HATCH NUCLEAR PLANT

EMERGENCY OPERATING PROCEDURES

PLANT SPECIFIC TECHNICAL GUIDELINE

UNIT 1

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PREFACE

This Plant Specific Technical Guideline was developed from the Boiling Water Reactor Owner's Group generic Emergency Procedure Guidelines, Revision 3, dated December 8, 1982, by following instructions contained on page I-2 of these generic guidelines. The format of this Plant Specific Technical Guideline is not intended to reflect the format of the Emergency Operating Procedures (EOP) developed from this guideline. Format of the EOP's will follow the instructions of the Plant Specific Writer's Guide.

INTRODUCTION

Based on the BWR system design, the following Plant Specific Technical Guidelines have been developed:

- RPV Control Guideline
- Primary Containment Control Guideline
- Secondary Containment Control Guideline
- Radioactivity Release Control Guideline

The RPV Control Guideline contains instructions to enable the operator to maintain adequate core cooling, shut down the reactor, and cool down the RPV to cold shutdown conditions. This guideline is entered whenever low RPV water level, high RPV pressure, high drywell pressure, or a condition which requires MSIV isolation has occurred, or whenever a condition which requires reactor scram exists and reactor power is above the APRM downscale trip or cannot be determined.

The Primary Containment Control Guideline contains instructions to enable the operator to maintain primary containment integrity and protect equipment in the primary containment. This guideline is entered whenever suppression pool temperature, drywell temperature, containment temperature, drywell pressure, or suppression pool water level is above its high operating limit or suppression pool water level is below its low operating limit.

The Secondary Containment Control Guideline contains instructions to enable the operator to protect equipment in the secondary containment, limit radioactivity release to the secondary containment, and either maintain secondary containment integrity or limit radioactivity release from the secondary containment. This guideline is entered whenever a secondary containment temperature, radiation level, or water level is above its maximum normal operating value or secondary containment differential pressure reaches zero.

The Radioactivity Release Control Guideline contains instructions to enable the operator to limit radioactivity release into areas outside the primary and secondary containments. This guideline is entered whenever offsite radioactivity release rate is above that which requires an Alert.

Table I is a list of abbreviations/definitions used in the guidelines.

Parentheses ( ) indicate the source for a plant specific variable. Illustrated in these guidelines are variables specifically for HNP Unit 1.

At various points throughout these guidelines, cautions are noted by, for example, the symbol [20]. The number within the box refers to a numbered "Caution" contained in the Operator Precautions section. These "Cautions" are brief and succinct red flags for the operator.

Where the basis for the "Caution" or a step is not completely evident from the text, a full discussion of the basis is contained in Appendix B to the generic Emergency Procedures Guidelines. Other system details which pertain to the guidelines are also included in this appendix.

At various points within these guidelines, limits are specified beyond which certain actions are required. While conservative, these limits are derived from engineering analyses utilizing best-estimate (as opposed to licensing) models. Consequently, these limits are not as conservative as the limits specified in a plant's Technical Specifications. This is not to imply that operation beyond the Technical Specifications is recommended in an emergency. Rather, such operation may be required under certain degraded conditions in order to safely mitigate the consequences of those degraded conditions. The limits specified in the guidelines establish the boundaries within which continued safe operation of the plant can be assured. Therefore, conformance with the guidelines does not ensure strict conformance with a plant's Technical Specifications or other licensing bases.

The entry conditions for these guidelines are symptomatic of both emergencies and events which may degrade into emergencies. The guidelines specify actions appropriate for both. Therefore, entry into procedures developed from these guidelines is not conclusive that an emergency has occurred.

TABLE I

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
A	Amendment
Adjust	To regulate or bring to a more satisfactory state. Example: "ADJUST Reactor Water Level setpoint to +36 inches."
ADS	Automatic Depressurization System.
Align	To place a system in proper or desired configuration for an intended purpose. Example: "ALIGN Standby Gas Treatment to Reactor Building".
Allow	To permit a stated condition to be achieved prior to proceeding. Example: "ALLOW discharge pressure to stabilize".
Alternate Injection Subsystem	Any of: keep fill systems, RHR service water, SLC.
Appendix	The Appendix to the Plant Specific Technical Guidelines.
APRM	Average Power Range Monitor.
Available	Capable of performing its intended function e.g. adding water to the reactor.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Check	To perform a physical action which determines the state of a variable or status of equipment without directing a change in status. Example: "CHECK for satisfactory lube oil level".
Close	To change the physical position of a mechanical device to the closed position so that it prevents fluid flow or permits passage of electric current. Example: "CLOSE valve 2B21-F019'."
Complete	To accomplish specific procedural requirements, Example: "COMPLETE valve check-off list 3.7.1", "COMPLETE data report QA-1", "COMPLETE steps 7 through 9 of Section III".
CRD	Control Rod Drive.
CS	Core Spray.
DW/T	Drywell Temperature Control.
ECCS	Emergency Core Cooling System.
EPG	Emergency Procedure Guideline generated by the BWR owners group with generic application to all BWRs.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
EOP	Emergency Operating Procedures.
Establish	To make arrangements for a stated condition. Example: "ESTABLISH communication with control room".
FSAR	Final Safety Analysis Report.
Ft.	Foot or feet.
HCU	Hydraulic Control Unit.
HNP	Hatch Nuclear Plant.
HPCI	High Pressure Coolant Injection.
HVAC	Heating, Ventilating and Air Conditioning.
In.	Inch or inches.
Injection Subsystem	Any of: condensate, LPCI, or CS
Isolate	To close one or more valves in a system for the purpose of separating or setting apart a complete system or a portion of the system from the rest. Example: "ISOLATE interruptible instrument air header by shutting valve 2P51-F011."

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Inspect	To measure, observe, or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included. Example: "visually INSPECT for leaks".
LCO	Limiting Condition for Operation.
LOCA	Loss of Coolant Accident.
LPCI	Low Pressure Coolant Injection.
Maintain	To keep in an existing state. Example: "MAINTAIN the reactor vessel water level between +15 and +55 inches, with one or more of the following systems".
MSIV	Main Steamline Isolation Valves.
NDTT	Nil-Ductility Transition Temperature.
NE	North East.
NPSH	Net Positive Suction Head.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Open	To change the physical position of a mechanical device to the open position so that it allows fluid flow or prevents passage of electrical current. Example: "OPEN valve 2B21-F016". Unless specifically directed otherwise, open means fully open.
P	Page.
PC	Primary Containment Control.
PC/P	Primary Containment Pressure Control.
PC/T	Primary Containment Temperature Control.
Place	To put in a particular position. Example: "PLACE mode switch to shutdown".
Press.	Pressure.
Primary System	Main Steam, HPCI, RCIC, Core Spray, RHR, CRD, Feedwater, RWCU, SLC, Reactor Sampling Systems are the systems designated primary systems.
PSIG	Pounds per square inch gage.
PSTG	Plant Specific Technical Guidelines.
RCIC	Reactor Core Isolation Cooling.
R 31	Revision Number 31.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
RC	RPV Control.
RC/L	RPV Level Control.
RC/P	RPV Pressure Control.
RC/Q	RPV Power Control.
Record	To document a specified condition or characteristic. Example: "RECORD discharge pressure".
Reduce	To cause a parameter to decrease in value. Example: "REDUCE reactor pressure with bypass valve manual jack".
RFPT	Reactor Feed Pump Turbine
RHR	Residual Heat Removal.
RPS	Reactor Protection System.
RPV	Reactor Pressure Vessel.
RR	Radioactivity Release.
RSCS	Rod Sequence Control System.
RWCU	Reactor Water Cleanup.
RWM	Rod Worth Minimizer
SBGT	Standby Gas Treatment.
SC	Secondary Containment Control.
SC/L	Secondary Containment Level Control.
SC/R	Secondary Containment Radiation Control.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
SC/T	Secondary Containment Temperature Control.
SE	South East.
Set	To physically adjust to a specified value an adjustable feature. Example: "SET diesel speed to...rpm".
SJAE	Steam Jet Air Ejector.
SLC	Standby Liquid Control.
SORV	Stuck Open Relief Valve.
SP/L	Suppression Pool Level Control.
SP/T	Suppression Pool Temperature Control.
SRV	Safety Relief Valve.
Start	To energize an electro-mechanical device by manipulation of a start switch or button. Example: "START a second CRD pump".
Stop	Opposite of start. Example: "STOP admitting steam by shutting valve 2B21-F044".
Synchronize	To make synchronous in operation. Example: "SYNCHRONIZE the Diesel Generator to 4160V Bus 2E".
Temp.	Temperature.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Throttle	To operate a valve in an intermediate position to obtain a certain flow rate. Example: "THROTTLE valve 2B21-F077 to obtain 2000 lb/hr flow".
Trip	To manually activate a semi-automatic feature. Example: "TRIP breaker...".
TS	Technical Specification.
Vent	To permit a gas or liquid confined under pressure to escape at a vent. Example: "VENT the Heat Exchanger before placing it in service".
Verify	To prove to be true, exact, or accurate by observation of a condition or characteristic for comparison with an original or procedural requirement. Example: "VERIFY discharge pressure".

OPERATOR PRECAUTIONS

GENERAL

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

CAUTION 1

MONITOR THE GENERAL STATE OF THE PLANT. IF AN ENTRY CONDITION FOR AN EMERGENCY OPERATING PROCEDURE OCCURS, ENTER THAT PROCEDURE. WHEN IT IS DETERMINED THAT AN EMERGENCY NO LONGER EXISTS, ENTER THE APPROPRIATE NORMAL OPERATING PROCEDURE AS DIRECTED BY THE EMERGENCY OPERATING PROCEDURES.

CAUTION 2

MONITOR RPV WATER LEVEL AND PRESSURE AND PRIMARY CONTAINMENT TEMPERATURES AND PRESSURE FROM MULTIPLE INDICATIONS.

CAUTION 3

IF A SAFETY FUNCTION INITIATES AUTOMATICALLY, ASSUME A TRUE INITIATING EVENT HAS OCCURRED UNLESS OTHERWISE CONFIRMED BY AT LEAST TWO INDEPENDENT INDICATIONS.

CAUTION 4

WHENEVER RHR IS IN THE LPCI MODE, INJECT THROUGH THE HEAT EXCHANGERS AS SOON AS POSSIBLE.

CAUTION 5

SUPPRESSION POOL TEMPERATURE IS DETERMINED BY THE HIGHEST READING ON 1H11-P650 1T47-R630, 1H11-P654 1T47-R612 OR 1H11-P657 1T47-R611. DRTWELL TEMPERATURE IS DETERMINED BY THE PROCEDURE IN HNP-1-1050, ITEM 10 DATA PACKAGE 1.

CAUTION 6

WHENEVER TEMPERATURE NEAR THE INSTRUMENT REFERENCE LEG VERTICAL RUN EXCEEDS THE TEMPERATURE SHOWN BELOW AND THE INSTRUMENT READS BELOW THE INDICATED LEVEL IN THE TABLE, THE ACTUAL RPV WATER LEVEL MAY BE ANYWHERE BELOW THE ELEVATION OF THE LOWER INSTRUMENT TAP.

TEMPERATURE	INDICATED LEVEL	INSTRUMENT
Any	95.7 IN.	SHUTDOWN RANGE LEVEL (-17 to +383 IN.) 1B21-R605
127.8°F	-107.9 IN.	WIDE RANGE LEVEL (-150 to +60 IN.) 1B21-N024, N025, N026, N031, R604
303°F (B)	1.8 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 1C32-R606B
303°F (C,D)	21.5 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 1B21-N017C,D
303°F (B)	21.4 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 1B21-N042B
305°F (A,C)	1.8 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 1C32-R606A,C
305°F (A)	20.8 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 1B21-N042A
305°F (A,B)	20.9 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 1B21-N017A,B
547°F	-330.6 IN.	FUEL ZONE LEVEL (-317 to -17 IN.) 1B21-N036 N037, R610, R615

CAUTION 7

1B21-R604A AND R604B (HEATED REFERENCE LEG INSTRUMENTS) INDICATED LEVELS ARE NOT RELIABLE DURING RAPID RPV DEPRESSURIZATION BELOW 500 PSIG. FOR THESE CONDITIONS, UTILIZE 1B21-R605, R610, AND R615 (COLD REFERENCE LEG INSTRUMENTS) TO MONITOR RPV WATER LEVEL.

CAUTION 8

OBSERVE NPSH REQUIREMENT FOR PUMPS TAKING SUCTION FROM THE SUPPRESSION POOL (SEE ATTACHMENT 1).

CAUTION 9

IF SIGNALS OF HIGH SUPPRESSION POOL WATER LEVEL 150 IN. (HIGH LEVEL SUCTION INTERLOCK) OR LOW CONDENSATE STORAGE TANK WATER LEVEL 0 IN. (LOW LEVEL SUCTION INTERLOCK) OCCUR, CONFIRM AUTOMATIC TRANSFER OF OR MANUALLY TRANSFER HPCI AND RCIC SUCTION FROM THE CONDENSATE STORAGE TANK TO THE SUPPRESSION POOL.

SPECIFIC

This section lists "Cautions" which are applicable at one or more specific points within the guidelines. Where a "Caution" is applicable, it is identified with a symbol, for example; | 20 | .

CAUTION 10

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 AUTOMATIC/STANDBY MODE IF POSSIBLE.

