OYSTER CREEK

NUCLEAR GENERATING STATION PROCEDURE

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OYSTER CREEK VERIFICATION AND VALIDATION PROGRAM FOR EOP'S

OYSTER CREEK NUCLEAR GENERATING STATION
VERIFICATION PROCEDURE FOR EMERGENCY OPERATING PROCEDURES

PURPOSE

The purpose of this procedure is to identify the phases of the verification process, how they will be performed and by whom, and what source documents will be used. This procedure shall be utilized for initial EOP approval and for any revisions made in the future.

DEFINITIONS

Emergency Operating Procedures (EOPs) - Plant procedures directing operator actions necessary to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system setpoints, engineered safety features setpoints, or other appropriate technical limits.

Emergency Operating Procedure Guidelines (EPGs) - Guidelines that provide sound technical bases for the development of EOPs.

EOP Source Documents - Fundamental documents or records upon which EOPs are based.

EOP Technical Accuracy - Proper incorporation of generic and/or plant-specific technical information from EOP source documents and plant hardware into the EOPs.

EOP Verification - The evaluation performed to confirm the written correctness of the EOPs and to ensure that the generic and/or plant specific technical aspects have been properly incorporated.

EOP Written Correctness - Proper incorporation of information from the Horizon writers guide for EOPs and other appropriate administrative policies into the EOPs.

Symptoms - Displayed plant characteristics which directly or indirectly indicate plant status.

EOP SOURCE DOCUMENTS

The designated EOP Source Documents to be used in completing the Verification Checklist for Written Correctness (Attachment 1) and the Verification Checklist for Technical Accuracy (Attachment 2) are:

Verification Checklist for Written Correctness

1. Writer's Guide For Emergency Operating Procedures (INPO)

2. Oyster Creek Nuclear Station Emergency Operating Procedure Writer's Guide

Verification Checklist for Technical Accuracy

3. Oyster Creek Nuclear Station Symptom Based Emergency Operating Procedure Technical Guidelines

4. Oyster Creek Nuclear Generating Station Technical Specifications

5. Memo, OC Emergency Operating Procedures: Plant Unique Action Points and Limit Curves, SAPC 043, March 7, 1983

The source document and section used should be referenced on the Discrepancy Sheet (Attachment 3).

RESPONSIBILITIES

The following personnel are responsible for some portion of the EOP Verification Process:

Oyster Creek Director of Operations

° Final approval of all EOP's and revisions.

Systems Engineering

° Overall responsibility of the EOP Verification Process.

° Determine when EOP verification is needed and its scope.

° Manage the technical accuracy evaluation portion of the process.

° Approve the technical content of all EOP's and revisions.

Special Engineering Projects

° Determine when EOP verification is needed and its scope.

° Approve the verification resolutions.

Human Factors

° Manage the written correctness evaluation portion of the process.

EOP VERIFICATION PROCESS

After personnel have been selected to perform the evaluation and the appropriate EOP Source Documents have been gathered, the process can be divided into three phases: verification, resolution, and documentation.

During the verification phase, the evaluators identify discrepancies using the Verification Checklist for Written Correctness and the Verification Checklist for Technical Accuracy. The Discrepancy Sheet is used for this purpose. This is accomplished by comparison of the EOP's to their source documents. Justifying remarks by the EOP writer shall be provided for the discrepancies noted by the evaluator. Concurrently, operators who have been trained on the new EOP's, participate in the verification phase by completing Operator Feedback Sheets (Attachment 4). Their comments are used by the evaluators in filling out Discrepancy Sheets.

After the EOP writer has provided justifying remarks, potential resolutions should be developed, the choices reviewed, and one of them selected, approved, and incorporated. The resolution phase requires input from supervisory personnel who have the responsibility of final approval of the EOP. They will review the evaluator's comments and resolve any conflicts between the writer's and evaluator's comments. Resolutions will then be forwarded to the Oyster Creek Director of Operations for review and approval. EOP's and/or source documents will be modified to reflect the approved resolutions under the direction of the Oyster Creek Director of Operations.

The identification of discrepancies and the resolution for each discrepancy should be documented fully, using the Discrepancy Sheet provided for this purpose. This documentation will aid in identifying future discrepancies, resolutions thereof, and incorporating the appropriate changes in the EOP's and/or EOP Source Document.

EOP VALIDATION PROCESS

To determine if the operator can effectively use the EOP's during emergency conditions, the table-top, walkthrough, and simulator validation methods will be used. Walkthroughs at the Oyster Creek Control Room Mockup will be conducted. Scenarios will be devised to challenge the Symptom-oriented procedures. Walkthroughs of the new Oyster Creek EOP's will include assessment of whether:

(1) The required controls and indications are available to the operator and can be interpreted as called for in the EOP's.

(2) The symptoms described and the guidance provided are sufficient to allow the operator to respond to the spectrum of plant upsets which might confront him.

(3) There are any evolutions spelled out for which time may be a controlling factor - is it reasonable to expect the operator(s) to act in the time required.

(4) There are any evolutions for which being in more than one procedure at a time may be a controlling factor - is it reasonable to expect the operator(s) to be in more than one procedure at a time.

The new EOP's will also be exercised at the simulator by each group of operators that pass through the training program. A checklist will be employed for the walkthrough portion (Attachment 5) and for the simulator portion (Attachment 6).

ATTACHMENT 1 will be provided at a later date specified by the cover letter.

VERIFICATION CHECKLIST
For Technical Accuracy

The following four areas will be evaluated using the Oyster Creek Nuclear Station Symptom Based Emergency Operating Procedure Technical Guidelines:

- Entry Conditions or Symptoms Information

- Instruction Step, Caution or Note Information

- Quantitative Information

- Plant Hardware Information

Goal of Evaluation: To determine if the entry conditions or symptoms used for identifying when to use the EOP are correct and not excessive.

ENTRY CONDITIONS OR SYMPTOMS INFORMATION

- Are the entry conditions listed correct in all cases?

- Are they unique entry conditions?

Goal of Evaluation: To determine if the content and arrangement of EOP instructional steps, cautions, and notes are supported by information from the Oyster Creek Technical Guidelines.

INSTRUCTION STEP, CAUTION OR NOTE INFORMATION

- Do EOP steps, cautions and notes reflect the intent of the Technical Guidelines?
  - By content?
  - By order?

- Are any differences documented and explained?

- Are limits used supported by Technical Guidelines?

- Are correct plant-specific systems, instrumentation, controls and indications called out in the EOPs?

- Do any licensing commitments have to be modified? (Please document including discrepancy and when and how it will be addressed.)

Goal of Evaluation: To determine if calculated or translated quantitative values used in the EOPs are correct.

QUANTITATIVE INFORMATION

- Do the quantitative values, including limits, used in the EOPs comply with the Technical Guidelines?

- Where values used are not prescribed in the Technical Guidelines, are they computed accurately?

- Where values are given in the Technical Guidelines but not utilized in the EOPs, is it documented and explained?

- When the EOP requires the operator to perform a calculation, is sufficient information provided for the operator to perform the calculation easily and is adequate space provided?

Goal of Evaluation: To determine if the hardware specified in the EOP is available for operator use.

PLANT HARDWARE INFORMATION

- Is the plant hardware specified in the EOP available for operator use, including all equipment, controls, indication and instrumentation?

ATTACHMENT 3

Discrepancy Sheet Number ____

Verification Checklist: ____

Procedure and Step Number: ____

Discrepancy: ____

____

____

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Evaluator: ______________________________
Date: ____________

Resolution:

Approved: Yes No (circle one)

Supervisor: ______________________________
Date: ____________

Operations Supervisor: ____________________
Date: ____________

Resolution Incorporated by: ________________
Date: ____________

Attachment 4

0970P/plt

NAME (optional)____________________

OPERATOR FEEDBACK SHEETS - Page 1

1. Are <u>entry conditions</u> unique and indicative of when the procedure should be used?

2. Are instructions short, specifying a single action, and easy to understand?

3. Is the numbering scheme used easy to understand and follow?

4. Are operator actions accurately and specifically stated? And to what, if necessary?

5. Is level of detail appropriate for understanding?

6. Are limits and alarm setpoints stated?

7. Are cautions placed before the steps to which they apply?

8. Are cautions brief and clear?

9. Are notes placed before the steps to which they apply?

10. Are notes brief and clear?

11. Is information presented in charts, tables, graphs, and figures easy to understand? Does it aid in properly carrying out the procedure?

12. Are conditional statements used where appropriate? Is it clear from the boxed format with arrow in the left margin, to which steps the statements apply?

13. Are the conditional statements clear, concise, and consistent with the rest of the procedure?

14. When more than one procedure or parts of a procedure should be followed at the same time, is this easy to do? How?

15. Is it clear if and when the operator should return to the first procedure?

16. Is there any way the procedures can be improved to be more accurate, understandable, or easier to follow?

WALKTHROUGH CHECKLIST
EMERGENCY OPERATING PROCEDURES

ENTRY CONDITIONS	0.	Are the conditions for entering the procedures clearly and unambiguously displayed?
NOMENCLATURE	1.	Is the nomenclature -- names or abbreviations-clear, consistent and unambiguous?
DISPLAY IDENTIFICATION	2.	Are the displays which should be used to read a referenced variable obvious? If there are disagreements, is it obvious what course the operator should follow?
DISPLAY UNITS	3.	Can the variable be read on the reference display with the required precision? In the same units as in the procedure? With reference to the same point?
DISPLAY TREND	4.	Is long term trend required of the display? If so, is the display capable of providing it?
CONTROL ACTIONS	5.	Is the control action required of the operator clearly spelled out? Is the control or controls to be used in taking this action obvious? Is the consequence of the control action obvious?

