

# **Final Submittal**

(Blue Paper)

1. Scenario Outline (ES-D-1) and Simulator Scenario Operator Actions (ES-D-2)
2. Final Operating Test Simulator Scenarios
  - A. ES-D-1
  - B. ES-D-2

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**SHEARON HARRIS**  
**EXAM 2002-301**

**50-400**  
**AUGUST 26 - 29, 2002**

Facility: **HARRIS** Scenario Number: **1** Op-Test Number: **2002-301**

Examiners

Operators

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**Objectives:** To evaluate the candidate's ability to operate the plant in a controlled and safe manner during a power decrease and diagnose and respond to the following events in accordance with applicable Harris plant procedures:

- Controlling pressure channel failure on a SG
- Loss of an Emergency AC 6.9 KV Bus
- Pressurizer level channel failure
- Loss of offsite power
- Subsequent loss of all AC power
- Restoration of one Emergency Diesel Generator

**Initial Conditions:** IC-25; 79% power BOL; Ensure Boric Acid Pump 'B' in AUTO and RMUW Pump 'B' in START; RHR Pump A-SA OOS (RHR022 RACK\_OUT); Ensure DEH HOLD button is illuminated. Ensure a Reactivity Plan is provided.

**Turnover:** The unit is at 79% power at BOL during a ramp from 100% power at 5 Mw per minute.

Severe thunderstorms have been reported in the area for the past 30 minutes. AP-301, "Seasonal Preparations and Monitoring," has been completed.

A 6.7 gpd tube leak exists in SG 'A'.

Boron concentration is 1293 ppm. Bank D rods are at 199 steps.

RHR Pump 'A' was taken out of service 2 hours ago for oil replacement due to contaminants and is expected to be returned to service within the next 2 hours. Technical Specification 3.5.2 has been entered. OWP-RH-01 has been completed. Risk is YELLOW.

Main Feed Pump 'A' has been inspected for potential vibration concerns and Engineering has requested that plant power be lowered at the current rate to allow removing the pump from service if required.

Shift orders are to continue the power decrease at 5 Mw per minute to 50% power and restore RHR Pump 'A' to service when it becomes available. GP-006 is being performed per Section 5.2, with Step 5.2.7 completed.

Event Number	Malfunction Number	Event Type*	Event Description
1	NA	N (SRO) R (RO) N (BOP)	Continued plant power reduction (GP-006)
2	PT:495 1300 0	I (SRO) I (BOP)	Controlling Channel of SG C pressure PT-495 high failure (AOP-010, OWP-ESF)
3	LT:459 100 0	I (RO) I (SRO)	Pressurizer Level Channel LT-459 fails high (OWP-RP)
4	EPS05A ZDSQ94:4A FAIL_ASIS Z1974TDI FAIL_ASIS Z1975TDI FAIL_ASIS	C (ALL)	Loss of 1A-SA Emergency AC Bus with failure of CSIP A to automatically start and failure of TDAFW Pump to automatically start (AOP-025)
5	EPS01 1 DSG01 2	M (ALL)	Lighting strike in switchyard - loss of offsite power. EDG A loads, EDG B trips (EOP-PATH-1, EOP-EPP-004)
6	DSG01 3	M (ALL)	EDG A trips - loss of all power (EOP-EPP-001)
7	NA	C (BOP) C (SRO)	EDG A is restarted after S/G depressurization has started (EOP-EPP-001)
8	NA	(SRO)	Classifies the Event

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

SCENARIO NUMBER: 1	EVENT NUMBER: 1	FACILITY: Harris
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BRIEF DESCRIPTION: Continued plant power reduction
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: NA

ANNUNCIATORS / CUES:

Plant management directs continued power reduction to 50% power.

- 1) Direct the actions of GP-006, "Normal Plant Shutdown from Power Operation to Hot Standby" after conducting a brief
- 2) Borate and / or insert Control Rods as necessary to control RCS temperature and AFD during the load reduction
- 3) Reduce Turbine Load
  - Place Impulse Pressure Feedback Loop in service
  - Place Megawatt Feedback Loop in service
  - Depress the Load Rate MW / Min pushbutton
  - Enter the desired unloading rate (5 MW / Min) in Demand display
  - Depress Enter pushbutton
  - Depress Ref pushbutton
  - Enter the desired load (approximately 50% power) in Demand display
  - Depress the Enter pushbutton and verify the Hold pushbutton illuminates
  - Depress the Go pushbutton to start the load reduction and verify the Reference display decreases
- 4) Verify Generator Load is decreasing

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 1      EVENT NUMBER: 2      FACILITY: Harris

BRIEF DESCRIPTION:      **Controlling Channel of SG C pressure PT-495 high failure**

EXPECTED OPERATOR / PLANT RESPONSE      SRO      RO      BOP

TIME:    T+0 (When Lead Examiner determines adequate power reduction has been observed)

ANNUNCIATORS / CUES:

- LOOP A HI STEAM LINE DP LOW-P1 (ALB-014-1-2)
- LOOP B HI STEAM LINE DP LOW-P3 (ALB-014-2-2)
- SG C STM > FW FLOW MISMATCH (ALB-014-6-1B)
- SG 'C' actual feed flow > steam flow
- SG 'C' feed reg valve opening
- SG 'C' level rising

- 1) Directs the BOP to take manual control of FK-498 and reduce feed flow per requirements of OMM-001
  - Condition / cause communicated to SRO
  - SRO provides concurrence to take manual control
  - SRO provides control limits
  - Appropriate procedure implemented when plant stabilized
  - Log entry made when controller in manual
- \*2) Take manual control of FK-498 and reduce feed flow to prevent turbine / reactor trip on high SG level**
- 3) Restore SG C level with feed flow and steam flow matched
- 4) Enters and directs the actions of AOP-010, "Feedwater Malfunctions"
- 5) Determines NO FW Pumps are tripped
- 6) (CONTINUOUS ACTION) Maintain at least 1 FW Pump running, flow to all SGs, all SGs > 30%
- 7) Determines Feed Reg Valve 'C' not operating properly in auto and verifies in manual
- 8) Maintain SG levels between 52% and 62%

COMMENTS:      BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 1	EVENT NUMBER: 2	FACILITY: Harris
BRIEF DESCRIPTION: Controlling Channel of SG C pressure PT-495 high failure (Page 2)		

EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
9) Check MCR annunciators available	_____		
10) Check all FW Train Pumps and both Heater Drain Pumps running			_____
11) Goes to Section 3.1 of AOP-010 for All Condensate / Feedwater Flow Malfunctions (other than pump trips)	_____		
12) Checks all Recirc and Dump valves operating properly in MODU			_____
13) Check Condensate and Feedwater system intact			_____
14) Check all Feedwater Train and Heater Drain Pumps operating normally			_____
15) Notify Load Dispatcher of any load limitations (NONE)	_____		
16) Check reactor thermal power changed by < 15% in any one-hour period	_____		
17) Refer to OWP-ESF for SG C pressure failure	_____		
18) Selects Channel 4 (495) for control in accordance with OWP-ESF			_____
<i>NOTE: Also likely to select Channel 496 for SG feed flow although not required.</i>			
19) Refers to TS 3.3.1 (Item 14), TS 3.3.2 (Item 1.e), and TS 3.3.3.6 (Item 6) – 6 hour requirement to trip bistables most limiting	_____		
20) Initiate a WR	_____		

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: <b>1</b>	EVENT NUMBER: <b>3</b>	FACILITY: <b>Harris</b>
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BRIEF DESCRIPTION: <b>Pressurizer Level Channel LT-459 fails high</b>
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+10 or At Lead Examiner's Direction

ANNUNCIATORS / CUES:

- |   |   |   |  |
|---|---|---|--|
| <ul style="list-style-type: none"> <li>• ALB-009-4-2, PRESSURIZER HIGH LEVEL ALERT</li> <li>• ALB-009-2-1, PZR CONT HIGH LEVEL DEVIATION AND HEATERS ON</li> <li>• LI-459 indicating 100%</li> <li>• LI-460 and LI-461 indicating normal</li> <li>• Charging flow decreasing</li> </ul> | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> |  |
|   |   |   |  |
| 1) Enters and directs the actions of ALB-009-4-2  | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |   |  |
| 2) Places LK-459F, PRZ Level Controller, in manual and raises charging flow to restore level to normal  |   | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |  |
| 3) Places PRZ Level Controller Selector to 460/461 position   |   | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |  |
| 4) Selects LI-460 or LI-461 as input to recorder  |   | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |  |
| 5) Places LK-459F in auto and verifies proper operation   |   | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |  |
| 6) Refers to OWP-RP   | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |   |  |
| 7) Refers to Tech Specs   |   |   |  |
| <ul style="list-style-type: none"> <li>• 3.3.3.5.a</li> <li>• 3.3.3.6</li> <li>• 3.3.1 (Item 11) – most limiting 6 hours to trip bistables</li> </ul>   | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |   |  |
| 8) Initiate a WR  | <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>   |   |  |

COMMENTS:	BOLD and * DENOTES CRITICAL TASK

SCENARIO NUMBER: <b>1</b>	EVENT NUMBER: <b>4</b>	FACILITY: <b>Harris</b>
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BRIEF DESCRIPTION:	<b>Loss of 1A-SA Emergency AC Bus with failure of CSIP A to automatically start and failure of TDAFW Pump to automatically start</b>
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+20 or At Lead Examiner's Direction (Ensure PRZ Level Control Master in AUTO)

- ANNUNCIATORS / CUES:
- ALB-024-1-2, 6.9 KV EMER BUS A-SA TROUBLE
  - ALB-024-1-3, 480V EMER BUS A-SA TROUBLE
  - ALB-024-2-3, DIESEL GENERATOR A TROUBLE
  - EDG A-SA starts and loads via the sequencer
  - Numerous plant alarms
- 
- 1) Enter AOP-025, , "Loss Of One Emergency AC Bus (6.9KV) Or One Emergency Dc Bus (125V)," (IMMEDIATE ACTION) check NO CSIP running, and isolate letdown by verifying the following valves shut:
    - 1CS-7, 45 GPM Letdown Orifice A
    - 1CS-8, 60 GPM Letdown Orifice B
    - 1CS-9, 60 GPM Letdown Orifice C
  - 2) Verify both Emergency AC Buses energized
  - 3) Refer TO PEP-110, Emergency Classification and Protective Action Recommendations, and enter EAL network at entry point X
- NOTE: Will review PEP-110 at conclusion of scenario*

