NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

02-REQ-009-1DY-2.14 Revision 4

TITLE: DBA LOCA WITH DEGRADED LOW PRESSURE ECCS

	SIGNATURE	DATE
PREPARER		2/15/91
VALIDATED BY	E Shift (Rev 4)	2/14/91
UNIT OPERATIONS TRAINING SUPERVISOR		2/19/91
PLANT SUPERVISOR/ USER GROUP SUPERVISOR		2/19/91

Summary of Pages

(Effective Date: 2/19/91)

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I. TRAINING DESCRIPTION

A. Title of Lesson: DBA LOCA with degraded Low Pressure ECCS

B. Lesson Description: The scenario begins while maintaining 95-100% power when a feedwater recirc. valve opens . This leads to lowering RPV water level which will require the team to reduce power to restore level.

Next a seizure of the B recirculation pump requires the team to take actions per OP-101D to exit the restricted zone of the power to flow map.

A rupture of the recirc. suction line provides the indications to start the emergency event. The event is complicated by a failure of the LPCS injection valve to open and a failure of Div. II ECCS to respond to an initiation signal. Operator action is required to restore LPCS and Div. II ECCS. The scenario is terminated when RPV pressure is being maintained above the MINIMUM RPV FLOODING PRESSURE and drywell cooling has been restored.

C. Estimate of the Duration of the Lesson: 50 minutes

D. Method of Evaluation, Grade Format, and Standard of Evaluation: Satisfactory completion of Simulator Evaluation performed in accordance with NTI-4.3.6.

E. Prerequisites:

1. Instructor:
   a. Qualified as simulator instructor per NTP-16.1.
   b. Be recommended for this training by the Operations Superintendent or Training Superintendent.

F. References:

1. N2-EOP's
2. N2-EOP-6
3. N2-OP-3, Condensate and Feedwater System
4. N2-OP-29, Reactor Recirculation System
5. N2-OP-31, Residual Heat Removal
6. N2-OP-101C, Plant Shutdown
7. N2-OP-101D, Power Changes
8. EAP-2, Classification of Emergency Conditions
9. EPP-20, Emergency Notifications
10. NMP2 Technical Specifications
    a. 3.4.1.1

II. REQUIREMENTS

A. 10CFR55.45 and 55.49

B. NUREG 1021

III. LEARNING OBJECTIVES/ISCT SUMMARY

A. ISCT Summary

ISCT #1 CSO/E — Lower reactor power to within the capacity of the feedwater system (2000310501).
K/A 295009 AA1.03-3.0

ISCT #2 CSO/E — Perform actions to exit the restricted zone following a recirc pump trip.
K/A 295001 A1.01-3.5

ISCT #3 SSS — Determine that water level cannot be determined (3449400603).

ISCT #4 SSS — Direct the actions required per EOP-C2, Emergency depressurization (3449520603).
K/A 295028 GEN.12-4.3

ISCT #5 CSO/E — Open 7 ADS valves.
K/A 239002 A4.01-4.4

ISCT #6 — Enter EOP-C4 RPV flooding (3449560603).
K/A 295028 GEN.12-4.3

ISCT #7 CSO/E — Manually inject feedwater/condensate during a large break LOCA inside the containment.
K/A 295024 GEN.6-3.9

ISCT #8 ASSS/CSO/E — Identify the failure of the LPCS injection valve to open.
K/A 209001 A3.01-3.6

ISCT #9 CSO/E — Perform manual injection of LPCS from the Control Room (2090020401).
K/A 209001 A4.03-3.7

ISCT #10 Identify the failure of Div. II low pressure ECCS to
ASSS/CSO/ initiate (2059450101).
E

ISCT #11 Manually inject to the RPV by opening 2RHS*MOV24B
CSO/E (2059020101).
K/A 203000 A4.05-4.3

ISCT #12 Manually inject to the RPV by opening 2RHS*MOV24C
CSO/E (2059020101).
K/A 203000 A4.05-4.3

ISCT #13 Restore drywell cooling with a LOCA signal present
CSO/E (2229020401).
K/A 295024 EA1.14-3.4

ISCT #14 Classify emergency events requiring emergency plan
SSS/ implementation (3440190303).
ASSS K/A 294000 A1.16-4.7

ISCT #15 Ensure required notification of on-site and off-site
SSS personnel during off-normal events (3440390303).
ASSS K/A 294001 A1.16-4.7

B. Objectives

TO-1.0 Perform actions to restore RPV level to the operating band following a failure of the B feedwater pump recirc. valve.

