



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

January 24, 1997

NOTE TO: NRC Document Control Desk
Mail Stop 0-5-D-24

FROM: Beverly Michael, Licensing Assistant *Bev Michael*
Operating Licensing and Human Performance Branch,
Region II

SUBJECT: OPERATOR LICENSING EXAMINATION ADMINISTERED AUGUST 16 - 24,
1996 AT CAROLINA POWER AND LIGHT COMPANY, H. B. ROBINSON
STEAM ELECTRIC PLANT - DOCKET NO. 50-261

During the period August 16 - 24, 1996, Operator Licensing Examinations were administered at the referenced facility. Attached, you will find the following information for processing through NUDOCS and distribution to the NRC staff, including the NRC PDR:

- Item #1 - a) Facility submitted outline and initial exam submittal, designated for distribution under RIDS Code A070.
- b) As given operating examination, designated for distribution under RIDS Code A070.
- Item #2 - Examination Report 50-261/96-301 has already been submitted with the as given written examination attached, designated for distribution under RIDS Code IE42.

9702060039 970124
PDR ADOCK 05000261
V PDR



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V PDR

Examination Level (Circle One):		SRO
Facility: _____		Week of Examination: _____
Examiner's Name (print): _____		
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Shift Turnover	What do the oncoming and offgoing CRSSs discuss
		What review actions are completed by the oncoming ROs
	Temporary Mods	How would the Shift Superintendent know that a Temporary Modification existed that prevented heating up above 200 degrees while preparing for a plant heatup? What is the disposition of the temporary mods
A.2	Plant Drawings	JPM-CR-033
		JPM-IP-075
A.3	Use of Radiation Instrument	Covered in RCA entry e.g. RWPs, hand held friskers
		Covered in RCA entry e.g. RWPs, hand held friskers
A.4	Emergency Action Levels and Classification	Covered in Simulator Scenario
		Covered in Simulator Scenario

Developed By: Sharon S. Platt Approved By: Steve Newton

Chief Examiner: Paul Hems

o/i
Robinson
As-Given Operating
A070

Examination Level (Circle One):		SRO
Facility: _____		Week of Examination: _____
Examiner's Name (print): _____		
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Shift Staffing	What are the requirements for the STA if they are not in the control room
		What are the requirements if the shift complement is less than the minimum shift complement
	Short Term Information	Explain purpose/use of the "Operation's Directive Book"
		How long do night orders remain in effect
A.2	Plant Drawings	JPM-CR-041(Set #2) - OR - JPM-IP-033(Set #3)
		JPM-CR-045
A.3	Use of Radiation Instruments	Covered in RCA entry e.g. RWPs, hand held friskers
		Covered in RCA entry e.g. RWPs, hand held friskers
A.4	Emergency Action Levels and Classification	Covered in Simulator Scenarios
		Covered in Simulator Scenarios

Developed By: Gregory S. P. [Signature] Approved By: Heidi A. [Signature]

Chief Examiner: Paul Stein [Signature]

Examination Level (Circle One):		RO
Facility: _____		Week of Examination: _____
Examiner's Name (print): _____		
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Shift Staffing	What is the minimum shift complement
		Actions taken by offgoing RO if oncoming RO is not physically fit to assume the watch
	Key Control	What are the required actions if a controlled key is lost
		What is required to revise the key inventory
A.2	Plant Drawings	JPM-IP-002
		JPM-IP-043
A.3	Use of Radiation Instruments	Covered in RCA entry e.g. RWPs, hand held friskers
		Covered in RCA entry e.g. RWPs, hand held friskers
A.4	Emergency Facilities	Describe purpose/activities of OSC
		List the Emergency Event Classifications in order of increasing severity

Developed By: Sherry Spent Approved By: Steve Keaton

Chief Examiner: Paul Men

EXAMINATION LEVEL (Circle One): RO SRO (I) / SRO (U)
 FACILITY: H. B. ROBINSON WEEK OF EXAMINATION: _____
 EXAMINER'S NAME (PRINT): _____

SYSTEM/JPM	SAFETY FUNCTION	PLANNED FOLLOWUP QUESTIONS K/A/G // IMPORTANCE // DESCRIPTION
1. CR-033, Perform Boration of the RCS - IAW GP-007	I SIM	004000.Gen.7 // 3.0/3.3 // Loss of Aux Panel DC
		004000.K1.16 // 3.3/3.5 // Clearance Req'd on "A" BAST
2. CR-005, Re-establish Letdown Flow IAW OP-301	II SIM	004010.A2.04 // 3.6/4.2 // PCV-145 fails/effects on CVCS
		073000.K3.01 // 3.6/4.2 // R-17 alarm while est. LTDN
3. CR-099, PZR Pressure Control Malfunction IAW AOP-019 (PSA) (Alt. Path) (NEW)	III SIM	010000.A3.02//3.6/3.5//Effect of raising pot setpt on PC-444J
		010000.K1.06 // 2.9/3.1 // Why can't use Aux Spray if normal LTDN isolated at power
4. CR-030, Loss of Residual Heat Removal (Shutdown Cooling) IAW AOP-020	IV SIM	005000.A2.04//2.9//2.9//Plant cooled and solid on RHR. PCV-145 closed down. Result on RCS pressure?
		005000.GEN.15//3.8/3.9//Reduced inventory and lose RHR cooling. Time to boil.
5. CR-009, Remove Power Range Channel N-44 from service IAW OWP-011	IX MCR	015000.K4.09 // 2.8/3.1 //N-44 OOS, What effect if pull instrument power fuses
		015000.K6.04//3.1/3.2//Upper/lower Section Deviation alarms response to comparator channel defeat switch out of NORMAL.
6. CR-028, Restoration of Normal Power After Loss of Start-Up Transformer	VII MCR	062000.K4.01//2.6/3.2//Resides the turb trip at power, what else is needed to get a Gen lockout/4kv bus transfer?
		062000.K4.03//2.8/3.1//Signals input to SUT lockout, and results of SUT
7. CR-066, Respond to a Loss of CCW to the RCP motor coolers IAW AOP-014 (Alt Path)	X SIM	026000.k1.02//4.1/4.1//How determine adequate CCW flow to CV Spray Pumps
		008000.A4.01 // 3.3/3.1 // FCV-626 open, How verify flow to RCP thermal barrier
8. IP-055, Align Deepwell to AFW IAW OP-402 (NEW) (PSA)	V PLANT	061000.K4.07//3.1/3.3//Trip and reset overspeed trip device on the SDAFW pump
		061000.K4.02//4.5/4.6//Auto start signals for SDAFW pump
9. IP-075, Energize Pressurizer Heaters from the Emergency Busses IAW EPP-21 (Alt Path) (RCA) (S/D) (NEW)	VII PLANT	010000.K4.02 // 3.0/3.4 // Htr response if PZR level dec. below 14.4%
		010000.K1.03 // 3.6/3.7 // What is purpose of the PZR HTR BKR arm switch
10. IP-053, Turbine Building Operator Actions IAW AOP-004 (S/D) (Alt Path)	VIII PLANT	039000.K4.04//3.1/3.2//S/G PORV oper during load 75% reject
		041020.K4.12//2.3/2.4//Secondary control panel indications used to determine Tcold constant.

DEVELOPED BY: Gregory Spina

APPROVED BY: Gregory Spina

EXAMINER: [Signature]

CHIEF EXAMINER: [Signature]

EXAMINATION LEVEL (Circle One):

RO / SRO (I) / SRO (U)

FACILITY: H. B. ROBINSON

WEEK OF EXAMINATION: _____

EXAMINER'S NAME (PRINT): _____

SYSTEM/JPM	SAFETY FUNCTION	PLANNED FOLLOWUP QUESTIONS K/A/G // IMPORTANCE // DESCRIPTION
1. CR-101, Withdrawing Control Rods to the Point of Adding Heat IAW GP-005	I SIM	001000.K4.04//3.2/3.4//S/U in progress, movement of control rods with respect to bank overlap 001000.K5.38//3.5/4.1//Changes in SDM after a trip
2. CR-074, Re-establish Letdown Flow IAW OP-301 (Alt. Path)	II MCR	004010.A4.02 // 3.1/3.6 // Charging System Response 004000.A2.07 // 3.4/3.7// Des. L/U after a Phase A isol.
3. CR-082, Depressurize RCS using PORV's IAW Path-2 (Alt. Path) (PSA) (S/D)	III SIM	000038.EK3.06 // 4.2/4.5 // Options for SGTR Cooldown 000038.EK3.01//4.1/4.3//Use Steam Tables to determine target for RCS depressurization
4. CR-041, Respond to a RCP Seal Malfunction IAW AOP-018	IV SIM	003000.K6.14//2.6/2.9//RCP flow Detectors and Pressure Taps 004000.A2.05 // 4.0/4.3 // Seal Leakoff ind. during #2 seal
5. CR-045, Transfer from the Bypass to the Main Feedwater Regulating Valves IAW GP-005 (low power)	V SIM	059000.K4.19 // 3.2/3.4 // Auto closure of FRV's 059000.A3.06 // 3.2/3.3 // FWI signal inputs/actions
6. CR-100, Respond to a Loss of Circulating Water Pump (Alt Path) (NEW)	X MCR	075000.K4.01//2.5/2.8//Response when stopping the last Circ Water pump 075000.A2.03//2.5/2.7//Leakage detection from the condenser integrally grooved tube sheet
7. CR-010, Place a Reactor Protection Channel in the Tripped Condition IAW OWP-030	IX MCR	012000.K4.01 // 3.7/4.0 // Prot & Cont func of sw positions 000027.EA1.01 // 4.0/3.9 // Lvl chan. Fail during NC Cooldown
8. IP-051, Perform Electrical Operator Actions of DSP-002 (Turbine Building) (Alt. Path) (low power)	VII PLANT	067GEN // 3.8/4.0 // Criteria for entering DSP's 000067.EA2.16 // 3.3/4.0 // Est.\Control AFW flow to S/G
9. IP-56, Perform Subsequent Actions of AOP-022 in the Auxiliary Building (PSA) (RCA) (NEW)	V PLANT	076000.K1.16//3.6/3.8//How can both SWBPs be operated if the North SW Header is isolated 076Gen.05//2.8/3.2//Service water pump declared inoperable. Time and date for going to cold shutdown
10. IP-033, Establish Emergency Cooling to the Spent Fuel Pit Heat Exchanger IAW OP-306 (RCA)	XI PLANT	008000.K4.01 // 3.1/3.3 // Operation of CCW Pumps 033000.A2.01//3.0/3.5//Time to boiling in SFP if lose off-site pwr

DEVELOPED BY: Gregory S. Pina

APPROVED BY: Steve Platon

EXAMINER: [Signature]

CHIEF EXAMINER: Paul Allen

EXAMINATION LEVEL (Circle One): RO / SRO (I) / SRO (U)
 FACILITY: H. B. ROBINSON WEEK OF EXAMINATION: _____
 EXAMINER'S NAME (PRINT): _____

