

INITIAL SUBMITTAL

**HARRIS EXAM
50-400/2004-301**

**FEBRUARY 23 - 27, 2004
& MARCH 4, 2004 (WRITTEN)**

INITIAL SUBMITTAL

**OPERATING TEST
SIMULATOR SCENARIOS**

Harris

Draft

Operating Exam

2004

Harris

Draft

Scenario 1

Operating Exam

2004

Facility: <u>HARRIS</u>	Scenario Number: <u>1</u>	Op-Test Number: _____	
Examiners _____ _____ _____	Operators _____ _____ _____		
<p>Initial Conditions: IC-32: 26% power MOL; AFW Pump A-SA OOS (CFW026 RACK_OUT); INSERT EVENTS 7, 8, and 9 DURING SIMULATOR SETUP. Ensure DEH HOLD button is illuminated. Ensure both Condensate Pumps and one Condensate Booster Pump is in service. Ensure a Reactivity Plan is provided (NOTE – NEW REACTIVITY PLAN REQUIRED FOR SCENARIO – DELETE THIS NOTE W O N COMPLETION OF REACTIVITY PLAN).</p>			
<p>Turnover: The unit is at 26% power at MOL, 8 hours following a reactor startup. The plant tripped approximately 20 hours ago (12 hours before startup).</p> <p>Boron concentration is 1166ppm. Bank D rods are at 108 steps.</p> <p>AFW 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 3.7.1.2 has been entered. Risk level is YELLOW.</p> <p>Shift orders are to place the second Condensate Booster Pump in service and continue the power ramp to 90% power and restore AFW Pump 'A' to service when it becomes available. GP-005 is being performed per Step 5.0.1 16.</p> <p>An Auxiliary Operator is standing by to start the Condensate Booster Pump. All prestart checks to start the pump are complete.</p>			
Event Number	Malfunction Number	Event Type*	Event Description
1	NA	N (BOP) N (SRO)	Place Second Condensate Booster Pump in service
2	LT:459 100 0	I (RO) I (SRO)	Pressurizer Level high failure
3	LT:486 0 0	I (BOP) I (SRO)	SG Level Low Failure
4	RCS06A 650	I (RO) I (SRO)	Median Tavg high failure NOTE: INITIATE THIS EVENT ON SAME TRIGGER AS EVENT 5.

Event Number	Malfunction Number	Event Type*	Event Description
5	CND03 18	C (BOP) C (SRO) R (RO)	Partial Loss of Condenser Vacuum <i>NOTE: INITIATE THIS EVENT ON SAME TRIGGER AS EVENT 4 DUE TO TIME' UNTIL THIS EVENT IS NOTED BY AVAILABLE CUES. THIS EVENT WILL ALSO REQUIRE SIMULATOR OPERATOR TO ADJUST SEVERITY.</i>
6	MSS01C 8E6 1200	M (ALL)	Steam Break Inside Containment
7	RPS01B 3 3	M (ALL)	Reactor Trip failure <i>NOTE: INSERT MALFUNCTION DURING INITIAL SETUP OF SIMULATOR.</i>
8	CFW1B	C (BOP) C (SRO)	AFW Pump 'B' trip <i>NOTE: INSERT MALFUNCTION DURING INITIAL SETUP OF SIMULATOR.</i>
9	CVC21A 0 ZRPK701B FAIL_ASIS ZRPK602B FAIL_ASIS	C (RO) C (SRO)	1CS-292 (LCV-115B) RWST to CSIPs failed shut <u>AND</u> 1CS-291 (LCV-115D) RWST to CSIPs fail to auto open on SI or lo-lo VCT level <i>NOTE: MULTIPLE EVENTS REQUIRED. INSERT MALFUNCTIONS DURING INITIAL SETUP OF SIMULATOR.</i>
10	NA	(SRO)	Classifies the Event

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

SCENARIO NUMBER: 1

EVENT NUMBER: 1

FACILITY: Harris

EVENT 1 DESCRIPTION:

Place Second Condensate Rooster Pump in service

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	Shift orders direct placing a second Condensate Booster Pump in service
	BOP	Verify Initial Conditions of OP-134, Section 5.6.1 1. One Condensate Booster Pump is in service per Section 5.5 of OP-134 2. Condensate Booster Pump B Lock-Out Relay reset Reviews CAUTION: To prevent damaging the CBP recirc valves, do not operate the second Condensate Booster Pump for more than 1.5 hours with MFP suction flow less than 4500 kpph. 3. Total feedwater flow is greater than 4500 kpph 4. CPD Operator and Chemistry have been notified of potential flow and pressure changes in the Condensate System.
	BOP	Direct AO to perform prestart checks on Condensate Booster Pump B per Attachment 6
	BOP	Verify CONDENSATE BOOSTER PUMP B RECIRC, ICE-261 in MODU and shut
+	BOP	Reviews CAUTION: There are no Condensate Booster Pump trips to protect the pump from running without seal water.
	BOP	Place PK-2308 (PK-2307) CNDST BSTR PUMP B SPEED CONTROLLER to MAN and zero the demand signal.
	BOP	Verify open ICE-268, CONDENSATE BOOSTER PUMP B DISCHARGE
	BOP	Reviews NOTE: Computer points listed in Section 6.0 of this procedure may be monitored for information. Reviews NOTE: When the Condensate Booster Pump control switch is placed to the START position, the Aux Lube Oil Pump will start and supply the VSF Coupling with oil until oil pressure is greater than or equal to 20 psig, at which time the Condensate Booster Pump starts.

COMMENTS:

SCENARIO NUMBER 1

EVENT NUMBER: 1

FACILITY: Harris

EVENT DESCRIPTION:

Place Second Condensate Train in service (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Reviews CAUTION: The amount of time the associated recirc valve, 1CE-261 is open, should be minimized due to lack of lubrication without Condensate Booster Pump running.
	BOP	Place the control switch CONDENSATE BOOSTER PUMP B RECIRC, 1CE-261 in the OPEN position immediately prior to starting Condensate Booster Pump B
	BOP	Reviews NOTE: Starting the second Condensate Booster Pump may cause the previously running pump controller to reject to Manual. This is due to the <i>speed</i> sensor on the pump being started initially providing a speed input signal that is based on electrical noise. If the running CBP controller rejects to manual, it <i>is</i> permissible to return the controller to Auto once the CBP being started reaches the no-load speed. If the controller again rejects to manual, then further investigation would be required.
	BOP	Start B Condensate Booster Pump
	BOP	Directs AO to locally verify Condensate Booster Pump A Aux Lube Oil Pump has stopped
	BOP	Directs AO to check differential pressure across the Pall Replaceable Duplex Filter, as indicated between PI-01LO-2304B1 and PI-01LO-2304B2 is less than 15 PSI. IF differential pressure across the Pall Replaceable Duplex Filter is greater than or equal to 15 PSI, then direct AO to swap to the idle/out of service filter per Section 8.13. (Otherwise this Step is N/A)
	BOP	Slowly increase the demand signal on PK-2308, CNDST B U R PUMP B SPEED CONTROLLER to match the demand signal on the previously running Condensate Booster Pump Speed Controller.
	BOP	Place PK-2308, CNDST BSTR PUMP B SPEED CONTROLLER to AUTO when the demand signals are matched
	BOP	Place the control switch for CONDENSATE BOOSTER PUMP B RECIRC, 1CE-261 in the MODU position
	BOP	Direct AO to that after 5 to 10 minutes of running, verify the VSF coupling oil level is in the normal operating range

COMMENTS:

FACILITY: **Harris**

COMMENTS:

SCENARIO NCJMRER: 1

EVENT NUMBER: 3

FACILITY: Harris

EVENT DESCRIPTION: SG Level Low Failure

TIME	POSITION	AFFILIANT'S ACTIONS OR BEHAVIOR
	SRO BOP	Diagnose low failure of controlling SG 'B' level channel <ul style="list-style-type: none">SG B NR LVL/SP HI/LO DEV (ALB-14-2-1B) alarmingSTEAM GEN B LOW LVL (ALB-14-5-4A) alarmingSTEAM GEN B LOW-LOW LEVEL (ALB-14-5-4B) alarmingSG 'B' level, IJ-486 SB, indicating 0%SG B PW > STM FLOW MISMATCH (ALB-14-5-1A) alarmingSG 'B' feed flow > steam flowSG 'B' feed reg valve openingSG 'B' level rising on operable SG level channels
	SRO	Enter and direct the actions of AOP-010, Feedwater Malfunctions
	SRO BOP	(IMMEDIATE ACTION) Check any Main Feedwater Pump tripped
	SRO BOP	(IMMEDIATE ACTION) Check initial Reactor power less than 90%.
	SRO BOP	(IMMEDIATE ACTION) Check initial Reactor power less than 80%.
	SRO BOP	Check initial Reactor power less than 60%.
	BOP	Check DEH controlling Turbine Valves properly
	BOP	Maintain all of the following: <ul style="list-style-type: none">At least one Main Feedwater Pump runningMain Feedwater flow to all Steam GeneratorsALL Steam Generator levels greater than 30%
	BOP	Check Feedwater Regulator Valves NOT operating properly in AUTO and perform the following: <ul style="list-style-type: none">Place applicable Feedwater Regulator Valve (FK-488) in MANUALMaintain Steam Generator levels between 52 and 62% (REDUCE FW FLOW)
		CRITICAL STEP TO PREVENT PLANT TRIP AS A RESULT OF HIGH-HIGH SG LEVEL.
	BOP	Check Main Control Room annunciators available