CAUTION 11

IF A HIGH DRYWELL PRESSURE ECCS INITIATION SIGNAL 2.0 PSIG (DRYWELL PRESSURE WHICH INITIATES ECCS) OCCURS OR EXISTS WHILE DEPRESSURIZING, PREVENT INJECTION FROM THOSE CS AND LPCI PUMPS NOT REQUIRED TO ASSURE ADEQUATE CORE COOLING PRIOR TO REACHING THEIR MAXIMUM INJECTION PRESSURES. WHEN THE HIGH DRYWELL PRESSURE ECCS INITIATION SIGNAL CLEARS, RESTORE CS AND LPCI TO AUTOMATIC/STANDBY MODE.

CAUTION 12

DO NOT THROTTLE HPCI TURBINE BELOW 2000 RPM OR RCIC TURBINE BELOW 2250 RPM (MINIMUM TURBINE SPEED LIMIT PER TURBINE VENDOR MANUAL).

CAUTION 13

COOLDOWN RATES ABOVE 100°F/HR (RPV COOLDOWN RATE LCO) MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 14

DO NOT DEPRESSURIZE THE RPV BELOW 100 PSIG (HPCI LOW PRESSURE ISOLATION SETPOINT) UNLESS MOTOR DRIVEN PUMPS SUFFICIENT TO MAINTAIN RPV WATER LEVEL ARE RUNNING AND AVAILABLE FOR INJECTION.

CAUTION 15

OPEN SRV'S IN THE FOLLOWING SEQUENCE IF POSSIBLE: G, D, L, H, E, J, C, F, K. USE SRV'S A AND B ONLY IF UNABLE TO MAINTAIN PRESSURE WITH OTHER SRV'S.

CAUTION 16

BYPASSING LOW RPV WATER LEVEL VENTILATION SYSTEM AND MSIV ISOLATION INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 17

COOLDOWN RATES ABOVE 100^{o}F/HR (RPV COOLDOWN RATE LCO) MAY BE REQUIRED TO CONSERVE RPV WATER INVENTORY, PROTECT PRIMARY CONTAINMENT INTEGRITY, OR LIMIT RADIOACTIVE RELEASE TO THE ENVIRONMENT.

CAUTION 18

IF CONTINUOUS LPCI OPERATION IS REQUIRED TO ASSURE ADEQUATE CORE COOLING, DO NOT DIVERT ALL RHR PUMPS FROM LPCI MODE.

CAUTION 19

MANUALLY TRIP SLC PUMPS AT 0% IN THE SLC TANK.

CAUTION 20

DEFEATING RSCS AND/OR RWM INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 21

ELEVATED SUPPRESSION CHAMBER PRESSURE MAY TRIP THE RCIC TURBINE ON HIGH EXHAUST PRESSURE.

CAUTION 22

DEFEATING ISOLATION INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 23

DO NOT INITIATE DRYWELL SPRAYS IF SUPPRESSION POOL WATER LEVEL IS ABOVE 198 IN. (ELEVATION OF BOTTOM OF MARK I INTERNAL SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS LESS VACUUM BREAKER OPENING PRESSURE IN FEET OF WATER).

CAUTION 24

BYPASSING HIGH DRYWELL PRESSURE AND LOW RPV WATER LEVEL SECONDARY CONTAINMENT HFAC ISOLATION INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 25

A RAPID INCREASE IN INJECTION INTO THE RPV MAY INDUCE A LARGE POWER EXCURSION AND RESULT IN SUBSTANTIAL CORE DAMAGE.

CAUTION 26

LARGE REACTOR POWER OSCILLATIONS MAY BE OBSERVED WHILE EXECUTING THIS STEP.

RPV CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to:

- Maintain adequate core cooling,
- Shut down the reactor, and
- Cool down the RPV to cold shutdown conditions (RPV temperature between 100°F and 212°F).

ENTRY CONDITIONS

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

- RPV water level below +12.5 inches (low level scram setpoint).
- RPV pressure above 1045 psig (high RPV pressure scram setpoint).
- Drywell pressure above 2 psig (high drywell pressure scram setpoint).
- A condition which requires MSIV isolation.
- A condition which requires reactor scram, and reactor power above 3% (APRM downscale trip) or cannot be determined.

OPERATOR ACTIONS

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

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

RC/L Monitor and control RPV water level.

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

- Isolation
- ECCS
- Emergency diesel generator

Initiate any of these which should have initiated but did not.

If while executing step RC/L-2:

- Boron Injection is required, enter the procedure developed from CONTINGENCY 7.
- RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter the procedure developed from CONTINGENCY 6.
- RPV Flooding is required, enter the procedure developed from CONTINGENCY 6.

RC/L-2 Restore and maintain RPV water level
between +12.5 in. (low level scram setpoint) 9
and +58 in. (high level trip setpoint) 10
with one or more of the following systems: 11

- Condensate system 385-0 psig (RPV pressure range for system operation).
- Condensate/feedwater system 1717-0 psig (RPV pressure range for system operation)
- CRD system 1525-0 psig (RPV pressure range for system operation)
- RCIC system 1120-50 psig (RPV pressure range for system operation) 12
- HPCI system 1120-150 psig (RPV pressure range for system operation)
- CS system 340-0 psig (RPV pressure range for system operations)
- LPCI system 280-0 psig (RPV pressure range for system operation)

If RPV water level cannot be restored and maintained above +12.5 inches (low level scram setpoint), maintain RPV water level above -164.5 inches (top of active fuel).

If RPV water level can be maintained above -164.5 inches (top of active fuel) and the ADS timer has initiated, prevent automatic RPV depressurization by resetting the ADS timer.

If RPV water level cannot be maintained above -164.5 inches (top of active fuel), enter the procedure developed from CONTINGENCY 1.

If Alternate Shutdown Cooling is required, enter the procedure developed from CONTINGENCY 5.

RC/L-3 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions or as directed by Plant Management.

RC/P Monitor and control RPV pressure.

If while executing any step in RC/P:

- Emergency RPV Depressurization is anticipated, rapidly depressurize the RPV with the main turbine bypass valves. 13

- Emergency RPV Depressurization or RPV Flooding is required and less than 7 (number of SRVs dedicated to ADS) SRVs are open, enter the procedure developed from CONTINGENCY 2.

- RPV Flooding is required and at least 7 (number of SRVs dedicated to ADS) SRVs are open, enter the procedure developed from CONTINGENCY 6.

RC/P-1 If any SRV is cycling, manually open SRVs until RPV pressure drops to 927 psig (RPV pressure at which all turbine bypass valves are fully open).

If while executing steps RC/P-2, RC/P-3, or RC/P-4:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit (see Attachment 2), maintain RPV pressure below the Limit. 8 13 14

- Suppression pool water level cannot be maintained below the Suppression Pool Load Limit (see Attachment 3) maintain RPV pressure below the Limit. 13 14

- Steam Cooling is required, enter the procedure developed from CONTINGENCY 3.

If while executing steps RC/P-2, RC/P-3, or RC/P-4:

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

open MSIVs to re-establish the main condenser as a heat sink. 16

RC/P-2 Control RPV pressure below 1080 psig (lowest SRV lifting pressure) with the main turbine bypass valves. 14

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

- SRVs only when suppression pool water level is above 63 in. (elevation of top of SRV discharge device). If the continuous SRV pneumatic supply is or becomes unavailable, depressurize with sustained SRV opening. 15
- HPCI 12
- RCIC

- Steam Jet Air Ejectors
- Reactor Feed Pump Turbines
- RHR Steam Condensing
- Offgas Preheater
- Steam Seal System
- RWCU (recirculation mode) if no boron has been injected into the RPV.
- Main steam line drains
- RWCU (blowdown mode) if no boron has been injected into the RPV. Refer to post accident sampling procedures prior to initiating blowdown.

If while executing steps RC/P-3 or RC/P-4, the reactor is not shutdown, return to Step RC/P-2.

RC/P-3 When either:

- All control rods except one are inserted to position 00 * (maximum subcritical banked withdrawal position), or
- 507 pounds (Cold Shutdown Boron Weight) (occurs at SLC tank indication of 17%) of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV,

depressurize the RPV and maintain cooldown rate below 100°F/hr (RPV cooldown rate LCO). 14, 17

* This is an interim value which will be used until the generic calculation is completed by General Electric Co.

RC/P-4 When the RHR shutdown cooling interlocks clear, initiate the shutdown cooling mode of RHR. 18

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

> If RPV cooldown is required but cannot be accomplished and all control rods except one are inserted to position 00 (maximum subcritical banked withdrawal position), ALTERNATE SHUTDOWN COOLING IS REQUIRED; enter the procedure developed from CONTINGENCY 5.

RC/P-5 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions or as directed by Plant Management.

RC/Q Monitor and control reactor power.

> If while executing any step in RC/Q:
>
> - All control rods except one are inserted to position 00 (maximum subcritical banked withdrawal position), terminate boron injection and enter the scram procedure.
> - The reactor is shutdown and no boron has been injected into the RPV, enter the scram procedure.

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

RC/Q-2 If the main turbine-generator is on-line and the MSIVs are open, confirm or initiate recirculation flow runback to minimum.

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

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

RC/Q-4 If the reactor cannot be shutdown before suppression pool temperature reaches 110°F (Boron Injection Initiation Temperature), BORON INJECTION IS REQUIRED; inject boron into the RPV with SLC and prevent automatic initiation of ADS. 19

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

- CRD
- RWCU
- HPCI
- RCIC

RC/Q-4.1 If boron is not being injected into the RPV by RWCU, confirm automatic isolation of or manually isolate RWCU.

RC/Q-4.2 Continue to inject boron until [illegible]07 pounds (Cold Shutdown Boron Weight) (occurs at SLC tank indication of 17%) of boron have been injected into the RPV.

RC/Q-4.3 Enter the scram procedure.

RC/Q-5 Insert control rods as follows:

RC/Q-5.1 If any scram valve is not open:

- Remove:

  1H11-P609 1C71-F18A, E, C, G

  1H11-P611 1C71-F18B, F, D, H

  (fuses which de-energize RPS scram solenoids).

- Close 1C11-F095 (scram air header supply valve) and open 1C11-F008 (scram air header vent valve).

When control rods are not moving inward:

- Replace:

  1H11-P609 1C71-F18A, E, C, G

  1H11-P611 1C71-F18B, F, D, H

  (fuses which de-energize RPS scram solenoids).

- Close 1C11-F008 (scram air header vent valve) and open 1C11-F095 (scram air header supply valve).

RC/Q-5.2 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.

   If no CRD pump can be started, continue at step RC/Q-5.6.1.

2. Close 1C11-F034 (HCU accumulator charging water header valve).

3. Rapidly insert control rods manually until the reactor scram can be reset 20
4. Reset the reactor scram.
5. Open 1C11-F034 (HCU accumulator charging water header valve).

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

1. If control rods moved inward, return to Step RC/Q-5.2.
2. Reset the reactor scram.
   If the reactor scram cannot be reset, continue at step RC/Q-5.5.1.
3. Open the scram discharge volume vent and drain valves.

RC/Q-5.4 Individually open the scram test switches for control rods not inserted to position 00 (maximum subcritical banked withdrawal position).

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

RC/Q-5.5 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.
   If no CRD pump can be started, continue at step RC/Q-5.6.1.

2. Close 1C11-F034 (HCU accumulator charging water header valve).

RC/Q-5.6 Rapidly insert control rods manually until all control rods except one are inserted to position 00 (maximum subcritical banked withdrawal position). 20

If more than one control rod cannot be inserted to position 00 (maximum subcritical banked withdrawal position):

1. Individually direct the effluent from 1C11-F102 (CRD withdraw line vent valve) to a contained radwaste drain and open 1C11-F102 (CRD withdraw line vent valve) for each control rod not inserted to position 00 (maximum subcritical banked withdrawal position).
2. When a control rod is not moving inward, close its 1C11-F102 (CRD withdraw line vent valve).

PRIMARY CONTAINMENT CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to:

- Maintain primary containment integrity, and
- Protect equipment in the primary containment.

ENTRY CONDITIONS

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

- Suppression pool temperature above 95°F (most limiting suppression pool temperature LCO)
- Drywell temperature above 148°F (maximum normal operating temperature).
- Drywell pressure above 2.0 psig (high drywell pressure scram setpoint)
- Suppression pool water level above 150 in. (maximum suppression pool water level LCO)
- Suppression pool water level below 146 in. (minimum suppression pool water level LCO).

OPERATOR ACTIONS

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

SP/T Monitor and control suppression pool temperature.

SP/T-1 Close all SORVs.

If any SORV cannot be closed scram the reactor.

SP/T-2 When suppression pool temperature exceeds 95°F (most limiting suppression pool temperature LCO), operate available suppression pool cooling. 18

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

SP/T-4 If suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit (see Attachment 2), maintain RPV pressure below the Limit. 13 14

If suppression pool temperature and RPV pressure cannot be restored and maintained below the Heat Capacity Temperature Limit (see Attachment 2), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SP/T.

DW/T Monitor and control drywell temperature.

DW/T-1 When drywell temperature exceeds 148°F (maximum normal operating temperature) operate available drywell cooling. 6

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

DW/T-2 If drywell temperature near the cold reference leg instrument vertical runs reaches the RPV Saturation Temperature (see Attachment 4), RPV FLOODING IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with DW/T.

DW/T-3 Before drywell temperature reaches 281°F (drywell design temperature), but only if suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays. 18

If drywell temperature cannot be maintained below 281°F (drywell design temperature), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with DW/T.

PC/P Monitor and control primary containment pressure.

PC/P-1 Operate the following system, as required: 21

- SBGT only when the temperature in the space being evacuated is below 212^{o}F (Maximum Noncondensible Evacuation Temperature). Use SBGT operating procedures.