SYSTEM/JPM	SAFETY FUNCTION	PLANNED FOLLOWUP QUESTIONS K/A/S // IMPORTANCE // DESCRIPTION
1. CR-047, Perform Boron Concentration Dilution of the RCS IAW OP-301	I SIM	004000.A2.01 // 4.2/4.3 // What prot. features prevent overpower condition & core damage of continuous dilution with no operator action
		004000.K4.04//3.2/3.1//Effect on CVCS when LT-115 fails high
2. CR-086, Depressurize RCS IAW Path-2, PORV Failure (Alt. Path) (PSA) (S/D)	III SIM	000038.EK3.01//4.1/4.3//Basis for S/G pressure >220 F in Path-2 prior to depressurizing the intact S/Gs
		010000.A2.03//4.1/4.2//How control PZR PORVs if normal power supply lost due to fire
3. CR-057, Respond to a Loss of RCP Seal Injection IAW AOP-018	IV SIM	003000.A2.01 // 3.5/3.9 // Des. all norm flowpaths thru RCP
		003000.K5.01//3.3/3.9//Loss of flow trips
4. CR-023, Transfer Auxiliary Loads from Auxiliary to Startup Transformer OP-603	VII SIM	062000.A4.07 // 3.7/4.2 // Interlocks for 52/7&12
		062000.K2.01//3.3/3.4//Automatic actions which occur on Generator Trip
5. CR-062, Remove Source Range Channel N-31 from Service IAW OWP-011	IX MCR	015000.K6.02 // 2.6/2.9 // During S/D lose IR compens. Volts to N-35
		015000.K4.01//3.1/3.3//Actions required if N-35 flows power fuses during a startup
6. CR-098, Initiate Containment Spray (Alt Path) (NEW) (S/D)	VI MCR	026000.A3.01//4.3/4.5//Auto vs Manual Spray Actuation
		000011.EK3.14//4.1/4.2//Why RCPs tripped when Spray actuates
7. CR-097 Establish Excess Letdown (Alt. Path), (NEW)	II MCR	004010.A2.05 // 4.1/4.3 // How Phase A effect ability to maintain Ex. LTDN temp.
		004000.K1.01 // 3.6/4.0 // Expected alarms w/No Ltdn avail.
8. IP-002, Shift Auxiliary Feedwater Pump Suction to Service Water IAW OP-402 (PSA) (RCA)	V PLANT	076000.K4.01 // 2.5/2.9 // Turbine Building Isolation
		022000.K1.01 // 3.5/3.7 // Bas. for SW Booster Pmp Oper.
9. IP-052, Perform Subsequent Actions of AOP-022 in the Auxiliary Building (Alt. Path) (RCA)	V PLANT	000067.EA2.04 // 3.1/4.3 // Local control/operation of SW pumps
		076000.K1.16//2.7/3.1//Keylock switch purpose/location for V6-16A
10. IP-043, Transfer "D" Service Water Pump to the DS Bus (RCA)	VII PLANT	076000.A4.05//2.0/2.1//SW Strainer Operation
		076000.K1.16//3.6/3.8//SW Booster Pump normal operation/control vs response to safeguards or blackout

DEVELOPED BY: Gregory S. Platt

APPROVED BY: David Bhatnagar

EXAMINER: [Signature]

CHIEF EXAMINER: Paul New

SIMULATION FACILITY: H. B. Robinson SCENARIO NO.: DSS-003

EXAMINERS: _____ APPLICANTS: _____

INITIAL CONDITIONS: The Unit is at 100% power. The following equipment is out of service: "B" Charging Pump for an oil change (OOS for 2 hours/back in 2 hours), SDAFW pump for steam inlet line leak (OOS for 8 hours/back in 14 hours), "A" CCW pump for excessive vibrations (pump uncoupled).

TURNOVER: Reduce power to 80% to remove HDP from service. Track equipment out of service and prepare for post maintenance testing to return equipment to service. Boron concentration 1017 ppm, CBD at 218 steps, equilibrium xenon.

EVENT NO.	MALF.	EVENT	EVENT
	MFI SIS01A MFI SIS01B	C	SI Failure to Auto Initiate
	RFI CFW083 RFI CFW084	C	"A" and "B" AFW pumps auto start failure
	MFI CCW1B (C)	C	Trip of running CCW pump after Path-1 entry point C
1		N, R	Reduce power to remove HDP from service
2		C	Hot bearing on the running CCW Pump
	CRF08: 575 degrees	I	Tref input to rod control fails as is
3	MFI CRF03A ROD G-3	C	Dropped Rod/Turbine Runback
4	MFI RCS09A	C	75 gpm RCS Leak
		N, R	Power reduction due to excessive RCS leakage.
5	MFI RCS01A	M	LOCA

(N) Normal, (R) Reactivity, (I) Instrument, (C) Component, (M) Major

Developed By: [Signature]

Approved By: [Signature]

Examiner: [Signature]

Chief Examiner: [Signature]

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSE EXAMINATION SCENARIO

DSS-003

CCW PUMP HOT BEARING

DROPPED ROD

RCS LEAK

LOCA

LOSS OF EMERGENCY COOLANT RECIRCULATION

DEVELOPED BY: _____ DATE _____

APPROVED BY: _____ DATE _____

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: DSS-003

SCENARIO NAME: Power reduction, Hot bearing on CCW pump, Dropped Rod, RCS Leak, LOCA, Loss of Emergency Coolant Recirculation

TEAM MEMBERS/INDIVIDUAL EVALUATIONS EXAMINERS:

SCO	_____	SAT	__	UNSAT	__	_____
RO	_____	SAT	__	UNSAT	__	_____
BOP	_____	SAT	__	UNSAT	__	_____

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 1017 ppm Tavg: 575°F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

<u>NORMAL CURRENTS</u>	<u>UPPER</u>	<u>LOWER</u>
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

"B" charging pump has been out for 2 hours for oil change, return to service in ≈ 2 hours;

SDAFW pump has steam inlet line leak, has been OOS for 8 hours, will be returned to service in ≈ 14 hours;

"A" CCW pump OOS due to excessive vibration, pump uncoupled for removal.

POWER HISTORY:

Equilibrium Xenon, No power ramp rate restriction.

DSS-003

SCENARIO DESCRIPTION

After shift turnover and allowing the crew to walk down the board, the crew will commence a power reduction to remove the "A" Heater Drain pump from service for maintenance. After the power reduction has commenced, the initiating event will be a hot bearing on the running CCW. After the crew has started the standby pump and secured the running pump, one (1) control rod will fall into the core initiating a turbine runback. The Tref input into rod control will fail at 575 degrees causing the rod control system to only respond to the power mismatch signal. After the plant is stabilized, an RCS leak develops which will require a plant shutdown. The leak will escalate to a LOCA requiring a manual reactor/turbine trip and will result in a manual or automatic Safety Injection signal. PATH-1 will be entered and followed to mitigate the accident. Safety injection will fail to automatically initiate requiring manual action. The MDAFW pumps will fail to auto-start requiring identification and manual actuation. A failure of the last operable CCW Pump will require the use of EPP-015, Loss of Containment Recirculation Ability, due to insufficient Supplement D components. The scenario should progress until EPP-015 entry is directed. The exercise may be terminated at any time at the evaluator(s) discretion after EPP-015 entry.

SCENARIO OBJECTIVES

1. Evaluate the response to hot bearings on the running CCW pump.
2. Evaluate the response to a dropped control rods and attendant turbine runback IAW AOP-001.
3. Evaluate the response to excessive RCS leakage IAW AOP-016.
4. Evaluate the response to radiation alarms IAW AOP-005.
5. Evaluate the response to a reactor trip and SI due to LOCA IAW PATH-1.
6. Evaluate the response to auto-start failures of safeguards equipment IAW PATH-1.
7. Evaluate the ability to recognize the need to conserve injection water due to the lack of sufficient Supplement D components and transition to EPP-015.
8. Evaluate the SRO's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

I. POWER REDUCTION TO SECURE HDP

EVENTCOMMENTS

- A. Actions for OP-105
1. Review precautions and limitations and hold crew brief
 2. Notify load dispatcher that unit load will be decreased to 80%
 3. Notify RC of expected increase in rad levels in the CV pump bays and pipe alley
 4. Verify NR-45 selected to the highest reading channel (PR and IR)
 5. If additional charging and letdown flow are desired, then initiate IAO OP-301
 6. Reduce turbine load as follows
 - a. Set the desired load in the SETTER
 - b. Select the desired load rate
 - c. Depress the GO pushbutton
 7. Monitor AFD and Tave-Tref

I. HOT BEARING ON RUNNING CCW PUMP

NOTE: Inside AO reports to the control room the hot bearing on the "B" CCW pump

- A. Crew shifts CCW pumps

EVENTCOMMENTS

- B. Notifies Maintenance and/or Work Control to investigate CCW pump bearings
- C. Refers to T.S 3.3.3

NOTE: If the crew elects to NOT rack out the breaker, the pump will trip on overcurrent during next attempted pump start

II. DROPPED CONTROL ROD

- A. Actions (AGP-001)
 - 1. Check for unwarranted rod motion
 - 2. Evaluate indications for multiple dropped rods
 - 3. Checks for Turbine runback
 - 4. Checks S/G levels
 - 5. Checks Tavg trending to Tref
 - 6. Checks Condenser Steam Dump operation
 - 7. Checks PZR PORV closed
 - 8. Checks RCS Press. trending to 2235 psig
 - 9. Checks PZR level trending to program
 - 10. Go to Section A of AOP-001

EVENTCOMMENTS

NOTE: **Initiate the 75 gpm RCS leak. Upon recognition AOP-001 should be terminated and AOP-016 entered**

III. RCS LEAKAGE

- A. Respond to RCS leakage IAW AOP-016
1. Check RCS level decreasing in and uncontrolled manner
 2. Check charging pumps all stopped
 3. Place running charging pumps in manual and adjust to max speed
 4. Check RCS level decreasing in an uncontrolled manner
 5. Adjust Charging and Letdown flow
 - a. Check two charging pumps running and at maximum speed
 - b. Check normal letdown in service
 - c. Reduce to a 45 gpm orifice
 6. Check PZR level decreasing in an uncontrolled manner
 7. Control charging to maintain PZR level

EVENTCOMMENTS

8. Checks charging flow > RCS
Leakage
9. Check VCT level < 12.5 inches
10. Align charging pump suction to the
RWST as follows
 - a. Check RWST level > 9%
 - b. Verify LCV-115B open
 - c. Verify LCV-115C closed
11. Implement T.S. 3.1.5
10. Implement EAL's
11. Check for primary to secondary
leakage

**NOTE: The actions of AOP-005 for
the rad monitor alarms
should be taken as the
alarms are received**

- a. Source check and verify
alarms
 - b. Make appropriate plant
announcements
 - c. Notify E&RC for needed
surveys
 - d. Go to AOP-016
12. Initiate leak determination

EVENTCOMMENTS

NOTE: Leak rate increases. When recognized should go back to step #8

13. Isolate letdown flowpath
14. Check RCS level decreasing in an uncontrolled manner
15. Establish maximum charging flow
16. Check RCS level decreasing in an uncontrolled manner
17. Check accumulator discharge valves open
18. Trip the reactor and go to PATH-1

IV. LOCA

A. PATH-1 Immediate Actions

1. Verify Rx tripped
2. Verify turbine tripped
3. E-1 & E-2 energized
4. Verify SI initiated

NOTE: The RO should note that SI has not auto initiated and manually initiates SI or manually starts components

5. Opens Foldout A

EVENTCOMMENTS

NOTE: RCP's should be tripped when trip criteria are met in Foldout A

6. Verify Phase A valves closed
7. Verify FW isolation
8. Verify FW pumps tripped
9. Verify both MDAFW pumps running

NOTE: The BOP should note that both AFW pumps failed to sequence/auto start and take manual action to start both pumps