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 3

FACILITY Harris

EVENT DESCRIPTION: SG Level Low Failure (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Check the following Pump status: <ul style="list-style-type: none">If any Feedwater Train Pumps tripped, go to Step 11 NOTE: ONLY 1 FW PUMP IS OPERATING AT THIS TIME
	SRO	Go to the applicable section: <ul style="list-style-type: none">All Condensate/Feedwater flow malfunctions (other than pump trips) Section 3.1
	BOP	Check the following Recirc and Dump Valves operating properly in MODU: <ul style="list-style-type: none">Main Feedwater PumpsCondensate Booster PumpsCondensate PumpsICE-293, Condensate RecircICE-142, Condensate Dump To CST Isolation Valve
	BOP	Check the Condensate and Feedwater System intact
	SRO	Reviews NOTE: Pumps should be stopped in the order of higher to lower pressure. (To stop a Condensate Pump, stop a Main Feedwater Pump followed by a Condensate Booster Pump and then the Condensate Pump.)
	BOP	Check pumps for normal operation.
	BOP	Notify Load Dispatcher of any load limitations.
	SRO	Check Reactor thermal power changed by less than 15% in any one hour period
	SRO	Exit AOP-010
	SRO	Refer to OWP-RP for SG 'B' level failure (SG 'B' Level)
	SRO	Refers to TS 3.3.1 (Items 13 and 14) - 6 hour requirement to trip bistables
	SRO	Initiate repairs

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 4

FACILITY. Harris

EVENT DESCRIPTICMedian Tavg high failure

TIME	POSITION	APPLICANT'S ACTIONS OK BEHAVIOR
	SRO RO	Diagnose high failure of RCS Median Select Tavg circuit <ul style="list-style-type: none">• Rods inserting• TR-408 Ked Pen at max output• RCS LOOPA/B/C TAVG HI/LO DEV (ALB-010-6-3A/7-3A/8-3A) all alarming• RCS TREF/TAVG HIGH-LOW (ALB-010-6-4B) alarming• PRESSURIZER CONTROL LOW LEVEL DEVIATION (ALB-009-2-2) alarming• Charging flow FI-122A.1 increasing• FK-122 ut increasing
	SRO	Enter and direct the actions of AOP-001, Malfunction of Kod Control and Indication System
	SRO RO	(IMMEDIATE ACTION) Check that < 2 control rods are dropped
	RO	(IMMEDIATE ACTION) Position Rod Bank Selector Switch to MAN
	RO	(IMMEDIATE ACTION) Check Control Bank motion stopped
	SRO	Go to the appropriate section: <ul style="list-style-type: none">• Section 3.2, Continuous Spurious Control Bank Motion
	RO	Manually operate affected control bank to restore the following : <ul style="list-style-type: none">• Equilibrium power and temperature conditions• Rods above the insertion limits of Tech Spec 3.1.3.6 and PLP-106, Technical Specification Equipment List Program and Core Operating Limits Report.

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 4

FACILITY: Harris

EVENT DESCRIPTION: Median Tav_g high failure (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO RO	Check that instrument channel failure has not occurred by observing the following: <ul style="list-style-type: none">• RCS Tav_g• RCS Tref• Power Range NH channels• Turbine first stage pressure
	SRO KO	Verify proper operation of the following: <ul style="list-style-type: none">• CVCS demineralizers• BTRS• Reactor Makeup Control System
	SRO	Check that this section was not entered due to control banks moving out and go to Step 6
	SRO RO	Check that neither of the following occurred: <ul style="list-style-type: none">• Unexplained RCS boration• Unplanned RCS dilution
	SRO KO	Check that an automatic Rod Control malfunction occurred
	RO	Maintain manual rod control until appropriate corrective action is complete
	SRO	Exit this procedure

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMRER 5

FACILITY: Harris

EVENT DESCRIPTION:

Partial Loss of Condenser Vacuum

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO BOP	Diagnoses lowering main condenser vacuum <ul style="list-style-type: none">Decreasing Condenser vacuum indication on MCBCNDSR PRE TRIP LOW VACUUM alarm (ALB-020-2-4A) alarmingCOMPUTER ALARM MS/TURBINE SYSTEMS (ALB-020-5-5) alarming
	SRO	Enters and directs the actions of AOP-012, Partial Loss of Condenser Vacuum
	BOP	Check Turbine in operation
	BOP	Check Condenser pressure in both Zones less than: <ul style="list-style-type: none">7.5 inches Hg absolute and Turbine first stage pressure is greater than 60% turbine load- OR -5 inches Hg absolute and Turbine first stage pressure is less than 60% turbine load
	SRO BOP	Reduce Turbine load as necessary to maintain Condenser vacuum using one of the following: <ul style="list-style-type: none">GP-006, Normal Plant Shutdown from Power Operation to Hot StandbyAOP-038, Rapid Down
	BOP	Continue Turbine load reduction until directed otherwise by Unit SCO based on the following: <ul style="list-style-type: none">Cause of vacuum loss identified and correctedVacuum stable or increasingPlant conditions require Reactor or Turbine trip
		NOTE TO SIMULATOR OPERATOR: AS SOON AS TURBINE LOAD HAS BEEN LOWERED IN RESPONSE TO LOWERING VACUUM, REDUCE MALFUNCTION SEVERITY TO 5.
		NOTE: SEVERAL MINUTES AFTER REMOVING MALFUNCTION, REPORT AS AO THAT AIR INLEAKAGE WAS APPARENT CAUSE AND ICE-475, CONDENSER VACUUM BREAKER, HAS BEEN FULLY CLOSED. NOISE LEVEL IN AREA HAS DECREASED SUBSTANTIALLY.

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 5

FACILITY: Harris

EVENT DESCRIPTION: Partial Loss of Condenser Vacuum (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Dispatch Operator(s) to locally perform actions of Attachment 1
	BOP	Verify the following valves shut <ul style="list-style-type: none">• 1CE-447, Condenser Vac Breaker• 1CE-475, Condenser Vac Breaker
	SRO	Check NO Circulating Water Pumps tripped and go to Step 11
	SRO	Check conditions to determine NO failure of a Circulating Water System expansion joint is indicated and go to Step 14
	SRO	Check NO major unisolable leak in Circulating Water System exists and go to Step 17
	SRO	Check NO isolable leak between Condenser Waterbox isolation valves exists and go to Step 20
	BOP	Check Circulating Water temperatures using the following ERFIS Computer Points stable or decreasing: <ul style="list-style-type: none">• TCW1930, Cooling Tower Basin Temp• TCW1940A, Condenser A Circ Water Inlet Temp• TCW1940B, Condenser B Circ Water Inlet Temp
	SRO	Check plant shutdown initiated
	SRO	Notify Load Dispatcher of reduced load capability
	BOP	Monitor Turbine vibration levels normal
	SRO	Reviews Note: Exhaust Hood Spray may not be effective in reducing Exhaust Hood temperature above 15% Turbine load
	BOP	Check Exhaust Hood temperature less than 175°F
	SRO	Check Reactor thermal power changed by less than 15% in any one hour period

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 5

FACILITY: Harris

EVENT DESCRIPTION: Partial Loss of Condenser Vacuum (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Check cause of loss vacuum identified and corrected
	BOP	Restore Turbine load as desired per GP-005, Power Operation
	SRO	Exit AOP-012

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 6 / 7

FACILITY: Harris

EVENT DESCRIPTION: Steam Break Inside Containment with Failure of Reactor to Trip

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO RO BOP	Diagnoses Main Steam break inside containment <ul style="list-style-type: none">Reactor power increasingSteam flow increasingFeed flow increasingSG levels decreasing after initial swellSteam pressure decreasingRCS temperature decreasingContainment pressure increasingContainment radiation levels unchanged
	SRO	Orders a reactor trip and safety injection and enters PATH-1
		NOTE: DUE TO THE FAILURE OF THE AUTOMATIC AND MANUAL REACTOR TRIP, A SAFETY INJECTION IS LIKELY TO OCCUR BEFORE THE REACTOR CAN BE TRIPPED LOCALLY.
	RO	Determines reactor failed to automatically trip <ul style="list-style-type: none">Reactor trip breakers closedRod bottom lights offNeutron flux NOT decreasing
	RO	Attempts manual trip of reactor
	RO	Determines manual trip NOT successful <ul style="list-style-type: none">Reactor trip breakers closedRod bottom lights offNeutron flux NOT decreasing
	RO	Informs SRO of failure of reactor to trip automatically or manually
	SRO	Transitions to and directs the actions of FRP-S. 1, Response to Nuclear Power Generation / ATWS
	RO	(IMMEDIATE ACTION) Verifies rods inserting automatically or manually inserts control rods

COMMENTS:

SCENARIO NUMBER: 1

EVEN? NUMBER: 6 / 7 / 8

FACILITY: Harris

EVENT DESCRIPTION:

