NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

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

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

	SIGNATURE	DATE
PREPARER	[signature]	8/30/90
TRAINING SUPPORT SUPERVISOR	[signature]	9-28-90
TRAINING AREA SUPERVISOR	[signature]	9/6/90
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	[signature]	9/7/90

MASTER CONTROLLED DOCUMENT

Summary of Pages

(Effective Date: 9/28/90)

Number of Pages: 13

Date	Pages
September 1990	i-13

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: ________ ____

DATA ENTRY: ________ ____

RECORDS: ________ ____

4/29/05

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:

1. Classroom Lecture
2. Assign the Student Learning Objectives as review problems with the students obtaining answers from the text, writing them down and handing them in for grading.

F. Prerequisites:

1. Instructor:
   a. Qualified in instructional skills per NTP-16 and/or 16.1.
2. Trainee:
   a. In accordance with NTP-10 and NTP-11 or
   b. Be recommended for this training by the Operations Superintendent or his designee or by the Training Superintendent.

G. References:
BWROG Emergency Procedure Guidelines, Rev. 4,
Plant Procedure N2-EOP-C1

II. REQUIREMENTS

A. AP-9, Administration of Training

B. NTP-10, Training of Licensed Operator Candidates

C. NTP-11, Licensed Operator Requalification Training

III. TRAINING MATERIALS

A. Instructor Materials:

1. Transparency Package
2. Overhead Projector
3. Whiteboard and Felt Tip Markers
4. EOP Flowchart for C1

B. Trainee Materials:

1. EOP Flowchart for C1

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

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.

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		
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.		EO-2.0
B. Procedural Steps		
1. While executing the following steps:	Show TP or flowchart of EOP-C1.	
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 Contingency #5, Level/Power Control.	Show entry into C-5.	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 Contingency #4, RPV Flooding	Show entry point into EOP-C-4.	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)
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.

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. EO-3.0
- 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.

3. Can at least 2 of the injection subsystems be lined up.

   a. YES - continue at STEP #5

b. NO - continue at STEP #4 — EO-3.0

- 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.

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" — step #11
   - RPV pressure may decrease to less than 195 psig. If it does it is appropriate to continue at the step specified. — EO-3.0
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. EO-3.0
- 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:

- 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 contingency #6 — *Delivery notes:* Show entry point in C-6.
    - If level cannot be restored at this point, then a last effort is the core by flooding the containment.

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.