WALKTHROUGH CHECKLIST
EMERGENCY OPERATING PROCEDURES

EXIT CONDITIONS	6.	Exit Conditions: Are the conditions which take the operator back to normal procedures clear?
COMPLICATIONS	7.	Simultaneous abnormal occurrences: Are these effectively treated, assuming EOPs come first?

SIMULATOR TRAINING EXERCISE CHECKLIST, EMERGENCY OPERATING PROCEDURES

1. What -- instruments
   -- controls
   are operators using to respond to scenario? Are these present at suitable locations for timely response at OysterCreek?

2. Are there -- instruments
   -- controls
   that the operator needs which are missing from the simulator? Are they missing at Oyster Creek?

3. In the scenarios exercised, would a division of responsibility along these lines work:

   (a) level/inventory

   (b) pressure/power

   (c) backup CRO-power (if no scram), otherwise containment control and ex-control room responsibility

   (d) SRO - Supervision of Oyster Creek operators -- imposition of interactive conditions on CRO's -- backup to CROs.

   (e) STA, -- backup to SRO in keeping track of where they are.

4. What was the most time-constrained control action(s) in the scenarios? Was it effectively handled?

5. Was the SRO (exercise leader) able to keep track of where the team was in each procedure? Was each operator able to keep track of where he was? How effectively were "hooks" imposed?

OYSTER CREEK TRAINING PROGRAM

FOR SYMPTOM BASED

EMERGENCY OPERATING PROCEDURE

Course 418.5
Symptom Based Emergency Operating Procedures

Course Title: Symptom Based Emergency Operating Procedures

Course Number: 418.5

Training Criteria:

This course, a part of the 1983 License Requal and STA Requal Programs, is designed to ensure that each Licensed Operator, Senior Operator, and Shift Technical Advisor is cognizant of the new Symptom Based Emergency Operating Procedures (EOP) including when entry or exit to each is required and how to utilize them effectively.

Behavioral Learning Objectives: At the completion of this training, the Licensed Operator or STA shall be able to:

(1) Given simulated plant parameters (alarms and indications), correctly determine when the EOP's should be entered and which procedure(s) to follow.

(2) Given any EOP precaution, state the basis and briefly explain the intent of that caution.

(3) Given any of the EOP parameter limit curves or graphs and stated parametric conditions, correctly determine whether a limit has been exceeded and the potential consequences if correct action is not taken.

(4) On a Non-Specific Plant Simulator, demonstrate the ability to maintain adequate core cooling, shut down the reactor, and cool down the RPV to cold shutdown as a member of a Control Room Team.

(5) On a Non-Specific Plant Simulator, demonstrate the ability to maintain primary containment integrity during analyzed plant accident conditions as a member of a Control Room Team.

(6) On a Non-Specific Plant Simulator, demonstrate the ability to restore and maintain control of reactor core reactivity during analyzed plant accident conditions as a member of a Control Room Team.

Note: Measurement of Behavioral Learning Objectives (4), (5), and (6) may be performed on a Non-Specific Plant Simulator.

Evaluation Criteria:

(1) Satisfactory achievement of Behavioral Learning Objectives (1), (2), and (3) shall be demonstrated by obtaining a score of at least 80% on a written examination.

(2) Satisfactory achievement of Behavioral Learning Objectives (4), (5), and (6) shall be demonstrated by each Control Room Team member by correct performance in real times with no operator errors that prevent (in and of themselves) meeting the objectives.

Prerequisites:

(1) Course participants are enrolled in (and are actively participating in) their respective Requalification Programs of which this course is but a part.

(2) A complete set of Symptom Based Emergency Operating Procedures are available.

(3) Full scope BWR Simulator is available including a qualified Simulator Instructor with demonstrated proficiency on Oyster Creek Symptom Based Emergency Operating Procedures.

Note: BWR Simulator need not be plant specific but must be approved for Oyster Creek Operator Training.

Instructor Qualifications:

(1) Demonstrated expertise in Symptom Based Emergency Operating Procedures.

(2) SRO Licensed or Certified (or SRO Licensed individual present during presentations).

(3) Instructor certified by GPUN training.

Training Methods:

(1) Formal classroom instruction.

(2) Directed self study and required reading.

(3) Procedural walkthroughs in Control Room Mockup and Oyster Creek Facility.

(4) Non-Plant Specific Full Scope Simulator, demonstrations and performance evaluations (team and individual).

Schedule for Course Completion:

(1) Formal classroom training is scheduled to begin on March 21, 1983 following initial verification and validation of the Oyster Creek Procedures.

(2) Simulator Training (including performance evaluations) is scheduled to begin on May 30, 1983 to be completed by October 2, 1983.

Audience (Required Course Participants):

(1) All Oyster Creek Licensed Operators.

(2) All Oyster Creek Shift Technical Advisors (Qualified).

References:

(1) Oyster Creek Training Program Manual, Section 303, "Licensed Operator Requalification Program," and Section 306, "STA Requalification Program."

(2) Oyster Creek NGS Symptom Based Emergency Operating Procedures Technical Guidelines (Draft).

(3) Memo, EPIC Committee Meeting Minutes (82-01), 9/16/82, A. Rone.

(4) Memo, Symptom Based Emergency Operating Procedure Operator Training, 10/15/82, A. Rone.

Instructional Materials and Proposed Topics:

The course will be broken down into several units of instruction, each covered by an individual Instructor Guide (Lesson Guide). Each Instructor Guide will detail the specific topic to be covered, method(s) of instruction appropriate to that topic, the topical behavioral learning objectives that relate directly to the overall course behavioral learning objectives, and the method of evaluation (including standards of performance) appropriate to that topic.

The following outline is a proposal of the topics to be covered and approximate instructional hours devoted to that topic.

Topics		Approximate Hours
I.	Symptom Based Emergency Operating Procedures Overview	- 4
II.	RPV Control Procedure	- 17
III.	Containment Control Procedure	- 17
IV.	Contingency Procedures	- 18
V.	BWR Simulator, Evaluation of Course Objectives	- 24
		- 80

Instructor Guides will be reviewed and approved in accordance with Oyster Creek Training Department Procedures.

Continued Evaluation and Follow-On Training:

Continued Evaluation of trainee proficiency on the job will be in accordance with their respective Requalification Program Requirements.

Follow-On Training - The objectives of this course will be met in subsequent initial training programs for Licensed Operators and STA's. An appropriate course of review of these topics is a part of the subsequent Requalification Program for Licensed Operators and will be made a part of the Requalification Program for STA's in accordance with Reference 1.

OYSTER CREEK PLANT SPECIFIC

EMERGENCY PROCEDURE GUIDELINES

From Revisions 2 & 3 of BWROG
Generic Guidelines

July 12, 1983

INTRODUCTION

The following symptomatic Emergency Procedure Technical Guidelines have been developed for Oyster Creek from the generic BWR Revision 2 Guidelines and enhanced with steps from the generic Revision 3 Guidelines:

- ° RPV Control Guideline
- ° Primary Containment Control Guideline

The RPV Control Guideline maintains adequate core cooling, shuts down the reactor, and cools down the RPV to cold shutdown conditions. This guideline is entered whenever a low RPV water level, high RPV pressure, high drywell pressure, or an isolation has occurred or a condition which requires reactor scram exists and reactor power is above 2% or cannot be determined.

The Primary Containment Control Guideline controls primary containment temperatures, pressure, and level whenever suppression pool temperature, drywell temperature, containment temperature, drywell pressure, or suppression pool water level is above its normal operating limit or suppression pool water level is below its normal operating limit.

Table 1 is a list of abbreviations used in the guidelines.

At various points throughout these guidelines, precautions are noted by the symbol [#]. The number within the box refers to a numbered "Caution" contained in the Operator Precautions section. These "Cautions" are brief and succinct red flags for the operator.

The differences between the Oyster Creek plant specific EPGs and the generic Revision 2 EPGs are summarized in Table 2.

TABLE 1

ABBREVIATIONS

ADS	-	Automatic Depressurization System
APRM	-	Average Power Range Monitor
CRD	-	Control Rod Drive
ECCS	-	Emergency Core Cooling System
HCU	-	Hydraulic Control Unit
IC	-	Isolation Condenser
LCO	-	Limiting Condition for Operation
LOCA	-	Loss of Coolant Accident
LPCS	-	Low Pressure Core Spray
MSIV	-	Main Steamline Isolation Valves
NDTT	-	Nil-Ductility Transition Temperature
NPSH	-	Net Positive Suction Head
RPS	-	Reactor Protection System
RPV	-	Reactor Pressure Vessel
RSCS	-	Rod Sequence Control System
RWCU	-	Reactor Water Cleanup
SBGT	-	Standby Gas Treatment
SLC	-	Standby Liquid Control
SORV	-	Stuck Open Relief Valve
EMRV	-	Electromatic Relief Valve
SDC	-	Shutdown Cooling

TABLE 2

DIFFERENCES BETWEEN OC EPGS AND REV. 2 GENERIC EPGS

- The OC EPGs have an entry condition into the RPV Control guideline based on high RPV pressure which is not included in the Rev. 2 generic guidelines. This entry condition was added to the OC EPGs from Rev. 3 of the generic EPGs.

- The OC EPGs have an entry condition into the RPV Control guideline based on operator judgment which is not included in the Rev. 2 or Rev. 3 generic EPGs. This entry condition was added to give the operator the flexibility of entering the EPGs prior to satisfying an entry condition if he needed to conserve inventory or limit a radioactive release.

