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January 15, 1985
RBG- 19,891
File Code: G9.5, G9.33.4

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

River Bend Station - Unit 1
Docket No. 50-458

Gulf States Utilities Company (GSU) submits the attached Emergency Procedure Guideline (EPG) deviation justification forms as requested in the Nuclear Regulatory Commission's (NRC) Safety Evaluation Report (SER) Section 13.5.2.3, Confirmatory Item No. (60). To assist your review, the following information is attached:

Attachment 1 - River Bend Station (RBS) EPG Deviation Justification Forms on Technical Matters.

Attachment 2 - RBS Emergency Operating Procedures (EOP), Rev. 1.

The Author's Guide/Control and Use Procedures, OSP-0009, incorporated accepted human engineering principles. Therefore, editorial differences may exist between the BWR Owner's Group (BWROG) EPG's, RBS EOPs and applicable AOPs. GSU's review of EOPs and comparison with the BWROG EPGs, Rev. 3, identified no safety significant deviations. However, deviations from the EPGs judged to be of technical substance are documented and justified on the attached deviation justification forms.

During the initial EOP verification and validation phase, it was determined that some EOP steps were event oriented. To provide cohesive guidance to the operator and utilize good human engineering principles, event oriented EOPs were combined into existing plant AOPs. Technical deviations from the EPGs incorporated into plant AOPs are documented on attached deviation justification forms.

As stated in GSU's February 27, 1984 letter to your office, an engineering evaluation is being performed to ensure EPG/EOP assumptions are consistent with the design basis described in the RBS Final Safety Analysis Report.

A001
1/44

Future changes to the EOPs will be evaluated in accordance with Operating Station Procedures (OSPs).

Sincerely,

J E Booker

J.E. Booker
Manager-Engineering
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/RJK/je

Attachments

Attachment 1

RBS EPG Deviation Justification
Forms on Technical Matters

# SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Cautions #1 - #8

EOP STEP: None

JUSTIFICATION OF DIFFERENCES:

General cautions are implemented in the training program and not included in the EOP's in accordance with OSP-0009, Step 4.7.1.1.

DATE: 1/14/85

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Caution #11

EOP STEP: EOP-0001, Caution #1

JUSTIFICATION OF DIFFERENCES:

Deleted last sentence of Caution #11. Operators are trained to restore LPCS and LFCI to standby as soon as possible.

DATE: 1/14/85

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: RC/Q; RC/L; RC/P

EOP STEP:
1. Added EOP-0001, Steps 3.1.3, C3.1.3, and Note 1.
2. Deleted steps concerning an ATWS condition from the above EPG's and established a seperate ATWS procedure incorporating these steps.

JUSTIFICATION OF DIFFERENCES:

EOP-0001 was reorganized deleting all ATWS related steps from the EOP and establishing a separate ATWS procedure (AOP-0021). This reorganization was performed to simplify the EOP's for non-ATWS events. The ATWS event requires the operator to perform steps that are contrary to the actions required for non-ATWS events. It also provides more cohesive guidance for the operator in an ATWS event. The necessity for this reorganization was indicated during the operator training and during the control room design review and EOP V&V. Steps 3.1.3, C3.1.3, and Note 1 were added to provide guidance on when to enter the ATWS or normal scram procedure.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: First box of RC/P; First "bullet"

EOP STEP: EOP-0001, Step 3.3.2.1 and C3.3.2 added additional requirement

JUSTIFICATION OF DIFFERENCES:

Added requirement "and boron injection is not required'. If boron injection is required, the operator should not simply depressurize since it would introduce positive reactivity (from cooldown). Procedure directs him to complete AOP-0021 "anticipated transient without scram".

DATE: 12/6/84

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: RC/P-3

EOP STEP: EOP-0001, Step 3.3.5

JUSTIFICATION OF DIFFERENCES:

1. Added requirement to have water level stabilized since this is the intent specified in Appendix B

2. Added entire SLC tank since (lbs) is not in the panel indicator.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency 2

EOP STEP: EOP-001, Step 3.3.6

JUSTIFICATION OF DIFFERENCES:

1. Deleted IC; this is not included in RBS design.

2. Added "if available, open all turbine bypass valves". This is preferable to ADS due to energy release to Suppression Pool. This is technically consistent with EPG's; it simply puts it "up front" in the Emergency Depressurization step in case it was missed in 3.3.2. The remaining EOP's direct the operator to this step whenever Emergency RPV Depressurization is required.

3. Contingency 2 was integrated into the RPV pressure control section of EOP-0001 based on observations in V&V. This reduces branching.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency #2, Step C2-1.3

EOP STEP: EOP-0001, Step C3.3.6.3

JUSTIFICATION OF DIFFERENCES:

The EOP does not provide the EPG direction for operator actions given less than 7 SRV's, but not less than 3 SRV's can be opened. This EOP step will be revised to include the intent of the EPG step.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C2-1.3

EOP STEP: EOP-0001, Step C3.3.6.3
Deleted Reference to Minimum SRV Re-opening Pressure

JUSTIFICATION OF DIFFERENCES:

The S/RV design at RBS can re-open at '0' PSIG.

DATE: 1/14/85

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: RC/P-4

EOP STEP: Added EOP-0001, Caution #18

JUSTIFICATION OF DIFFERENCES:

To provide an additional caution to operators to maintain RPV level below +55" if boron has been inserted to prevent boron dilution.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency 7 in its entirety
RC/Q-2 through RC/Q5.6

EOP STEP: Not in EOP's. All of these steps are included in AOP-0021 "Anticipated Transient Without Scram"

JUSTIFICATION OF DIFFERFNCES:

1. This is an event readily identifiable by the operators. The AOP's are event based Abnormal Operating Procedures.

2. EOP V&V program supports a separate procedure for ATWS. Integration into the EOP's proved cumbersome for the operators to implement.

3. Current training experience indicate less problem dealing with ATWS events with the current configuration.

4. GE will review AOP-0021 to assure its steps incorporate contingency 7 and RC/Q-2 through RC/Q5.6.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: RC/Q-3, RC/Q-4

EOP STEP: AOP-0021, Steps 4.2 & 4.3

JUSTIFICATION OF DIFFERENCES:

1. Reversed the order of steps to assure SLC is considered for initiation earilier in the transient.

2. Most of the recirculation flow reduction will occur when the pumps are transferred to Low Frequency Motor Generator. This change was made based on observations during V&V.

3. The procedure requires that the operator determine by all available means that power is above 5% before tripping recirculation pumps.

4. Operator training will insure that indeterminate power levels are assumed to be above 5%.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: RC/Q-5

EOP STEP: AOP-0021, Step 5.2

JUSTIFICATION OF DIFFERENCES:

1. Details of inserting control rods are put into AOP-0021 Enclosure 1 to avoid clutter.

2. This is an option recommended by the BWR Owners Group and was found to be necessary during EOP V&V.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: RC/Q-5.4

EOP STEP: Added AOP-0021, Steps C5.2.1.4

JUSTIFICATION OF DIFFERENCES:

Since the CRD HCU's hydraulic system, and test switches are located inside containment, they may not be accessible during ATWS conditions. Additional information is therefore provided if containment is inaccessible.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Caution #20

EOP STEP: AOP-0021, Step C5.2.1

JUSTIFICATION OF DIFFERENCES:

1. No "hard-wired" bypass is provided in the RBS RCIS. Other possible bypass techniques will be evaluated and included in the revision to AOP-0021 as appropriate.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C7-2

EOP STEP: AOP-0021, Step 5.6

JUSTIFICATION OF DIFFERENCES:

1. Technical intent is to maintain reactor water level above top of active fuel. It is inadvisable to cause level fluctuation at this point due to other RPV stabilization concerns.

2. Water level is restored to normal in Step 5.7.

3. This change was made based on observation during V&V.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C7-2.1

EOP STEP: AOP-0021, Step 5.6.3

JUSTIFICATION OF DIFFERENCES:

This EPG step was omitted from AOP-0021. The intent of this EPG will be added to AOP-0021.

DATE: 1/14/85 EOP WRITER: G G Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C7-3

EOP STEP: AOP-0021, Step 5.9

JUSTIFICATION OF DIFFERENCES:

1. Cold shutdown boron weight was used as a conservative value because plant conditions may require cooldown in order to restore and maintain RPV water level.

2. EPG Step C7-3 requires restoration of water level to normal range if all rods are inserted past minimum subcritical withdrawal position. This step was ommitted from AOP-0021 and the intent will be added to this procedure.

DATE: 1/14/85 EOP WRITER: G G Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C-7 Box Prior to C7-4

EOP STEP: AOP-0021

JUSTIFICATION OF DIFFERENCES:

Omitted box prior to EPG Step C7-4. The intent of this step is incorporated into River Bend Station Operating Procedures.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Caution 26; C7-1

EOP STEP: AOP-0021, Step 5.4 Cau tion #2.

JUSTIFICATION OF DIFFERENCES:

Caution #2 reflects Caution #25 of EPG, not Caution #26. Intent of Caution #26 will be incorporated in AOP-0021.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Box Before C7-1

EOP STEP: AOP-0021, Step 5.1

JUSTIFICATION OF DIFFERENCES:

The EPG step was omitted and will be added to AOP-0021.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Radioactivity Release Control Guideline in its entirety

EOP STEP: Not in EOP's - All of these steps are included in AOP-0022 "Radioactivity Release"

JUSTIFICATION OF DIFFERENCES:

1. This is an event readily identifiable by the operators. The AOP's are event base Abnormal Operating Procedures.

2. EOP V&V program supports a separate procedure for Radioactivity Release. Integration into the EOP's proved cumbersome for the operator to implement.

3. Current simulator class is having less problem dealing with Radioactivity Release events with the current configuration.

4. Radioactive Release is also covered in EIP's.

5. GE will review AOP-0021 to assure its steps incorporate the Radioactivity Release Control Guidelines.

6. Added immediate operator action to conform with Abnormal Operating Procedure Format.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Primary Containment Control Guideline
Entry Condition on DW Pressure

EOP STEP: EOP-0002, Step 2.4
Added "or Containment to Annulus Differential"

JUSTIFICATION OF DIFFERENCES:

The MARK-III design at RBS requires monitoring of the containment to annulus differential pressure to maintaint containment integrity.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: SP/T-3

EOP STEP: EOP-0002, Step 3.1.3

JUSTIFICATION OF DIFFERENCES:

1. Specified IF rather than BEFORE to give the operator more specific guidance and to preclude premature scrams.

2. Since the scram can be effected within less than 10 seconds, it is not necessary to have an anticipatory time delay built in.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: DW/T

EOP STEP: EOP-0002, Step 3.2
Added Caution #5

JUSTIFICATION OF DIFFERENCES:

The RBS design allows the hydrogen mixing system to aid in controlling DW temperature, so a caution was added to provide guidance to closely monitor containment pressure and temperature while using this system.

DATE: 1/14/85

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: DW/T-1

EOP STEP: EOP-0002, Step 3.2.1

JUSTIFICATION OF DIFFERENCES:

1. Specified IF instead of WHEN; see OSP-0009, Step 4.7.1.3.
2. Provided interim actions such as drywell purge, Hydrogen mixing, and controlled RPV depressurization before Emergency RPV depressurization.
3. The River Bend Station design does not include drywell sprays.
4. These interim steps were shown to be effective in mitigating High Drywell Temperatures during performance of the V&V.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: DW/T-3

EOP STEP: EOP-0002, Step C3.2.1

JUSTIFICATION OF DIFFERENCES:

Added an intermediate step to begin a controlled cooldown at 180 F rather than wait until 340 F to begin rapid depressurization.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: DW/T-2

EOP STEP: EOP-0002, Caution 6 Added

JUSTIFICATION OF DIFFERENCES:

Caution #6 was added based upon earlier RBS design. The RBS design has been changed and Caution #6 will be deleted.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: DW/T-2

EOP STEP: EOP-0002, Step 3.2.2.2

JUSTIFICATION OF DIFFERENCES:

1. Added assuring reactor is scrammed and open two SRV's since these are the first actions required to flood the reactor. Flooding is entered through EOP-0001 as specified in EPG's.

2. These steps more directly and more explicitly direct the operator to flood the RPV and reduces branching.

3. Changes were made as a result of observations during V&V.

DATE: 12/6/84 EOP WRITER: M A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: CN/T-1

EOP STEP: EOP-0002, Step 3.3.1

JUSTIFICATION OF DIFFERENCES:
1. Specified IF rather than WHEN; see OSP-0009, Step 4.7.1.3.

2. Last sentence added as a clarification based on observation during V&V.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: CN/T-2

EOP STEP: EOP-0002, Step 3.3.3 - Added

JUSTIFICATION OF DIFFERENCES:

1. Added as an interim measure to reduce containment temperature before RPV depressurization.

2. Containment purge can be an effective mechanism for reducing containment temperature.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: PC/P-1

EOP STEP: EOP-0002, Steps 3.4.1, 3.4.3

JUSTIFICATION OF DIFFERENCES:

Containment ventilation system operates to maintain design conditions and to remove heat generated within the containment. In addition, Step 3.4.1 allows use of containment purge if no primary boundary leakage exists.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: None

EOP STEP: EOP-0002, Step 3.4.2

JUSTIFICATION OF DIFFERENCES:

The operator is directed to depressurize at 200 F/hr or emergency depressurize when the containment to annulus differential pressure reaches 5 psid. The additional operator action is required by FSAR analysis, Section 6.2.1.1.3.4.

DATE: 1/14/85 EOP WRITER: G G Johnson

# SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: PC/P-6

EOP STEP: EOP-0002, Step 3.4.4/C3.4.4

JUSTIFICATION OF DIFFERENCES:

1. The suppression pool is a likely source of thermal energy in the containment and initiating suppression pool cooling can be effective in reducing containment pressure.

2. Suppresion pool cooling is operated in conjunction with the ventilation system to maintain containment temperature below 185 F and pressure < 2 Psig.

3. There are no suppression pool sprays in RBS design.

4. There are no drywell sprays in RBS design.

DATE: 1/14/85 EOP WRITER: H a Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: SP/L-3, Note.

EOP STEP: EOP-0002, Step 3.5.3 & 3.5.4

JUSTIFICATION OF DIFFERENCES:

Due to the plant specific configuration of the suppression pool load limit curve, Step 3.5.3 and 3.5.4 will be performed consecutively rather than concurrently.

DATE: 1/14/85 EOP WRITER: G G Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: SP/L-3.2

EOP STEP: EOP-0002, Step 3.5.4

JUSTIFICATION OF DIFFERENCES:

SLC and CRD are located inside containment in the River Bend Station Design and were not considered as external to the containment. The intent of the EPG step is to consider sources of water external to the suppression pool. The intent of EPG setp SP/L-3.2 will be incorporated in the EOP.

DATE: 1/14/85 EOP WRITER: G a Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency #1

EOP STEP: EOP-0004

JUSTIFICATION OF DIFFERENCES:

The Contingency #1 was rewritten as a seperate EOP to conform with the format of the RBS operating procedures.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C1-7

EOP STEP: EOP-0004, Step 3.2.9

JUSTIFICATION OF DIFFERENCES:

1. CRD is started since it is a source of high pressure, high quality water.

2. Steam cooling steps (3.2.9.1) are incorporated into EOP-0004. This is to provide better integration and less branching. This was recommended by GE in their initial review and was indicated as a necessary move during the V&V process.

DATE: 12-6-84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C1-7

EOP STEP: EOP-0004, Step C3.2.9

JUSTIFICATION OF DIFFERENCES:

Changed the requirement from one injection subsystem to two injection subsystems - during the V&V, the operators considered the CRD system to be an injection subsystem although it could be inadequte when used alone. The step will be rewritten requiring one injection subsystem regardless of CRD availability.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C1-8

EOP STEP: EOP-0004, Step 3.2.10

JUSTIFICATION OF DIFFERENCES:

The statement "if no HPCS or LPCS subsystem is operating" was deleted. Appendix B of the EPG's allowed using alternate injection subsystems prior to using core spray systems as currently written in the EOP. The decision has now been made to use the core spray systems prior to use of the alternate injection subsystems and the EOP will be revised.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C1-8

EOP STEP: EOP-0004, Step 3.2.10

JUSTIFICATION OF DIFFERENCES:

Included contingency #4 steps in here to provide better integration and less branching and was recommended by GE in their initial review. The need for this integration was also observed during V&V.

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency #3 in its entirety

EOP STEP: EOP-0001, Step 3.3.3.2
EOP-0004, Step 3.2.9.1

JUSTIFICATION OF DIFFERENCES:

1. Included in EOP-0001 instead of a separate procedure to provide more direct integration and reduce branching.

2. This integration was recommended by GE during their initial review of the Draft EOP's.

3. EOP V&V supports integrating these steps into EOP-0001 and EOP-0004 so that RPV level control and/or level restoration steps are together and reduce branching.

4. Current training experience indicates less problems dealing with RPV pressure control with the current configuation.

5. GE will review EOP-0001 and EOP-0004 to assure contingency #3 is incorporated as stated.

6. RBS design does not include Isolation Condensers.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency #4

EOP STEP: EOP-0004, Step 3.2.10

JUSTIFICATION OF DIFFERENCES:

1. Included in EOP-0004 instead of a separate procedure to provide more direct integration and reduce branching.

2. This integration was recommended by GE during their initial review of the Draft EOP's.

3. EOP V&V supports integrating these steps into EOP-0004 so that level restoration steps are in one procedure and reduce branching.

4. Current training experience indicates less problems dealing with RPV pressure control with the current configuration.

5. GE will review EOP-0004 to assure contingency #4 is incorporated as stated.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency #6

EOP STEP: EOP-0005 - General; organized into 3 modes of flooding - these do not include flooding with boron and no level indication.

JUSTIFICATION OF DIFFERENCES:

1. V&V uncovered major problems with implementing the EOP's when organized per the EPG's.

2. Flooding with boron and no level indication is virtually an impossible task and having these steps in the EOP cluttered the procedure. This scenerio is covered, however; the operator will "hold" the level as required to maintain MARFP and will not flood up until level indication is restored.

DATE: 12-6-84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Box after C6-2.1

EOP STEP: EOP-0005, Steps 3.1 & 3.3

JUSTIFICATION OF DIFFERENCES:

1. Level indication is assumed to be available during these flooding modes.

2. This does not result in a technical problem since the operator will hold at MARFP until level is restored or until control rods are inserted.

DATE: 12-6-84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-2.2

EOP STEP: EOP-0005, Step 3.1.3

JUSTIFICATION OF DIFFERENCES:

1. Requirement to determine RPV pressure is below MARFP before commencing injection. Wording in EPG was confusing to the operator as observed during V&V.

2. No technical impact since this requirement is imposed in C6-2.1.

3. Added requirement to open additional SRV's if only low pressure systems are operable since MARFP is above shutoff head with 2 SRV's open. The EPG's say '....at least...SRV's".

DATE: 12-6-84 EOP WRITER: G a johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-3

EOP STEP: EOP-0005, Step 3.2

JUSTIFICATION OF DIFFERENCES:

1. Addressed as a separate mode to reduce the operator "decision blocks" down to a reasonable level, identified in the V&V program.

