

NIAGARA MOHAWK POWER CORPORATION

07-187-91

NINE MILE POINT NUCLEAR STATION

UNIT II OPERATIONS

02-LOT-006-344-2-06

Revision

4 JK 12/13/90

TITLE: EMERGENCY OPERATING PROCEDURES, DRYWELL TEMPERATURE

CONTROL (DWT)

	SIGNATURE	DATE
PREPARER	<u>[Signature]</u>	<u>12-1-90</u>
TRAINING SUPPORT SUPERVISOR	<u>[Signature]</u>	<u>12-1-90</u>
TRAINING AREA SUPERVISOR	<u>[Signature]</u>	<u>12-5-90</u>
PLANT SUPERVISOR/ USER GROUP SUPERVISOR	<u>[Signature]</u>	<u>12/10/90</u>

Summary of Pages: _____
 Effective Date: 12/1/90

Number of Pages: 14
 Date: December 1990
 Pages: 1-14

CONTROLLED DOCUMENT

TRAINING DEPARTMENT RECORDS ADMINISTRATION ONLY:

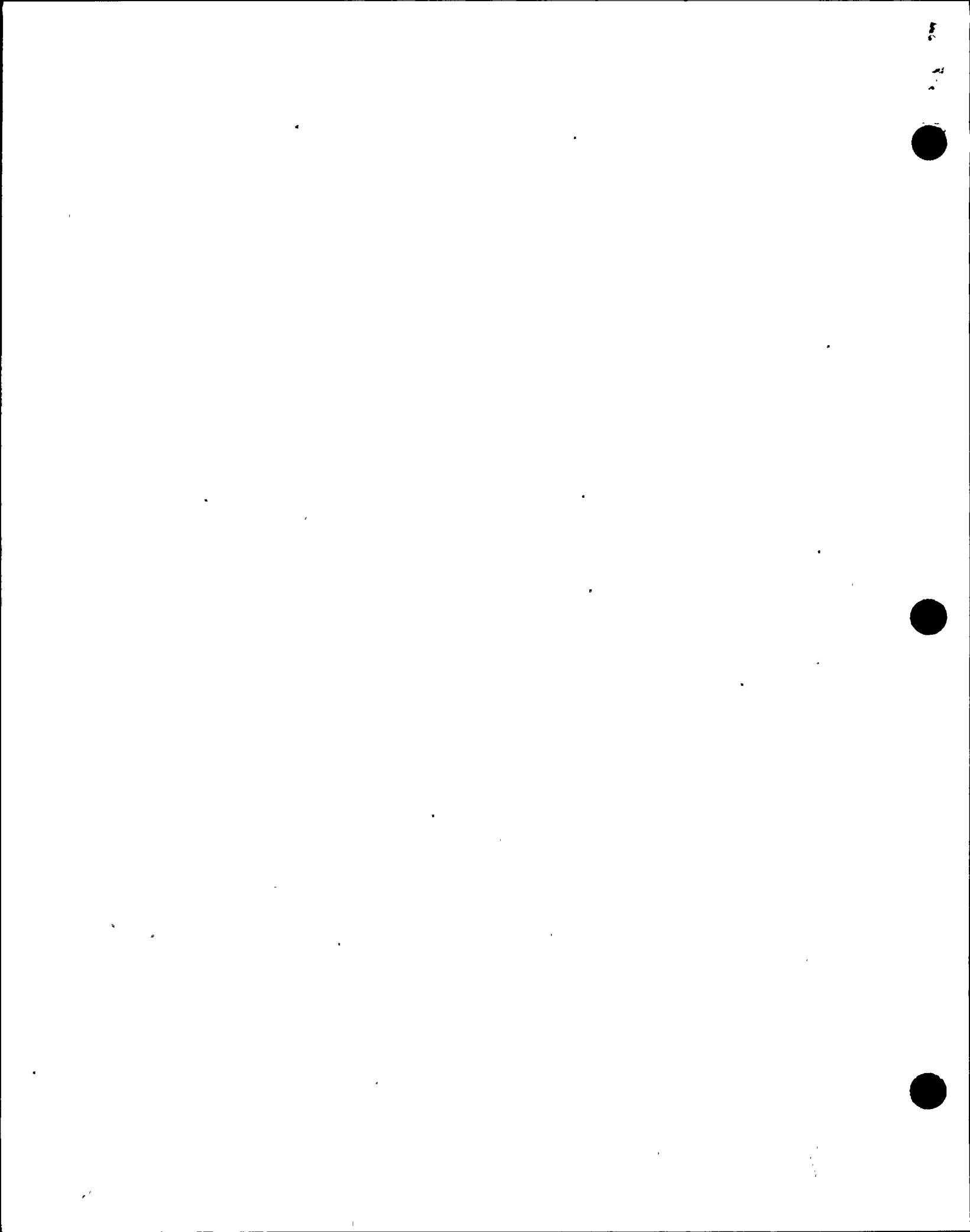
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ATTACHMENT 6
LESSON PLAN TEMPORARY/PUBLICATION/ADDENDUM CHANGE FORM