PC/P-2 Before suppression pool pressure reaches 17.5 psig (Suppression Pool Spray Initiation Pressure), but only if suppression pool water level is below 287 in. (elevation of suppression pool spray nozzles), initiate suppression pool sprays. 8, 18

PC/P-3 If suppression chamber pressure exceeds 17.5 psig (Suppression Chamber Spray Initiation Pressure) but only if suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays. 18

PC/P-4 If suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure (see Attachment 6), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

PC/P-5 If suppression chamber pressure cannot be maintained below the Primary Containment Design Pressure (see Attachment 7), RPV FLOODING IS REQUIRED.

PC/P-6 If suppression chamber pressure cannot be maintained below the Primary Containment Pressure Limit (see Attachment 8), then irrespective of whether adequate core cooling is assured:

- If suppression pool water level is below 287 in. (elevation of suppression pool spray nozzles), initiate suppression pool sprays.

- If suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

PC/P-7 If suppression chamber pressure exceeds the Primary Containment Pressure Limit, vent the primary containment in accordance with the Post Accident Venting Procedure to reduce and maintain pressure below the Primary Containment Pressure Limit (see Attachment 8). 22

SP/L Monitor and control suppression pool water level.

SP/L-1 Maintain suppression pool water level between 150 in. (maximum suppression pool water level LCO) and 146 in. (minimum suppression pool water level LCO). Refer to Suppression Pool sampling program prior to discharging water. 8, 9

If suppression pool water level cannot be maintained above 146 in. (minimum suppression pool water level LCO) execute Step SP/L-2.

If suppression pool water level cannot be maintained below 150 in. (maximum suppression pool water level LCO), execute Step SP/L-3.

SP/L-2 SUPPRESSION POOL WATER LEVEL BELOW 146 in. (minimum suppression pool water level LCO).

Maintain suppression pool water level above the Heat Capacity Level Limit (see Attachment 9).

If suppression pool water level cannot be maintained above the Heat Capacity Level Limit (see Attachment 9), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SP/L.

SP/L-3 SUPPRESSION POOL WATER LEVEL ABOVE 150 in. (maximum suppression pool water level LCO).

Execute Steps SP/L-3.1 and SP/L-3.2 concurrently.

SP/L-3.1 Maintain suppression pool water level below the Suppression Pool Load Limit (see Attachment 3).

If suppression pool water level cannot be maintained below the Suppression Pool Load Limit (see Attachment 3), maintain RPV pressure below the limit. 13 14

If suppression pool water level and RPV pressure cannot be maintained below the Suppression Pool Load Limit (see Attachment 3) but only if adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

If suppression pool water level and RPV pressure cannot be restored and maintained below the Suppression Pool Load Limit (see Attachment 3), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SP/L.

SP/L-3.2 Before suppression pool water level reaches 198 in. (elevation of bottom of Mark I internal suppression pool to drywell vacuum breakers less vacuum breaker opening pressure in feet of water), but only if adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

1. When suppression pool water level reaches 198 in. (elevation of bottom of Mark I internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water) but only if suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays. 18

2. If suppression pool water level exceeds 198 in. (elevation of bottom of Mark I internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water), continue to operate drywell sprays. 23

3. When primary containment water level reaches 104.25 ft. (Maximum Primary Containment Water Level Limit), terminate injection into the RPV from sources external to the primary containment irrespective of whether adequate core cooling is assured.

SECONDARY CONTAINMENT CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to:

- Protect equipment in the secondary containment,
- Limit radioactivity release to the secondary containment, and either:
- Maintain secondary containment integrity, or
- Limit radioactivity release from the secondary containment.

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following secondary containment conditions (see Table II):

- Differential pressure at or above 0 in. of water
- An area temperature above the maximum normal operating temperature
- A HVAC cooler differential temperature above the maximum normal operating differential temperature
- A HVAC exhaust radiation level above the maximum normal operating radiation level
- An area radiation level above the maximum normal operating radiation level
- A floor drain sump water level above the maximum normal operating water level
- An area water level above the maximum normal operating water level

OPERATOR ACTIONS

If while executing the following steps secondary containment HVAC exhaust radiation level exceeds 20mr/hr Refuel floor or 15mr/hr Reactor Building (secondary containment HVAC isolation setpoint):

- Confirm or manually initiate isolation of secondary containment HVAC, and
- Confirm initiation of or manually initiate SBGT only when the space being evacuated is below 212°F.

If while executing the following steps:

- Secondary containment HVAC isolates, and
- Secondary containment HVAC exhaust radiation level is below 20mr/hr Refuel floor or 15mr/hr Reactor Building (secondary containment HVAC isolation setpoint),

restart secondary containment HVAC. 24

Irrespective of the entry condition, execute Steps SC/T, SC/R, and SC/L concurrently.

SC/T Monitor and control secondary containment temperatures.

SC/T-1 Operate available area coolers.

SC/T-2 If secondary containment HVAC exhaust radiation level is below 20mr/hr Refuel floor or 15mr/hr Reactor Building (secondary containment HVAC isolation setpoint), operate available secondary containment HVAC.

SC/T-3 If any area temperature exceeds its maximum normal operating temperature, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, or suppress a working fire.

SC/T-4 If a primary system is discharging into an area, then before any area temperature reaches its maximum safe operating temperature, enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SC/T.

SC/T-5 If a primary system is discharging into an area and an area temperature exceeds its maximum safe operating temperature in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/R Monitor and control secondary containment radiation levels.

SC/R-1 If any area radiation level exceeds its maximum normal operating radiation level, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, or suppress a working fire.

SC/R-2 If a primary system is discharging into an area, then before any area radiation level reaches its maximum safe operating radiation level, enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SC/R.

SC/R-3 If a primary system is discharging into an area and an area radiation level exceeds its maximum safe operating radiation level in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/L Monitor and control secondary containment water levels.

SC/L-1 If any floor drain sump or area water level is above its maximum normal operating water level, operate available sump pumps to restore and maintain it below its maximum normal operating water level.

If any floor drain sump or area water level cannot be restored and maintained below its maximum normal operating water level, isolate all systems that are discharging water into the sump or area except systems required to shut down the reactor, assure adequate core cooling, or suppress a working fire.

SC/L-2 If a primary system is discharging into an area, then before any floor drain sump or area water level reaches its maximum safe operating water level, enter procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SC/L.

SC/L-3 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, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

TABLE II

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION	ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
Differential pressure on 1H11-P700	(in.water)	(in.water)	psig
- Reactor Building/outside air T46-R602A	0	0	+0.25
- Refuel Floor/outside air T46-R602B or 1H11-P657-R604A or B	0	0	+0.25
Area temperature from 1H11-P614-R614	(°F)	(°F)	(°F)
- RWCU "A" pump room 158' G31-N016A	130	150	214
- RWCU "B" pump room 158' G31-N016B	130	150	214
- RWCU Hx room 158' at Hx.G31-N016C	130	150	214
- RWCU Hx room 158' disch-H.W. G31-N016D	130	150	214
- RWCU phase sep. room 158' G31-N016E	130	150	214
- RWCU holding pump room 185 G31-N016F	130	150	214
- NE Diagonal E11-N009A	175	175 *	214
- SE Diagonal E11-N009B	175	175 *	214
- HPCI room, area A E41-N024	150	175	214
- HPCI room, area B E41-N030A	150	175	214
- HPCI room, area C E41-N030B	150	175	214
- Torus room, westwall E51-N025A	150	175	218
- Torus room, eastwall E51-N025B	150	175	218
- Torus room, northwall E51-N025C	150	175	218
- Torus room, southwall E51-N025D	150	175	218
- Main steam tunnel B21-N014	160	200	300
- SE, Reactor 130 elev., area A E41-N046A	175	175 *	214
- SE, Reactor 130 elev., area B E41-N046B	175	175 *	214
- NW Diagonal, area A E51-N011	150	175	310
- NW Diagonal, area B E51-N023A	150	175	310
- NW Diagonal, area C E51-N023B	150	175	310

* Same as alarm setpoint

TABLE II (Continued)

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION		ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
Steam Leak Detection System Area Differential Temperatures		(°F)	(°F)	(°F)
- RWCU "A" Pump room	G31-NO22/NO23A	75	75	98
- RWCU "B" Pump room	G31-NO22/NO23B	75	75	98
- RWCU Hx Room 158' at Hxs	G31-NO22/NO23C	75	75	98
- RWCU Hx Room 158' disch. to Hotwell	G31-NO22/NO23D	75	75 *	98
- RWCU phase separator room 158'	G31-NO22/NO23E	75	75	98
- RWCU holding pump room 185'	G31-NO22/NO23F	75	75	98
- Torus Room, NW/West	E51-NO26/NO27A	40	50	102
- Torus Room, NW/West	E51-NO26/NO27B	40	50	102
- Torus Room, NW/West	E51-NO26/NO27C	40	50	102
- Torus Room, NW/West	E51-NO26/NO27D	40	50	102

* Same as alarm setpoint

TABLE II (Continued)

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION		ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
HVAC exhaust radiation level above		(mr/hr)	(mr/hr)	(mr/hr)
- Reactor Building		15	50	1250
- Refuel Floor		20	50	1250
Area radiation level				
- 158' Southeast Area	Ch 9	15	50	1250
- Reactor Water Sample Rack	Ch 10	30	50	1250
- 130' Northeast Work Area	Ch 7	15	50	1250
- 130' Southwest Work Area	Ch 8	15	50	1250
- North CRD Hydraulic Units	Ch 13	15	50	1250
- South CRD Hydraulic Units	Ch 12	15	50	1250
- Spent Fuel Pool Passageway	Ch 11	15	50	1250
- 185' Operating Floor	Ch 25	30	50	1250
- Spent Fuel Pool	Ch 3	130	150	1250
- Fuel Pool Demin Panel Area	Ch 31	10	50	1250
- Refuel Floor	Ch 4	15	50	1250
- HPCI Turbine Area	Ch 16	100	150	1250
- RCIC Equipment Area	Ch 18	20	50	1250
- CRD Pump Room NW	Ch 19	20	50	1250
- North Core Spray & RHR Area	Ch 21	20	50	1250
- South Core Spray & RHR Area	Ch 14	20	50	1250

TABLE II (Continued

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION		ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
Floor drain sump water level		(in.)	(in.)	(in.)
- Sump A (NE Diagonal)	T45-N006	53	62	N/A
- Sump B (NW Diagonal)	T45-N007	53	53	N/A
Area water level				
- CRD Compartment	T45-N005	5	11	14
- RCIC Compartment	T45-N004	5	11	32
- RB NE Corner RM	T45-N003B	5	11	19
- RB SE Corner RM	T45-N003A	5	11	14
- HPCI Compartment	T45-N001	5	11	37
- Torus Compartment NW	T45-N002D	5	7	9
- Torus Compartment NE	T45-N002B	5	7	9
- Torus Compartment SE	T45-N002A	5	7	9
- Torus Compartment SW	T45-N002C	5	7	9

RADIOACTIVITY RELEASE CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to limit radioactivity release into areas outside the primary and secondary containments.

ENTRY CONDITIONS

The entry condition for this guideline is:

- Offsite radioactivity release rate above 3 Ci/sec (release rate which requires an Alert).

OPERATOR ACTIONS

RR-1 Isolate all primary systems that are discharging into areas outside the primary and secondary containments except systems required to assure adequate core cooling or shut down the reactor.

RR-2 If offsite radioactivity release rate approaches or exceeds 91 Ci/sec (release rate which requires a General Emergency) and a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with RR.

CONTINGENCY 1

LEVEL RESTORATION

If while executing any step in Contingency 1:

- Boron Injection is required, enter the procedure developed from CONTINGENCY 7.
- RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter the procedure developed from CONTINGENCY 6.
- RPV Flooding is required, enter procedure developed from CONTINGENCY 6.

C1-1 Line up for injection and start pumps in 2 or more of the following injection subsystems:

- Condensate
- LPCI LOOP A
- LPCI LOOP B
- CS LOOP A
- CS LOOP B

If less than 2 of the injection subsystems can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

- RHR service water crosstie
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

Cl-2 Monitor RPV pressure and water level. Continue in this Contingency at the step indicated as follows:

RPV PRESSURE REGION

340 psig [1] 100 psig [2]

		HIGH	INTERMEDIATE	LOW
RPV LEVEL	INCREASING	Cl-3	Cl-4	Cl-5
	DECREASING	Cl-6	Cl-6	Cl-7

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

[2] (HPCI low pressure isolation setpoint).

If while executing steps C1-3, C1-4, C1-5, C1-6, or C1-7:

- The RPV water level trend reverses or RPV pressure changes region, return to Step C1-2.
- RPV water level drops below -146 inches (ADS initiation setpoint), prevent automatic initiation of ADS.

C1-3 RPV WATER LEVEL INCREASING, RPV PRESSURE HIGH

Enter the procedure developed from the RPV Control Guideline at Step RC/L.

C1-4 RPV WATER LEVEL INCREASING, RPV PRESSURE INTERMEDIATE

If HPCI and RCIC are not available and RPV pressure is increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV pressure is decreasing, enter the procedure developed from the RPV Control Guideline at Step RC/L.

If HPCI and RCIC are not available and RPV pressure is not increasing, enter the procedure developed from the RPV Control Guideline at Step RC/L.

Otherwise, when RPV water level reaches +12.5 inches (low level scram setpoint), enter the procedure developed from the RPV Control Guideline at Step RC/L.

C1-5 RPV WATER LEVEL INCREASING, RPV PRESSURE LOW

If RPV pressure is increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV pressure is decreasing, enter the procedure developed from the RPV Control Guideline at Step RC/L. Otherwise, enter the procedure developed from the RPV Control Guideline at Step RC/L.

