

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

02-REQ-009-IDY-2-11 Revision 6

TITLE: ATWS WITH SLC INJECTION

	<u>SIGNATURE</u>	<u>DATE</u>
PREPARED BY	<u>[Signature]</u>	<u>11/28/90</u>
VALIDATED BY	<u>D. Slifk (Rev 4)</u>	
UNIT OPERATIONS TRAINING SUPERVISOR	<u>[Signature]</u>	<u>11/28/90</u>
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	<u>[Signature]</u>	<u>11/28/90</u>

Summary of Pages

(Effective Date: 11/28/90)
Number of Pages: 20

Date: November 1990 Pages: 1 - 20
THIS LESSON PLAN IS A GENERAL REWRITE

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: _____
DATA ENTRY: _____
RECORDS: _____

9304290178 911031
PDR ADDCK 05000410
S PDR

4/29/78 22



I. TRAINING DESCRIPTION

- A. Title of Lesson: ATWS With SLC Injection
- B. Lesson Description: While operating at 100% power, the C APRM fails upscale. The SROs should review Technical Specifications for applicability. Normal operation can be resumed when the C APRM channel is bypassed.

The 1A feed water heater tube ruptures and the subsequent heater string isolation results in a power decrease. Once the isolation is complete the turbine begins to lose vacuum due to a boot rip. The loss of vacuum causes a turbine trip and scram signal. The turbine bypass valves fail to open following the trip.

The control rods fail to insert following the scram signal and a failure of the Redundant Reactivity Control System occurs. The rods will not respond to manual scram signals until after the SDV is drained. The operators enter and execute EOPs RPV, PC, and C5 as well as the appropriate off normal procedures.

The scenario ends after SLC injection causes reactor power to be reduced to below the heating range and/or the control rods are inserted.

- 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 Nuclear Training Instruction 4.3.6.
- E. Prerequisites:
 - 1. Instructor:
 - a. Qualified in accordance with NTP-16.1.
 - 2. Trainee:
 - a. Meet eligibility requirements per 10CFR55, or
 - b. Be recommended for this training by the Operations Superintendent, his designee, or the Training Superintendent.



F. References:

1. N2-OP-8, Feedwater Heaters and Extraction Steam System
2. N2-OP-9, Condenser Air Removal System
3. N2-OP-31, Residual Heat Removal System
4. N2-OP-35, Reactor Core Isolation Cooling
5. N2-OP-36A, Standby Liquid Control
6. N2-OP-92, Neutron Monitoring
7. N2-OP-101C, Plant Shutdown
8. N2-OP-101D, Power Changes
9. N2-EOP's
10. EAP-2, Classification of Emergency Conditions
11. EPP-20, Emergency Notifications
12. Technical Specifications:
3.3.1; Table 3.3.1-1, Note C

II. REQUIREMENTS

- A. 10CFR55.45 and 55.49
- B. NUREG 1021



III. LEARNING OBJECTIVES

ISCT Summary

- ISCT #1 (SSS) Respond to a rising feedwater heater level (3449040403).
K/A 259001 Gen 15-3.8
- ISCT #2 (CSO/E) Perform the actions required for a loss feedwater heating (2439070101).
K/A 259001 A2.02-3.1
- ISCT #3 (CSO/E) Perform the actions required for an anticipated trip without scram (2000200501).
K/A 295037 Gen 11-4.4
- ISCT #4 (SSS/ASSS) Direct the actions required per EOP-RPV Section RQ (3449390603).
K/A 295006 Gen 12-4.4
Direct actions required per EOP-RPV Section RP (3449410603).
K/A 295006 Gen 12-4.4
- ISCT #5 (SSS/ASSS) Direct the actions required per EOP-C5, level/power control (3449570603).
K/A 295037 Gen 12-4.6
- ISCT #6 (SSS/ASSS) Direct the actions required per EOP-PC Section SPT (3449450603).
K/A 295013 Gen 12-4.2
- ISCT #7 (CSO/E) Perform the actions required for an anticipated trip without scram (2000200501).
K/A 295037 EA1.11-3.5
- ISCT #9 (CSO/E) Perform the actions required for an anticipated trip without scram (2000200501).
K/A 295037 EA1.01-4.6
- ISCT #10 (CSO/E) Perform the actions required for a safety relief valve opening (2000260501).
K/A 239002 A4.04-4.3
- ISCT #11 (SSS/ASSS) Direct the actions required per EOP-RPV Section RQ (3449390603).
K/A 295037 EA1.04-4.5
- ISCT #12 (CSO/E) Operate the SLC System with RRC5 inoperable (2119170101).
K/A 295037 EA1.04-4.5
- ISCT #13 (CSO/E) Perform the actions required for an anticipated trip without scram (2000200501).
K/A 295037 Gen 10-3.9
- ISCT #14 (CSO/E) Perform the actions required for an anticipated trip without scram (2000200501).
K/A 295037 Gen 10.39