10. Start SDAFW pump as necessary

NOTE: Pump is OOS and not available

11. Verify 2 SI pumps running
12. Verify both RHR pumps running
13. SI valves properly aligned
14. Verify at least 1 CCW pump running
15. Verify all SW & SW booster pumps running
16. Verify HVH 1-4 running
17. Verify IVSW system initiated
18. Verify CV ventilation isolation

DSS-003

EVENT

COMMENTS

19. Verify CR vent aligned for press. mode
20. Verify both EDG's running
21. Energize battery chargers as necessary
22. Verify CV pressure remains <20 psig
23. Checks for auto steam line isolation
24. Checks if steam line isolation required
25. Locally open breaker for HVS-1 at MCC-5
26. Check RCS pressure > 1350[1250] psig
27. Verify proper SI flow
28. Check RCS pressure > 125 psig
29. Verify at least 300 gpm AFW flow available
30. Verify AFW valves properly aligned
31. Control AFW to maintain S/G level 10 [20]% to 50%
32. Check RCP thermal barrier cooling water hi or low flow alarm lit
33. Place the steam dump mode selector Switch in manual

EVENTCOMMENTS

34. RCS temperature stable at or trending to 547 degrees
35. Check PZR PORV's closed
36. Check PZR spray and aux spray valve closed
37. Check at least one RCP running
38. Any S/G pressure decreasing in an uncontrolled manner or completely depressurized
39. R-15 and R-19A, B, C rad levels normal
40. Check for indications of an RCS leak
 - a. Rad monitors, CV pressure, sump level
41. Go to PATH-1 Entry Point C

B. Entry Point "C" on PATH-1

1. Reset SPDS, CSFST Monitoring

NOTE: If FR-P.1 conditions are met, the crew will transition but not implement any actions due to the LOCA

2. Open Foldout "B"

NOTE: At this time, "C" CCW pump trips. When "B" tries to start, the breaker trips

EVENTCOMMENTS

NOTE: The SCO should assign AOP-014 to the Ro or BOP to complete the required actions for loss of all CCW

3. Request periodic activity sample of S/G's
4. Check at least one RCP running
5. Any S/G depressurizing in an uncontrolled manner of completely depressurized
6. Control AFW flow to maintain S/G level
7. Check for S/G with uncontrolled level increase
8. Check R-15 and R-19's rad levels normal
9. Check PZR PORV's closed and at least one block valve open
10. Reset SI, CV Spray and Phase A and B
11. Establish instrument air to the CV
12. Check offsite power available to the charging pumps and establish desired flow
13. Check CV Spray pumps running
14. Check RCS subcooling > 35 [55]

EVENTCOMMENTS

15. When below 10 E-10 amps then energize the source ranges and transfer the recorders
16. Check RCS pressure > 275 [400] psig
17. If RCS pressure stable or increasing then stop the RHR pumps
18. E-1 and E-2 energized by offsite power
19. Check starting air receivers repressurized on the unloaded EDGs
20. Stop the unloaded EDG's
21. Verify Supplement D components capable of recirculation

NOTE: The crew should note that no CCW pumps are running and transition to EPP-15

22. Transition to EPP-15

NOTE: Scenario can be terminated at this point at the evaluators discretion.

C. All SRO's

1. Classify the event as Site Area Emergency (RCS leakage > makeup capability)

SIMULATION FACILITY: H.B. Robinson SCENARIO NO.: DSS-005

EXAMINERS: _____ APPLICANTS : _____

INITIAL CONDITIONS: The Unit is at 100% power. The following equipment is out of service: "B" MDAFW for motor replacement (OOS for 8hrs/no projected return time). HVH-1 for vibration concerns (OOS for 1 hr/back in 3 hrs).

TURNOVER: Maintain current plant conditions. Boron concentration 1017 ppm. CBD at 218 steps. equilibrium xenon.

EVENT	MALF.	EVENT	EVENT
	MFI EDG4A	C	"A" and "B" HHSI Pump auto start failure
	RFI CFW83	C	"A" MDAFW auto start failure
	RFI CFW85, 86 and 87	C	V1-8A, B, C fails to auto open, steam supply to the steam driven AFW pump
1	CORD PT:445	I	PT-445 Fails high (pressurizer control channel)
2	MFI SGN2B	C	100 gpm steam generator tube leak
		N, R	Power reduction
3	MFI CND2 300, 180	C	Condenser air inleakage
	MFI CND2 700, 120	C	Condenser Air inleak (Rapid load reduction) (Leak increases after initial actions taken)
4	SGN01H	M	"B" S/G safety valve failure resulting in a safety injection

(N) Normal, (R) Reactivity, (I) Instrument, (C)Component, (M) Major

Developed By: *Gregory S. P...*

Approved By: *Thy Patel*

Examiner: *Mike Erata*

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CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSE EXAMINATION SCENARIO

DSS-005

PZR PRESSURE CHANNEL FAILURE

SGTL

LOSS OF CONDENSER VACUUM

SG SAFETY VALVE FAILS OPEN

DEVELOPED BY: _____ DATE _____

APPROVED BY: _____ DATE _____

SCENARIO NUMBER: DSS-005

SCENARIO NAME: PZR Pressure Channel Failure, SGTL, Loss of Condenser Vacuum,
S/G Safety Valve Fails Open

TEAM MEMBERS/INDIVIDUAL EVALUATIONS

EXAMINERS:

SCO _____	SAT ___	UNSAT ___	_____
RO _____	SAT ___	UNSAT ___	_____
BOP _____	SAT ___	UNSAT ___	_____

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 1017 ppm Tavg: 575°F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

<u>NORMAL CURRENTS</u>	<u>UPPER</u>	<u>LOWER</u>
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

"B" MDAFW pump, OOS for 8 hrs, motor replacement;

HVH-1, OOS for 1 hr, investigating vibration problems.

POWER HISTORY:

Equilibrium Xenon, no power ramp rate restrictions. Maintain current power level.

SCENARIO DESCRIPTION

After shift turnover and allowing the crew to walk down the board, pressurizer pressure control channel PT-445 will fail high. After the plant has been stabilized and appropriate procedure actions have been completed, a 100 gpm tube leak will occur on the "B" SG requiring a plant shutdown due to excessive leakage. A condenser vacuum leak will escalate into the need to trip the turbine due to a loss of condenser vacuum. Following entry into PATH-1, a S/G safety valve will open on "B" SG, causing a safety injection. The operators will work through PATH-1 with a subsequent transition to Path-2. Safety Injection pumps, MDAFW pumps, and the Steam Driven AFW pump valves will fail to start/open automatically, requiring operator action. The final plant conditions will be a faulted/ruptured "B" steam generator. The scenario may be terminated at the evaluators discretion following transition to EPP-17.

SCENARIO OBJECTIVES

1. Evaluate the response to a failed pressurizer pressure transmitter PT-445.
2. Evaluate the response to a steam generator tube leak IAW AOP-005 and AOP-035.
3. Evaluate the response to a partial loss of condenser vacuum IAW AOP-012.
4. Evaluate the response to a failed open steam generator safety valve while attempting to recover from a turbine trip coincident with a tube leak.
5. Evaluate the response to a reactor trip and SI due to steam break IAW PATH-1 and PATH-2.
6. Evaluate the response to auto-start failures of safeguards equipment IAW PATH-1
7. Evaluate the ability to recognize to conduct the post SGTR response IAW EPP-017
8. Evaluate the SRO's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENTCOMMENTSI. PT-445 FAILURE

NOTE: The crew may respond in accordance with AOP-019 or AOP-025. The most likely path is via AOP-025

A. Crew identifies failed channel and implements AOP-025 "RTGB Instrument Failure"

1. Identifies correct channel and implements Section "C"
2. Check either PORV open
3. Closes the open PORV

NOTE: Depending on recognition time, the crew may get a short cyclic runback due to OT delta T

4. Check PT-444 failed
5. Verify the selector switch PM-444 selected to the operable channel
6. Implement EAL's
7. Checks Tech Specs for applicable LCO's
8. Return to procedure and step in effect

B. Crew identifies failed channel and implements AOP-019 "Pressure Control Malfunction"

1. Identifies PCV-456 open and closes the valve
2. Checks PZR pressure < 2335#
3. Verify both PORV's closed
4. Control spray valves and heaters to restore RCS pressure
5. Check PZR pressure control under operator control

EVENTCOMMENTS

6. Check PC-444J operating properly in AUTO
7. Check RCS pressure less than required for current plant conditions
8. Check both PZR spray valves closed
9. Check aux spray valve closed
10. Check AOP-003-F8 extinguished
11. Check PZR pressure stable or trending to required value
12. Implement EAL's
13. Contact I&C and Work Control
14. Refer to Tech Spec 3.1.1.5

II. SG TUBE LEAK

NOTE: If crew detects RCS leakage prior to the R-15 alarm they may enter AOP-016 for excessive RCS leakage. This procedure will direct entry into AOP-035

- A. Actions for R-15 alarm, AOP-005
 1. Verify alarm validity
 - a. Source check
 - b. Reset alarm
 2. AOP-005 actions for R-15 alarm
 - a. Check R-14C, R-19's, R-31's for an increasing trend or alarm
 - b. Request E&RC group to sample the S/G's and survey around R-15

EVENTCOMMENTS

- c. IF pri-sec leakage confirmed, THEN go to AOP-035
- d. Refer to Tech Spec 3.1.5
- e. Implement EALs

B. AOP-035 actions

1. Check PZR level decreasing in an uncontrolled manner
2. Start additional charging to have two pumps running at max speed
3. Reduce letdown to a 45 gpm orifice
4. Check PZR level decreasing in an uncontrolled manner
5. Control charging flow to maintain program PZR level
6. Check available charging flow greater than RCS leakage
7. Check VCT Level - not less than 12.5 inches
8. Notify chemistry personnel to periodically sample all S/Gs for activity and boron concentration
9. Determine RCS leak rate

NOTE: R-19 actions of AOP-005 will be completed by the BOP when the alarm is received and directed by the SRO

10. R-19B alarm, AOP-005, use status lights to check blowdown isolation
 - a. FCV-1931 A & B, S/G B Blowdown Flow Control Valves close

EVENTCOMMENTS

- b. FCV-1934 A & B, S/G B Sample Flow Control Valves closed
- c. Verify FCV-4204B, S/G B Blowdown Flow Rate Control Valve - Closed
- d. Verify V1-31, S/G Blowdown Drain Header Discharge to circulating water catch basin valve
- e. Verify All S/G Drain/Wet Layup Pumps - OFF
- f. Request E&RC Perform The Following:
 - g. Sample Steam Generators for indication of Primary to Secondary
 - h. Perform a background radiation survey at Radiation Monitor R-19B
 - i. Check primary to secondary leakage indicated, if yes the go to
 - 1) EOP Network or
 - 2) AOP-035, Steam Generator Tube Leak
- 11. Identifies that the leak rate is greater than the following:
 - a. 0.35 gpm for a single S/G or
 - b. 1 gpm for all S/Gs
- 12. Identify leaking S/G based on R-19's, R-31's or chemistry samples
- 13. Implement EAL's
- 14. Refer To Tech Spec 3.1.5
- 15. Check reactor critical

EVENTCOMMENTS

16. Normally performed steps in GP-006, such as placing S/G Blowdown to the Flash Tank may require Release Permits.
17. Initiate Plant Shutdown To Hot Shutdown Using GP-006, Normal Plant Shutdown From Power Operation To Hot Shutdown, While Continuing With This Procedure

NOTE: Allow time to commence the power reduction prior to inserting the vacuum leak