2. Added 'qualifier' on low pressure systems so the operator will have direction to open more SRV's. This is technically justifiable since the EPG's say "...at least SRV's".

DATE: 12-6-84

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-6

EOP STEP: EOP-0005, Step 3.3.4

JUSTIFICATION OF DIFFERENCES:

1. This step is not in section 3.1 and 3.2 since flooding under these circumstances is for other considerations that must be met before the containment pressure can be restored (i.e., you can't go back to EOP-0001 until: (a) all rods are at (04) and (b) RPV level indication is operable).

DATE: 12/6/84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: Contingency #5 in its entirety

EOP STEP: Not in EOP's. All of these steps are included in AOP-0020 "Alternate Shutdown Cooling"

JUSTIFICATION OF DIFFERENCES:

1. This is an event readily identifiable by the operators. The AOP's are event based abnormal operating procedures.

2. The BWR OG Emergency Procedures Committee is considering deleting contingency #5 from Revision 4 of the EPG's.

3. EOP V&V program supports a separate procedure for Alternate Shutdown Cooling. Integration into the EOP's proved cumbersome for the operator to implement.

4. Current training experience indicates less problem dealing with Alternate Shutdown Cooling events with the current configuration.

5. GE will review AOP-0020 to assure its steps incorporate contingency #5 in its entirety.

DATE: 1/14/85 EOP WRITER: H a johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: None in Contingency #5

EOP STEP: AOP-0020, Step 5.1

JUSTIFICATION OF DIFFERENCES:

1. This is a condition for Alternate Shutdown Cooling but is not specified in Contingency #5. It is possible that the operator could be using this AOP and not meet the entry conditions in EOP's. Since this condition is specified/implemented in the EPG for RPV control it is needed to be specified here.

2. This does not alter the technical content of AOP-0020 as it relates to contingency #5.

DATE: 12-6-84 EOP WRITER: H A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-1 was deleted

EOP STEP: EOP-0005, Step 3.1, 3.2.4

JUSTIFICATION OF DIFFERENCES:

During conditions that require boron injection and the MSIV & main steam line drains are open or RCIC is operating, it would not be prudent to isolate these heat sinks and divert the heat to the containment.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-2.2

EOP STEP: EOP-0005, Step 3.1.3

JUSTIFICATION OF DIFFERENCES:

Added steps to ensure that the RPV pressure is above MARFP, but as low as possible to reduce the heat load as much as possible.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-2.2

EOP STEP: EOP-0005, Step C3.1.3

JUSTIFICATION OF DIFFERENCES:

A statement in the EPG's concerning increasing flow with the non-preferred systems until "the RPV pressure is above MARFP" was omitted. This statement will be added to the EOPS.

DATE: 1/14/85

EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: None in contingency #5

EOP STEP: AOP-0020, Step 5.3

JUSTIFICATION OF DIFFERENCES:

Must evacuate containment before opening SRV's for personnel protection.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C6-5.1, C6-5.2

EOP STEP: None

JUSTIFICATION OF DIFFERENCES:

Due to the RBS design , the water level instrumentation fill connections are located inside containment. During postulated events that would cause loss of the reference line water level, the containment is uninhabitable. The EPG step was based on the Mark I design where the fill lines may be accessible.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C5-3

EOP STEP: AOP-0020, Step 5.5

JUSTIFICATION OF DIFFERENCES:

1. Provide explicit instructions to the operator to assure 2 and only 2 SRV's are open.
2. This clarification was identified as being needed during V&V.
3. Does not alter the technical content of the corresponding EPG step.

DATE: 12-6-84 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: None in contingency #5

EOP STEP: AOP-0020, Caution before 5.6

JUSTIFICATION OF DIFFERENCES:

Recent GE analysis indicates there may be some conditions/RPV pressures that may cause concern to monitor SRV discharge lines. The pressure is left as (later) until further analysis is received from GE.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C5-5

EOP STEP: AOP-0020, Step 5.7

JUSTIFICATION OF DIFFERENCES:

1. Specified preference for shutdown cooling inlet (VSLPCI) due to potential damage to LPRM strings if LPCI inject point is used.

2. This change is consistent with the technical intent of the EPG step.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C5-6

EOP STEP: AOP-0020, Step 5.8.1

JUSTIFICATION OF DIFFERENCES:

1. Specified methods the operator can use to determine RPV cooldown rate.

2. This addition is consistent with the technical content of the EPG step.

DATE: 1/14/85 EOP WRITER: G A Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C5-6.3

EOP STEP: AOP-0020, Step 5.11

JUSTIFICATION OF DIFFERENCES:

Deleted discussion of minimum S/RV opening pressure since the RBS design allows opening of S/RV's at 0 PSIG.

DATE: 1/14/85 EOP WRITER: G R Johnson

SUPPORTING DOCUMENTATION OF EOP DEVELOPMENT

EPG STEP: C5-6.3

EOP STEP: AOP-0020, Step 5.11

JUSTIFICATION OF DIFFERENCES:

1. Specified reducing service water flow as an alternate way to decrease cooldown rate.

2. This addition is consistent with the technical content of the EPG step.

DATE: 1/14/85 EOP WRITER: G a Johnson

Attachment 2

RBS EOPs, Rev. 1

TABLE OF CONTENTS

## TABLE I

| ALARM | CONDITION / ALARM WINDOW NO. |
|---|---|
| HIGH DRYWELL PRESSURE (P601) | 2 (1.68*) Psid/ 2300 |
| MAIN STEAM LINE DIV I, IV DIV I, IV HI-HI RAD OR INOP (P601) | 3 X Normal / 2221 |
| MAIN STEAM LINE FLOW HIGH (P601) | 140% (173 Psid*) / 2033 |
| STEAM PIPE TUNNEL AMBIENT TEMP HIGH (P601) | 200°F / 2403 |
| MAIN CONDENSER LOW VACUUM (P601) | 11 (8.5*) in. Hg / 2030 |
| MAIN STEAM LINE LOW PRESSURE (P601) | 850 (849*) Psig in Run / 2037 |
| REACTOR VESSEL LOW WATER LEVEL I (P601) | -144 (-145.5*) in. / 2541 |
| CRD DISCH VOL HI WATER LEVEL (P680) | 39 Gals / 2176 |
| DRYWELL HIGH PRESSURE (P680) | 2 Psid / 2178 |
| REACTOR VESSEL HIGH PRESSURE (P680) | 1065 (1064.7*) Psig / 2179 |
| MAIN STEAM LINE HIGH RADIATION | 3 X Normal / 2181 |
| APRM "A" OR "E" UPSC TRIP OR INOP (P680) | 15%/118% / 2161 |
| APRM "B" OR "F" UPSC TRIP OR INOP (P680) | 15%/118% / 2162 |
| APRM "C" OR "G" UPSC TRIP OR INOP (P680) | 15%/118% / 2163 |
| ARPM "D" OR "H" UPSC TRIP OR INOP (P680) | 15%/118% / 2164 |
| IRM UPSCALE TRIP OR INOP RPS CHAN B (P680) | 120/125 / 2149 |
| IRM UPSCALE TRIP OR INOP RPS CHAN D (P680) | 120/125 / 2154 |
| IRM UPSCALE TRIP OR INOP RPS CHAN A (P680) | 120/125 / 2146 |
| IRM UPSCALE TRIP OR INOP RPS CHAN C (P680) | 120/125 / 2151 |
| TRIP UNIT OOF OR POWER FAILURE (4 WINDOWS) (P680) | N/A |
| TURBINE CONTROL VALVE FAST CLOSURE (P680) | 530 Psig / 2182 |
| TURBINE STOP VALVE CLOSURE (P680) | 5% Closed / 2184 |
| NEUTRON MONITORING SYSTEM (P680) | Various / 2186 |
| REACTOR PROTECTION SYS TRIP TRIP LOGIC A OR LOGIC C (P680) | N/A / 2187 |
| MANUAL SCRAM (P680) | N/A / 2188 |
| REACTOR VESSEL LOW WATER LEVEL 3 (P680) | +10 (+8.9*) in. / 2180 |

## 1.0 PURPOSE

The purpose of this procedure is to:

1.1 Maintain adequate core cooling.

1.2 Shutdown the reactor AND

1.3 Cooldown the RPV to cold shutdown conditions; RPV water temperature less than 200°F but greater than 70°F.

## 2.0 ENTRY CONDITIONS

Entry conditions are ANY of the following:

| CONDITION | SYMPTOM |
|---|---|
| | NOTE<br>Conditions and applicable alarm window numbers are denoted in Table I, Page 2. *Technical Specification Setpoint. |
| ___2.1 RPV water level below +10 in. | 2.1 REACTOR VESSEL LOW WATER LEVEL 3 ALARM ON P680. |
| ___2.2 RPV pressure above 1065 Psig. | 2.2 REACTOR VESSEL HIGH PRESSURE ALARM ON P680. |
| ___2.3 Drywell pressure above +2 Psig. | 2.3 DRYWELL HIGH PRESSURE ALARM ON P680 |
| ___2.4 A RPV isolation which requires or initiates reactor scram. | 2.4 Any of the RED annunciator windows corresponding to an automatic MSIV isolation or a condition that would require RPV isolation to protect the containment or control radioactive release rates. |

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| CONDITION | SYMPTOM |
|---|---|
| ___2.5 A condition which requires reactor scram AND reactor power is above 5%. | 2.5 Any of the RED annunciators (on P680) that correspond to an automatic or manual scram signal AND APRM's or IRM's indicating greater than 5% power. |
| ___2.6 A condition which requires reactor scram AND reactor power cannot be determined. | 2.6 Any alarms in (2.5) AND no reliable indication on ARPM, IRM or SRM. |

[NOTE 1]

If control rods are not inserted beyond [[06]] by the reactor scram, then the operator must exit this procedure and complete AOP-0021 before returning to this procedure. At that point, power control predominates the operator action; RPV level and pressure are controlled as dictated by reactor power. The operator must closely monitor containment parameters and enter EOP-0002 (concurrently with AOP-0021) as entry conditions are reached.

## 3.0 OPERATOP ACTIONS

**Irrespective of the entry conditions; execute the following concurrently:**

___MONITOR AND CONTROL REACTOR POWER PER SECTION 3.1.

___MONITOR AND CONTROL RPV WATER LEVEL PER SECTION 3.2.

___MONITOR AND CONTROL RPV PRESSURE PER SECTION 3.3.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.1 MONITOR AND CONTROL REACTOR POWER | |
| ___3.1.1 IF a reactor scram has not been initiated THEN initiate a reactor scram. | |
| ___3.1.2 Confirm or place the mode switch in SHUTDOWN. | |
| ___3.1.3 Confirm that all control rods are inserted beyond position [[06]]. | C3.1.3 IF all control rods are not inserted beyond position [[06]] THEN proceed to AOP-0021 [NOTE 1]. |
| ___3.1.4 Enter AOP-0001 and perform concurrently with this procedure. | |

[NOTE 2]

RPV water level can be monitored on the following instruments in the Main Control Room.

| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1B21-R605 | P601 | Shutdown/0 in to 400 in |
| 1B21-R623A/B | P601 | Wide Range/-160 in to +60 in |
| 1B21-R604 | P680 | Wide Range/-160 in to +60 in |
| 1C33-R608A | P680 | Narrow Range/0 in to +60 in |
| 1C33-R608B | P680 | Narrow Range/0 in to +60 in |
| 1C33-R608C | P680 | Narrow Range/0 in to +60 in |
| 1C33-LR-R608 | P680 | Narrow Range/0 in to +60 in |
| 1C33-LR-R608 | P680 | Upset Range/0 in to 180 in |
| 1B21-R615 | P601 | Fuel Zone/+50 in to -150 in* |
| 1B21-R610 | P601 | Fuel Zone/+50 in to -150 in* |

*0 in. reference is top of active fuel.

If none of these instruments are operable then use other sources of RPV level such as alarms, trip units, computer, local transmitters.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.2 MONITOR AND CONTROL RPV WATER LEVEL [NOTE 2] | |
| ___3.2.1 Confirm initiation of any of the following:<br>___Reactor Scram<br>___RPV Isolation<br>___ECCS<br>___Emergency Diesel Generator | C3.2.1 IF any should have initiated but did not,<br>THEN manually initiate. |

CAUTION #1

Do not permit low pressure ECCS injection not required for adequate core cooling (from 2 Psig drywell pressure) while depressurizing.

CAUTION #2

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. 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 STANDBY mode if possible.

CAUTION #3

Do not throttle RCIC below 1700 RPM.

CAUTION #4

If suppression pool water level increases to 20.4 ft (+.4 ft indicated) or if CST level decreases to 2 ft 4 5/8 in., then confirm automatic transfer of HPCS and RCIC suctions from the CST to the suppression pool. If necessary, manually initiate as follows:

HPCS; open E22-MOVF015, close E22-MOVF001
RCIC; open E22-MOVF031, close E22-MOVF010

[NOTE 3]

It is the intent, here, to complete the requirements of EOP-0005 or AOP-0021 (as applicable) before proceeding further in Section 3.2 of EOP-0001.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ********** SEE CAUTIONS #1, #2, #3 AND #4 ********** | |
| ___3.2.2 IF while executing step 3.2.3 [NOTE 3]<br><br>1. Boron Inject is required THEN proceed to AOP-0021.<br><br>2. RPV water level cannot be determined THEN proceed to EOP-0005.<br><br>3. RPV flooding is required ([NOTE 5]; Page 20) THEN proceed to EOP-0005. | |
| ___3.2.3 Restore and maintain RPV water level between +10 in. and +55 in. with one or more of the following system:<br><br>___1. Condensate/Feedwater (preferred)<br><br>___2. CRD<br>a. Operate two pumps if possible<br>b. Increase flow rate to maximum.<br><br>___3. RCIC<br><br>___4. HPCS<br><br>___5. LPCS<br><br>___6. LPCI | C3.2.3 IF water level cannot be restored and maintained between +10 and +55 in. THEN maintain RPV water level above -160 in.<br><br>1. IF ADS timers initiated AND RPV level can be maintained above -160 in. THEN prevent automatic RPV depressurization by resetting the ADS timer.<br><br>2. IF RPV water level cannot be maintained above -160 in. THEN proceed to EOP-0004 "Level Restoration". |

[NOTE 4]

RPV pressure can be monitored on the following instruments in the Main Control Room.

| | PANEL | TYPE/RANGE |
|---|---|---|
| 1C33-P605 | P680 | Wide Range/0 - 1200 Psig |
| 1C33-R609 | P680 | Narrow Range/850 - 1050 Psig |
| 1C33-R623A/B | P601 | Wide Range/0 - 1500 Psig |
| 1E51-R602 | P601 | RCIC St. Press/0 - 1500 Psig |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.2.4 WHEN specified in Section 3.3 proceed to normal shutdown procedures (GOP-0003 or 0004) as applicable. | C3.2.4 IF RPV can no longer be cooled down by depressurization AND<br><br>1. RHR shutdown cooling mode cannot be established<br><br>2. RPV temperature must be reduced and/or the RPV must be maintained in a cold shutdown condition<br><br>3. Control rods are inserted beyond position [[06]].<br><br>THEN proceed to AOP-0020 "Alternate Shutdown Cooling". |

## CAUTION #5

**Cooldown rates above 100°F/hr may be required to accomplish this step.**

## CAUTION #6

Combinations of temperature and level denoted below may render the level instrument inoperable.

| TEMP ELEMENT/ *TEMPERATURE | INDICATED LEVEL | LEVEL INSTRUMENT TYPE | RANGE | NUMBER | LOWER TAP ELEVATION |
|---|---|---|---|---|---|
| | | Shutdown 0 in. to +400 in. (Indicator) | ** | B21-R605 | (LATER) in. |
| (LATER) | (LATER) | Wide Range -160 in. to +60 in. | | C33-R608 | (LATER) in. |
| | | (Recorder & Indicator) | ** | B21-R604 | (LATER) in. |
| (LATER) | (LATER) | Narrow Range 0 in. to +60 in. | | C33-R608 | |
| | | (Recorder & Indicator) | ** | C33-R608 A, B, C | (LATER) in. |
| (LATER) | (LATER) | Upset Range (0 in. to 180 in.) | ** | C33-LR-R608 | (LATER) in. |
| | | Fuel Zone +50 to -150 in. (Recorder & Indicator) | *** | B21-R615 | (LATER) in. |
| | | | | B21-R610 | (LATER) in. |

*Drywell area temperature (M71); average the two points.
**0" reference is 15 in. above bottom of Steam Dryer Skirt; 162 in. above TAF
***0" reference is TAF; 147 in. below bottom of Steam Dryer Skirt.

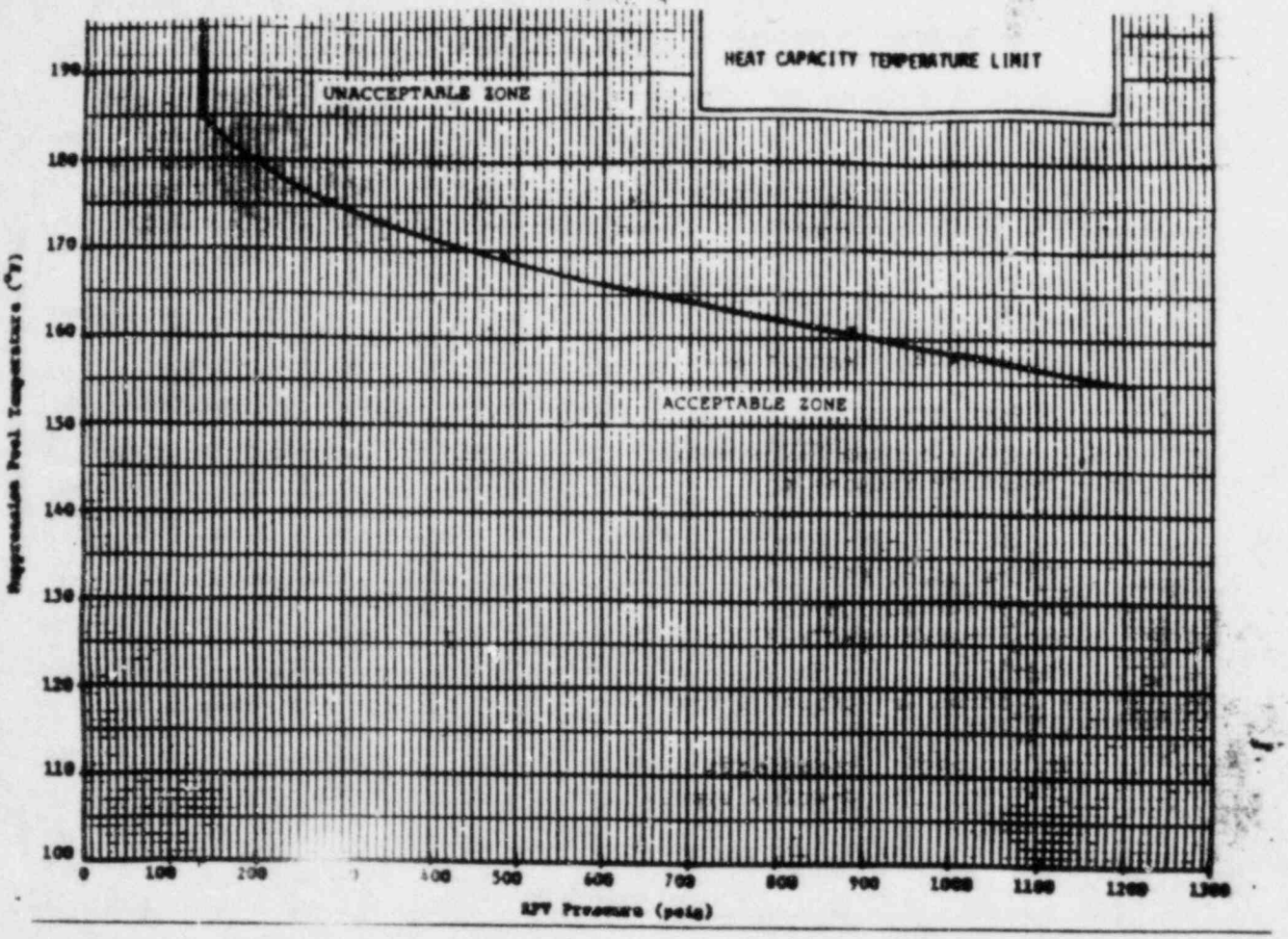
## CAUTION #7

Do not throttle RCIC below 1700 RPM.