COMMENTS:	BOLD and * DENOTES CRITICAL TASK



SCENARIO NUMBER: 1	EVENT NUMBER: 4	FACILITY: Harris
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BRIEF DESCRIPTION: **Loss of 1A-SA Emergency AC Bus with failure of CSIP A to automatically start and failure of TDAFW Pump to automatically start (Page 2)**

EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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- 4) Refer to the following Tech Specs:
  - 3.0.3 (Due to loss of 2/4 containment rad monitors and CVIS affect on CNMT vacuum reliefs)
  - 3.3.3.1 Radiation Monitoring for Plant Operations (Due to inoperable Control Room Outside Air Intake Monitors)
  - 3.4.6.1 RCS Leak Detection (Due to RM-3502A inop)
  - 3.6.5 Vacuum Relief System
  - 3.8.1.1 AC Sources Operating
  - 3.8.2.1 DC Sources Operating
  - 3.8.3.1 Onsite Power Distribution - Operating
- 5) Go to Section 3.1, Loss of 1A-SA Emergency AC Bus of AOP-025
- 6) Check EDG A is running properly:
  - Voltage - normal range
  - Frequency - normal range
- 7) Check Bus 1A-SA is energized by EDG A
- 8) (CONTINUOUS ACTION) Check ESW A header cooling water flow:
  - ESW A Pump is running

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COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 1	EVENT NUMBER: 4	FACILITY: Harris
BRIEF DESCRIPTION:	Loss of 1A-SA Emergency AC Bus with failure of CSIP A to automatically start and failure of TDAFW Pump to automatically start (Page 3)	

EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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- 9) Check NO CSIP running
  - Start ANY CSIP (If > 5 min, restore seal injection per AOP-018, Attachment 4)
  - Adjust HC-186.1, RCP Seal WTR INJ Flow, to establish seal injection flow as necessary to maintain less than 31 gpm total flow to all RCPs and between 8 and 13 gpm to all RCPs
  - Start CSIP Room Ventilation per OP-172, "Reactor Auxiliary Building HVAC System"
- 10) Verify A Train CCW Pump running
- 11) Verify charging flow, but NO letdown flow, and establish letdown per OP-107, "Chemical and Volume Control System"
  - Verify ICC-337, TK-144 LTDN TEMPERATURE, controller is in AUTO and set for 110 to 120°F (4.0 to 4.7 on potentiometer)
  - Verify 1CS-38 Controller, PK-145.1 LTDN PRESSURE, in MAN with output set at 50%
  - Verify open 1CS-2, LETDOWN ISOLATION LCV-459, 1CS-1, LETDOWN ISOLATION LCV-460, 1CS-11, LETDOWN ISOLATION
  - Adjust controller 1CS-231, FK-122.1 CHARGING FLOW, as required
  - OPEN an Orifice Isolation Valve (1CS-7, 1CS-8, 1CS-9)
  - Adjust 1CS-38 position by adjusting PK-145.1 output as necessary to control LP LTDN Pressure (PI-145.1), then ADJUST PK-145.1 LTDN PRESSURE setpoint to 58%, and PLACE the controller in AUTO
  - Open additional orifice isolation valves (1CS-7, 1CS-8, 1CS-9) as required
  - Place controller 1CS-231, FK-122.1 CHARGING FLOW, in AUTO

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 1	EVENT NUMBER: 4	FACILITY: Harris
BRIEF DESCRIPTION: Loss of 1A-SA Emergency AC Bus with failure of CSIP A to automatically start and failure of TDAFW Pump to automatically start (Page 4)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

  

12) Control AFW as necessary to maintain reactor power and S/G levels

- Close AFW FCVs from MDAFW Pump, if desired
- If MDAFW Pump stopped enter 72 hour LCO
- If TDAFW Pump stopped enter 72 hour LCO

*NOTE: TDAFW Pump should have started on UV condition. Crew may elect to NOT start pump at this time since AFW is NOT required, but will be required to start pump later in scenario.*

13) Verify ventilation support equipment for operating CSIP is in service:

- P-4 Pump
- WC-2 Chiller
- CSIP Room HVAC

14) Check Instrument Air pressure greater than or equal to 90 psig

15) Check RHR operation was NOT in progress and go to Step 46

16) Verify proper load sequencing per OMM-004, "Post Trip/Safeguards Review," Attachment 12

17) Check A Sequencer Load Block 9 AUTO ACT COMPLETE MAN LOAD PERMITTED light is LIT

18) Perform Attachment 3 to reset CVIS and restore RM 3502A operation (Allows exiting T/S 3.0.3)

- Verify operability of rad monitors
- Momentarily place Containment Purge Dampers in shut
- Momentarily place Normal Purge Supply Fans in stop
- Reset CVIS
- Restore RM-3502A by opening RCS Leak Det Sample Isol Valves (ISP-16, ISP-939, ISP-916, and ISP-918)
- Start RM-3502A sample pump

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 1	EVENT NUMBER: 4	FACILITY: Harris
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BRIEF DESCRIPTION:	Loss of 1A-SA Emergency AC Bus with failure of CSIP A to automatically start and failure of TDAFW Pump to automatically start (Page 5)
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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19) Re-energize 480V Emergency Bus 1A1

20) Restore Makeup capability:

- Verify a Reactor Makeup Water Pump is running with Control switch in START
- Verify 'B' train Boric Acid Transfer Pump is available and in AUTO

21) Perform the following:

- Verify Brg Oil & Seal Oil BU from Main Rsvr control switch in Start
- Stop DC Emergency Bearing Oil Pump and place in auto
- Direct an operator to locally verify Air Side Seal Oil Pump running
- Direct an operator to locally stop Air Side Seal Oil Backup Pump

**NOTE: Initiate Event 5, "Lighting strike in switchyard - loss of offsite power. EDG A loads, EDG B trips" after DC Emergency Bearing Oil Pump stopped.**

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 1	EVENT NUMBER: 5	FACILITY: Harris
BRIEF DESCRIPTION: Lighting strike in switchyard - loss of offsite power. EDG A loads, EDG B trips		

EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+40 (based on time to perform AOP-025 actions) or At Lead Examiner's Direction

ANNUNCIATORS / CUES:

- Reactor Trip
- Loss of RCPs
- ALB-025-1-2, 6.9 KV EMER BUS B-SB TROUBLE
- ALB-025-1-3, 480V EMER BUS B-SB TROUBLE
- ALB-02B-2-3, DIESEL GENERATOR B TROUBLE
- EDG A-SA continues operating loaded
- Numerous plant alarms

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1) (IMMEDIATE ACTION) Verify Reactor Trip:

- Trip breakers RTA and BYA – open
- Trip breakers RTB and BYB – open
- Rod bottom lights – not available due to loss of power
- Neutron flux decreasing

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2) (IMMEDIATE ACTION) Verify Turbine Trip:

- All turbine throttle valves – shut
- All turbine governor valves - shut

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3) (IMMEDIATE ACTION) Verify Power To AC Emergency Buses:

- Check AC emergency bus 1A-SA – energized EDG
- Check AC emergency bus 1B-SB - deenergized
- Check bus voltages
- Check 6.9 KV bus 1A-SA breaker 106 (EDG) – closed
- Check 6.9 KV bus 1B-SB breakers – open

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**NOTE: TDAFW Pump should have started on UV condition. Crew may elect to NOT start pump at this time since AFW is NOT required, but will be required to start pump later in scenario.**

COMMENTS:	BOLD and * DENOTES CRITICAL TASK
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SCENARIO NUMBER: <b>1</b>	EVENT NUMBER: <b>5</b>	FACILITY: <b>Harris</b>
BRIEF DESCRIPTION: <b>Lighting strike in switchyard - loss of offsite power. EDG A loads, EDG B trips (Page 2)</b>		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

4) (IMMEDIATE ACTION) Check NO SI Actuation and NOT required

- Check all of the following dark:
  - SI Actuated bypass permissive light
  - ALB-11-2-2
  - ALB-11-5-1
  - ALB-11-5-3
  - ALB-12-1-4
- CNMT pressure < 3.0 PSIG
- PRZ pressure > 1850 PSIG
- Steam pressure > 601 PSIG

5) Go to EOP-EPP-004. "Reactor Trip Response"

6) Implement Function Restoration Procedures As Required

7) Evaluate EAL network using entry point X

**NOTE: Will review PEP-110 at conclusion of scenario**

8) Check RCS temperature and control AFW flow to stabilize temperature

9) Check RCPs - NONE running and verify SG PORVs operating to establish natural circulation

10) Check Feed System Status:

- Verify feed reg valves – SHUT
- Establish AFW flow to SGs using MDAFW Pump A and TDAFW Pump as necessary

COMMENTS: **BOLD and \* DENOTES CRITICAL TASK**

SCENARIO NUMBER: 1	EVENT NUMBER: 5	FACILITY: Harris
BRIEF DESCRIPTION: Lighting strike in switchyard - loss of offsite power. EDG A loads, EDG B trips (Page 3)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

11) Check Control Rod Status:

- Check DRPI – not available
- When DRPI becomes available, verify all control rods fully inserted

12) Check PRZ Level > 17%

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**NOTE: Initiate Event 6, "EDG A trips - loss of all power" after PRZ level verified.**

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 1		EVENT NUMBER: 6		FACILITY: Harris	
BRIEF DESCRIPTION: EDG A trips - loss of all power					
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP	
TIME: T+50 (based on time to perform EOP-EPP-004 actions) or At Lead Examiner's Direction					
ANNUNCIATORS / CUES:					
<ul style="list-style-type: none"> <li>ALB-024-1-2, 6.9 KV EMER BUS A-SA TROUBLE</li> <li>ALB-024-1-3, 480V EMER BUS A-SA TROUBLE</li> <li>ALB-024-2-3, DIESEL GENERATOR A TROUBLE</li> <li>ALB-024-3-1, DIESEL GENERATOR A TRIP</li> <li>Loss of lighting in Control Room</li> <li>Numerous plant alarms</li> </ul>		_____	_____	_____	
1) Determines loss of all AC power has occurred and transitions to EOP-EPP-001, "Loss of Power to 1A-SA and 1B-SB Buses"		_____	_____	_____	
2) (IMMEDIATE ACTION) Verify Reactor Trip		_____	_____	_____	
3) (IMMEDIATE ACTION) Verify Turbine Trip		_____	_____	_____	
4) Check If RCS Isolated:					
<ul style="list-style-type: none"> <li>Check PRZ PORVs shut</li> <li>Check letdown isolation valves shut: <ul style="list-style-type: none"> <li>Shut 1CS-7, 1CS-8, 1CS-9 (Orifice Isolation Valves)</li> <li>Shut ICS-1 (LCV-459) and ICS-2 (LCV-460)</li> </ul> </li> <li>Verify excess letdown valves shut: <ul style="list-style-type: none"> <li>ICS-460</li> <li>ICS-461</li> </ul> </li> </ul>			_____		
*5) Opens MS-70 and / or MS-72 to start TDAFW Pump and establish AFW Flow $\geq$ 210 KPPH				_____	
6) Evaluate EAL network using entry point X		_____		_____	
NOTE: Will review PEP-110 at conclusion of scenario					
7) Determines NO EDGs are running		_____		_____	
NOTE: May elect to actuate SI at this time in attempt to emergency start EDGs, but NOT required.					
8) Determine unable to restore power from offsite sources and perform Attachment 5		_____		_____	
COMMENTS:		BOLD and * DENOTES CRITICAL TASK			