C1-6 RPV WATER LEVEL DECREASING, RPV PRESSURE HIGH OR INTERMEDIATE

If HPCI or RCIC is not operating, restart whichever is not operating.
If no injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.

When RPV water level drops to -164.5 inches (top of active fuel):

- If no system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, STEAM COOLING IS REQUIRED. When any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, return to Step C1-2.
- Otherwise, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV water level is increasing or RPV pressure drops below 100 psig (HPCI low pressure isolation setpoint), return to Step C1-2.

C1-7 RPV WATER LEVEL DECREASING, RPV PRESSURE LOW

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

If RPV pressure in increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

When RPV water level drops to -164.5 inches (top of active fuel), enter the procedure developed from CONTINGENCY 4.

CONTINGENCY 2

EMERGENCY RPV DEPRESSURIZATION

C2-1 When either: 13, 14

- Boron Injection is required and all injection into the RPV except from boron injection systems and CRD has been terminated and prevented, or
- Boron Injection is not required,

C2-1.1 If suppression pool water level is above 63 in. (elevation of top of SRV discharge device):

- Open all ADS valves.
- If any ADS valve cannot be opened, open other SRVs until 7 (number of SRVs dedicated to ADS) valves are open.

C2-1.2 If less than 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs are open and RPV pressure is at least 50 psig (minimum SRV re-opening pressure) above suppression chamber pressure, rapidly depressurize the RPV using one or more of the following systems (use in order which will minimize radioactive release to the environment): 22

- Main condenser
- RHR (steam condensing mode)
- Steam Jet Air Ejectors
- Reactor Feed Pump Turbines
- Main steam line drains
- HPCI steam line
- RCIC steam line
- Head vent

If RPV Flooding is required, enter the procedure developed from CONTINGENCY 6.

C2-2 Enter the procedure developed from the RPV Control Guideline at Step RC/P-4.

CONTINGENCY 3

STEAM COOLING

> If while executing any step in Contingency 3 Emergency RPV Depressurization is required or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter the procedure developed from CONTINGENCY 2.

C3-1 When RPV water level drops to -264.5 in. (Minimum Zero-Injection RPV Water Level) or if RPV water level cannot be determined, open one SRV.

> When RPV pressure drops below 700 psig (Minimum Single SRV Steam Cooling Pressure), enter the procedure developed from CONTINGENCY 2.

CONTINGENCY 4

CORE COOLING WITHOUT LEVEL RESTORATION

C4-1 Open all ADS valves. 13

If any ADS valve cannot be opened, open other SRVs until 7 (number of SRVs dedicated to ADS) valves are open.

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

When at least one core spray subsystem is operating with suction from the suppression pool and RPV pressure is below 113 psig (RPV pressure for rated CS flow, terminate injection into the RPV from sources external to the primary containment.

C4-3 When RPV water level is restored to -164.5 inches (top of active fuel), enter the procedure developed from the RPV Control Guideline at Step RC/L.

CONTINGENCY 5

ALTERNATE SHUTDOWN COOLING

C5-1 Initiate suppression pool cooling.

C5-2 Close the RPV head vents, MSIVs, main steam line drain valves, and HPCI and RCIC isolation valves.

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

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

C5-5 Start one CS or LPCI pump with suction from the suppression pool.

C5-6 Slowly increase CS or LPCI injection into the RPV to the maximum.

C5-6.1 If RPV pressure does not stabilize at least 108 psig (Minimum Alternate Shutdown Cooling RPV Pressure) above suppression chamber pressure, start another CS or LPCI pump.

C5-6.2 If RPV pressure does not stabilize below 168 psig (Maximum Alternate Shutdown Cooling RPV Pressure), open another SRV.

C5-6.3 If the cooldown rate exceeds 100°F/hr (maximum RPV cooldown rate LCO), reduce CS or LPCI injection into the RPV until the cooldown rate decreases below 100°F/hr (maximum RPV cooldown rate LCO) or RPV pressure decreases to within 50 psig (Minimum SRV Re-opening Pressure) of suppression chamber pressure, whichever occurs first.

C5-7 Control suppression pool temperature to maintain RPV water temperature above 70°F (head tensioning limit).

C5-8 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions, or as directed by Plant Management.

CONTINGENCY 6

RPV FLOODING

C6-1 If at least 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs can be opened, close the MSIVs, main steam line drain valves, HPCI, RCIC and RHR steam condensing isolation valves.

C6-2 If two or more control rods are at other than position 00 (maximum subcritical banked withdrawal position):

C6-2.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

Number of Open SRVs	Minimum Alternate RPV Flooding Pressure (psig)
7 or more	149
6	177
5	215
4	272
3	368
2	560

If less than 2 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRVs can be opened, continue in this procedure.

> If while executing step C6-2.2, RPV water level can be determined and RPV Flooding is not required, enter the procedure developed from CONTINGENCY 7 and the procedure developed from the RPV Control Guideline at Step RC/P-4 and execute them concurrently.

C6-2.2 Commence and slowly increase injection into the RPV with the following systems until at least 2 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRVs are open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure: 25

- Condensate pumps
- CRD
- LPCI

If at least 2 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRVs are not open or RPV pressure cannot be increased to above the Minimum Alternate RPV Flooding Pressure, commence and slowly increase injection into the RPV with the following systems until at least 2 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRVs are open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure:

- CS
- RHR service water crosstie
- ECCS keep-full systems

C6-2.3 Maintain at least 2 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRVs open and RPV pressure above the Minimum Alternate RPV Flooding Pressure by throttling injection.

C6-2.4 When:

- All control rods, except one, are inserted to position 00 (maximum subcritical banked withdrawal position), or
- The reactor is shutdown and no boron has been injected into the RPV,

continue in this contingency.

C6-3 If RPV water level cannot be determined:

C6-3.1 Commence and increase injection into the RPV with the following systems until at least 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs are open and RPV pressure is not decreasing and is at least 53 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure.

- CS
- LPCI
- Condensate pumps
- CRD
- RHR service water crosstie
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

C6-3.2 Maintain at least 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs open and RPV pressure at least 53 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure by throttling injection.

C6-4 If RPV water level can be determined, commence and increase injection into the RPV with the following systems until RPV water level is increasing:

- CS
- LPCI
- Condensate pumps
- CRD
- RHR service water crosstie
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

C6-5 If RPV water level cannot be determined:

C6-5.1 Fill all RPV water level instrumentation reference columns.

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

If while executing steps C6-5.3 or C6-5.4, level can be determined, continue at step C6-6.

C6-5.3 If it can be determined that the RPV is filled or if RPV pressure is at least 53 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure, terminate all injection into the RPV and reduce RPV water level.

C6-5.4 If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit (see Attachment 10) after commencing termination of injection into the RPV, return to Step C6-3.

C6-6 When suppression chamber pressure can be maintained below the Primary Containment Design Pressure (see Attachment 7), enter the procedure developed from the RPV Control Guideline at Steps RC/L and RC/P-4 and execute these steps concurrently.

CONTINGENCY 7

LEVEL/POWER CONTROL

> If while executing any step in Contingency 7 RPV Flooding is required or RPV water level cannot be determined, control injection into the RPV to maintain reactor power above 8% (Reactor Flow Stagnation Power) but as low as practicable. However, if reactor power cannot be determined or maintained above 8% (Reactor Flow Stagnation Power), RPV FLOODING IS REQUIRED; enter the procedure developed from CONTINGENCY 6.

C7-1 If:

- Reactor power is above 3% (APRM downscale trip) or cannot be determined, and
- Suppression pool temperature is above 110°F (Boron Injection Initiation Temperature), and
- Either an SRV is open or opens or drywell pressure is above 2.0 psig (high drywell pressure scram setpoint),

lower RPV water level by terminating and preventing all injection into the RPV except from boron injection systems and CRD until either: 26

- Reactor power drops below 3% (APRM downscale trip), or
- RPV water level reaches -164.5 inches (top of active fuel), or
- All SRVs remain closed and drywell pressure remains below 2.0 psig (high drywell pressure scram setpoint).

If while executing steps C7-2 or C7-3 Emergency RPV Depressurization is required, continue at step C7-2.1.

If while executing steps C7-2 or C7-3:

- Reactor power is above 3% (APRM downscale trip) or cannot be determined, and
- RPV water level is above -164.5 inches (top of active fuel), and
- Suppression pool temperature is above 110°F (Boron Injection Initiation Temperature), and
- Either an SRV is open or opens or drywell pressure is above 2.0 psig (high drywell pressure scram setpoint),

return to Step C7-1.

C7-2 Maintain RPV water level either: 9, 10, 11, 25

- If RPV water level was deliberately lowered in Step C7-1, at the level to which it was lowered, or
- If RPV water level was not deliberately lowered in Step C7-1, between +12.5 inches (low level scram setpoint) and +58 inches (high level trip setpoint),

with the following systems:

- Condensate System 385-0 psig (RPV pressure range for system operation)
- Condensate/feedwater system 1717-0 psig (RPV pressure range for system operation)
- CRD system 1525-0 psig (RPV pressure range for system operation)
- RCIC system 1120-50 psig (RPV pressure range for system operation) 12
- HPCI system 1120-150 psig (RPV pressure range for system operation)
- LPCI system 280-0 psig (RPV pressure range for system operation)

If RPV water level cannot be so maintained, maintain RPV water level above -164.5 inches (top of active fuel).

If RPV water level cannot be maintained above -164.5 inches (top of active fuel), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

C7-2.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

Number of Open SRVs	Minimum Alternate RPV Flooding Pressure (psig)
7 or more	149
6	177
5	215
4	272
3	368
2	560

If less than 2 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRVs can be opened, continue in this Contingency.

C7-2.2 Commence and slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above -164.5 inches (top of active fuel): 25

- Condensate/feedwater system
- CRD
- RCIC
- HPCI
- LPCI

If RPV water level cannot be restored and maintained above -164.5 inches (top of active fuel), commence and slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above -164.5 inches (top of active fuel):

- CS
- RHR service water crosstie
- ECCS keep-full systems

> If while executing step C7-3 step reactor power commences and continues to increase, return to Step C7-1.

C7-3 When 262.5 pounds (Hot Shutdown Boron Weight) (occurs at SLC tank indication of 39%) of boron have been injected or all control rods, except one, are inserted to position 00 (maximum subcritical banked withdrawal position), restore and maintain RPV water level between +12.5 inches (low level scram setpoint) and +58 inches (high level trip setpoint).

If RPV water level cannot be restored and maintained above +12.5 inches (low level scram setpoint), maintain RPV water level above -164.5 inches (top of active fuel).

If RPV water level cannot be maintained above -164.5 inches (top of active fuel), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; return to Step C7-2.1.

If Alternate Shutdown Cooling is required, enter the procedure developed from CONTINGENCY 5.

C7-4 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions, or as directed by Plant Management.

GEORGIA POWER COMPANY
HATCH NUCLEAR PLANT
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES
PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)
ATTACHMENT TITLE:
NPSH REQUIREMENTS

ATTACHMENT
PAGE 1 OF 1
REVISION:
0

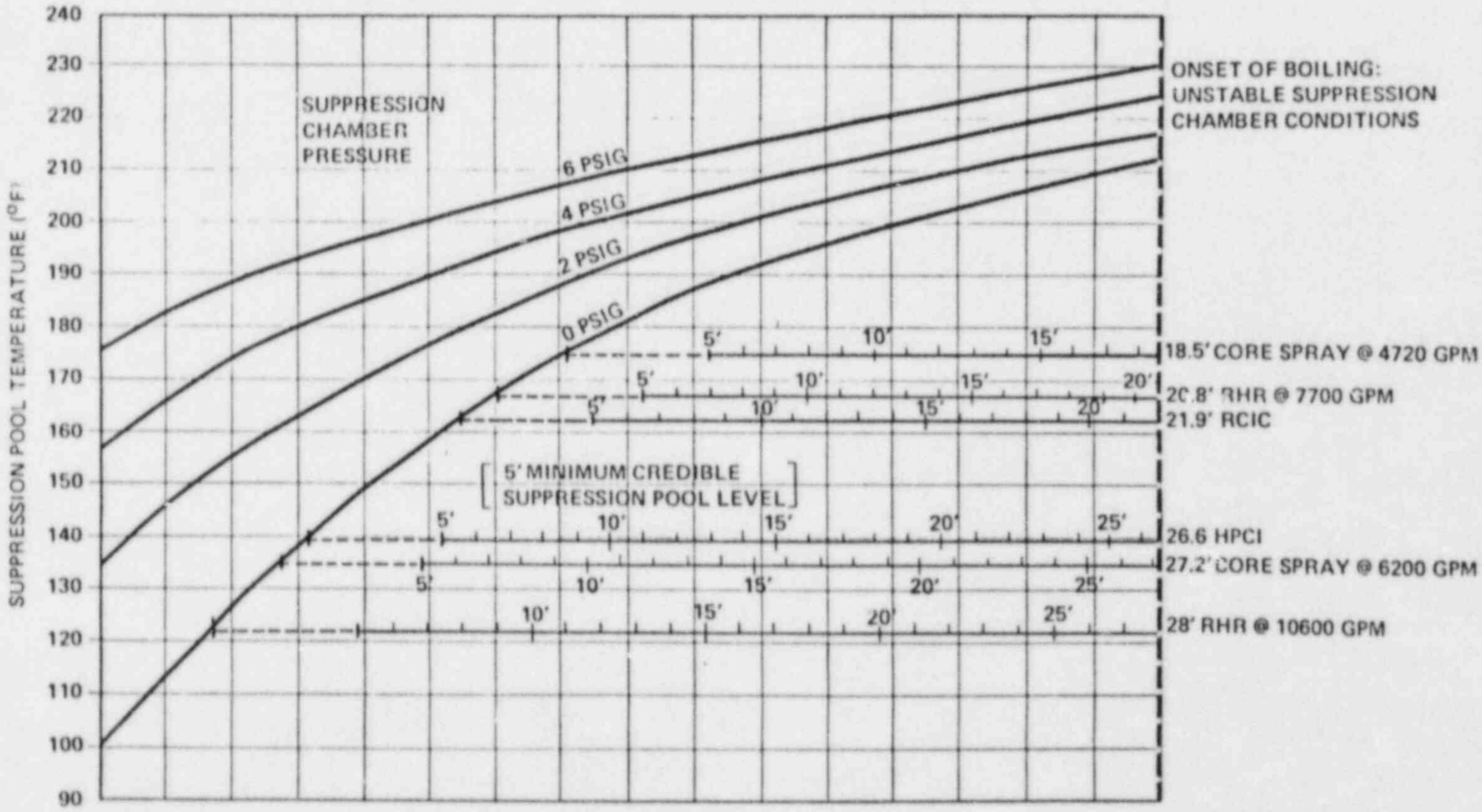


FIGURE 1 HATCH UNIT 1. MINIMUM SUPPRESSION POOL LEVEL WHICH MEETS REQUIRED NPSH FOR ECC'S PUMPS TAKING SUCTION FROM TORUS.

