEN
+13" AND **+54"**
USING TABLE **3** SYSTEMS

RC/L-5 **IF** LVL CANNOT BE RESTORED AND MAINTAINED **> +13"**
MAINTAIN LVL **> -129"** USING TABLE **3** SYSTEMS
AUGMENTING AS DESIRED WITH
TABLE **5** ALTERNATE SUBSYSTEMS

RC/L-10 IRRESPECTIVE OF VORTEX LIMITS
WITH TABLE **3** SYSTEMS
PERFORM ALL
1 LINE UP FOR INJECTION
2 START PUMPS
3 INCREASE INJECTION TO MAX

RC/L-11 **IF** LESS THAN 2 TABLE **4** SUBSYSTEMS CAN BE LINED UP
COMMENCE LINING UP AS MANY AS POSSIBLE
TABLE **5** ALTERNATE SUBSYSTEMS

RC/L-13 WITH TABLE **5** ALTERNATE SUBSYSTEMS PERFORM ALL:
1 LINE UP FOR INJECTION
2 START PUMPS
3 INCREASE INJECTION TO MAX

CRITICAL TASKS

RC/L-16 **WHEN** LVL CANNOT BE RESTORED AND MAINTAINED **> -161"** GO TO RAPID DEPRESS

Rapid Depressurization is not initiated until RPV water level has dropped to -161" (TAF) because:

- *Adequate core cooling exists so long as RPV water level remains above -161" (TAF).*
- *The time required for RPV water level to decrease to -161" (TAF) can best be used to line up and start pumps, attempting to reverse the decreasing RPV water level trend before Rapid Depressurization is required to assure continued adequate core cooling.*

(Reference: SSES-EPG C1-4 and second override before C3-1)

Indications/Cues for Event Requiring Critical Task

Reactor water level trending downward, eventually indicating less than the top of active fuel height on the Fuel Zone Level Indicator.

Performance Criteria

Perform a Rapid Depressurization per EO-100-112 when water level reaches the TAF –161" as read on the Fuel Zone Instrument.

Initiate ADS / Manually Open all 6 ADS valves

Performance Feedback

Initiating a rapid depressurization causes Reactor pressure to lower to the shutoff head of the low pressure injection systems allowing water level to rise on the Fuel Zone and Wide Range level instruments.

Verify ADS valves are open using light red light indication, acoustic monitoring and lowering Reactor pressure and rising reactor water level.

CRITICAL TASKS

★ **Declare RPV level indication indeterminate due to violation of the RPV Saturation Curve**

★ **Perform RPV Flooding when RPV level becomes indeterminate by increasing injection flowrate to raise RPV pressure to ≥ 81 psid above Suppression Chamber pressure**

★ **Manually open RHR F015B valve to inject to the RPV** (*Division 2 RHR is needed for injection and the injection valve fails to auto open)*

Safety Significance

Adequate core cooling may be challenged if core submergence can not be verified due to indeterminate RPV level indication.

Consequences for Failure to Perform Task

Failure to take the EOP actions may result in uncovering the core and breach of the fuel clad due to over heating.

SSES EOP Basis for:

RC/L-2 **IF** LVL CANNOT BE DETERMINED
GO TO RPV FLOODING

If RPV water level cannot be determined, the actions specified in the subsequent [E0-102] steps cannot be performed since RPV water level and water level trend information is required for determining which actions to take. The transition to EO-100-114, RPV Flooding, is necessary to assure continued adequate core cooling under conditions where RPV water level cannot be determined.

RF-12 COMMENCE AND IRRESPECTIVE OF VORTEX LIMITS INCREASE INJECTION TO ESTABLISH:

RPV PRESS NOT DECREASING
AND
RPV PRESS ≥ **81 PSID** ABOVE SUPP CHMBR PRESS
USING ANY:

- CORE SPRAY
- LPCI WITH FLOW THROUGH HX ASAP
- COND
- CRD MAXIMIZED
- RHRSW X-TIE FROM EITHER UNIT
- FIRE SYSTEM IAW ES-013-001

CRITICAL TASKS

- CRD X-TIE TO OTHER UNIT
- ECCS KEEP-FILL
- RHR SDC SUCTION FILL
- SLC BORON TANK
- SLC DEMIN X-TIE

These systems consist of all motor-driven systems which are available to flood the RPV. As many of these systems as necessary must be used to establish and maintain the conditions required to verify RPV flooding. Establishing adequate core cooling conditions dictates that adherence to Vortex limits not be required.

