NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

02-REQ-009-1DY-2-07 Revision 3

TITLE: FEEDWATER SYSTEM MALFUNCTIONS/EHC OSCILLATIONS/DIESEL GENERATOR INOP/HIGH WATER LEVEL TRIP DUE TO INSTRUMENT FAILURE

	SIGNATURE	DATE
PREPARER		6/14/91
VALIDATED BY		6/14/91
TRAINING AREA SUPERVISOR		6/14/91
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	FOR J B HELKKIL	6/14/91

Summary of Pages

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I. TRAINING DESCRIPTION

A. Title of Lesson: Feedwater System Malfunction/EHC Oscillations/Diesel Generator INOP/High Water Level Trip due to Instrument Failure

B. Lesson Description: The scenario begins with the shift crew maintaining 90% power when a feedwater recirc valve fails open. The transient is further complicated by a failure of the feedwater master controller. This leads to a lowering vessel level driving the crew to reduce power to within the capacity of the feed system and take manual control of the feed water control valves.

When the plant has been stabilized the EHC pressure regulator begins to oscillate causing power to cycle. The crew will shift EHC to the B regulator to stabilize the oscillations.

Next the crew will demonstrate their ability to use technical specifications when they receive a report of an unsatisfactory chemistry surveillance on the Div II Diesel Generator fuel oil storage tank. The crew will be forced to declare the Div II DG INOP and perform the required surveillance. After the inoperable DG has been addressed a failure of two narrow range level instruments will cause a high level trip of the main turbine and feed pumps. The operators should enter RPV control and restore water level using RCIC.

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. Method and Setting of Instruction: Simulator/Performance Mode

F. Prerequisites:

1. Instructor:
   a. Qualified as a simulator instructor per NTP-16.1.
2. Trainee:
   a. As required per NTP-11.

G. References:

1. N2-EOPs
2. N2-EOP-6
3. OP-31, RHR System

4. OP-35, RCIC System
5. OP-101C, Scram and Scram Recovery
6. EAP-2, Classification of Emergency Conditions
7. EPP-20, Emergency Classifications
8. EPP-25, Emergency Reclassification and Recovery
9. NMP2 Technical Specifications 3.8.1
10. SER 02-84
11. SOER 84-4

H. Manipulations:

1. O2-REQ-MAN-A05-2-00, Power Change >10%
2. O2-REQ-MAN-B04-2-00, Loss of Normal Feedwater/System Failure
3. O2-REQ-MAN-B10-2-00, Turbine or Generator Trip
4. O2-REQ-MAN-B12-2-00, Malfunction of Reactor Pressure Control System
5. O2-REQ-MAN-B13-2-00, Reactor Scram

II. REQUIREMENTS

A. 10CFR55.45 and 55.49

III. PERFORMANCE OBJECTIVES/ISCT SUMMARY

A. ISCT Summary:

ISCT #1 SSS/ASSS — Direct actions for a loss of individual feedwater systems. (3449210503)
K/A Rating 259001 A2.07-3.8

ISCT #2 CSO/E — Perform the actions required for a reactor water level low. (2000310501)
K/A Rating 259001 A2.07-3.7

ISCT #3 SSS/ASSS — Direct the actions required per EOP-RPV Section RL. (3449390603)
K/A Rating 295009 SG.12-4.4

ISCT #4 CSO/E — Perform a manual startup of RCIC from the Control Room. (2179150101)
K/A Rating 217000 A2.01-3.8

B. Performance Objectives:

1.0 Demonstrate effective communications in accordance with the Operations Department Instruction on verbal communications.

2.0 Demonstrate for those exercises that require use of the Emergency Plan, an understanding of the roles and responsibilities of the SSS, ASSS/STA, and CSO/NAOE in accordance with Operations Department Instructions.

3.0 SRO's shall demonstrate an understanding of command and control, EOP place keeping techniques and effective use of Control Room personnel during emergency conditions.

4.0 Operators shall demonstrate "Self Verification" work practices in accordance with Operations Department Instructions.

5.0 Given the reactor plant operating at 90% power when a malfunction occurs that results in a feedwater recirc valve opening and a failure of the feedwater master controller, the operating crew will reduce power to within the capacity of the feedwater system and take manual control of the feed system to restore RPV level between 178 inches and 187 inches.

6.0 Given the reactor plant operating at approximately 60% with a malfunction in the "A" EHC pressure regulator, the crew will transfer EHC to the "B" regulator prior to the exceeding any power limits.

7.0 Given a reactor plant operating in mode 1 with a failed surveillance on the Div. II diesel, the crew will declare the diesel inoperable and take action to ensure all technical specification requirements are met.