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: HEAT CAPACITY TEMPERATURE LIMIT	

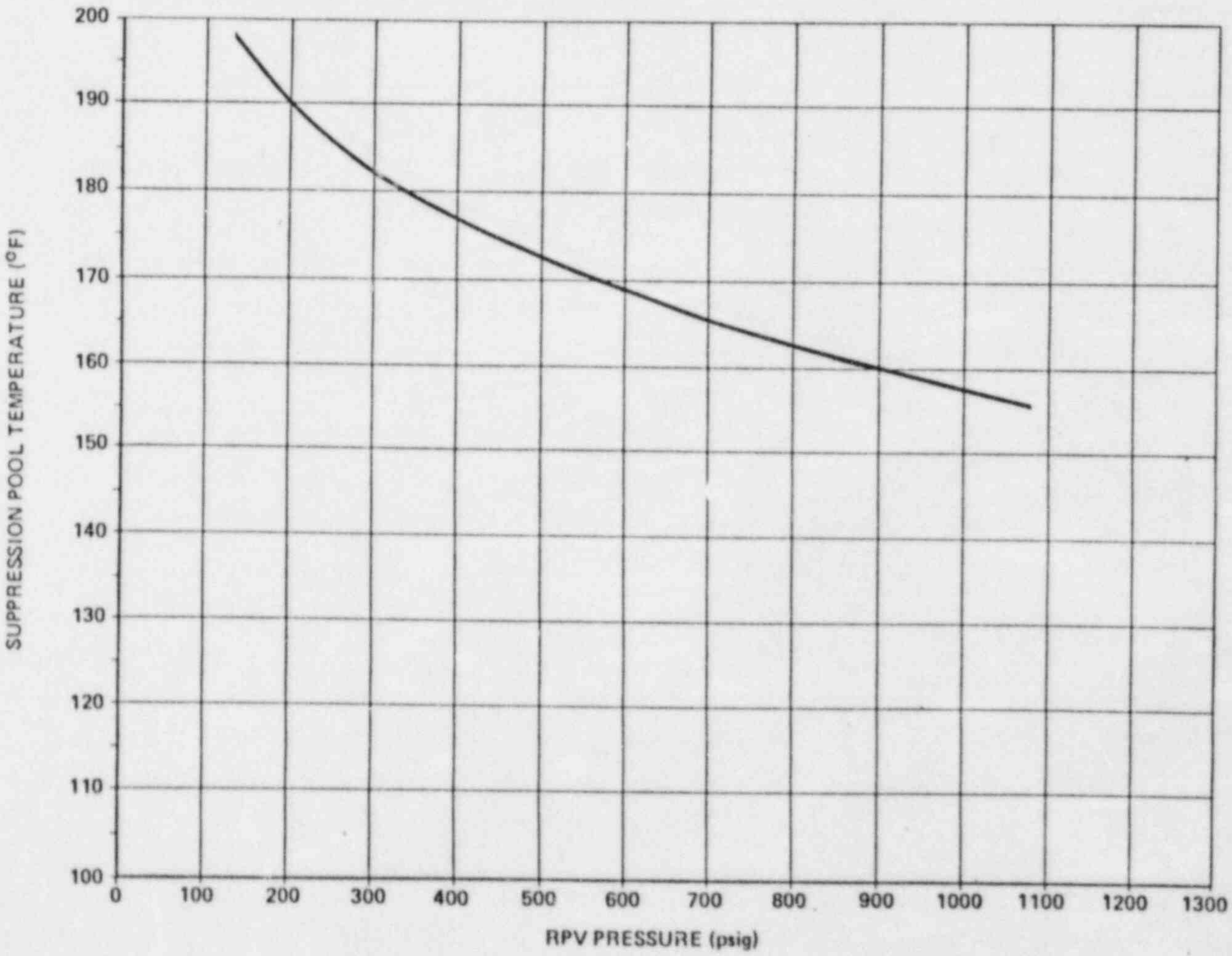


FIGURE C3-4

HEAT CAPACITY TEMPERATURE LIMIT

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: SUPPRESSION POOL LOAD LIMIT	

(TO BE PROVIDED LATER)

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: REACTOR PRESSURE VESSEL SATURATION LIMIT	

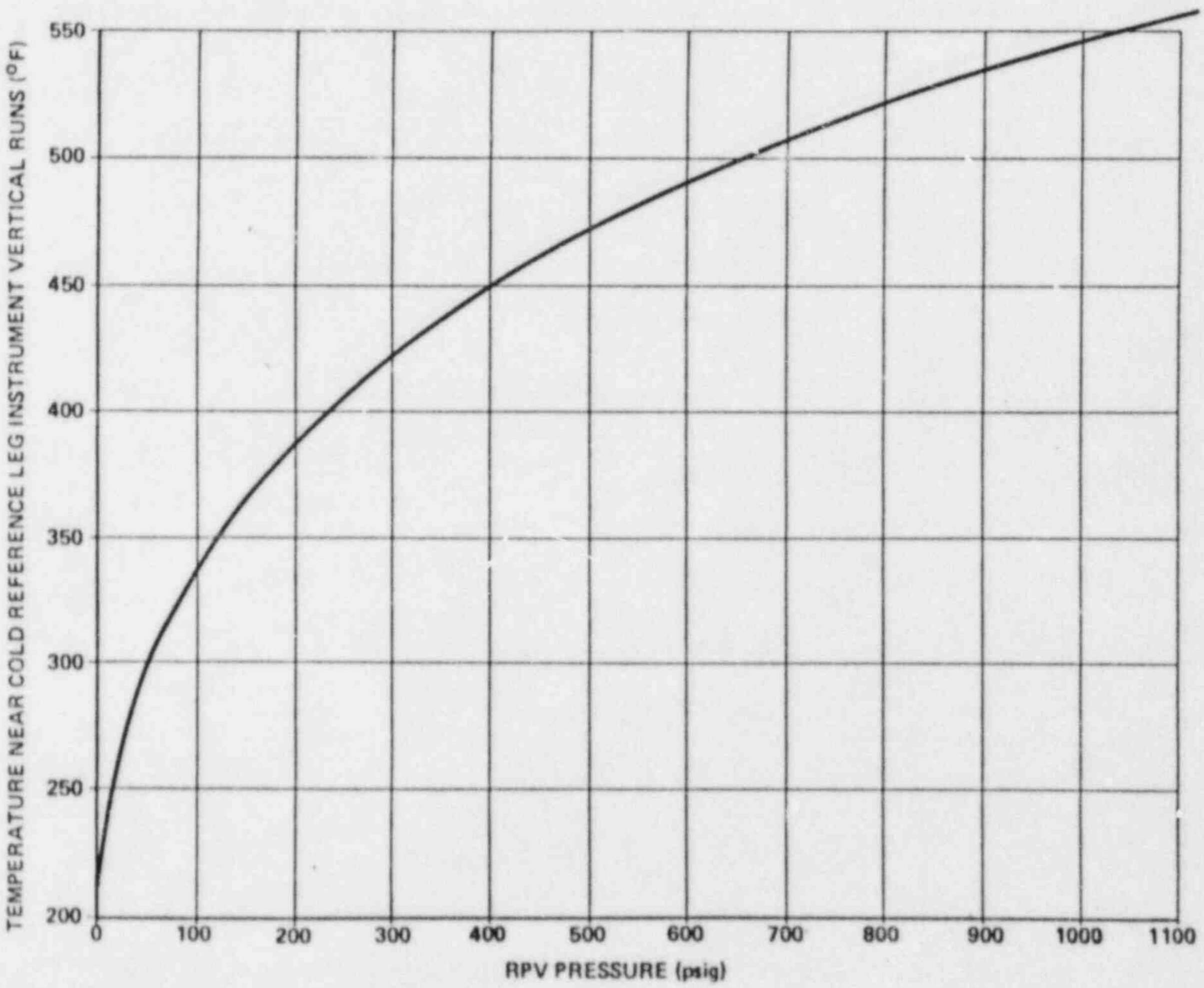


FIGURE C7-1
RPV SATURATION TEMPERATURE

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 2
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: DRYWELL SPRAY INITIATION PRESSURE LIMIT	

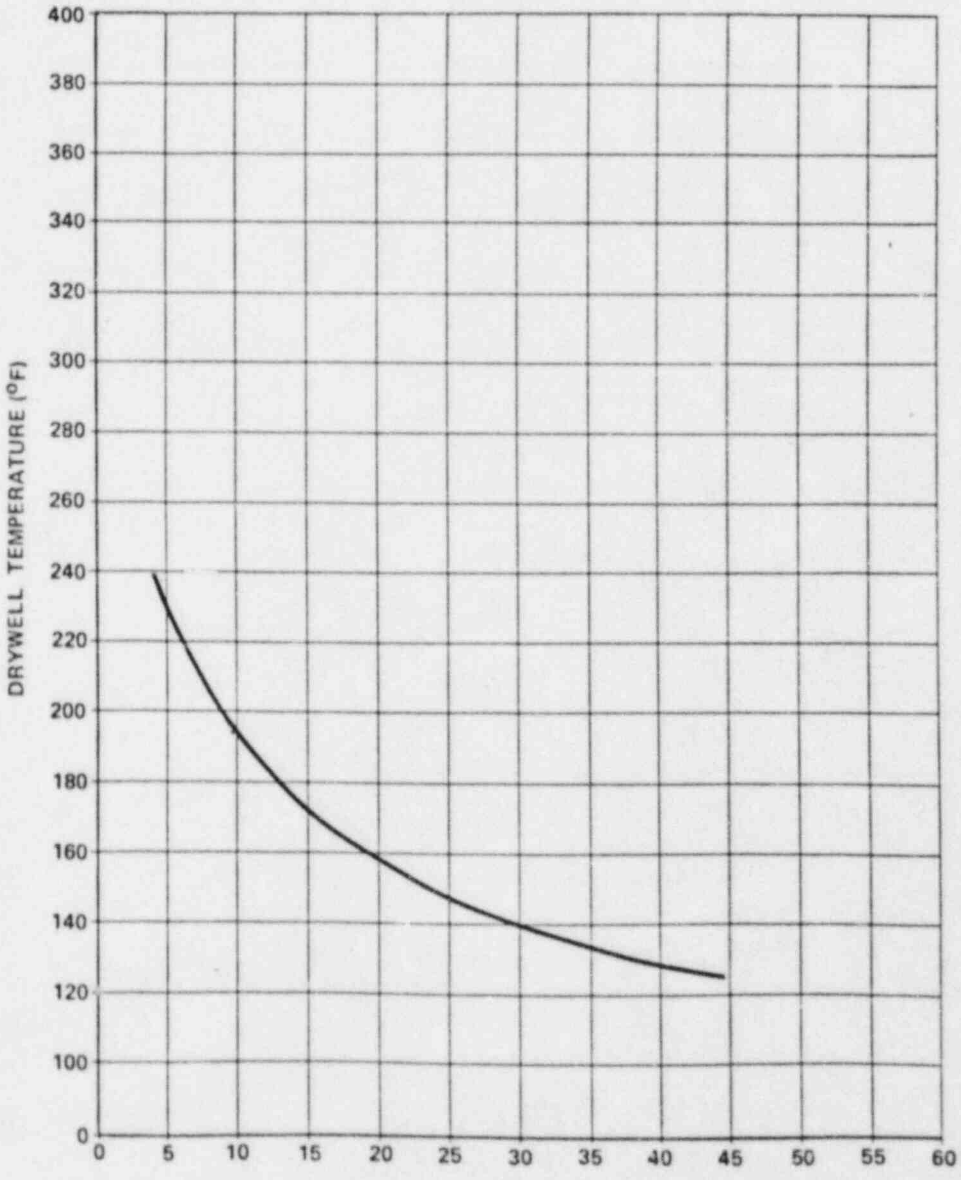


FIGURE C9-1
DRYWELL SPRAY INITIATION PRESSURE LIMIT
(C9.I. WETWELL-TO-DRYWELL ΔP LIMIT)

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 2 OF 2
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: DRYWELL SPRAY INITIATION PRESSURE LIMIT	