SCENARIO NUMBER: 1	EVENT NUMBER: 6	FACILITY: Harris
BRIEF DESCRIPTION: EDG A trips - loss of all power (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

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|---|--|--|--|
| 9) Check Status of SI Signal:   |  |  |  |
| • Actuate SI, if not previously actuated                                      |  |  |  |
| • Reset SI  |  |  |  |
| 10) Direct local operations to align equipment for extended power loss        |  |  |  |
| 11) Continue attempts to restore EDG or offsite power                         |  |  |  |
| 12) Direct AO to locally isolate RCP seals                                    |  |  |  |
| • ICS-472   |  |  |  |
| • ICS-340   |  |  |  |
| • ICS-381   |  |  |  |
| • ICS-422   |  |  |  |
| • ICC-251   |  |  |  |
| 13) Direct AO to locally isolate CST Makeup to Hotwell                        |  |  |  |
| • ICE-26  |  |  |  |
| • ICE-27  |  |  |  |
| 14) Isolate SGs:  |  |  |  |
| • Shut all MSIVs  |  |  |  |
| • Verify all MSIV bypass valves shut  |  |  |  |
| • Verify main FW isolation valves shut  |  |  |  |
| • Shut main steam drain isolation(s) before MSIVs                             |  |  |  |
| • Check SG blowdown AND SG sample isolation valves shut                       |  |  |  |
| 15) Determine NO SGs are faulted  |  |  |  |
| 16) Determine NO SGs are ruptured   |  |  |  |
| 17) Control AFW flow to maintain all SG levels between 25% and 50%            |  |  |  |
| 18) When turbine coastdown complete place the DC bearing pump in Pull-To-Lock |  |  |  |

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 1	EVENT NUMBER: 6	FACILITY: Harris
BRIEF DESCRIPTION: EDG A trips - loss of all power (Page 3)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

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|--|-------|-------|
| 19) Direct AOs to locally align equipment to conserve DC power                                       | _____ |       |
| 20) Direct AO to locally vent main generator and secure DC air side seal oil backup pump             | _____ |       |
| 21) Monitor CST Level > 10%  |       | _____ |
| 22) Check Intact SG Levels at least one > 25%  |       | _____ |
| *23) Depressurize Intact SGs to 180 PSIG by dumping steam at maximum rate using all intact SG PORVs: |       |       |
| • SG C PORV from MCB   |       |       |
| • Locally operate SG A and SG B PORVs  |       | _____ |

*NOTE: When directed to establish local control of SG A and SG B PORVs, take manual control by inserting Remote Functions <MRF MSS027 LOCAL\_OPS and MRF MSS029 LOCAL\_OPS> but DO NOT open valves to lower pressure in SGs A and B.*

- |   |  |       |
|---|--|-------|
| 24) Control SG PORVs to maintain SG pressures between 180 PSIG and 140 psig |  | _____ |
|---|--|-------|

*NOTE: Initiate Event 7, "EDG A is restarted after S/G depressurization has started" after SG depressurization is commenced.*

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 1	EVENT NUMBER: 7	FACILITY: Harris
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BRIEF DESCRIPTION: EDG A is restarted after S/G depressurization has started
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+70 (based on time to perform EOP-EPP-001 actions) or At Lead Examiner's Direction

ANNUNCIATORS / CUES:

- EDG A-SA starts due to local actions
- Control Room lighting becomes available
- Numerous alarms clear

1) Per foldout page, determine EDG A has been restored and go to Step 29 for recovery actions

2) Stabilize Intact SG Pressure:

- Set each SG PORV controller to maintain existing SG pressure
- Place each controller in auto AND verify proper operation of SG PORVs

**TERMINATE THE SCENARIO (AT THE LEAD EXAMINER'S DISCRETION) WHEN SG C PORV IS BEING CONTROLLED IN AUTOMATIC AT THE MCB.**

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 1	EVENT NUMBER: 8	FACILITY: Harris
BRIEF DESCRIPTION: Classifies the Event		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

TIME: NA

ANNUNCIATORS / CUES:

None

- 1) Classifies the event as a Site Area Emergency due to both 1A-SA and 1B-SB being deenergized for > 15 minutes

**NOTE: Performance Rating for Admin JPM based on 20% for satisfactory classification during simulator scenario, 20% for satisfactory classification during JPM, and 60% for satisfactory protective action recommendation during JPM. SEE LAST PAGE IN SCENARIO FOR DATA TO BE COMPLETED.**

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

Event 2

**Take manual control of FK-498 and reduce feed flow to prevent turbine / reactor trip on high SG level** - On transmitter failure, with proper actions, the operators should be able to control S/G water level in manual without causing a high S/G water level turbine / reactor trip. Per NUREG 1021, App D, Step D.1a., "prevent inappropriate actions that create a challenge to plant safety (such as an unintentional reactor protection system (RPS) or ESF actuation)."

Event 6

**Opens MS-70 and / or MS-72 to start TDAFW Pump and establish AFW Flow  $\geq$  210 KPPH** - Establish a heat sink for RCS heat removal to prevent a challenge to core cooling and heat sink critical safety functions (only source of RCS heat removal). (preventing a challenge to plant safety (App D, Step D.1.a))

Event 6

**Depressurize Intact SGs to 180 PSIG by dumping steam at maximum rate using all intact SG PORVs** - Reduce temp and press of RCS to reduce RCP seal leakage and minimize RCS inventory loss (no way to makeup). (preventing a challenge to plant safety (App D, Step D.1.a))

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SCENARIO NUMBER: 1	DOCUMENTATION OF EMERGENCY PLAN CLASSIFICATION	FACILITY: Harris
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SRO CANDIDATE: \_\_\_\_\_

CLASSIFICATION: \_\_\_\_\_

BASIS FOR CLASSIFICATION: \_\_\_\_\_

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SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

EXAMINER: \_\_\_\_\_

Attach this sheet to candidate's administrative JPM – JPM SRO-A.4, "Perform an Emergency Action Level Classification and Recommend Protective Actions," as part of grading criteria.

Facility: <b>HARRIS</b>	Scenario Number: <b>2 (Spare)</b>	Op-Test Number: <b>2002-301</b>	
Examiners	Operators		
_____	_____		
_____	_____		
_____	_____		

**Objectives:** To evaluate the candidate's ability to operate the plant in a controlled and safe manner during a plant startup and subsequent power decrease and diagnose and respond to the following events in accordance with applicable Harris plant procedures:

- Loss of a vital instrument bus
- Service Water Pump sheared shaft
- Condenser vacuum pump trip
- SG tube leakage requiring plant shutdown
- Ruptured / Faulted SG due to a seismic event

**Initial Conditions:** IC-14; 52% power EOL; STOP Condensate Booster Pump 'B' and Condensate Pump 'B' per OP-134; RHR Pump A-SA OOS (RHR022 RACK\_OUT)

**Turnover:** The unit is at 49% power at EOL, 6 hours following a reactor startup from xenon-free conditions.

Severe thunderstorms have been reported in the area for the past 30 minutes. AP-301, "Seasonal Preparations and Monitoring," has been completed.

A 6.7 gpd tube leak exists in SG 'A'.

Boron concentration is 735 ppm. Bank D rods are at 152 steps.

RHR Pump 'A' was taken out of service 2 hours ago for oil replacement due to contaminants and is expected to be returned to service within the next 2 hours. Technical Specification 3.5.2 has been entered. OWP-RH-01 has been completed. Risk is YELLOW.

Shift orders are to place a second feedwater train in service, continue the power increase and restore RHR Pump 'A' to service when it becomes available. GP-005 has been completed through Step 5.0.137.

Event Number	Malfunction Number	Event Type*	Event Description
1	NA	N (BOP) N (SRO)	Place a Second Feedwater Train in service (OP-134)
2	EPS02 3	C (ALL)	Loss of Instrument Bus SIII (AOP-024)

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

Event Number	Malfunction Number	Event Type*	Event Description
3	SWS07A	C (RO) C (SRO)	Normal Service Water Pump A Shaft Shear (AOP-022)
4	CND04A	C (BOP) C (SRO)	Condenser Vacuum Pump A trip (AOP-012)
5	SGN05A 2 0	C (ALL)	SG A tube leak at 2 gpm (AOP-016)
6	NA	N (SRO) N (BOP) R (RO)	Commence plant shutdown due to SG tube leak (AOP-038)
7	XN10A25 ALARM_ON SGN05B 700 600 MSS02B 1E6 600	M (ALL)	Seismic event causes faulted S/G B and S/G B tube rupture at 700 gpm to occur simultaneously (EOP-PATH-1, EOP-EPP-014, EOP-PATH-2, EOP-EPP-020)
8	NA	(SRO)	Classifies the Event

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



SCENARIO NUMBER: 2	EVENT NUMBER: 1	FACILITY: Harris
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BRIEF DESCRIPTION: Start Up a Second Feedwater Train
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: NA

ANNUNCIATORS / CUES:

NONE

- |  |       |       |
|--|-------|-------|
| 1) Enter and direct the actions of GP-005, "Power Operation," and OP-134, "Condensate System"              | _____ |       |
| 2) Direct BOP to place second Condensate Pump and second Condensate Booster Pump in service per OP-134     | _____ |       |
| 3) Verify initial conditions are met to start 1B Condensate Pump   |       | _____ |
| 4) Direct operator to open 1B Condensate Pump Seal Water Isolation from Condensate Transfer Pump, 1CE-1109 |       | _____ |
| 5) Direct operator to perform prestart checks on Condensate Pump B per Attachment 5                        |       | _____ |
| 6) Verify open 1CE-129 Condensate Pump B Discharge valve   |       | _____ |
| 7) Start Condensate Pump B   |       | _____ |
| 8) Verify initial conditions are met to start 1B Condensate Booster Pump                                   |       | _____ |
| 9) Direct operator to perform prestart checks on Condensate Booster Pump B per Attachment 6                |       | _____ |
| 10) Verify Condensate Booster Pump B recirc, 1CE-261 in MODU and shut                                      |       | _____ |