Steam Break Inside Containment with Failure of Reactor to Trip
(CONTINUED) – Failure of MDAFW Pump to Start

TIME	POSITION	APPLICANT’S ACTIONS OR BEHAVIOR
	BOP	(IMMEDIATE ACTION) Verifies turbine tripped All turbine throttle valves shut <ul style="list-style-type: none">All turbine governor valves shut
	BOP	(IMMEDIATE ACTION) Determines neither Motor-Driven AFW pump running and verifies Turbine-Driven AFW Pump operating
	RO	(IMMEDIATE ACTION) Determines reactor is not tripped and directs operator to contact or report to Control Room
		CRITICAL STEP TO DIRECT A LOCAL REACTOR TRIP TO ADD NEGATIVE REACTIVITY TO CORE. <i>NOTE: AFTER APPROXIMATELY 15 SECOND DELAY, CONTACT CONTROL ROOM AS THE OPERATOR DIRECTED TO CONTACT / REPORT.</i>
	RO	Directs operator to locally trip the reactor by (order of preference): <ul style="list-style-type: none">Locally opening the reactor trip breakersLocally trip both rod drive MG set generator output breakers.Locally trip both rod drive MG set motor breakers
		<i>,VOTE: APPROXIMATELY 30 SECONDS AFTER BEING DIRECTED TO LOCALLY TRIP THE REACTOR, OPEN THE REACTOR TRIP BREAKERS.</i>
	SRO	Initiate monitoring of CSFSTs

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 6/7/9

FACILITY: Harris

EVENT DESCRIPTION:

Steam Break Inside Containment with Failure of Reactor to Trip
(CONTINUED) – Failure of RWST to CSIP Suctions to Open

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	<div>If SI has NOT initiated, initiate Emergency Boration</div> <ul style="list-style-type: none">Start a boric acid pumpOpen ICS-278, Emergency Boric Acid Addition valveVerify > 30 gpm emergency boration flowVerify > 30 gpm CSIP flow to RCSVerify RCS pressure < 2335 psig
		<div>NOTE: SI ACTUATED LIGHT AND SEVERAL OTHER UNEXPECTED INDICATIONS WILL BE RECEIVED DUE TO A FAILURE OF SLAVE RELAY K602B WHICH IS INCLUDED AS THE INITIATING FAILURE FOR THIS EVENT. THE FOLLOWING COMPONENTS ARE AFFECTED:</div> <ul style="list-style-type: none">SI Actuated light – blinks due to difference in Train SA & SB – light operated by contact on K602 via multiplexerSI Reset Auto-SI Blocked – blinks when attempting to reset SI due to Train SA reset with Train SB not able to reset – timer started by contact on K602LCV-115D does not auto openLCV-115E does not auto closeCC-115 does not auto closeCC 305 does not auto close
	RO	<div>Identify failure of RWST suction to CSIPs to open</div> <ul style="list-style-type: none">ICS-291 red light off, green light on
	RO	Attempts to open ICS-291 and reports failure to SRO

COMMENTS:

SCENARIO NUMBER: 1

EVENT MJMRER: 6 / 4

FACILITY: Harris

EVENT DESCRIPTION: Steam Break Inside Containment with Failure of Reactor to Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Isolate Containment Ventilation by stopping the following fans: <ul style="list-style-type: none"> AH-82A AH-82B E-5A E-5B
	BOP	Verify Containment Ventilation valves and dampers shut
	RO	Verify reactor tripped
	BOP	Verifies turbine tripped
	SRO	Begin monitoring of foldout for FRP-S.I
	BOP	Controls AFW flow to intact SGs to maintain between 40% and 50%
		NOTE: MAY RECOGNIZE THAT STEAM BREAK IS ON SG 'C' BY THIS TIME, PARTICULARLY IF MS ISOLATION HAS OCCURRED, AND CHOOSE TO ISOLATE AFW TO SG 'C'.
	RO	Verify All Dilution Paths Isolated <ul style="list-style-type: none"> Reactor Makeup Water pumps OFF FCV-114B, Reactor Makeup Water valve SHUT ICS-98, BTRS Bypass valve OPEN Direct AO to locally verify ICS-510, Boric Acid Batch Tank Outlet valve SHUT
	RO	Checks for positive reactivity addition due to cooldown <ul style="list-style-type: none"> Reactor tripped Intermediate range startup rate positive
	SRO	Determines a SG is depressurizing in an uncontrolled manner and go to Step 18
	BOP	Verifies MSIVs and bypass valves closed
	BOP	Determines SG 'C' faulted due to SG pressure decreasing in an uncontrolled manner or completely depressurized

COMMENTS:

SCENARIO NUMBER: 1EVENT NUMBER: 6 / 7FACILITY: Harris

EVENT DESCRIPTION: Steam Break Inside Containment with Failure of Reactor to Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Detemiines SG 'A' and SG 'B' NOT faulted
	BOP	Isolates SG 'C' <ul style="list-style-type: none">• Verifies PORV closed• Verifies FW Isolation closed• Verifies AFW isolated to SG• Closes steam supply to TDAFW Pump• Verifies before seat drain isolation closed• Verifies SG blowdown isolation closed• Verifies steam analyzer isolation closed• Verifies chemical addition isolations closed
		CRITICAL STEP TO ISOLATE SG 'C' PRIOR TO EXITING FRP-S.1 TO MINIMIZE PRESSURE RISE INSIDE CONTAINMENT.
	RO	Verifies core exit thermocouples < 1200 °F
	RO	Verify reactor subcritical <ul style="list-style-type: none">• Power ranges < 5%• Intermediate startup rate negative
	SRO	Implements FRPs, as required

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 6 / 7

FACILITY: Harris

EVENT DESCRIPTION: Steam Break **Inside** Containment with Failure of Reactor **to** Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Transitions to and directs the actions of FRP-J.1 based on MAGENTA path on Containment CSFST
	BOP	Verifies Phase A isolation valves closed
	BOP	Verifies Containment Vent isolation valves closed
	BOP	Verifies Containment Spray operation due to pressure > 10 psig <ul style="list-style-type: none">• Verify Spray Pumps running• Verify proper valve alignment
	BOP	Verifies Phase B isolation
	RO	Stop all RCPs due to loss of cooling flow
	SRO	Verifies proper operation of containment fan coolers
	BOP	Verifies MSIVs and bypasses closed
	BOP	Determines SG 'C' is only faulted SG and verifies isolated
	RO	Check both Spray Pumps running
	RO	Check both ESW Booster Pumps running and orifice bypass isolation valves closed

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER 6 / 7

FACILITY: Harris

EVENT DESCRIPTION: Steam Break Inside Containment with Failure of Reactor to Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Transitions to and directs the actions of EOP PATH-1
	RO	Verifies reactor tripped
	BOP	Verifies turbine tripped
	BOP	Verifies power to AC safeguards buses
	RO	Verifies SI actuated
	SRO	Begins monitoring of CSFSTs
	SRO RO BOP	Begins monitoring of Foldout A
	RO	Verifies proper operation of emergency safeguards equipment <ul style="list-style-type: none">CSIP and RHR pumps runningSI flow > 200 gpmMain steam line isolationContainment pressure above 10psig, with actions takenAFW flow at least 210 KPPH available

COMMENTS:

SCENARIO NUMBER: I

EVENT NUMBER: 6 / 7

FACILITY: Harris

EVENT DESCRIPTION: Steam Break Inside Containment with Failure of Reactor to Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	<div>ESFAS proper alignment using Attachment 6</div> <ul style="list-style-type: none"> 2 CSIPs running 2 RHR Pumps running 2 CCW Pumps running All ESW and ESW Booster Pumps running SI Valves properly aligned <div>NOTE: RWST SUCTIONS TO CSIPs FAILED TO OPEN ON SI ACTUATION. MAY HAVE BEEN RECOGNIZED BY THIS POINT AND OPERABLE VALVE OPENED. IF NOT, IT IS CRITICAL AT THIS POINT TO OPEN THE VALVE TO ESTABLISH FLOW.</div> <ul style="list-style-type: none"> Phase A proper alignment Blowdown and SG sample valves shut Main steam lines isolated Containment Spray operation RCPs stopped Both FW Pumps tripped FW Isolation valves closed NEITHER MDAFW Pump operating TDAFW Pump operating AFW alignment (FLOW ISOLATED TO SG 'C') Both EDGs running Containment Fan Coolers – 1 per unit operating in slow speed Control Room Ventilation in Emergency Recirc AC Ruses 1A1 and 1B1 energized Air compressors 1A and 1B in Local Control Mode

COMMENTS:

FACILITY **Harris**

Steam Break Inside Containment with Failure of Reactor to Trip (CONTINUED)

[illegible]

COMMENTS:

SCENARIO NUMBER: 1

EVENT NUMBER: 6 / 7

FACILITY: Harris

EVENT DESCRIPTION:

Steam Break Inside Containment with Failure of Reactor to Trip
(CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Transitions to and directs the actions of EPP-014, Faulted Steam Generator Isolation
	BOP	Check MSIVs and bypass valves shut
	BOP	Determines SGs 'A' and 'B' are NOT faulted
	BOP	Determines SG 'C' is faulted
	SRO	Verifies SG 'C' was previously isolated
	BOP	Checks CST level > 10%
	BOP	Check Secondary Radiation levels normal
	BOP	Check NO SG levels increasing in an uncontrolled manner
	RO	Check SI NOT terminated by SI flow being > 200 gpm
	RO	Determines SI Termination Criteria are met <ul style="list-style-type: none">Subcooling (> 40°F)Heat Sink (SG level > 40%)RCS Pressure (stable / increasing)RCS Inventory (> 30%)
		NOTE: SI TERMINATION CRITERIA WILL BE MET ONLY AFTER THE FAULTED SG HAS COMPLETED BLOWING DRY.
		CRITICAL TO TERMINATE SAFETY INJECTION TO PREVENT RCS OVERFILL AND PRESSURIZATION RESULTING IN CHALLENGING PRZ PORVs AND/OR SAFETIES.