## CAUTION #8

Do not depressurize the RPV below 50 Psig unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| **3.3 MONITOR AND CONTROL RPV PRESSURE [NOTE 4, PAGE 12]** | |
| ********** SEE CAUTIONS #5, #6, #7 AND #8 ********** | |
| ___3.3.1 IF a reactor scram has not been initiated<br>THEN initiate a reactor scram. | |
| ___3.3.2 IF any SRV is cycling<br>THEN manually open SRV's until RPV pressure reduces to 935 Psig. | C3.3.2 IF no SRV is cycling<br>THEN continue with instructions 3.3.2.1. |
| 1. IF Emergency RPV Depressurization is anticipated ([NOTE 7]; Page 20)<br>AND boron injection is not required<br>THEN rapidly depressurize with the main turbine bypass valves. | 1. IF boron injection is required<br>THEN proceed to AOP-0021 and continue concurrently in this procedure at Step 3.3.3. |
| ___2. IF Emergency RPV Depressurization or RPV Flooding is required ([NOTE 7]; Page 20)<br>AND less than 7 SRV's are open<br>THEN proceed to 3.3.6 "Emergency RPV Depressurization". | |
| ___3. IF RPV FLOODING IS REQUIRED ([NOTE 7]; Page 20)<br>AND at least 7 SRV's are OPEN<br>THEN proceed to EOP-0005 "RPV Flooding". | |




[NOTE 5]

Figure B is on Page 18.

CAUTION #9

Cooldown rates above 100°F/hr may be required to accomplish this step.

CAUTION #10

Observe NPSH requirements for pumps taking suction from the suppression pool. (NPSH limit curves (LATER)).

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.3.3 While performing Step 3.3.4<br><br>1. Maintain suppression pool temperature in the acceptable zone of the Heat Capacity Temp Limit in Figure A and suppression pool level in the acceptable zone of the Suppression Pool Load Limit of Figure B [NOTE 5]. | C3.3.3<br><br>1. IF the suppression pool cannot be maintained in the acceptable zone of Figure A or Figure B (Page 18) THEN maintain RPV pressure below the limit. |
| SEE CAUTIONS #9 AND #10 | |
| ___2. IF RPV water level cannot be determined OR has decreased to -160 in. AND no injection or alternate injection subsystem is lined up for injection. (No lined up subsystem has at least one pump running.) THEN when RPV level drops to -111 in. on Fuel Zone Instruments OPEN ONE SRV WHEN RPV pressure drops below 700 Psig, proceed to Step 3.3.6. | 2. IF any injection subsystem or alternate injection subsystem becomes lined up for injection with at least one pump running, proceed to Step 3.3.6. |
| ___3. IF boron injection is required AND the main condenser is available AND no fuel failure or steam line break is indicated THEN open MSIV's to reestablish the main condenser as a heat sink. | 3. IF low water level MSIV interlocks must be bypassed, THEN complete contingency action detail (LATER) to bypass these interlocks. |

CAUTION #11

**Do not depressurize below 50 Psig unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.**

---

[NOTE 6]

It is the intent to give the operator a wide control band to eliminate unnecessary actions that would be required for a narrower band, however, the operator should minimize rapid depressurization/cooldown rates and should attempt to maintain RPV pressure above RCIC Isolation Setpoint (50 Psig).

---

CAUTION #12

Do not open SRV's if supression pool indicated water level is below -14 feet since the "X" quencher would not be submerged in water.

---

CAUTION #13

Do not throttle RCIC below 1700 Rpm.

---

CAUTION #14

Do not use RWCU if boron has been injected.

---

FIGURE B

Suppression Pool Load Limit Curve.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| SEE CAUTIONS #11 AND #12 | |
| ___3.3.4 Control RPV pressure below 1033 Psig with the main turbine bypass valves. | C3.3.4 IF additional pressure relief is needed THEN use one or more of the following [NOTE 6]:<br><br>1. SRV's - cycle in the following order IF suppression pool indicated water level is above -14 ft.<br><br>a. IF SRV pneumatic supply is or becomes unavailable THEN depressurize with sustained SRV opening<br><br>___[1B21-RVF051G]<br>___[1B21-RVF047B]<br>___[1B21-RVF041L]<br>___[1B21-RVF041F]<br>___[1B21-RVF047C]<br>___[1B21-RVF051B]<br>___[1B21-RVF041G]<br>___[1B21-RVF051D]<br>___[1B21-RVF041B]<br>___[1B21-RVF051C]<br>___[1B21-RVF047D]<br>___[1B21-RVF047A]<br>___[1B21-RVF047B]<br>___[1B21-RVF041C]<br>___[1B21-RVF041D]<br>___[1B21-RVF041A] |
| SEE CAUTIONS #13 AND #14 | |
| | ___2. RCIC<br><br>___3. RWCU<br><br>___4. Steam Line Drains<br><br>___5. Other steam driven equipment |

CAUTION #15

**Do not depressurize the RPV below 50 Psig unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.**

---

CAUTION #16

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

---

[NOTE 7]

Emergency RPV Depressurization is required when:

- RPV flooding is required and less than 7 SRV's are open (EOP-0001, Step C3.3.2.2).
- Suppression pool temperature and RPV pressure cannot be restored and maintained below the Heat Capacity Temperature Limit (EOP-0002, Step C3.1.4).
- Drywell temperature cannot be maintained below 185°F (EOP-0002, Step 3.2.1).
- Suppression pool water level cannot be maintained above the Heat Capacity Level Limit (EOP-0002, Step 3.5.2) or below the Suppression Pool Load Limit (EOP-0002, Step C3.5.3).
- Secondary containment temperature, radiation levels or water levels exceed the Maximum Safe Operating Limits (EOP-0003, Steps C3.1.7, C3.2.5 or C3.3.5).
- RPV pressure is too high to permit available injection systems, injection subsystems or alternate injection subsystems from injecting adequate flow into RPV (EOP-0004, numerous steps).

RPV Flooding is required when:

- Temperature near the cold reference leg instrument vertical runs exceeds the RPV saturation limit.
- RPV water level cannot be determined.
- Containment to annulus differential pressure cannot be maintained below 15 Psid or drywell to containment differential pressure below 25 Psid.
- Drywell temperature cannot be maintained below 330°F.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| SEE CAUTIONS #15 AND #16 | |
| ___3.3.5 WHEN RPV water level is stabilized<br>AND all control rods are inserted beyond position [[06]]<br>OR<br><br>1. RPV water level is stabilized<br>AND the entire SLC tank has been injected into the RPV<br>OR<br><br>2. RPV water level is stabilized<br>AND the reactor is shutdown<br>AND no boron has been injected into the RPV.<br><br>THEN depressurize the RPV and maintain cooldown rate below 100°F/hr. | C3.3.5 IF the reactor is not shutdown while executing this step,<br>THEN return to Step 3.3.4 and continue until the reactor is shutdown<br><br>1. IF the entire contents of the SLC tank has not been injected into the RPV<br>THEN determine that at least 618 lbs of boron has been injected into the RPV per (LATER). |
| ___3.3.6 IF Emergency RPV Depressurization is required [NOTE 7]<br>THEN perform the following:<br><br>1. IF boron is injecting<br>THEN before depressurizing terminate and prevent all injection into the RPV except boron and CRD. | C3.3.6<br><br>1. IF boron is not injecting<br>THEN proceed to Step 3.3.6.2. |

[NOTE 8]

**Use in the order which will minimize radioactive release to the environment. See (LATER) for bypass details.**

---

CAUTION #17

Do not use the RHR steam condensing mode unless (1) the suppression pool temperature can be maintained below 155°F and (2) more than one RHR loop is available.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___2. IF available, open all turbine bypass valves. | |
| ********** SEE CAUTION #17 ********** | |
| ___3. IF suppression pool indicated water level above -14 ft<br>THEN open all ADS valves. | 3. IF suppression pool indicated water level is not above -14 ft.<br>THEN rapidly depressurize the RPV using: [NOTE 8]<br>___RCIC<br>___RHR (Steam Condensing)<br>___Main Condenser<br>___SJAE<br>___Steam Seal Evaporator<br>___Main Steam Drains<br>___RPV Head Vent<br><br>IF all ADS valves cannot be opened<br>THEN open SRV's until a total of 7 SRV's are open. |
| ___4. Monitor RPV water level | 4. IF RPV water level cannot be determined<br>THEN exit this procedure and complete EOP-0005 "RPV Flooding". |
| ___5. Maintain containment parameters as follows:<br>___Containment to annulus differential pressure below 15 Psid<br>___Drywell to containment differential pressure below 25 Psid<br>___Drywell temperature below 330°F | 5. IF containment parameters cannot be so maintained<br>THEN exit this procedure and complete EOP-0005 "RPV Flooding". |

## CAUTION #18

If continuous LPCI operation is required to assure adequate core cooling, do not divert all RHR pumps from LPCI mode. Leave at least one RHR pump in the LPCI mode.

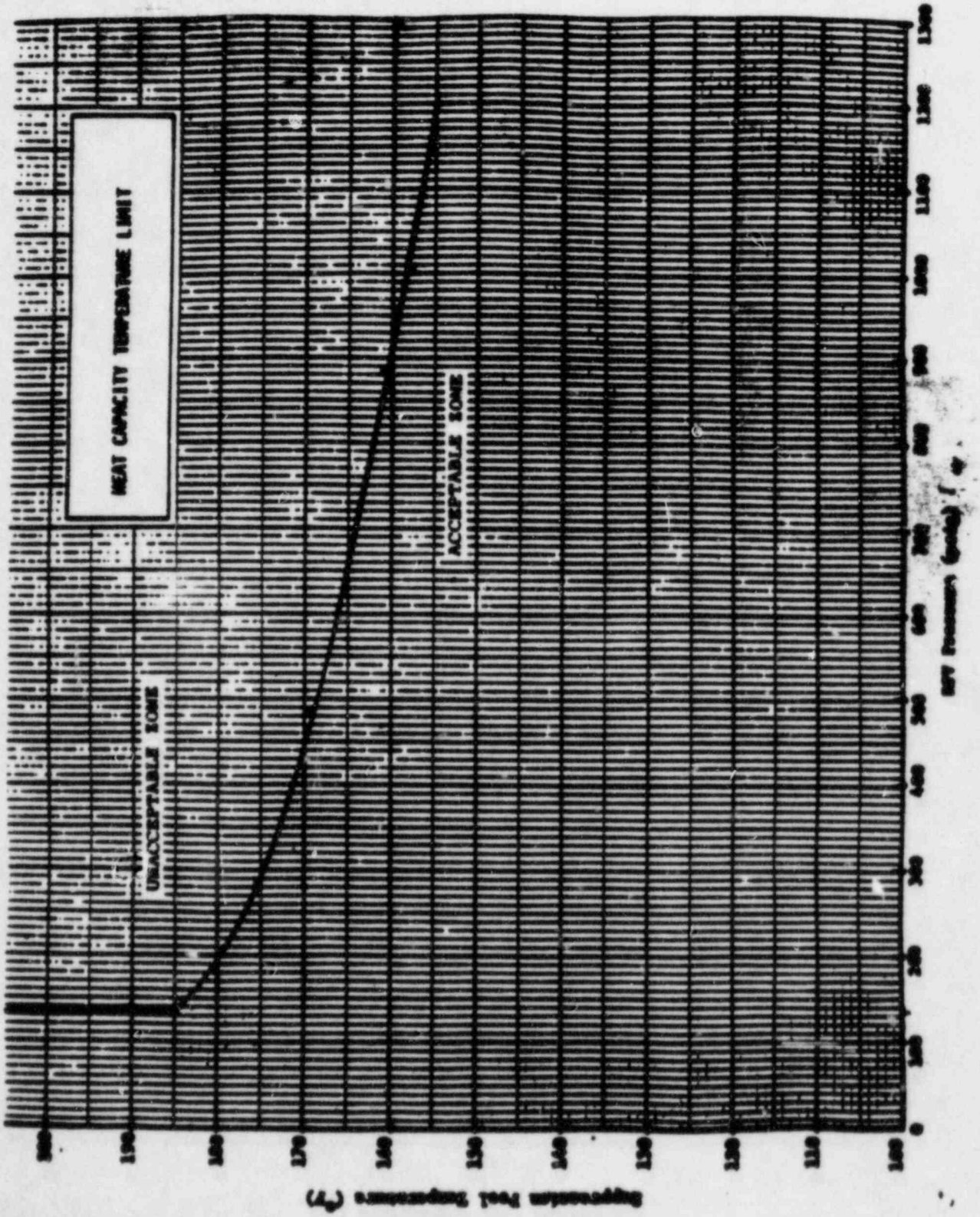
## CAUTION #19

If boron has been injected and all control rods are not inserted beyond [[06]] then the RPV level must be maintained below +55 in. while using Shutdown Cooling mode of RHR to prevent excessive dilution of the boron solution.

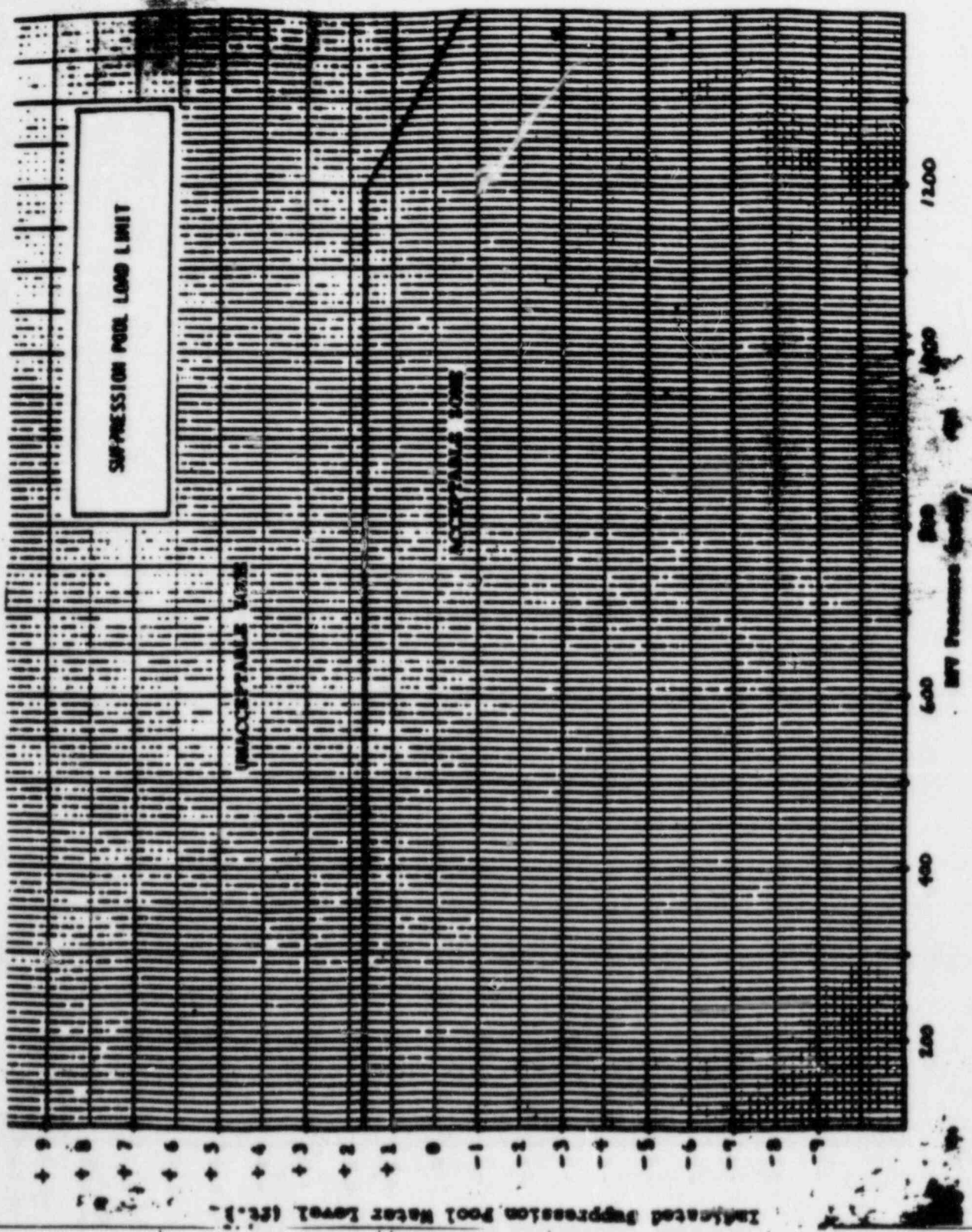
| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| SEE CAUTION #18 AND #19 | |
| ___3.3.7 WHEN the RHR shutdown cooling interlocks clear (at 135 Psig RPV pressure) THEN initiate the shutdown cooling mode of RHR. | C3.3.7 IF the RHR shutdown cooling mode cannot be established AND further cooldown is required THEN continue to cooldown using one or more of the systems used in Step 3.3.4. |
| ___3.3.8 Proceed to normal shutdown procedures (GOP-0003 or 0004) as applicable. | C3.3.8 IF RPV can no longer be cooled down by depressurization AND<br>1. RHR shutdown cooling mode cannot be established<br>2. RPV temperature must be reduced and/or the RPV must be maintained in a cold shutdown condition<br>3. Control rods are inserted beyond position [[06]]<br>THEN proceed to AOP-0020 "Alternate Shutdown Cooling". |

"END OF EOP-0001"

ENCLOSURE - 1 FULL SIZE FIGURE A; HEAT CAPACITY TEMPERATURE LIMIT CURVE



FULL SIZE FIGURE B; SUPPRESSION POOL LOAD LIMIT CURVE



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## 1.0 PURPOSE

___1.1 To maintain primary containment intact.

___1.2 To protect equipment in the primary containment.

## 2.0 ENTRY CONDITIONS

Entry conditions are any of the following:

| CONDITION | SYMPTOM |
|---|---|
| ___2.1 Suppression pool temperature above 95°F. | ___2.1 SUPPRESSION POOL TEMP NORM MAX GREATER THAN OR EQUAL TO 95°F Alarm on P808. |
| ___2.2 Drywell temperature above 145°F. | ___2.2 DRYWELL AMBIENT HIGH TEMP alarm on P601. |
| ___2.3 Containment temperature above 90°F. | ___2.3 CTMT TEMP HI alarm on P601. |
| ___2.4 Drywell to containment OR containment to annulus differential pressure above 2 Psid. | ___2.4 HIGH DRYWELL PRESS alarm on P601. |
| ___2.5 Suppression pool water level above 20.0 feet (0 ft indicated). | ___2.5 SUPPRESSION POOL LEVEL HIGH alarm on P808 and/or P601. |
| ___2.6 Suppression pool water level below 19.5 ft (-.5 ft indicated). | ___2.6 SUPPRESSION POOL LEVEL LOW alarm on P808. |

[NOTE 1]

**Suppression pool temperature can be monitored on the following instruments in the Main Control Room.**

| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1CMS-TR40A,B,C,D | P808 | Wide Range/0 - 200°F |

CAUTION #1

If continuous LPCI operation is required to assure adequate core cooling, do not divert all RHR pumps from LPCI mode. Leave at least one RHR pump in the LPCI mode.