COMMENTS:	BOLD and * DENOTES CRITICAL TASK
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SCENARIO NUMBER: 2		EVENT NUMBER: 1	FACILITY: Harris	
BRIEF DESCRIPTION: Start Up a Second Feedwater Train (Page 2)				
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP
11) Place the Condensate Booster Pump B Speed Controller to MAN and zero the demand signal				_____
12) Open, 1CE-268 Condensate Booster Pump B Discharge valve				_____
13) Place the control switch for the associated recirc valve, 1CE-261 in the OPEN position immediately prior to starting Condensate Booster Pump B				_____
14) Start Condensate Booster Pump B				_____
15) Direct operator to verify differential pressure across the Pall Replaceable Duplex Filter as indicated between PI-01LO-2304B1 and PI-01LO-2304B2 is less than 15 psid				_____
16) Slowly increase the demand signal on the Condensate Booster Pump B Speed Controller to match the demand signal on the previously running Condensate Booster Pump Speed Controller				_____
17) Place the Condensate Booster Pump B Speed Controller to AUTO when the demand signals are matched				_____
18) Place the control switch for the associated recirc valve 1CE-261 in the MODU position				_____
19) Direct operator to verify the VSF coupling oil level is in the normal operating range after 5 to 10 minutes of running				_____

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 2	EVENT NUMBER: 2	FACILITY: Harris
BRIEF DESCRIPTION: Loss of Instrument Bus SIII		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP
TIME: T+0 At Lead Examiner's Direction		
ANNUNCIATORS / CUES:		
<ul style="list-style-type: none"> <li>ALB-015-4-4, CHANNEL III UPS FAILURE</li> <li>NI Alarms on ALB-013</li> <li>TSLBs 1 and 3, 3<sup>rd</sup> row of lights lit</li> <li>Numerous plant alarms</li> </ul>	_____	_____
1) Enter and direct the actions of AOP-024, "Loss Of Uninterruptible Power Supply"	_____	
2) (IMMEDIATE ACTION) Place Rod Control in MANUAL		_____
*3) (IMMEDIATE ACTION) Perform the following due to Instrument Bus SIII being deenergized:		
<ul style="list-style-type: none"> <li>Place Main FW Regulator Valves in MANUAL</li> <li>Control SG levels between 52% and 62%</li> </ul>		_____
3) Refer to PEP-110, Emergency Classification and Protective Action Recommendations, and enter EAL network at entry point X	_____	
<i>NOTE: Will review PEP-110 at conclusion of scenario</i>		
4) Determine Instrument Bus SIII lost and go to Section 3.1, "Loss of Instrument Bus," of AOP-024	_____	
5) Perform the following:		
<ul style="list-style-type: none"> <li>Place the N43 NI Rod Stop Bypass switch to BYPASS at the Detector Current Comparator Drawer</li> <li>Restore Tavg as necessary</li> </ul>		_____
6) Check plant in Mode 1	_____	

COMMENTS:	BOLD and * DENOTES CRITICAL TASK

SCENARIO NUMBER: 2	EVENT NUMBER: 2	FACILITY: Harris
BRIEF DESCRIPTION: Loss of Instrument Bus SIII (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

7) Manually control the following:

- Rod Control

8) Manually control the following:

- Main FW Reg Valves

9) Direct AO to manually control C SG PORV, if desired

10) Verify PRZ Level Controller Selector switch in CHAN 459/460

11) Refer to Tech Specs due to ESW screen wash inoperable

- 3.7.4, Emergency Service Water
- 3.8.1.1, AC Sources - Operating

12) Perform OST-1023, "Offsite Power Availability Verification Weekly Interval Modes 1-6" (within 1 hour)

13) Check letdown in service

14) Check all PRZ heaters in service.

15) Check any WC-2 Essential Chiller running

**NOTE: SRO may direct BOP to either start Essential Chiller 'B' or wait until power is restored to Instrument Bus SIII at which time Essential Chiller 'A' will restart. Either is acceptable.**

16) Contact Maintenance

- Check the inverter and vital bus for indications of grounds or other faults
- Correct any problems found

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 2      EVENT NUMBER: 2      FACILITY: Harris	
BRIEF DESCRIPTION: Loss of Instrument Bus SIII (Page 3)	
EXPECTED OPERATOR / PLANT RESPONSE	SRO      RO      BOP
17) Dispatch an operator to check the affected instrument inverter (7.5 KVA UPS PANEL SIII for ANY of the following: <ul style="list-style-type: none"> <li>• Red OVERCURRENT I-IL light lit</li> <li>• Obvious signs of damage</li> </ul>	<div></div> <div></div>
<p><i>NOTE: Operator reports overcurrent light lit, but no obvious signs of damage.</i></p>	
18) Dispatch an operator to transfer the Instrument Bus to the alternate power supply per OP-156.02, "AC Electrical Distribution"	<div></div>
<p><i>NOTE: Transfer Bus SIII to alternate power supply when directed.</i></p>	
19) Refer to the Attachment 3, "SIII Instrument Bus Power Supplies and Loads," to determine instrumentation affected	<div></div>
20) Refer to Tech Specs <ul style="list-style-type: none"> <li>• 3.3.1, Reactor trip System Instrumentation</li> <li>• 3.3.2, Engineered Safety Features Actuation System Instrumentation</li> <li>• 3.3.3.5a, Remote Shutdown System</li> <li>• 3.3.3.6, Accident Monitoring System</li> <li>• 3.7.1.2, Auxiliary Feedwater System</li> <li>• 3.7.4, Emergency Service Water</li> <li>• 3.8.3.1, Onsite Power Distribution - Operating</li> </ul>	<div></div>
COMMENTS:	BOLD and * DENOTES CRITICAL TASK

SCENARIO NUMBER: 2	EVENT NUMBER: 2	FACILITY: Harris
BRIEF DESCRIPTION: Loss of Instrument Bus SIII (Page 4)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

21) When power is restored to SIII

- Reset the Reactor Trip Power Range High Flux Rate alarm at the NIS panel
- Return the affected NI Rod Stop Bypass switch to OPERATE at the Detector Current Comparator Drawer
- Set AFW flow control valve controllers to 100%
- Check Steam Dump bypass permissive lights (C7A or C7B) indicate the Steam Dumps not armed
- Reset Steam Dumps, if required

22) Place Rod Control in auto, if desired

23) Place Main FW Regulator Valves in auto

24) Place C SG PORV in AUTO control at 85% demand

***Note: Insert Event 3, "Normal Service Water Pump A Sheared Shaft," at Lead Examiner's Direction after SIII is on bypass supply and plant conditions are restored (including Rod Control in AUTO).***

25) Perform a channel check of any RPS and ESF instrumentation affected by the loss of power

26) Check RVLIS Plasma Displays updating

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 2	EVENT NUMBER: 3	FACILITY: Harris
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BRIEF DESCRIPTION: Normal Service Water Pump A sheared shaft
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+15 (ensure SIII on bypass supply and plant conditions restored, including Rod Control in AUTO) or At Lead Examiner's Direction

ANNUNCIATORS / CUES:

- ALB-002-6-5, SERV WTR HEADER B HIGH-LOW FLOW
- ALB-002-7-1, SERV WTR SUPPLY HDR B LOW PRESS
- ALB-002-7-2, SERV WTR PUMPS DISCHARGE LOW PRESS
- Loss of flow on ESW Train B
- Loss of flow on NSW

- 1) Enter and direct the actions of AOP-022, "Loss Of Service Water"
- 2) (IMMEDIATE ACTION) Check loss of ESW header due to loss of NSW flow and restore ESW
  - Verify ESW Pump B started
  - Verify open 1SW-271, Header B To Auxiliary Reservoir
  - Verify shut 1SW-274, Header B Return To Normal Header
  - Verify shut 1SW-40, Normal SW Supply To Header B
- 3) (IMMEDIATE ACTION) Start standby NSW pump
  - Start NSW Pump 'B' and verify discharge valve for NSW Pump A is closing by placing NSW Pump A switch to stop
  - Start NSW Pump B in priming mode by momentarily placing switch to start
  - When discharge valve for NSW Pump A is fully shut, then place and hold control for NSW Pump B to start to fully open discharge valve

COMMENTS:	BOLD and * DENOTES CRITICAL TASK
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SCENARIO NUMBER: 2	EVENT NUMBER: 3	FACILITY: Harris
BRIEF DESCRIPTION: Normal Service Water Pump A sheared shaft (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

- 4) Go to Section 3.2, "Loss Of Normal Service Water Pump And/Or Header" of AOP-022

*Note: Insert Event 4, "S/G A PORV Pressure Transmitter PT-308 Fails High," at Lead Examiner's Direction after SRO makes an entry into Section 3.2 of AOP-022.*

- 5) Notify Maintenance to investigate reason for pump trip
- 6) Initiate WR

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK



SCENARIO NUMBER: 2	EVENT NUMBER: 4	FACILITY: Harris
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BRIEF DESCRIPTION: Condenser Vacuum Pump A trip
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+25 or At Lead Examiner Direction

ANNUNCIATORS / CUES:

- ALB-021-4-1, CONDENSER VACUUM PUMP A TRIP
- ALB-021-8-5, COMPUTER ALARM CIRC WATER SYSTEMS
- Condenser Vacuum Pump 'A' light indication
- Slowly lowering condenser vacuum

- 1) If condenser vacuum lowers, refers to and directs the actions of AOP-012, "Partial Loss of Condenser Vacuum"
- 2) Directs AO to investigate cause of trip of vacuum pump
- 3) Directs AO to verify suction valve on Condenser Vacuum Pump A closed
- 4) Starts Condenser Vacuum Pump B
- 5) Initiate a WR