The attached change was made to:

Lesson plan title: Emergency Operating Procedures Drywell

Lesson plan number: 02-LOT-~~006~~-344-2-~~06~~ Temperature Control (DWT)

Name of instructor initiating change: D. Pentfield

Reason for the change: Change Revision # to Rev. 4

due to typographical error

Type of change:

1. Temporary change

2. Publication change

3. Addendum change


Disposition:


1. Incorporate this change during the next scheduled revision.

2. Begin revising the lesson plan immediately. Supervisor initiate the process.

3. To be used one time only.

Approvals:

Instructor:  /Date 12-12-90

Training Area Supervisor
(or designee):  /Date 12-15-90



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: 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-DWT, 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 DWT
 - 5. Training Record
- B. Trainee Materials:
 - 1. EOP Flowchart for DWT
 - 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

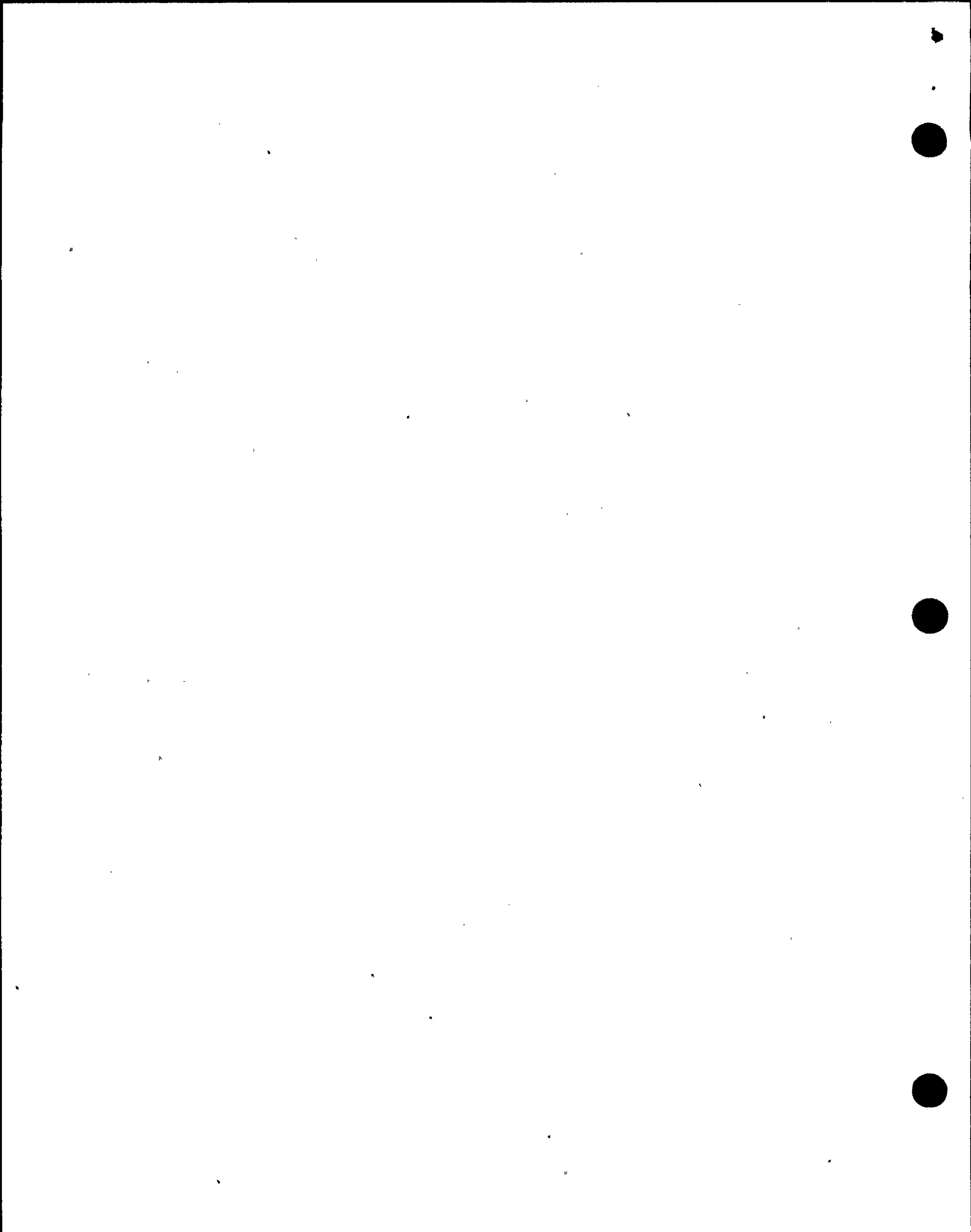
Upon completion of this training, the trainee will have gained the knowledge to perform the following:

A. Terminal Objectives:

- TO-1.0 Given conditions requiring the use of the 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 N2-EOP-PC Section DWT. (3449420603)
- TO-3.0 (SRO ONLY) Respond to a high drywell temperature. (3449800403)
- TO-4.0 Perform the actions required for a high drywell pressure. (2000070501)
- TO-5.0 Perform the actions required for a high suppression pool water level. (2000230501)
- TO-6.0 Perform the actions required for a steam line rupture. (2000400501)
- TO-7.0 Perform the actions required for a large break LOCA, inside the Primary Containment. (2009150501)
- TO-8.0 Operate the Containment Spray System. (2050150101)
- TO-9.0 Restore RBCLC to DRS unit coolers following automatic isolation, from the Control Room. (2089130401)

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.