- The generic EPGs include a conditional statement prior to step RC/L-2 which instructs the operator to go to Contingency #7 to better control the effects of an ATWS if boron injection is required. The OC EPGs do not include this step since the Contingency #7 guideline is not being implemented at this time.

- In step RC/L-2, the OC EPGs set a lower limit for controlling level at LO-LO-LO level. Both the generic Rev. 2 and Rev. 3 EPGs specify this limit at TAF. If the level cannot be maintained above this limit, the operator is instructed to abandon RC/L and go to Contingency #1. From our simulator experience, the lower limit for level control was raised from TAF to LO-LO-LO level. This higher limit gives the operator more time to recover level with steps in Contingency #1.

TABLE 2 (Cont'd)

- Caution #18 was added to the OC EPGs at step RC/Q-5.1.1 to assure that the RPS subchannel test switches can be placed in the trip position. This caution is Oyster Creek specific and is not contained in the generic Revision 2 or Revision 3 EPGs.

- The OC EPGs instruct the operator to put the mode switch in REFUEL to manually drive in individual rods in step RC/Q-5.2. This instruction is not included in either Rev. 2 or Rev. 3 of the generic EPGs since it is an Oyster Creek specific step.

- Step RC/Q-5.6.2 in the OC EPGs loops the operator back to the start of the RC/Q guideline to give him an exit path from the Power Control guideline or to allow him to try the steps again to insert control rods. This step is not present in Rev. 2 or Rev. 3 of the generic EPGs but is correctly placed in the OC EPGs.

- Caution #19 was added to the OC EPGs at step SP/T-1 to make the operator aware that removing the right combination of control power fuses defeats ADS for all of the valves. This caution is Oyster Creek specific and is not contained in the generic Revision 2 or Revision 3 EPGs.

- Caution #20 was added to the OC EPGs at step SP/T-2 to guard against overloading the diesel generator if it is necessary to use this power source for operating the containment spray system. This caution is Oyster Creek plant specific.

- Caution #21 was also added at step SP/T-2 to assure that excessive differential pressure is not imposed on the containment spray heat exchanger baffle plate. This caution is Oyster Creek plant specific.

- The OC EPGs include a step prior to step DW/T-2 which instructs the operator to execute steps DW/T-2 and DW/T-3 concurrently. This assures that the drywell temperature is maintained below the qualification temperature of the drywell liner and that reference legs of the RPV level instruments are monitored to determine if they flash. This step is not included in Rev. 2 of the generic EPGs but was added from the Rev. 3 EPGs.

- In step DW/T-3, the generic Rev. 2 and Rev. 3 EPGs make use of a limit curve as a criterion for initiating drywell sprays at a reduced flowrate. This limit curve guards against rapid depressurization in the drywell caused by condensation or evaporation cooling when the drywell sprays are initiated at the wrong time. The curve is a function of temperature in the torus vapor space and torus pressure. Oyster Creek has no temperature measurement capability in the torus vapor space and has no way to throttle drywell sprayflow rate. Thus, this curve is not included in the OC EPGs.

  The OC EPGs will instruct the operator to initiate drywell sprays at full flow if the temperature in the drywell exceeds the design temperature of the liner. This step appears again in step PC/P-3 and the above argument applies in that case also.

<u>TABLE 2</u> (Cont'd)

- Step PC/P-5 in the OC EPGs instructs the operator to enter the RPV Control guideline if RPV flooding is required. This step is included to assure that the RPV level and pressure control is transferred to Contingency #6. In addition, it assures that the reactor is shut down prior to flooding the RPV. This branch to RPV control is not included in Rev. 2 or Rev. 3 of the generic EPGs.

- Step SP/L-3 in the OC EPGs instructs the operator to execute steps SP/L-3.1 and SP/L-3.2 concurrently to lower torus level and to give him some criteria for terminating external water injection sources from adding water to the RPV which may be raising the level in the torus. This step is not present in the Rev. 2 EPGs but was taken from the Rev. 3 generic EPGs.

- In the OC EPGs, steps SP/L-3.1 through SP/L-3.2 are taken from Rev. 3 of the generic EPGs. These steps were incorporated to give the operator greater flexibility in controlling torus level.

- The conditional statement prior to step C1-4 in both sets of generic EPGs directs the operator to inhibit automatic ADS actuation whenever level is less than LO-LO-LO level. In the OC EPGs, automatic ADS actuation will be overridden only when level is below LO-LO-LO level and steam cooling is being used to remove the core heat.

TABLE 2 (Cont'd)

- In the OC EPGs, step C6-2.2 returns the operator to steps RC/P-4 and RC/L if the RPV level can be determined and all of the control rods are not inserted. The generic Rev. 2 guidelines direct the operator to Contingency #7 and step RC/P-4 under the same conditions. However, since Contingency #7 has been omitted from the OC EPGs at this time, the best guidance available is to direct the operator back to RPV control at steps RC/L and RC/P-4.

- The ATWS mitigation steps in Contingency #7 of the generic EPGs have been omitted from the OC EPGs due to technical questions about the guidance given in Contingency #7. The implementation of ATWS mitigation guidelines in the OC EPGs are contingent upon analysis work currently underway which evaluates Contingency #7 and alternate ATWS mitigation methods.

OPERATOR PRECAUTIONS

GENERAL

This section lists "Cautions" which are generally applicable at all times.

CAUTION #1

Monitor the general state of the plant. If an entry condition for either EMG-3200.01 "RPV Control" or EMG-3200.02 "Containment Control" occurs, enter that procedure. When it is determined that an emergency no longer exists, enter normal operating procedure.

CAUTION #2

Monitor RPV water level and pressure and primary containment temperatures and pressure from multiple indications.

CAUTION #3

If a safety function initiates automatically, assume a true initiating event has occurred unless otherwise confirmed by at least two independent indications.

CAUTION #4

Suppression pool temperature is determined by [procedure for determining bulk suppression pool water temperature]. Drywell temperature is determined by [procedure for determining drywell atmosphere average temperature].

CAUTION #5

Whenever [temperature near the instrument reference leg vertical runs] exceeds the temperature in the table and the instrument reads below the indicated level in the table, the actual RPV water level may be anywhere below the elevation of the lower instrument tap.

Temperature*	Indicated Level	Instrument
107°F	-107 in.	Wide Range Level (90 to 490 in.)
310°F	19 in.	GEMAC Narrow Range Level (90 to 180 in.)
545°F	168 in.	YARWAY Narrow Range Level (85 to 185 in.)

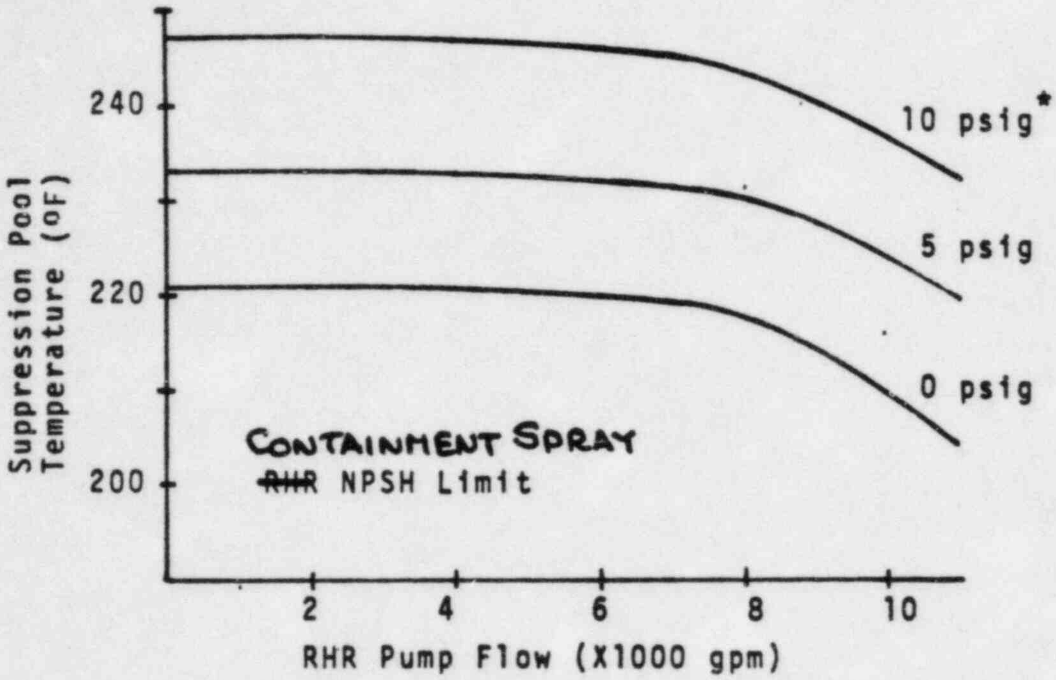
NOTE: The values in the above table are not plant specific and are presented for illustrative purposes only.