Three conditions must be satisfied to verify RPV flooding without direct indication of RPV water level:

1. *At least 4 SRVs must be open. This ensures that adequate steam flow will exist for cooling any un-submerged portion of the core when RPV pressure is ≥ 81 psid above Suppression Chamber pressure.*

2. *RPV pressure must <u>not</u> be decreasing. This ensures that the required steam flow will be maintained.*

3. *RPV pressure must be greater than Suppression Chamber pressure by at least 81 psid, the Minimum RPV Flooding Pressure (MRFP).*

The MRFP is defined to be the lowest differential pressure between the RPV and the Suppression Chamber at which steam flow through 4 SRVs is sufficient to remove decay heat. The assumed decay heat generation rate is ten minutes after shutdown from full power. Since ten minutes is the earliest that RPV flooding could reasonably be expected to be needed, establishing and maintaining RPV pressure above the MRFP assures that more than enough steam flows through the SRVs to carry away all core decay heat.

This requires that a sufficient quantity of water reach the core to carry away decay heat by boiling, which in turn requires that RPV water level increase. Maintaining this above the minimum pressure (81 psid) assures that the RPV will ultimately flood to the main steam lines.

Indications/Cues for Event Requiring Critical Task

Violation of the RPV Saturation Curve is indicated by PICSY format (RPVSAT) showing purple indication on the curve, plot on the unsafe side by the Crew and/or RPV level instrumentation failing in the upscale direction.

CRITICAL TASKS

Performance Criteria

Recognize failure of RPV level indicators due to reaching saturation conditions on the instrument runs, initiate rapid depressurization by opening ADS valves and then increasing RPV injection until RPV pressure is NOT decreasing and is ≥ 81 psid above Suppression Chamber pressure.

Performance Feedback

Initiating a rapid depressurization causes Reactor pressure to lower to the shutoff head of the low pressure injection systems allowing water level to rise to the point that RPV pressure will increase to a value that is 81 psid above Suppression Chamber. At this point injection should be stabilized to maintain the DP.

Verify ADS valves are open using light red light indication, acoustic monitoring and lowering Reactor pressure.

Verify injection from available systems raises RPV pressure to a value that is 81 psid above Suppression Chamber.

★ Denotes Simulator Critical Task

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SCENARIO REFERENCES

1. TRANSFER STARTUP BUS 10 TO STARTUP TRANSFORMER 10

   OP-003-001 13.8KV COMMON ELECTRICAL EQUIPMENT, REV. 6

2. INCREASE REACTOR POWER

   CORE REACTIVITY CONTROL BOOK
   GO-100-002 PLANT STARTUP, HEATUP AND POWER OPERATION, REV. 46
   OP-AD-338 COMMUNICATION REQUIREMENTS FOR REACTIVITY MANIPULATIONS, REV. 1

3. LOSS OF INSTRUMENT BUS 1Y125

   ON-117-001 LOSS OF INSTRUMENT BUS, REV. 24
   TS 3.3.3.1 PAM INSTRUMENTAION, AMMENDMENT 178

4. STEAM LEAK DETECTION FAILURE / HPCI ISOLATION

   AR-114-C02 HPCI TURBINE TRIP SOLENOID ENERGIZED, REV. 23
   AR-114-F05 HPCI LEAK DETECT LOGIC B HI TEMP, REV. 23
   AR-114-B05 HPCI OUT OF SERVICE, REV. 23
   TS 3.5.1 ECCS OPERATING, AMMENDMENT 178
   TS 3.3.6.1 PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION, AMMENDMENT 213

5. LOSS OF INSTRUMENT AIR

   AR-124-A01 INSTRUMENT AIR LOOP A LO PRESSURE, REV. 3
   AR-124-B01 INSTRUMENT AIR HEADER LO PRESSURE, REV. 4
   AR-124-E01 SERVICE AIR LO PRESSURE, REV. 4
   ON-118-001 LOSS OF INSTRUMENT AIR, REV. 15
   ON-100-101 SCRAM, REV. 12