CAUTION #2

Observe NPSH requirements for pumps taking suction from the suppression pool. (NPSH limit curves (LATER).

CAUTION #3

Cooldown rates above 100°F/hr may be required to accomplish this step.

CAUTION #4

Do not depressurize the RPV below 50 Psig unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.

3.0 **OPERATOR ACTIONS**

**Irrespective of the entry conditions, execute the following concurrently:**

___MONITOR AND CONTROL SUPPRESSION POOL TEMPERATURE (proceed to Section 3.1).

___MONITOR AND CONTROL DRYWELL TEMPERATURE (proceed to Section 3.2).

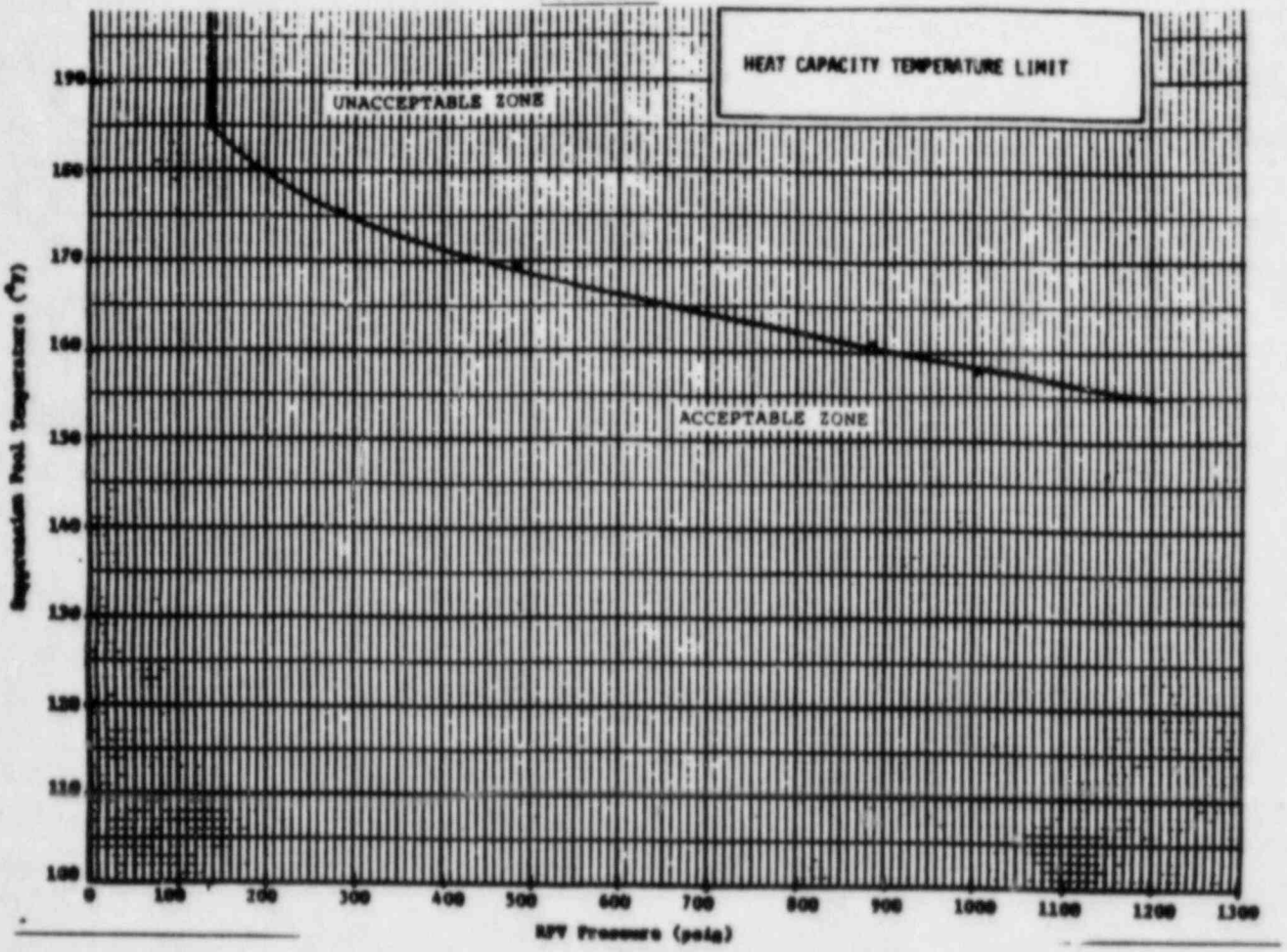
___MONITOR AND CONTROL CONTAINMENT TEMPERATURE (proceed to Section 3.3).

___MONITOR AND CONTROL PRIMARY CONTAINMENT PRESSURE (proceed to Section 3.4).

___MONITOR AND CONTROL SUPPRESSION POOL WATER LEVEL (proceed to Section 3.5).

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.1 MONITOR AND CONTROL SUPPRESSION POOL TEMPERATURE [NOTE 1] | |
| ___3.1.1 Close all stuck open relief valves (SORV). | C3.1.1 IF any SORV cannot be closed within approximately [[2 minutes]] from first attempting to close THEN scram the reactor. |
| ********** SEE CAUTION #1 ********** | |
| ___3.1.2 Operate available suppression pool cooling when pool temperature exceeds 95°F. | |
| ___3.1.3 IF suppression pool temperature reaches 110°F THEN scram the reactor. | |
| ********** SEE CAUTIONS #2, #3 AND #4 ********** | |

FIGURE A




[NOTE 1]

The main condenser (if available) should be used to divert energy from the suppression pool to the maximum extent possible.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.1.4 IF suppression pool temperature cannot be maintained in the acceptable zone of Heat Capacity Temperature Limit in Figure A<br>THEN maintain RPV pressure below the limit [NOTE 1].<br>Proceed to EOP-0001; Instructions 3.0<br>AND execute concurrently with this procedure. | C3.1.4 IF suppression pool temperature AND RPV pressure cannot be maintained in the acceptable zone of the Heat Capacity Temperature Limit in Figure A<br>THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0 and execute concurrently with this procedure. |

## CAUTION #5

While using Hydrogen Mixing System for drywell temperature control, closely monitor containment pressure and temperature.

TABLE A

| TEMP ELEMENT/ *TEMPERATURE | INDICATED LEVEL | LEVEL INSTRUMENT TYPE | RANGE | NUMBER | LOWER TAP ELEVATION |
|---|---|---|---|---|---|
| (LATER) | (LATER) | Shutdown 0 in. to 400 in. | ** | B21-R605 | (LATER) in |
| (LATER) | (LATER) | Wide Range -160 in. to +60 in. | | C33-R608 | (LATER) in |
| | | | ** | B21-R604 | (LATER) in |
| (LATER) | (LATER) | Narrow Range 0 in. to +60 in. | | C33-R608A | (LATER) in |
| | | | | C33-R608B | |
| | | | | C33-R608C | |
| | | | ** | C33-R608 | |
| (LATER) | (LATER) | Upset Range (0 to 180 in.) | ** | C33-LR-R608 | |
| (LATER) | (LATER) | Fuel Zone +50 in. to -150 in. | *** | B21-R615 | (LATER) in |

*Drywell area temperature (M71); average the two points.
**0 in. reference is 15 in. above bottom of Steam Dryer Skirt; 162 in. above TAF
***0 in. reference is TAF; 147 in. below bottom of Steam Dryer Skirt.

[NOTE 2]

Drywell temperature can be monitored on the following instruments in the Main Control Room.

| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1CMS-TR41A, B | P808 | Wide Range/0 - 200°F |
| 1CMS-TI43A,B,C,D,E,F | P808 | Wide Range/0 - 200°F |

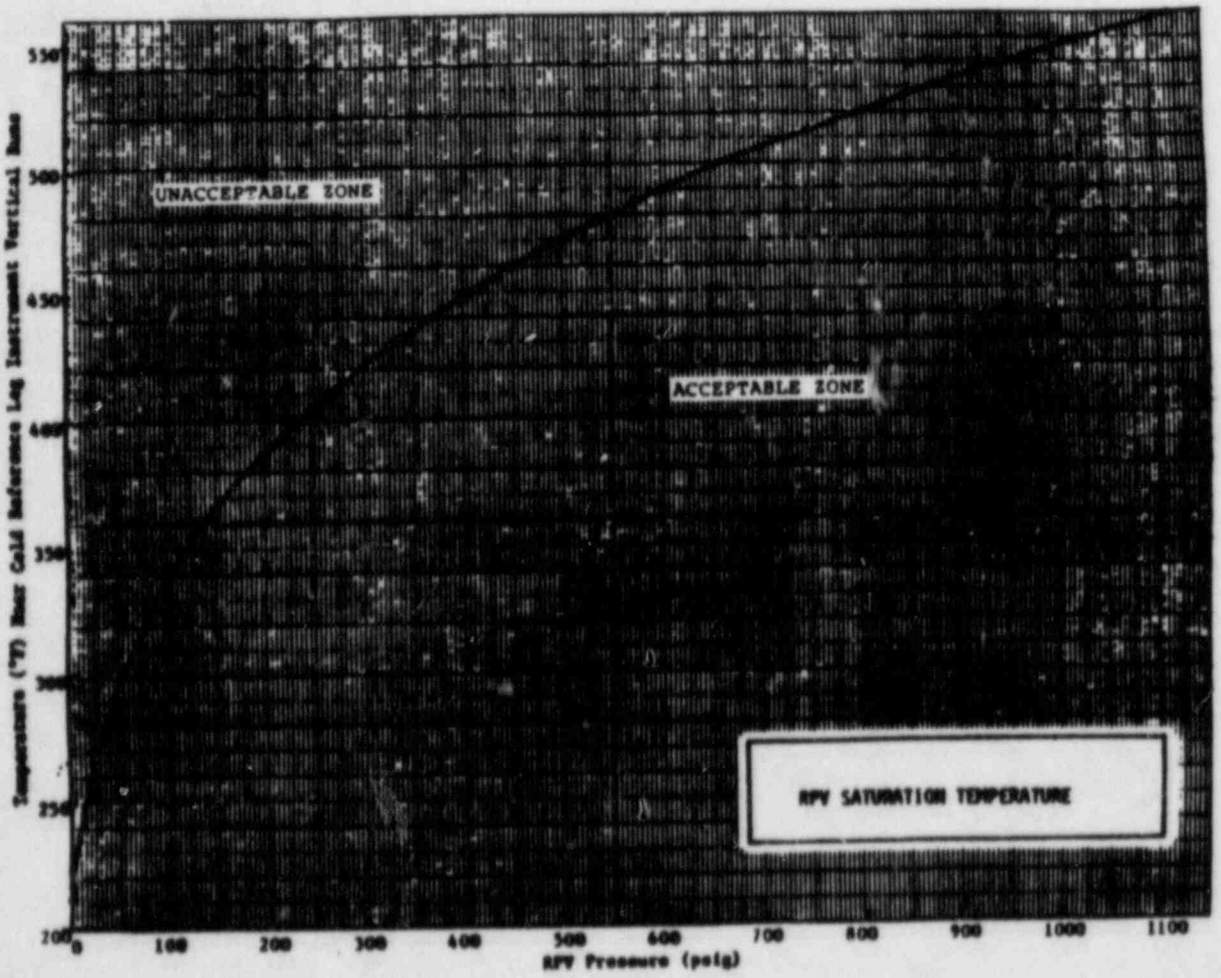
If none of these instruments are operable, then use other sources of information as necessary.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| SEE CAUTION #5 | |
| 3.2 MONITOR AND CONTROL DRYWELL TEMPERATURE [NOTE 2] | |
| ___3.2.1 IF the drywell temperature exceeds 145°F<br>THEN operate all available drywell cooling to maintain drywell temperature less than 180°F<br><br>___1. IF there is no Primary System Boundary Leakage<br>THEN operate drywell purge via Containment Ventilation System or SGTS.<br>a. Assure it isolates if radiation setpoints are exceeded.<br>b. Shutdown purge to SGTS if temperature exceeds 212°F<br><br>___2. IF high drywell pressure signal is sealed in<br>BUT NO PRIMARY COOLANT LEAKAGE IS PRESENT.<br>THEN start the Hydrogen Mixing System (one train) to maintain drywell temperature less than 180°F (operate bypass switch as necessary) | C3.2.1 IF the drywell temperature cannot be maintained below 180°F<br>THEN proceed to EOP-0001; Instructions 3.0<br>AND<br>initiate a controlled depressurization at approximately 100°F/hr using turbine bypass valves or SRV's as necessary. Execute EOP-0001 concurrently with this procedure.<br><br>IF the drywell temperature cannot be maintained below 330°F<br>THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0<br>AND execute concurrently with this procedure. |
| ___3.2.2 IF the temperature near the Cold Reference Leg vertical runs:<br><br>1. Exceeds the limits listed in the temperature column of Table A<br>AND the indicated RPV water level decreases to that given in the indicated level column<br>THEN disregard the instrument for further reliability | |

CAUTION #6

If the drywell temperature reaches the RPV saturation temperature (see Figure B) the RPV level instruments should be considered unreliable since their reference legs have probably flashed. If this occurs, the level indication will probably "peg high" even though the actual RPV level may be low and decreasing.

FIGURE B



| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| SEE CAUTION #6 | |
| 3.2.2 (Continued)<br><br>___2. Reaches the RPV saturation limit as determined from Figure B (unacceptable zone) THEN RPV FLOODING IS REQUIRED.<br><br>a. Assure the reactor is scrammed<br><br>b. Open two SRV's<br><br>c. Proceed to EOP-0001, Step 3.0. Execute concurrently with EOP-0002. | |

## TABLE B

| TEMP ELEMENT/ *TEMPERATURE | INDICATED LEVEL | LEVEL INSTRUMENT TYPE | RANGE | NUMBER | LOWER TAP ELEVATION |
|---|---|---|---|---|---|
| (LATER) | (LATER) | Shutdown | 0 in. to 400 in. *** | B21-R605 | (LATER) in |
| (LATER) | (LATER) | Wide Range | -160 in. to +60 in. | C33-R608 | (LATER) in |
| | | | *** | B21-R604 | (LATER) in |
| (LATER) | (LATER) | Narrow Range | 0 in. to +60 in. | C33-R608A | (LATER) in |
| | | | | C33-R608B | |
| | | | | C33-R608C | |
| | | | *** | C33-R608 | |
| (LATER) | (LATER) | Fuel Zone | +50 in. to -150 in. | B21-R615 | (LATER) in |
| | | | **** | B21-R610 | (LATER) in |

*Use containment cooler inlet air temperature.

**For those instruments there is no elevated containment temperature which will cause onscale reading if the actual level is at or below the lower instrument tap, i.e; if the instrument reads on scale, actual RPV water level is at or above the lower instrument tap.

***0" reference is 15 in. above bottom of Steam Dryer Skirt; 162 in. above TAF.

****0" reference is TAF; 147 in. below bottom of Steam Dryer Skirt.

---

CAUTION #7

If the containment temperature reaches the RPV saturation temperature, the RPV level instruments should be considered unreliable since their reference legs have probably flashed. If this occurs, the level indication will probably "peg high" even though actual RPV level may be low and decreasing.

---

[NOTE 3]

Containment temperature can be monitored on the following instruments in the Main Control Room.

| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1CMS-TRY42A, B | P808 | Wide Range/0 - 200°F |
| 1CMS-TRX42A, B | P808 | Wide Range/0 - 200°F |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.3 MONITOR AND CONTROL CONTAINMENT TEMPERATURE [NOTE 3] | |
| ___3.3.1 IF containment temperature exceeds 90°F THEN operate all available containment cooling and continue in this procedure. | |
| ___3.3.2 IF the temperature near the cold reference leg vertical runs exceeds the limits listed in the temp column of Table B AND the indicated water level decreases to that given in the indicated level column THEN disregard the instrument for further reliability and continue in this procedure. | C3.3.2 IF the temperature does not exceed Table B THEN continue at Step 3.3.3. |
| ___3.3.3 IF containment temperature reaches [[180°F]] and if containment pressure is below 2 Psid THEN initiate containment purge via SGTS and continue in this procedure. | |
| ___3.3.4 IF containment temperature can not be maintained below 185°F THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0. AND execute concurrently with this procedure. | |
| ********** SEE CAUTION #7 ********** | |
| ___3.3.5 IF containment temperature reaches the RPV saturation temp (see Figure B, Page 10) THEN RPV FLOODING IS REQUIRED.<br>___1. Assure the reactor is scrammed<br>___2. Open two SRV's<br>___3. Proceed to EOP-0001, Step 3.0. Execute concurrently with EOP-0002. | |

[NOTE 4]

Primary containment pressure can be monitored on the following instruments in the Main Control Room.

| INSTRUMENT NUMBER | PANEL | TYPE RANGE |
|---|---|---|
| 1CMS-PR2A, B | P808 | Wide Range/0 - 75 Psia |

CAUTION #8

Observe NPSH requirements for pumps taking suction from the suppression pool. (NPSH limit curves (LATER).

CAUTION #9

Elevated containment pressure may trip the RCIC turbine on high exhaust pressure.