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

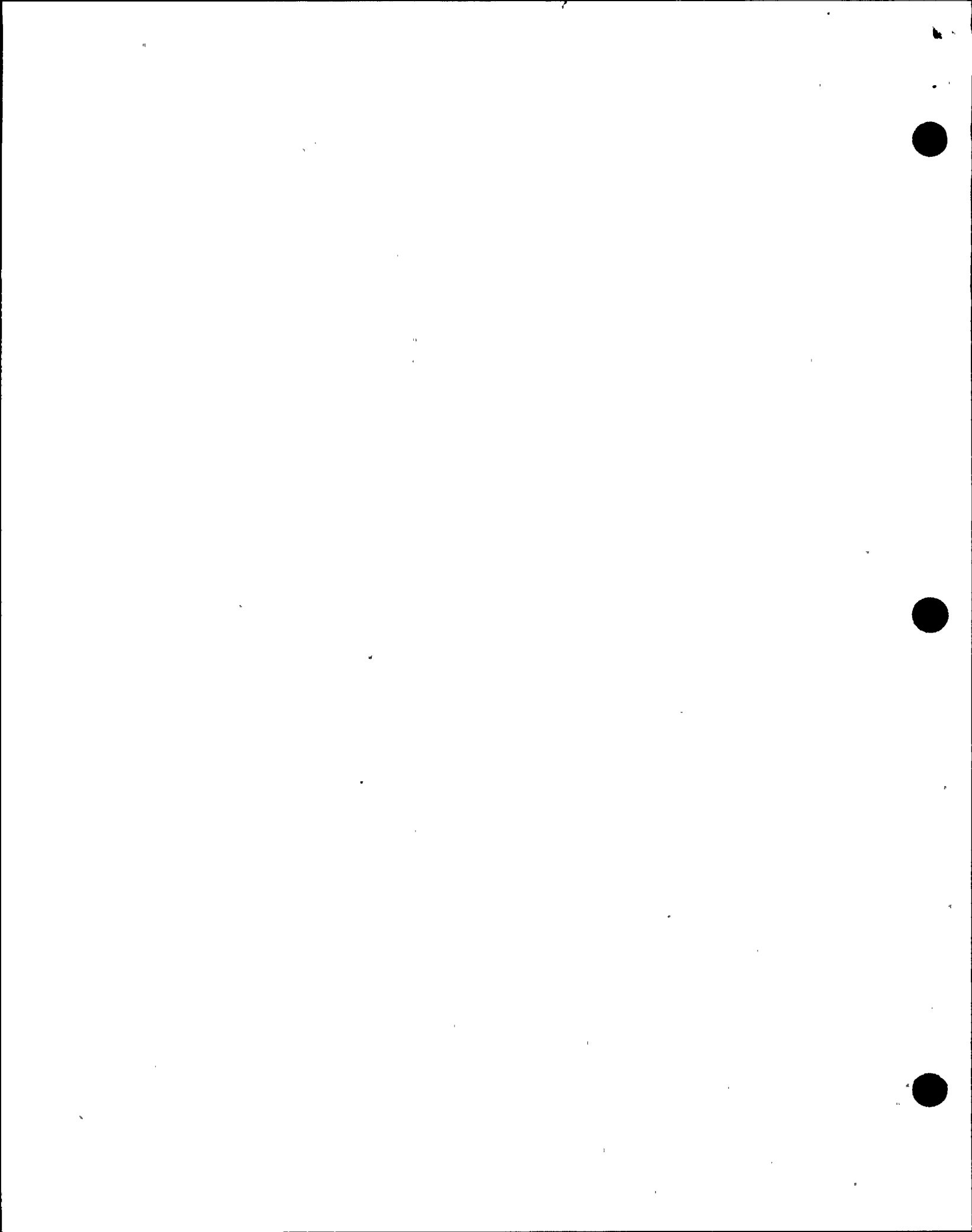
This procedure specifies the operator actions for controlling and maintaining drywell temperature below that which would cause damage to Primary Containment equipment or threaten Primary Containment integrity.

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 order of executing of each flowpath (procedure).