TO-2.0 Perform actions to exit the restricted zone following a recirc. pump trip.

TO-3.0 Ensure that all Tech. Spec. requirements are met for single loop operation.

TO-4.0 Perform the actions for a LOCA inside the containment that will result in achieving the minimum RPV flooding pressure.

TO-5.0 Respond to a failure of Div. II ECCS to initiate by manually injecting with LPCI B and C.

TO-6.0 Respond to a failure of the LPCS injection valve to open by taking action to manually open it and inject to the vessel.

TO-7.0 Take action to lower containment temperature and pressure by restoring drywell cooling with an isolation signal present.

IV. LESSON CONTENT LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
1. Establish simulator initial conditions.		
2. Bring crew into the classroom and brief using Attachment 6, Simulator Briefing Checklist.	Discuss each item on the checklist. This checklist should be discussed during the first evaluated lesson plan during a training week and prior to subsequent evaluated lesson plans as necessary.	
3. Identify the roles and responsibilities and individuals performing the function for: a. Crew Evaluator b. SRO Evaluator c. RO Evaluator(s) d. Console Operator e. If NRC is present introduce the NRC participants.	Ensure the participants understand that the evaluators will be taking extensive notes during the session and not to be concerned with the evaluators actions.	
4. Identify the roles of the participants. a. SSS b. ASSS c. CSO d. AOEs e. SEPC (if applicable)		
5. Ensure video tape is running and participants are aware: (NCTS-2) a. That video taping is being conducted. b. The reason for the video tape.		

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES

6. Refer to Attachment 2. Turnover information and conduct shift turnover in the simulator.

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Simulator Setup Initialize IC-17			
		Markup the following: HPCS in PTL and depress the manually out of service push-button. CRD-P1B in PTL			
		Preset Malfunctions:			
		1,CS07	LPCS injection valve fails to open.		
		2,AD01	ADS fails to initiate.		
		3,RH14B	Div. II LP ECCS fails to initiation.		
		Preset I/O's None			
		Hang Yellow 80-100% redline sign			
		Turnover Information 100% power 80-100% rod line RWM Gp 141 Operating per OP-101D			