NOTE: Vacuum leak inserted at the evaluators discretion

III. PARTIAL LOSS OF CONDENSER VACUUM

A. AOP-012 Immediate Actions

1. Check Circulating Water Pump-ANY TRIPPED
2. Verify stand-by vacuum pump running
3. Reduce turbine load as necessary to maintain back press < 5.5 in. Hg.
4. Notify load dispatcher

NOTE: Vacuum leak increases

5. Verify vacuum breakers closed

NOTE: The crew may manually trip the reactor/turbine or may trip automatically on low vacuum

IV. LOSS OF VACUUM, REACTOR TRIP

A. PATH-1 Immediate Actions

1. Verify Rx tripped
2. Verify turbine trip

EVENTCOMMENTS

3. Verify E1 & E2 energized

NOTE: Insert the failure of "B" S/G safety at this time

4. Verify SI initiated
5. Opens Foldout A
6. Verify Phase A valves closed
7. Verify FW isolation
8. Verify both FW pumps tripped
9. Verify both MDAFW pumps running

NOTE: BOP should recognize the start failure of the "A" MDAFW and start the pump

10. Start the SDAFW pump as necessary

NOTE: BOP should recognize the start failure of the SDAFW pump and open the required valves

11. Verify two SI pumps running

NOTE: RO should recognize the start failure of the HHSI pumps and start the required pumps

12. Verify both RHR pumps running
13. SI valves properly aligned
14. Verify at least 1 CCW pump running
15. Verify all SW & SW booster pumps running
16. Verify HVH 1-4 running
17. Verify IVSW system initiated
18. Verify CV ventilation isolation

EVENTCOMMENTS

19. Verify CR vent aligned for press. mode
20. Verify both EDG's running
21. Energize battery chargers as necessary
22. Verify CV pressure remains <20 psig
23. Checks for auto steam line isolation
24. Checks if steam line isolation required
25. Locally open breaker for HVS-1 at MCC-5
26. Check RCS pressure > 1350[1250] psig
27. Verify proper SI flow
28. Check RCS pressure > 125 psig
29. Verify at least 300 gpm AFW flow available
30. Verify AFW valves properly aligned
31. Control AFW to maintain S/G level 10 [20]% to 50%
32. Check RCP thermal barrier cooling water hi or low flow alarm illuminated
33. Place the steam dump mode selector Switch in manual
34. RCS temperature stable at or trending to 547
35. Check PZR PORV's closed
36. Check PZR spray and aux spray valve closed
37. Check at least one RCP running
38. Any S/G pressure decreasing in an uncontrolled manner or completely depressurized

EVENTCOMMENTS

39. Transition to EPP-11 "Faulted S/G Isolation
- D. Faulted SG Isolation IAW EPP-11
1. Maintain at least 1 S/G available for RCS cooldown
 2. Check S/G status by identifying intact and faulted S/G's
 3. Isolate faulted SG using Supplement G
 - a. Close MSIV and bypass when Tave <547°F
 - b. Close FW reg and bypass valves
 - c. Close V2-6B
 - d. Close V2-14B
 - e. Close V2-16B and open it's breaker
 - f. Close steam line PORV
 - g. Close V1-8B and open it's breaker
 - h. Check blowdown isolation and sample valves closed
 - i. Direct AO to close MS-29
 - j. Direct AO to verify MSIV above seat drains closed
 - k. Direct AO to verify MSIV below seat drains closed
 4. Check CST level >10%
 5. Check available secondary radiation monitors normal
 6. Go to PATH-2 entry point J

EVENTCOMMENTS

E. PATH-2 Entry Point J

1. Reset SPDS, initiate monitoring CSFSTs
2. Open Foldout C
3. Ensure SR detectors energize
4. Request periodic activity samples of all S/G's
5. Place steam dumps mode switch to Press. Mode
6. Bypass Condensate Polishers
7. Check for at least one RCP running
8. Ruptured SG identified
9. Maintain at least one S/G for cooldown
10. Verify ruptures S/G PORV setpoint at 1035 psig
11. Verify RCS temp less than 547
12. Close ruptured S/G MSIV and bypass
13. Verify ruptured SG PORV shut

NOTE: Supplement G actions from EPP-11 for the faulted S/G should have already isolated the ruptured S/G

14. Verify ruptured SG isolated
15. Any S/G with uncontrolled depressurization or completely depressurized
16. Check faulted S/G isolated per EPP-11
17. Control feed flow to maintain intact S/G level between 10-50%
18. Any other S/G with an uncontrolled level increase

EVENTCOMMENTS

19. Check PZR PORV's closed
20. Check at least one block valve open unless isolated for a leaking PORV
21. Reset SI, phase A and B, and CV Spray
22. Establish instrument air to containment
23. Verify AC busses energized from offsite
24. Check RCS pressure >275 psig
25. Stop RHR pumps
26. Verify ruptured SG isolated
27. Check ruptured SG pressure > 250 psig
28. Check for at least 1 intact SG
29. Transition to EPP-17 "SGTR with Loss of Reactor Coolant - Subcooled Recovery"

NOTE: Scenario can be terminated at this point at the evaluators discretion

F. All SRO's

1. Classify the event as Site Area Emergency (two fission product barriers breached)

NOTE: May classify SAE based on RCS leakage > charging. No way to know if leakage has increased and based on SI flow it would be conservative.

SIMULATION FACILITY: H.B. Robinson SCENARIO NO. DSS-008

EXAMINERS: _____ APPLICANTS : _____

INITIAL CONDITIONS: The Unit is at 100% power. The following equipment is out of service: "B" EDG (OOS for 3 hours/back in 2 hours), "B" MDAFW Pump (OOS for 8 hours/bump motor grounded), "B" Service Water booster pump SWBP (OOS for 3 hours, motor grounds) "B" S/G PORV has a small gasket leak, "A" S/G tube leakage is 0.1 gpm.

TURNOVER: Commence a normal plant shutdown to repair "B" S/G PORV. Chemistry sampling S/G's IAW OP-504. Boron Concentration 1017 ppm, CBD at 218 steps.

EVENT NO.	MALF.	EVENT TYPE	EVENT DESCRIPTION
	RFI SGN023, 024 and 025	C	Failure of all MSIV's to auto close
	MFI MSS03C	C	Failure of the "C" MSIV to manually close
	ORP XA00086R	C	Failure of Phase "A" valve WD-1721 to close
	RFI CVC046	C	CVC-348 BAST outlet closed
1		N, R	Plant Shutdown
2	MFI NIS12A	I	N-41 Fails low (control power fuse)
3	ORP XN36105	C	Override of a seismic alarm to cause an earthquake
	MFI CFW029	C	2000 gpm leak on the bottom of the CST due to the earthquake.
	MFI TURB18	C	EH pump common suction line leak
4	MFI RPS01A MFI RPS01B	M	Failure of both reactor trip breakers to open causing an ATWS.
5	MFI MSS09	M	Steam break on the 72" header (common steam line).

(N) Normal, (R) Reactivity, (I) Instrument, (C)Component, (M) Major

Developed By: Gregory S. Pineda

Approved By: Thy Water

Examiner: Mike G. [Signature]

Chief Examiner: Paul [Signature]

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSE EXAMINATION SCENARIO

DSS-008

PR NI CONTROL POWER FUSE FAILURE

SEISMIC EVENT

CST LEAK

EH LEAK

ATWS

STEAM BREAK

DEVELOPED BY: _____ DATE _____

APPROVED BY: _____ DATE _____

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: DSS-008

SCENARIO NAME: PR NI Control Power Fuse Failure, Seismic Event, CST Leak, EH Leak, ATWS, Steamline Break

TEAM MEMBERS/INDIVIDUAL EVALUATIONS

EXAMINERS:

SCO	_____	SAT	__	UNSAT	__	_____
RO	_____	SAT	__	UNSAT	__	_____
BOP	_____	SAT	__	UNSAT	__	_____

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 1017 ppm Tavg: 575°F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

<u>NORMAL CURRENTS</u>	<u>UPPER</u>	<u>LOWER</u>
N-41	249	249
N-42	249	249
N-43	249	249
N-44	249	249

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

"B" MDAFW Pump, OOS for 8 hours, pump motor grounded.

"B" EDG, OOS for 3 hours, expected to be back in 2 hours.

"B" SWBP OOS due to motor ground, has been OOS for 6 hours.

"A" S/G tube leakage of 0.1 gpm, chemistry is monitoring.

"B" S/G PORV has been identified to have a small gasket leak.

POWER HISTORY:

Equilibrium Xenon, No power ramp rate restriction.

EVENTCOMMENTS**SCENARIO DESCRIPTION**

After shift turnover and allowing the crew to walkdown the board, the crew will initiate a normal plant shutdown due to the S/G PORV. Following initiation of the plant shutdown, a blown fuse in the control circuit of PR NI-41A will initiate a Turbine Runback. When the plant is stabilized, a seismic event will occur. The seismic event causes an unisolable leak at the bottom of the CST that will be found by the makeup water treatment AO. Use of AOP-021 (Seismic Disturbances) and Technical Specifications should result in a plant shutdown being directed. During the subsequent plant shutdown an EH leak will result in a Turbine/Reactor Trip signal with a failure of the reactor to trip (ATWS). A Steam Break on the 72" header will develop immediately after the turbine/reactor trip and will be compounded by an automatic close failure of all MSIV's and a stuck open MSIV on "C" MS line. The scenario should progress through EPP-11 (Faulted S/G Isolation); The scenario may be terminated at the evaluators discretion following transition to EPP-7.

SCENARIO OBJECTIVES

1. Evaluate the crew's response to a PR NI control power fuse failure IAW AOP-015.
2. Evaluate the crew's response to a Seismic Event IAW AOP-021.
3. Evaluate the crew's response to a CST leak (T.S. shutdown required)
4. Evaluate the crew's response to a MSLB IAW PATH-1.
5. Evaluate the crew's response to an ATWS using Path-1, and FRP-S.1.
6. Evaluate the SRO's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENTCOMMENTSI. PLANT SHUTDOWN

- A. Initiate shutdown per GP-006
1. Review precautions and limitations
 2. Complete initial conditions per section 5.1
 3. Start additional charging pumps and open additional letdown orifices as necessary
 4. Reduce turbine load as follows
 - a. Set desired load in the SETTER
 - b. Select the desired load rate
 - c. Depress the GO push button
 5. Monitor axial flux power distribution

NOTE: At evaluator discretion after the load decrease has commenced, the NI failure may be inserted.