II. DETAILED DESCRIPTION:

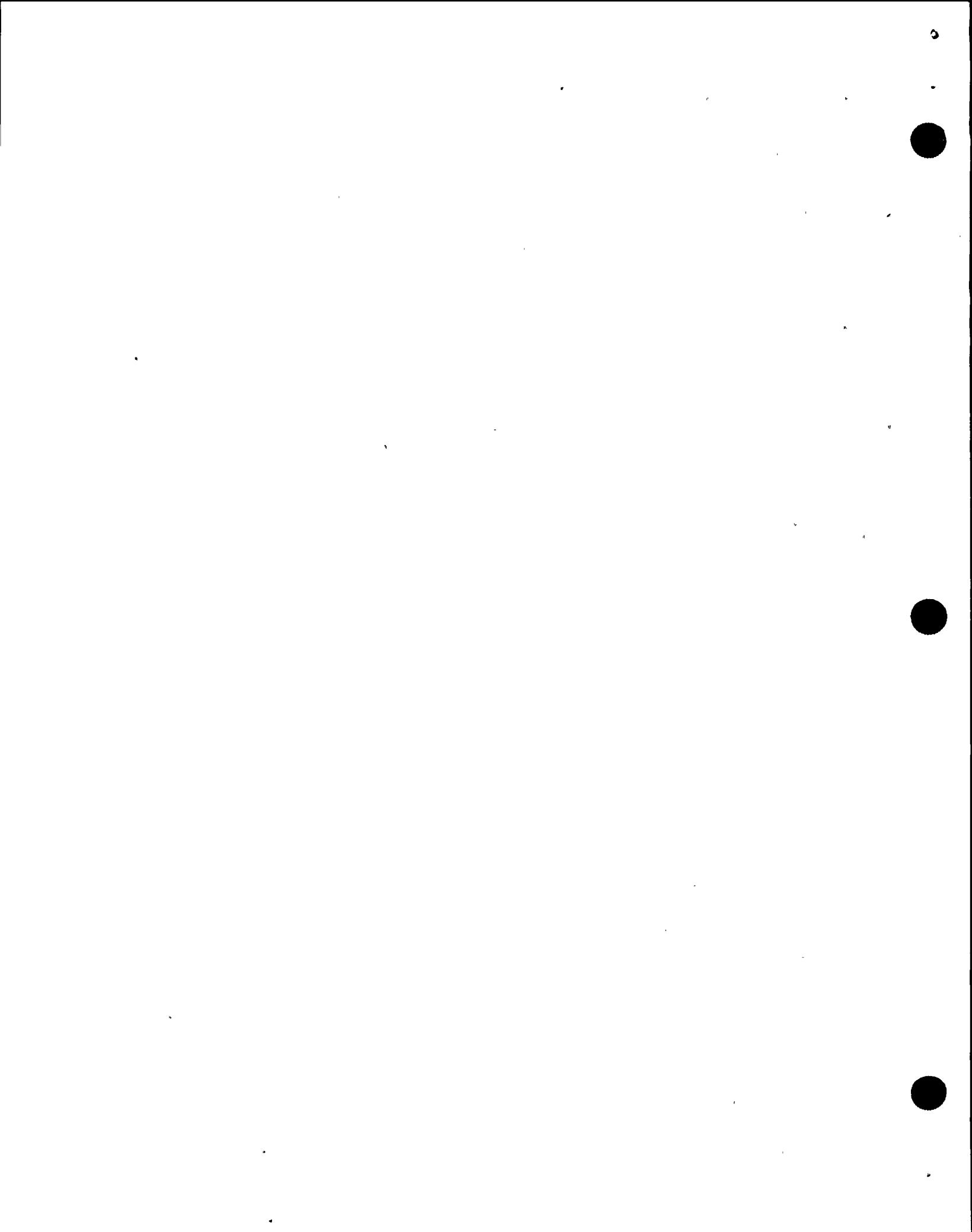
A. Entry Conditions

1. Setpoints

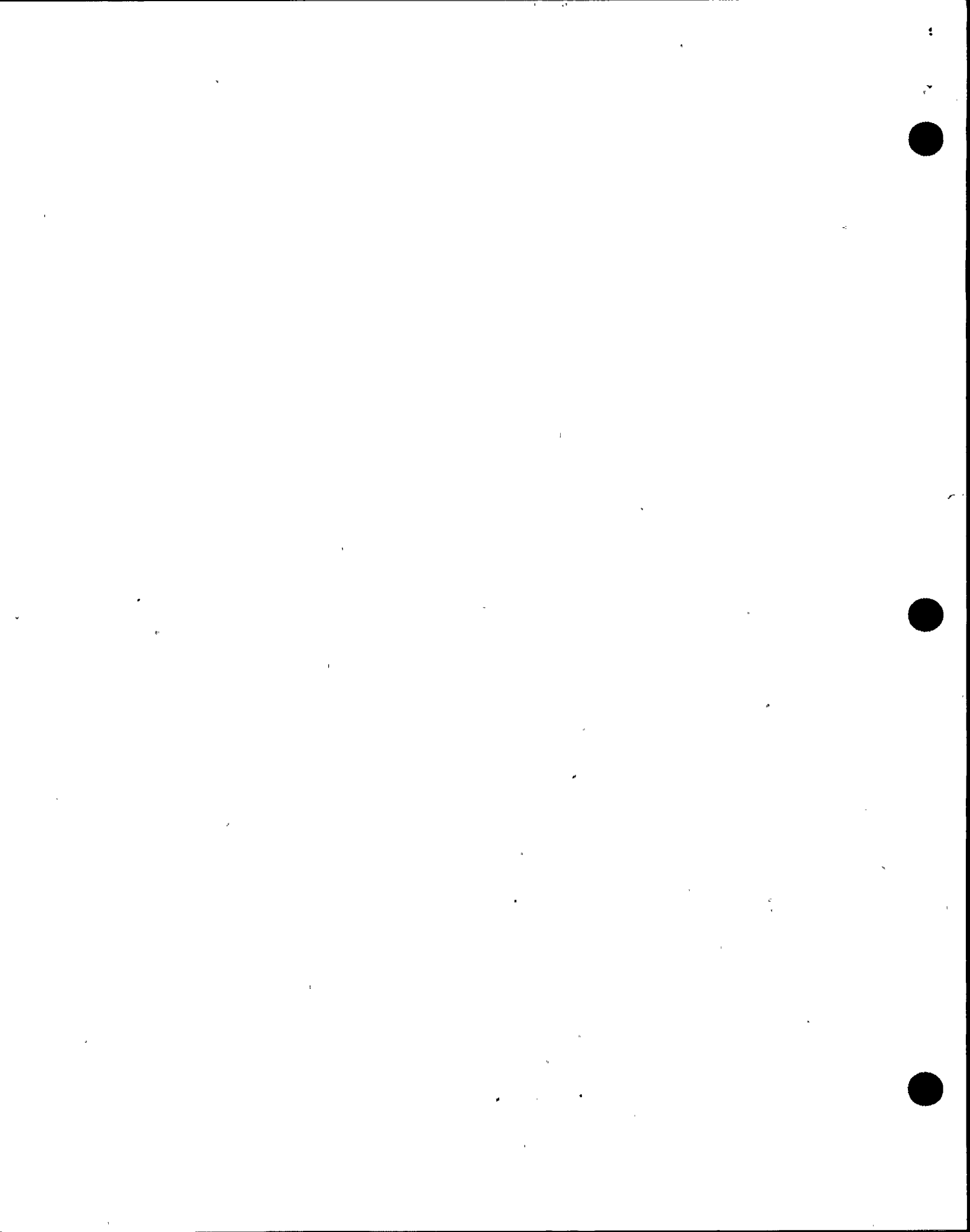
- a. The conditions which require entry into this procedure are:
 - 1) Suppression Pool temperature above 90°F.
 - Most limiting pool temperature addressed by Technical Specifications.

NOTE: TP's may be used to highlight points of interest on flowcharts; use TP's to show procedural steps if flowchart not used.