6. RECIRC LOOP B SUCTION LINE BREAK / RAPID DEPRESSURIZATION / RPV FLOODING

   EO-100-102 RPV CONTROL, REV. 2
   EO-100-103 PRIMARY CONTRAINMENT CONTROL, REV. 7
   OP-149-004 RHR CONTAINMENT SPRAY, REV. 18
   AR-112-D03 DRWL/SUPP CHAMBER HI-LOW PRESS, REV. 26
   AR-104-B03 PRIMARY CONTAINMENT HI-LO PRESS, REV. 19
   EO-100-112 RAPID DEPRESSURIZATION, REV. 2
   EO-100-114 RPV FLOODING, REV. 3

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SCENARIO SPECIAL INSTRUCTIONS

1. Initialize the simulator to **IC-16:** Unit 1 at 51% power EOL, Unit 2 at 100% power EOL.

2. Set up the simulator for the scenario by performing the following:

   a. Remove SUT 10 from service.
      - Supply SUB 10 from SUB 20 with the Tie Breaker 0A10502 closed.
      - Open SUT 10 MOAB 1R105.
      - Transfer 4KV buses to SUB 20.
   b. Perform GO-100-002 step 5.73.
   c. Withdraw rod 42-47 (Step 539) from 12 to 36.

3. Take a snapshot to an available IC (currently **IC-102**).

4. Insert Auto exercise **OPRMIS** file to install OPRM program.

5. Type **restorepref YPP.ILO-502**

6. Place simulator in run and verify the following pre-inserts and Program Button assignments.

7. **Verify the Environment window:**

MALFS	REMFS	OVRDS	TRIGS
3 : 3	10	2 : 2	1

MALFUNCTIONS

MV06:HV151F015B	RHR INJ F015B FAILS TO AUTO OPEN
RL01:B21C1K5A	DIV 1 ADS AUTO LOGIC FAILURE
RL01:B21C1K5B	DIV 2 ADS AUTO LOGIC FAILURE

REMOTE FUNCTIONS

DB106723 OPEN	BKR FOR 1B SLC PUMP OPEN

OVERRIDES

AN:AR106B14	(Not associated with scenario setup)
AN:AR106C15	(Not associated with scenario setup)

TRIGGERS / ACTIONS

E1 ILO502MTGLO	E1 IS TRUE WHEN MTGLO PUMP STARTED
E1 = MMF IA118002 20	INCREASES INSTRUMENT AIR LEAK RATE

SCENARIO SPECIAL INSTRUCTIONS

PROGRAM BUTTONS

[P-1] MRF DC102114 OPEN	POWER TO INVERTER 1D125/1Y125 OPEN
[P-2] IMF TH02:TEE41N24B 350 0 ASIS	TSH-E41-1N006B FAILS HIGH – HPCI AREA
[P-3] IMF IA118002 5	IA COMMON HEADER RUPTURE – 5%
[P-4] MMF IA118002 20	IA COMMON HEADER RUPTURE – 20%
[P-5] IMF RR164011B 0.5 300	RECIRC LOOP 'B' SUCTION LINE BRK – 0.5%
[P-6] MMF RR164011B 40 300 0.5	RECIRC LOOP 'B' SUCTION LINE BRK – 40%
[P-7] MMF RR164011B 5 120 40	RECIRC LOOP 'B' SUCTION LINE BRK – 5%
[P-23] bat FWB.101ALARM	FEEDWATER HEATER PANEL ALARM RESET
[P-24] bat FWB.102 ALARM	FEEDWATER HEATER PANEL ALARM RESET
[P-25] bat FWB.103 ALARM	FEEDWATER HEATER PANEL ALARM RESET

8. Verify LEFM is selected as the Feedwater flow input to PICSY IAW OI-TA-021.

9. Prepare a turnover sheet indicating:

   a. Unit 1 is at 51% power; Unit 2 is at 100% power EOL.
   b. Power ascension on Unit 1 on hold to allow Electrical Maintenance to inspect Startup Transformer T10 following a report of a small oil leak.
   c. Startup Transformer T10 was removed from service IAW OP-003-001 section 2.7 approximately 3 hours ago.
   d. Maintenance has now completed the inspection of Startup Transformer T10. All Clearances are closed. Restore Startup Bus 10 to Startup Transformer 10 IAW OP-003-001 Section 2.8. The pre-job brief has been completed, personnel are in place to support this restoration.
   e. DO NOT transfer 4Kv buses to normal lineup until Maintenance calls back and concurs with that activity.
   f. When T10 is returned to service, continue with the power ascension by pulling Control Rods starting at GO-100-002 step 5.74, Startup Sequence B2 at step 540. Reactor Engineering is on site and available if needed.
   g. 1B SLC pump O/S for Maintenance to investigate high motor vibration.