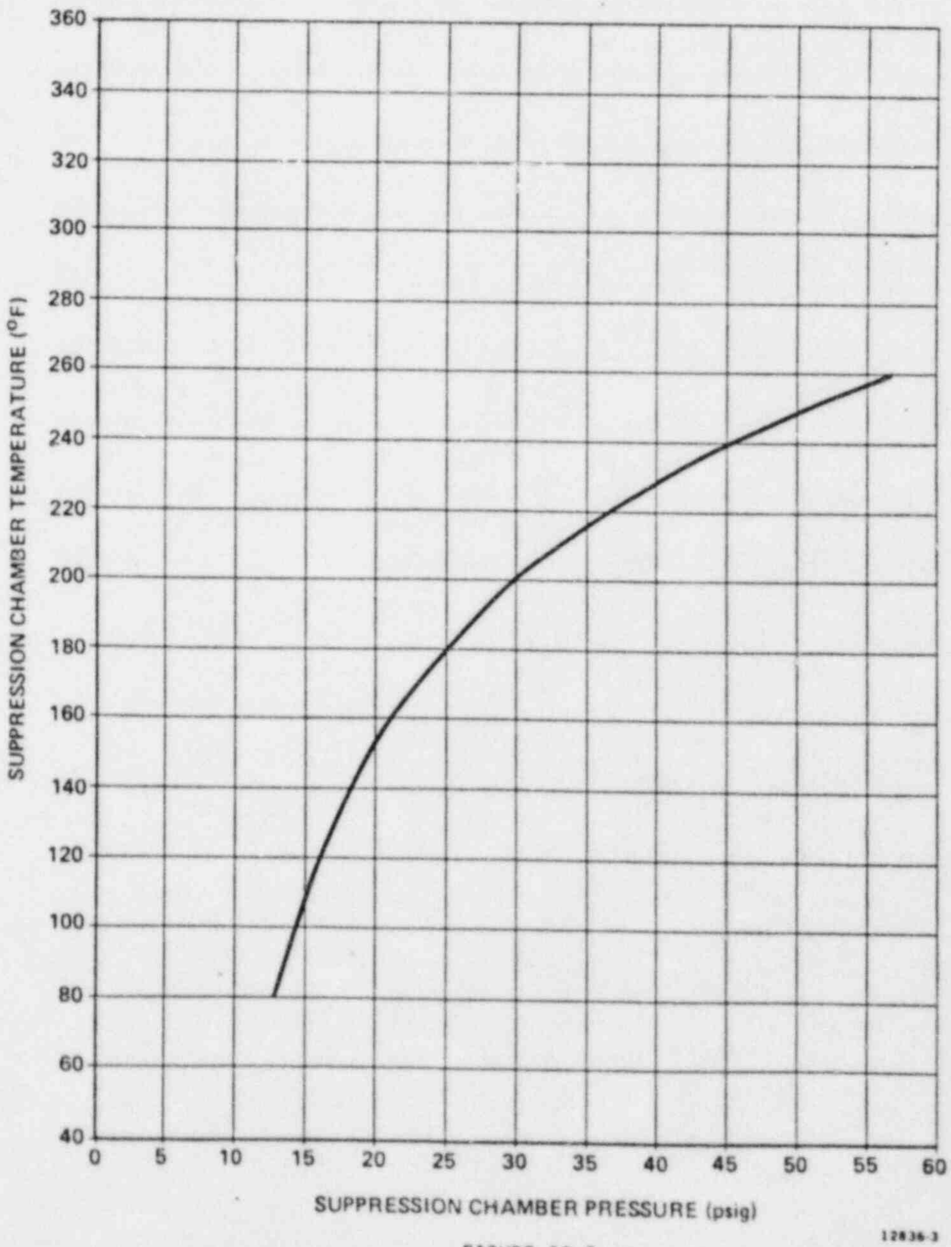


FIGURE C9-2
DRYWELL SPRAY INITIATION PRESSURE LIMIT
(C9.II.A. CONTAINMENT-TO-RB ΔP LIMIT FOR RELATED SPRAY)

GEORGIA POWER COMPANY
HATCH NUCLEAR PLANT

ATTACHMENT
PAGE 1 OF 1

DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES
PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)

REVISION:
0

ATTACHMENT TITLE:
PRESSURE SUPPRESSION PRESSURE

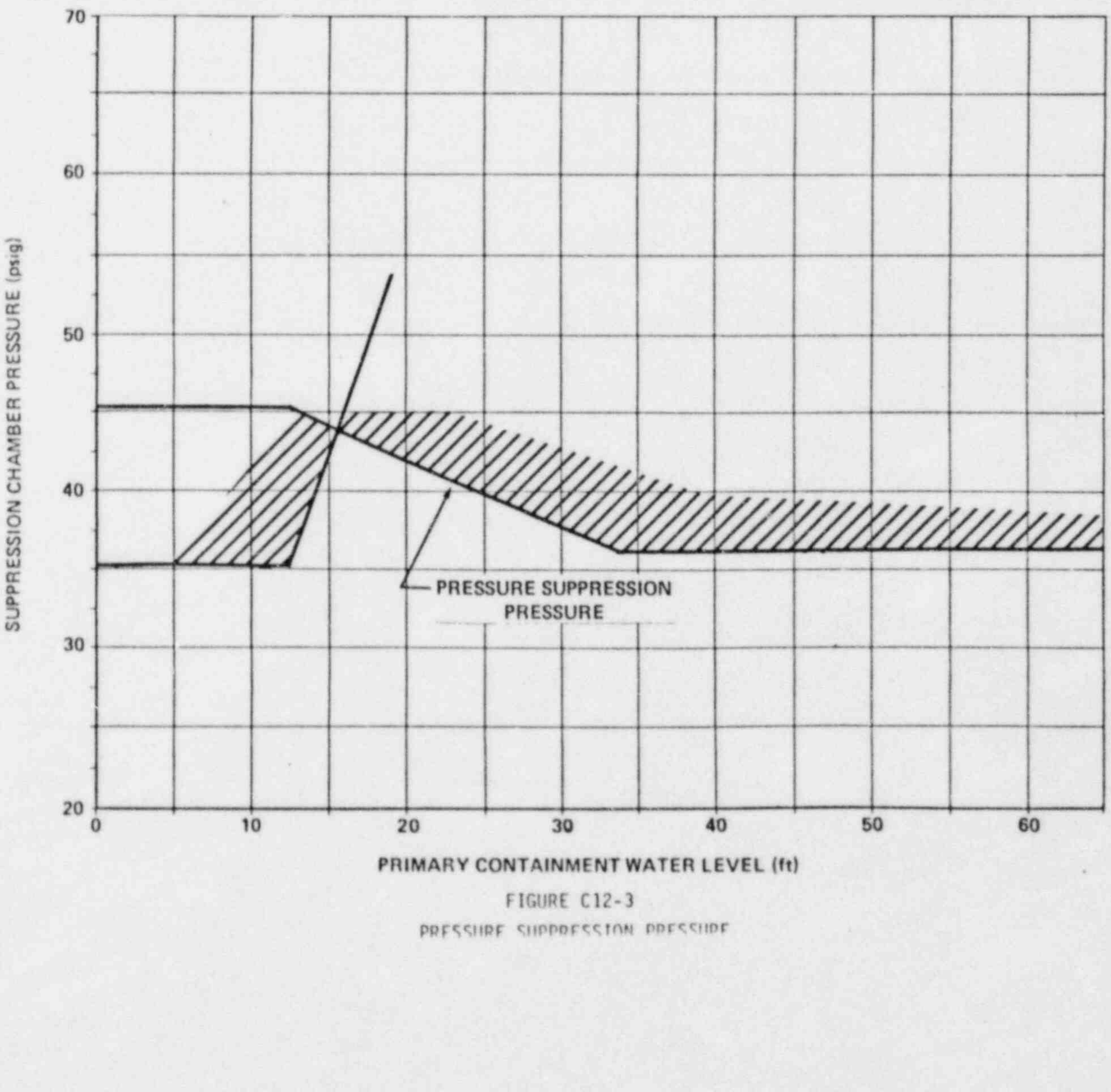


FIGURE C12-3

PRESSURE SUPPRESSION PRESSURE

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: PRIMARY CONTAINMENT DESIGN PRESSURE	

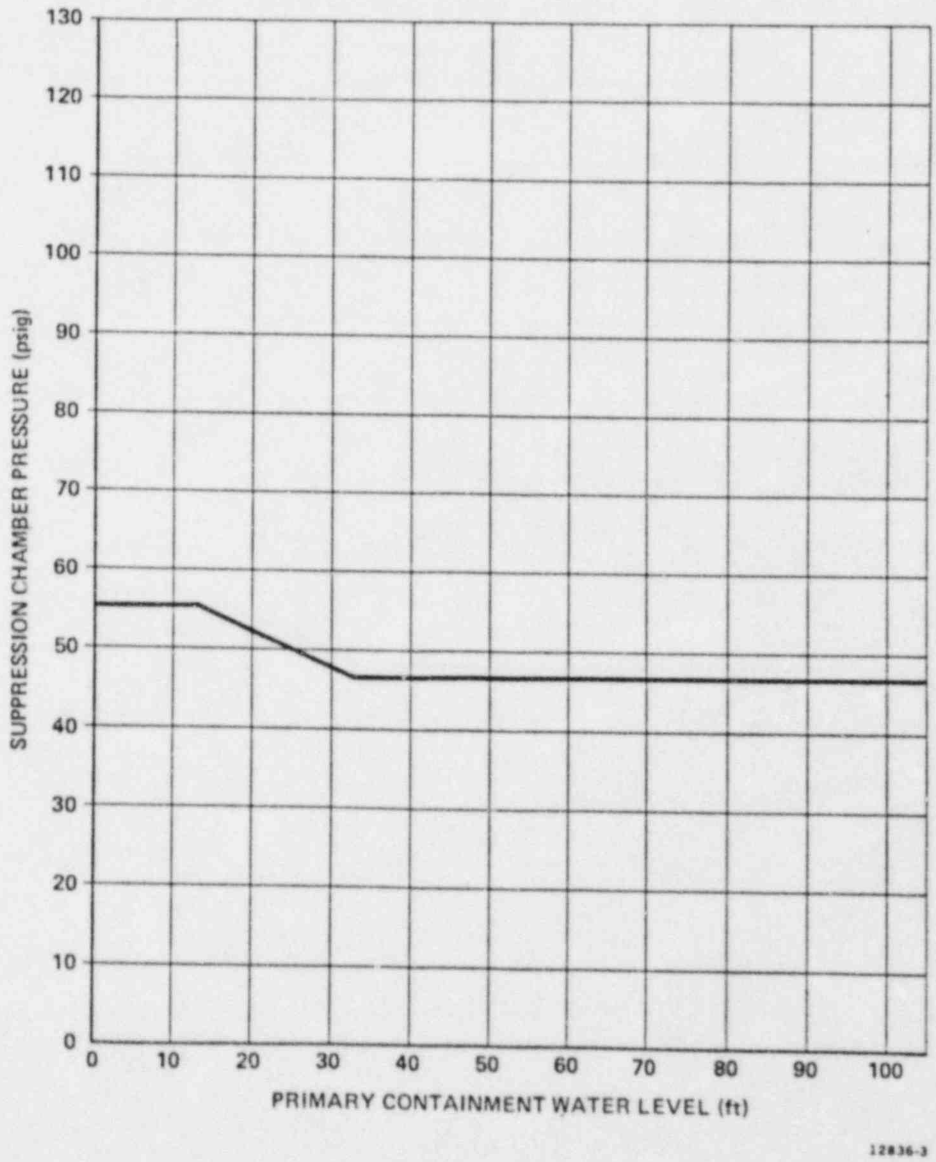


FIGURE C13-2
PRIMARY CONTAINMENT DESIGN PRESSURE

GEORGIA POWER COMPANY	ATTACHMENT
HATCH NUCLEAR PLANT	PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES	REVISION:
PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	0
ATTACHMENT TITLE:	
PRIMARY CONTAINMENT PRESSURE LIMIT	