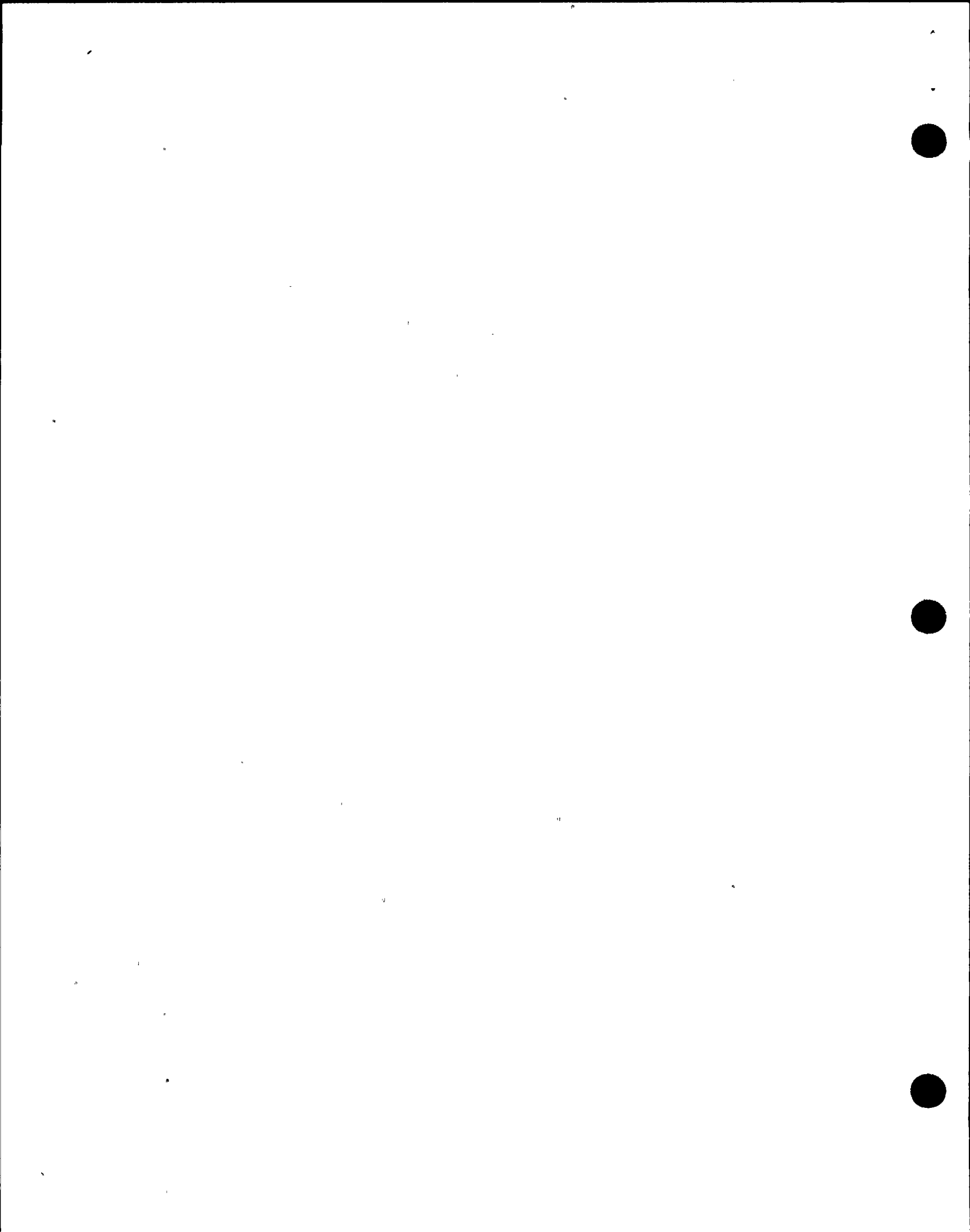
EO-2.0



- 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%.
 - H₂/O₂ 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 exits 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.

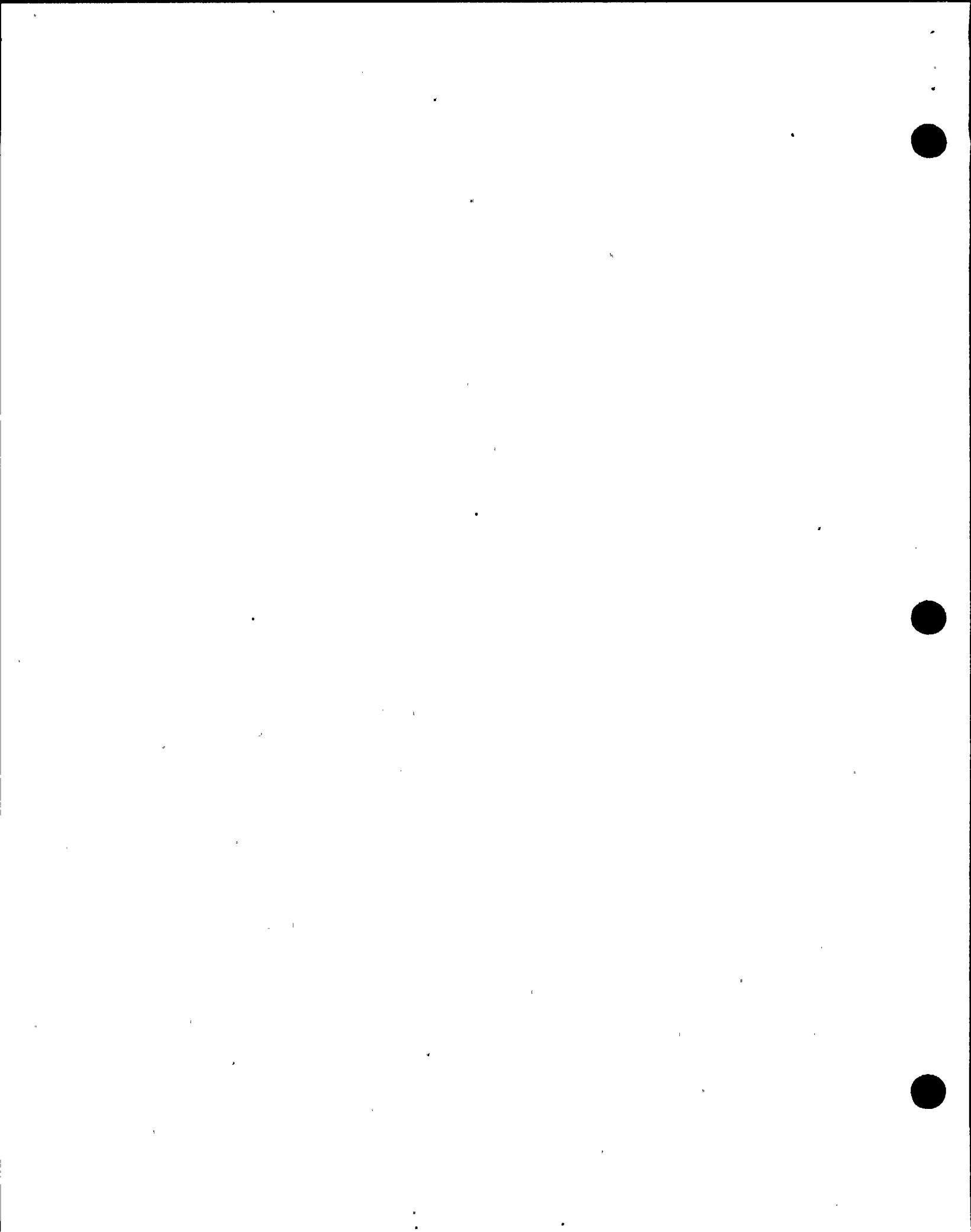
CAUTION An RPV water level instrument may be used to determine RPV water level only when:

- 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.