COMMENTS:

SCENARIO NUMBER: 1EVENT NUMBER: 6 / 4FACILITY: Harris

EVENT DESCRIPTION: Steam Break Inside Containment with Failure of Reactor to Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Reset SI
	RO BOF	Manually realign safeguards equipment, if required, following a loss of offsite power
	RO	Stops all but 1 CSIP
	RO	Determines RCS pressure stable or increasing
	RO	Check CSIP suction aligned to RWST
	RO	Opens normal miniflow isolation valves <ul style="list-style-type: none">• 1CS-182• ICs-196• 1CS-210e ICs-214
	RO	Isolates BIT outlet valves <ul style="list-style-type: none">• 1SI-3• ISH4
	RO	Verify cold and hot leg injection valves closed <ul style="list-style-type: none">• 1SI-52• 1SI-86* 1SI-107
	RO	Establishes charging lineup <ul style="list-style-type: none">• Closes FK-122.1Opens ICs-235• Opens 1CS-238
	RO	Controls charging to maintain pressurizer level using FK-122.1 and maintain flow 150 gpm
	RO	Verify PRZ level can be maintained stable or increasing
	RO	Reset Phase A and Phase B Isolation signals

COMMENTS:

SCENARIO NUMBER: 1

EVEN? NUMBER: 6 / 7

FACILITY: Harris

EVENT DESCRIPTION:

Steam Break Inside Containment with Failure of Reactor to Trip
(CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Establish IA and Nitrogen to Containment by opening: <ul style="list-style-type: none">• 1IA-819• .SI-287
	SRO	T ansition to EPP-008, SI Termination
		TERMINATE THE SCENARIO AFTER THE TRANSITION TO EPP-008 IS ANNOUNCED.

COMMENTS:

FACILITY: Hart's

Classifies the Event

COMMENTS

Harris

Draft

Scenario 2

Operating Exam

2004

Facility: HARRIS	Scenario Number: 2	Op-Test Number: _____	
Examiners _____ _____ _____	Operators _____ _____ _____		
<p>Initial Conditions: IC-18; 100% power BOL; AFW Pump A-SA OOS (CFW026 RACK-OUT); HDP A OOS (CND065 RACK-OUT); Lower power by 25 MWe and increase boron concentration by 2 ppm; Allow plant to stabilize.</p> <p>Turnover: The unit is at 100% power at BOL, with equilibrium xenon conditions.</p> <p>Boron concentration is 1238ppm. Bank D rods are at 218 steps.</p> <p>AFW 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 3.7.1.2 has been entered. Risk level is YELLOW.</p> <p>HDP 'A' is tagged out of service for hearing replacement and is not expected back for the next several days.</p> <p>Shift orders are to maintain power at 100% and restore AFW Pump 'A' to service when it becomes available. GP-005 has been completed and the plant has been stable for 3 weeks.</p>			
Event Number	Malfunction Number	Event Type*	Event Description
1	PT:308A Severity 1300 Ramp 90 XB1O007B OFF with 1 sec TD	I (BOP) I (SRO)	S/G A PORV Pressure Transmitter PT-308 fails high with failure of S/G A PORV open indication <i>NOTE: MULTIPLE EVENTS ON SAME TRIGGER.</i>
2	LT:112 Severity 100	I (RO) I (SRO)	LT-112, VCT Level, High Failure
3	CRF3A Mode 2 Rod F2	C (RO) C (SRO)	Dropped Control Rod F2
4	NA	R (RO) N (BOP) N (SRO)	Power Reduction

Event Number	Malfunction Number	Event Type*	Event Description
5	CVC23A	C (RO) C (SRO)	Boric Acid Pump Trip
6	EPS5A with 1 sec TD DSG1 Mode 1	C (ALL)	Loss of Power to an ESF Bus with Failure of EDG to Load <i>NOTE: MULTIPLE EVENTS ON SAME TRIGGER.</i>
7	CRF3B Mode 2 Rod K14	M (ALL)	Second Dropped Control Rod K14
8	PRS1 Severity 40 Ramp 300 with 1 sec TD	M (ALL)	Pressurizer Steam Space Break <i>NOTE: THIS EVENT SHOULD BE SET ON SAME TRIGGER AS EVENT 7.</i>
9	NIS6A 1E-9	I (RO) I (SRO)	NIS Intermediate Range Compensating Voltage Low Failure
10	NA	(SRO)	Classifies the Event

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

SCENARIO NUMBER: 2

EVENT NUMBER: 1

FACILITY: Harris

EVENT DESCRIPTION:

S/G A PORV Pressure Transmitter PT-308 fails high with failure of S/G A PORV open indication

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	<ul style="list-style-type: none">ALB-014-8-5, COMPUTER ALARM STEAM GENERATORSSG A PORV open (open indication failed)<ul style="list-style-type: none">RCS temperature loweringSteam flow increasing
	BOP	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
	SRO	<div>Directs operator to take manual control of SG 'A' PORV and close per requirements of OMM-001</div> <ul style="list-style-type: none">Condition / cause communicated to SROSRO provides concurrence to take manual controlSRO provides control limitsAppropriate procedure implemented when plant stabilizedLog entry made when controller in manual
	BOP	Places SG 'A' PORV controller in manual
	BOP	Closes SG 'A' PORV
	SRO	Initiates repairs

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 2

FACILITY: Harris

EVEKT DESCRIPTION: LT-112, VCT Level, High Failure

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	<ul style="list-style-type: none">ALB-007-5-5. COMPUTER ALARM CHEM & VOL SYSTEMSICS-120 (LCV-115A), Letdown VCT / Holdup Tank, aligns to HUT
	SRO	Enters and directs the actions of AOP-003, Malfunction of Reactor Makeup Control
	RO	Check IA available
	SRO	Determines LK-112 output has failed and goes to Section 3.1, LT-112 or LT-115 Malfunction
	SRO	(CONTINUOUS ACTION) Assesses effects of LT-112 failure (Attachment 1)
	RO	Determines failure is NOT due to LT-115 and go to Step 8
	RO	Determines failure caused by LT-112
	RO	Monitor VCT level using either: <ul style="list-style-type: none">ERFIS point LCS0115LT-115
	RO	Determines that LT-112 is failed high and places ICS-120 (LCV-115A), Letdown VCT / Holdup Tank, to VCT position
	RO	(CONTINUOUS ACTION) Maintain VCT level above 20% using auto makeup
	RO	(CONTINUOUS ACTION) Maintain VCT level below 70% by manually diverting to HUT as needed
	RO	(CONTINUOUS ACTION) Maintain VCT level above 5% auto switchover point to RWST

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 2

FACILITY: Harris

EVENT DESCRIPTION

LT-112, VCT Level, High Failure (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Determines LT-112 has failed high and directs Maintenance to lift leads in SSPS for auto switchover to RWST (Step 18)
	RO	Maintains LCV-115A in VCT position

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 3

FACILITY: Harris

EVENT DESCRIPTION: Dropped Control Rod F2

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	<ul style="list-style-type: none">ALB-013-4-2, POWER RANGE HIGH NEUTRON FLUX RATE ALERT, alarmingALB-013-4-5, POWER RANGE CHANNEL DEVIATION, alarmingALH-013-7-4, ONE ROD AT BOTTOM, alarmingALE-013-8-1, BANK D FULL ROD WITHDRAWAL, alarmingALB-013-8-5, COMPUTER ALARM ROD DEVIATION/SEQUENCE PWR RANGE TILTS, alarmingRCS temperature decreasingControl rods stepping out until C-11 interlockDRPI indicates Rod F2 dropped
	SRO	Enters and directs the actions of AOP-001, Malfunction of Rod Control and Indication System
	RO	(IMMEDIATE ACTION) Check that LESS THAN TWO control rods are dropped
	RO	(IMMEDIATE ACTION) Position Rod Bank Selector Switch to MAN
	RO	(IMMEDIATE ACTION) Check Control Bank motion STOPPED
	SRO	Go To Section 3.1, Dropped Control Rod
	SKO	Record the time at which the rod dropped
	RO BOP	Adjust one of the following to equalize Tav _g with Tref: <ul style="list-style-type: none">Turbine loadBoron concentration
	SRO	Direct an operator to check ALL Rod Control Power and Logic Cabinets for normal operation, as follows <ul style="list-style-type: none">NO Blown fusesNO other visible malfunctions
		NOTE: REPORT THAT POWER CABINET 1AC HAS A BLOWN FUSE.
	SRO	Direct Maintenance to perform corrective action on ALL affected Rod Control Power and Logic Cabinets
	RO	Check that ALB-13-7-1, ROD CONTROL URGENT ALARM, is ALARMING, but do not reset until Maintenance has completed repairs