COMMENTS:	BOLD AND * DENOTES CRITICAL TASK
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SCENARIO NUMBER: 2	EVENT NUMBER: 5	FACILITY: Harris		
BRIEF DESCRIPTION: SG A tube leak at 2 gpm				
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP	
TIME: T+30 or At Lead Examiner's Direction				
ANNUNCIATORS / CUES:				
<ul style="list-style-type: none"> <li>• REM-1TV-3534, COND VAC PUMP EFFLUENT HIGH, on RM-11</li> </ul>	_____			
1) Enters and directs the action of AOP-016, "Excessive Primary Plant Leakage"	_____			
2) Refer TO PEP-110, Emergency Classification and Protective Action Recommendations, and enter EAL network at entry point X	_____			
<i>NOTE: Will review PEP-110 at conclusion of scenario</i>				
3) (CONTINUOUS ACTION) Check RCS Leakage within VCT makeup capability		_____		
4) (CONTINUOUS ACTION) Check PRZ Pressure > 1960 psig		_____		
5) Check that RMS alarm indicates that a SG tube leak exists	_____			_____
6) Sound local evacuation alarm and make plant announcement				_____
7) (CONTINUOUS ACTION) Check radiation monitors indicate normal				
<ul style="list-style-type: none"> <li>• CNMT ventilation isolation monitors (REM-3561A/B/C/D)</li> <li>• RCS Leak Detection Radiation Monitor (RM 3502A)</li> </ul>	_____			_____
8) (CONTINUOUS ACTION) Check PRZ level > 17%		_____		
9) (CONTINUOUS ACTION) Check VCT level > 5%		_____		
10) Check ALB-5-1-2A, RCP THER BAR HDR HIGH FLOW, alarm clear		_____		

COMMENTS:	BOLD and * DENOTES CRITICAL TASK

SCENARIO NUMBER: 2		EVENT NUMBER: 5		FACILITY: Harris	
BRIEF DESCRIPTION: SG A tube leak at 2 gpm (Page 2)					
EXPECTED OPERATOR / PLANT RESPONSE			SRO	RO	BOP
11) (CONTINUOUS ACTION) Check radiation monitors indicate normal					
<ul style="list-style-type: none"><li>Area rad monitors</li><li>Stack rad monitors</li></ul>			_____		_____
12) Isolate Primary Sampling System					
<ul style="list-style-type: none"><li>Shut 1SP-945, RCS Loop B Hot Leg Smpl Isol</li><li>Verify all other sample valves closed</li></ul>					_____
13) Perform an RCS flow balance calculation					
<ul style="list-style-type: none"><li>Control charging flow using FK-122.1, to stabilize PZR level</li><li>Operate letdown orifice valves as necessary to maintain charging flow on scale<ul style="list-style-type: none"><li>1CS-7</li><li>1CS-8</li><li>1CS-9</li></ul></li><li>Calculate leak rate</li></ul>				_____	
14) Perform OST-1026 or OST-1226 (RCS Leakage Evaluation Calculation)					
15) Evaluate RCS leakage per Tech Spec 3.4.6.2					
16) Determine leakage to be SG tube leakage			_____		_____
17) (CONTINUOUS ACTION) Check RCP seals for normal conditions			_____	_____	_____
18) Notify Health Physics of leak location and radiation levels			_____	_____	
19) (CONTINUOUS ACTION) When leakage location has been determined to be SG tube leakage, then go to Attachment 1 of AOP-016			_____		

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 2		EVENT NUMBER: 5		FACILITY: Harris	
BRIEF DESCRIPTION: SG A tube leak at 2 gpm (Page 3)					
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP	
20) Notify Chemistry to implement CRC-804		_____			
21) Estimate Primary-to-Secondary Leak Rate to be > 150 gpd using Condenser Vacuum Pump Rad Monitor (3534) and plant curves		_____		_____	
22) Determine SG 'A' is leaking using individual SGBD samples and local surveys (Main Steamline Rad Monitors are not likely to identify – other indications must be obtained from Chemistry and HP)		_____			
23) Check secondary rad monitors not normal and direct HP to perform surveys and evacuate local areas		_____			
24) (CONTINUOUS ACTION) Check SG tube leakage is greater than TS limits and start CVPETS per OP-133		_____		_____	
25) (CONTINUOUS ACTION) Check WPB radiation monitors indicate normal		_____		_____	
26) Notify Chemistry to sample Aux Steam system for activity		_____			
27) Determine Action Level 3 has been reached due to SG tube leakage $\geq$ 75 gpd with a rapid increase in leak rate		_____			
28) Enter and direct the actions of Attachment 11		_____			
29) Check PZR level stable or trending to reference level			_____		
30) Verify Reactor Makeup Control System operating to maintain VCT level			_____		
31) Verify Attachment 9, Increased Monitoring Actions for Primary-To-Secondary Leakage, is in progress or has been completed		_____			

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 2	EVENT NUMBER: 5	FACILITY: Harris
BRIEF DESCRIPTION: SG A tube leak at 2 gpm (Page 4)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

32) Check Attachment 10, Escalated Monitoring Actions for Primary-To-Secondary Leakage Action Level 1, has been completed or estimate primary-to-secondary leak rate every 15 minutes

33) (CONTINUOUS ACTION) Notify Chemistry and Plant Management of major changes in leak rate

34) (CONTINUOUS ACTION) Check primary-to-secondary leakage rate-of-change > 30 gpd in a one hour period and commence a power reduction to be < 50% within one hour and in Mode 3 within the next 2 hours per AOP-038

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 2	EVENT NUMBER: 6	FACILITY: Harris
BRIEF DESCRIPTION: Commence plant shutdown due to SG tube leak		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

TIME: NA

ANNUNCIATORS / CUES:

- Plant shutdown to < 50% in 1 hour and Mode 3 within next 2 hours (3 hours total) directed to be performed per AOP-038 due to tube leakage

*NOTE: If crew determines that GP-006 is to be used to reduce power below 50%, inform SRO (as Plant Management) that a shutdown to Hot Standby conditions is to be made at 10 MW per minute.*

1) Enters and directs the actions of AOP-038, "Rapid Downpower"	_____		
2) Discuss Reactor Trip Criteria using Attachment 1	_____	_____	_____
3) Refer TO PEP-110, Emergency Classification and Protective Action Recommendations, and enter EAL network at entry point X	_____		
<i>NOTE: Will review PEP-110 at conclusion of scenario</i>			
4) Notify Load Dispatcher that the Unit is reducing load	_____		
5) Determine required boric acid addition for desired power reduction by obtaining values from Attachment 2, Gallons of Boric Acid Required for Power Reduction (1023 gallons required)		_____	
6) Notify Radwaste Control Room to be prepared for the increased water processing requirements due to boration	_____		
7) Notify Chemistry that a reactor power change will exceed 15% in a one hour period	_____		
8) Check Rod Control in auto		_____	
9) Energize all available PRZ Backup heaters		_____	
10) Check the DEH System in auto			_____

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 2	EVENT NUMBER: 6	FACILITY: Harris
BRIEF DESCRIPTION: Commence plant shutdown due to SG tube leak (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

11) PERFORM the following at the DEH panel

- Check secondary plant stable
- Place Impulse Pressure Feedback Loop in service
- Place the Megawatt Feedback Loop in service
- Depress the Load Rate MW/MIN pushbutton
- Enter desired rate (Not to exceed 45 MW/MIN) in DEMAND display.
- Depress ENTER pushbutton
- Depress REF pushbutton
- Enter desired load in DEMAND display
- Depress ENTER pushbutton
- Check HOLD pushbutton LIT
- Depress GO pushbutton
- Verify the value in the REFERENCE display LOWERS

12) Commence RCS boration as required to maintain Control Rods above the Rod Insertion Limit

13) Verify Generator load and Reactor power lowering

14) (CONTINUOUS ACTION) Maintain Generator reactive load (VARs) within guidelines

15) (CONTINUOUS ACTION) Check Tavg within 5°F of Tref

**NOTE: Initiate Event 7, "Seismic event causes S/G B tube rupture at 700 gpm and faults S/G B," after Lead Examiner determines adequate power change has occurred.**

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 2      EVENT NUMBER: 7      FACILITY: Harris

BRIEF DESCRIPTION:      Seismic event causes faulted S/G B and S/G B tube rupture at 700 gpm to occur simultaneously

EXPECTED OPERATOR / PLANT RESPONSE      SRO      RO      BOP

TIME:      At Lead Examiner's Direction

ANNUNCIATORS / CUES:

- ALB-010-4-4, SEISMIC MON SYS OBE EXCEEDED
- Steam Line Radiation Monitor Alarm on RM-11
- Steam Tunnel Temperatures increasing
- Reactor Power increasing
- Rods stepping out in response to Tav<sub>g</sub> decreasing
- Numerous plant alarms

*NOTE: If crew requests Seismic Monitoring Panel information, provide them with data on last page of scenario package.*

- 1) Determines SG leakage has escalated, orders a Reactor Trip and Safety Injection, and enters EOP PATH-1
- 2) (IMMEDIATE ACTION) Verify Reactor Trip
  - Trip breakers RTA and BYA – open
  - Trip breakers RTB and BYB – open
  - Rod bottom lights – lit
  - Neutron flux decreasing
- 3) (IMMEDIATE ACTION) Verify Turbine Trip
  - All turbine throttle valves – shut
  - All turbine governor valves - shut
- 14) (IMMEDIATE ACTION) Verify Power To AC Emergency Buses
  - Check AC emergency buses 1A-SA and 1B-SB – energized by offsite power or EDGs
  - Check bus voltages
  - Check 6.9 KV bus 1A-SA breaker breaker 105 (OFFSITE) – closed
  - Check 6.9 KV bus 1B-SB breaker breaker 125 (OFFSITE) – closed

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK



SCENARIO NUMBER: 2	EVENT NUMBER: 7	FACILITY: Harris
BRIEF DESCRIPTION: Seismic event causes faulted S/G B and S/G B tube rupture at 700 gpm to occur simultaneously (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

2) (IMMEDIATE ACTION) Actuates SI Actuation and determines SI has actuated

- SI Actuated bypass permissive light LIT
- ALB-11-5-3, REACTOR TRIP MANUAL SI

5) Perform The Following:

- Initiate monitoring the Critical Safety Function Status Trees
- Evaluate EAL Network using entry point X

*NOTE: Will review PEP-110 at conclusion of scenario*

6) Monitor Foldout A

*NOTE: RCPs may be tripped due to meeting Trip Criteria at any time during this event. See Step 30 of this event for criteria meeting Critical Step.*

7) Verify all CSIPs and RHR Pump 'B' running

8) Verify SI flow > 200 gpm

9) Verify RCS pressure > 230 psig

10) Verify Main Steam Isolation actuated if SG pressure has lowered below 601 psig due to faulted SG

11) Verify Containment pressure has remained < 10 psig

12) Verify  $\geq$  210 KPPH AFW flow

13) Verify alignment of components from actuation of ESFAS signals using PATH-1 Guide, Attachment 6