8.0 Given a reactor plant operating at approximately 60% power when a malfunction occurs to the RPV level transmitters to cause a turbine and feedpump high level trip, the crew will enter the EOP's and restore level to 159.3-202 inches and maintain RPV pressure less than 1037 psig.

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 (as applicable) f. STA (as 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 with the SSS.

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Special Instructions:			
		Markup as out-of-service:			
		Simulator Operation:			
		Initialize: IC-20	100%, BOL		
		lower power to 90% with recirc flow control.			
		Preset Malfunctions:			
		MF;1,RC01	RCIC Auto Start Fail		
		2,CS02	HPCS fails to auto start		
		3,CS04	HPCS injection valve fails to open.		
		Preset Remote Functions:			
		None			
		Preset Instructor Overrides:			
		None			
		Provide Turnover information to SSS.			

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS	
		Initial Conditions: 90%, BOL, maintaining power IAW OP-101D Power being maintained at 90% in preparation for rod maneuvering. Out-of-service equipment: None Surveillances scheduled: None				
		Allow not more than five minutes to walk down the panels.		Walkdown control panels. SSS briefs crew. Crew assumes the shift.		
T = 0		Commence the scenario		Continue with normal power operation.		
T = 5		Enter Malfunction FW Master Controller Fail As Is MF; 4,FW15				
T + 1		Enter Malfunction FW Recirc Valve Fail Open MF; 5,FW16A	2FWR-FV2A fails to full open position RPV level is lowering, AN603139 "Vessel Level High Low" alarms	CREW 1. Reports/alarm 2. Reports lowering vessel level	Sat/Unsat/NA Sat/Unsat/NA	PO #5

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		If requested to manually close 2FWR-FV2A enter IO 1,2FWR-ZI2A,,,0 then clear malfunction 3. If directed to manually close 2FWR-V1B enter IO 1,2FWR-ZI2A,,,100 then clear malfunction 3			
			Power reduced to <85%.	SSS/ASSS 1. Direct power reduction. Lower power to match feed system capacity. 2. Directs level restoration to operating band (178"-187").	ISCT #1 Sat/Unsat/NA Sat/Unsat/NA
				CSO/E 1. Reduce power with recirc flow to stop lowering level. 2. Reports that feedwater control valves are not responding.	ISCT #2 Sat/Unsat/NA Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				a. Take manual control of feedwater control valves.	Sat/Unsat/NA
				b. Take action to maintain level in the ordered band.	Sat/Unsat/NA
				SSS/ASSS	
				1. Direct plant I&C personnel to investigate controller failure.	Sat/Unsat/NA
				CREW	
				1. Discovers part of the problem is the open FW recirc valve.	Sat/Unsat/NA
				SSS/ASSS/CSO	
				1. Direct plant personnel to investigate the cause of FV2B failure.	Sat/Unsat/NA
				2. Contact Chemistry for power reduction	SAT/UNSAT/NA
				3. Contact Station Mangment for power reduction	SAT/UNSAT/NA
		ROLE PLAY: As AOE respond that it will take a few minutes			

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
T = 11					
T = 13		Enter Malfunction EHC Regulator Oscillates MF;6,TC03A	Generator load swings	CREW 1. Notices/investigates power oscillations	Sat/Unsat/NA PO #6
T = 14		ROLE PLAY: As I&C, (or licensed operator) state that it will be a few minutes before you can get to it.		SSS/ASSS 1. Direct plant/I&C personnel to investigate EHC controller failure 2. Direct EHC pressure control swapped to the B regulator.	Sat/Unsat/NA Sat/Unsat/NA
T = 15		ROLE PLAY: As AOE, report that the FW minimum flow valve pneumatic controller has apparently lost its signal; but the air pressure's OK. In 1.0 psig increments, adjust bias to B regulator from - 2.9 to + 3.0 psig using malfunction Pg TC Remote #2. Clear MF; 6			

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		ROLE PLAY: Report B regulator in control			
		ROLE PLAY: Chemistry Supervisor report to the Control Room that you just received the monthly diesel fuel oil samples and Div. II diesel fuel oil storage tank particulate contamination is greater than 10 mg/liter (actual results are 45 mg/liter). Div. I/III diesels are within specification.	1 hr. - 3.8.1.b - Demonstrate operability of required AC offsite sources. Perform surv. req. 4.8.1.1.1 initially and at least every 8 hours (N2-OSP-LOG-W001).	SSS/ASSS 1. Declare Div. II diesel inop. Sat/Unsat/NA PO #7 2. Consult Tech. Specs. for loss of one DG (3.8.1). Sat/Unsat/NA 3. Direct actions to comply with technical specification for one DG inoperable. Sat/Unsat/NA 4. Inform station management of Tech Spec LCO entry SAT/UNSAT/NA	
			2 hr. - 3.8.1.1.e - Verify all required systems, subsystems trains, components and devices that depend on the remaining DG for emergency power are available.		
			24 hr. - Demonstrate operability of remaining operable diesel generators by performing surv. req. 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5 within 24 hours. (N2-OSP-EGS-M101/M102).		

