Ø7-187-91

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-LOT-006-344-2-13 Revision 4

TITLE: EMERGENCY OPERATING PROCEDURES, ALTERNATE LEVEL CONTROL (C-1)

	SIGNATURE	DATE
PREPARER		12-4-90
TRAINING SUPPORT SUPERVISOR	J. Lynch for J. LeClair	12-4-90
TRAINING AREA SUPERVISOR	J Kaminski	12-5-90
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	Signature for D Tuley	12/6/90

Summary of Pages

(Effective Date: 12/10/90)

Number of Pages: 14

Date	Pages
December 1990	1 - 14

THIS LESSON PLAN IS A GENERAL REWRITE
THIS LESSON PLAN SUPERSEDES LESSON PLAN #N2-OLP-C1

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: _____ _____

DATA ENTRY: _____ _____

RECORDS: _____ _____

1 5/3/273

I. TRAINING DESCRIPTION

A. Title of Lesson: Emergency Operating Procedure, Alternate Level Control (C-1)

B. Lesson Description: This lesson discusses the detailed actions taken on low RPV water level under degraded plant conditions.

C. Estimate of the Duration of the Lesson: Approximately 1 hour

D. Method of Evaluation, Grade Format, and Standard of Evaluation: Written Examination with 80% minimum passing grade.

E. Method and Setting of Instruction: Classroom Lecture

F. Prerequisites:

1. Instructor:
   a. Certified in accordance with NTP-16.
2. Trainee:
   a. Certified in accordance with NTP-10.

G. References:

1. BWROG Emergency Procedure Guidelines, Rev. 4
2. Plant Procedure N2-EOP-C1, Rev. 4

II. REQUIREMENTS

A. AP-9, Administration of Training

B. NTP-10, Training of Licensed Operator Candidates

III. TRAINING MATERIALS

A. Instructor Materials:

1. Transparencies Package
2. Overhead Projector
3. Whiteboard and Felt Tip Markers
4. EOP Flowchart for C1
5. Training Record

B. Trainee Materials:

1. EOP Flowchart for C1
2. Course Evaluation Form

IV. EXAM AND MASTER ANSWER KEYS

Will be generated and administered as necessary. They will be on permanent file in the Records Room.

V. LEARNING OBJECTIVES

Upon completion of this training, the trainee will have gained the knowledge to perform the following:

A. Terminal Objectives:

TO-1.0	Given conditions requiring the use of Emergency Operating Procedure, use the procedure to place the plant in a stable condition as prescribed in the procedure.	
TO-2.0	(SRO ONLY) Direct the actions required per EOP-C1, Level Restoration,	(3449510603)
TO-3.0	Perform RPV/containment service water flooding from the Control Room.	(2059330101)
TO-4.0	Perform RHR keep full pump alternate RPV injection from the Control Room.	(2059340401)
TO-5.0	Manually initiate HPCS from the Control Room.	(2060050101)
TO-6.0	Perform manual injection of LPCS from the Control Room.	(2099020401)
TO-7.0	Inject to the vessel using the condensate transfer pumps.	(2569180501)
TO-8.0	Manually inject poison solution into the reactor from the Control Room.	(2000250501)
TO-9.0	Perform the actions required for a reactor water level low.	(2000310501)
TO-10.0	Perform the actions required for a large break LOCA, outside the Primary Containment.	(2009120501)
TO-11.0	Perform the actions required for a large break LOCA, inside the Primary Containment.	(2009150501)
TO-12.0	Inject into the vessel using non-preferred injection systems as directed by the EOP's.	(2009280501)
TO-13.0	Monitor the automatic initiation of the HPCS System during a LOCA with normal power available and/or not available.	(2060020101)

B. Enabling Objectives:

EO-1.0 State the purpose of the Alternate Level Control procedure.

EO-2.0 State the entry conditions for Alternate Level Control procedure.

EO-3.0 Given the procedural step, discuss the technical basis for that step.

LESSON CONTENT	DELIVERY NOTES	OBJECTIVES/ NOTES
I. INTRODUCTION	Preliminary Activities: 1. Introduce self to class (if unfamiliar). 2. Distribute TR for completion. 3. Distribute Course Evaluation Forms and describe their use. 4. Discuss Method of Evaluation. Review Learning Objectives with the class.	
A. Student Learning Objectives B. Purpose This procedure provides explicit instructions for RPV water level control to restore and maintain RPV level to above the top of active fuel.		EO-1.0
II. DETAILED DESCRIPTION A. Entry Conditions This procedure is entered only upon direction from other emergency operating procedures.	NOTE: TP's may be used to highlight points of interest on flowchart; use TP's to show procedural steps if flowchart not used.	EO-2.0
B. Procedural Steps 1. While executing the following steps: a. IF All control rods are not inserted to at least position 02. AND The Reactor will not remain shutdown without boron		

THEN

Exit this procedure and enter EOP-C5, Level/Power Control.

Show entry point into EOP-C5.

EO-3.0

- When boron injection is required control of RPV water level differs from that prescribed in this procedure.
- With boron being injected consideration must be given to with injection systems are used and what flow rates should be established.

EO-3.0

b. IF

RPV water level cannot be determined

THEN

Exit this procedure and enter EOP-C4, RPV Flooding

Show entry point into EOP-C4.

EO-3.0

- Without RPV water level and level trend information the actions specified in this procedure cannot be performed. RPV flooding is performed to assure continued adequate core cooling.

c. IF
RPV water level is rising
THEN
Exit this procedure and enter RPV Control Section RL at "A".

Show entry point into EOP-RL.

d. IF
Primary Containment water level and Suppression Chamber pressure cannot be maintained below the Maximum Primary Containment Water Level Limit (Fig. C1)

Show TP of Fig. C1.