CAUTION #10

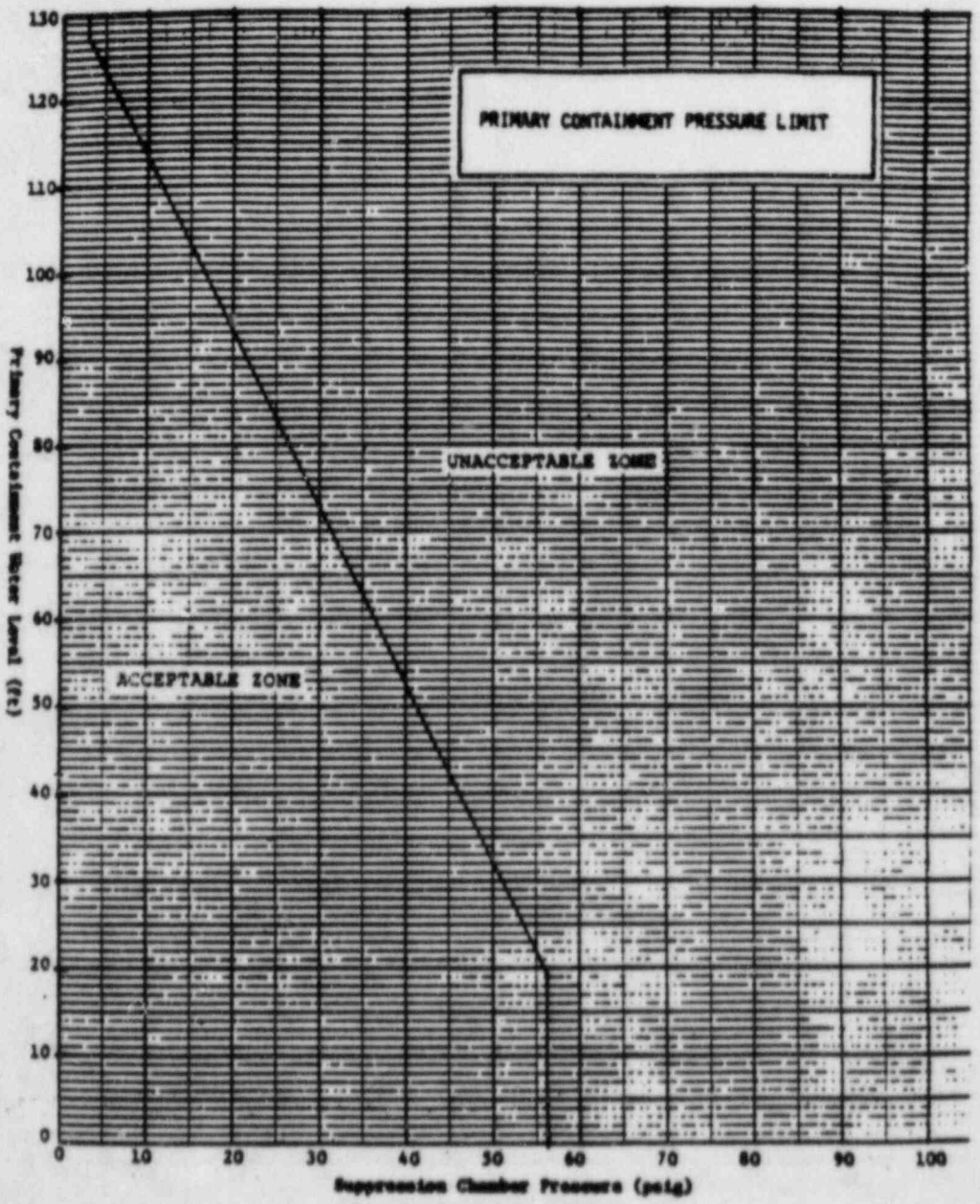
Bypassing Secondary Containment HVAC Isolation signals may be required to perform these steps (instructions (LATER).

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.4 MONITOR AND CONTROL PRIMARY CONTAINMENT PRESSURE [NOTE 4] | |
| ___3.4.1 IF containment and drywell temperatures are below 212°F THEN operate Containment Ventilation System and Drywell Purge via [1CPM-MOV2A(B) and 4A(B)] to maintain drywell to containment differential pressure below 2 Psid and containment to annulus differential pressure below 2 Psig. | C3.4.1 IF containment ventilation system isolates AND there is no primary coolant boundary leakage THEN reset the isolation at P680 and restore Containment Ventilation System to normal before drywell pressure reaches 2 Psig. |
| ********** SEE CAUTIONS #8, #9 AND #10 ********** | |
| ___3.4.2 IF containment to annulus differential pressure reaches 5.0 Psid THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0 AND execute concurrently with this procedure. | |
| ___3.4.3 IF containment pressure reaches [[7.5]] Psig THEN operate all available containment cooling to maintain less than [[9.0]] Psig. | C3.4.3 IF containment cooling is not effective in maintaining containment pressure less than [[9.0]] Psig THEN attempt to restart drywell cooling. |

CAUTION #11

If continuous LPCI operation of A and B RHR pumps is required to assure adequate core cooling then do not divert A or B RHR pumps from the LPCI mode.

FIGURE C



| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| SEE CAUTION #11 | |
| ___3.4.4 IF containment pressure reaches [[9.0]] Psig AND adequate core cooling is assured THEN initiate suppression pool cooling to maintain less than [[12]] Psig. | C3.4.4 IF containment pressure cannot be maintained below [[12]] Psig THEN initiate suppression pool cooling even if adequate core cooling is not assured. |
| ___3.4.5 IF containment to annulus differential pressure cannot be maintained below 15 Psid or drywell below 25 Psid THEN RPV FLOODING IS REQUIRED.<br>___1. Assure the reactor is scrammed<br>___2. Open two SRV's<br>___3. Proceed to EOP-0001; Step 3.0. Execute concurrently with EOP-0002. | |
| ___3.4.6 IF containment pressure exceeds acceptable zone of Figure C THEN vent the containment to reduce pressure below Figure C; OPEN Hydrogen Purge outlet to Annulus [1CPP-MOV104 and 105] on [1CPP-PNL102] (Aux Bldg EL 170 feet). | C3.4.6 IF Hydrogen Purge to Annulus is not effective in reducing containment pressure within acceptable zone of Figure C THEN perform the following:<br>___Bypass the Containment Ventilation (details (LATER)<br>___Open CTMT purge valves (P863) [1HVR-AOD127, 128 and 166] to vent containment to the Ventilation System Exhaust. |

[NOTE 5]

Suppression pool water level can be monitored on the following instruments in the Main Control Room.

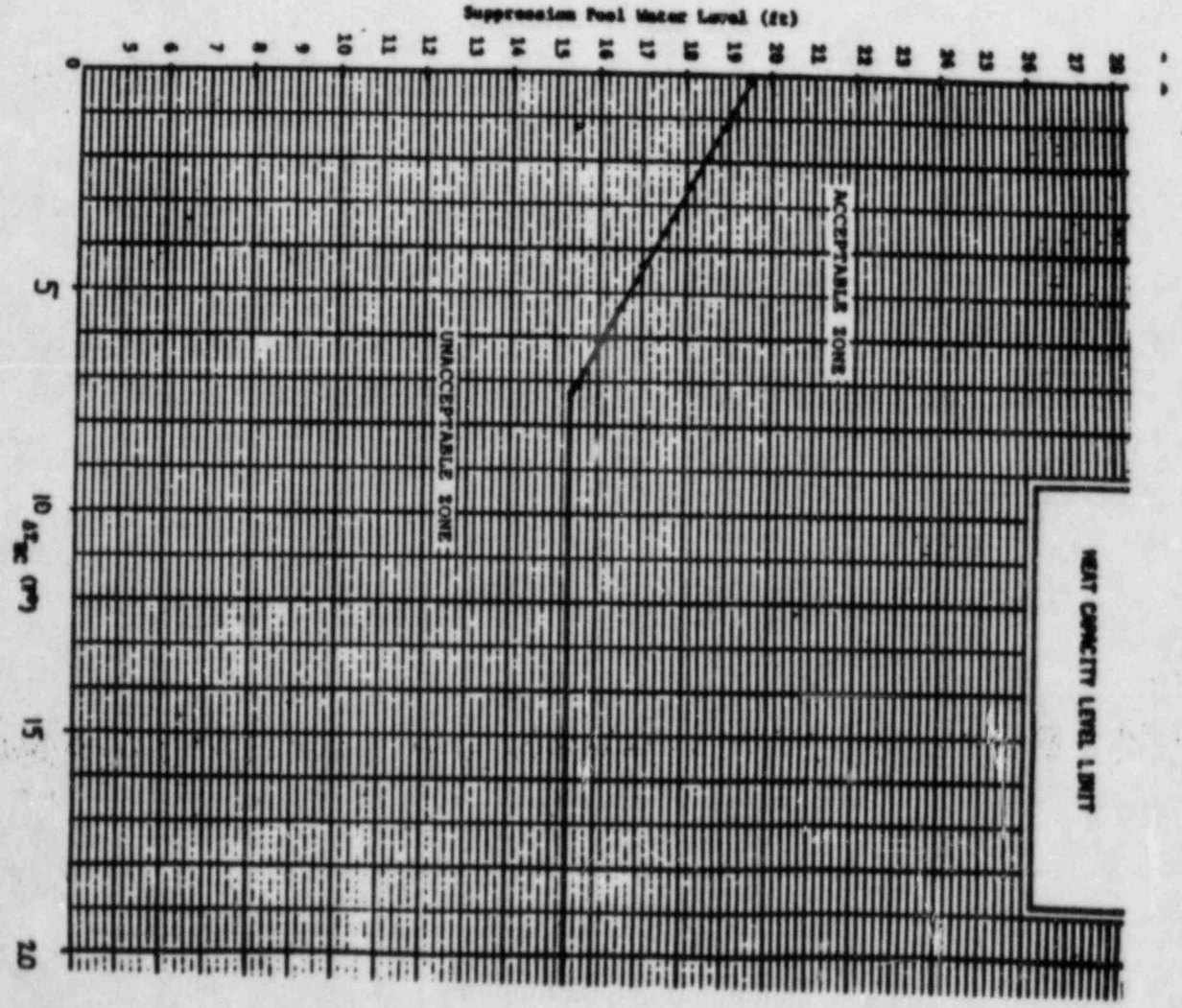
| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1CMS-TR40A,B,C,D | P808 | Wide Range/-18 to +4 ft* |
| 1CMS-LI23A, B | P808 | Wide Range/-18 to +4 ft* |

*0 ft indicated is 20.0 ft of water level in suppression pool

CAUTION #12

Observe NPSH requirements for pumps taking suction from the suppression pool. (NPSH limit curves (LATER).

FIGURE D



| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.5 MONITOR AND CONTROL SUPPRESSION POOL WATER LEVEL [NOTE 5] | |
| ********** SEE CAUTION #12 ********** | |
| ___3.5.1 Maintain suppression pool water level less than 20.0 ft (0 ft indicated) and greater than 19.5 ft (-.5 ft indicated).<br><br>___1. IF there is any potential for abnormally high activity levels in the suppression pool<br>THEN request a sample analysis by Radio-chemistry Personnel.<br><br>___2. Use all available normal makeup if suppression pool level is low. | C3.5.1 IF suppression pool level increases to 20.0 ft (0 ft indicated)<br>OR if CST level decreases to 2 ft 4 5/8 in.<br>THEN confirm auto transfer or manually transfer HPCS and RCIC suction from the CST to the suppression pool.<br><br>1. HPCS E22-MOV105 opens and then E22-MOVF001 closes<br><br>2. RCIC E51-MOVF031 opens and then E51-MOVF010 closes<br><br>IF suppression pool level can not be maintained below 20.0 ft AND adequate core cooling is assured<br>THEN terminate injection into the RPV from sources external to the primary containment.<br>AND proceed to EOP-0001, Instructions 3.0. Execute concurrently with this procedure |
| ___3.5.2 IF suppression pool water level cannot be maintained in the acceptable zone of Heat Capacity Level Limit (Figure D)<br>THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0<br>AND execute these concurrently with this procedure. | |

CAUTION #13

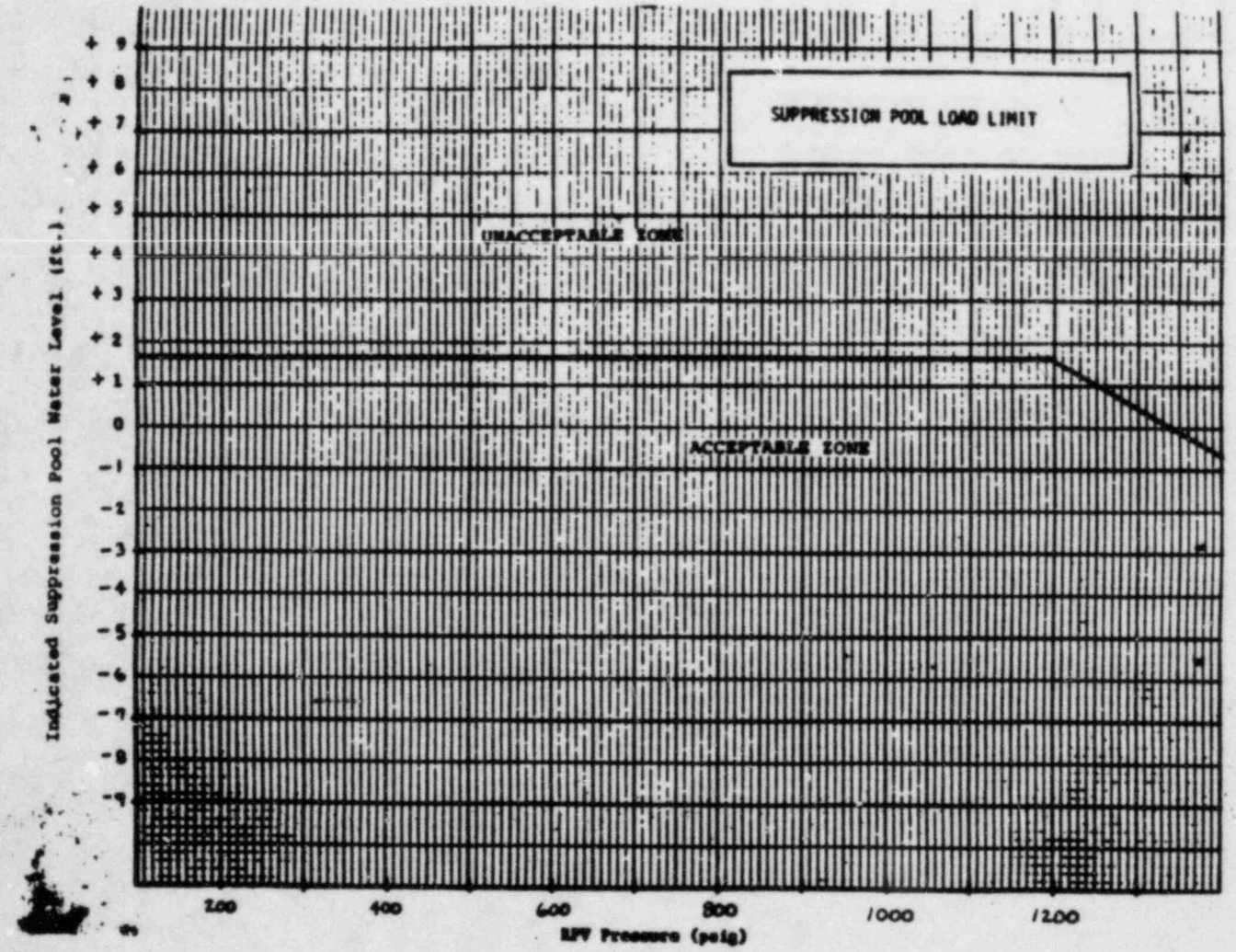
Cooldown rates above 100°F/hr may be required to accomplish this step.

CAUTION #14

Do not depressurize the RPV below 50 Psig unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.