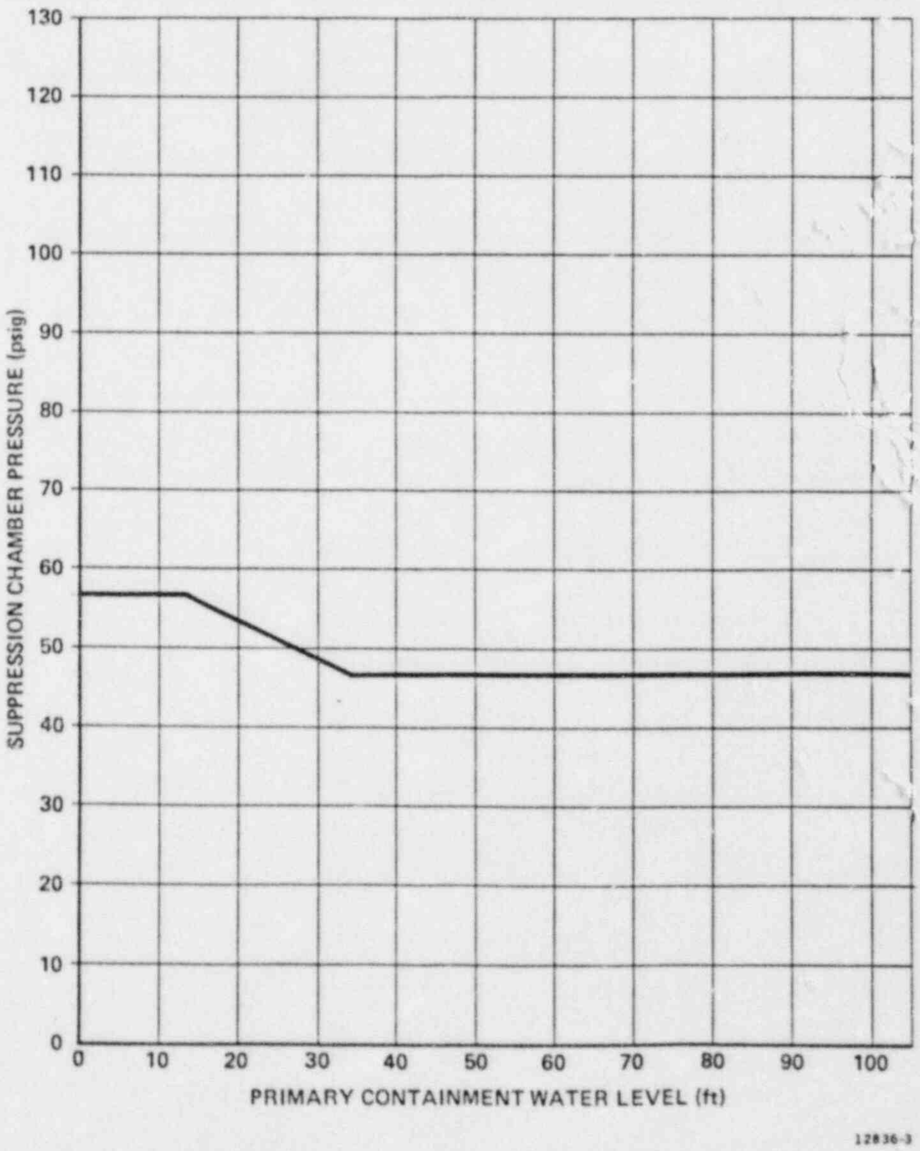


FIGURE C14-1

PRIMARY CONTAINMENT PRESSURE LIMIT

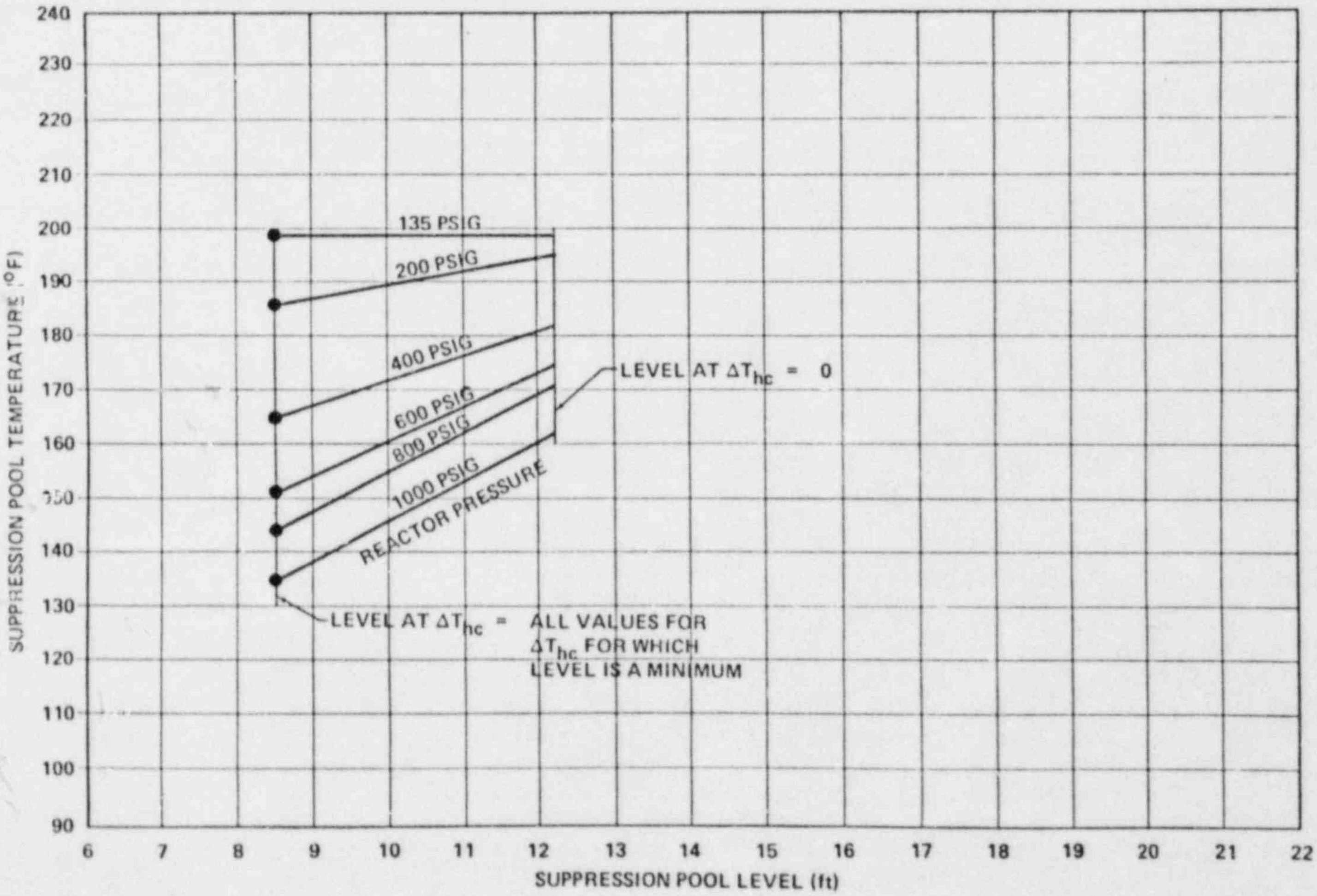
GEORGIA POWER COMPANY
HATCH NUCLEAR PLANT

ATTACHMENT
PAGE 1 OF 1

DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES
PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)

REVISION:
0

ATTACHMENT TITLE:
HEAT CAPACITY LEVEL LIMIT



GEORGIA POWER COMPANY	ATTACHMENT
HATCH NUCLEAR PLANT	PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 1)	REVISION: 0
ATTACHMENT TITLE: MAXIMUM CORE UNCOVERY TIME LIMIT	

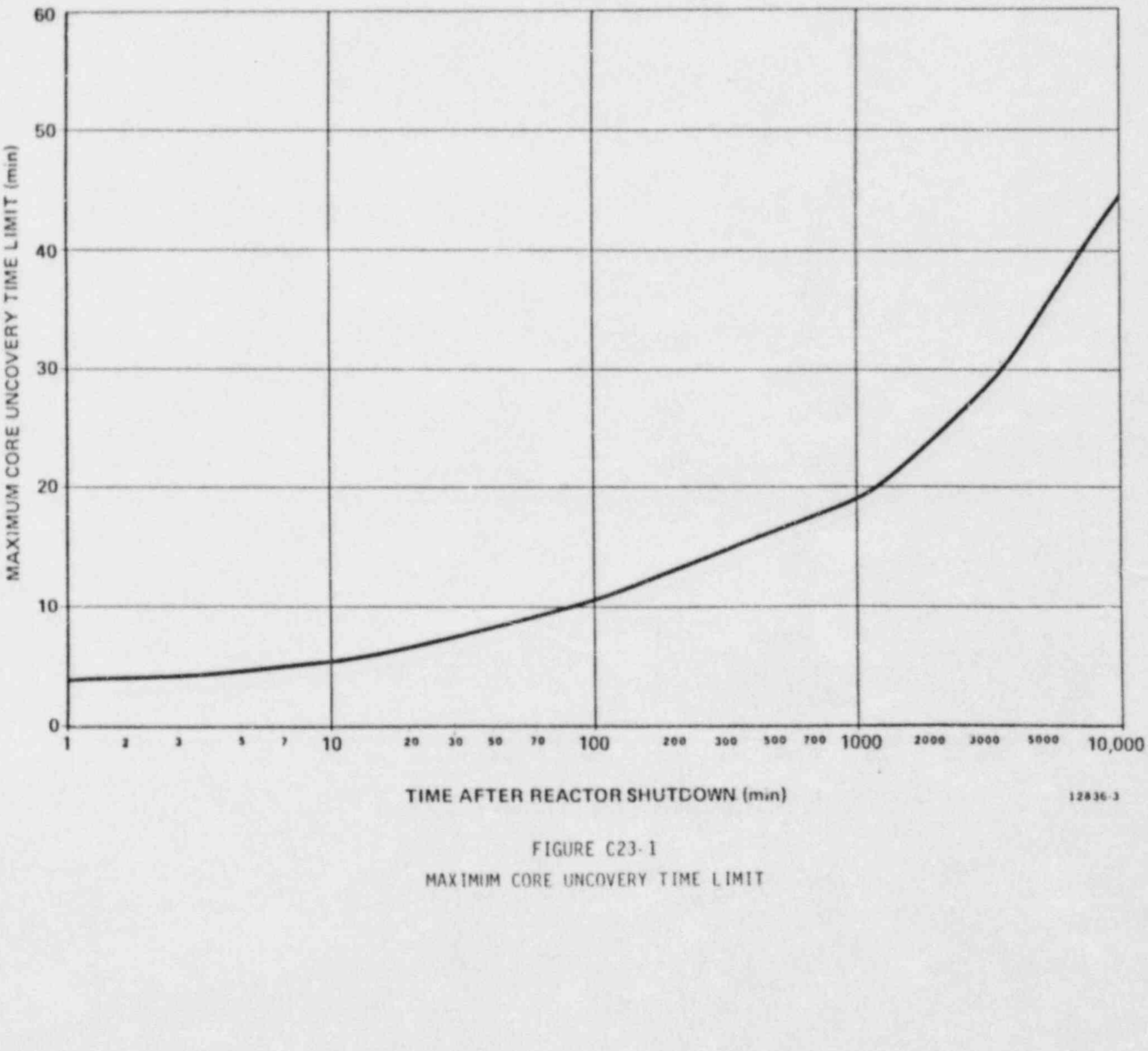


FIGURE C23-1

MAXIMUM CORE UNCOVERY TIME LIMIT

HATCH NUCLEAR PLANT

EMERGENCY OPERATING PROCEDURES

PLANT SPECIFIC TECHNICAL GUIDELINE

UNIT 2

TABLE OF CONTENTS

SECTION PAGE

PREFACE

This Plant Specific Technical Guideline was developed from the Boiling Water Reactor Owner's Group generic Emergency Procedure Guidelines, Revision 3, dated December 8, 1982, by following instructions contained on page I-2 of these generic guidelines. The format of this Plant Specific Technical Guideline is not intended to reflect the format of the Emergency Operating Procedures (EOP) developed from this guideline. Format of the EOP's will follow the instructions of the Plant Specific Writer's Guide.

INTRODUCTION

Based on the BWR system design, the following Plant Specific Technical Guidelines have been developed:

- RPV Control Guideline
- Primary Containment Control Guideline
- Secondary Containment Control Guideline
- Radioactivity Release Control Guideline

The RPV Control Guideline contains instructions to enable the operator to maintain adequate core cooling, shut down the reactor, and cool down the RPV to cold shutdown conditions. This guideline is entered whenever low RPV water level, high RPV pressure, high drywell pressure, or a condition which requires MSIV isolation has occurred, or whenever a condition which requires reactor scram exists and reactor power is above the APRM downscale trip or cannot be determined.

The Primary Containment Control Guideline contains instructions to enable the operator to maintain primary containment integrity and protect equipment in the primary containment. This guideline is entered whenever suppression pool temperature, drywell temperature, containment temperature, drywell pressure, or suppression pool water level is above its high operating limit or suppression pool water level is below its low operating limit.

The Secondary Containment Control Guideline contains instructions to enable the operator to protect equipment in the secondary containment, limit radioactivity release to the secondary containment, and either maintain secondary containment integrity or limit radioactivity release from the secondary containment. This guideline is entered whenever a secondary containment temperature, radiation level, or water level is above its maximum normal operating value or secondary containment differential pressure reaches zero.

The Radioactivity Release Control Guideline contains instructions to enable the operator to limit radioactivity release into areas outside the primary and secondary containments. This guideline is entered whenever offsite radioactivity release rate is above that which requires an Alert.

Table I is a list of abbreviations/definitions used in the guidelines.

Parentheses ( ) indicate the source for a plant specific variable. Illustrated in these guidelines are variables specifically for HNP Unit 2.

At various points throughout these guidelines, cautions are noted by, for example, the symbol [20]. The number within the box refers to a numbered "Caution" contained in the Operator Precautions section. These "Cautions" are brief and succinct red flags for the operator.

Where the basis for the "Caution" or a step is not completely evident from the text, a full discussion of the basis is contained in Appendix B to the generic Emergency Procedures Guidelines. Other system details which pertain to the guidelines are also included in this appendix.

At various points within these guidelines, limits are specified beyond which certain actions are required. While conservative, these limits are derived from engineering analyses utilizing best-estimate (as opposed to licensing) models. Consequently, these limits are not as conservative as the limits specified in a plant's Technical Specifications. This is not to imply that operation beyond the Technical Specifications is recommended in an emergency. Rather, such operation may be required under certain degraded conditions in order to safely mitigate the consequences of those degraded conditions. The limits specified in the guidelines establish the boundaries within which continued safe operation of the plant can be assured. Therefore, conformance with the guidelines does not ensure strict conformance with a plant's Technical Specifications or other licensing bases.

The entry conditions for these guidelines are symptomatic of both emergencies and events which may degrade into emergencies. The guidelines specify actions appropriate for both. Therefore, entry into procedures developed from these guidelines is not conclusive that an emergency has occurred.