Common

- 'A' RW Chiller O/S
- C&D Collection Tank Discharge Valve failed to open. Solenoid is to be replaced by FIN under 575842.
- SCC D/G Generator Over Temperature alarm received during manual run. Waiting on procurement of parts.

10. Prepare an LCO sheet (TS 3.8.1) identifying that Startup Transformer 10 has been out of service for 3 hours and a Repetitive Required Action Completion Sheet.

11. Prepare an LCO sheet (TS 3.1.7 and 3.3.6.1, Table 3.3.6.1-1, Function 5.e) identifying that SBLC has been out of service for 2 hours.

12. Prepare a Loss of Safety Function Work Sheet for PCIV

SCENARIO EVENT DESCRIPTION FORM

Initial Conditions: Initialize the Simulator to **IC-102**. Place the Simulator to RUN. Ensure the Program Buttons are assigned as indicated on the Special Instructions sheet via the appropriate Preference File. Assign Shift positions; direct the start of the 5-minute panel walkdown.

EVENT	TIME	DESCRIPTION
1		TRANSFER SUB 10 TO SUT 10
2		INCREASE REACTOR POWER
3		LOSS OF POWER TO INVERTER 1D125 (FOR INSTRUMENT BUS 1Y125)
4		STEAM LEAK DETECTION FAILURE / HPCI ISOLATION
5		LOSS OF INSTRUMENT AIR
6		RECIRC LOOP B SUCTION LINE BREAK
7		AUTO ADS LOGIC FAILURE
8		RAPID DEPRESSUIRZATION
9		LPCI INJECTION VALVE HV-F015B FAILS TO AUTO-OPEN
10		RPV FLOODING

SCENARIO EVENT FORM

Event No: 1, 2
Brief Description: TRANSFER SUB 10 TO SUT 10 / INCREASE REACTOR POWER

POSITION	TIME	STUDENT ACTIVITIES
US		Directs PCOP to transfer Startup Bus 10 to Startup Transformer 10.
PCOP		Implements OP-003-001, 13.8KV COMMON ELECTRICAL EQUIPMENT, Section 2.8. 1. Notifies Transmission Control Center. 2. Closes MOAB 1R105. 3. Places SU XFMR 10 TO BUS 10 SYNC SEL HS-00014 to ON. 4. Verifies SUT 10 and SUB 10 voltages are matched and in phase. 5. Closes breaker 0A10301. 6. Verifies Tie Breaker 0A010502 OPENS. 7. Places SU XFMR 10 TO BUS 10 SYNC SEL HS-00014 to OFF. 8. Aligns all control switch flags to actual breaker position. 9. Notifies Transmission Control Center SUT 10 is in service.
US		Directs continuing the power ascension with Control Rods.
		Briefs the crew for the upcoming power increase.
		Directs implementation of Reactor Engineer Instruction in the CRC Book.
		Directs the implementation of GO-100-102, PLANT STARTUP, HEATUP AND POWER OPERATION.
PCOM		Increases reactor power as directed by the US and CRC Book.
		Plots power change on the power-to-flow map.
		Maintains LOAD SET ≈100 MWe above existing load.
PCOP		Notifies GCC before the power increase begins.

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 1, 2
Brief Description: TRANSFER SUB 10 TO SUT 10 / INCREASE REACTOR POWER

INSTRUCTOR ACTIVITY:

As necessary

ROLE PLAY:

Transmission Control Center: ready to re-energize Startup Transformer 10; all inspections in the Switchyard have been completed and power is available to Startup Transformer 10.

SCENARIO EVENT FORM

Event No: 3
Brief Description: **LOSS OF POWER TO INVERTER 1D125 (1Y125 INSTRUMENT BUS)**