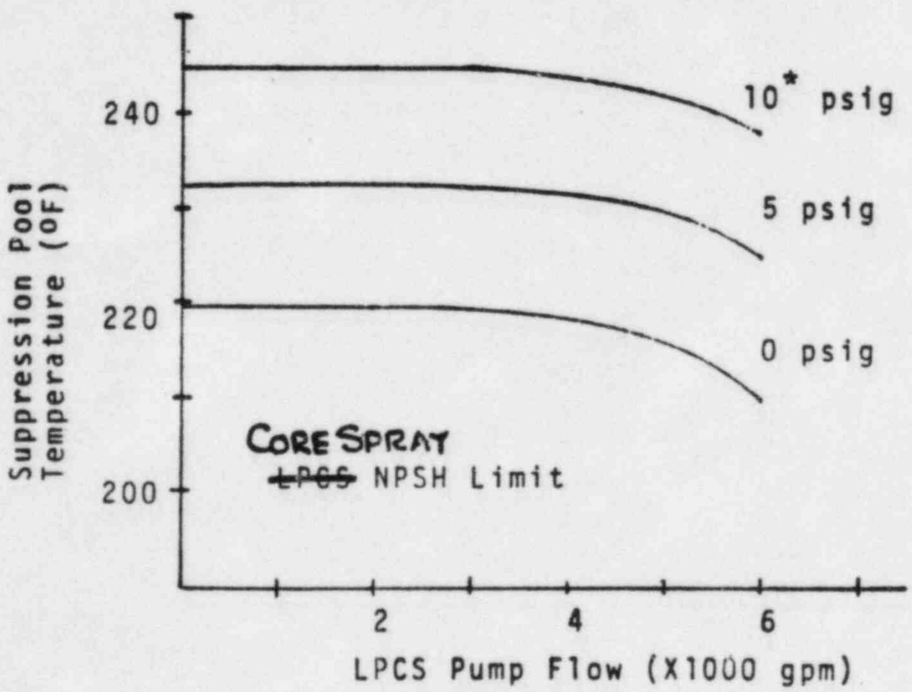
CAUTION #6

YARWAY indicated levels are not reliable during rapid RPV depressurization below 500 psig. For these conditions, utilize GEMAC and fuel zone level instruments to monitor RPV water level.

CAUTION #7

Observe NPSH requirements for pumps taking suction from the suppression pool.





*Suppression chamber pressure

Suppression pool at normal water level

NOTE: The above curves are not plant specific.

SPECIFIC

This section lists "Cautions" which are applicable at one or more specific points within the guidelines. Where a "Caution" is applicable, it is identified with the symbol [#].

CAUTION #8

Do not secure or place an ECCS in MANUAL mode unless, by at least two independent indications, (1) misoperation in AUTOMATIC mode is confirmed, or (2) adequate core cooling is assured or (3) manual operation of ECCS is required by EOPS. If an ECCS is placed in MANUAL mode, it will not initiate automatically. Make frequent checks of the initiating or controlling parameter. When manual operation is no longer required, restore the system to AUTOMATIC mode if possible.

CAUTION #9

If a high drywell pressure ECCS initiation signal 2.0 psig (drywell pressure which initiates ECCS) occurs or exists while depressurizing, prevent injection from those LPCS pumps not required to assure adequate core cooling prior to reaching their maximum injection pressures. When the high drywell pressure ECCS initiation signal clears, restore LPCS to AUTOMATIC mode.

CAUTION #10

Cooldown rates above 100°F/hr (RPV cooldown rate LCO) may be required to accomplish this step.

CAUTION #11

Open EMRVS in the following sequence if possible: EMRV opening sequence: A, C, D, B, E

CAUTION #12

Bypassing MSIV isolation interlocks may be required to accomplish this step.

CAUTION #13

Cooldown rates above 100°F/hr (RPV cooldown rate LCO) may be required to conserve RPV water inventory, protect primary containment integrity, or limit radioactive release to the environment.

CAUTION #14

Confirm automatic trip or manually trip SLC pumps at 0% (low level trip) in the SLC tank.

CAUTION #15

Defeating isolation interlocks may be required to accomplish this step.

CAUTION #16

A rapid increase in injection into the RPV may induce a large power excursion and result in substantial core damage.

CAUTION #17

Large reactor power oscillations may be observed while executing this step.

CAUTION #18

Do not place the isolation subchannel test switches to the trip position.

CAUTION #19

Removing the control power fuses from both NR108A and NR108B defeats ADS for all valves.

CAUTION #20

Do not exceed a diesel generator load of 2750 kW when placing the containment spray system into service.

CAUTION #21

Limit containment spray heat exchanger baffle plate differential pressure to less than 10 psi.

PURPOSE

The purpose of this guideline is to:

° Restore and maintain RPV water level within a satisfactory range to assure adequate core cooling,

° Shut down the reactor, and

° Control RPV pressure and/or cool down the RPV to cold shutdown conditions (100°F < RPV water temperature < 212°F (cold shutdown conditions)).

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

° RPV water level below +138 in. (low level scram setpoint), or

° Drywell pressure above 2.0 psig (high drywell pressure scram setpoint), or

° MSIV closure, or

° RPV pressure above 1060 psig (high Rx pressure scram setpoint)

° A condition which requires reactor scram, and reactor power above 2% (APRM downscale trip) or cannot be determined.

° Condition which requires a scram in the judgment of the operator to conserve inventory or limit radioactive releases to the environment.

OPERATOR ACTIONS

RC-1 If reactor scram has not been identified, initiate reactor scram.

Irrespective of the entry condition, execute Steps RC/L, RC/P, and RC/Q concurrently.

RC/L Monitor and control RPV water level.

RC/L-1 Confirm initiation of any of the following:

- Reactor Isolation
- IC Isolation
- RWCU Isolation
- SDC Isolation
- LPCS Start

If while executing the following step: ° RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter Procedure EMG-3200.08 "RPV Flooding." ° RPV Flooding is required for reasons other than level cannot be determined, enter Procedure EMG-3200.08 "RPV Flooding."

RC/L-2 Restore and maintain RPV water level between +138 in. (low level scram setpoint) and +176 in. (high level trip setpoint) with one or more of the following systems: #8 #9

- ° Condensate/feedwater system 1500 - 0 psig (RPV pressure range for system operation)
- ° CRD system 1500 - 0 psig (RPV pressure range for system operation)
- ° LPCS system 285 - 0 psig (RPV pressure range for system operation)

If RPV water level cannot be restored and maintained above 138 in. (low level scram setpoint), maintain RPV water level above (61 in TAF LO-LO-LO Level).

If RPV water level cannot be maintained above 61 in TAF LO-LO-LO Level, enter Procedure EMG-3200.03 "Level Restoration."

If Alternate Shutdown Cooling is required, enter Procedure EMG-3200.07 "Alternate Shutdown Cooling."

RC/L-3 Process to cold shutdown in accordance with [procedure for cooldown to cold shutdown conditions].

RC/P Monitor and control RPV pressure.

If while executing the following steps:

° Emergency RPV Depressurization is anticipated, rapidly depressurize the RPV with the main turbine bypass valves. #10

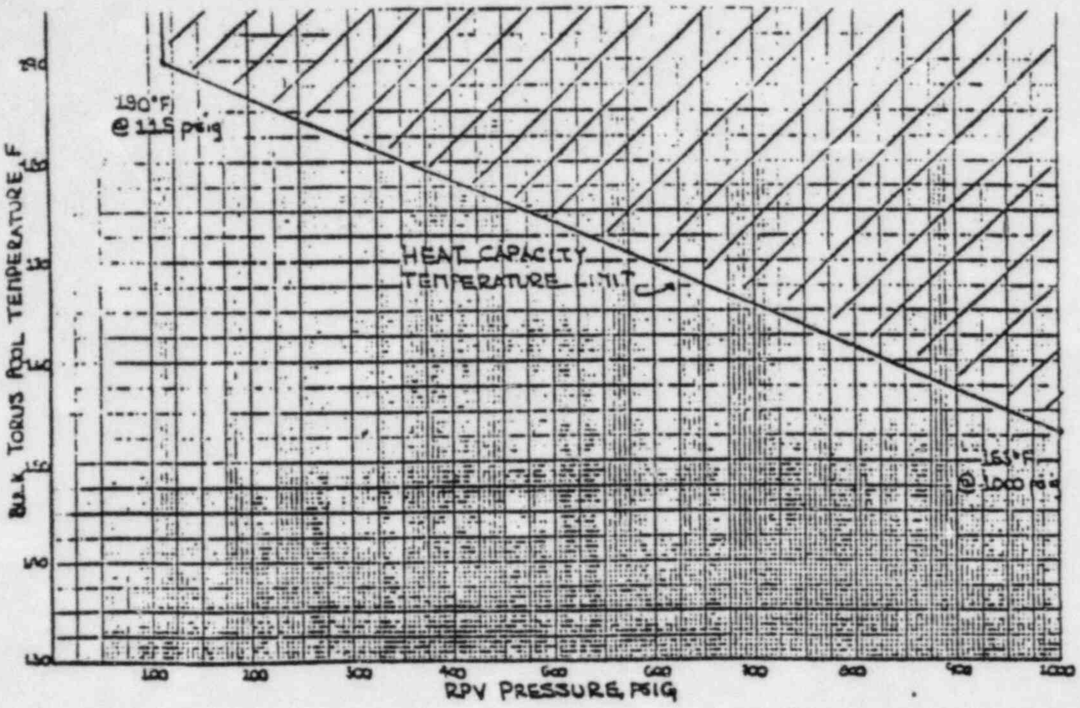
° Emergency RPV Depressurization or RPV Flooding is required and less than 3 (number of EMRVs required for Emergency Depressurization) EMRVs are open, enter Procedure EMG-3200.04 "Emergency RPV Depressurization."

° RPV Flooding is required and at least 3 (number of EMRVs required for emergency dedicated depressurization) EMRVs are open, enter Procedure EMG-3200.08 "RPV Flooding."