- ISCT #15
(CSO/E) Perform the actions for an anticipated trip without scram
(2000200501).
K/A 295037 Gen 10-3.9
- ISCT #16
(CSO/E) Scram the reactor manually and take immediate actions
(2010130101).
K/A 295037 EA1.01-4.6
- ISCT #17
(SSS/ASSS) Classify emergency events requiring emergency plan implementation
(3440190303).
K/A 294000 A1.16-4.7
- ISCT #18
(SSS/ASSS) Ensure required notification of on-site and off-site personnel
during off normal events (3440390303).
K/A 294001 A1.16-4.7



ATTACHMENT 1
PRE-EVALUATION BRIEFING

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.
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.
4. Identify the roles of the participants.
 - a. SSS
 - b. ASSS
 - c. CSO
 - d. AOE's
 - 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.

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.

Ensure the participants understand that the evaluators will be taking extensive notes during the session and not to be concerned with the evaluators actions.



ATTACHMENT 1
PRE-EVALUATION BRIEFING

LESSON CONTENT

DELIVERY NOTES

OBJECTIVES/
NOTES

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



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Special Instructions:			
		Markup as out-of-service:			
		None			
		Simulator Operation:			
		Initialize: IC-20	100%, BOL		
		Preset Malfunctions:			
		MF;1,TC06	TBV Fail Closed		
		MF;2,RD17,10	Control Rods Stuck		
		MF;3,RP12	RRCS Division Failure		
		Preset Remote Functions:			
		None			
		Preset Overrides:			
		None			
		Distribute and discuss			
		Turnover sheets			
		Initial Conditions:			
		100%, BOL, maintaining			
		power in OP-101D			
		RHM GR-147 above			
		100% Rod Line			



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Out-of-service equipment: None			
		Surveillances scheduled: None			
		Allow not more than five minutes for panel walk down.		Walk panels	
T = 0		Commence scenario		Assume the shift, continue power operation.	
T = +1		Set Malfunction APRM C fail upscale MF;4,NM11C,..,+04:00		CSO	
T = +4	1	Malfunction 4 becomes active.	APRM C upscale 603-202 RPS A Trip will cause recirc. FCVs to close and power to decrease.	Report/respond to alarm TEAM Locate and use OP-92 1. Determine which RPS channel tripped 2. Consult SSS 3. Bypass Channel C 4. Reset half'scram	1a,6a Sat/Unsat/NA 4a Sat/Unsat/NA 6b Sat/Unsat/NA 5a,b Sat/Unsat/NA 5a,b Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				SSS/ASSS Review Technical Specifications (3/4.3.1) for minimum number of trip channels	3a,b Sat/Unsat/NA
T = +9		Set Malfunction Feedwater Heater 1A Tube Leak HF; 5,FW22A1			
T = +10	2	Malfunction 5 causes alarms	1st Pt Htr High Htr Drn Pp Trip 4th Pt Htr High	CS0/E Report/respond to alarms: SSS/ASSS Direct actions for a loss of feedwater heating OP-8, H.3.0	1a,6a Sat/Unsat/NA ISCT #1 Sat/Unsat/NA
				CS0/E Locate and use OP-8, H.3.0 1. Determine which heater is high-high by computer points. 2. Verify automatic actions HDL pump trips Heater string isolates Inlet closes CNM-33A Disch closes CNM-32A	4a Sat/Unsat/NA 4a Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
T = +19		Set Malfunction Main Condenser Air Inleakage MF; 6,MC01,100,5,+20:00 Note: If team tries to scram prior to vacuum induced turbine trip. Set Malfunction Spurious Main Turbine Trip MF;7,TU07		3. Reduce power with recirc to ≤ 70 . 4. Verify feed temperature normal for new power level. 5. Verify reactor level normal. 6. Determine cause 7. Notify reactor analyst.	ISCT #2 5a,b Sat/Unsat/NA 4a 2b,4b Sat/Unsat/NA Sat/Unsat/NA Sat/Unsat/NA
T = +20		Malfunction 6 effective.	Main Condenser Air Inleakage		
T = +24			Increased OFG System flow; Vacuum decrease should be noticeable	Team Report/respond to a loss of main condenser vacuum.	Sat/Unsat/NA
T = +26			Low vacuum alarm	SSS Direct actions for a loss of condenser vacuum.	Sat/Unsat/NA



TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATION	GRADE
				00-0		
				or	6a	Sat/Unsat
				minimum	5a,b	Sat/Unsat
				zone) or		
				stabilizes		
				Insert rods in sequence	5a,b	
				or as Rx Analyst direct		
			turbine trip and scram;	SSS		
			bypass valves fail shut	Direct scram actions	6a	Sat/Unsat
				CSO/E		
				Performs actions of OP-1010		
				H.I.U		
				Mode switch to S/D	5a,b	
				Ensure scram by		Sat/Unsat/Un
				verifying rod position		



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
	4		ATWS		ISCT #3
				3. Reports failure to scram	Sat/Unsat/NA
				4. Verify/report APRMs	Sat/Unsat/NA
				SSS	
				1. Enters RPV Control; exercise sections RL, RP and RQ concurrently.	ISCT #4 Sat/Unsat/NA
				2. Exit RL and enter C-5	ISCT#5 Sat/Unsat/NA
				a. Directs ADS logic inhibit to on.	Sat/Unsat/NA
				b. Directs actions per C-5 to maintain level.	Sat/Unsat/NA
				3. Directs pressure control using SRV's.	Sat/Unsat/NA
				4. Directs action of RQ	
				a. Manually initiate RRCS	Sat/Unsat/NA
				b. Direct RR pumps tripped	Sat/Unsat/NA
				c. Direct actions per EOP-6 attachment 14 to insert rods.	Sat/Unsat/NA
				5. Enter PC control when SP temp above 90°F: Exercise DWT, SPL, PCP, PCH and SPT concurrently.	ISCT #6 Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				a. Order SP cooling initiated.	Sat/Unsat/NA
				b. Orders SBTG placed on the drywell.	Sat/Unsat/NA
		ROLE PLAY: As I&C report it will take a minute or two To bypass RSCS		CSO/E	
		Set Malfunction: MF; 7,RW02		1. Insert rods in accordance with RQ and EOP-6 Attachment 14.	4b Sat/Unsat/NA
		Then report RSCS bypass accomplished		2. Manually initiate RRCS	Sat/Unsat/NA
		Note: To "reset" the scram by jumpering out, insert (when asked): MF; 8,RP02 MF; 9,RP14		3. Report failure of RRCS to function.	Sat/Unsat/NA
				4. Place ADS inhibit switches to on.	ISCT #7 Sat/Unsat/NA
				5. Resets RPS to allow SDV to drain.	ISCT #9 Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		Clear MF; 3, after the scram has been reset.	Performs in order: #1 = PSV 128 #2 = PSV 133 #3 = PSV 123 #4 = PSV 124 etc.	6. RPV Press Control with SRVs, a. Place keylock to OPEN b. Monitor pressure c. Place keylock to AUTO	5a,b Sat/Unsat/NA 4a 5a,b Sat/Unsat/NA Sat/Unsat/NA ISCT #10
				7. Place RHS in Supp Pool Cooling per OP-31	3b Sat/Unsat/NA
				8. Place SBT on the drywell in accordance with OP61A Section H.1.	Sat/Unsat/NA
				9. Monitor/Report: a. Reactor Pressure, Power and Level. b. Drywell Pressure and Temperature c. Suppression Pool Temperature and level	2a,6a Sat/Unsat/NA Sat/Unsat/NA Sat/Unsat/NA
				SSS Order SLC initiation before SPT reaches 110°F	6a ISCT #11 Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
					ISCT #12
				1. Initiates SLC manually	Sat/Unsat/NA
				a. Takes (both) SLC pump keylock switch(es) to start	5a,b Sat/Unsat/NA
				b. Verify/reports immediate response; Tank outlet valves 1A and 1B open, both pumps start, both squib valve ready lights out (3A and 3B)	4a,6a Sat/Unsat/NA
				c. Monitors/reports parameters.	4a,6 Sat/Unsat/NA
				d. Verify/report RVCU isolation.	Sat/Unsat/NA
			SP temp is 110°F	SSS	
				1. Direct actions per EOP-C5 to lower RPV water level to reduce power.	3b,c Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
				CSO/E	
				1. Carry out actions directed by SSS.	Sat/Unsat/NA
				2. Terminate and prevent	ISCT #13
				a. Feedwater	Sat/Unsat/NA
				b. RCIC	ISCT #14
				c. HPCS	Sat/Unsat/NA
			RPV water level lowers, reactor power lowers.	CSO/E	
				Reports RPV water level when power is below 4%.	Sat/Unsat/NA
				SSS	
				Directs water level to be maintained between -45 and the level at which power.	Sat/Unsat/NA
				CSO/E	
				1. Takes appropriate actions to maintain water level within the prescribed band.	Sat/Unsat/NA