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Out of Service Equipment: HPCS - Excessive pump vibration, maintenance performing inspection. Day 1 of 14 day LCO Estimate 2 days downtime. CRD P1B - Down for seal repair/ replacement. No surveillances scheduled:			
T = 0		Begin the scenario		Crew assumes the shift.	
T = 5	1	Enter Malfunction 4,FW16B	2FWR-FV2B fails to the full open position. RPV level is lowering. An 603-139 - vessel level high/low.	Crew 1. Reports alarm. 2. Identifies lowering vessel level.	Sat/Unsat/NA Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				SSS	
				1. Direct power reduction. Lower power to match feed-system capacity.	Sat/Unsat/NA
				2. Direct level restoration to operating ban (178"-187").	
				CSO/E	ISCT #1
			Power reduce to <85%.	1. Reduce power with recirc. flow to stop lowering level.	Sat/Unsat/NA
				2. Restore level between 178" and 187".	Sat/Unsat/NA
				Team determines that the open feedwater recirc. valve is the cause of the event.	Sat/Unsat/NA
		Role Play: As Aux. Operator report that you can find no reason why the valve is failed open. Inform them that you verified instrument air is properly lined up to the valve.		SSS/ASSS/CSO Direct Plan personnel to investigate the cause of the FV2B failure.	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		If directed to manually close 2FWR-FV2B enter I/O 3,2FWR-ZI2B,,,0 then clear Malf. 4		Team Decide to start another feed-water pump and secure the affected pump.	Sat/Unsat/NA
		If directed to manually close FV2B's isolation valve (2FWR-V1B) enter I/O 3,2FWR-ZI2B,,,100 then clear Malf. 4		Note: Team may decide to manually close FW recirc. valve rather than swap pumps.	
		Make reports back on ordered manipulations.			
T = 12		Role Play: As load dispatcher call for a change in reactive load to 200 MVAR's to the grid.		SSS/ASSS Directs reactive load adjust-ment.	Sat/Unsat/NA
		When power has been reduced to ≤65%.		CSO/E Adjust reactive load to 200 MVARs.	Sat/Unsat/NA
		Enter Malfunction 5,RR11B		SSS Direct actions for RR pump trip.	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
			Recirc. Pump B trips due to pump seizure	IAW OP-101D Section H.2.0	
			AN602107 "Recirc. 1A/1B motor Elec. Fault"	CSO/E	
			AN602119 "Recirc. Pump 1A/1B Motor Auto Trip"	1. Monitor APRM/LPRM from oscillations.	Sat/Unsat/NA
			AN602219 "Recirc. Pump 1A/1B Mot Vibration High"	2. Drive cram rods until power <36% or increase core flow to above 45% with operating loop.	ISCT #2 Sat/Unsat/NA
				CSO/E Perform actions of OP-29 Section H.2.0 and Section H.7.0	
		Acknowledge request for Reactor Engineering and I&C assistance.		1. Verify operating loop <41,800 gpm.	Sat/Unsat/NA
				2. Transfer recirc. control to loop manual.	Sat/Unsat/NA
				3. Notify I&C to perform APRM scram and rodblock setpoint changes.	Sat/Unsat/NA
				4. Close FCV for B recirc. pump to 0%.	Sat/Unsat/NA
				5. Verify thermal power less than 70%.	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				6. Verify tripped pump motor speed indicates 0 RPM.	Sat/Unsat/NA
				SSS/ASSS	
				1. Ensure compliance with Technical Specifications 3.4.1.1 (within four hours).	
				a. Recirc. flow control in loop manual.	Sat/Unsat/NA
				b. Power ≤70%.	Sat/Unsat/NA
				c. Notify Reactor Analyst to reduce thermal limits.	Sat/Unsat/NA
				d. Notify I&C to perform APRM and rod block set-point changes.	Sat/Unsat/NA
				e. Verify operating loop flow is <41,800 gpm.	Sat/Unsat/NA
		After actions are complete for the pump trip.			
		Enter Malfunction 6,RR20	Reactor scram and isolation.	Team	
			DW temperature and pressure increase rapidly.	Respond to alarms.	
			Reactor pressure drops rapidly.	CSO/E	
				1. Mode switch to S/D.	Sat/Unsat/NA
			MSIV's close.	2. Verify all rods inserted.	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				3. Verify/report APRMs lowering.	Sat/Unsat/NA
				4. Report RPV pressure/level.	Sat/Unsat/NA
				SSS/ASSS	
				1. Enter EOP-RPV control; exercise Sections RL, RP, and RQ concurrently.	Sat/Unsat/NA
				2. Enter EOP-PC control; exercise DWT, SPL, PCP, PCH, and SPT concurrently.	Sat/Unsat/NA
			Containment parameters indicate saturation conditions in the drywell.	3. Decide that RPV water level cannot be determined, RPV flooding required.	ISCT #3 Sat/Unsat/NA
				4. Exit RP enter C2 and order 7ADS valves to be opened.	ISCT #4 Sat/Unsat/NA
				CSO/E	ISCT #5
				Open 7 ADS valves.	Sat/Unsat/NA
				SSS/ASSS	
				1. Exit C2 and enter C4.	ISCT #6 Sat/Unsat/NA
				2. Direct injection of: a. Feedwater/condensate b. LPCS c. LPCI	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				d. CRD	
				e. SLC from the test tank	
				CSO/E	
				1. Initiate injection using feedwater/condensate.	ISCT #7 Sat/Unsat/NA
				2. Identify LPCS injection valve did not open.	ISCT #8 Sat/Unsat/NA
		When ordered to manually open the LPCS injection valve, wait 5 minutes then clear malfunction #1.		3. Direct an aux. operator to manually open the LPCS injection valve.	ISCT #9 Sat/Unsat/NA
				4. Identify failure of Div. II low pressure ECCS to initiate.	ISCT #10 Sat/Unsat/NA
				SSS/ASSS	
				Direct Div. II low pressure ECCS be manually lined up for injection.	Sat/Unsat/NA
		When Div. I & II ECCS systems are operating: Enter Malfunction 7,RR19,100 then clear malfunction #6.		CSO/E	
				Manually start LPCI B and C.	
				1. LPCI B	
				a. Start RHR Pump B	Sat/Unsat/NA
				b. Verify MOV4B open	Sat/Unsat/NA
				c. Open MOV24B	ISCT #1 Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				d. Verify injection	Sat/Unsat/NA
				e. Verify MOV4B closes	Sat/Unsat/NA
				2. LPCI C	
				a. Start RHR Pump B	Sat/Unsat/NA
				b. Verify MOV4C open	Sat/Unsat/NA
				c. Open MOV24C	ISCT #12 Sat/Unsat/NA
				d. Verify injection	Sat/Unsat/NA
				e. Verify MOV4C closes	Sat/Unsat/NA
		If requested to make MOV24 valves throttleable go to page RH2, lines 10, 11, 12.	Vessel pressure beings to increase.		
				SSS/ASSS	
				1. Identify when RPV pressure is 61 psig above supp. chamber pressure.	Sat/Unsat/NA
				2. Start the clock for time to maintain RPV pressure at or above target pressure.	Sat/Unsat/NA
				3. Direct actions to restore drywell cooling (EOP-6 Attachment 24).	Sat/Unsat/NA
				CSO/E	
				1. DW Unit Cooler WRT LOCA overrides to override.	Sat/Unsat/NA
				2. Open 2CCP*MOV124, 122, 265, and 273.	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				3. Unit Cooler fans GR 1/2 LOCA override switches to override.	Sat/Unsat/NA
				4. Start all DW Unit Coolers.	
				a. UC1A, B, C running.	Sat/Unsat/NA
				b. UC2A, B, C running.	Sat/Unsat/NA
				c. UC3A, 3B running.	Sat/Unsat/NA
			DW pressure and temperature begin to lower.	5. DW Cooling restored per EOP-6, Att. 24.	ISCT #13 Sat/Unsat
		Termination Cue: -RPV pressure 61 psig above supp. chamber pressure. -DW cooling restored.		SSS/ASSS	
				1. Classifies event as an alert or higher.	ISCT #14 Sat/Unsat/NA
				2. Makes notifications.	ISCT #15 Sat/Unsat/NA