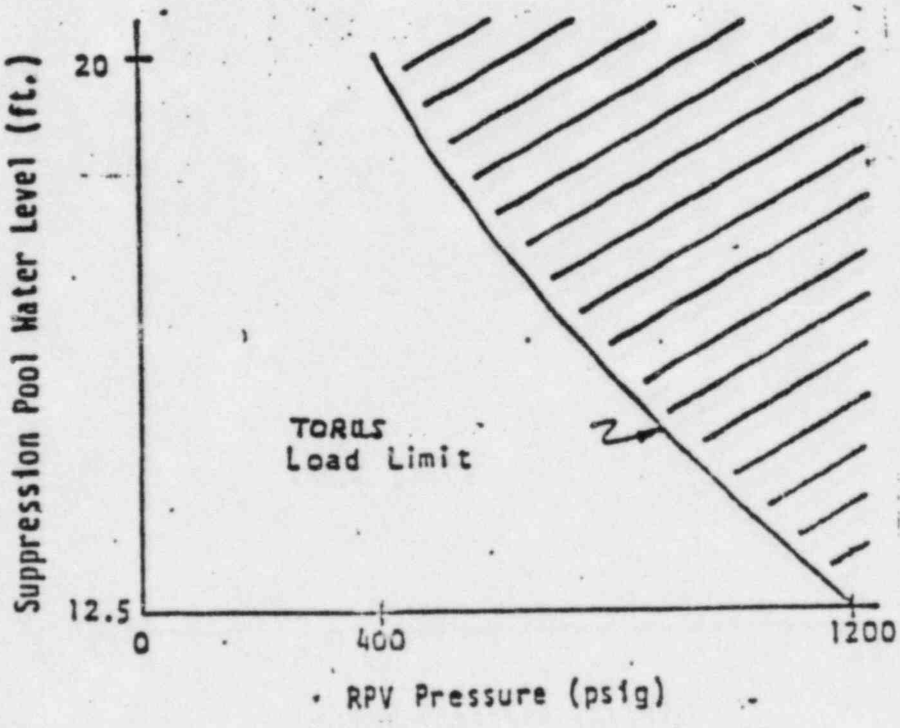
RC/P-1 If any EMRV is cycling, initiate IC and manually open EMRVs until RPV pressure drops to 920 psig or any open turbine bypass valve begins to close.

If while executing the following steps:

° Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV below the Limit. #7 #10



° Suppression pool water level cannot be maintained below the Suppression Load Limit, maintain RPV pressure below the Limit. #10



NOTE: The above curve is not plant specific.

- Steam Cooling is required, enter Procedure EMG-3200.05 "Steam Cooling."

If while executing the following steps:

- Boron Injection is required, and
- The main condenser is available, and
- There has been no indication of gross fuel failure or steam line break,

open MSIVs to re-establish the main condenser as a heat sink irrespective of the differential pressure across the valves. #12

RC/P-2 Control RPV pressure below 1060 psig (lowest EMRV lifting pressure) with the main turbine bypass valves.

RPV pressure control may be augmented by one or more of the following systems:

- IC
- EMRVs if torus level is greater than 4 ft. 9 inches (EMRV quencher height). #11
- RWCU (recirculation mode) if no boron has been injected into the RPV.
- Main steam line drains.

> If while executing the following steps the reactor is not shutdown, return to Step RC/P-2.

RC/P-3 When RPV water level is stabilized and either:

- ° All control rods are inserted to at least position 02 (maximum subcritical banked withdrawal position), or
- ° 273 pounds (Cold Shutdown Boron Weight) of boron have been injected into the RPV, or
- ° The reactor is shutdown and no boron has been injected into the RPV,

Depressurize the RPV and maintain cooldown rate below 100°F/hr (RPV cooldown rate LCO). #13

RC/P-4 When the shutdown cooling interlocks clear, initiate shutdown cooling.

If the shutdown cooling cannot be established and further cooldown is required, continue to cool down using one or more of the systems used for depressurization.

> If RPV cooldown is required but cannot be accomplished and all control rods are inserted to at least position 02 (maximum subcritical banked withdrawal position), ALTERNATE SHUTDOWN COOLING IS REQUIRED; enter Procedure EMG-3200.07 "Alternate Shutdown Cooling."

RC/P-5 Proceed to cold shutdown in accordance with [procedure for cooldown to cold shutdown conditions].

RC/Q Monitor and control reactor power.

If while executing the following steps: ° All control rods are inserted to at least position 02 (maximum subcritical banked withdrawal position), terminate boron injection and enter [scram procedure]. ° The reactor is shutdown and no boron has been injected into the RPV, enter [scram procedure].

RC/Q-1 Confirm the reactor mode switch in SHUTDOWN.

RC/Q-2 If the main turbine-generator is on-line, confirm or initiate recirculation flow runback to minimum. When recirculation flow is at minimum, trip the recirculation pumps.

RC/Q-3 If reactor power is above 2% (APRM downscale trip) or cannot be determined, trip the recirculation pumps.

Execute Steps RC/Q-4 and RC/Q-5 concurrently.

RC/Q-4 If the reactor cannot be shutdown before suppression pool temperature reaches 110°F (Boron Injection Initiation Temperature), BORON INJECTION IS REQUIRED; inject boron into the RPV with SLC and prevent automatic initiation of ADS. #14

RC/Q-4.1 If boron cannot be injected with SLC, inject boron into the RPV by one or more of the following alternate methods:

- ° RWCU
- ° Feedwater

RC/Q-4.2 If boron is not being injected into the RPV by RWCU, confirm automatic isolation of RWCU.

RC/Q-4.3 Continue to inject boron until 273 pounds (Cold Shutdown Boron Weight) of boron have been injected into the RPV.

RC/Q-4.4 Enter [scram procedure].

RC/Q-5 Insert control rods as follows:

RC/Q-5.1 If any scram valve is not open and MSIVs are closed:

- ° Open both 100 amp RPS breakers. Continue at RC/Q-5.1.2.

RC/Q-5.1.1 If any scram valve is not open and main condenser is being use as heat sink, place RPS channel I and II subchannel test switches IA, IB, IIA and IIB to trip position. #18

RC/Q-5.1.2 Close V-6-175 (scram air header supply) and open V-6-409 (scram air header vent).

RC/Q-5.1.3 When control rods are not moving inward:

Close any breakers opened in Step RC/Q-5.1 or close any switches tripped in Step RC/Q-5.1.1.

RC/Q-5.1.4 Close V-6-409 (scram air header vent) and open V-6-175 (scram air header supply).

RC/Q-5.2 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.

   If no CRD pump can be started, continue in this procedure at Step RC/Q-5.6.1.

2. Close V-15-52 (CRD charging water supply valve).

2.5 Place mode switch in REFUEL.

3. Rapidly insert control rods manually until the reactor scram can be reset. #20

4. Reset the reactor scram.

5. Open V-15-52 (CRD charging water supply valve).

RC/Q-5.3 If the scram discharge volume vent and drain valves are open, initiate a manual reactor scram after the SDV headers have drained.

1. If control rods moved inward, return to Step RC/Q-5.2.

2. Otherwise reset the reactor scram.

   If the reactor scram cannot be reset, continue in this procedure at Step RC/Q-5.5.1.

3. Open the scram discharge vent and drain valves.

RC/Q-5.4 Individually open the scram test switches for control rods not inserted to at least position 02 (maximum subcritical banked withdrawal position).

NOTE:	Control rods of highest reactivity should be selected first.

When a control rod is not moving inward, close its scram test switch.

RC/Q-5.5 Reset the reactor scram.

RC/Q-5.5.1 If the reactor scram cannot be reset, start available CRD pumps and close V-15-52 (CRD charging water supply valve).

RC/Q-5.5.2 If no CRD pump can be started, continue in this procedure at Step RC/Q-5.6.1.

RC/Q-5.6 Place the mode switch in REFUEL and rapidly insert control rods manually until all control rods are inserted to at least position 02 (maximum subcritical banked withdrawal position).

RC/Q-5.6.1 If any control rod cannot be inserted to at least position 02 (maximum subcritical banked withdrawal position):

1. Individually direct the effluent from CRD withdraw line vent to a contained radwaste drain and open CRD withdraw line vent for each control rod not inserted to at least position 02 (maximum subcritical banked withdrawal position).

2. When a control rod is not moving inward, close its withdraw line vent.

RC/Q-5.6.2 Continue in this procedure at step RC/Q.

PURPOSE

The purpose of this guideline is to control primary containment temperatures, pressure, and level.

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following:

- Suppression pool temperature above 90°F (most limiting suppression pool temperature LCO)
- Drywell temperature above 135°F (maximum normal operating temperature)
- Drywell pressure above 2.0 psig (high drywell pressure scram setpoint)
- Suppression pool water level above 10.9 inches (maximum suppression pool water level LCO)
- Suppression pool water level below [-1.9 inches (minimum suppression pool water level LCO)]

OPERATOR ACTIONS

Irrespective of the entry condition, execute Steps SP/T, DW/T, PC/P, and SP/L concurrently.