II. NI-41A FUSE FAILURE

- A. Recognition of failure
1. Checks instrument busses energized
 2. Checks for a dropped rod
 3. Checks power range channels

NOTE: May identify the power range failure without checking other parameters

EVENTCOMMENTS

- B. Actions of AOP-015 for Turbine Runback
1. Checks S/G level trending to program
 2. Checks Tave trending to Tref
 3. Checks load reduction > 100 Mwe
 4. Checks Steam Dumps to condenser actuated
 5. Checks PZR PORV closed
 6. Checks PZR pressure trending to 2235#
 7. Checks PZR level trending to program
 8. Check APP-005-B5 Rod Banks A/B/C/D low limit extinguished
 9. Monitors AFD to ensure compliance with Tech Specs
 10. Checks reactor power > 15%
 11. Check APP-006-F5 Steam Dumps armed illuminated
 12. Check steam dump valves closed

NOTE: Continuous action. When the valves are closed, the BOP should reset

13. Check GEN VARS within limits for current plant conditions
14. Checks regulator balance between +2 and -2
15. Check Power Range NIS cause of runback

EVENTCOMMENTS

16. Check affected Power Range NIS control power fuses intact
17. Contact I&C to replace blown fuse using PLP-049

NOTE: Seismic event initiates at this time. Booth instructor should call with prompt from load dispatcher

18. Remove N41 from service using OWP-11, NI-1

III. SEISMIC ALARM

A. AOP-021 (Seismic Disturbances), Actions

NOTE: When AOP-21 is identified, the CST leak should be inserted

1. Compare current indications with known values or log reading to observe trends
2. Check for noticeable tremors or vibrations

NOTE: Inform SRO that vibrations are felt in the control room

3. Notify Manager - Operations of seismic event and any identified abnormalities
4. Checks Reactor Critical
5. Notify Manager - Operations to obtain Plant General Manager concurrence for plant to continue operations until data is analyzed

EVENTCOMMENTS

NOTE: Permission is given to continue operation

6. Place the unit in condition specified by Manager - Operations

NOTE: If CST leak has been identified should direct power reduction

7. Notify I&C to perform attachment 2 of AOP-21 to obtain and analyze the data
8. Evaluate RCP and Turbine vibration levels

NOTE: If BOP has not identified CST leakage a call should be made to the control room from the outside AO reporting the rupture of the tank

B. Condensate Storage Tank Leak

1. Recognize level decrease and inform SRO
2. Evaluate Tech Spec 3.4.1
3. Initiate a plant shutdown

C. EH Reservoir Leak

1. Recognize/Identify EH leak
2. Accelerate the load reduction due to severity of the EH leak

NOTE: May manually trip or receive an automatic reactor trip signal

3. Manually trip the reactor and turbine if load decrease can not be controlled

EVENTCOMMENTSIV. ATWS - STEAM BREAK

A. PATH-1 Entry

1. Verify reactor tripped
2. Attempt to manually trip the reactor using both push buttons
3. Go to FRP-S.1

B. FRP-S.1 Actions

1. Check reactor tripped
2. Insert control rods AND direct AOs to locally trip reactor trip breakers OR rod drive MG sets

NOTE: Trip the reactor from the booth after the RO has initiated emergency boration

3. Verify turbine tripped

NOTE: Initiate the steam break at this time

4. Verify all available AFW pumps are running
5. Initiate Emergency Boration
 - a. Verify that 2 charging pumps are running at maximum speed
 - b. Verify boric acid pump aligned for blend is running
 - c. Verify MOV-350 is open

EVENTCOMMENTS

e. Verify flow on FI-110 > 10gpm

NOTE: Should not no flow an open LCV-115B and close LCV-115C

f. Verify charging valves CVC-310B and HCV-121 are open

g. Check charging flow to the RCS on FI-122

6. If SI signal exists then verify auto start of SI equipment using Supplement "L"

NOTE: The RO or BOP will be broken off to complete this attachment

7. Check reactor and turbine tripped

NOTE: The BOP should recognize the failure of the MSIV's to shut and request to close them

8. Check for adequate heat sink, level in at least one S/G >10% or total AFW flow > 600 gpm

9. Maintain total feed flow > 600 gpm until level in one S/G > 10%

10. Control feed flow to maintain S/G level between 10-50%

11. Verify both primary water pumps stopped

NOTE: The RO should take the control switch to off for both pumps

EVENTCOMMENTS

12. Verify FCV-114A closed

NOTE: The RO should take the valve switch to close

13. Check for reactivity from uncontrolled cooldown

NOTE: Depending on timing and crew pace, the faulted S/G may still be depressurizing. Steps 14-16 will only apply if S/G is still depressurizing

14. Verify all MSIV's and bypass valves are closed

15. Identify the faulted S/G

16. Isolate the faulted S/G using Supplement "G"

17. Check Battery Charger alarms APP-036-D1/D2 illuminated

18. Check reactor subcritical

19. Check emergency boration being performed

20. Notify Tech Support to evaluate RCP conditions

21. Reset SPDS and initiate monitoring of the Critical Safety Function Status Trees

22. Transition back to procedure and step in effect which was PATH-1

C. PATH-1 actions

1. Verify turbine tripped

2. Verify E1 & E2 energized

EVENTCOMMENTS

3. Verify SI initiated
4. Opens Foldout A
5. Verify Phase A valves closed

NOTE: RO should recognize WD-1721 did not close and manually closes

6. Verify FW isolation
7. Verify both FW pumps tripped
8. Verify both MDAFW pumps running

NOTE: The BOP should note the "B" MDAFW pump can not be started - OOS

9. Start the SDAFW pump as necessary
10. Verify two SI pumps running
11. Verify both RHR pumps running
12. Verify SI valves properly aligned
13. Verify at least 1 CCW pump running
14. Verify all SW & SW booster pumps running
 - a. Attempts to start all Service Water and Service Water Booster pumps
 - b. Checks North and South SW header low pressure alarms illuminated

NOTE: BOP should note the "B" SWBP can not be started - OOS

EVENTCOMMENTS

15. Verify HVH 1-4 running
16. Verify IVSW system initiated
17. Verify CV ventilation isolation
18. Verify CR vent aligned for
press. mode
19. Verify both EDG's running
20. Energize battery chargers as necessary
(<30 min)
21. Verify CV pressure remains <20 psig
22. Checks for auto steam line isolation

**NOTE: BOP should acknowledge that
MSIV's failed to auto close
and the "C" MSIV is failed
open**

23. Locally open breaker for HVS-1 at
MCC-5
24. Check RCS pressure > 1350[1250] psig
25. Verify proper SI flow
26. Check RCS pressure <125 psig
27. Verify at least 300 gpm AFW flow
available
29. Verify AFW valves properly aligned
30. Control AFW to maintain S/G level
10 [20]% to 50%
31. Check RCP thermal barrier cooling
water hi or low flow alarm illuminated

EVENTCOMMENTS

- 32. Place the steam dump mode selector Switch in manual
- 33. RCS temperature stable at or trending to 547
- 34. Check PZR PORV's closed
- 35. Check PZR spray and aux spray valve closed
- 36. Check at least one RCP running
- 37. Any S/G pressure decreasing in an uncontrolled manner or completely depressurized
- 36. Transition to EPP-11 "Faulted S/G Isolation

D. Faulted SG Isolation IAW EPP-11

- 1. Maintain at least 1 S/G available for RCS cooldown
- 2. Check S/G status by identifying intact and faulted S/G's

NOTE: The following supplement may have been completed in IAW RP-S.1. The SRO will direct one of the board operators to complete the supplement

- 3. Isolate faulted S/G using Supplement G
 - a. Close MSIV and bypass when Tave < 547°F
 - b. Close FW reg and bypass valves
 - c. Close V2-6B
 - d. Close V2-14B

EVENTCOMMENTS

- e. Close V2-16B and open it's breaker
 - f. Close steam line PORV
 - g. Close V1-8B and open it's breaker
 - h. Check blowdown isolation and sample valves closed
 - i. Direct AO to close MS-29
 - j. Direct AO to verify MSIV above seat drains closed
 - k. Direct AO to verify MSIV below seat drains closed
- 4. Check CST level >10%
 - 5. Check available secondary radiation monitors normal
 - 6. Transition to PATH-1 entry point C
- E. PATH-1 entry point C
- 1. Reset SPDS, CSFST Monitoring
 - 2. Open Foldout "B"
 - 3. Request periodic activity sample of S/G's
 - 4. Check at least one RCP running
 - 5. Check at least one HHSI pump running
 - 6. Check RCS subcooling < 35 degrees
 - 7. Any S/G depressurizing in an uncontrolled manner of completely depressurized

EVENTCOMMENTS

8. Faulted S/G isolated using Supplement "G"
9. When faulted S/G dries out, then dump steam from intact S/G's to control RCS repressurization

NOTE: S/G dryout has already occurred and the crew may already be performing this step to control RCS temperature

10. Control AFW flow to maintain S/G level
11. Check for S/G with uncontrolled level increase
12. Check R-15 and R-19's rad levels normal
13. Check PZR PORV's closed and at least one block valve open
14. If offsite power is lost then restart safeguards equipment
15. Reset SI, CV Spray and Phase A and B
16. Establish instrument air to the containment
17. Check offsite power available to the charging pumps and establish desired flow
18. Check CV Spray pumps running
19. Check RCS subcooling > 35
20. Check level in at least one S/G > 10% or greater than 300 gpm AFW flow

EVENTCOMMENTS

21. Check RCS pressure > 1650 psig

NOTE: **The intent is to terminate SI. The conditions may not be met at this time dependent on crew pace. If not the crew will loop back to the beginning of entry point "C" and return to this point in the procedure**

22. RCS pressure stable or increasing

23. Pressurizer level > 10%

24. Go to EPP-7 "SI Termination"

NOTE: **Scenario can be terminated at this point at the evaluators discretion**

VI. EVENT CLASSIFICATION

A. Classifies as Site Area Emergency (ATWS)

SIMULATION FACILITY: H.B Robinson SCENARIO NO: DSS-009
 EXAMINERS: _____ APPLICANTS: _____

INITIAL CONDITIONS: The Unit is at 100% power. The following equipment is out of service: HVH-1 out for motor replacement, will be back this shift. "A" EDG out for governor repair (OOS for 2 days/back in 2 days).

TURNOVER: You have been instructed to maintain current plant conditions. Boron concentration 1017 ppm. CBD at 218 steps. CV pressure relief in progress IAW OP-921, section 6.1.

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
		C	Prevents auto closure of V12-10 and V12-11 on the R11/R12 alarm.
	CORDS PI:953 CORDS PI:955	C	Auto spray actuation failure.
	RFI RHR009 SHUTRHR764	C	RHR-764 out of position closed.
	MFI CFW01C	C	SDAFW Pump trips on auto start.
1	ORP AA085A PC444J 60%	I	PC-444J partial failure causes spray valves to open.
2	MFI RCS013B	C	RCP "B" #1 Seal failure
	MFI RCS016B	C	RCP "B" high vibrations
		N, R	Power reduction
3	MFI RCS02B	C	RCP "B" trips on overcurrent prior to operator action to trip the RCP.
	MFI RCS09A	C	300 gpm RCS leak ramped over 120 seconds
4	MFI RCS01A	M	Large Break LOCA

(N) Normal, (R) Reactivity, (I) Instrument, (C)Component, (M) Major

Developed By: Gregory S. P. [Signature]

Approved By: [Signature]

Examiner: [Signature]

Chief Examiner: [Signature]

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSE EXAMINATION SCENARIO

DSS-009

PZR MASTER CONTROLLER FAILURE

RCP VIBRATION

RC SEAL LEAK

RCS LEAK

LBLOCA

DEVELOPED BY: _____ DATE _____

APPROVED BY: _____ DATE _____

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: DSS-009

SCENARIO NAME: PZR Master Controller, RCP Vibration, RCP Seal leak, RCS Leak, LBLOCA

TEAM MEMBERS/INDIVIDUAL EVALUATIONS

EXAMINERS:

SCO _____	SAT ___	UNSAT ___	_____
RO _____	SAT ___	UNSAT ___	_____
BOP _____	SAT ___	UNSAT ___	_____

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 5 POWER LEVEL: 100% BORON: 1017 ppm Tavg: 575.3°F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

<u>NORMAL CURRENTS</u>	<u>UPPER</u>	<u>LOWER</u>
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

HVH-1 , motor to be replaced this shift

"A" EDG OOS for governor repairs, out for two days, repairs to be completed in two days.