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 3

FACILITY: Harris

EVENT DESCRIPTION

Dropped Control Rod F2 (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Review the following Technical Specifications: <ul style="list-style-type: none">3.1.1.1, Boration Control – Shutdown Margin – Modes 1& 23.1.1.2, Control Rod Assemblies – Group H3.1.3.5, Shutdown Rod Insertion Limit3.1.3.6, Control Rod Insertion Limits3.2.1, Axial Flow Differ3.2.4, Quadrant Power Tilt Ratio
	SRO	Notify the following: <ul style="list-style-type: none">Manager – OperationsReactor Engineering
	RO	Check Reactor Power AT OR ABOVE P-10 (10%).
	KO	Reset any negative rate trip alarm at the NIS cabinets
	SRO	Lower turbine load as recommended by Reactor Engineering
		NOTE: AS MANAGER – SHIFT OPERATIONS, INFORM THE CREW THAT YOU HAVE CONSULTED WITH REACTOR ENGINEERING, AND A DECISION HAS BEEN MADE TO REDUCE POWER TO LESS THAN 90% WITHIN THE NEXT 20 MINUTES USING AOP-038, “RAPID DOWNPOWER,” TO FACILITATE ROD RECOVERY.

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 4

FACILITY: Harris

EVENT DESCRIPTION		Power Reduction
TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	<i>Power reduction to less than 90% within the next 20 minutes has been directed to allow for dropped Rod recovery.</i>
	SRO	Direct the actions of AOP-038, "Rapid Downpower" after discussing Reactor Trip Criteria using Attachment I
	SRO	Notify Load Dispatcher that the Unit is reducing load
	SRO	Determine required boric acid addition for desired power reduction, as follows: <ul style="list-style-type: none">Obtain values from the latest completed OPT-1525, Reactivity Plan Generation Weekly Interval MODE 1 at Full Power
	SRO	Notify Radwaste Control Room to be prepared for the increased water processing requirements due to boration
	SRO	Check that a planned load reduction will NOT take the Unit to Turbine shutdown
	SRO	Determine reactor power change will NOT exceed 15% in a one hour period
	RO	Check Rod Control in AUTO
	RO	Energize all available PRZ Backup heaters
	BOP	Check the DEH System in AUTO
	BOP	Perform the following at the DEK panel: <ul style="list-style-type: none">Depress the Load Rate MW/MIN pushbuttonEnter desired rate in DEMAND displayDepress ENTER pushbuttonDepress REF pushbuttonEnter desired load in DEMAND displayDepress ENTER pushbuttonCheck HOLD pushbutton LITDepress GO pushbuttonVerify the value in the REFERENCE display lowers

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 4 / 5

FACILITY: Harris

EVENT DESCRIPTION: Power Reduction (Continued) / Boric Acid Pump Trip

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
		SIMULATOR OPERATOR INSTRUCTIONS: AFTER BORATION IS STARTED, INSERT NEXT MALFUNCTION TO TRIP RUNNING BORIC ACID PUMP.
	RO	Commence RCS boration as required to maintain Control Rods above the Rod Insertion Limit
	CUE	<ul style="list-style-type: none">ALE-006-8-4, BORIC ACID FLOW DEVIATION, alarmingBoric Acid Pump A-SA tripped
	SRO	Directs KO to stat? standby boric acid pump to allow continuing boration
		NOTE: IF OPERATOR SENT TO INVESTIGATE, REPORT BREAKER FOR PUMP CLOSED, BUT MOTOR IS EXTREMELY HOT TO TOUCH.
	RO	Starts standby Boric Acid Pump
	RO	Restarts boration flow
	SRO	Initiates repairs to pump
	BOP / RO	Verify Generator load and Reactor power lowering
	BOP	Maintain Generator reactive load (VARs) within guidelines
	BOP	When Turbine load is less than 95%, then dispatch an operator to open 3A and 3B Feedwater Heater vents per OP-136, Shutdown of Feedwater Heaters 3A and 3B
	RO	Check T _{avg} within 5°F of T _{ref} .
	BOP	Check Power level at the target value

COMMENTS:

SCENARIO NUMBER 2

EVENT NUMBER: 6

FACILITY: Harris

EVENT DESCRIPTION

Loss of Power to an ESF Bus with Failure of EDG to Load

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
		SIMULATOR OPERATOR INSTRUCTIONS: INSERT NEXT MALFUNCTION FOR LOSS OF POWER AFTER CREW HAS REDUCED POWER
	CUE	<ul style="list-style-type: none">e Multiple system alarms• Loss of power to Bus 1A-SAe EDG 1.4-SA fails to load
	SRO	Enters and directs the actions of AOP-025. Loss of One Emergency AC Bus (6.9KV) or one Emergency DC Bus (125V)
	RO	(IMMEDIATE ACTION) Determines no CSIP running and isolates letdown by closing any open orifice isolation valves
	SRO	VERIFY at least one Emergency AC Bus is ENERGIZED
	SRO	REFER TO the following Tech Specs: <ul style="list-style-type: none">e 3.0.3 (Due to loss of 2/4 containment rad monitors and CVIS affect on CNMT vacuum reliefs)e 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• 3.8.3.1 Onsite Power Distribution - Operating
	SRO	Go to Section 3.1 for Loss of Emergency Bus 1.4-SA

COMMENTS:

SCENARIO NUMBER: 2

EVENTNUMBER: 6

FACILITY: Harris

EVEN?' DESCRIPTION: Loss of Power to an ESF Bus with Failure of EDG to Load (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Check EDG A is running properly <ul style="list-style-type: none"> Voltage Frequency
	BOP	Check Bus 1A-SA is NOT energized and place EMERGENCY STOP switch for EDG A in EMER STOP
	RO	Check B Train CSIP – NOT running
	KO	Start B Train CSIP
	RO	Adjust HC-186.1, RCP Seal WTR IN3 Flow. to establish seal injection flow as necessary to maintain the following: <ul style="list-style-type: none"> Less than 31 gpm total flow to all RCPs Between 8 and 13 gpm to all RCPs
	BOP	Start CSIP Room Ventilation per OP-172, Reactor Auxiliary Building HVAC System
	KO	Verify any CCW Pump - running
	RO	Verify Charging and Letdown flow per OP-107, Chemical and Volume Control System, to maintain Pressurizer level
	BOP	Control AFW as necessary to maintain reactor power and S/G levels

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 7

FACILITY: Harris

EVENT DESCRIPTION: Second Dropped Control Rod K14 / Reactor Trip

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
		SIMULATOR OPERATOR INSTRUCTIONS: INSERT NEXT MALFUNCTION FOR SECOND DROPPED ROD AND PRZ STEAM SPACE BREAK AFTER CREW HAS DETERMINED DESIRED ACTIONS FOR AFW FLOW AT POWER.
	CUE	e ALB-013-7-3, TWO OK MORE RODS AT BOTTOM, alarming DRPI indicates <u>dropped Rod K14</u>
	SRO	Determines a second dropped rod has occurred and orders Reactor Trip
		CRITICAL STEP TO TRIP REACTOR WHEN SECOND DROPPED ROD OCCURS.
	SRO	Enters and directs the action of PATH-I
	RO	(IMMEDIATE ACTION) Verify Reactor Trip: <ul style="list-style-type: none">• Trip breakers RTA and BYA - open• Trip breakers RTB and BYB - opene Rod bottom lights - not available due to loss of powere Neutron <u>flux</u> decreasing
	BOP	(IMMEDIATE ACTION) Verify Turbine Trip: <ul style="list-style-type: none">e All turbine throttle valves - shut• All turbine governor valves - shut
	BOP	(IMMEDIATE ACTION) Verify Power To AC Emergency Buses: <ul style="list-style-type: none">• Check AC emergency bus 1A-SA - deenergizede Check AC emergency bus 1B-SB - energized• Check bus voltages• Check 6.9 KV bus 1A-SA breakers - open• Check 6.9 KV bus 1B-SB breakers - closed

COMMENTS:

SCENARIO NUMBER: 2

EVENT NIJMBER: 7

FACILITY: Harris

EVENT DESCRIPTION: Second Dropped Control Rod K14 / Reactor Trip (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OK BEHAVIOR
	RO	(IMMEDIATE ACTION) Check NO SI Actuation and NOT required <ul style="list-style-type: none">• Check ail of the following dark:<ul style="list-style-type: none">• SI Actuated bypass permissive light• ALB-11-2-2• ALB-11-5-1• ALB-11-5-3• ALB-12-1-4• CNMT pressure < 3.0PSIG• PRZ pressure > 1850 PSIG• Steam pressure > 601 PSIG
	SRO	Transition to and direct the actions of EOP-EPP-004, Reactor Trip Response
	SRO	Implement Function Restoration Procedures As Required
	RO	Check RCS temperature and control AFW flow to stabilize temperature
	RO	Check RCPs running
	BOP	Check Feed System Status : <ul style="list-style-type: none">• Verify feed reg valves – SHUT• Establish AFW flow to SGs using MDAFW Pump B and TDAFW Pump as necessary
	RO	Verify all control rods fully inserted
	RO	Check PRZ Level > 17%