SP/T Monitor and control suppression pool temperature

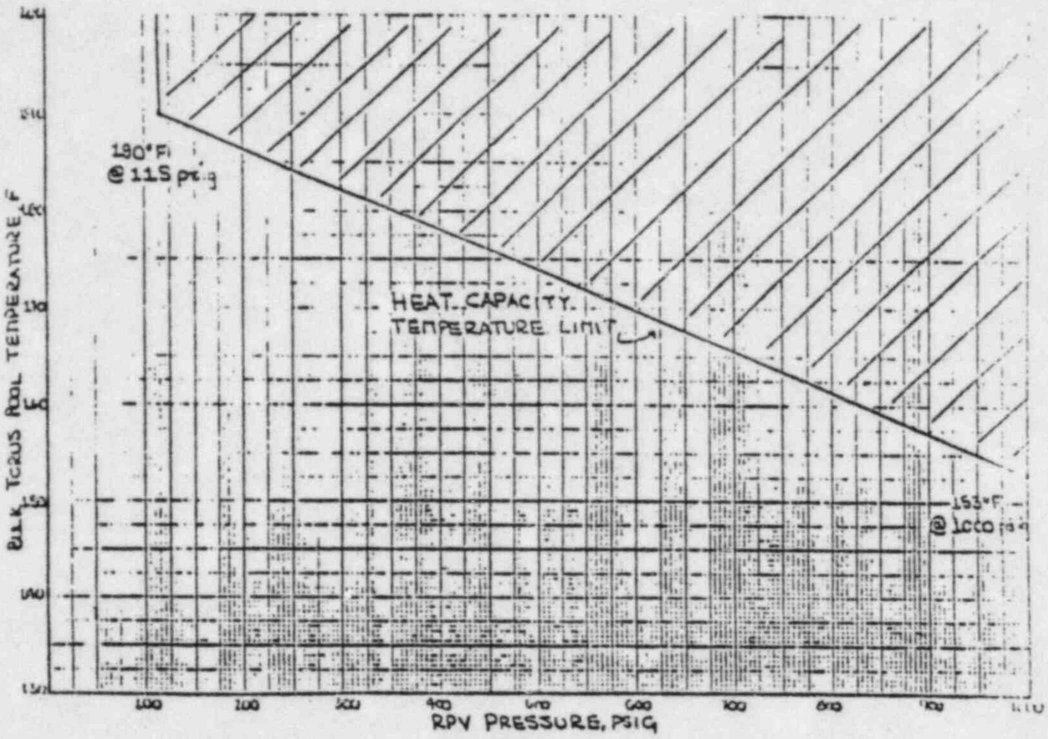
SP/T-1 Close any SORV. #19

If any SORV cannot be closed, scram the reactor.

SP/T-2 If pool temperature exceeds 90°F, start one loop of containment spray in dynamic test. If pool temperature exceeds 95°F, start other loop of containment spray in dynamic test. #20 #21

SP/T-3 Before suppression pool temperature reaches 110°F (Boron Injection Initiation Temperature), scram the reactor.

SP/T-4 If suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the Limit. #7 #10



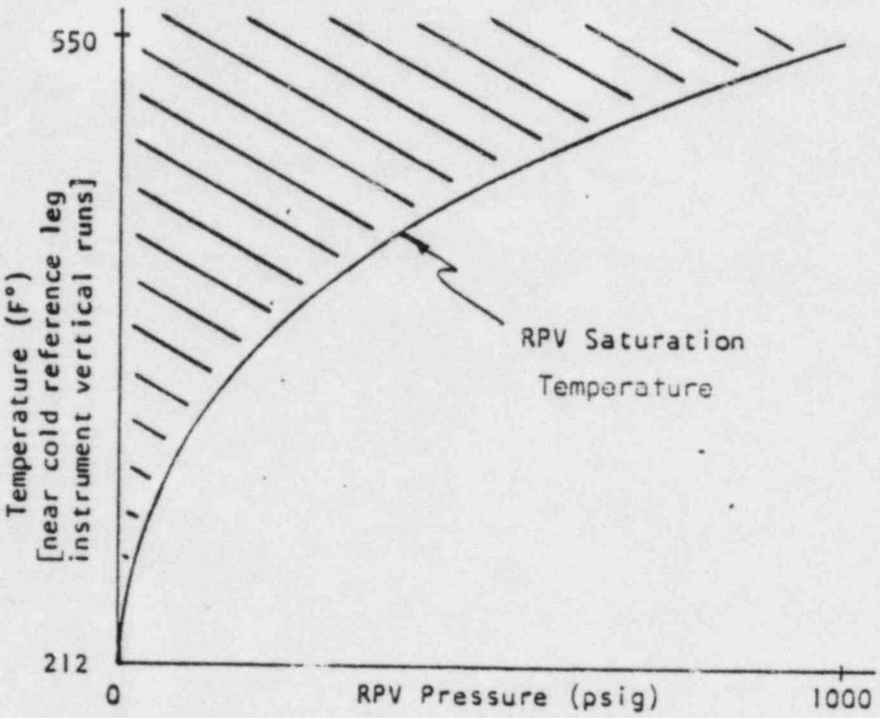
If suppression pool temperature and RPV pressure cannot be restored and maintained below the Heat Capacity Temperature Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.

DW/T Monitor and control drywell temperature.

DW/T-1 Operate available drywell cooling when drywell temperature exceeds 135°F (maximum normal operating temperature) #5

Execute steps DW/T-2 and DW/T-3 concurrently.

DW/T-2 If drywell temperature near the cold reference leg instrument vertical runs reaches the RPV Saturation Temperature, RPV FLOODING IS REQUIRED; enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.



DW/T-3 Before drywell average temperature reaches 281°F (maximum drywell design temperature), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

DW/T-4 If drywell temperature cannot be maintained below 281°F (maximum drywell design temperature), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.

PC/P Monitor and control primary containment pressure.

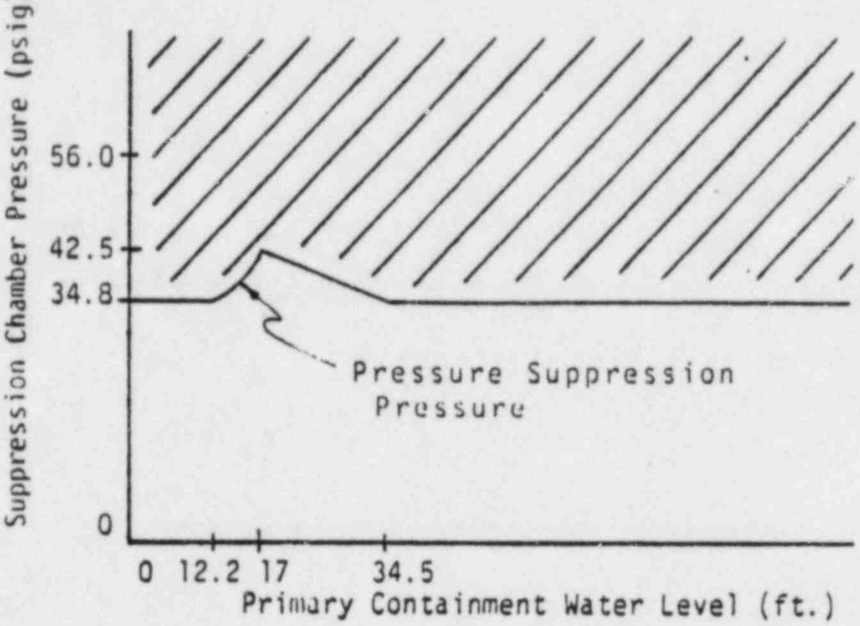
PC/P-1 Operate the following systems, as required:

- SBGT and drywell purge, only when the temperature in the space being evacuated is below 212°F (Maximum Noncondensible Evacuation Temperature). Use [SBGT and drywell purge operating procedures].

PC/P-2 If suppression chamber pressure exceeds 18.6 psig (Suppression Chamber Spray Initiation Pressure), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

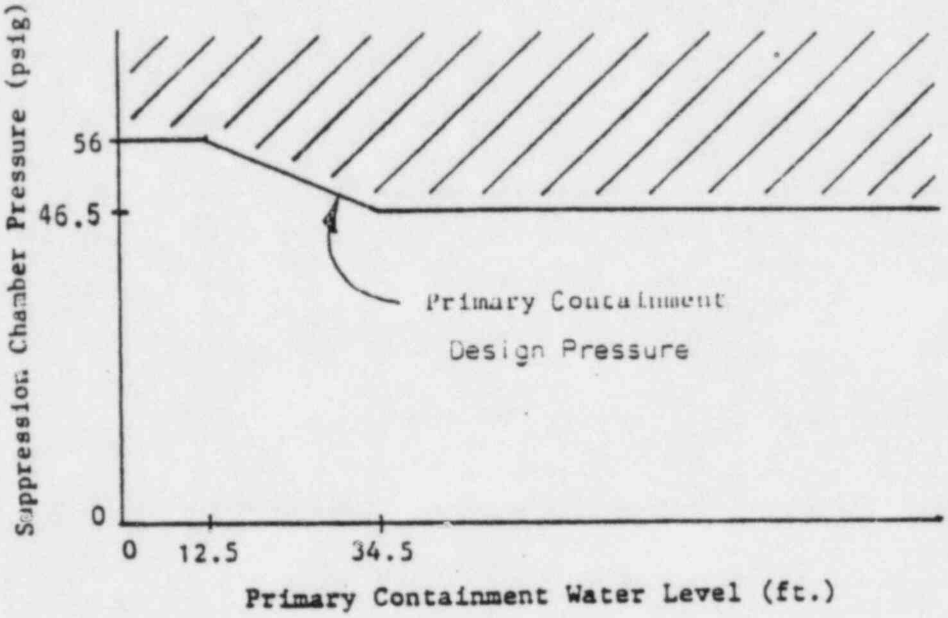
PC/P-3 If suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.

PC/P-4 If suppression chamber pressure cannot be maintained below the Primary Containment Design Pressure Limit, RPV FLOODING IS REQUIRED. Enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.