FIGURE E

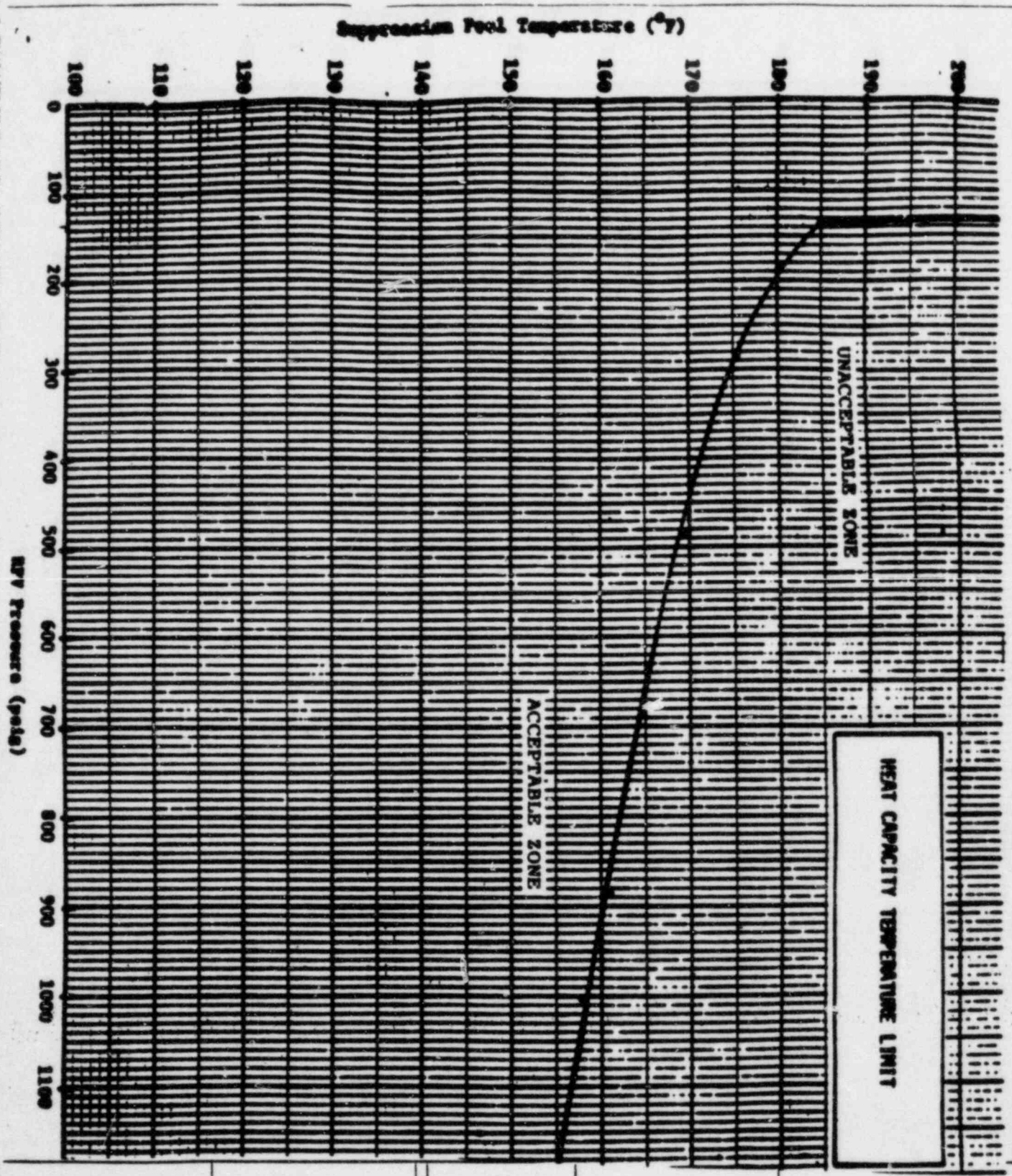
Suppression Pool Load Limit



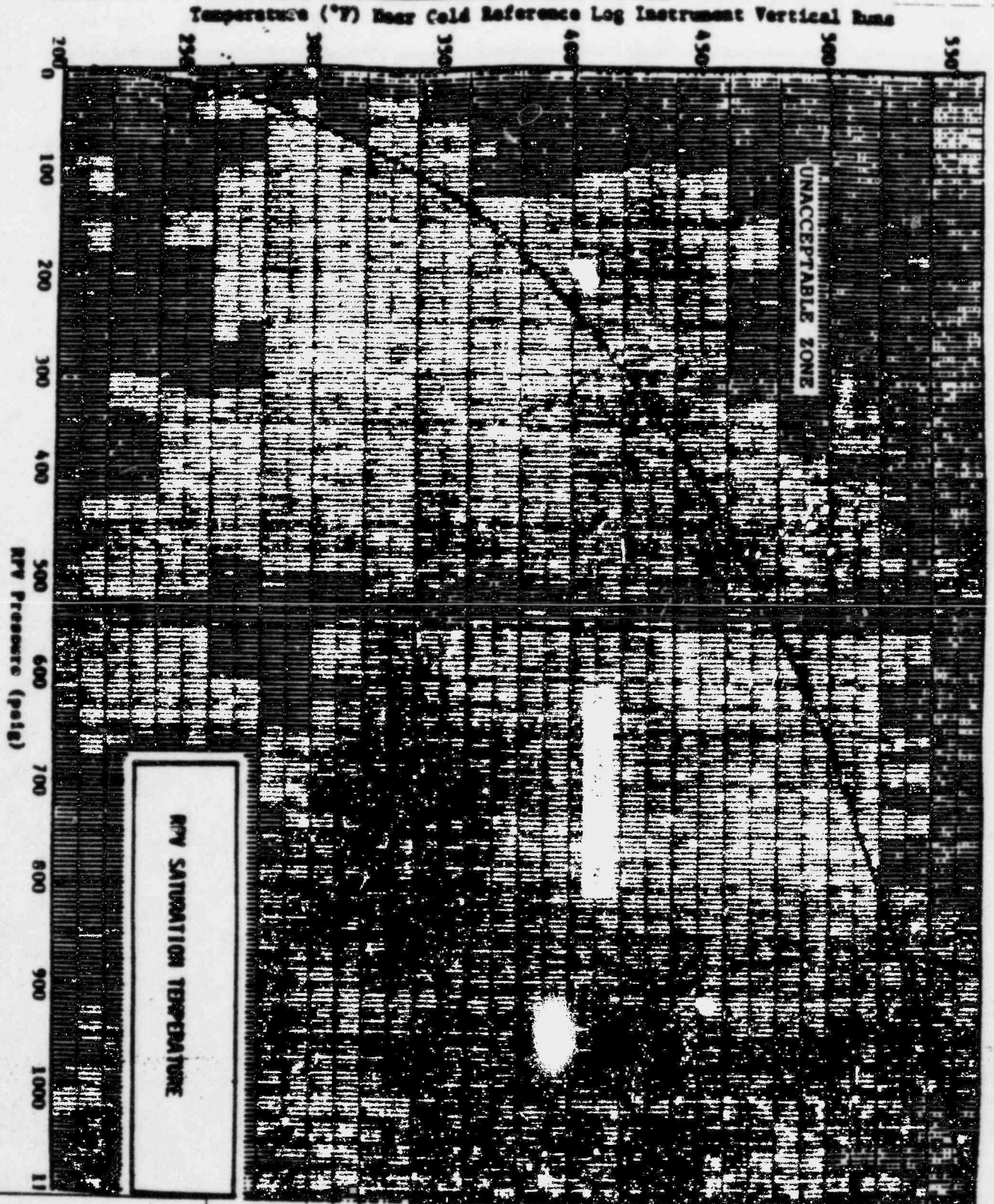
| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ********** SEE CAUTIONS #13 AND #14 ********** | |
| ___3.5.3 IF suppression pool water level cannot be maintained in the acceptable zone of suppression pool load limit (Figure E) THEN maintain RPV pressure below the limit | C3.5.3 IF suppression pool water level AND RPV pressure cannot be restored and maintained in the acceptable zone of the suppression pool load limit THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0 AND execute these concurrently with this procedure. |
| ___3.5.4 WHEN primary containment water level reaches 158 feet Mean Sea Level (MSL) THEN terminate injection into the RPV from sources external to the containment regardless of whether adequate core cooling is required | |
| NOTE<br><br>This corresponds to a static system pressure on RHR pumps of approximately 25 Psig above containment pressure. | |

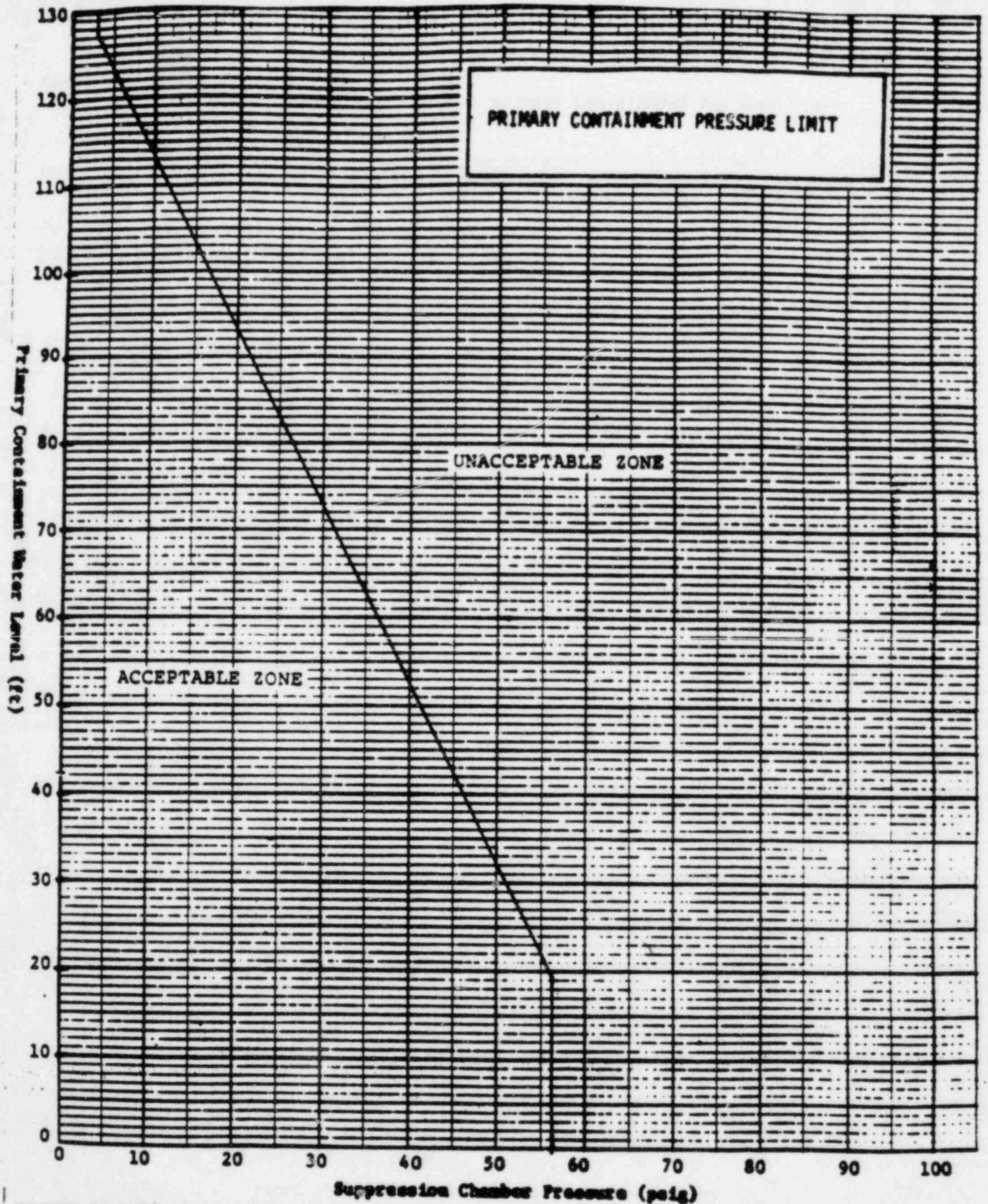
"END OF EOP-0002"

ENCLOSURE - 1 FULL (SEE FIGURE A: HEAT CAPACITY TEMPERATURE LIMIT CURVE

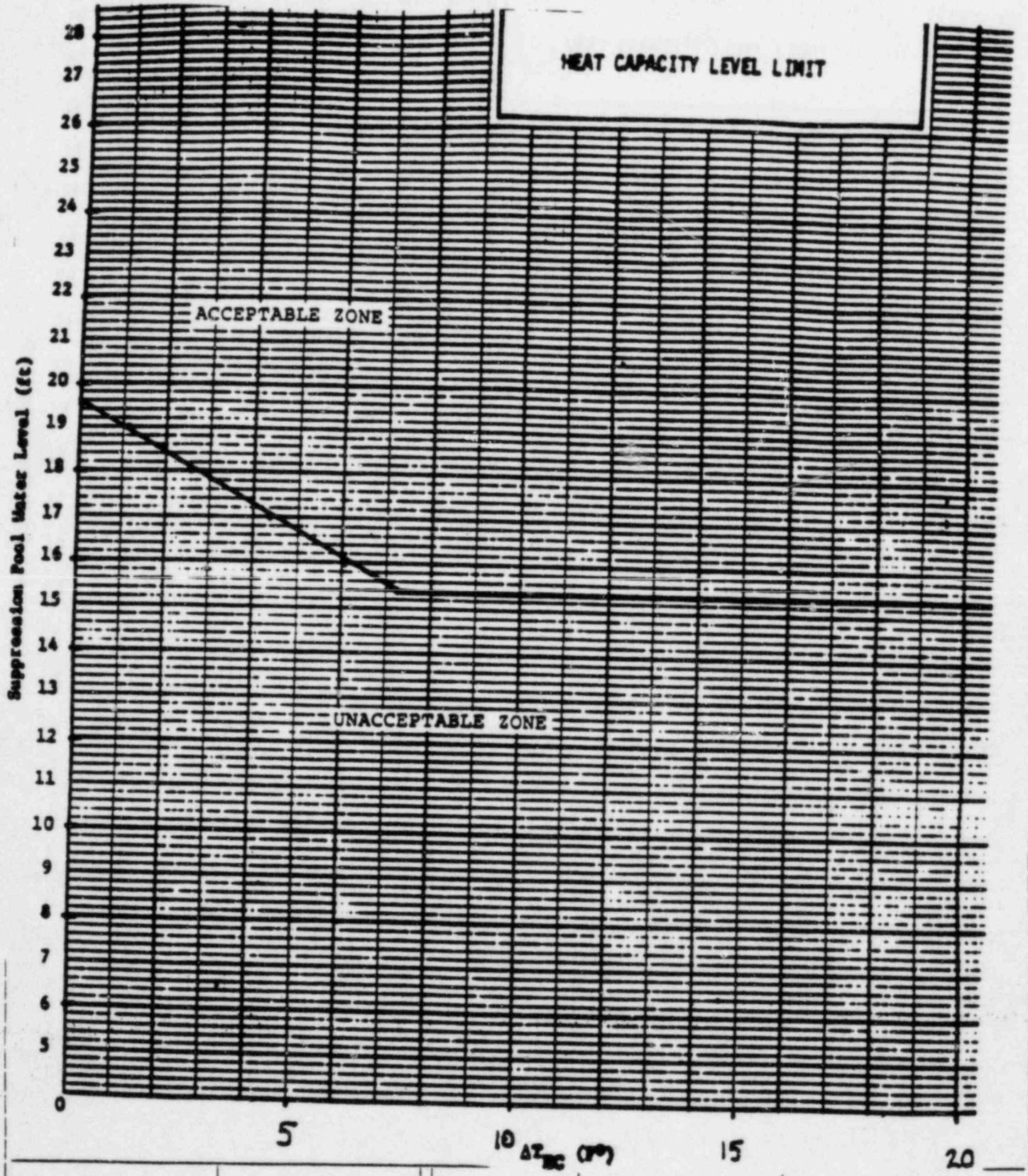


ENCLOSURE - 2 FULL SIZE FIGURE 3: RPV SATURATION TEMPERATURE CURVE




PRIMARY CONTAINMENT PRESSURE LIMIT
UNACCEPTABLE ZONE
ACCEPTABLE ZONE
Primary Containment Water Level (ft)
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Suppression Chamber Pressure (psig)

ENCLOSURE - 4 FULL SIZE FIGURE D: HEAT CAPACITY LEVEL LIMIT



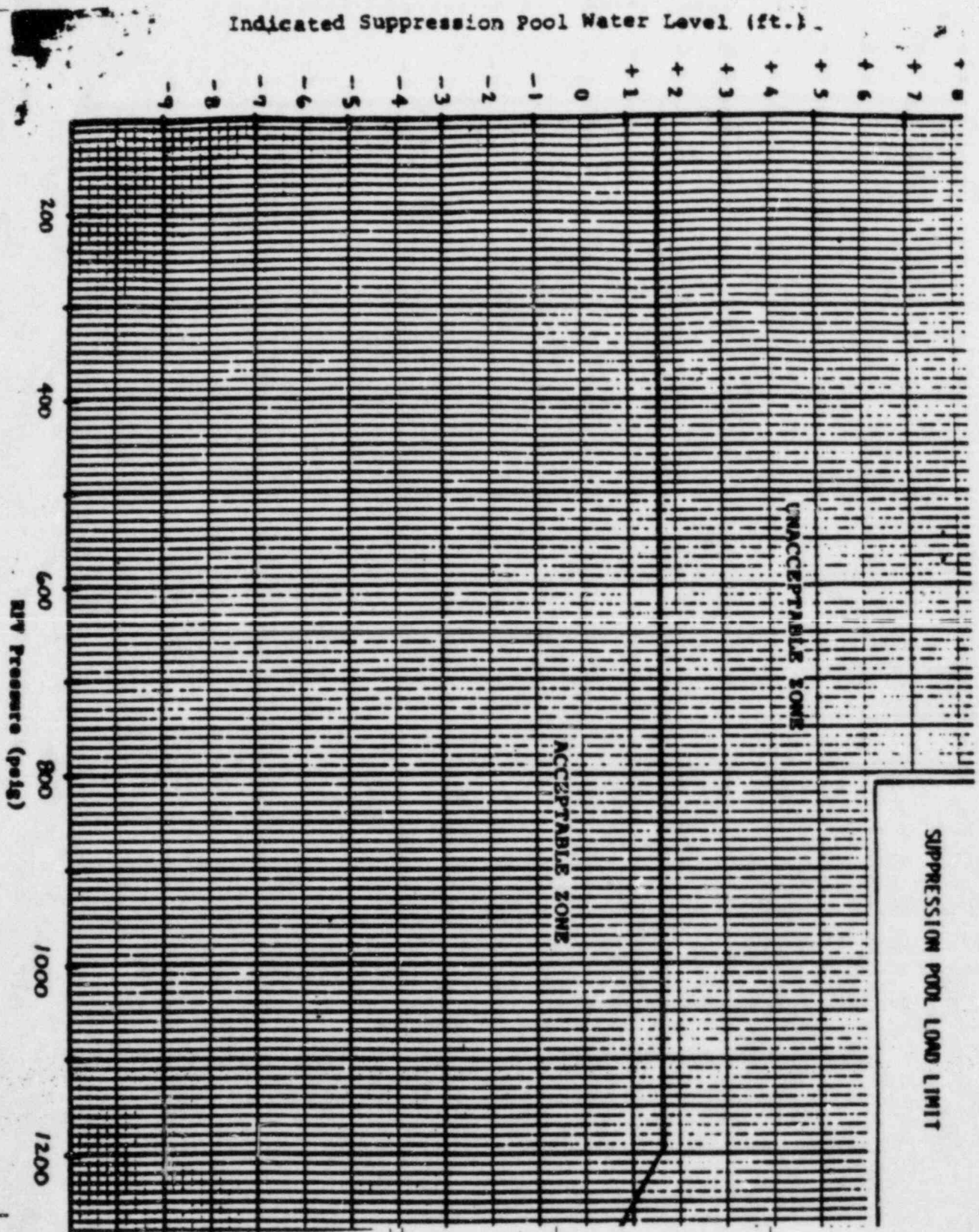

Indicated Suppression Pool Water Level (ft.)
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
+1
+2
+3
+4
+5
+6
+7
+8
200
400
600
800
1000
1200
RPV Pressure (psig)
UNACCEPTABLE ZONE
ACCEPTABLE ZONE
SUPPRESSION POOL LOAD LIMIT

TABLE OF CONTENTS

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1.0 PURPOSE

___1.1 To protect equipment in the secondary containment.

___1.2 To limit radioactivity release to the secondary containment.

AND

___1.3 Maintain secondary containment integrity.

OR

___1.4 Limit radioactivity release from the secondary containment.

2.0 ENTRY CONDITIONS

___2.1 Any of the following secondary containment conditions:

___2.1.1 Differential pressure at 0 in. of water or positive.

___2.1.2 Any area temperature above the maximum normal operating temperature per Table I of page 6.

___2.1.3 Any HVAC cooler differential temperature above the maximum normal operating differential temperature on Table I on page 6.

___2.1.4 Any HVAC exhaust radiation above the maximum normal operating level per Table II on page 10.

___2.1.5 Any area radiation level above the maximum normal operating level per Table II on page 10.

___2.1.6 A floor drain sump water level above the maximum normal operating water level per Table III on page 12.

___2.1.7 An area water level above the maximum normal operating water level per Table III on page 12.

[NOTE 1]

Secondary Containment Temperatures are monitored on the BOP computer (points (LATER).

Secondary Containment Radiation levels are monitored in the Main Control Room as follows:

| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1RMS-RIX5B | P863 | Effluent Recorder/(LATER) |
| 1RMS-RIY5B | P863 | Effluent Recorder/(LATER) |
| 1RMS*RE5A(B) | DRMS | Fuel Bldg Vent Exhaust/(LATER) |
| 1RMS*RE125, 126 | DRMS | Main Plant Exhaust Duct/(LATER) |
| 1RMS*RE110 | DRMS | Auxiliary Bldg Ventilation/(LATER) |
| 1RMS*RE11A(B) | DRMS | Reactor Bldg Annulus Vent/(LATER) |
| 1RMS-RE103 | DRMS | SGTS Effluent/(LATER) |
| Various | DRMS | Area Rad Monitors in Aux Bldg & Fuel Bldg/(LATER) |

Secondary Containment water levels are monitored in the Main Control Room as follows:

| INSTRUMENT NUMBER | PANEL | TYPE/RANGE |
|---|---|---|
| 1DFR-LI134 | P870 | LPCS Room/0 - 100% |
| 1DFR-LI135 | P870 | A RHR Room/0 - 100% |
| 1DFR-LI136 | P870 | RCIC Room/0 - 100% |
| 1DFR-LI137 | P870 | C RHR Room/0 - 100% |
| 1DFR-LI138 | P870 | B RHR Room/0 - 100% |

## 3.0 OPERATOR ACTIONS

Irrespective of the entry conditions, execute the following concurrently:

MONITOR AND CONTROL SECONDARY CONTAINMENT TEMPERATURES (proceed to Section 3.1) [NOTE 1].