POSITION	TIME	STUDENT ACTIVITIES
PCOM/P		Reports AR-107-C06, BIS SYS DIV 2 INOP ECCS/ESF SYS Reports AR-150-D01 CONTN INSTR GAS SYSTEM
		Recognize and report loss of multiple instruments: • Post Accident Monitoring RPV Water Level • SPOTMOS Division 2
US		Directs PCO to perform ON-117-001, LOSS OF INSTRUMENT BUS Section 3.10
		Contacts Work Week Manager to provide assistance with investigation.
		Refers to TS 3.3.3.1 table 3.3.3.1-1 • Determines Reactor Vessel Level and Suppression Chamber Water Temperature required Channels are not met. Enters CONDITION A. REQUIRED ACTION A.1: Restore required channel to OPERABLE status within 30 days
PCOP		Implements ON-117-001, LOSS OF INSTRUMENT BUS Section 3.10: (May implement ON-145-004 RPV WATER LEVEL ANOMALY to determine power source to RPV Level Instruments.) • Refer to Attachment N for functions/instrumentation lost and recommended actions. • Ensure 1D624030 CLOSED. • Dispatch Operator to 1D125. • Observe 1D125 Master Unit Indicating Light ILLUMINATED. • Observe 1D125 Slave Unit Indicating Light ILLUMINATED. • IF 1D125 Indicating Lights EXTINGUISHED: • At 1C661-B1, PLACE HSE-112505 in ALTERNATE position. • At 1C690B, PLACE HSE-112502 in ALTERNATE position. • At 1C601-22B, PLACE HSE-112501 in ALTERNATE position.

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 3
Brief Description: **LOSS OF POWER TO INVERTER 1D125 (1Y125 INSTRUMENT BUS)**

INSTRUCTOR ACTIVITY:

After Reactor power is raised to ≈ 60%, or when directed by Lead Examiner, insert a loss of power to Inverter 1D125 by depressing:

[P-1] MRF DC102114 OPEN Open feeder breaker 1D624030

ROLE PLAY:

1. As NPO dispatched to 1D125, report that both Master and Slave Units are extinguished.
2. As NPO dispatched to 1D624030, report that the breaker is tripped open.
3. If requested to re-close the breaker, report that the breaker **will not** re-close.
4. When dispatched to URR to 1C661-B1, PLACE HSE-112505 in **ALTERNATE** position by either:
   - Go to Simulation Diagram DB17 and click on Transfer Switch to transfer to Alternate
   - **MRF DB157002 ALTERNATE**
5. As Work Week Manager, assemble team to diagnose problem, and take no further action.

SCENARIO EVENT FORM

Event No: 4
Brief Description: **STEAM LEAK DETECTION FAILURE / HPCI ISOLATION**

POSITION	TIME	STUDENT ACTIVITIES
PCOP		Reports HPCI LEAK DETECT LOGIC B HI TEMP, refers to AR-114-F05.
		Reports HPCI TURBINE TRIP SOLENOID ENERGIZED refers to AR-114-C02.
		Reports HPCI OUT OF SERVICE, refer to AR-114-B05.
		Reports HPCI STM SUPPLY OB ISO valve HV-155-F003 is CLOSED.
		Determines TSH-E41-1N600B is tripped and indicates 350°F.
		Dispatches Plant Operator to HPCI Equipment Room to investigate potential high temperature condition, using appropriate safety precautions.
US		Contacts I&C to investigate TSH-E41-1N600B.
		Declares HPCI System inoperable.
		Refers to TS 3.5.1, ECCS–Operating; determines Condition 'D' applies. • REQUIRED ACTION D.1: Verify by administrative means RCIC System is OPERABLE Immediately AND D.2: Restore HPCI System to OPERABLE status within 14 days
		Verifies RCIC is OPERABLE by Administrative means.
		Refers to TS 3.3.6.1, Primary Containment Isolation Instrumentation; determines Condition A applies. • REQUIRED ACTION: A.1: Place channel in trip within 24 hours.

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 4
Brief Description: **STEAM LEAK DETECTION FAILURE / HPCI ISOLATION**

INSTRUCTOR ACTIVITY:

After Instrument power has been restored, and upon direction from Lead Evaluator, initiate Steam Leak Detection failure and HPCI auto isolation by depressing:

[P-2] IMF TH02:TEE41N24B 350 0 ASIS TSH-E41-1N006B FAILS HIGH – HPCI AREA

ROLE PLAY:

1. As Plant Operator sent to investigate HPCI Equipment Area, wait 2 minutes and report all conditions in the HPCI room are normal.