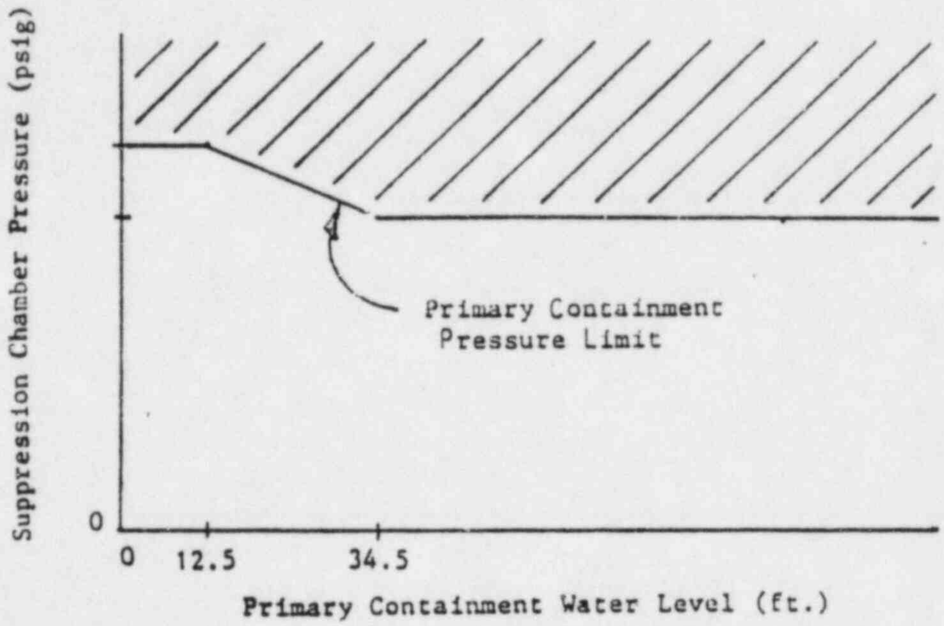
NOTE: The above curve is not plant specific.

PC/P-5 If suppression chamber pressure cannot be maintained below the Primary Containment Pressure Limit, then irrespective of whether adequate core cooling is assured; trip the recirculation pumps and drywell cooling fans and initiate containment spray.



NOTE: The above curve is not plant specific.

When containment pressure is below the Primary Containment Pressure Limit, restore cooling to the core.



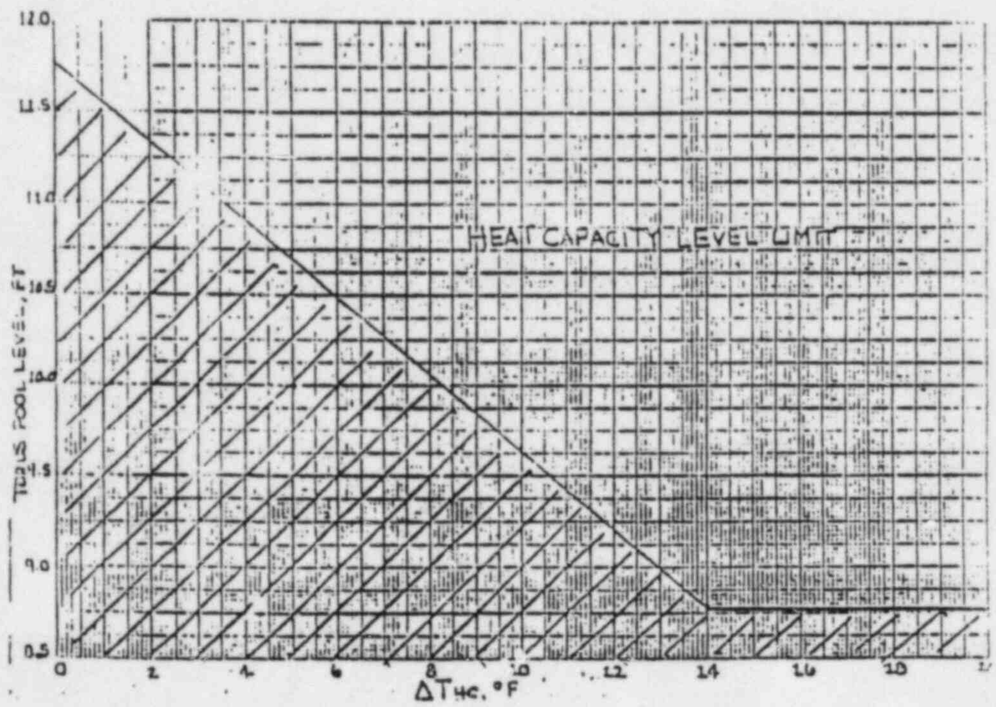
NOTE: The above curve is not plant specific.

PC/P-6 If suppression chamber pressure exceeds the Primary Containment Pressure Limit, vent the primary containment in accordance with [procedure for containment venting] to reduce and maintain pressure below the Primary Containment Pressure Limit. #15

SP/L Monitor and control suppression pool water level.

SP/L-1 Maintain suppression pool water level between 10.9 inches (maximum suppression pool water level LCO) and 1.9 inches (minimum suppression pool water level LCO). If level cannot be maintained above -1.9 inches, execute step SP/L-2. If level cannot be maintained below 10.9 inches, execute step SP/L-3. #7

SP/L-2 Maintain water level above the Heat Capacity Level Limit using core spray system. If suppression pool water level cannot be maintained above the Heat Capacity Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.

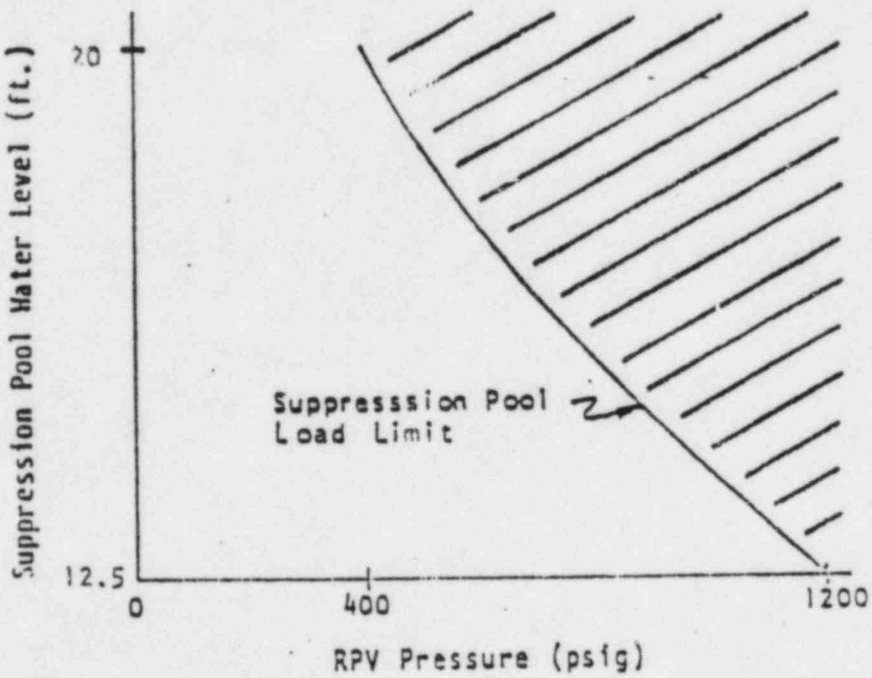


SP/L-3 Execute steps SP/L-3.1 and SP/L-3.2 concurrently.

SP/L-3.1 Maintain level below the Suppression Pool Load Limit

SP/L-3.1.1 If suppression pool water level cannot be maintained below the Suppression Pool Load Limit, maintain RPV pressure below the Limit. #10

SP/L-3.1.2 If level and RPV pressure cannot be maintained below the Suppression Pool Load Limit and adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except Boron injection and CRD.



NOTE: The above curve is not plant specific.

SP/L-3.1.3 If suppression pool water level and RPV pressure cannot be restored and maintained below the Suppression Pool Load Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter Procedure EMG-3200.01 "RPV Control" at Step RC-1 and execute it concurrently with this procedure.

SP/L-3.2 Before primary containment water level reaches [104 ft. (maximum primary containment water level limit)], and only if adequate core cooling is assured, terminate injection to the RPV from sources external to the primary containment except for Boron injection and CRD.

If primary containment water level reaches [104 ft. (Maximum Primary Containment Water Level Limit)], terminate injection into the RPV from sources external to the primary containment irrespective of whether adequate core cooling is assured.

> If while executing the following steps:
>
> - RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter Procedure EMG-3200.08 "RPV Flooding."
>
> - RPV Flooding is required, enter Procedure EMG-3200.08 "RPV Flooding."

C1-1 Initiate IC.

C1-2 Line up for injection and start pumps in two or more of the following injection subsystems:

- Condensate
- LPCS-I
- LPCS-II

If less than two of the injection subsystems can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

- Fire system
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

C1-3 Monitor RPV pressure and water level. Continue in this procedure at the step indicated in the following table.

	RPV PRESSURE REGION [285 psig][1]	
RPV Level	High	Low
Increasing	C1-4	C1-6
Decreasing	C1-7	C1-8

[1](RPV pressure at which LPCS shutoff head is reached)

> If while executing the following steps:
>
> ° The RPV water level trend reverses or RPV pressure changes region, return to Step C1-3.
>
> ° RPV water level drops below 61 inches TAF (ADS initiation setpoint) and Steam Cooling is required, prevent automatic initiation of ADS.

C1-4 RPV WATER LEVEL INCREASING, RPV PRESSURE HIGH

Enter Procedure EMG-3200.01 "RPV Control" at Step RC/L.

C1-6 RPV WATER LEVEL INCREASING, RPV PRESSURE LOW

> If RPV pressure is increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Enter Procedure EMG-3200.04 "Emergency RPV Depressurization."

Otherwise, enter Procedure EMG-3200.01 "RPV Control" at Step RC/L.

C1-7 RPV WATER LEVEL DECREASING, RPV PRESSURE HIGH

If no injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.

When RPV water level drops to 0 inches (top of active fuel): ° If no system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, STEAM COOLING IS REQUIRED. Enter Procedure EMG-3200.05 "Steam Cooling." When any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Enter Procedure EMG-3200.04 "Emergency RPV Depressurization." When RPV water level is increasing or RPV pressure drops below 285 psig, return to Step C1-3.

