NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-REQ-006-344-2-06 Revision 4

TITLE: EMERGENCY OPERATING PROCEDURES, DRYWELL TEMPERATURE CONTROL (DWT)

	SIGNATURE	DATE
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TRAINING AREA SUPERVISOR		10/12/90
PLANT SUPERVISOR/ USER GROUP SUPERVISOR		10/12/90

Summary of Pages

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Number of Pages 14

Date Pages

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THIS LESSON PLAN IS A GENERAL REWRITE

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

VERIFICATION: _____ _____

DATA ENTRY: _____ _____

RECORDS: _____ _____

I. TRAINING DESCRIPTION

A. Title of Lesson: Emergency Operating Procedures, Drywell Temperature Control (DWT)

B. Lesson Description: This lesson plan discusses actions taken to control drywell temperature.

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

D. Method of Evaluation, Grade Format, and Standard of Evaluation:

1. Written examination with 80% minimum passing grade.

E. Method of 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. Certified in accordance with NTP-16 or NTP-16.1.
2. Trainee:
   a. In accordance with NTP-10 or NTP-11 or
   b. Be recommended for this training by the Operations Superintendent (or designee) for the Training Superintendent.

G. References:

1. BWROG Emergency Procedure Guidelines, Rev. 4
2. Plant Procedure N2-EOP-PC Section DWT.

II. REQUIREMENTS

A. Requirements for class:

1. AP-9, Administration of Training
2. NTP-10, Training of Licensed Operator Candidates
3. 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 DWT

B. Trainee Materials:

1. EOP Flowchart for DWT
2. OLP-DWT

IV. EXAM AND MASTER ANSWER KEYS

A. 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 the 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 Drywell Temperature Control Procedure.

EO-2.0 State the entry conditions for the Drywell Temperature 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 specifies the operator actions for controlling and maintaining drywell temperature below that which would cause damage to Primary Containment equipment or threaten Primary Containment integrity.		EO-1.0
C. Procedural Overview		
1. The Drywell Temperature Control Procedure is executed concurrently with the following procedures:		
a. N2-EOP-SPT Suppression Pool Temperature Control		
b. N2-EOP-SPL Suppression Pool Level Control		
c. N2-EOP-PCP Primary Containment Pressure Control		
d. N2-EOP-PCH Primary Containment Hydrogen Control		
2. Concurrent execution is necessary because:		
a. The actions taken to control any one parameter may directly effect control of the others.		

b. This procedure is based on the symptomatic approach to emergency response where the initiating events of the transient is not known in advance. Assignment of priorities to any one of the five parameters is not therefore possible.

3. The values and trends of parameters and the status of plant equipment during the event will dictate the other of executing of each flowpath (procedure).

II. DETAILED DESCRIPTION:

A. Entry Conditions

1. Setpoints

a. The conditions which require entry into this procedure are: EO-2.0

1) Suppression Pool temperature above 90°F.

- Most limiting pool temperature addressed by Technical Specifications.

2) Drywell temperature above 150°F.

- Drywell limiting temperature as specified by Tech. Specs.

3) Suppression Pool water level above El. 201 ft.
   - Maximum LCO pool level by Tech. Specs.

4) Suppression Pool water level below El. 199.5 ft.
   - Minimum LCO pool level by Tech. Specs.

5) Drywell pressure above 1.68 psig.
   - Limiting Safety System Setting for drywell pressure by Tech. Specs.
     - ALSO: ECCS setpoint & entry into RPV control.

6) Primary Containment hydrogen concentration above 1.8%.
   - H_2/O_2 Analyzer alarm setpoint.

b. The occurrence of any one of these conditions requires entry into this procedure.

c. If any entry condition clears prior to exiting this procedure, and then reoccurs, re-entry at the beginning of the procedure is required.

d. If a second entry condition occurs while performing the procedures, re-entry at the beginning is again required.

e. If all entry conditions clear while executing this procedure, this procedure may be exited.

f. Termination of the emergency rather than termination of an event is the basis for exiting conditions for EOP's. Consequently, these procedures may be exited at any point during their execution if the operator determines that an emergency no longer exists. The EOP's have been written so that if an operator remains in a procedure when an emergency no longer exists, they still provide proper guidance. Alternately, if the operator exists a procedure prematurely, reoccurrence of an entry condition will follow and the appropriate EOP procedure will be re-entered. (TMR #02-88.232)

2. Setpoint Bases

   a. The values selected were chosen on the basis of being simple, readily identifiable and operationally significant. They also provide advance warning of potential emergency conditions, allowing action to be taken which may prevent more severe circumstances.