POWER HISTORY:

Equilibrium Xenon, No power ramp rate restriction.

EVOLUTIONS IN PROGRESS:

CV Pressure Relief in progress IAW OP-921, Section 6.1; maintain current power level.

SCENARIO DESCRIPTION

After shift turnover and allowing the crew to walk down the board, the first event will be a failure of PC-444J which causes PZR spray valve to open slowly and continuously until the controller is shifted to Manual. PZR pressure will decrease due to the excess spray flow requiring prompt operator action. When the plant has been stabilized, "B" Reactor Coolant Pump will develop high vibrations. These vibrations will cause seal leakoff flows and pump bearing temperatures to increase, indicating a severe problem with the RCP. The RCP vibrations will increase as the crew attempts to decrease power to remove the pump from service. As power is decreased, RCS leakage will increase until the RCP shaft binds resulting in an overcurrent trip of the pump and subsequent Loss of Flow trip followed by a LBLOCA in the affected loop. The CV spray will fail to operate automatically requiring operator identification and manual actuation. RHR flow does not occur during large break LOCA due to valve RHR-764 being shut. The operating crew will investigate and have the valve re-opened. The LOCA will require entry into PATH-1 and eventually transition to FRP-P.1. The scenario may be terminated at the discretion of the evaluators any time after FRP-P.1 has been implemented.

SCENARIO OBJECTIVES

1. Evaluate the response to a failed PZR master pressure controller(PC-444J).
2. Evaluate the response to a RCP vibration alarm IAW AOP-018.
3. Evaluate the response to a RCP #1 seal failure IAW AOP-018.
4. Evaluate the response to a loss of flow trip and LBLOCA IAW PATH-1.
5. Evaluate the response to a failure of CV spray to actuate automatically.
6. Evaluate the response to a lack of RHR flow following a LBLOCA.
7. Evaluate the response to radiation monitor alarms IAW AOP-005.
8. Evaluate the SRO's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENTCOMMENTSI. PC-444J FAILURE

- A. RO recognizes malfunction with the pressure control system and informs the SRO
- B. Action of AOP-19 "Pressure Control Malfunction"
 - 1. Checks RCS pressure less than 2335 psig
 - 2. Checks PZR PORV's closed
 - 3. Controls heaters and spray to restore RCS pressure
 - 4. Checks PZR pressure control under operator control
 - 5. Checks PC-444J operating properly in automatic
 - 6. Places PC-444J in manual
 - 7. Adjust PC-444J as necessary to restore RCS pressure

NOTE: PC-444J will respond in as expected in manual

- 8. Implement EAL's
- 9. Contact I&C to repairs to the system
- 10. Refer to Tech Specs for applicable LCO's

NOTE: No EAL's or Tech Specs apply

NOTE: Insert the RCP vibration

EVENTCOMMENTSII. RCP VIBRATION/SEAL LEAKAGE

NOTE: After the vibration alarm has been received, then insert the seal leakage to ensure crew enters section "B" prior to "C" of AOP-018

B. Enters AOP-018 Section "C"

1. Checks for valid alarm
 - a. Check green OK status light for affected channel illuminated
 - b. Check both x and y probes for the affected channel valid
2. Checks for the following vibration levels to determine if RCP trip is required
 - a. Frame > 5 mils
 - b. Frame > 3 mils and increasing at greater than 0.2 mils per hour
 - c. Shaft > 20 mils
 - d. Shaft > 15 mils and increasing at greater than 1.0 mils per hour

NOTE: Shaft vibrations should be 14 mils

3. Notify engineering to determine if installation of vibration analysis equipment for the "B" RCP is required
4. Monitor the affected RCP for proper operation
 - a. #1 seal leakoff temp < 235 degrees
 - b. Pump bearing temp < 225 degrees

EVENTCOMMENTS

- c. Thrust guide temp < 200 degrees
- d. RCP current < 880 amps

NOTE: Ensure #1 seal leakoff is greater than 5 gpm but less than 6 gpm at this point to ensure transition to section "B"

- 5. Check APP-001-E8 for the oil reservoir hi/lo level extinguished
- 6. Check #1 seal leakoff between 1 and 5 gpm
- 7. Go to section "B" for pumps seal failure

C. Enters AOP-018 section "B"

- 1. Check any RCP #1 seal leakoff flow greater than 6 gpm
- 2. Check affected RCP parameters
 - a. RCP bearing temp less than 225 degrees
 - b. RCP #1 seal leakoff temp less than 235 degrees
- 3. Check affected RCP #1 seal leakoff flow less than 5 gpm
- 4. Verify seal injection flow exceeds #1 seal leakoff flow for the "B" RCP
- 5. Closely monitor RCP seal parameters

EVENTCOMMENTS

6. Notify Engineering of RCP seal condition and instruct them to contact Westinghouse for further instructions.

NOTE: Inform the SRO that Westinghouse has already been contacted and their recommendation is to shut the pump down as soon as possible

7. Check affected RCP #1 seal leakoff flow less than 1 gpm

NOTE: Operations Manager calls and directs the shutdown at 2% per minute

NOTE: Direction should be given from the SRO to commence unit shutdown in accordance with GP-006. The SRO may elect to direct GP-006 or AOP-018. AOP-018 may be given to a board operator to complete

8. Check APP-001-C5 RCP standpipe hi/lo level illuminated

9. Check seal injection flow between 8 and 13 gpm

10. Check FCV-626 closed

NOTE: After the load decrease is commenced and at the evaluators discretion the #1 seal leakoff should be increased above 6 gpm

11. RO should recognize the increase in #1 seal leakoff and inform the SRO

NOTE: Trip of the RCP on overcurrent and increase in RCS leakage to 300 gpm should occur at this time

EVENTCOMMENTSIII. REACTOR TRIP/ INCREASED RCS LEAKAGE

A. PATH-1 actions

1. Verify reactor tripped
2. Verify turbine tripped
3. Verify E-1 and E-2 energized
4. Verify SI initiated

NOTE: SRO should direct the implementation of, or implement the actions of AOP-018 for the "B" RCP

B. AOP-018 actions to stop RCP

1. Check RCP "B" running
2. Place PCV-455A controller to manual and adjust output to zero
3. After 90 seconds has elapsed since pump trip then close CVC-303B

NOTE: Insert LBLOCA at this time

IV. LBLOCA

A. PATH-1 actions

1. Opens Foldout

NOTE: RCP's should be tripped when trip criteria are met in Foldout A

2. Verify Phase A valves closed
3. Verify FW isolation

EVENTCOMMENTS

4. Verify FW pumps tripped
5. Verify both MDAFW pumps running
6. Start SDAFW pump as necessary

NOTE: The BOP should note that the SDAFW pump has tripped. May attempt one restart

7. Verify 2 SI pumps running
8. Verify both RHR pumps running
9. SI valves properly aligned
10. Verify at least 1 CCW pump running
11. Verify all SW & SW booster pumps running
12. Verify HVH 1-4 running

NOTE: RO should note that HVH-1 can not be started - OOS

13. Verify IVSW system initiated
14. Verify CV ventilation isolation

NOTE: The RO should recognize the failure of V12-10 and 11 to close. Can be closed by using the control switch on RTGB

15. Verify CR vent aligned for press. mode
16. Verify both EDG's running

NOTE: The BOP should recognize the "A" EDG is not running - OOS

EVENTCOMMENTS

17. Energize battery chargers as necessary
18. Verify CV pressure remains < 20 psig

**NOTE: RO should note that CV
Spray did not actuate and
manually initiate CV spray**

- a. Verify CV spray initiated
 - b. Verify all CV spray pumps running with valves properly aligned
 - c. Verify approximately 12 gpm spray additive tank flow
 - d. Verify phase B isolation valves closed
 - e. Stop all RCP's
19. Verify all MSIV's and MSIV bypass valves are closed
 20. Locally open breaker for HVS-1 at MCC-5
 21. Check RCS pressure > 1350[1250] psig
 22. Verify proper SI flow
 23. Check RCS pressure > 125 psig
 24. Verify proper RHR flow
 - a. Align RHR valves

**NOTE: RO should recognize no RHR flow
and dispatch an AO.**

**If dispatched to look for a leak,
report back no leak exists.**

EVENTCOMMENTS

**If dispatched to check lineup,
report back as directed in scenario**

25. Verify at least 300 gpm AFW flow
26. Verify AFW valves properly aligned
27. Control AFW to maintain S/G level
10 [20]% to 50%
28. Check RCP thermal barrier cooling water
hi or low flow alarm illuminated
29. Place the steam dump mode selector
Switch in manual
30. RCS temperature stable at or trending to
547 degrees
 - a. Check RCS temperature > 547
degrees
 - b. Attempt to limit cooldown
 - c. If cooldown continues and is not due
to SI flow then shut the MSIV's and
bypass valves
31. Check PZR PORV's closed
32. Check PZR spray and aux spray valve
closed
33. Check at least one RCP running
34. Any S/G pressure decreasing in an
uncontrolled manner or completely
depressurized
35. R-15 and R-19A, B, C rad levels normal
36. Check for indications of an RCS leak

EVENTCOMMENTS

- Rad monitors, CV pressure, sump level

37. Go to PATH-1 Entry Point C

B. Entry Point "C" on PATH-1

1. Reset SPDS, CSFST Monitoring

NOTE: FRP-P.1 entry conditions will be met and the crew should transition. The crew will transition but not implement any actions due to the LBLOCA

2. Open Foldout "B"
3. Request periodic activity sample of S/G's
4. Check at least one RCP running
5. Any S/G depressurizing in an uncontrolled manner of completely depressurized
6. Control AFW flow to maintain S/G level between 10%~~[20%]~~ and 50%
7. Check for S/G with uncontrolled level increase
8. Check R-15 and R-19's rad levels normal
9. Check PZR PORV's closed and at least one block valve open
10. Reset SI, CV Spray and Phase A and B
11. Establish instrument air to the CV
12. Check offsite power available to the charging pumps and establish desired flow
13. Check CV Spray pumps running

EVENTCOMMENTS

- a. When CV pressure decreases below 4 psig then stop the CV spray pumps and close SI-880 valves

NOTE: Report back as the inside AO that RHR-764 was found out of position and request permission to reposition the valve (if AO was requested to investigate)

15. SRO should provide permission to open the valve and RO should verify proper RHR flow
16. Check RCS subcooling > 35 [55]
17. When below 10 E-10 amps then energize the source ranges and transfer the recorders
18. Check RCS pressure > 275 [400] psig
19. E-1 and E-2 energized by offsite power
20. Check starting air receivers repressurized on the unloaded EDGs
21. Stop the unloaded EDG's
22. Verify Supplement D components capable of recirculation

NOTE: If the crew never requested the AO to investigate valve line up, the crew will transition to EPP-15 due to loss of recirc capability

23. Check Aux building rad levels normal
24. Obtain RCS, boron, and H2 samples
25. RCS pressure > 275 [400] psig

EVENTCOMMENTS

26. Check flow from RHR pumps > 1200 gpm

27. Check RWST > 27%

NOTE: If level not below 27% the crew will be in a loop until this level criteria is met

28. SI system aligned for cold leg recirc

29. Transition to EPP-9 "Transition to Cold Leg Recirculation"

NOTE: Scenario can be terminated at this point at the evaluators discretion

IV. EVENT CLASSIFICATION

- A. Classify the event as Site Area Emergency based on RCS leakage > makeup capability and two fission product barriers breached

INITIAL CONDITIONS/TURNOVER INFORMATION:

POWER LEVEL: 100% BORON: 1017 ppm Tavg: 575.3°F
TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 218D

<u>NORMAL CURRENTS</u>	<u>UPPER</u>	<u>LOWER</u>
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

HVH-1 , motor to be replaced this shift.

