NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

02-REQ-009-1DY-2-10 Revision 5

TITLE: MAIN STEAMLINE BREAK INSIDE CONTAINMENT

| | SIGNATURE | DATE |
|---|---|---|
| PREPARED BY | [signature] | 5/30/91 |
| VALIDATED BY | [signature] | 5/30/91 |
| UNIT OPERATIONS TRAINING SUPERVISOR | [signature] | 6/3/91 |
| PLANT SUPERVISOR/ USER GROUP SUPERVISOR | [signature] | 6/4/91 |



Summary of Pages

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TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: _____ _____

DATA ENTRY: _____ _____

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4/29/176

I. TRAINING DESCRIPTION

A. Title of Lesson: Main Steamline Break Inside Containment

B. Lesson Description: The scenario begins with the shift crew maintaining 100% power when the EHC pressure regulator fails low. Reactor pressure and power increase noticeably, and the crew should be able to quickly diagnose and correct the problem. The standby pressure regulator gains control automatically to limit the transient. The 4B breaker for the recirculation pump opens due to human error caused by maintenance.

The B recirculation pump trip causes the shift crew to enter OP-29 and OP-101D to react to this off normal event.

A sudden loss of electrical load caused by a fault on the grid provides the scram signal to start the emergency evolution. The scram is coupled with a steam line break inside the containment. Emergency actions are hampered by degraded ECCS; the LPCS injection valve fails to open, and the HPCS system fails to auto initiate. The shift crew is forced to make decisions about priority use of the remaining systems for Rx level control, suppression pool cooling and the spray mode.

The scenario is terminated when reactor vessel flooding is in progress and drywell pressure has been reduced.

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 as simulator instructor per NTP-16.1.
2. Trainee:
   a. Meet the 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-23, Main Turbine Electrohydraulic Control
2. N2-OP-29, Reactor Recirculation System
3. N2-OP-31, Residual Heat Removal
4. N2-op-32, Low Pressure Core Spray
5. N2-OP-33, High Pressure Core Spray
6. N2-OP-101c, Plant Shutdown
7. N2-OP-101d, Power Changes
8. N2-EOP's
9. N2-EOP-6
10. EAP-2, Classification of Emergency Conditions
11. EPP-20, Emergency Notifications
12. NMP2 Technical Specification
    a. 3.4.1.1

II. REQUIREMENTS

A. 10CFR55.45 and 55.49

B. NUREG 1021

## III. LEARNING OBJECTIVES

### A. ISCT Summary

ISCT #1 (SSS) Respond to a Reactor recirc. pump trip. K/A 295001 Gen. 7-3.6

ISCT #2 (CSO/E) Perform actions for one recirc. pump trip. K/A 295001 AA1.01-3.5

ISCT #3 (SSS) Direct the actions required per EOP-RPV section RL (3449400603). K/A 295006 Gen. 12-4.4
Direct the actions required per EOP-RPV section RP (3449410603). K/A 295006 Gen. 12-4.4

ISCT #4 (SSS) Direct the actions required per EOP-PC section DWT (3449420603). K/A 295028 Gen. 12-4.3
Direct tne actions required per EOP-PC section PCP (3449430603). K/A 295024 Gen. 12-4.5

ISCT #5 (SSS) Direct the actions required per EOP-PC section PCP (3449430603). K/A 295024 EA2.03-3.9

ISCT #6 (CSO/E) Manually initiate the ADS sytem and monitor while activated (2180020101). K/A 295028 EA1.05-3.7

ISCT #7 (SSS) Direct the actions required per EOP-C4 RPV flooding (3449560603). K/A 295028 Gen. 12-4.3

ISCT #8 (ASSS/CSO/E) Perform the actions required for a large break LOCA, inside the primary containment (2009150501). K/A 209002 A2.01-3.8

ISCT #9 (CSO/E) Manually initiate HPCS from the Control Room (2060050101). K/A 209002 Gen. 9-3.8

ISCT #10 (CSO/E) Perform the actions required for a large break LOCA, inside the primary containment (2009150501). K/A 295024 Gen. 6-3.9

ISCT #11 (ASSS/CSO/E) Monitor the automatic operation of the LPCS system from the Control Room. K/A 209001 A3.01-3.6

ISCT #12 (CSO/E) Perform manual injection of LPCS from the Control Room (2099020401). K/A 209001 A4.03-3.7

ISCT #13 Direct the actions required per EOP-PC section PCP (3449430603). K/A 295024 Gen. 12-4.5

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

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

B. Generic Objectives:

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

GO-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.

GO-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.