COMMENTS:

FACILITY: **Harris**

Pressurizer Steam Space Break / Single Train SI

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	<ul style="list-style-type: none"> • RCS pressure decreasing • PRZ level increasing • Containment temperature increasing • Containment pressure increasing
	SRO	Directs SI Actuation due to loss of subcooling and transitions and directs the actions of PATH-1, Entry Point A
	RO	Manually initiates Safety Injection or verifies automatic Safety Injection
	SRO	<u>Holdout A</u> applies
	RO	Trips RCPs when RCS pressure decreases below 1400psig after verifying SI flow greater than 200 gpm
		CRITICAL STEP TO TRIP RCPs WHEN TRIP CRITERIA MET.
	RO	Verify CSIP B and RHR Pump B operating
	RO	Verify SI flow > 200 gpm
	RO	Verify RCS pressure > 230 psig
	BOP	Check MS Line Actuation occurs when Containment pressure exceeds 3 psig
	RO	Verify Containment Pressure has remained below 10psig
	BOP	Verify at least 210 KFPB AFW flow
	BOP	Verify alignment of components from actuation of ESFAS signals using PATH-1 <u>guide, Attachment 6.</u>
	RO	Control feed flow and steam dump to stabilize RCS temperature at 557 °F
	RO	Energize AC Bus 1B1
	RO	Check PRZ PORVs closed

COMMENTS:

SCENARIO NUMBER 2

EVENT NUMBER: 8

FACILITY: Harris

EVENT DESCRIPTION: Pressurizer Steam Space Break / Single Train SI (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Verify at least one PORV Block Valve open
	RO	Chesk PRZ spray valves closed
	RO	Check NO SGs depressurizing in an uncontrolled manner or completely depressurized
	BOP	Check secondary radiation normal
	RO	Check containment pressure NOT normal
	SRO	Foldouts A and B apply
	RO	Maintain RCS seal injection flow between 8 and 13 gpm
	BOP	Maintain at least 210 KPPH AFW flow to SGs until at least one SG is above 25% [40%]
	BOP	Control feed flow to maintain proper SG levels
	BOP	Verify Bus 1B1 is energized
	RO	Verify PRZ PORVs closed
	RO	Verify at least one PORV Block Valve open
	RO	Check RCS subcooling not adequate

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 8 / 9

FACILITY **Harris**

EVENT DESCRIPTION: **Pressurizer Steam Break / Train SI (CONTINUED)**
NIS Intermediate Range Compensating Voltage Low Failure

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
		Check NIS Containment Spray Pumps operating
		Determine NIS Intermediate Range Compensating Voltage is failed low and manually energizes both Source Range channels
		Checks RCS pressure > 230 psig
	RO	Checks KCS pressure stable
	RO	Stops RHR Pump B
	BOP	Checks SG pressures stable or increasing
	RO	Checks RCS pressure stable
	RO	Open the CCW Return from RHR HX Valve, 1CC-167
	RO	Maintain Train B CCW flow to the non-essential header
	BOP	Verify 1B-SB energized by offsite power
	BOP	Verify Bus 1B1 energized
	BOP	Verify Compressor 1B running
	BOP	Load the following: <ul style="list-style-type: none"> Train B CRDM fans Turbine Normal Bearing Oil Pump
	BOP	Stop the DC bearing Oil Pump
	BOP	Continue attempts to restore offsite power to Emergency Bus 1A-SA

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 8

FACILITY: Harris

EVENT DESCRIPTION: Pressurizer Steam Space Break / Single Train SI (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Verify EDG B running unloaded
	RO	Reset SI
	BOP	Shutdown EDG B per OP-155, Section 4.0
	RO	Determine RHR Train B capable of Cold Leg Recirculation
	BOP	Verify Auxiliary and Radwaste Processing Building Radiation normal
	RO	Check KCS pressure greater than 230 psig
	SRO	Transition to EOP-EPP-009, Post LOCA Cooldown and Depressurization
		TERMINATE THE SCENARIO AFTER THE TRANSITION TO EPP-009 IS ANNOUNCED.

COMMENTS:

SCENARIO NUMBER: 2

EVENT NUMBER: 10

FACILITY: Harri

EVENT DESCRIPTION:

Classifies the Event

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Classifies the event as an Site Area Emergency (EAL 2-1-3)
		<i>NOTE: SAE BASED ON BREACH OF RCS BARRIER AND CONTAINMENT PRESSURE IN EXCESS OF 3 PSIG.</i>

COMMENTS:

Harris

Draft

Scenario 3

Operating Exam

2004

Facility: HARRIS	Scenario Number: 3	Op-Test Number: _____
Examiners	Operators	
_____	_____	
_____	_____	
_____	_____	

Initial Conditions: **IC-18**; 100% power BOL; AFW Pump A-8A OOS (CFW026 RACK-OUT); HDP A OOS (CND065 RACK-OUT); **INSERT EVENTS 6 and 7 DURING SIMULATOR SETUP**. Lower power by **25** MWe and increase boron concentration by 2 ppm; Allow plant to stabilize.

Turnover: The unit is **at** 100% power at BOL, with equilibrium xenon conditions.

Boron concentration is 1238ppm. Hank D rods are at 218 steps.

AFW 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 3.7.1.2 has been entered. Risk level is YELLOW.

HDP 'A' is tagged out of service for hearing replacement and is not expected back **for the** next several days.

Shift orders are to maintain power at 100% and restore AFW 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	CCW01A CCW047 0 0	C (RO) C (SRO)	Operating CCW Pump Trip with failure of standby pump to automatically start
2	FT:477 0 0	I (BOP) I (SRO)	Feed Water Flow Low Failure
3	CFW-12B PS:1006 0	C (BOP) C (SRO) R (RO)	Heater Drain Pump Trip with Failure of Turbine to Automatically Runback
4	PT:444 2500 60	I (RO) I (SRO)	Pressurizer Pressure High Failure

Event Number	Malfunction Number	Event Type*	Event Description
5	SGN-5C 420 600	M (ALL)	SG Tube Rupture
6	MSS-5C 2	C (RO) C (SRO)	Failure of MSIV on Ruptured SG to close – can be closed locally NOTE: INSERT MALFUNCTION DURING INITIAL SETUP OF SIMULATOR.
7	ZRPK622B Deenergize	C (BOP)	Partial failure of Automatic Phase A Isolation signal (Train B Phase A Slave Relay for select CNMT Phase A valves fails to energize when required). 1SI-287, ICs-11 & 1SW-242 NOTE: INSERT MALFUNCTION DURING INITIAL SETUP OF SIMULATOR.
8	NA	(SRO)	Classifies the Event

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

SCENARIO NUMBER: 3

EVENT NUMBER: 1

FACILITY: Harris

EVENT DESCRIPTION:

Operating CCW Pump Trip with failure of standby pump to automatically start

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	Diagnose trip of CCW Pump 1A-SA and failure of CCW Pump 1B-SB to automatic start <ul style="list-style-type: none">Numerous alarms on ALB-005 due to no CCW flowBreaker indication on CCW Pump 1A-SAFailure of CCW Pump 1B-SB to start
	SRO	Enters and directs the actions of AOP-014, Loss of Component Cooling Water
	RO	Start CCW Pump 1B-2B
	RO	Check CCW header pressure greater than 52 psig
	RO	Dispatch AO to check condition of the breaker and the pump
	RO	Verify adequate ESW cooling water flow to the associated CCW heat exchanger
	RO	Check RHR NOT in service
	SRO	Refer to TS 3.7.3, Component Cooling Water System
	SRO	Contact Maintenance to determine the cause of the CCW pump failure, and initiate corrective action

COMMENTS:

SCENARIO NUMBER: 3EVENT NUMBER: 2FACILITY: Harris

EVEN?' DESCRIPTION:Peed Water Flow Low Failure

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	Diagnose low failure of controlling SG 'A' feed flow channel <ul style="list-style-type: none">SG A STM > FW FLOW MISMATCH (ALB-014-4-1A and 1B) alarmingFI-477 indicating 0SG 'A' feed reg valve openingSG 'A' level increasingSG 'A' actual feed flow > steam flow
	SRO	Enter arid direct the actions of AOP-010, Feedwater Malfunctions
	BOP	(IMMEDIATE ACTION) Check NO Main Feedwater Pump tripped
	BOP	rakes MANUAL control of FK-478 prior to direction in AOP-010 to prevent overfeeding per OMM-001 instructions
	BOP	Check DEH controlling Turbine Valves properly
	BOP	Maintain all of the following: <ul style="list-style-type: none">At least one Main Feedwater Pump runningMain Feedwater flow to all Steam GeneratorsAt Steam Generator levels greater than 30%
	BOP	Check Feedwater Regulator Valves NOT operating properly in AUTO and perform the following: <ul style="list-style-type: none">Place applicable Feedwater Regulator Valve (FK-478) in MANUALMaintain Steam Generator levels between 52 and 62% (REDUCE FW FLOW)
		CRITICAL STEP TO PREVENT PLANT TRIP AS A RESULT OF HIGH-HIGH SG LEVEL
	BOP	Check Main Control Room annunciators available
	BOP	Check the following Pump status: <ul style="list-style-type: none">NO Feedwater Train Pumps trippedOnly one HDP operating