"A" EDG OOS for governor repairs, out for two days, repairs to be completed in two days.

POWER HISTORY:

Equilibrium Xenon, No power ramp rate restriction.

EVOLUTIONS IN PROGRESS:

CV Pressure Relief in progress IAW OP-921, Section 6.1; maintain current power level.

SIMULATION FACILITY: H. B. Robinson SCENARIO NO: DSS-038

EXAMINERS: _____ APPLICANTS : _____

INITIAL CONDITIONS: The Unit is at 20% power. The following equipment is out of service: HVH-4 out for motor replacement, will be back this shift. "B" EDG out for high chromates in cooling water, will return this shift. MOV-350 out for limit switch repair, back in 6 hours. Pressurizer level channel 461 out due to being out of tolerance.

TURNOVER: You have been instructed to increase power to 50% in accordance with GP-005. Boron concentration is 1378 ppm. CBD at 179 steps. GP-005 complete through step 5.4.40.

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
	RFI SWS56	C	"A" Sevice Water Booster pumps fail to auto start.
	RFI RHR013	C	"A" RHR pumps fail to auto start.
1	CORD PT:485	I	Failure low of PT-485 S/G "B" steam pressure.
2	CORD LT:459	I	Failure low of LT-459, Pressurizer level channel.
3		N	Reduce power to take unit off line due to inability to take channel LT-459 OOS without tripping unit.
4	MFI GEN06	C	Spurious Turbine Generator lockout
	EPS 13	C	Loss of offsite power
	MFI PRS04C	M	SBLOCA due to failure of Pressurizer safety causing steam space LOCA.

(N) Normal, (R) Reactivity, (I) Instrument, (C)Component, (M) Major

Developed By: Gregory S. [Signature]

Approved By: [Signature]

Examiner: Mike [Signature]

Chief Examiner: Paul [Signature]

SIMULATION FACILITY: H. B. Robinson SCENARIO NO: DSS-038 A
 EXAMINERS: _____ APPLICANTS: _____

 INITIAL CONDITIONS: The Unit is at 20% power. The following equipment is out of service: HVH-4 out for motor replacement, will be back this shift. "B" EDG out for high chromates in cooling water, will return this shift. MOV-350 out for limit switch repair, back in 6 hours. Pressurizer level channel 461 out due to being out of tolerance.
 TURNOVER: You have been instructed to increase power to 50% in accordance with GP-005. Boron concentration is 1378 ppm. CBD at 179 steps. GP-005 complete through step 5.4.40.

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
	RFI SWS56	C	"A" Service Water Booster pumps fail to auto start.
	RFI RHR013	C	"A" RHR pumps fail to auto start.
1	CORD PT:485	I	Failure low of PT-485 S/G "B" steam pressure.
2	CORD LT:459	I	Failure low of LT-459, Pressurizer level channel.
3		N	Reduce power to take unit off line due to inability to take channel LT-459 OOS without tripping unit.
4	MFI GEN06	C	Spurious Turbine Generator lockout
	EPS 13	C	Loss of offsite power
	MFI PRS04C	M	SBLOCA due to failure of Pressurizer safety causing steam space LOCA.

← Simulator failed @ this time. Scenario resumed later. DSS-038 B

(N) Normal, (R) Reactivity, (I) Instrument, (C)Component, (M) Major

Developed By: [Signature]

Approved By: [Signature]

Examiner: [Signature]

Chief Examiner: [Signature]

SIMULATION FACILITY: H. B. Robinson SCENARIO NO: DSS-038 B
 EXAMINERS: _____ APPLICANTS: _____

INITIAL CONDITIONS: ^{100%}The Unit is at 20% power. The following equipment is out of service: HVH-4 out for motor replacement, will be back this shift. "B" EDG out for high chromates in cooling water, will return this shift. MOV-350 out for limit switch repair, back in 6 hours. Pressurizer level channel 461 out due to being out of tolerance.

TURNOVER: ^{decrease} You have been instructed to ^{70%}increase power to 50% in accordance with GP-005. Boron concentration is 1378 ppm. CED at 179 steps. ⁻⁰⁰⁶GP-005 complete through step 5-140.

EVENT NO.	MALF. NO.	EVENT TYPE	EVENT DESCRIPTION
	RFI SWS56	C	"A" Service Water Booster pumps fail to auto start.
	RFI RHR013	C	"A" RHR pumps fail to auto start.
1	CORD PT:485	I	Failure low of PT-485 S/G "B" steam pressure.
2	CORD LT:459	I	Failure low of LT-459, Pressurizer level channel.
3		N	Reduce power to take unit off line due to inability to take channel LT-459 OOS without tripping unit.
4	MFI GEN06	C	Spurious Turbine Generator lockout
	EPS 13	C	Loss of offsite power
	MFI PRS04C	M	SBLOCA due to failure of Pressurizer safety causing steam space LOCA.

(N) Normal, (R) Reactivity, (I) Instrument, (C)Component, (M) Major

Developed By: *[Signature]*

Approved By: *[Signature]*

Examiner: *[Signature]*

Chief Examiner: *[Signature]*

CAROLINA POWER & LIGHT COMPANY

H. B. ROBINSON PLANT

INITIAL LICENSE EXAMINATION SCENARIO

DSS-038

STEAM PRESSURE CHANNEL FAILURE

PZR LEVEL CHANNEL FAILURE

EXCESS LETDOWN

TECH SPEC REQUIRED SHUTDOWN

TURBINE GENERATOR LOCKOUT - LOSS OF OFFSITE POWER

SMALL BREAK LOCA

DEVELOPED BY: _____ DATE _____

APPROVED BY: _____ DATE _____

DYNAMIC SIMULATOR SCENARIO EXAMINATION

SCENARIO NUMBER: DSS-038

SCENARIO NAME: PT-485 failure, LT-459 failure, Excess letdown, Plant shutdown,
Turbine Generator Lockout - Loss of Offsite power, SBLOCA

TEAM MEMBERS/INDIVIDUAL EVALUATIONS

EXAMINERS:

SCO	_____	SAT	__	UNSAT	__	_____
RO	_____	SAT	__	UNSAT	__	_____
BOP	_____	SAT	__	UNSAT	__	_____

INITIAL CONDITIONS/TURNOVER INFORMATION:

IC#: 44 POWER LEVEL: 20% BORON: 1378 ppm Tavg: 551°F

TARGET VALUE: +0.1 TARGET BAND: ±5 MWD/MT: 150 RODS: 179D

<u>NORMAL CURRENTS</u>	<u>UPPER</u>	<u>LOWER</u>
N-41	250	250
N-42	250	250
N-43	250	250
N-44	250	250

REQUIRED XENON FREE SHUTDOWN BORON CONCENTRATION:

HOT: 1188 ppm 100°F COLD: 1646 ppm

EQUIPMENT OUT OF SERVICE:

"B" EDG OOS for high chromates in the cooling water, return this shift.

HVH-4 OOS for motor replacement, expected to return this shift.

MOV-350 OOS for limit switch repair, return in 6 hours: -

LT-461 OOS due to power supply problem, bistables tripped

POWER HISTORY:

Reactor startup completed last shift. Unit placed on line two hours ago. No power ramp rate restrictions.

EVENTCOMMENTS**SCENARIO DESCRIPTION**

After shift turnover and allowing the crew to walk down the board, the initiating event will be a failure of steam pressure transmitter PT-485 low on "B" S/G. This will require manual feed control of the "B" S/G main FRV to restore S/G level. After the plant has been stabilized and the appropriate actions taken to remove the channel from service, a failure of pressurizer level channel LT-459 low will occur. The crew will not be able to remove the instrument from service due to LT-461 being out of service and will be required to place excess letdown in service. This will require a plant shutdown in accordance with Technical Specifications. After excess letdown has been established and a power reduction has been initiated, a spurious generator lockout will cause a turbine/reactor trip and a loss of offsite power. On the trip, the transient causes a PZR safety valve to prematurely open and has failed to reseat causing a PZR steam space LOCA. The service water booster pump and RHR pump powered from the "A" EDG will fail to automatically start and will require manual operator action to start. The crew should respond in accordance with PATH-1. The exercise may be terminated at the discretion of the evaluators after entry into EPP-8 "Post LOCA cooldown and depressurization".

SCENARIO OBJECTIVES

1. Evaluate the response to failed steam pressure channel PT-485 IAW AOP-025.
2. Evaluate the response to failed PZR level channel LT-459 IAW AOP-025.
3. Evaluate the response to a Tech Spec required shutdown due to two PZR level channels out of service.
4. Evaluate the response to a Turbine generator lockout and loss of offsite power IAW PATH-1.
5. Evaluate the response to a SBLOCA IAW PATH-1.
6. Evaluate the SRO's ability to direct the crew during abnormal and emergency conditions in accordance with the above listed procedures.

EVENTCOMMENTSI. STEAM PRESSURE CHANNEL FAILURE

A. BOP recognition of failure

1. BOP diagnose the failure of PT-485 "B" S/G pressure low which causes steam flow channel FT-484 to indicate low
2. Takes the "B" FRV maintain S/G level to 39%-52%

NOTE: These are immediate operator actions for AOP-025. Actual S/G level will not change much due to low power condition

B. Actions per AOP-25 "RTGB Instrument Failure"

1. Enter appropriate section for the failure

NOTE: Since both the steam pressure and steam flow are affected. Should implement section G first since the steam pressure channel is the failed channel

2. Place the "B" FRV in manual
3. Restore the affected S/G level to between 39% and 52%
4. Place the "B" S/G steam flow selector switch to channel 485
5. Restore "B" FRV to automatic
 - a. Check S/G level within 1% of programmed level

EVENTCOMMENTS

- b. Place the "B" FRV in AUTO
- 6. Remove the steam pressure channel 485 from service using OWP-025, SGP-8
- 7. Implement EAL's
- 8. Check Tech Specs for applicable LCO's
- 9. Return to procedure and step in effect

NOTE: The crew may also elect to take steam flow channel FT-484 out of service at this time. Insert the LT-459 failure prior to taking FT-484 out of service

II. PZR LEVEL CHANNEL FAILURE

- A. RO recognition of failure
 - 1. Diagnose that PZR level channel LT-459 has failed low.
- B. Actions per AOP-025 "RTGB Instrument Failure"
 - 1. Check CVC-460A&B closed
 - 2. Place control switches to close for CVC-460 A and B
 - 3. Restore PZR level to between 22% and 53%
 - 4. Check the number of operable PZR level channels greater than one

EVENT

COMMENTS

NOTE: Number of operable channels equals one due to LT-461 OOS

5. Place excess letdown in service using OP-301 "Chemical and Volume Control System"
6. Consult Tech Spec Tables 3.5-2 and 3.5-5 for LCO actions

NOTE: The SRO should determine that a plant shutdown is required for not meeting minimum degree of redundancy

7. Contact plant operations staff to expedite repair of the failed PZR level channels

NOTE: Inform the crew as I&C that repairs can not be completed on 461 due to parts and can not work on 459 without tripping the unit

8. Verify selector switch LR-459 for PZR level recorder selected to LT-460
9. Implement EAL's

III. GP-006 ACTIONS FOR PLANT SHUTDOWN

- A. Prepare for unit shutdown
 1. SRO conducts a brief and reviews the precautions and limitations of the procedure