MONITOR AND CONTROL SECONDARY CONTAINMENT RADIATION LEVELS (proceed to Section 3.2) [NOTE 1].

MONITOR AND CONTROL SECONDARY CONTAINMENT WATER LEVELS (proceed to Section 3.3) [NOTE 1].

## TABLE I

### Operating Values of Secondary Containment Temperature

| SECONDARY CONTAINMENT LOCATION | ALARM | MAXIMUM NORMAL | MAXIMUM SAFE |
|---|---|---|---|
| HVAC COOLER DIFFERENTIAL TEMPERATURE | | | |
| MSL Pipe Tunnel | (LATER) | (LATER) | (LATER) |
| RHR Equipment Area 1 | 29°F | (LATER) | (LATER) |
| RHR Equipment Area 2 | 29°F | (LATER) | (LATER) |
| RCIC Equipment Area | (LATER) | (LATER) | (LATER) |
| RWCU Heat Exchanger Room | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 1 | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 2 | (LATER) | (LATER) | (LATER) |
| RWCU Valve Nest Room | (LATER) | (LATER) | (LATER) |
| RWCU Demin Room 1 | (LATER) | (LATER) | (LATER) |
| RWCU Demin Room 2 | (LATER) | (LATER) | (LATER) |
| RWCU Demin Valve Room | (LATER) | (LATER) | (LATER) |
| RWCU Rec Tank | (LATER) | (LATER) | (LATER) |
| AREA TEMPERATURE | | | |
| MSL Pipe Tunnel | (LATER) | (LATER) | (LATER) |
| RHR Equipment Area 1 | 117°F | (LATER) | (LATER) |
| RHR Equipment Area 2 | 117°F | (LATER) | (LATER) |
| RCIC Equipment Area | 185°F | (LATER) | (LATER) |
| RWCU Heat Exchanger Room | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 1 | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 2 | (LATER) | (LATER) | (LATER) |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.1 MONITOR AND CONTROL SECONDARY CONTAINMENT TEMPERATURE | |
| ___3.1.1 Operate available area unit coolers. | |
| ___3.1.2 IF secondary containment HVAC exhaust radiation levels exceed (LATER)Cpm while performing Step 3.1.5, 3.1.6 or 3.1.7 THEN isolate or confirm isolation of secondary containment HVAC. | |
| ___3.1.3 IF secondary containment HVAC exhaust radiation levels exceed (LATER)Cpm while performing step 3.1.5, 3.1.6 or 3.1.7 AND IF the space being exhausted is below 212°F THEN initiate or confirm initiation of SGTS. | C3.1.3 IF space temperature is above 212°F THEN stop SGTS. |
| ___3.1.4 IF secondary containment HVAC isolates while performing step 3.1.5, 3.1.6 or 3.1.7 AND IF secondary containment HVAC exhaust radiation level is below (LATER)Cpm THEN restart secondary containment HVAC. | C3.1.4 IF bypassing high drywell pressure and low RPV water level secondary containment interlocks are required THEN bypass these per contingency actions details (LATER). |
| ___3.1.5 IF secondary containment HVAC exhaust radiation level is below (LATER)Cpm THEN operate available secondary containment HVAC. | |
| ___3.1.6 IF any area temperature exceeds its maximum normal operating temperature per Table I THEN isolate all systems that are discharging into the area except systems required to shutdown the reactor, assure adequate core cooling or suppress a working fire. | |

## TABLE I

### Operating Values of Secondary Containment Temperature

| SECONDARY CONTAINMENT LOCATION | ALARM | MAXIMUM NORMAL | MAXIMUM SAFE |
|---|---|---|---|
| HVAC COOLER DIFFERENTIAL TEMPERATURE | | | |
| MSL Pipe Tunnel | (LATER) | (LATER) | (LATER) |
| RHR Equipment Area 1 | 29°F | (LATER) | (LATER) |
| RHR Equipment Area 2 | 29°F | (LATER) | (LATER) |
| RCIC Equipment Area | (LATER) | (LATER) | (LATER) |
| RWCU Heat Exchanger Room | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 1 | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 2 | (LATER) | (LATER) | (LATER) |
| RWCU Valve Nest Room | (LATER) | (LATER) | (LATER) |
| RWCU Demin Room 1 | (LATER) | (LATER) | (LATER) |
| RWCU Demin Room 2 | (LATER) | (LATER) | (LATER) |
| RWCU Demin Valve Room | (LATER) | (LATER) | (LATER) |
| RWCU Rec Tank | (LATER) | (LATER) | (LATER) |
| AREA TEMPERATURE | | | |
| MSL Pipe Tunnel | (LATER) | (LATER) | (LATER) |
| RHR Equipment Area 1 | 117°F | (LATER) | (LATER) |
| RHR Equipment Area 2 | 117°F | (LATER) | (LATER) |
| RCIC Equipment Area | 185°F | (LATER) | (LATER) |
| RWCU Heat Exchanger Room | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 1 | (LATER) | (LATER) | (LATER) |
| RWCU Pump Room 2 | (LATER) | (LATER) | (LATER) |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.1.7 IF a primary system is discharging into an area THEN BEFORE any area temp reaches its maximum safe operating temperature (Table I) proceed to EOP-0001; Instructions 3.0 and execute concurrently with this procedure. | C3.1.7 IF a primary system is discharging into an area AND an area temperature exceeds its maximum safe operating temperature in more than one location THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0 AND execute concurrently with this procedure. |

## TABLE II

Operating Values of Secondary Containment Radiation

| SECONDARY CONTAINMENT LOCATION | ALARM | MAXIMUM NORMAL | MAXIMUM SAFE |
|---|---|---|---|
| Effluent Recorder [1RMS-RIX5B] | (LATER)Cpm | (LATER) | (LATER) |
| Effluent Recorder [1RMS-RIY5B] | (LATER)Cpm | (LATER) | (LATER) |
| Fuel Bldg Vent Exhaust [1RMS-RE5A(B)] | (LATER)Cpm | (LATER) | (LATER) |
| Main Plant Exhaust Duct [1RMS-RE125, 126] | (LATER)Cpm | (LATER) | (LATER) |
| Auxiliary Bldg Ventilation [1RMS-RE110] | (LATER)Cpm | (LATER) | (LATER) |
| Reactor Bldg Annulus Vent [1RMS-RE11A(B)] | (LATER)Cpm | (LATER) | (LATER) |
| SGTS Effluent [1RMS-RE103] | (LATER)Cpm | (LATER) | (LATER) |
| AREA RADIATION LEVELS (Locations LATER) | (LATER)Mr | (LATER) | (LATER) |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.2 MONITOR AND CONTROL SECONDARY CONTAINMENT RADIATION LEVELS | |
| ___3.2.1 IF secondary containment HVAC exhaust radiation levels exceed alarm level in Table II while performing Steps 3.2.4 or 3.2.5 THEN isolate or confirm isolation of secondary containment HVAC. | |
| ___3.2.2 IF secondary containment HVAC exhaust radiation levels exceed (LATER)Cpm while performing steps 3.2.4 or 3.2.5 AND IF the space being exhausted is below 212°F THEN initiate or confirm initiation of SGTS. | C3.2.2 IF space temperature is above 212°F THEN stop SGTS. |
| ___3.2.3 IF secondary containment HVAC isolates while performing Steps 3.2.4, 3.2.5 AND IF secondary containment HVAC exhaust radiation level is below (LATER)Cpm THEN restart secondary containment HVAC. | C3.2.3 IF bypassing high drywell pressure and low RPV water level secondary containment interlocks is required THEN bypass these per contingency action details (LATER). |
| ___3.2.4 IF any area radiation level exceeds its maximum normal operating level THEN isolate all systems that are discharging into the area except systems required to shutdown the reactor, assure adequate core cooling or suppress a working fire. | |
| ___3.2.5 IF a primary system is discharging into an area THEN before any area radiation reaches its maximum safe operating level proceed to EOP-0001; Instructions 3.0 and execute it concurrently with this procedure. | C3.2.5 IF a primary system is discharging into an area and an area radiation level exceeds its maximum safe operating level in more than one area THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001; Instructions 3.0 AND execute concurrently with this procedure. |

## TABLE III

### Operating Values of Secondary Containment Water Levels

| SECONDARY CONTAINMENT LOCATION | ALARM | MAXIMUM NORMAL | MAXIMUM SAFE |
|---|---|---|---|
| HPCS Pump Room | 6" | (LATER) | (LATER) |
| RHR Hx and Pump Room B | 6" | (LATER) | (LATER) |
| RHR Pump Room C | 6" | (LATER) | (LATER) |
| RCIC Pump Room | 6" | (LATER) | (LATER) |
| RHR Hx and Pump Room A | 6" | (LATER) | (LATER) |
| LPCS Pump Room | 6" | (LATER) | (LATER) |
| Aux Bldg Floor Drn Sump (5A) | 32 1/8" | (LATER) | (LATER) |
| Aux Bldg Floor Drn Sump (5B) | 32 1/8" | (LATER) | (LATER) |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.3 MONITOR AND CONTROL SECONDARY CONTAINMENT WATER LEVELS | |
| ___3.3.1 IF secondary containment HVAC exhaust radiation levels exceed (LATER)Cpm while performing steps 3.2.4 or 3.2.5 THEN isolate or confirm isolation of secondary containment HVAC. | |
| ___3.3.2 IF secondary containment HVAC exhaust radiation levels exceed (LATER)Cpm while performing steps 3.2.4 or 3.2.5 AND IF the space being exhausted is below 212°F THEN initiate or confirm initiation of SGTS. | C3.3.2 IF space temperature is above 212°F THEN stop SGTS. |
| ___3.3.3 IF secondary containment HVAC isolates while performing steps 3.2.4 or 3.2.5 AND IF secondary containment HVAC exhaust radiation level is below (LATER)Cpm THEN restart secondary containment HVAC. | C3.3.3 IF bypassing high drywell pressure and low RPV water level, secondary containment interlocks is required THEN bypass these per contingency actions details (LATER). |
| ___3.3.4 IF any floor drain sump or area water level is above its maximum normal operating water level (Table III) THEN operate available sump pumps to restore and maintain it below its maximum normal operating level. | C3.3.4 IF any floor drain sump or area water level cannot be restored and maintained below its maximum normal operating water level (Table III) THEN isolate all systems that are discharging into the sump or area except systems required to shutdown the reactor, assure adequate core cooling or suppress a working fire. |

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| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.3.5 IF a primary system is discharging into an area THEN BEFORE any floor drain sump or area water level reaches its maximum safe operating level, proceed to EOP-0001, Instructions 3.0 and execute concurrently with this procedure. | C3.3.5 IF a primary system is discharging into an area AND a floor drain sump or area water level exceeds its maximum safe operating water level in more than one area THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001, Instructions 3.0 AND execute concurrently with this procedure. |

"END OF EOP-0003"

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[NOTE 1]

Boron injection is required if the reactor cannot be shutdown (all rods inserted beyond [[06]]) before suppression pool temperature reaches 110°F.

---

[NOTE 2]

RPV flooding is required under any of the following conditions:

- Temperature near the cold reference leg instrument vertical runs exceeds the RPV saturation limit.
- RPV water level cannot be determined.
- Containment to annulus differential pressure cannot be maintained below 15 Psid or drywell to containment differential pressure below 25 Psid.
- Drywell temperature cannot be maintained below 330°F.

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[NOTE 3]

The most rapid way to initiate ECCS Injection Systems (HPCS, LPCS or LPCI) is to actuate the division initiate pushbuttons (on P601).

## 1.0 PURPOSE

To restore RPV water level to above TAF.

## 2.0 ENTRY CONDITIONS

2.1 Enter this procedure from EOP-0001; Step C3.2.3, IF water level cannot be maintained above -160 in. as read on wide range water level instruments.

## 3.0 OPERATOR ACTIONS

__3.1 Start the Combustible Gas Control Recombiners and Igniters.

___3.2 Complete instructions and contingenecy actions (as necessary) 3.2.1 - 3.2.10.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.2.1 IF while executing Steps 3.2.4 through 3.2.10, boron injection is required [NOTE 1] THEN proceed to AOP-0021 "Level/Power Control". | |
| ___3.2.2 IF while executing Steps 3.2.4 through 3.2.10, RPV water level cannot be determined THEN proceed to EOP-0005 "RPV Flooding" [NOTE 2]. | |
| ___3.2.3 IF while executing Steps 3.2.4 through 3.2.10, RPV flooding is required THEN proceed to EOP-0005 "RPV Flooding" [NOTE 2]. | |
| ___3.2.4 Line up for injection and start pumps in at least two of the following injection subsystems [NOTE 3]:<br>___Condensate/Feedwater (1103 - 0 Psig)<br>___HPCS (1103 - 0 Psig)<br>___LPCI A (310 - 0 Psig)<br>___LPCI B (310 - 0 Psig)<br>___LPCI C (310 - 0 Psig)<br>___LPCS (500 - 0 Psig) | C3.2.4 IF less than 2 of the injection subsystems can be lined up, line up as many of the following alternate injection subsystems as possible:<br>___Standby Service Water Intertie Valve [1RHS-MOVF094 and F096] on P061 [[125 - 0 Psig]]<br>___Fire Protection System (150 - 0 Psig) (See AOP-0050 "Station Blackout" for details)<br>___SLC (test tank, with refill from CNS) (1103 - 0 Psig)<br>___SLC (boron inject)<br>___ECCS Line Fill Pumps (10 Psig) |

## TABLE A

| RPV PRESSURE | RANGE | RPV LEVEL: INCREASING | RPV LEVEL: DROPPING |
|---|---|---|---|
| | HIGH, Greater Than or Equal to 485 Psig | STEP 3.2.6 | STEP 3.2.9 |
| | INTERMEDIATE (485 to 50 Psig) | STEP 3.2.7 | |
| | LOW (Less than 50 Psig) | STEP 3.2.8 | STEP 3.2.10 |

[NOTE 4]

485 Psig = RPV pressure at which LPCS shutoff head is reached.
50 Psig = RCIC low steam pressure isolation setpoint.

[NOTE 5]

CRD should be operated at maximum flow; operate 2 pumps; open flow control valve to keep pump flow as close to maximum as possible.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.2.5 Monitor RPV pressure and water level and continue in this procedure at the step indicated in TABLE A [NOTE 4]. | |
| ___1. IF water level trend reverses or RPV pressure changes region THEN return to TABLE A and execute the applicable step. | |
| ___2. IF RPV water level drops below -144 in. while performing Step 3.2.6 - 3.2.10 THEN prevent automatic initiation of ADS. | |
| ___3.2.6 IF WATER LEVEL IS INCREASING AND RPV PRESSURE IS HIGH THEN proceed to EOP-0001, Step 3.2. | |
| ___3.2.7 IF RPV WATER LEVEL IS INCREASING AND RPV PRESSURE IS INTERMEDIATE THEN START HPCS AND RCIC. | C3.2.7 IF HPCS and RCIC are not available AND RPV pressure is increasing, THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001, Step 3.0, implement concurrently with this procedure |
| ___1. WHEN RPV water level reaches +10 in. OR RPV pressure is dropping THEN proceed to EOP-0001, Instructions 3.2. | |
| ___3.2.8 IF RPV WATER LEVEL IS INCREASING AND RPV PRESSURE IS LOW AND NOT INCREASING THEN proceed to EOP-0001, Step 3.2. | C3.2.8 IF RPV pressure is increasing THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001, Step 3.0, implement concurrently with this procedure |
| ___3.2.9 IF RPV WATER LEVEL IS DROPPING AND RPV PRESSURE IS HIGH OR INTERMEDIATE THEN start and/or verify operating HPCS, RCIC and CRD [NOTE 5]. | C3.2.9 IF HPCS and RCIC cannot be started AND at least two injection subsystems are lined up for injection with pumps running THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001, Step 3.0, implement concurrently with this procedure |

## TABLE B

| INJECTION SUBSYSTEMS | | ALTERNATE INJECTION SUBSYSTEMS | |
|---|---|---|---|
| SYSTEM | PRESSURE RANGE | SYSTEM | PRESSURE RANGE |
| Condensate/F-W | 1103 - 0 | Standby Service Water | [[125 - 0]] |
| HPCS | 1103 - 0 | Fire Protection | 150 - 0 |
| LPCS | 500 - 0 | ECCS Flush (from Cond Xfr) | 100 - 0 |
| RCIC | 1103 - 50 | SLC | 1130 - 0 |
| LPCI | 310 - 0 | ECCS Line Fill Pumps | 10 - 0 |
| CRD | 1103 - 0 | | |
| Condensate (Condensate Pumps Only) | 450 - 0 | | |

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.2.9 (Continued) | C3.2.9 (Continued)<br>IF no CRD pump is operating,<br>AND no injection subsystem is lined up for injection.<br>(No lined up subsystem has at least one pump running.)<br>THEN start all pumps in alternate injection subsystems which are lined up for injection. |
| ___1. IF RPV water level drops to -160 in.<br>AND no injection subsystem (capable of injecting into the RPV at the existing pressure per TABLE B) is lined up. (No lined up subsystem has at least one pump running.)<br>THEN:<br><br>a. WHEN RPV water level drops to -112 in. on FUEL ZONE Instruments; open one SRV.<br><br>b. WHEN RPV pressure drops to 700 Psig; EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001, Step 3.0.<br><br>c. WHEN any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running THEN return to Step 3.2.5 | |

**CAUTION #1**

Cooldown rates in excess of 100°F/hr
may be required to accomplish this step.