14) Attempt to control RCS temperature using AFW flow and steam dumps

15) Energize buses 1A1 and 1B1

16) Verify proper PRZ PORV and spray valve response

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

NUREG-1021, Revision 8, Supplement 1  
Rev Date 07/25/02

SCENARIO NUMBER: 2	EVENT NUMBER: 7	FACILITY: Harris		
BRIEF DESCRIPTION:	Seismic event causes faulted S/G B and S/G B tube rupture at 700 gpm to occur simultaneously (Page 4)			
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP	
26) Transition to and direct the actions of EOP PATH-2, Entry Point J	_____			
27) Monitor Foldout C	_____	_____	_____	
28) Evaluate EAL Network using entry point U	_____			
NOTE: Will review PEP-110 at conclusion of scenario				
29) Implement FRPs as required	_____			
*30) Trip RCPs when RCP trip criteria is reached (MAY HAVE BEEN TRIPPED EARLIER DUE TO FOLDOUT PAGE CONDITONS BEING MET)				
• SI flow > 200 gpm				
• RCS pressure < 1400 psig				
31) Identify SG B as ruptured SG	_____	_____	_____	
32) Adjust ruptured SG PORV controller to 88% and place in AUTO and check shut			_____	
33) Verify SG B isolated (performed during EOP-EPP-014)			_____	
34) Determine ruptured SG should not be fed to restore level due to also being faulted	_____		_____	
35) Determine ruptured SG pressure < 260 psig	_____		_____	
36) Transition to and direct the actions of EOP-EPP-020, "SGTR with Loss of Reactor Coolant: Subcooled Recovery"				

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 2	EVENT NUMBER: 7	FACILITY: Harris		
BRIEF DESCRIPTION:		Seismic event causes faulted S/G B and S/G B tube rupture at 700 gpm to occur simultaneously (Page 5)		
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP
37) Monitor Foldout Page		_____	_____	_____
38) Reset SI			_____	
39) Reset Phase A and Phase B			_____	
NOTE: Phase B did NOT occur during this scenario				
40) Establish IA and Nitrogen to Containment				_____
41) Monitor AC Buses				
• 1A-SA and 1B-SB energized from offsite				
• All non-emergency AC buses energized				_____
42) Verify SG B level < 78%				_____
43) Secure PRZ heaters			_____	
44) Determine Containment Spray has NOT actuated		_____	_____	
45) Verifies SG B is ruptured and faulted and maintains AFW flow to SG B isolated		_____		_____
46) Stops RHR Pumps				
• RCS pressure > 230 psig, stable or increasing				
• Suction NOT aligned to RWST			_____	
47) Coordinate with plant operations staff and chemistry to obtain primary and secondary samples		_____		
48) Initiate evaluation of plant status		_____		
49) Control AFW flow to maintain SGs A and C levels between 30% and 50%				_____
50) Block low steam press SI when RCS pressure < 2000 psig			_____	

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 2	EVENT NUMBER: 7	FACILITY: Harris
BRIEF DESCRIPTION: Seismic event causes faulted S/G B and S/G B tube rupture at 700 gpm to occur simultaneously (Page 6)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

51) Initiate cooldown to cold shutdown conditions

- Maintain RCS cooldown rate < 100°F / hour
- Use SG 'A' and 'C' PORVs for cooldown

**NOTE: Cooldown due to faulted SG is likely to have exceeded 100°F already, so no additional cooldown will be performed at this time.**

52) Monitor SDM while performing cooldown

53) Determine EOP-EPP-020 acceptable for performing cooldown

- RWST level > 70%
- SG B level < 95%

54) Determine adequate subcooling exists

55) Check SI flow > 200 gpm

56) Depressurize RCS to refill PRZ

- PRZ level < 25%
- Depressurize using PORVs
- Stop depressurization when PRZ level > 25%

**TERMINATE THE SCENARIO (AT THE LEAD EXAMINER'S DISCRETION) WHEN DEPRESSURIZATION OF THE RCS HAS BEEN OBSERVED.**

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 2	EVENT NUMBER: 8	FACILITY: Harris
BRIEF DESCRIPTION: Classifies the Event		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

TIME: NA

ANNUNCIATORS / CUES:

None

- 1) Classifies the event as a Site Area Emergency due to two fission product barriers (RCS and Containment) being breached

**NOTE: Performance Rating for Admin JPM based on 20% for satisfactory classification during simulator scenario, 20% for satisfactory classification during JPM, and 60% for satisfactory protective action recommendation during JPM. SEE NEXT-TO-LAST PAGE IN SCENARIO FOR DATA TO BE COMPLETED.**

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

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Event 2

**Place Main FW Regulator Valves in MANUAL** - On transmitter failure as a result of loss of instrument power, with proper actions, the operators should be able to control S/G water level in manual without causing a high S/G water level turbine / reactor trip or a low water level reactor trip. Per NUREG 1021, App D, Step D.1a., "prevent inappropriate actions that create a challenge to plant safety (such as an unintentional reactor protection system (RPS) or ESF actuation)."

Event 7

**Determines RCP trip criteria met and trips all RCPs** - depending on the conditions of the accident, for a SBLOCA, the RCPs should be tripped when specified parameters are met. The RCPs should be tripped to avoid more serious impacts. If the criteria is not satisfied, the pumps should continue to be operated because they can provide core heat removal without ECCS in operation (preventing a challenge to plant safety (App D, Step D.1.a))

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SCENARIO NUMBER: 2	DOCUMENTATION OF EMERGENCY PLAN CLASSIFICATION	FACILITY: Harris
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SRO CANDIDATE: \_\_\_\_\_

CLASSIFICATION: \_\_\_\_\_

BASIS FOR CLASSIFICATION: \_\_\_\_\_

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SAT \_\_\_\_\_

UNSAT \_\_\_\_\_

EXAMINER: \_\_\_\_\_

Attach this sheet to candidate's administrative JPM – JPM SRO-A.4, "Perform an Emergency Action Level Classification and Recommend Protective Actions," as part of grading criteria.



**Amber EVENT ALARM light is illuminated on the Strong Motion Accelerograph.**  
**White flag is present on EVENT INDICATOR on the Strong Motion Accelerograph.**  
**AMBER and RED alarm lights are lit on the Response Spectrum Annunciator.**  
**Seismic Switch Power Supply ALARM light is lit.**

Facility: **HARRIS** Scenario Number: **3** Op-Test Number: **2002-301**

Examiners

Operators

Objectives: To evaluate the candidate's ability to operate the plant in a controlled and safe manner during a power decrease and diagnose and respond to the following events in accordance with applicable Harris plant procedures:

- VCT Level Channel High Failure
- T-ref failure resulting in abnormal rod motion
- SG PORV pressure channel high failure
- Controlling channel of feed flow fails low
- Rapid downpower
- RCS leakage inside containment requiring manual reactor trip
- Failure of reactor to trip automatically or manually
- RHR pump failure on Safety Injection

Initial Conditions: IC-20; 100% power equilibrium EOL; RHR Pump A-SA OOS (RHR022 RACK\_OUT)

Turnover: The unit is at 100% equilibrium conditions at EOL.

Severe thunderstorms have been reported in the area for the past 30 minutes. AP-301, "Seasonal Preparations and Monitoring," has been completed.

A 6.7 gpd tube leak exists in SG 'A'.

Boron concentration is 319 ppm. Bank D rods are at 218 steps.

RHR Pump 'A' was taken out of service 2 hours ago for oil replacement due to contaminants and is expected to be returned to service within the next 2 hours. Technical Specification 3.5.2 has been entered. OWP-RH-01 has been completed. Risk is YELLOW.

Main Feed Pump 'A' has been inspected for potential vibration concerns and Engineering is currently evaluating the data.

Shift orders are to maintain power and restore RHR Pump 'A' to service when it becomes available. GP-005 has been completed and the plant has been stable for 3 weeks.

Event Number	Malfunction Number	Event Type*	Event Description
1	LT:112 100 0	I (SRO) I (RO)	LT-112, VCT Level, High Failure (AOP-003)
2	PT:308A 1300 90 XB1O007B OFF	I (BOP) I (SRO)	S/G A PORV Pressure Transmitter PT-308 fails high with failure of S/G A PORV open indication (ALB-014)
3	CRF08 557 0	I (SRO) I (RO)	T-ref Processor low failure (AOP-001)
4	FT:477 0 0	I (SRO) I (BOP)	Controlling channel of SG A feed flow FT-477 fails low (OWP-RP)
5	NA	N (SRO) R (RO) N (BOP)	Rapid downpower to remove MFP A from service (AOP-038)
6	RCS18A 8 900	M (ALL)	RCS Loop A cold leg small break LOCA, ramped in over 15 minutes (AOP-016, EOP-PATH-1)
7	RPS01B 3 3	M (ALL)	Rx will not trip in manual or automatic (EOP-FRP-S.1)
8	ZDSQ2:52B FAIL_ASIS	C (BOP)	Train B RHR Pump fails to autostart on SI (EOP-PATH-1)
9	NA	SRO	Classifies the Event

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

SCENARIO NUMBER: 3		EVENT NUMBER: 1		FACILITY: Harris	
BRIEF DESCRIPTION: LT-112, VCT Level, High Failure					
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP	
TIME: T+0 or At Lead Examiner Direction					
ANNUNCIATORS / CUES:					
<ul style="list-style-type: none"> <li>ALB-007-5-5, COMPUTER ALARM CHEM &amp; VOL SYSTEMS</li> <li>1CS-120 (LCV-115A), Letdown VCT / Holdup Tank, aligns to HUT</li> </ul>		_____	_____		
1) Enters and directs the actions of AOP-003, "Malfunction of Reactor Makeup Control"		_____			
2) Check IA available			_____		
3) Determines LK-112 output has failed and goes to Section 3.1, "LT-112 or LT-115 Malfunction"		_____			
4) (CONTINUOUS ACTION) Assesses effects of LT-112 failure (Attachment 1)		_____			
5) Determines failure is NOT due to LT-115			_____		
6) Determines failure caused by LT-112			_____		
7) Monitor VCT level using either:					
<ul style="list-style-type: none"> <li>ERFIS point LCS0115</li> <li>LT-115</li> </ul>			_____		
8) Determines that LT-112 is failed high and places 1CS-120 (LCV-115A), Letdown VCT / Holdup Tank, to VCT position			_____		
9) (CONTINUOUS ACTION) Maintain VCT level above 20% using auto makeup			_____		
10) (CONTINUOUS ACTION) Maintain VCT level below 70% by manually diverting to HUT as needed			_____		
11) (CONTINUOUS ACTION) Maintain VCT level above 5% auto switchover point to RWST			_____		
12) Determines LT-112 has failed high and directs Maintenance to lift leads in SSPS for auto switchover to RWST		_____			
13) Maintain LCV-115A in VCT position			_____		
COMMENTS:		BOLD AND * DENOTES CRITICAL TASK			