NOTE: Execute EOP-SPT, SPL, PCP and PCH concurrently with this procedure.

EO-3.0

Show TP of Figure PC-9.



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 able to control this temperature confirms the inability of drywell cooling systems to maintain temperature and further actions are necessary.
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

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)

- Action must be taken to reverse the increasing temperature as drywell cooling has been ineffective.
- 340°F is the Drywell design temperature.

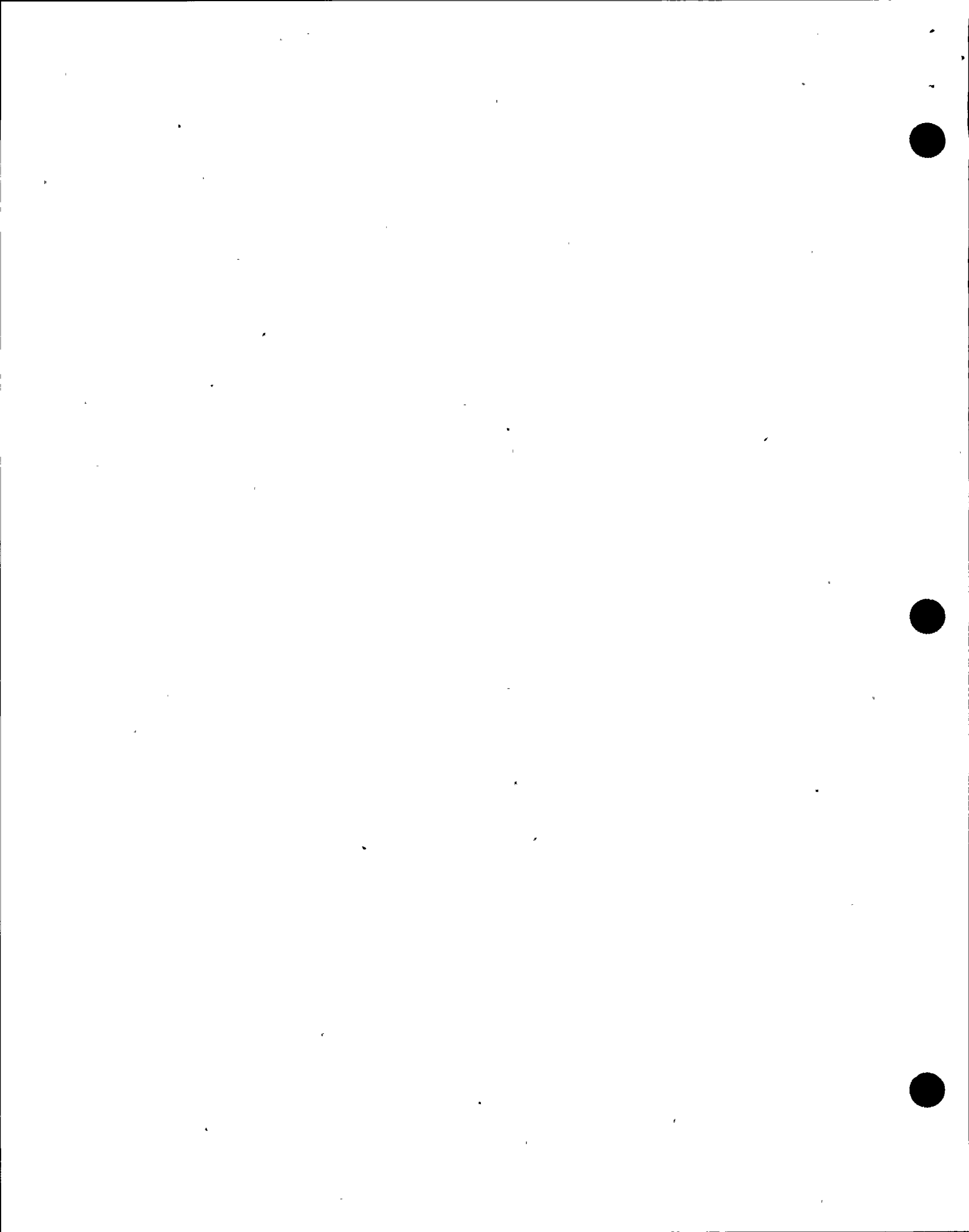
EO-3.0

6. Is Suppression Pool water level below E1 217 ft.

a. YES - continue at STEP #7

- Vacuum breakers are not submerged and will function as designed.

EO-3.0



- b. NO - continue at STEP #9
- Drywell spray operation with the vacuum breakers submerged could result in exceeding the design negative differential pressure capability (-4.7 PSID) of the Primary Containment due to inability to equalize pressure.
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

Show TP of Figure PC-3.