EVENTCOMMENTS

2. Complete the initial conditions of section 5.1

B. Initiate plant shutdown

1. Start additional charging pumps and open additional orifices as necessary for the shutdown

NOTE: Can not complete due to letdown isolated and on excess letdown

2. Reduce turbine load as follows
 - a. Set desired load in the SETTER
 - b. Select the desired load rate
 - c. Depress the GO push button
3. Verify that Tave and PZR level remain on program
4. Maintain rods above the rod insertion limit
5. Have the AO start the Aux boilers IAW OP-401 if required
6. When power is in the range of 15%-20% then open all turbine drain valves
7. When generator load is between 90 and 110 MW then transfer the auxiliary electrical loads from the Aux transformer to the S/U transformer

EVENTCOMMENTS

8. Open feed pump recirc valves FCV-1444 and FCV-1445
9. When power is between 15% and 20% then transfer rods to manual
10. When power is between 10% and 15% then transfer feed to the bypasses

NOTE: **Initiate the generator lockout and loss of offsite power when doing the transfer to the S/U transformer or when the crew requests additional assistance in the control room for a S/G level watch**

IV. SMALL BREAK LOCA

A. PATH-1 actions

1. Verify reactor trip
2. Verify turbine tripped

NOTE: **Initiate the PZR steam space break on the loss of offsite power**

3. Verify E1 & E2 energized
 - a. Attempt to restore power to the deenergized bus
 - b. If additional power is required then place the dedicated shutdown diesel in service using EPP-25

EVENTCOMMENTS

NOTE: If requested, tell the crew that the "B" EDG will be ready for service in 30 minutes

4. Verify SI initiated

5. Opens Foldout A

NOTE: Will have to call the AO's to locally close MSR valves

6. Verify Phase A valves closed

NOTE: Request AO's to locally close valves without power

7. Verify FW isolation valves closed

NOTE: Request AO to close or verify closed V6-B and V6-C

8. Verify both FW pumps tripped

NOTE: Only one bus energized, will not be able to start components powered from "B" EDG

9. Verify both MDAFW pumps running

10. Start the SDAFW pump as necessary

11. Verify two SI pumps running

12. Verify both RHR pumps running

NOTE: RO should recognize the failure of the "A" RHR pump to start and manually start the pump

EVENTCOMMENTS

- 13. Verify SI valves properly aligned
- 14. Verify at least 1 CCW pump running

NOTE: Crew will have to manually start either "B" or "C" CCW pump

- a. Check CV spray initiated
 - b. Start one CCW pump
 - c. Verify FCV-626 is closed
- 15. Verify all SW & SW booster pumps running
 - a. Attempts to start all Service Water and Service Water Booster pumps
 - b. Checks North and South SW header low pressure alarms illuminated
 - c. Close V2-16C or V2-16 A and B
 - d. Implement Supplement "M"

NOTE: The RO should note the failure of the "A" SW booster pump to start and manually start the pump

- 16. Verify HVH 1-4 running

NOTE: Can only run HVH 1 and 2 with the loss of "B" EDG.

EVENTCOMMENTS

- 17. Verify IVSW system initiated
- 18. Verify CV ventilation isolation
- 19. Verify CR vent aligned for
press. mode

NOTE: Evaluator que that exhaust fans are stopped and dampers are closed

- 20. Verify both EDG's running

NOTE: "B" EDG OOS

- 21. Energize battery chargers as necessary
- 22. Verify CV pressure remains < 20 psig
- 23. Checks for auto steam line isolation
- 24. Verify MSIV's and bypass valves closed
- 25. Locally open breaker for HVS-1 at
MCC-5
- 26. Check RCS pressure > 1350[1250] psig
- 27. Verify proper SI flow

NOTE: No indications on control board of flow due to LOOP

- 28. Check RCS pressure >125 psig
- 29. Verify at least 300 gpm AFW flow
available
- 30. Verify AFW valves properly aligned

DSS-038

EVENT

COMMENTS

31. Control AFW to maintain S/G level
10 [20]% to 50%
32. Check RCP thermal barrier cooling
water hi or low flow alarm illuminated
33. Place the steam dump mode selector
Switch to steam pressure
34. RCS temperature stable at or trending to
547 degrees
35. Check PZR PORV's closed
36. Check PZR spray and aux spray valve
closed
37. Check at least one RCP running
38. Any S/G pressure decreasing in an
uncontrolled manner or completely
depressurized
39. R-15 and R-19A, B, C rad levels normal

**NOTE: PRT should be ruptured at this
point providing increasing CV
trends**

40. Check for indications of an RCS leak
 - a. Rad monitors, CV pressure,
sump level
41. Go to PATH-1 Entry Point C

EVENTCOMMENTS

B. PATH-1 entry point C

1. Reset SPDS, CSFST Monitoring
2. Open Foldout "B"

NOTE: If requested earlier, call the control room and inform them the "B" EDG is ready to be returned to service

3. Request periodic activity sample of S/G's
4. Check at least one RCP running
5. Any S/G depressurizing in an uncontrolled manner or completely depressurized
6. Control AFW flow to maintain S/G level between 10%~~[20%]~~ and 50%
7. Check for S/G with uncontrolled level increase
8. Check R-15 and R-19's rad levels normal
9. Check PZR PORV's closed and at least one block valve open
10. If offsite power is lost then restart safeguards equipment
11. Reset SI, CV Spray and Phase A and B
12. Establish instrument air to the containment

EVENTCOMMENTS

13. Check offsite power available
14. If adequate diesel capacity is not available to run charging pumps then shed non-essential loads using Supplement "F"
15. Start at least one charging pumps and establish desired flow
16. Check CV Spray pumps running
17. Check RCS subcooling > 35
18. When below 10 E-10 amps then energize the source ranges and transfer the recorders
19. Check RCS pressure > 275 [400] psig
20. Check RCS pressure stable or increasing
21. Stop RHR pumps
22. Check for any S/G with uncontrolled depressurization
23. Check RCS pressure increasing
24. E-1 and E-2 energized by offsite power
25. Attempt to restore offsite power to E-1 and E-2

NOTE: If requested, inform the operator that offsite power will be restored in about 30 - 60 minutes

EVENTCOMMENTS

26. Restart battery chargers within 30 minutes
27. Verify EDG's are properly loaded
28. Verify emergency oil pump is running
29. Locally verify the air side seal oil backup pump is running
30. If diesel capacity is not adequate to run instrument air compressors and battery chargers then shed non-essential loads using Supplement "F"
31. Locally load instrument air compressor and battery chargers
32. Check E-1 and E-2 energized by offsite power
33. Verify Supplement D components capable of recirculation
34. Check Aux building rad levels normal
35. Obtain RCS, boron, and H2 samples
36. RCS pressure > 275 [400] psig
37. Transition to EPP-8 "Post LOCA Cooldown and Depressurization"

NOTE: Scenario can be terminated at this point at the evaluators discretion

EVENT

COMMENTS

VI. EVENT CLASSIFICATION

- A. Classifies as Site Area Emergency based on
RCS leakage > charging pump capacity

EFFECTIVE DATE: 08/15/96

G U I D A N C E

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

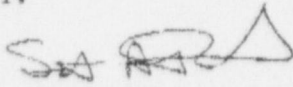
August 15, 1996

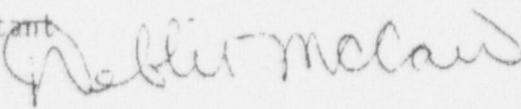
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Operator Licensing and Human
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Division of Reactor Safety, RI

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Division of Reactor Controls
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Licensing Assistants

- 2 -

August 15, 1996

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Attachment:
As stated

cc w/attachment:
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T. Peebles, RII
M. Leach, RIII
J. Pellet, RIV

EFFECTIVE DATE: 08/15/96

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File Center

PDR

o WHEN TO SEND:

The above 3 packages are sent AT THE SAME TIME to ensure it remains and is filed in the PDR together. Since it has to be sent to the Document Control Desk at the same time, it obviously gets sent after the exam is given.

o WHERE TO SEND:

Any material going to the Document Control Desk is sent to headquarters at Mail Stop 0-5-D-24.

ADDITIONAL INFORMATION:

When the exam material reaches the Document Control Desk, it is given to the contractor, and is placed on microfiche. All the exam material in the PDR is available on microfiche and paper. Microfiche can be purchased for \$7.00 per fiche. Each microfiche contains approximately 300 hundred pages of material and be carried away in your shirt pocket. A paper copy can be purchased for \$.09 per page, and most likely would be unable to carry it away.

The paper copy that you sent to the Document Control Desk is sent to the PDR with the appropriate microfiche and kept for the public to look at in the PDR.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011

FACSIMILE TRANSMITTAL

DATE/TIME: 1/24

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2-4 Hours _____

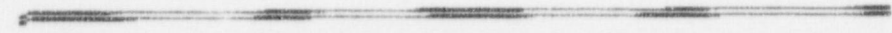
MESSAGE TO: Bob & Michael

MESSAGE FROM: Laura Suley

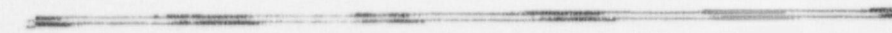
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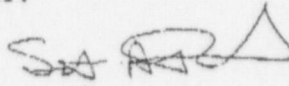
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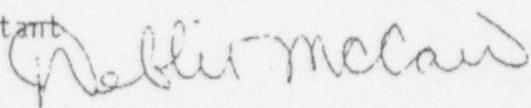
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If distribution code IE42 were placed on all 3 packages going to the Document Control Desk/PDR it would receive the above distribution. IT IS TOO VOLUMINOUS AND NOT NECESSARY TO HAVE ANYTHING OTHER THEN THE EXAMINATION REPORT RECEIVE THIS DISTRIBUTION.

Distribution Code A070 has a distribution list attached to it with the following:

Distribution:
File Center
PDR

o WHEN TO SEND:

The above 3 packages are sent AT THE SAME TIME to ensure it remains and is filed in the PDR together. Since it has to be sent to the Document Control Desk at the same time, it obviously gets sent after the exam is given.

o WHERE TO SEND:

Any material going to the Document Control Desk is sent to headquarters at Mail Stop O-5-D-24.

ADDITIONAL INFORMATION:

When the exam material reaches the Document Control Desk, it is given to the contractor, and is placed on microfiche. All the exam material in the PDR is available on microfiche and paper. Microfiche can be purchased for \$7.00 per fiche. Each microfiche contains approximately 300 hundred pages of material and be carried away in your shirt pocket. A paper copy can be purchased for \$.09 per page, and most likely would be unable to carry it away.

The paper copy that you sent to the Document Control Desk is sent to the PDR with the appropriate microfiche and kept for the public to look at in the PDR.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011

FACSIMILE TRANSMITTAL

DATE/TIME: 1/24

PRIORITY:
Immediately _____
1 Hour _____
2-4 Hours _____

MESSAGE TO: Bob Michael

MESSAGE FROM: Laura Lusk

NUMBER OF PAGES: 6 PLUS TRANSMITTAL SHEET

TELECOPY NUMBER: _____ VERIFICATION NUMBER: _____

CONTACT: Laura (817) 860-8253

TRANSMITTAL INSTRUCTIONS/ATTACHMENT(S):

Transmitted & Verified by: _____

DISPOSITION:
Return to Originator _____
Place in Mail _____
Other _____