SCENARIO NUMBER: 2	EVENT NUMBER: 2	FACILITY: Harris
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BRIEF DESCRIPTION: S/G A PORV Pressure Transmitter PT-308 fails high with failure of S/G A PORV open indication
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+10 or At Lead Examiner's Direction

ANNUNCIATORS / CUES:

- ALB-014-8-5, COMPUTER ALARM STEAM GENERATORS
- SG A PORV open (open indication failed)
- RCS temperature lowering
- Steam flow increasing

- 1) Determines cause of alarm is SG 'A' PORV open due to failed high pressure transmitter, using alarm screen to determine cause since SG PORV does not indicate open or determined by MA station indication
- 2) Directs operator to take manual control of SG 'A' PORV and close per requirements of OMM-001
  - Condition / cause communicated to SRO
  - SRO provides concurrence to take manual control
  - SRO provides control limits
  - Appropriate procedure implemented when plant stabilized
  - Log entry made when controller in manual
- 3) Places SG 'A' PORV controller in manual
- 4) Closes SG 'A' PORV
- 5) Initiate a WR

COMMENTS:	BOLD and * DENOTES CRITICAL TASK
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SCENARIO NUMBER: 3	EVENT NUMBER: 3	FACILITY: Harris		
BRIEF DESCRIPTION: T-ref Processor low failure				
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP	
TIME: T+15 or At Lead Examiner Direction				
ANNUNCIATORS / CUES:				
<ul style="list-style-type: none"> <li>ALB-010-6-4B, RCS Tref / Tavg HIGH-LOW</li> <li>Rods stepping in at 72 steps per minute</li> </ul>	_____	_____		
1) Enters and directs the actions of AOP-001, "Malfunction of Rod Control and Indication System"	_____			
2) (IMMEDIATE ACTION) Determines NO control rods have dropped		_____		
3) (IMMEDIATE ACTION) Place rod control in manual		_____		
4) (IMMEDIATE ACTION) Check rod motion stopped		_____		
5) Go to Section 3.2, "Continuous Spurious Control Bank Motion," of AOP-001	_____			
6) Manually operate rods to restore temperature		_____		
7) Determine cause of rod movement was a low failure of Tref instrument	_____	_____	_____	
8) Initiate a WR	_____			
9) Maintain rods in manual until Tref restored		_____		
10) Verify proper operation of boration sources				
<ul style="list-style-type: none"> <li>CVCS demineralizers</li> <li>BTRS</li> <li>Reactor Makeup</li> </ul>		_____	_____	
COMMENTS:		BOLD AND * DENOTES CRITICAL TASK		

SCENARIO NUMBER: 3		EVENT NUMBER: 4		FACILITY: Harris	
BRIEF DESCRIPTION: Controlling channel of SG A feed flow FT-477 fails low					
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP	
TIME: T+25 or At Lead Examiner Direction					
ANNUNCIATORS / CUES:					
<ul style="list-style-type: none"> <li>• ALB-014-4-1A, SG A STM &gt; FW FLOW MISMATCH</li> <li>• FI-477 indicating 0</li> <li>• SG A feed reg valve opening</li> <li>• SG A level increasing</li> <li>• SG A actual feed flow &gt; steam flow</li> </ul>					
<ol style="list-style-type: none"> <li>1) Directs the BOP to take manual control of FK-478 and reduce feed flow per requirements of OMM-001</li> <li>• Condition / cause communicated to SRO</li> <li>• SRO provides concurrence to take manual control</li> <li>• SRO provides control limits</li> <li>• Appropriate procedure implemented when plant stabilized</li> <li>• Log entry made when controller in manual</li> <li>*2) <b>Take manual control of FK-478 and reduce feed flow to prevent turbine / reactor trip on high SG level</b></li> <li>3) Restore SG A level with feed flow and steam flow matched</li> <li>4) Enters and directs the actions of AOP-010, "Feedwater Malfunctions"</li> <li>5) Determines NO FW Pumps are tripped</li> <li>6) (CONTINUOUS ACTION) Maintain at least 1 FW Pump running, flow to all SGs, all SGs &gt; 30%</li> <li>7) Determines Feed Reg Valve 'A' not operating properly in auto and verifies in manual</li> <li>8) Maintain SG levels between 52% and 62%</li> </ol>					
COMMENTS:		BOLD AND * DENOTES CRITICAL TASK			

SCENARIO NUMBER: 3		EVENT NUMBER: 4		FACILITY: Harris	
BRIEF DESCRIPTION: Controlling channel of SG A feed flow FT-477 fails low (Page 2)					
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP	
9) Check MCR annunciators available		_____			
10) Check all FW Train Pumps and both Heater Drain Pumps running				_____	
11) Goes to Section 3.1 of AOP-010 for All Condensate / Feedwater Flow Malfunctions (other than pump trips)		_____			
12) Checks all Recirc and Dump valves operating properly in MODU				_____	
13) Check Condensate and Feedwater system intact				_____	
14) Check all Feedwater Train and Heater Drain Pumps operating normally				_____	
15) Notify Load Dispatcher of any load limitations (NONE)		_____			
16) Check reactor thermal power changed by < 15% in any one-hour period		_____			
17) Refer to OWP-RP for SG A feed flow failure		_____			
18) Selects Channel 4 (476) for control in accordance with OWP-RP				_____	
<i>NOTE: Also likely to select Channel 475 for SG steam flow although not required.</i>					
19) Refers to TS 3.3.1 (Item 14) – 6 hour requirement to trip bistables		_____			
20) Initiate a WR		_____			

COMMENTS:

BOLD and \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 3	EVENT NUMBER: 5	FACILITY: Harris
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BRIEF DESCRIPTION: Rapid downpower to remove MFP A from service
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: T+35 or At Lead Examiner Direction

ANNUNCIATORS / CUES:

Plant management informs the control room that the evaluation for FWP 'A' requires the pump be removed from service within 1 hour.

***CUE: Direct the crew to lower power at a rate to be below 60% within the next 60 minutes.***

- |   |       |       |       |
|---|-------|-------|-------|
| 1) Enters and directs the actions of AOP-038, "Rapid Downpower"   | _____ |       |       |
| 2) Discuss Reactor Trip Criteria using Attachment 1   | _____ | _____ | _____ |
| 3) Refer TO PEP-110, Emergency Classification and Protective Action Recommendations, and enter EAL network at entry point X   | _____ |       |       |
| <b><i>NOTE: Will review PEP-110 at conclusion of scenario</i></b>   |       |       |       |
| 4) Notify Load Dispatcher that the Unit is reducing load  | _____ |       |       |
| 5) Determine required boric acid addition for desired power reduction by obtaining values from the latest completed OPT-1525, "Reactivity Plan Generation Weekly Interval Mode 1 at Full Power" |       | _____ |       |
| 6) Notify Radwaste Control Room to be prepared for the increased water processing requirements due to boration  | _____ |       |       |
| 7) Notify Chemistry that a reactor power change will exceed 15% in a one hour period  | _____ |       |       |
| 8) Control rods in manual as necessary to maintain Tavg within 2°F of Tref  |       | _____ |       |
| 9) Energize all available PRZ Backup heaters  |       | _____ |       |
| 10) Check the DEH System in auto  |       |       | _____ |

COMMENTS:	BOLD and * DENOTES CRITICAL TASK
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SCENARIO NUMBER: 3	EVENT NUMBER: 5	FACILITY: Harris
BRIEF DESCRIPTION: Rapid downpower to remove MFP A from service (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

11) PERFORM the following at the DEH panel

- Check secondary plant stable
- Place Impulse Pressure Feedback Loop in service
- Place the Megawatt Feedback Loop in service
- Depress the Load Rate MW/MIN pushbutton
- Enter desired rate (Not to exceed 45 MW/MIN) in DEMAND display.
- Depress ENTER pushbutton
- Depress REF pushbutton
- Enter desired load in DEMAND display
- Depress ENTER pushbutton
- Check HOLD pushbutton LIT
- Depress GO pushbutton
- Verify the value in the REFERENCE display LOWERS

12) Commence RCS boration as required to maintain Control Rods above the Rod Insertion Limit

13) Verify Generator load and Reactor power lowering

14) (CONTINUOUS ACTION) Maintain Generator reactive load (VARs) within guidelines

15) (CONTINUOUS ACTION) Check Tavg within 5°F of Tref

**NOTE: Initiate Event 6, "RCS Loop A cold leg small break LOCA, ramped in over 15 minutes," after Lead Examiner determines adequate power change has occurred.**

COMMENTS: BOLD and \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 3	EVENT NUMBER: 6	FACILITY: Harris
BRIEF DESCRIPTION: RCS Loop A cold leg small break LOCA, ramped in over 15 minutes		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP
TIME: At Lead Examiner's Direction		
<u>ANNUNCIATORS / CUES:</u>		
<ul style="list-style-type: none"> <li>• RM-1CR-3575, CONT S STAIR EL 261 HIGH, on RM-11</li> <li>• Charging flow increasing</li> <li>• Pressurizer level decreasing</li> <li>• ALB-028-8-5, COMPUTER ALARM VENTILATION SYSTEM</li> </ul>	_____	_____
1) Enters and directs the action of AOP-016	_____	
2) Refer to PEP-110, Emergency Classification and Protective Action Recommendations, and enter EAL network at entry point X	_____	
<i>NOTE: Will review PEP-110 at conclusion of scenario</i>		
3) (CONTINUOUS ACTION) Check RCS Leakage within VCT makeup capability		_____
4) (CONTINUOUS ACTION) Check PRZ Pressure > 1960 psig		_____
<i>NOTE: Reactor Trip and SI will eventually be required based upon RCS leakage exceeding makeup capabilities and / or RCS pressure.</i>		
5) (CONTINUOUS ACTION) Check radiation monitors indicate normal		
<ul style="list-style-type: none"> <li>• CNMT ventilation isolation monitors (REM-3561A/B/C/D)</li> <li>• RCS Leak Detection Radiation Monitor (RM 3502A)</li> </ul>		_____
6) (CONTINUOUS ACTION) Check PRZ level > 17%		_____
7) (CONTINUOUS ACTION) Check VCT level > 5%		_____
<b>COMMENTS: BOLD AND * DENOTES CRITICAL TASK</b>		

SCENARIO NUMBER: 3	EVENT NUMBER: 6 / 7	FACILITY: Harris
BRIEF DESCRIPTION: RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