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

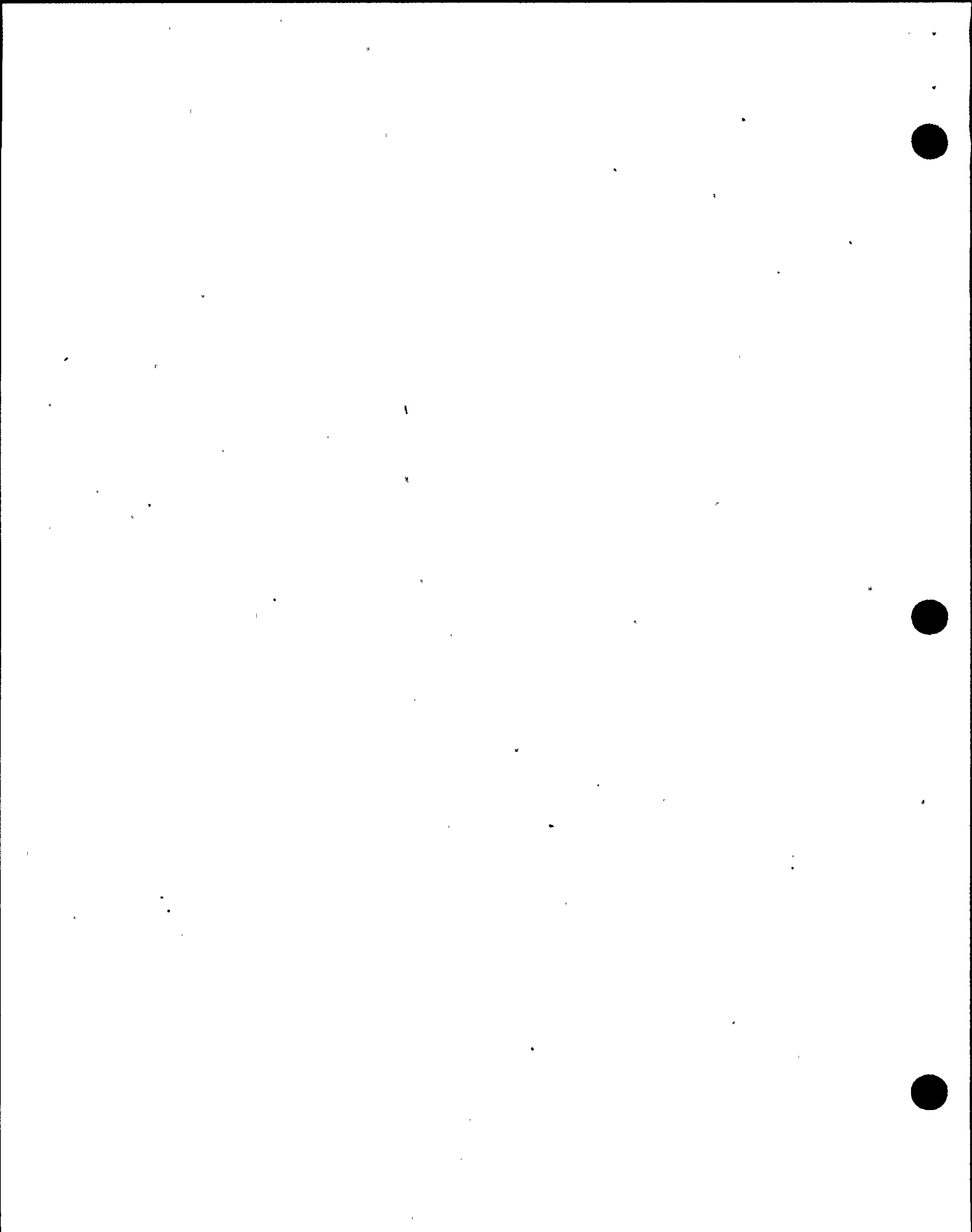
Emergency RPV Depressurization is required:
enter RPV Control and execute it
concurrently with this procedure.

- 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

Q: What is the purpose of EOP-DWT?

A: Provides actions necessary to control and
maintain drywell temperature below that
which would cause damage to the containment
and threaten Primary Containment integrity.



Q: What are the entry conditions of EOP-DWT?

- A:
- Suppression pool temperature above 90°F
 - Suppression pool water level above El. 201 ft.
 - Suppression pool water level below El. 199.5 ft.
 - Drywell temperature above 150°F
 - Drywell pressure above 1.68 psig
 - Primary Containment H₂ concentration above 1.8%

Q: Which EOP's are executed concurrently with EOP-DWT?

- A:
- N2-EOP-SPT
 - N2-EOP-SPL
 - N2-EOP-PCP
 - N2-EOP-PCH



III. WRAP-UP

A. Summary

The drywell temperature control procedure specifies actions for controlling and maintaining 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 maintained below the temperature for which ADS is qualified, Emergency RPV Depressurization is required before drywell temperatures exceed 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.