2. A I&C sent to investigate TE-E41-1N600B, acknowledge the direction to investigate; no further actions will be taken.

SCENARIO EVENT FORM

Event No: 5
Brief Description: LOSS OF INSTRUMENT AIR

POSITION	TIME	STUDENT ACTIVITIES
PCOP		Reports lowering Instrument Air pressure.
		Reports SERVICE AIR LO PRESS; refers to AR-124-E01.
		Reports INSTRUMENT AIR LOOP A LO PRESS; refers to AR-124-A01.
		Dispatches a Plant Operator to investigate IA system.
		Implements ON-118-001, LOSS OF INSTRUMENT AIR.
US		Directs performance of ON-118-001, LOSS OF INSTRUMENT AIR Directs/ensures PCOM to scram the Reactor when IA header pressure ≥ 65 psig. Ensures local investigation of air system to determine severity of leak.
PCOM		Ensures/Reduces Recirc flow to ≈ 65 Mlbm/hr.
PCOP		Shifts Aux Buses 11A/11B to S/U Buses
US		Enters EO-100-102, RPV CONTROL when RPV Level goes below +13". Directs RPV level maintained +13" to +54" with available systems. Directs RPV pressure stabilized <1087 psig using available systems • For RPV Level Control, Condenseate and FW will not be available due to Air Operated valves failing open/closed such that feed is not directed to RPV. CRD, RCIC, LP ECCS and other secondary systems will be available. • For RPV Pressure Control, MT BPV will be available until OB MSIVs close, requiring use of SRVs in. May also use MSL drains until -129" isolation removes that capability.
PCOM		Places Mode Switch to SHUTDOWN. Performs actions of ON-100-101, SCRAM, SCRAM IMMINENT Inserts SRMs and IRMs

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 5
Brief Description: **LOSS OF INSTRUMENT AIR**

INSTRUCTOR ACTIVITY:

1. When the crew has completed addressing Steam Leak Detection System failure and HPCI Isolation, insert an instrument air leak by depressing:

   [P-3] IMF IA118002 5 IA COMMON HEADER RUPTURE – 5%

2. When the crew performs Scram Imminent Actions, verify trigger **E1** (TGOP pump started) fires to increase the severity of the IA leak, OR increase the severity of the rupture to 20% by depressing

   [P-4] MMF IA118002 20 IA COMMON HEADER RUPTURE – 20%

ROLE PLAY:

1. As Plant Operator sent to IA, wait 2 minutes and report that all IA and SA compressors are running, the SA cross tie appears to be operating normally but IA pressure is slowly decreasing. If asked, inform the crew that "I will investigate the system for a possible leak."

2. As Plant Operator sent to IA, report "I have located a large air leak at the common IA header piping just downstream of the receivers; I do not see any way to isolate the leak, and header pressure is dropping rapidly."

SCENARIO EVENT FORM

Event No: 6, 7
Brief Description: RECIRC LOOP B SUCTION LINE BREAK / AUTO ADS LOGIC FAILURE

POSITION	TIME	STUDENT ACTIVITIES
PCOP		Reports increasing Drywell Pressure and Drywell Temperature.
US		Enters EO-100-103, PRIMARY CONTAINMENT CONTROL. Directs one loop of RHR placed in Suppression Chamber Spray.
PCOP		Places one loop of RHR in Suppression Chamber Spray IAW OP-149-004, RHR CONTAINMENT SPRAY. 1. Places ESW in service. 2. Places LOCA OVERRIDE MANUAL OVERRIDE switch to OVERRIDE. 3. Closes LPCI injection valve HV-151-F017A (B). 4. Opens Suppression Chamber test valve HV-151-F028A (B). 5. Starts RHR pump 1P202A(B)(C)(D). 6. Throttles open Suppression Chamber spray valve HV-151-F027A (B) to maintain ≤ 500 gpm as indicated on FI-15120A(B). 7. Places RHRSW in service to RHR heat exchanger A (B).
		Reports rapidly decreasing RPV water level.
US		Re-enters EO-100-102 due to high Drywell pressure.
		Directs injection with all available systems.
PCOP/M		Attempts to maintain RPV water level +13" to +54" with available systems.
		Verifies isolations, ECCS initiations, and DG starts as directed.
		Reports RPV water level is approaching/at –161".
		Recognizes and reports ADS did **not** auto initiate.