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.2.10 IF RPV WATER LEVEL IS DROPPING AND RPV PRESSURE IS LOW (TABLE A) AND NOT INCREASING THEN start all pumps in alternate injection subsystems which are lined up for injection. | C3.2.10 IF RPV pressure is increasing THEN EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. Proceed to EOP-0001, Step 3.0, AND execute concurrently with this procedure. |

**********

SEE CAUTION #1

**********

| | |
|---|---|
| ___1. WHEN RPV water level drops to -160 in. THEN | |
| a. Open all ADS valves. | a. IF any ADS valves cannot be opened THEN open other SRV's until a total of seven valves are open. |
| b. Inject into the RPV with the HPCS and LPCS (taking suction from the suppression pool). | |
| c. IF at least one Core Spray System is injecting into the RPV with suction from the suppression pool AND RPV pressure is less than 315 Psig THEN terminate injection into the RPV from sources external to the primary containment. | c. IF no HPCS or LPCS system is injecting into the RPV THEN return to Step 3.2.9.1. |
| d. IF RPV water level is restored to -160 in. THEN proceed to EOP-0001, Step 3.2. | |

"END OF EOP-0004"

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TABLE A

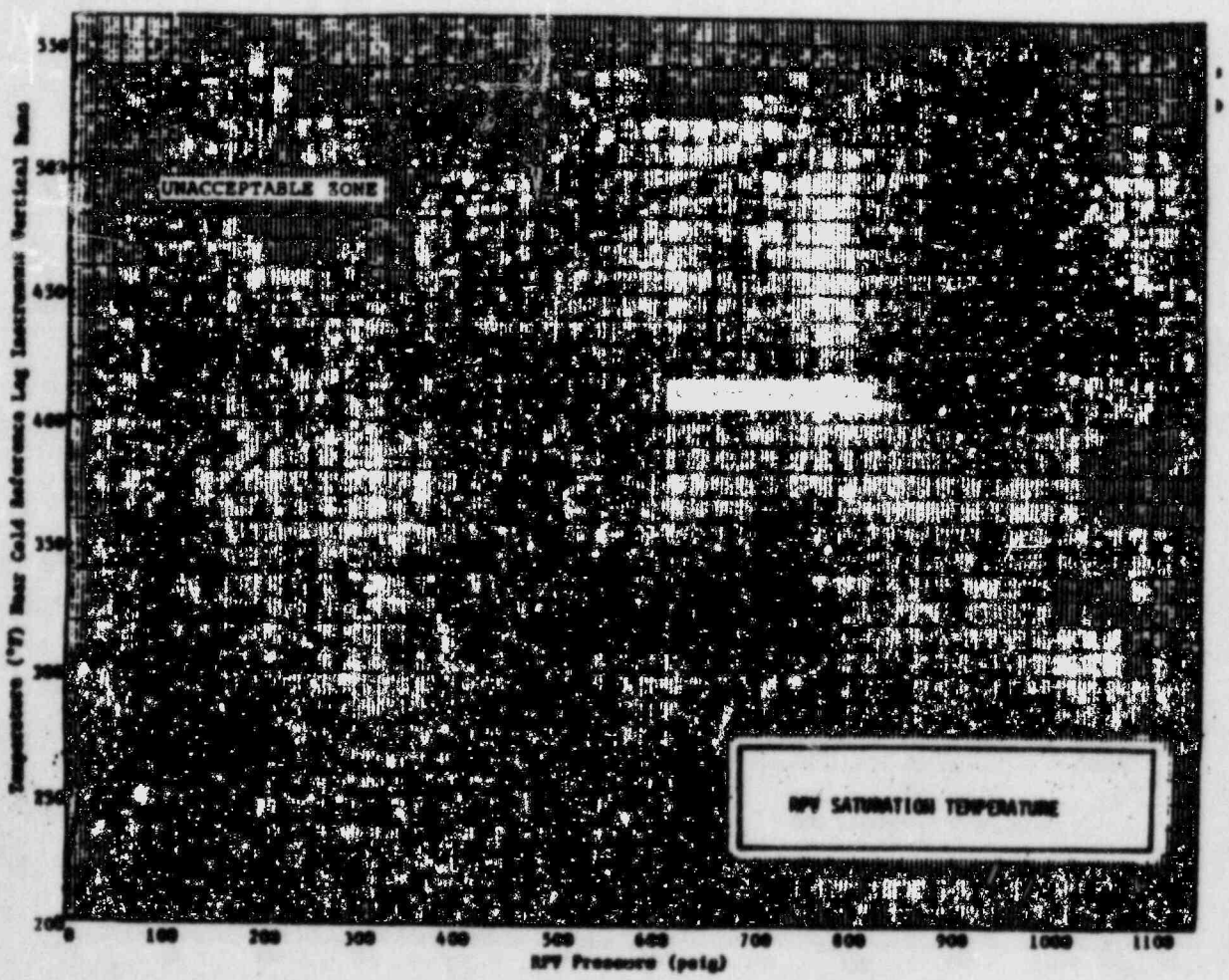
MINIMUM ALTERNATE RPV FLOODING PRESSURE (MARFP)

| NUMBER OF SRV's OPEN | MARFP |
|---|---|
| 7 | 155 Psig* |
| 6 | 185 Psig* |
| 5 | 225 Psig* |
| 4 | 280 Psig* |
| 3 | 380 Psig* |
| 2 | 575 Psig* |
| 1 or 0 | 1103 Psig* |

*Above Containment Pressure

FIGURE A

RPV Saturation Temperature Curve



1.0 PURPOSE

To flood the RPV using all available injection subsystems.

2.0 ENTRY CONDITIONS

Enter from EOP-0001 or EOP-0002 when any of the following occur:

___2.1 Temperature near the cold reference leg instrument vertical runs exceeds the RPV saturation limit (Figure A).

___2.2 RPV water level cannot be determined.

___2.3 Containment to annulus differential pressure cannot be maintained below 15 Psid or drywell to containment differential pressure below 25 Psid.

___2.4 Drywell temperature cannot be maintained below 330°F.

3.0 OPERATOR ACTIONS

Flood the RPV per the applicable sections:

FLOODING WITH BORON INJECTION (3.1)

FLOODING WITH RPV LEVEL UNKNOWN - ALL RODS INSERTED BEYOND [[06]] (3.2).

FLOODING WITH RPV LEVEL INDICATION - ALL RODS INSERTED BEYOND [[06]] (3.3).

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.1 FLOODING WITH BORON INJECTION | |
| ___3.1.1 Terminate and prevent all injection systems except boron and CRD from injecting until RPV pressure is below MINUMUM ALTERNATE RPV FLOODING PRESSURE (MARFP); TABLE A. | C3.1.1 IF RPV pressure does not decrease below MARFP (TABLE A) with 3 minutes THEN continue in this procedure at Step 3.1.2. |
| ___3.1.2 Open at least 2 SRV's; place the control switches to OPEN. | C3.1.2 IF less than 2 SRV's can be open THEN continue with Step 3.1.3 even if no SRV's can be open. |

CAUTION #1

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

TABLE A

MINIMUM ALTERNATE RPV FLOODING PRESSURE (MARFP)

| NUMBER OF SRV's OPEN | MARFP |
|---|---|
| 7 | 155 Psig* |
| 6 | 185 Psig* |
| 5 | 225 Psig* |
| 4 | 280 Psig* |
| 3 | 380 Psig* |
| 2 | 575 Psig* |
| 1 or 0 | 1103 Psig* |

*Above Containment Pressure

| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ********** SEE CAUTION #1 ********** | |
| ___3.1.3 IF RPV pressure is below MARFP THEN commence injection and slowly increase flow into the RPV with the following systems until at least 2 SRV's are open AND RPV pressure has stabilized above MARFP per Table A; use the following preferred pumps:<br>___Condensate/Feedwater Pumps<br>___CRD (Maximum Flow)<br><br>___1. Maintain at least 2 SRV's open and RPV pressure above MARFP but as low as practicable by throttling injection flow rate.<br><br>___2. IF only low pressure systems are available THEN open additional SRV's as necessary to obtain MARFP below the injection/ alternate injection system discharge pressure.<br><br>___3. WHEN all control rods are inserted beyond position [06] THEN proceed to Section 3.2 or 3.3 as applicable. | C3.1.3 IF at least 2 SRV's are not open OR the RPV pressure does not stabilize above MARFP AND all available preferred pumps are being used THEN commence and slowly increase flow into the RPV with the following until 2 SRV's are open:<br>___HPCS<br>___LPCS<br>___LPCI<br>___Standby Service Water Cross-tie (Open Valve [1RHS-MOVF094 and F096] on P601)<br>___Fire Water System (see AOP-0050)<br>___ECCS Flush Connections from Condensate Transfer<br>___SLC (Test Tank)<br>___SLC (Boron Tank) |

## TABLE A

### MINIMUM ALTERNATE RPV FLOODING PRESSURE (MARFP)

| NUMBER OF SRV's OPEN | MARFP |
|---|---|
| 7 | 155 Psig* |
| 6 | 185 Psig* |
| 5 | 225 Psig* |
| 4 | 280 Psig* |
| 3 | 380 Psig* |
| 2 | 575 Psig* |
| 1 or 0 | 1103 Psig* |

*Above Containment Pressure

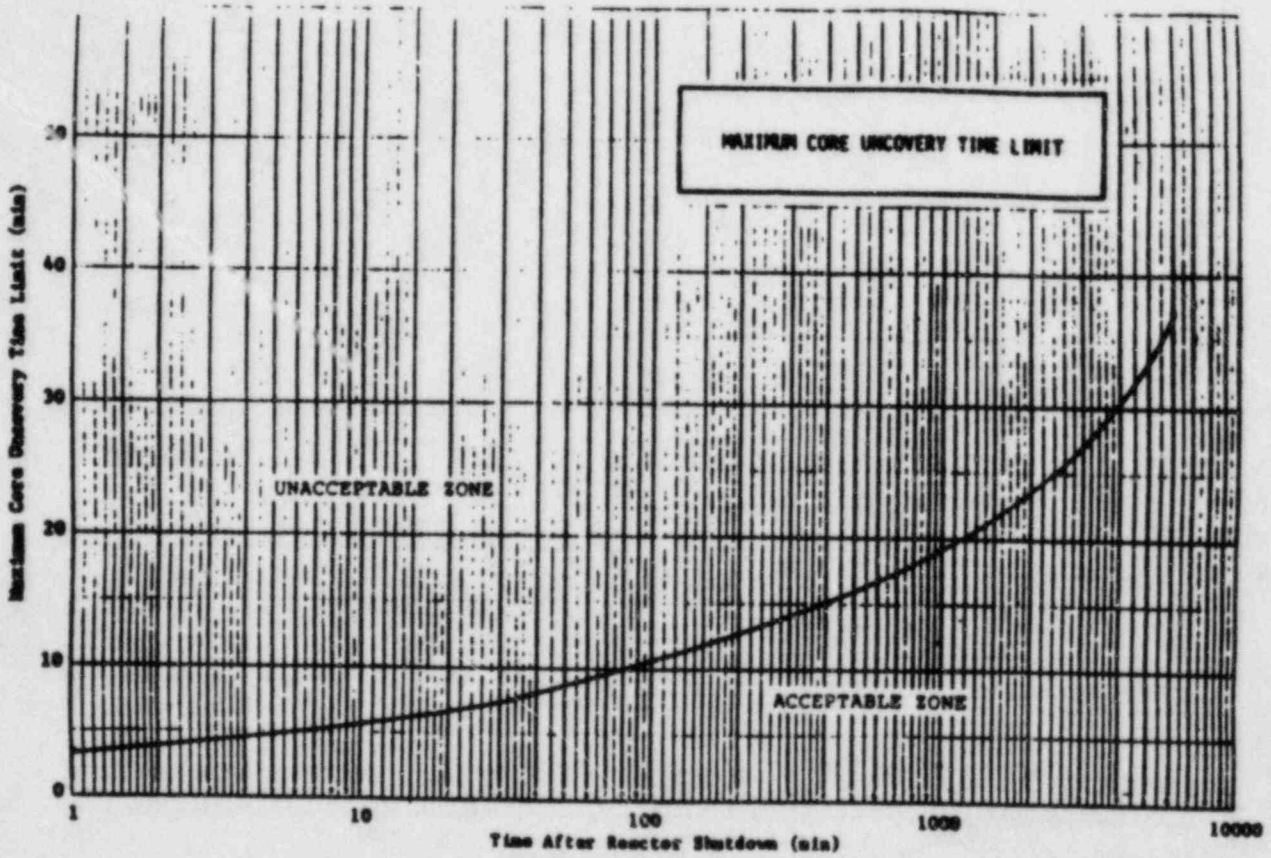
| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| **3.2 FLOODING WITH RPV LEVEL UNKNOWN - ALL RODS INSERTED BEYOND [[06]]** | |
| ___3.2.1 Open at least 3 SRV's; place the control switches to OPEN. | C3.2.1 IF less than 3 SRV's can be open THEN continue in this procedure even if no SRV's can be open. |
| ___3.2.2 WHEN at least 3 SRV's can be opened OR if a HPCS or feedwater pump is running or in STANDBY THEN close the following:<br>___MSIV's<br>___Main Steam Line Drains [1B21-F019, F085, F086, F067]<br>___RCIC Steam Isolation Valves [1E51-MOVF063, F064]<br>___RHR Steam Cond Isol Vlv [1RHS-MOV52A, 52B] | |
| ___3.2.3 IF RPV pressure is below MARFP (TABLE A) THEN commence injection and slowly increase flow into the RPV with the following systems until at least 3 SRV's are open AND RPV pressure has stabilized above MARFP per Table A, use the following preferred pumps:<br>___Condensate/Feedwater Pumps<br>___CRD<br>___1. Maintain at least 3 SRV's open and RPV pressure above MARFP but as low as practicable by throttling injection flow rate.<br>___2. IF only low pressure systems are available THEN open additional SRV's as necessary to obtain MARFP below the injection/ alternate injection system discharge pressure. | C3.2.3 IF at least 3 SRV's are not open OR the RPV pressure does not stabilize above MARFP AND all available preferred pumps are being used THEN commence and slowly increase flow into the RPV with the following until 2 SRV's are open:<br>___HPCS<br>___LPCS<br>___LPCI<br>___Standby Service Water Cross-tie (Open Vlvs [1RHS-MOVF094 and F096] on P601)<br>___Fire Water System<br>___ECCS Flush Connections from Condensate Transfer<br>___SLC (Test Tank)<br>___SLC (Boron Tank) |

[NOTE 1]

The intent of "...RPV water level ca be determined..." is that there are no elevated containment or drywell temperatures which could cause flashing of level instrument reference legs.

FIGURE B

Maximum Core Uncovery Time Limit



| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| ___3.2.4 IF while executing Step 3.2.5 RPV water level can be determined [NOTE 1] THEN proceed to Section 3.3. | |
| ___3.2.5 IF it can be determined that the RPV is filled OR that RPV pressure is at least 80 Psig above containment pressure THEN terminate all injection into the RPV for no longer than the Maximum Core Uncovery Time Limit (Figure B) and reduce RPV water inventory to bring level within range of operable level indication. | C3.2.5 IF water level indication is not restored with the maximum core uncovery time limit (Figure B) after terminating injection into the RPV THEN return to Instructions 3.2.3 AND continue to repeat Instructions 3.2.3, 3.2.4 and 3.2.5 until RPV water level indication is restored. |

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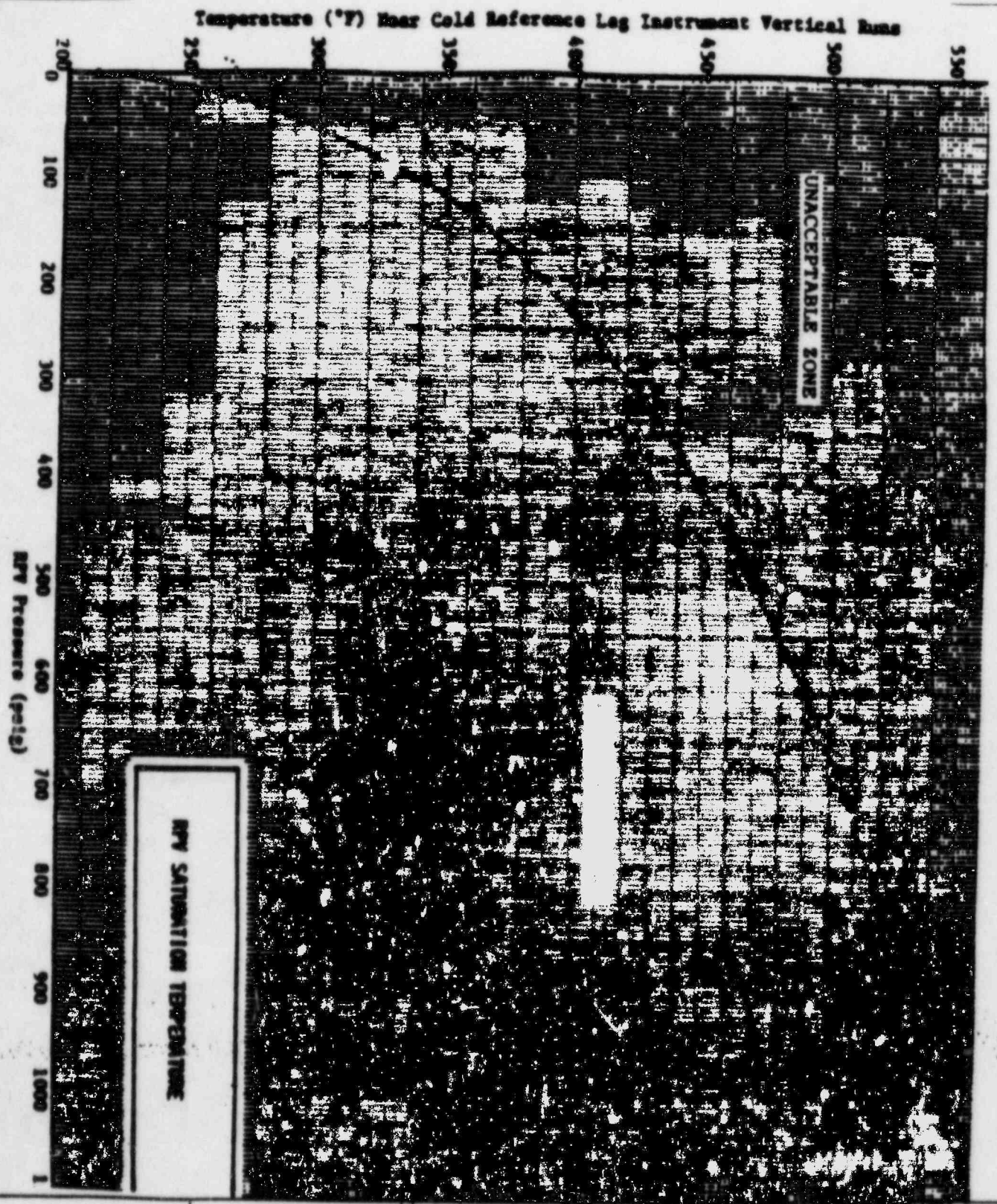
| INSTRUCTIONS | CONTINGENCY ACTIONS |
|---|---|
| 3.3 FLOODING WITH RPV LEVEL INDICATION - ALL RODS INSERTED BEYOND [[06]] | |
| ___3.3.1 Open at least 2 SRV's; place the control switches to OPEN. | C3.3.1 IF less than 2 SRV's can be open THEN continue in this procedure even if no SRV's are open. |
| ___3.3.2 WHEN at least 2 SRV's are opened OR if a HPCS or feedwater pump is running or in STANDBY THEN close the following:<br>___MSIV's<br>___Main Steam Line Drains [1B21-F019, F085, F086, F067]<br>___RCIC Steam Isolation Valves [1E51-MOVF063, F064]<br>___RHR Steam Cond Isol Vlvs [1RHS-MOV52A, 52B] | |
| ___3.3.3 Commence injection and increase flow into the RPV with the following systems. Use only those systems required to cause RPV water level to increase (listed in order of preferred use):<br>___CRD<br>___Condensate/Feedwater Pumps<br>___HPCS (Suction from CST)<br>___LPCS<br>___Standby Service Water<br>___Fire Water System<br>___ECCS Flush Connections from Condensate Transfer<br>___ECCS Line Fill Pump<br>___SLC (Test Tank)<br>___SLC (Boron Tank) | |
| ___3.3.4 WHEN drywell to containment differential pressure can be maintained below 25 Psid AND containment to annulus differential pressure can be maintained below 15 Psid THEN proceed to EOP-0001 "RPV Control", Instructions 3.2 and 3.3.5 and execute these steps concurrently. | |

"END OF EOP-0005"

ENCLOSURE - 1 FULL SIZE FIGURE A: RPV SATURATION TEMPERATURE CURVE



ENCLOSURE - 2 FULL SIZE FIGURE B; MAXIMUM CORE UNCOVERY TIME LIMIT