THEN
Irrespective of whether adequate core cooling is assured, terminate injection into the Primary Containment from sources external to the Primary Containment until Primary Containment Water Level and Suppression Chamber Pressure can be maintained below the curve (Figure C1-1).

Show TP of Fig. C1-1.

- This action precludes any further increase in Primary Containment Water Level, to prevent what may be complete and uncontrolled loss of Primary Containment integrity.

EO-3.0

2. Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with 2 or more of the following injection subsystems.
   a. Condensate
   b. HPCS
   c. LPCI-A - inject through the heat exchanger as soon as possible.
   d. LPCI-B - inject through the heat exchanger as soon as possible.
   e. LPCI-C
   f. LPCS

- Injection subsystems are lined up with pumps running to assure that water will be injected into the RPV during and following a blowdown.
- At least two subsystems are required to accommodate the possibility of one subsystem not operating properly.
- Flow is raised to the maximum to provide as much flow as possible when RPV pressure drops below system shutoff head.

EO-3.0

3. Can at least 2 of the injection subsystems be lined up.
   a. YES - continue at STEP #5
   b. NO - continue at STEP #4
      - This step tests for success of the previous steps, if successful (YES), then sufficient makeup will be available to the RPV if pressure is below or is reduced below the shutoff head of the pumps. If unsuccessful (NO), inadequate makeup exists regardless of RPV pressure hence the direction to the next step.

EO-3.0

4. Commence lining up as many of the following alternate injection subsystems as possible.
   a. Service water to RHR crosstie
   b. Fire system
   c. ECCS keep full system
   d. SLC (test tank)
   e. SLC (boron tank)
   f. Condensate Transfer
      - Does not include starting pumps.
      - These systems are alternates for the following reasons:
        - low water quality

- relative difficulty in establishing RPV injection Lineup.
- lineup is not permitted during normal operation.

5. Is RPV pressure above 195 psig.
   a. YES - continue at STEP #6
   b. NO - continue at STEP #11

EO-3.0

   - With pressure above 195 psig, RPV injection is precluded due to pressure being above the shutoff head of the listed systems (except SLC).

6. While executing the following steps
   IF
   RPV pressure drops below 195 psig
   THEN
   Continue at "G"

Show entry point at "G" (Step #11).

EO-3.0

   - RPV pressure may decrease to less than 195 psig. If it does it is appropriate to continue at the step specified.

7. Is any injection subsystem lined up for injection with at least one pump running?
   a. YES - continue at STEP #9

b. NO - continue at STEP #8 — EO-3.0

- Evaluate present status of RPV injection subsystems to determine if alternate subsystems will be required.
  - If yes, depressurization of RPV to allow subsystem to inject.
  - If no, alternates must be readied.

8. Start pumps in alternate injection subsystems which are lined up for injection.
   - Action required by NO response to #7
9. WAIT until RPV water level drops to -14 in. — EO-3.0
   - Adequate core cooling by submergence (most preferred method).
   - Time used waiting can be best used to line up and start pumps to attempt decreasing level trend reversal. — EO-3.0
10. Is any system or subsystem lined up for injection with at least one pump running?
    a. YES - Emergency RPV Depressurization is required.

- If RPV water level drops to -14 in. and at least one source of injection is available, RPV depressurization is required to maximize injection flow.
- RPV emergency depressurization is not initiated until -14 in. because:
  - Adequate core cooling is assured with RPV level above -14 in.
  - While RPV level is decreasing time is better spent attempting to make additional systems available for injection.

b. No - Steam Cooling is required.

- With RPV level decreasing and no source of injection available the only mechanism by which adequate core cooling can be maintained is steam cooling.
- Steam cooling is not initiated until level decreases to top of active fuel because:

EO-3.0

- Adequate core cooling is assured with level above TAF.
- Steam cooling is effective only when RPV water level has decreased into the core region.

11. Line up for injection, start pumps, and irrespective of pump NPSH and vortex limits, raise injection flow to the maximum with all systems and injection subsystems.
    - This step insures all available, specified means are used to inject into the vessel. EO-3.0
12. WAIT until RPV water level drops to -14 in.
    - RPV emergency depressurization is not initiated until -14 in. because: EO-3.0
        - Adequate core cooling is assured with RPV level above -14 in.
        - While RPV level is decreasing time is better spent attempting to make additional systems available for injection.
13. Emergency RPV Depressurization is required: Line up for injection, start pumps, and raise injection flow to the maximum with all alternate injection subsystems.

- Since all available systems and subsystems are unavailable to maintain RPV water level above TAF, the use of alternate injection subsystems is required.

EO-3.0

14. IF
Water level cannot be restored and maintained above -14 in.
THEN
Primary Containment Flooding is required: enter EOP-C6.

- If level cannot be restored at this point, then a last effort is the core by flooding the containment.

Show entry point into EOP-C6.

Q: What is the purpose of EOP-C1?
A: To provide explicit instructions for RPV water level control to restore and maintain RPV level above TAF.
Q: If all control rods are not inserted to at least position 02 AND the Rx will not remain shutdown without boron, then which procedure is entered from EOP-C1?
A: N2-EOP-C5.

Q: If RPV water level cannot be determined, then which procedure is entered from EOP-C1?

A: N2-EOP-C4.

Q: If RPV water level is rising, then which procedure is entered from EOP-C1?

A: N2-EOP-RL.

III. WRAP-UP

A. Summary

The actions specified in this procedure provided more explicit instructions for RPV water level control than those provided in the RPV Level Control Procedure. Specific instructions are given based on the status of RPV water level and water level trend, and availability of specific systems. These instructions are given in an effort to restore and maintain RPV water level to above the top of active fuel.