COMMENTS:

SCENARIO NUMBER: 3EVENT NUMBER: 2FACILITY: Harris

EVENT DESCRIPTION: Feed Water Flow Low Failure (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
		NOTE: EVEN THOUGH ONLY ONE HDP IS OPERATING, THE CREW SHOULD GO TO SECTION 3.1 FOR THE FAILURE OF THE FEED FLOW TRANSMITTER.
	SRO	Go to the applicable section: <ul style="list-style-type: none">All Condensate/Feedwater flow malfunctions (other than pump trips) Section 3.1
	BOP	Check the following Recirc and Dump Valves operating properly in MODU: <ul style="list-style-type: none">Main Feedwater PumpsCondensate Booster PumpsCondensate Pumps1CE-293, Condensate Recirc1CE-142, Condensate Dump To CST Isolation Valve
	BOP	Check the Condensate and Feedwater System intact
	BOP	Check pumps for normal operation
	SRO	Notify Load Dispatcher of any load limitations
	SRO	Check Reactor thermal power changed by less than 15% in any one hour period
	SRO	Exit AOP-010
	SRO	Refer to OWP-RP for SG 'A' feed flow failure (SF/FF Loop 1)
	BOP	Selects Channel 476 for control in accordance with OWP-RP NOTE: ALSO LIKELY TO SELECT CHANNEL 475 FOR SG STEAM FLOW ALTHOUGH NOT REQUIRED.
	SRO	Refers to TS 3.3.1 (Item 14) - 6 hour requirement to trip bistables
	BOP	Restores Feed Keg Valve controller to AUTO when level stable at program with feed flow and steam flow matched
	SRO	Initiate repairs

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 3

FACILITY: Harris

EVENT DESCRIPTION: Heater Drain Pump Trip with Failure of Turbine to Automatically Runback

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
		SIMULATOR OPERATOR INSTRUCTIONS: ENSURE ALL FEED REG VALVES HAVE BEEN RETURNED TO AUTOMATIC CONTROL PRIOR TO INSERTING THIS EVENT.
	CUE	Diagnoses trip of Heater Drain Pump 'B' <ul style="list-style-type: none">• HTR DRN PUMP B O/C TRIP-GND (ALB-019-3-1A) alarming• HTR DRN PUMP B LO UP-LO FLOW (ALB-019-3-1A) alarming• SG levels decreasing• Reactor Power increasing
	SRO	Enters and directs the actions of AOP-010, Feedwater Malfunctions
	BOP	(IMMEDIATE ACTION) Check NO Main Feedwater Pump tripped
	BOP	Check DEH controlling Turbine Valves properly
	BOP	Maintain all of the following: <ul style="list-style-type: none">• At least one Main Feedwater Pump running• Main Feedwater flow to all Steam Generators• ALL Steam Generator levels greater than 30%
	BOP	Check Main Control Room annunciators available
	BOP	Check the following Pump status: <ul style="list-style-type: none">• NO Feedwater Train Pumps tripped• Both HDPs tripped
	SRO	Go to the applicable section: <ul style="list-style-type: none">• Loss of Running Pumps (including BOTH Heater Drain Pumps) Section 3.2
	BOP	Maintain all of the following: <ul style="list-style-type: none">• At least one Main Feedwater Pump running• Main Feedwater flow to all Steam Generators• ALL Steam Generator levels greater than 30%

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 3

FACILITY: Harris

EVENT DESCRIPTION:

Heater Drain Pump Trip with Failure of Turbine to Automatically Runback (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Check control rods inserting to reduce Tav _g - Tref mismatch
	BOP	Check Main Steam pressure less than PORV controller setpoint
	BOP	Check proper Steam Dump Valve operation
	BOP	Check SG levels trending to between 52% and 62%.
	RO	Check PZR PORVs shut.
	RO	Check PZR pressure trending to 2235 psig
	KO	Check PZR Level trending to reference level
	BOP	Align Main Feedwater Pump control switches, as applicable: <ul style="list-style-type: none">Tripped Pump - STOP (spring-return to AUTO)Pump Recirc Valves Tripped Pump - SHUT
	BOP	Check both Heater Drain Pumps tripped
	BOP	Check the heater and MSDT high-high level alarms clear
	BOP	Check load NOT less than or equal to 90%
	BOP	Commence load reduction to target using one of the following: <ul style="list-style-type: none">AOP-038, Rapid Downpower
	SRO	Discuss Reactor Trip Criteria using Attachment 1

COMMENTS:

SCENARIO NUMBER 3

EVENT NUMBER: 3

FACILITY: Harris

EVENT DESCRIPTION: Heater Drain Pump Trip with Failure of Turbine to Automatically
Runback (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Notify Load Dispatcher that the Unit is reducing load
	BOP	Controls reactivity during downpower evolution by adjusting rods and/or boron concentration as necessary by borating per OP-107, Chemical and Volume Control System <ul style="list-style-type: none"> • Determines number of gallons required per Reactivity Plan • Sets FIS-113, Boric Acid Batch Counter, for correct number of gallons • Sets ICs-283, FK-1 13 Boric Acid Flow, for desired value (typically approximately 5 gpm) • Places RMW CONTROL to STOP • Places RMW MODE SELECTOR to BOR • Places RMW CONTROL to START • When desired boric acid added, align system for AUTO
	RO	Notify Radwaste Control Room to be prepared for the increased water processing requirements due to boration
	SRO	Check that a planned load reduction will NOT take the Unit to Turbine shutdown
	SRO	Notify Chemistry that Reactor power change will exceed 15% in a one hour period.
	RO	Check Rod Control in AUTO.
	RO	Energize all available PRZ Backup heaters
	BOP	Check the DEM System in AUTO
	BOP	Perform the following at the DEH panel: <ul style="list-style-type: none"> • 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

COMMENTS:

SCENARIO NUMBER 3EVENT NUMBER: 3FACILITY: Harris

EVENT DESCRIPTION: Heater Drain Pump Trip with Failure of Turbine to Automatically Runback (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Commence RCS boration as required to maintain Control Rods above the Rod Insertion Limit
	BOP	Verify Generator load and Reactor power lowering
	BOP	Maintain Generator reactive load (VARs) within guidelines
	SRO	When Turbine load is less than 95%, then dispatch an operator to open 3A and 3B Feedwater Heater vents per OP-136, Shutdown of Feedwater Heaters 3A and 3B
	RO	Check T_{avg} within 5°F of T_{ref}
	BOP	Check Power level at the target value
	RO	Borate or dilute as necessary to maintain AFD (Curve F-X-2) as close to the target value as possible while maintaining rods above the Rod Insertion Limit (Curve F-12-1)
	SRO	Request Chemistry obtain RCS boron samples
	RO	Align RCS makeup for AUTO operation using OP-107, Chemical and Volume Control System
	SRO	Notify the Load Dispatcher that power reduction is complete
	SRO	Returns to AOP-010
	SRO	Dispatch an operator to check the following seated, observing tailpipes: <ul style="list-style-type: none">MSR Relief ValvesSG Safety Valves
	BOP	Check Hotwell level trending to between 71% and 76%.
	BOP	Reset Loss of Load interlocks C7A and C7B
	SRO	Notify Load Dispatcher of any load limitations
	SRO	Check Reactor thermal power changed by less than 15% in any one hour period
	RO	Within 1.5 hours of load rejection, check control rods above insertion limits
	SRO	Exit AOP-010

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 4

FACILITY: Harris

EVENT DESCRIPTION: Pressurizer Pressure High Failure

TIME	POSITION	APPLICANT'S ACTIONS OK BEHAVIOR
	CUE	Diagnoses high failure of Pressurizer Pressure channel P-444 <ul style="list-style-type: none">• PRESSURIZER HIGH PRESS DEVIATION CONTROL (ALB-009-3-1), alarming• PRESSURIZER RELIEF DISCHARGE HIGH TEMP (ALB-009-8-2), alarming• PRESSURIZER HIGH-LOW PRESS (ALB-009-5-1), alarming• PRESSURIZER RELIEF TANK HIGH-LOW LEVEL PRESS OR TEMP (ALB-009-8-1), alarming• PRZ heaters off• PRZ sprays open• PRZ PORV 4443 momentarily open• PRZ pressure lowering on other channels
	SRO	Enters and directs the actions of AOP-019, Malfunction of RCS Pressure Control
	RO	(IMMEDIATE ACTION) Check that a bubble exists in the PRZ
	RO	(IMMEDIATE ACTION) Verifies proper operation of PRZ PORVs AND associated block valves
	RO	(IMMEDIATE ACTION) Takes manual control of pressurizer pressure by either: <ul style="list-style-type: none">• Placing master controller PK-444A in manual, or• Placing heaters and spray valves in manual
	SRO	Go TO Section 3.1, Pressure Control Malfunctions While Operating With a Pressurizer Bubble
	RO	Monitor PRZ pressure by observing other reliable indication
	SRO	Check plant in MODE 1 OR 2
	RO	Check PRZ pressure controlled
	RO	Check PRZ pressure 2335 PSIG OR LESS