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

C. Scenario Objectives:

1. Given a reactor plant at approximately 70% power with an EHC failure, the operating crew will dispatch operators to transfer regulator within 5 minutes of the failure.
2. Given a reactor plant at approximately 70% power with a recirc pump trip the operating crew will exit the restricted zone by ensuring reactor power is <36% or core flow is >49 mlbm/hr.
3. Given a reactor plant at approximately 50% power with a LOCA inside the drywell the operating crew will assure adequate core cooling by maintain RPV pressure 61 psig great than the suppression pool pressure in accordance to EOP-C4.
4. Given a LOCA, the SSS will classify the event as an ALERT or higher and initiate the off site notifications within 15 minutes.

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: | Ensure the participants understand that the evaluators will be taking extensive notes during the session and not to be concerned with the evaluators actions. | |
| 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. 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, Section C. Turnover information and conduct shift turnover in the simulator.

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|

Special Instructions:

Hang yellow 80% - 100% Rod Line sign

Simulator Operation:

Initialize: IC-17

Preset Malfunctions:

1,CS02 HPCS Auto Start Fail

2,CS07 LPCS injection valve fails to open.

Lower power to 70-75%

Preset Instructor Override:

None

Distribute and discuss

Turnover sheets

Initial Conditions:

BOL, 80-100% Rod Line maintaining power IAW OP-101D, Awaiting Reactor Analyst concurrence to raise power

Out-of-service equipment:

None

Surveillances scheduled:

None

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|
| | | Allow not more than five minutes to walk down the panels. | | Walk panels. | |
| T = 0 | | Begin the scenario | | Assume the shift; continue power operation. | |
| T = 4 | 1 | Enter Malfunction 2,1C02A | Annunciator 851148 "B Reg in control" | TEAM<br>1. Recognize increasing reactor pressure and power. | Sat/Unsat/NA |
| | | | | 2. Determine cause of problem is EHC pressure regulation. | Sat/Unsat/NA |
| | | | | SSS/ASSS<br>Request AOE to transfer regulator control. | Sat/Unsat/NA |
| T = 5 | | ROLE PLAY: As AOE report that it will take you a few minutes to get to the relay room.<br><br>Set Malfunction Recirc Pump Trip<br>IO; 3, B35A-S117B-A, +10:00, STP<br>IO; 5, AN602101-19, +10:00, ON | | | |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|
| T = 7 | | ROLE PLAY: As AOE state that you're ready to set the pressure regulator. | | | |
| T = 10 | 2 | I03 and 5 effective<br>Immediately clear I03.<br>This must be done <u>before</u> the operator takes the 4B breaker to PTL.<br>Clear I05 <u>concurrent</u> with the operator taking 4B to PTL. | Recirc pump trips | Team<br>Report/respond to trip annunciators. | Sat/Unsat/NA |
| | | | | SSS<br>Direct actions for RR pump trip IAW OP-101D Section H.2.0. | ISCT #1<br>Sat/Unsat/NA |
| | | | | CSO/E<br>1. Monitor APRM/LPMM for oscillations. | Sat/Unsat/NA |
| | | | | 2. Drive cram rods until power <36% <u>or</u> increase core flow to above 45% with operating loop. | ISCT #2<br>Sat/Unsat/NA |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|
| | | | | CSO/E | |
| | | | | Perform actions of OP-29 Section H.2.0 and Section H.7.0. | Sat/Unsat/NA |
| | | Role Play: As electrician report that Auxiliary Mechanics cleaning the Switchgear Room were wheeling the LIFT-A-LOFT around and slammed into the 4B breaker cabinet. No physical damage apparent. All the flags appeared reset and only the 86 was tipped. | | SSS/ASSS/CSO | |
| | | | | Request investigation by electricians. | Sat/Unsat/NA |
| | | As plant management: When contacted, inform crew to maintain single loop ops. | | SSS/ASSS | |
| | | | | 1. Ensure compliance with Technical Specifications 3.4.1.1 (within four hours). | Sat/Unsat/NA |
| | | | | 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/reduce operating loop flow to ≤41,800 gpm. | Sat/Unsat/NA |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|
| | | (Note: Allow yourself approx. 5 minutes to get this information entered.) | | | |
| | | Set Malfunctions for loss of load followed by a steam line break in the drywell.<br>MF;3,EG13,,,+25:00,+27:00<br>MF;4,MS04,,,+25:00,+27:00<br>MF;5,RR19,100,,+25:30<br>MF;6,MS03,100,,+25:30 | | | |
| I = 25 | 3 | MSIV's close Rx. Pressure drops rapidly, Turbine Trip. | Scram; LOCA | Team<br>Respond to alarms | 1a;6a Sat/Unsat/NA |
| | | | | CSO/E<br>1. Mode switch to S/D.<br>2. Verify all rods inserted.<br>3. Verify/report APRMs lowering.<br>4. Report RPV pressure/level. | Sat/Unsat/NA<br>Sat/Unsat/NA<br>Sat/Unsat/NA<br>Sat/Unsat/NA |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|
| | | | | SSS/ASSS | ISCT #3 |
| | | | | 1. Enter EOP-RPV control; exercise Sections R1, RP and RQ concurrently. | Sat/Unsat/NA |
| | | | | 2. Enter EOP-PC control: exercise DWT, SPL, PCP, PCH, and SPT concurrently. | ISCT #4 Sat/Unsat/NA |
| | | | Containment parameters indicate saturation conditions in the drywell. | 3. Decide that RPV water level cannot be determined, RPV flooding required. | ISCT #5 Sat/Unsat/NA |
| | | | | 4. Exit RP enter C2 and order 7ADS valves to be opened. | Sat/Unsat/NA |
| | | | | CSO/E | ISCT #6 |
| | | | | Open 7 ADS valves. | Sat/Unsat/NA |
| | | | | SSS/ASSS | ISCT #7 |
| | | | 7 ADS valves open. | 1. Exit C2 and enter C4. | Sat/Unsat/NA |
| | | | | 2. Direct injection of: | Sat/Unsat/NA |
| | | | | a. HPCS | Sat/Unsat/NA |
| | | | | b. Feedwater/condensate | Sat/Unsat/NA |
| | | | | c. LPCS | Sat/Unsat/NA |
| | | | | d. LPCI | Sat/Unsat/NA |
| | | | | e. CRD | Sat/Unsat/NA |
| | | | | f. SLC from the test tank | Sat/Unsat/NA |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR COMMENTS |
|---|---|---|---|---|---|
| | | | | CSO/E | ISCT #8 |
| | | | | 1. Identify HPCS did not auto start. | Sat/Unsat/NA |
| | | When asked to defeat Level 8 interlock's, go to page CS2 Remote 11. | | 2. Defeat HPCS high level interlocks (if above Level 8). | Sat/Unsat/NA<br>ISCT #9 |
| | | | | 3. Manually start HPCS and inject to the vessel. | Sat/Unsat/NA<br>ISCT #10 |
| | | | | 4. Initiate injection using feedwater/condensate. | Sat/Unsat/NA<br>ISCT #11 |
| | | | | 5. Identify LPCS injection valve did not open. | Sat/Unsat/NA |
| | | When ordered to manually open the LPCS injection value, wait 5 minutes then remove malfunction 2. | | 6. Direct an aux. operator to manually open the LPCS inj. valve. | ISCT #12<br>Sat/Unsat/NA |
| | | | | SSS/ASSS | |
| | | | | Direct actions to restore drywell cooling. | Sat/Unsat/NA |
| | | | | CSO/E | |
| | | | | Restore drywell cooling. | Sat/Unsat/NA |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR-COMMENTS |
|---|---|---|---|---|---|
| | | | RPV pressure increases. | Team<br>Monitor parameters, identify when RPV pressure is 61 psig above suppression chamber pressure. | Sat/Unsat/NA |
| | | | | SSS<br>1. Determine that one loop of RHR can be re-directed from LPCI mode to containment spray mode and adequate core cooling will be maintained.<br>2. Direct Reactor recirc. pumps and drywell unit coolers secured. | ISCT #13<br>Sat/Unsat/NA<br>Sat/Unsat/NA |
| | | | | CSO/E<br>1. Verify/trip Reactor recirc. pumps and drywell unit coolers.<br>2. Close the RHR injection valve for the loop to be re-directed. | Sat/Unsat/NA<br>Sat/Unsat/NA |