- |  |       |       |       |
|--|-------|-------|-------|
| 8) Orders a reactor trip and safety injection and enters and directs the actions of EOP PATH-1   | _____ |       |       |
| 9) (IMMEDIATE ACTION) Attempts to manually trip the reactor and informs SRO that reactor will NOT trip   |       | _____ |       |
| 10) Enters and directs the actions of EOP-FRS-0.1, "Response to Nuclear Power Generation / ATWS"   | _____ |       |       |
| *11) (IMMEDIATE ACTION) Manually insert control rods due to reactor failure to trip  |       | _____ |       |
| 12) (IMMEDIATE ACTION) Manually trip Turbine   |       |       |       |
| • All turbine throttle valves – shut   |       |       |       |
| • All turbine governor valves - shut   |       |       | _____ |
| 13) (IMMEDIATE ACTION) Start all AFW Pumps   |       |       | _____ |
| 14) (IMMEDIATE ACTION) Direct an operator to contact or report to the main control room (to receive instructions to locally trip the reactor). | _____ |       |       |

*NOTE: Approximately 15 seconds after being directed to contact the Control Room, call the Control Room to receive instructions. After approximately 1 additional minute, locally open the Reactor Trip breakers.*

COMMENTS: BOLD AND \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 3	EVENT NUMBER: 6 / 7	FACILITY: Harris
BRIEF DESCRIPTION: RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic (Page 2)		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

15) Perform The Following:

- Initiate monitoring the Critical Safety Function Status Trees
- Evaluate EAL Network using entry point X

**NOTE: Will review PEP-110 at conclusion of scenario**

16) Initiate Emergency Boration of RCS from the RWST or through CS-278

17) Isolate CNMT Ventilation

- Stop Normal Purge Supply and Pre-Entry Purge Exhaust Fans
- Verify valves and dampers closed

18) Check reactor tripped locally

19) Check turbine tripped

20) Monitor Foldout Page

21) Verify proper operation of safeguards equipment using PATH-I GUIDE, Attachment 6

COMMENTS:

BOLD AND \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 3	EVENT NUMBER: 6/7/8	FACILITY: Harris
BRIEF DESCRIPTION: RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic - Train B RHR Pump fails to autostart on SI		
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO BOP

\*22) Determines neither RHR pump is operating and starts RHR pump B \_\_\_\_\_

*NOTE: Starting the RHR Pump is only critical if RCS pressure decreases to below the shutoff head of the pump.*

23) Control feed flow to maintain all intact SG levels between 40% and 50% (adverse containment values) \_\_\_\_\_

24) Verify All Dilution Paths Isolated \_\_\_\_\_

25) Determines NO positive reactivity addition from RCS cooldown \_\_\_\_\_

26) Determines NO faulted SG exists \_\_\_\_\_

27) Determines core exit thermocouples < 1200°F \_\_\_\_\_

28) Checks reactor subcritical

- Power range channels < 5%
- Intermediate startup range channels have negative SUR

29) Implement FRPs as required \_\_\_\_\_

30) Return to EOP PATH-1, Step 1 \_\_\_\_\_

31) Verify reactor tripped \_\_\_\_\_

32) Verify turbine tripped \_\_\_\_\_

COMMENTS:

BOLD AND \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 3    EVENT NUMBER: 6 / 7 / 8    FACILITY: Harris			
BRIEF DESCRIPTION: <b>RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic - Train B RHR Pump fails to autostart on SI (Page 2)</b>			
EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP

  

33) Verify Power To AC Emergency Buses

- Check AC emergency buses 1A-SA and 1B-SB – energized by offsite power or EDGs
- Check bus voltages
- Check 6.9 KV bus 1A-SA breaker breaker 105 (OFFSITE) – closed
- Check 6.9 KV bus 1B-SB breaker breaker 125 (OFFSITE) – closed

34) Determines SI has actuated (actuated during performance of EOP-FRP-S.1)

35) Perform The Following:

- Initiate monitoring the Critical Safety Function Status Trees
- Evaluate EAL Network using entry point X

*NOTE: Will review PEP-110 at conclusion of scenario*

36) Monitor Foldout A

\*37) Determines RCP trip criteria met and trips all RCPs

- SI flow > 200 gpm
- RCS pressure < 1400 psig

38) Verify all CSIPs and RHR Pump B running (RHR Pump A OOS)

39) Verify SI flow > 200 gpm

40) Verify RCS pressure > 230 psig

41) Verify Main Steam Isolation actuated due to containment pressure > 3.0 psig (May have manually actuated this during the performance of Attachment 6)

COMMENTS:

BOLD AND \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 3	EVENT NUMBER: 6/7/8	FACILITY: Harris
BRIEF DESCRIPTION: RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic - Train B RHR Pump fails to autostart on SI (Page 3)		

EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
42) Verify Containment Spray actuation if containment pressure exceeds 10 psig (not expected to occur)			_____
43) Verify $\geq 210$ KPPH AFW flow			_____
44) Verify alignment of components from actuation of ESFAS signals using PATH-1 Guide, Attachment 6 (already performed during EOP-FRP-S.1)			_____
45) Control RCS temperature using AFW flow and steam dumps			_____
46) Verify buses 1A1 and 1B1 energized			_____
47) Verify proper PRZ PORV and spray valve response		_____	
48) Determine no faulted SGs	_____	_____	_____
49) Determine no ruptured SGs	_____	_____	_____
50) Determine Containment pressure NOT normal		_____	
51) Implement Functional Restoration Procedures as required	_____		
52) Monitor Foldout Pages A and B	_____	_____	_____
53) Maintain seal injection flow between 8 and 13 gpm		_____	
54) Control AFW flow to maintain SG levels between 40% and 50% (adverse containment values)			_____
55) Energize buses 1A1 and 1B1			_____
56) Verify proper PRZ PORV response		_____	

COMMENTS: **BOLD AND \* DENOTES CRITICAL TASK**

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SCENARIO NUMBER: 3	EVENT NUMBER: 6/7/8	FACILITY: Harris
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BRIEF DESCRIPTION:	RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic - Train B RHR Pump fails to autostart on SI (Page 4)
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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57) Determine SI Termination criteria NOT met and continues in PATH-1

- RCS subcooling < 40°F (adverse containment value)
- RCS pressure NOT stable or increasing
- PRZ level < 30% (adverse containment value)

58) Consult plant staff to determine if Containment Spray should be placed in standby if running

59) Verify SR detectors energized below  $5 \times 10^{-11}$  amps and transfer recorder

60) Determines RCS pressure is > 230 psig and stable or increasing and stops RHR Pump B

61) Determines RCS and SG pressures are both stable or increasing

62) For each running CCW pump, open the associated CCW return valve from the RHR HX

63) Verify 1A-SA and 1B-SB energized by offsite power

64) Reset SI

65) Shutdown both EDGs using OP-155

66) Determine RHR Train B is capable of Cold Leg Recirc

67) Determine Aux and Radwaste Bldg rad levels normal

COMMENTS:

BOLD AND \* DENOTES CRITICAL TASK

SCENARIO NUMBER: 3		EVENT NUMBER: 6/7/8		FACILITY: Harris	
BRIEF DESCRIPTION:		RCS Loop A cold leg small break LOCA, ramped in over 15 minutes - Rx will not trip in manual or automatic - Train B RHR Pump fails to autostart on SI (Page 4)			
EXPECTED OPERATOR / PLANT RESPONSE		SRO	RO	BOP	

68) Determine RCS pressure > 230 psig and RHR Pumps secured

69) Transition to EOP-EPP-009, "Post LOCA Cooldown and Depressurization"

**TERMINATE THE SCENARIO (AT THE LEAD EXAMINER'S DISCRETION) WHEN A DETERMINATION HAS BEEN MADE THAT A TRANSITION TO EPP-009 IS REQUIRED.**

COMMENTS: BOLD AND \* DENOTES CRITICAL TASK

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SCENARIO NUMBER: 3	EVENT NUMBER: 9	FACILITY: Harris
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BRIEF DESCRIPTION: Classifies the Event
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EXPECTED OPERATOR / PLANT RESPONSE	SRO	RO	BOP
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TIME: NA

ANNUNCIATORS / CUES:

None

- 1) Classifies the event as a Site Area Emergency due to ATWS while in Mode 1 with a failure of both manual trip switches in the Control Room

OR

- 2) Classifies the event as a Site Area Emergency due to two fission product barriers (RCS and Containment) being breached

**NOTE: Performance Rating for Admin JPM based on 20% for satisfactory classification during simulator scenario, 20% for satisfactory classification during JPM, and 60% for satisfactory protective action recommendation during JPM.**

COMMENTS:

BOLD AND \* DENOTES CRITICAL TASK

Event 4

**Take manual control of FK-478 and reduce feed flow to prevent turbine / reactor trip on high SG level** - On transmitter failure, with proper actions, the operators should be able to control S/G water level in manual without causing a high S/G water level turbine / reactor trip. Per NUREG 1021, App D, Step D.1a., "prevent inappropriate actions that create a challenge to plant safety (such as an unintentional reactor protection system (RPS) or ESF actuation)."

Event 7

**Manually insert control rods due to reactor failure to trip** - Correct reactivity control (such as failure to initiate emergency boration or manually insert control rods) following a failure of the reactor to trip – Note that Emergency Boration is NOT considered a Critical Task in this scenario due to automatic actuation of SI providing alignment from RWST (App D, Step D.1.a)

Event 8

**Starts RHR pump B (ONLY IF RCS PRESSURE DECREASES TO BELOW THE SHUTOFF HEAD OF THE PUMP DURING THE SCENARIO)** - Recognize a failure or an incorrect automatic actuation of an ESF system or component with neither pump operating during a LOCA (preventing a challenge to plant safety (App D, Step D.1.a))

Event 6

**Determines RCP trip criteria met and trips all RCPs** - depending on the conditions of the accident, for a SBLOCA, the RCPs should be tripped when specified parameters are met. The RCPs should be tripped to avoid more serious impacts. If the criteria is not satisfied, the pumps should continue to be operated because they can provide core heat removal without ECCS in operation (preventing a challenge to plant safety (App D, Step D.1.a))

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SCENARIO NUMBER: 3      DOCUMENTATION OF      FACILITY: Harris  
EMERGENCY PLAN  
CLASSIFICATION

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SRO CANDIDATE: \_\_\_\_\_

CLASSIFICATION: \_\_\_\_\_

BASIS FOR CLASSIFICATION: \_\_\_\_\_

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SAT      \_\_\_\_\_

UNSAT      \_\_\_\_\_

EXAMINER: \_\_\_\_\_

Attach this sheet to candidate's administrative JPM – JPM SRO-A.4, "Perform an Emergency Action Level Classification and Recommend Protective Actions," as part of grading criteria.