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 6, 7
Brief Description: RECIRC LOOP B SUCTION LINE BREAK / AUTO ADS LOGIC FAILURE

INSTRUCTOR ACTIVITY:

When the crew scrams the Reactor and RPV water level is stable at +13" to +54", initiate a small break inside the primary containment by depressing:

[P-5] IMF RR164011B 0.5 300 RECIRC LOOP B SUCTION LINE BREAK – 0.5%

After the crew has commenced Suppression Chamber Spray, increase the severity of the Recirc loop rupture to 40% by depressing:

[P-6] MMF RR164011B 40 300 0.5 RECIRC LOOP B SUCTION LINE BREAK – 40%

ROLE PLAY:

As necessary

SCENARIO EVENT FORM

Event No: 7, 8
Brief Description: AUTO ADS LOGIC FAILURE / RAPID DEPRESSURIZATION

POSITION	TIME	STUDENT ACTIVITIES
★ US		**Directs Rapid Depressurization when RPV level drops to –161 inches.** 1. Enters EO-100-112, RAPID DEPRESSURIZATION. 2. Directs preventing uncontrolled Condensate injection. 3. Verifies Suppression Pool level > 5 feet. 4. Directs opening all ADS SRVs. 5. Verifies all ADS SRVs are open.
★PCOP/M		**Performs Rapid Depressurization by opening all ADS SRVs.** 1. Arms and depresses Division 1 and/or Division 2 ADS manual pushbuttons **OR** 2. Places individual control switch to open for each ADS SRV (G, J, K, L, M, & N) and verifies red light lit and amber light not lit for each valve solenoid. 3. Verifies 6 ADS SRVs are open by observing : • 6 ADS SRVs open on acoustic monitor status light indication. • RPV pressure decrease. • Suppression Pool Temperature rise. • SRV Tailpipe temperatures rise on TRS-B21-1R614.

★ Denotes Critical Task

NOTES:	

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 7, 8
Brief Description: AUTO ADS LOGIC FAILURE / RAPID DEPRESSURIZATION

INSTRUCTOR ACTIVITY:

As necessary

ROLE PLAY:

As necessary

SCENARIO EVENT FORM

Event No: 9, 10
Brief Description: LPCI INJECTION VALVE HV-F015B FAILS TO AUTO-OPEN / RPV FLOODING

POSITION	TIME	STUDENT ACTIVITIES
US		Plots Drywell Instrument Run Temperature and RPV Pressure on the SAT curve.
★ US (Note 1)		**Declares RPV level indication indeterminate due to violation of the RPV Saturation Curve.**
★ US (Note 2)		**Performs EO-100-114, RPV FLOODING** **Directs increasing injection to RPV in order to raise RPV Pressure ≥ 81 psid above Suppression Chamber pressure.** Verifies: • MSIVs and MSL drains closed • RCIC isolation valves HV-149-F007 and HV-149-F008 closed
★ PCOP		**Manually opens RHR F015B to inject to the RPV after identifying RHR F015B failed to auto-open.** **Increases injection to raise RPV pressure to ≥ 81 psid above Suppression Chamber pressure.** 1. Ensures maximum injection from Core Spray and LPCI pumps. 2. Reports RPV pressure and Suppression Chamber pressure. 3. Controls injection flowrate to maintain RPV Flooding Pressure.
US		Determines RPV pressure ≥ 81 psid above Suppression Chamber pressure.
		Records time conditions are met.
		Contacts TSC to enter EP-DS-003, RPV LEVEL DETERMINATION.
US		***After the scenario is complete, classifies the event as a SITE AREA EMERGENCY under EAL FS1 due to a Loss or Potential Loss of the Fuel Clad Barrier and a Loss of the RCS Barrier.***

★ Denotes Critical Task

NOTES:	**NOTE 1:** Fuel Zone level may decrease <-290" requiring entry into RPV Flooding.
	NOTE 2: Crew must terminate Containment Sprays, if in progress, and direct all ECCS flow to the RPV in order to establish RPV Flooding Pressure.

INSTRUCTOR ACTIVITIES, ROLE PLAY, AND INSTRUCTOR'S PERSONAL NOTES

Event No: 9, 10
Brief Description: LPCI INJECTION VALVE HV-F015B FAILS TO AUTO-OPEN / RPV FLOODING

INSTRUCTOR ACTIVITY:

When the crew has commenced RPV flooding with RHR F015B open, decrease the size of the Recirc rupture to allow achieving flooding pressure by depressing:

[P-7] MMF RR164011B 5 120 40 RECIRC LOOP B SUCTION LINE BREAK – 5%

ROLE PLAY:

As necessary

TERMINATION CUE:

The crew has established injection to raise RPV Pressure ≥ 81 psid above Suppression Chamber Pressure.

EVENT CLASSIFICATION:

After the Scenario is complete, have the US classify the scenario for the HIGHEST EAL. Provide the US with any requested information needed to perform the classification.