B. Procedural Steps

1. Monitor and Control Drywell Temperature below 150°F using available drywell cooling.

   - Provides a smooth transition from general plant procedures to EOPs.
   - Assures normal methods have been employed prior to more complex actions.

   CAUTION An RPV water level instrument may be used to determine RPV water level only when:

   1) The hottest drywell temperature is below the RPV Saturation Temperature (Fig. PC-9).

   2) For each of the instruments in the table below, Refer to table in EOP the instrument reads above the Minimum Indicated level.

EO-3.0

2. WAIT until drywell temperature cannot be maintained below 150°F.

   • The possibility exists that drywell temperature is not the concern, allows attention to be diverted to that which is BUT, not to ignore this parameter, as not being a le to control this temperature confirms the inability of drywell cooling systems to maintain temperature and further actions are necessary.

   EO-3.0

3. Operate all available drywell cooling.

   - Defeat isolation interlocks if necessary.

     • Provides authorization to defeat isolation interlocks, isolations that may very well have been caused by the actions required by other EOPs (eg lowering RPV water level as required by C5, Level/Power Control).

     EO-3.0

4. While executing the following steps:
   IF
   Drywell sprays have been initiated
   AND
   Drywell pressure drops below 1.68 psig.
   THEN
   Terminate drywell spray — EO-3.0
   - Avoids creating excessive negative pressures that may exceed the design capacity of the containment.
   - Permits resetting scram and containment isolation logic, which allows performing EOP actions without defeating interlocks.

5. BEFORE - drywell temperature reaches 340°F (Drywell sprays) — EO-3.0
   - Action must be taken to reverse the increasing temperature as drywell cooling has been ineffective.
   - 340°F is the Drywell design temperature.

6. Is Suppression Pool water level below El 217 ft.
   a. YES - continue at STEP #7 — EO-3.0
      - Vacuum breakers are not submerged and will function as designed.

b. NO - continue at STEP #9

- Drywell spray operation with the vacuum breakers submerges could result in exceeding the design negative differential pressure capability (-4.7 PSID) of the Primary Containment due to inability to equalize pressure.

EO-3.0

7. Are drywell temperature and pressure within the Drywell Spray Initiation Pressure Limit (Fig. PC-3)
   a. YES - continue at STEP #8
   b. NO - continue at STEP #9
8.
   a. Trip recirculation pumps.
   b. Trip drywell cooling fans.
   c. Initiate drywell sprays.
      - Use only RHR pumps which do not have to be run continuously in the LPCI mode for adequate core cooling.
        - Before the ADS qualification temperature (340°F) is exceeded drywell spray should be initiated.

EO-3.0

- However, drywell spray can only be utilized if the drywell parameters are within the limits of Figure (PC-3).

d. Fig. PC-3 is curve of drywell temperature.

e. This limit is defined as the highest drywell temperature at which initiation of drywell sprays will not result in evaporative cooling pressure drop to below either.

Curve discussed in LP#2

1) The drywell-below-wetwell d/p capability or,

2) The high d/w pressure scram setpoint.

- Drywell cooling fans and recirc pumps are shutdown to prevent electrical damage to their motors.

EO-3.0

9. IF
Drywell temperature cannot be maintained below 340°F
THEN
Emergency RPV Depressurization is required: enter RPV Control and execute it concurrently with this procedure.

a. 340°F is the ADS qualification temperature; above 340°F there is no guarantee that ADS will function as designed.

b. Emergency RPV Depressurization is required before temperature reaches 340°F to assure that the ADS valves will open.

c. Entry into RPV Control assures that the reactor (if possible) is scrammed and shutdown by control rod insertion before depressurization occurs.

EO-3.0

III. WRAP-UP

A. Summary

The drywell temperature control procedure specifies actions for controlling and maintaining drywell temperature. The preferred method of drywell temperature. The preferred method of drywell temperature control uses available drywell cooling. If drywell temperature continues to increase, drywell spray may be used if certain restrictions are satisfied. If drywell temperature increases high enough to cause the water in the RPV water level instrument reference legs to boil, RPV water indication can no longer be relied upon. RPV Flooding is therefore required. If drywell temperature cannot be maintain below the temperature for which ADS is qualified, Emergency RPV Depressurization is required before drywell temperatures exceeds the temperature capability of ADS. This is to assure the SRV's will be opened if emergency RPV depressurization is subsequently required to assure adequate core cooling or protect containment integrity.