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
			72 hrs. - Restore DG within 72 hrs. or be in at least hot shutdown within the next 12 hrs. and in cold shutdown within the following 24 hrs.		
T = 30		Enter Malfunction Reactor Vessel NR Transmitters B and C Fail Upscale MF; 6,FW28B,,,35:00 MF; 7,FW28C,,,35:00	Level 8 turbine and FW trips; scram		
T = 35				CSO/E Performs actions of OP-101C, H.1.0 1. Mode switch to S/D. Sat/Unsat/NA 2. Report all rods full in Sat/Unsat/NA 3. Verify/report APRMs decreasing Sat/Unsat/NA 4. Insert SRMs/IRMs Sat/Unsat/NA 5. Reports water level below 159.3 Sat/Unsat/NA	
				SSS/ASSS 1. Enter EOP RPV control; execute sections RL, RP, and RQ concurrently. Sat/Unsat/NA	PO #9

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				2. Directs RPV level maintained 159.3 to 202.3 using HPCS/RCIC/Condensate	ISCT #3 Sat/Unsat/NA
				3. Directs pressure maintained below 1037 psig using bypass valves.	
	5		RCIC fails to auto start	CSO/E	
				1. Takes appropriate action to maintain RPV pressure within the prescribed band.	Sat/Unsat/NA
				2. If Manual Initiation is used, RCIC Auto/Man Initiation per OP-35.F.2	
				a. Arm and depress switches	Sat/Unsat/NA
				b. Check auto actions:	Sat/Unsat/NA
				c. Reports RCIC will not start (or reports RCIC has not initiated if level 2 is reached first.)	Sat/Unsat/NA
		Note: Operators may elect to do this directly.		3. Manually starts RCIC	ISCT #4 Sat/Unsat/NA
				a. Open 116, lube oil water supply	Sat/Unsat/NA
				b. Start gland seal compressor	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR-COMMENTS
				c. Open 120, steam supply	Sat/Unsat/NA
				d. Open 126, injection valve	Sat/Unsat/NA
				e. Adjust flow controller to maintain/restore RPV level (as directed) to 159.3" to 202.3"	Sat/Unsat/NA
				4. Reports HPCS did not start if level 2 is reached.	Sat/Unsat/NA
				5. Manually start HPCS (if directed).	Sat/Unsat/NA
				6. Report HPCS inj. valve failed to open.	Sat/Unsat/NA
				7. Place RHRA(B) in Supp. Pool cooling OP-31, E.7.0	Sat/Unsat/NA
				a. Open 2SWP*MOV90A(B)	Sat/Unsat/NA
				b. Throttle 2SWP*MOV33A(B) to 7,400 gpm.	Sat/Unsat/NA
				c. Start RHR pump	Sat/Unsat/NA
				d. Throttle RHS FV 38 to 7,450 gpm (return to SP)	Sat/Unsat/NA
				e. Throttle HX Bypass RHS MOV 8 to vary cooling as required	Sat/Unsat/NA
				f. Monitor/report SP temperature/level	Sat/Unsat/NA

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				SSS/ASSS	
				(If level reaches 108.8" and an ECCS injection occurs.)	
				1. Classifies event as an Unusual Event	Sat/Unsat/NA
				2. Makes/directs notifications to be made.	Sat/Unsat/NA

TERMINATION CUES:

Level 159.3" to 202.3"

and Pressure controlled

POST EVALUATION ASSESSMENT

LESSON CONTENT	DELIVERY NOTES	NOTES AND COMMENTS

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.
4. 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 Attachments 10 and 11.
5. Following the evaluation (if NRC) is present) the results of evaluation should be given to the NRC examiners.
6. 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	NOTES AND COMMENTS
b. Participants Self-Evaluation Discussion 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. Instructors 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.	
7. Session and program feedback.	1. Distribute Simulator Training Evaluation Feedback Form, NTI-4.4 Attachment 13. 2. Provide students with time to complete form.	
8. 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)	