| TIME | EVENT | INSTRUCTOR ACTIVITY | PLANT RESPONSE | OPERATOR ACTIONS | EVALUATOR-COMMENTS |
|---|---|---|---|---|---|
| | | | | SSS | |
| | | | | 1. Direct RHR placed in suppression chamber and drywell sprays. | Sat/Unsat/NA |
| | | | | 2. Order that drywell sprays be secured when drywell pressure drops below 1.68 psig and | Sat/Unsat/NA |
| | | | | 3. Order that supp. chamber spray be secured when supp. chamber pressure drops. | Sat/Unsat/NA |
| | | Termination Cue: Adequate core cooling is being maintained with Rx. Pressure >61 psig above SC pressure. Containment sprays in progress to reduce drywell press/temp. | | CSO/E | |
| | | | | 1. Place an RHR loop in drywell and suppression chambers sprays. | Sat/Unsat/NA |
| | | | | SSS/ASSS | ISCT #15 |
| | | | | 1. Classifies event as an alert or higher. | Sat/Unsat/NA<br>ISCT #14 |
| | | | | 2. Makes notifications. | Sat/Unsat/NA |

| 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<br><br>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.<br>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.<br>2. Provide students with time to complete form. | |
| 9. Document session. | 1. Complete Post Evaluation Summary, Attachment 4.<br>2. Place a copy in file for next training session.<br>3. Document any NRC/INPO operating concerns as an items list attached to the training record. (TR) | |