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
			When scram discharge volume is drained crew will attempt another scram.	<ol style="list-style-type: none"> 2. Report SDV drained. 3. Insert manual scram after SDV level alarms clear. 	<p>Sat/Unsat/NA</p> <p>ISCT #16</p> <p>Sat/Unsat/NA</p>
				<p>TEAM</p> <p>Recognizes/reports rod movement</p>	<p>2a;6a Sat/Unsat/NA</p>
				<p>SSS/ASSS</p> <p>Recognizes that rods are inserting and has team concentrate on restoring level and controlling pressure.</p>	<p>2b,c Sat/Unsat/NA</p>
				<p>SSS/ASSS</p> <ol style="list-style-type: none"> 1. Classifies event as Site Area Emergency (SLC initiated) due to failure to complete a scram. 2. Makes notifications 	<p>ISCT #17</p> <p>2b,c Sat/Unsat/NA</p> <p>ISCT #18</p> <p>Sat/Unsat/NA</p>



ATTACHMENT II

TIME	EVENT	INSTRUCTOR ACTIVITY	PLANT RESPONSE	OPERATOR ACTIONS	EVALUATOR COMMENTS
		TERMINATION CUES: When level is 159.3 to 202.3" and press is <950 psig and being controlled per EOP-RPV.			



ATTACHMENT 3
POST EVALUATION ASSESSMENT

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
<ol style="list-style-type: none">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:<ol style="list-style-type: none">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:<ol style="list-style-type: none">a. Review the learning objectives. Have the crew state how each was met during the session.		



LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
<p>b. Participant Self-Evaluation</p> <p>Discuss should focus on measurable behaviors and how these contributed to or detract from meeting the objectives.</p>	<p>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.</p>	
<p>c. Instructor assessment and performance (NCTS-2) recommendations.</p>	<ol style="list-style-type: none"> 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. 	
<p>8. Session and program feedback.</p>	<ol style="list-style-type: none"> 1. Distribute Simulator Training Evaluation Feedback For, NTI-4.4 Attachment 13. 2. Provide students with time to complete form. 	
<p>9. Document session..</p>	<ol style="list-style-type: none"> 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) 	