C1-8 RPV WATER LEVEL DECREASING, RPV PRESSURE LOW

If no LPCS subsystem is operating, start pumps in alternate injection subsystems which are lined up for injection.

If RPV pressure is increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Enter Procedure EMG-3200.04 "Emergency RPV Depressurization."

When RPV water level drops to 0 in. (top of active fuel), SPRAY COOLING IS REQUIRED; enter Procedure EMG-3200.06 "Spray Cooling."

C2-1 Initiate IC.

C2-2 If suppression pool water level is above 4 ft. 9 in. (elevation of top of EMRV discharge device), open all EMRVs.

C2-3 If less than 3 (Minimum Number of EMRVs Required for Emergency Depressurization) EMRVs are open and RPV pressure is at least 50 psig (Minimum EMRV Re-opening Pressure) above suppression chamber pressure, rapidly depressurize the RPV using one or more of the following systems (use in order which will minimize the radioactive release to the environment): #15

- Main condenser
- Main steam line drains
- IC tube side vent

C2-4 If RPV Flooding is required, enter Procedure EMG-3200.08 "RPV Flooding."

C2-5 Enter Procedure EMG-3200.01 "RPV Control" at Step RC/P-4.

EMG-3200.05 "STEAM COOLING"

C3-1 Confirm initiation of IC.

If while executing the following steps Emergency RPV Depressurization is required or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter Procedure EMG-3200.04 "Emergency RPV Depressurization."

If IC cannot be initiated:

When RPV water level drops to -65 in. (Minimum Zero-Injection RPV Water Level) or if RPV water level cannot be determined, open one EMRV.

When RPV pressure drops below 700 psig (Minimum Single EMRV Steam Cooling Pressure), enter Procedure EMG-3200.04 "Emergency RPV Depressurization."

C4-1 Open all EMRVS #10

C4-2 Operate LPCS subsystems with suction from the suppression pool.

When at least one core spray subsystem is operating and RPV pressure is below 285 psig (RPV pressure for rated LPCS flow), terminate injection into the RPV from sources external to the primary containment except for Boron injection and CRD.

C4-3 When RPV water level is restored to 0 in. (top of active fuel), enter Procedure EMG-3200.01 "RPV Control" at Step RC/L.

EMG-3200.07 "ALTERNATE SHUTDOWN COOLING"

C5-1 Initiate suppression pool cooling.

C5-2 Close the MSIVs, main steam line drain valves, and IC isolation valves.

C5-3 Place the control switch for one (Minimum Number of EMRVs Required for Alternate Shutdown Cooling) EMRV in the OPEN position.

C5-4 Slowly raise the RPV water level to establish a flow path through the open EMRV back to the suppression pool.

C5-6 Slowly open LPCS injection valve into the RPV until it is full open.

C5-6.1 Maintain RPV pressure between 130 psig and 273 psig above torus pressure as follows: If RPV pressure does not stabilize at least 130 psig (Minimum Alternate Shutdown Cooling RPV Pressure) above suppression chamber pressure, start another LPCS pump.

If RPV pressure does not stabilize below 237 psig (Maximum Alternate Shutdown Cooling RPV Pressure), open another EMRV.

C5-6.2 If the cooldown rate exceeds 100°F/hr (maximum RPV cooldown rate LCO), reduce LPCS injection into the RPV until the cooldown rate decreases below 100°F/hr (maximum RPV cooldown rate LCO)

or RPV pressure decreases to within 50 psig (Minimum EMRV Re-opening Pressure) of suppression chamber pressure, whichever occurs first.

C5-7 Control suppression pool temperature to maintain RPV water temperature above 185°F (RPV NDTT or head tensioning limit).

C5-8 Proceed to cold shutdown in accordance with [procedure for cooldown to cold shutdown conditions].

C6-1 If at least 3 (Minimum Number of EMRVs Required for Emergency Depressurization) EMRVs can be opened or if feedwater pumps are available for injection, close the MSIVs, main steam line drain valves, IC, isolation valves.

C6-2 If any control rod is not inserted beyond position 02 (maximum subcritical banked withdrawal position):

C6-2.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD.

If while executing the following steps, RPV water level can be determined and RPV flooding is not required, enter Procedure EMG-3200.01 "RPV Control."

C6-2.2 When RPV pressure is below the Minimum Alternate RPV Flooding Pressure, commence and slowly increase injection into the RPV with the following systems to maintain RPV pressure above the Minimum Alternate RPV Flooding Pressure: #16

Number of Open SRVS	Minimum Alternate RPV Flooding Pressure (psig)
5	285
4	340
3	425
2	600

- Feedwater pumps
- Condensate pumps
- CRD pumps

If RPV pressure cannot be maintained above the Minimum Alternate RPV Flooding Pressure, commence and slowly increase injection into the RPV with the following systems to maintain RPV pressure above the Minimum Alternate RPV Flooding Pressure:

- LPCS
- Fire System
- ECCS keep-full systems
- Poison test tank
- Poison system

C6-2.3 When:

- All control rods are inserted to at least position 02 (maximum subcritical banked withdrawal position), or

- The reactor is shut down and no boron has been injected into the RPV,

continue in this procedure.

C6-3 If RPV water level cannot be determined:

C6-3.1 Continue injecting into the RPV with the systems initiated in Step C6-2 and maintain at least 3

(Minimum Number of EMRVs Required for Emergency Depressurization) EMRVs are open and RPV pressure is at least 77 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure.

C6-4 If RPV water level can be determined, continue injecting into the RPV until RPV water level is increasing.

C6-5 If RPV water level cannot be determined:

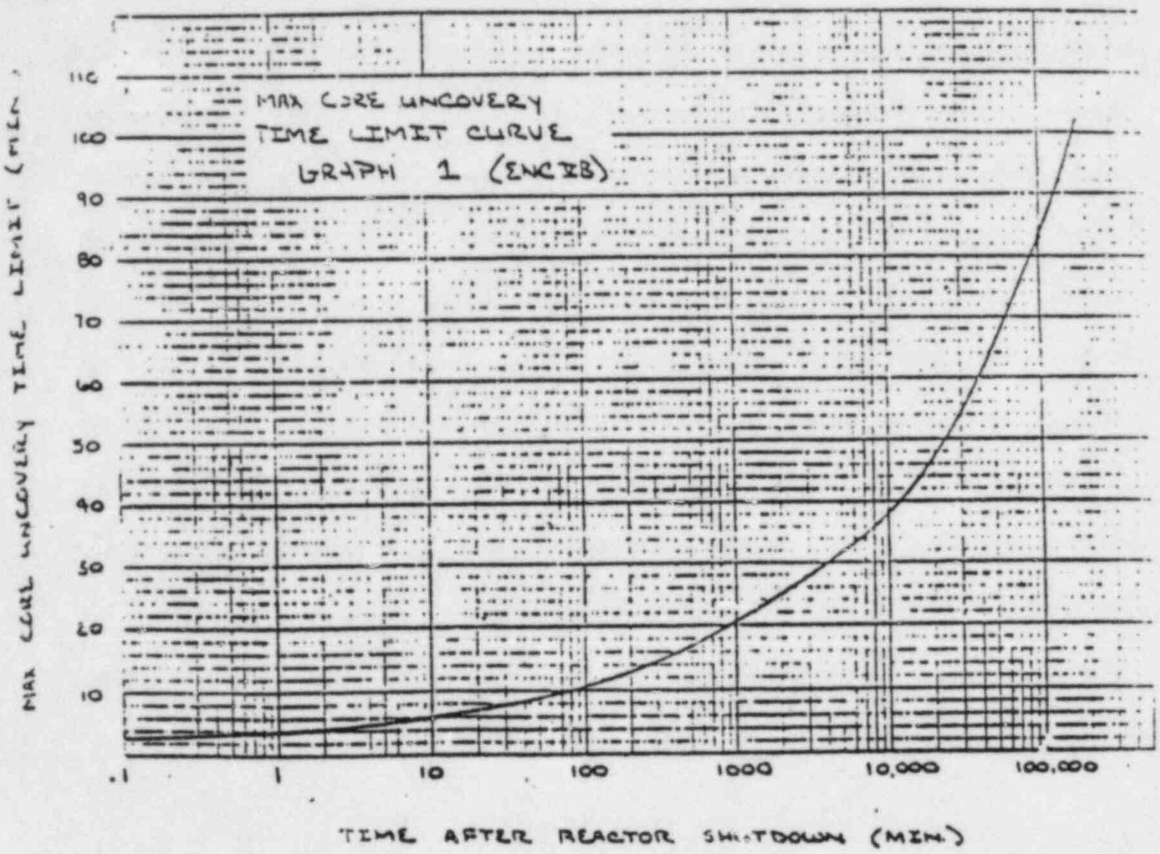
C6-5.1 Fill all RPV level instrumentation reference columns.

C6-5.2 Continue injecting water into the RPV until temperature near the cold reference leg instrument vertical runs is below 212°F and RPV water level instrumentation is available.

If while executing the following steps, RPV water level can be determined, continue in this procedure at Step C6-6.

C6-5.3 If it can be determined that the RPV is filled or if RPV pressure is at least 77 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure, terminate all injection into the RPV and reduce RPV water level.

C6-5.4 If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit after terminating injection into the RPV, return to Step C6-3.



C6-6 When suppression chamber pressure can be maintained below the Primary Containment Pressure Limit, enter Procedure EMG-3200.01 "RPV Control" at Steps RC/L and RC/P-4 and execute these steps concurrently.