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 4

FACILITY: **Harris**

EVENT 1 DESCRIPTION: Pressurizer Pressure High Failure (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Check all of the PRZ PORV block valves open
	RO	Check that a malfunction of PT-444 has occurred
	RO	Verify PK-444A in MANUAL
	RO	Control PRZ pressure as follows: <ul style="list-style-type: none"> Adjust PK-444A output as necessary, to attempt to restore and maintain PRZ pressure Check both PRZ spray valve controllers in AUTO and both spray valves operating as desired Check all PRZ heaters operating as desired
	RO	Check both of the following conditions present: <ul style="list-style-type: none"> PRZ pressure is controlled Status of a <u>normal</u> spray valve or a PRZ heater bank <u>is</u> controlled
	SIC	Refer to Technical Specification 3.2.5, DNB Parameters
	RO	Refer to Attachment 3, Pressure Control Malfunction Symptoms—Bubble in Pressurizer
	SRO	Direct Maintenance to investigate and repair the PRZ Pressure Control System component malfunction

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 5

FACILITY: Harris

EVENT DESCRIPTION: SG Tube Rupture

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	CUE	Diagnoses SGTR by multiple radiation monitor alarms, including: CEV high alarm Steamline 'C' alert • Steamline 'C' high alarm
	SRO	Determines SG tube rupture has occurred, orders a Reactor Trip and Safety Injection, and enters and directs the actions of PATH-1
		NEVER MAY MAKE ATTEMPTS TO PERFORM ACTIONS OF AOP-010, BEFORE TERMINATING THAT LEAKAGE IS IN EXCESS OF CAPABILITIES TO PERFORM CONTROLLED PLANT SHUTDOWN.
	O	(IMMEDIATE ACTION) Verify Reactor Trip • Trip breakers RTA and BYA – open • Trip breakers RTB and BYB – open • Rod 1 – lit • Neutron flux decreasing
	BOP	(IMMEDIATE ACTION) Verify Turbine Trip • All turbine throttle valves – shut • All turbine governor valves – shut
	BOP	(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 105 (OFFSITE) – close • Check 6.9 KV bus 1B-SB breaker 125 (OFFSITE) – closed

COMMENTS:

EVENT DESCRIPTION:	SG Tube Rupture (CONTINUED) Partial Failure of Automatic Phase A Isolation Signal
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TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	(IMMEDIATE ACTION) Actuates SI Actuation and determines SI has actuated <ul style="list-style-type: none"> • SI Actuated bypass permissive light LIT • ALB-11-5-3, REACTOR TRIP MANUAL SI
	SRO	Initiate monitoring the Critical Safety Function Status Trees
	RO	Verify all CSIPs and RHR Pumps running
	RO	Verify SI flow > 200 gpm
	RO	Verify RCS pressure > 230 psig
	BOP	Verify Main Steam Isolation NOT actuated, NOR required
	RO	Verify Containment pressure has remained < 10 psig
	BOP	Verify >= 210 KPPH AFW flow
	BOP	Verify alignment of components from actuation of ESFAS signals using PATH-I Guide, Attachment 6
	BOP	Determines the following Phase A valves failed to close and manually closes them: <ul style="list-style-type: none"> • ISI-287, ACCUMULATORS & PRZ PORV N2 SUPPLY. • ICs-II, LTDN ISOL VLV • ISW-242, NNS CNMT FAN CLRS OUTLET ISOL
		CRITICAL TO COMPLETE PHASE A ISOLATION WHICH FAILED TO AUTOMATICALLY ACTUATE.
	RO	Control RCS temperature using AFW flow and steam dumps
		NOTE: MAY ISOLATE AFW TO SG 'C' ANYTIME MINIMUM LEVEL OF 25% IS MET, BUT NOT REQUIRED UNTIL DIRECTED BY PROCEDURE.

[illegible]

SCENARIO NUMBER: 3

EVENT NUMBER: 5 / 6

FACILITY: Harris

EVENT DESCRIPTION:

SG Tube Rupture (CONTINUED)
Failure of MSIV on Ruptured SG to Close

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Energize buses 1A1 and 1B1
	RO	Verify proper PRZ PORV and spray valve response
	BOP	Determines NO SGs are faulted
	BOP	Determines SG 'C' is ruptured <ul style="list-style-type: none">Abnormal secondary radiation levelsUncontrolled level increase
	BOP	When SG 'C' level is > 25%, isolates AFW flow to SG 'C'
	SRO	Transitions to and directs the actions of PATH-2 at Entry Point J
	SRO	Foldout 'C' applies
	SRO	Implement Functional Restoration Procedures as required
	RO	Determines RCP trip criteria is NOT met
	BOP	Identifies ruptured SG as SG 'C'
	BOP	Isolate SG 'C' <ul style="list-style-type: none">Adjust ruptured SG 'C' PORV controller to 88% and verify proper operationShut faulted SG 'C' steam supply valve, 1MS-72, to TDAFW pump (may have been performed earlier for RCS temperature control)Verify SG blowdown isolation valves shutVerify SG 'C' Main Steam Drain isolation valves shutVerify SG 'C' Main Steam Isolation Bypass valve shutAttempt to shut SG 'C' Main Steam Isolation valve
		CRITICAL TO ISOLATE STEAM SUPPLY TO TDAFW PUMP TO ISOLATE POTENTIAL RELEASE PATH.

COMMENTS:

SCENARIO NUMBER: 3 EVENT NUMBER: 5 / 6 FACILITY: Harris

EVENT DESCRIPTION: SG Tube 3 CONTINUED
Failure of MSIV on Ruptured SG to Close

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Determines SG 'C' Main Steam Isolation valve failed to shut <ul style="list-style-type: none"> Shut all remaining Main Steam Isolation valves and bypasses Place both Steam Dump interlock switches to OFF / RESET Use intact SG PORVs for all further steam dumping Direct operator to locally isolate SG 'C' using PATH-2 Guide, Attachment 1 Verify SG 'A' and 'B' MSIV and bypass valves shut
		CRITICAL TO CLOSE SG 'A' AND 'B' MSIVs AND PLACE STEAMDUMP INTERLOCK SWITCHES IN OFF / RESET TO PREVENT STEAMING RUPTURED SG.
	BOP	Isolate feed flow to SG 'C' when level > 25%
		CRITICAL TO ISOLATE FEED FLOW TO SG 'C' TO PREVENT OVERFILLING RUPTURED SG.
	BOP	Check ruptured SG 'C' pressure > 260 psig
	RO	When PRZ pressure decreases below 2000 psig, block low steam pressure SI signal
	BOP	Check SG 'A' and 'B' both available for RCS cooldown
	SRO	Determine required Core Exit Temperature based on SG 'C' pressure
	BOP	Check condenser NOT available and direct steam from SG 'A' and 'B' to maximum rate using SG PORVs
	BOP	When Core Exit Temperatures are less than target temperature <ul style="list-style-type: none"> Stop the RCS cooldown Maintain CETs less than target temperature
	SRO	Continue recovery actions during cooldown
	RO	Maintain RCP seal injection between 8 and 13 gpm
	BOP	Control feed flow to maintain SG 'A' and 'B' levels between 25% and 50%

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 5

FACILITY: Harris

EVENT DESCRIPTION: SG Tube Rupture (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	BOP	Verify at least 210 KPPH AFW flow available
	RO	Verify power available to PRZ PORV Block valves
	RO	Check PRZ PORVs closed
	RO	Verify at least one PRZ PORV Block valve open
	RO	If PRZ PORV actuates, verify proper operation
	RO	Reset SI
	SRO	If offsite power lost, manually realign safeguards equipment
	RO	Reset Phase A and Phase B
	RO	Establish IA and N2 to Containment
	RO	Check RCS pressure > 230 psig
	RO	Stop both RIIR pumps
	RO	When Core Exit Temperatures are less than target temperature <ul style="list-style-type: none">Stop the RCS cooldownMaintain CETs less than target temperature
	SRO	DO NOT continue until cooldown complete
	BOP	Check SG 'C' pressure stable or increasing
	RO	Check RCS subcooling greater than 30 °F using the computer

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 5

FACILITY: Harris

EVENT DESCRIPTION: SG Tube Rupture (CONTINUED)

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	RO	Depressurize the RCS using normal spray until one of the following conditions met: <ul style="list-style-type: none">PRZ level \geq 75%RCS subcooling \leq 10 °FRCS pressure < SG 'C' pressure AND PRZ level > 10%
		CRITICAL TO DEPRESSURIZE THE RCS TO MINIMIMZE PRIMARY TO SECONDARY LEAKAGE.
		TERMINATE THE SCENARIO AFTER THE DEPRESSURIZATION HAS BEEN COMPLETED.

COMMENTS:

SCENARIO NUMBER: 3

EVENT NUMBER: 8

FACILITY: Harris

EVENT DESCRIPTION: Classifies the Event

TIME	POSITION	APPLICANT'S ACTIONS OR BEHAVIOR
	SRO	Classifies the event as an Alert (EAL 2-1-2)
		NOTE: ALERT BASED ON BREACH OF RCS BARRIER (SGTR).

COMMENTS:

Harris

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**Scenario 4
Spare**

Operating Exam

2004