ATTACHMENT 3
POST EVALUATION ASSESSMENT

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES

1. Ensure operators stand fast and do not communicate immediately after simulator is placed in freeze.
2. Evaluators should caucus to determine if any follow-up questions are necessary.
3. Ask follow-up questions before the SSS and crew is released.
4. Instruct the SSS to assess the session with the crew to determine crew strengths and areas for improvement. This should be documented in Attachment 4 for later evaluations.
5. Evaluation Team Shall:
   a. Determine crew strengths and areas for improvement.
   b. Conduct a crew evaluation in Attachment 13.
   c. Determine SAT/UNSAT/NA for all critical tasks and who performed each task.
   d. Conduct individual evaluations on Attachment 10 and 11.
6. Following the evaluation (if NRC) is present) the results of evaluation should be given to the NRC examiners.
7. Conduct a post exercise assessment as follows:
   a. Review the learning objectives.
      Have the crew state how each was met during the session.

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
b. Participant Self-Evaluation Discuss should focus on measurable behaviors and how these contributed to or detract from meeting the objectives.	Allow participants to evaluate themselves against the learning objectives and tasks for the session. Discussion should center on performances and not personal feelings or interpretations of actions.	
c. Instructor assessment and performance recommendations. (NCTS-2)	1. Assess the participants performance for those objectives and tasks not included in the crew self-assessment. Use the video tape in the assessment to more effectively assess communications, teamwork, and prioritization, if necessary. 2. Provide feedback on ways to improve performance as appropriate.	
8. Session and program feedback.	1. Distribute Simulator Training Evaluation Feedback For, NTI-4.4 Attachment 13. 2. Provide students with time to complete form.	
9. Document session.	1. Complete Post Evaluation Summary, Attachment 4. 2. Place a copy in file for next training session. 3. Document any NRC/INPO operating concerns as an items list attached to the training record. (TR)	