TABLE I

ABBREVIATIONS/DEFINITIONS

)RD/ABBREVIATION	MEANING/APPLICATION
	Amendment
ljust	To regulate or bring to a more satisfactory state. Example: "ADJUST Reactor Water Level setpoint to +36 inches."
)S	Automatic Depressurization System.
ign	To place a system in proper or desired configuration for an intended purrose. Example: "ALIGN Standby Gas Treatment to Reactor Building".
low	To permit a stated condition to be achieved prior to proceeding. Example: "ALLOW discharge pressure to stabilize".
ternate Injection Subsystem	Any of: keep fill systems, RHR service water, SLC.
pendix	The Appendix to the Plant Specific Technical Guidelines.
'RM	Average Power Range Monitor.
ailable	Capable of performing its intended function e.g. adding water to the reactor.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Check	To perform a physical action which determines the state of a variable or status of equipment without directing a change in status. Example: "CHECK for satisfactory lube oil level".
Close	To change the physical position of a mechanical device to the closed position so that . prevents fluid flow or permits passage of electric current. Example: "CLOSE valve 2B21-F019."
Complete	To accomplish specific procedural requirements, Example: "COMPLETE valve check-off list 3.7.1", "COMPLETE data report QA-1", "COMPLETE steps 7 through 9 of Section III".
CRD	Control Rod Drive.
CS	Core Spray.
DW/T	Drywell Temperature Control.
ECCS	Emergency Core Cooling System.
EPG	Emergency Procedure Guideline generated by the BWR owners group with generic application to all BWRs.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
EOP	Emergency Operating Procedures.
Establish	To make arrangements for a stated condition. Example: "ESTABLISH communication with control room".
FSAR	Final Safety Analysis Report.
Ft.	Foot or feet.
HCU	Hydraulic Control Unit.
HNP	Hatch Nuclear Plant.
HPCI	High Pressure Coolant Injection.
HVAC	Heating, Ventilating and Air Conditioning.
In.	Inch or inches.
Injection Subsystem	Any of: condensate, LPCI, or CS
Isolate	To close one or more valves in a system for the purpose of separating or setting apart a complete system or a portion of the system from the rest. Example: "ISOLATE interruptible instrument air header by shutting valve 2P51-F011."

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Inspect	To measure, observe, or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included. Example: "visually INSPECT for leaks".
LCO	Limiting Condition for Operation.
LOCA	Loss of Coolant Accident.
LPCI	Low Pressure Coolant Injection.
Maintain	To keep in an existing state. Example: "MAINTAIN the reactor vessel water level between +15 and +55 inches, with one or more of the following systems".
MSIV	Main Steamline Isolation Valves.
NDTT	Nil-Ductility Transition Temperature.
NE	North East.
NPSH	Net Positive Suction Head.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Open	To change the physical position of a mechanical device to the open position so that it allows fluid flow or prevents passage of electrical current. Example: "OPEN valve 2B21-F016". Unless specifically directed otherwise, open means fully open.
P	Page.
PC	Primary Containment Control.
PC/P	Primary Containment Pressure Control.
PC/T	Primary Containment Temperature Control.
Place	To put in a particular position. Example: "PLACE mode switch to shutdown".
Press.	Pressure.
Primary System	Main Steam, HPCI, RCIC, Core Spray, RHR, CRD, Feedwater, RWCU, SLC, Reactor Sampling Systems are the systems designated primary systems.
PSIG	Pounds per square inch gage.
PSTG	Plant Specific Technical Guidelines.
RCIC	Reactor Core Isolation Cooling.
R 31	Revision Number 31.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
RC	RPV Control.
RC/L	RPV Level Control.
RC/P	RPV Pressure Control.
RC/Q	RPV Power Control.
Record	To document a specified condition or characteristic. Example: "RECORD discharge pressure".
Reduce	To cause a parameter to decrease in value. Example: "REDUCE reactor pressure with bypass valve manual jack".
RFPT	Reactor Feed Pump Turbine
RHR	Residual Heat Removal.
RPS	Reactor Protection System.
RPV	Reactor Pressure Vessel.
RR	Radioactivity Release.
RSCS	Rod Sequence Control System.
RWCU	Reactor Water Cleanup.
RWM	Rod Worth Minimizer
SBGT	Standby Gas Treatment.
SC	Secondary Containment Control.
SC/L	Secondary Containment Level Control.
SC/R	Secondary Containment Radiation Control.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
SC/T	Secondary Containment Temperature Control.
SE	South East.
Set	To physically adjust to a specified value an adjustable feature. Example: "SET diesel speed to...rpm".
SJAE	Steam Jet Air Ejector.
SLC	Standby Liquid Control.
SORV	Stuck Open Relief Valve.
SP/L	Suppression Pool Level Control.
SP/T	Suppression Pool Temperature Control.
SRV	Safety Relief Valve.
Start	To energize an electro-mechanical device by manipulation of a start switch or button. Example: "START a second CRD pump".
Stop	Opposite of start. Example: "STOP admitting steam by shutting valve 2B21-F044".
Synchronize	To make synchronous in operation. Example: "SYNCHRONIZE the Diesel Generator to 4160V Bus 2E".
Temp.	Temperature.

TABLE I (Continued)

ABBREVIATIONS/DEFINITIONS

WORD/ABBREVIATION	MEANING/APPLICATION
Throttle	To operate a valve in an intermediate position to obtain a certain flow rate. Example: "THROTTLE valve 2B21-F077 to obtain 2000 lb/hr. flow".
Trip	To manually activate a semi-automatic feature. Example: "TRIP breaker...".
TS	Technical Specification.
Vent	To permit a gas or liquid confined under pressure to escape at a vent. Example: "VENT the Heat Exchanger before placing it in service".
Verify	To prove to be true, exact, or accurate by observation of a condition or characteristic for comparison with an original or procedural requirement. Example: "VERIFY discharge pressure".

OPERATOR PRECAUTIONS

GENERAL

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

CAUTION 1

MONITOR THE GENERAL STATE OF THE PLANT. IF AN ENTRY CONDITION FOR AN EMERGENCY OPERATING PROCEDURE OCCURS, ENTER THAT PROCEDURE. WHEN IT IS DETERMINED THAT AN EMERGENCY NO LONGER EXISTS, ENTER THE APPROPRIATE NORMAL OPERATING PROCEDURE AS DIRECTED BY THE EMERGENCY OPERATING PROCEDURES.

CAUTION 2

MONITOR RPV WATER LEVEL AND PRESSURE AND PRIMARY CONTAINMENT TEMPERATURES AND PRESSURE FROM MULTIPLE INDICATIONS.

CAUTION 3

IF A SAFETY FUNCTION INITIATES AUTOMATICALLY, ASSUME A TRUE INITIATING EVENT HAS OCCURRED UNLESS OTHERWISE CONFIRMED BY AT LEAST TWO INDEPENDENT INDICATIONS.

CAUTION 4

WHENEVER RHR IS IN THE LPCI MODE, INJECT THROUGH THE HEAT EXCHANGERS AS SOON AS POSSIBLE.

CAUTION 5

SUPPRESSION POOL TEMPERATURE IS DETERMINED BY THE HIGHEST READING ON 2H11-P650 2T47-R627, 2H11-P657 2T47-R626. DRYWELL TEMPERATURE IS DETERMINED BY THE PROCEDURE IN HNP-2-1050, ITEM 8, DATA PACKAGE 1.

CAUTION 6

WHENEVER TEMPERATURE NEAR THE INSTRUMENT REFERENCE LEG VERTICAL RUN EXCEEDS THE TEMPERATURE SHOWN BELOW AND THE INSTRUMENT READS BELOW THE INDICATED LEVEL IN THE TABLE, THE ACTUAL RPV WATER LEVEL MAY BE ANYWHERE BELOW THE ELEVATION OF THE LOWER INSTRUMENT TAP.

TEMPERATURE	INDICATED LEVEL	INSTRUMENT
Any	96.2 IN.	SHUTDOWN RANGE LEVEL (-17 to+383 IN.) 2B21-R605
127.8°F	-107.7 IN.	WIDE RANGE LEVEL (-150 to +60 IN.) 2B21-N024, N025, N026, N031, 2C82-R005
285.6°F (B)	2.1 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 2C32-R606B
285.6°F (B)	25.54 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 2B21-N042B
286.7°F (C,D)	25.54 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 2B21-N017C,D
287.8°F (A,C)	2.2 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 2C32-R606A,C
287.8°F (A)	25.42 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 2B21-N042A
287.8°F (A,B)	25.42 IN.	NARROW RANGE LEVEL (0 to +60 IN.) 2B21-N017A,B
545°F	-346.9 IN.	FUEL ZONE LEVEL (-317 to -17 IN.) 2B21-N036 N037, R610, R615 A,B

CAUTION 7

2B21-R604 A AND B ON P603, 2B21-R623 A AND B ON P601 (HEATED REFERENCE LEG INSTRUMENTS) INDICATED LEVELS ARE NOT RELIABLE DURING RAPID RPV DEPRESSURIZATION BELOW 500 PSIG. FOR THESE CONDITIONS, UTILIZE 2B21-R605 ON P602, 2B21-R610 ON P601, OR 2B21-R615 ON P601 (COLD REFERENCE LEG INSTRUMENTS) TO MONITOR RPV WATER LEVEL.

CAUTION 8

OBSERVE NPSH REQUIREMENT FOR PUMPS TAKING SUCTION FROM THE SUPPRESSION POOL (SEE ATTACHMENT 1).

CAUTION 9

IF SIGNALS OF HIGH SUPPRESSION POOL WATER LEVEL 150 IN. (HIGH LEVEL SUCTION INTERLOCK) OR LOW CONDENSATE STORAGE TANK WATER LEVEL 0 IN. (LOW LEVEL SUCTION INTERLOCK) OCCUR, CONFIRM AUTOMATIC TRANSFER OF OR MANUALLY TRANSFER HPCI AND RCIC SUCTION FROM THE CONDENSATE STORAGE TANK TO THE SUPPRESSION POOL.

SPECIFIC

THIS section lists "CAUTIONS" Which are applicable at one or more specific points within the guidelines. Where a "Caution" is applicable, it is identified with a symbol, for example: [20].

CAUTION 10

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 AUTOMATIC/STANDBY MODE IF POSSIBLE.

CAUTION 11

IF A HIGH DRYWELL PRESSURE ECCS INITIATION SIGNAL 2.0 PSIG (DRYWELL PRESSURE WHICH INITIATES ECCS) OCCURS OR EXISTS WHILE DEPRESSURIZING, PREVENT INJECTION FROM THOSE CS AND LPCI PUMPS NOT REQUIRED TO ASSURE ADEQUATE CORE COOLING PRIOR TO REACHING THEIR MAXIMUM INJECTION PRESSURES. WHEN THE HIGH DRYWELL PRESSURE ECCS INITIATION SIGNAL CLEARS, RESTORE CS AND LPCI TO AUTOMATIC/STANDBY MODE.

CAUTION 12

DO NOT THROTTLE HPCI TURBINE BELOW 2000 RPM OR RCIC TURBINE BELOW 2250 RPM (MINIMUM TURBINE SPEED LIMIT PER TURBINE VENDOR MANUAL).

CAUTION 13

COOLDOWN RATES ABOVE 100°F/HR (RPV COOLDOWN RATE LCO) MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 14

DO NOT DEPRESSURIZE THE RPV BELOW 100 PSIG (HPCI LOW PRESSURE ISOLATION SETPOINT) UNLESS MOTOR DRIVEN PUMPS SUFFICIENT TO MAINTAIN RPV WATER LEVEL ARE RUNNING AND AVAILABLE FOR INJECTION.

CAUTION 15

OPEN SRV'S IN THE FOLLOWING SEQUENCE IF POSSIBLE: M, B, G, F, D, L, K, C, A. USE SRV'S E AND H ONLY IF UNABLE TO MAINTAIN PRESSURE WITH OTHER SRV'S.

CAUTION 16

BYPASSING LOW RPV WATER LEVEL VENTILATION SYSTEM AND MSIV ISOLATION INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 17

COOLDOWN RATES ABOVE 1CO°F/HR (RPV COOLDOWN RATE LCO) MAY BE REQUIRED TO CONSERVE RPV WATER INVENTORY, PROTECT PRIMARY CONTAINMENT INTEGRITY, OR LIMIT RADIOACTIVE RELEASE TO THE ENVIRONMENT.

CAUTION 18

IF CONTINUOUS LPCI OPERATION IS REQUIRED TO ASSURE ADEQUATE CORE COOLING, DO NOT DIVERT ALL RHR PUMPS FROM LPCI MODE.

CAUTION 19

MANUALLY TRIP SLC PUMPS AT 0% IN THE SLC TANK.

CAUTION 20

DEFEATING RSCS AND/OR RWM INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 21

ELEVATED SUPPRESSION CHAMBER PRESSURE MAY TRIP THE RCIC TURBINE ON HIGH EXHAUST PRESSURE.

CAUTION 22

DEFEATING ISOLATION INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 23

DO NOT INITIATE DRYWELL SPRAYS IF SUPPRESSION POOL WATER LEVEL IS ABOVE 216 IN. (ELEVATION OF BOTTOM OF MARK I INTERNAL SUPPRESSION CHAMBER TO DRYWELL VACUUM BREAKERS LESS VACUUM BREAKER OPENING PRESSURE IN FEET OF WATER).

CAUTION 24

BYPASSING HIGH DRYWELL PRESSURE AND LOW RPV WATER LEVEL SECONDARY CONTAINMENT HVAC ISOLATION INTERLOCKS MAY BE REQUIRED TO ACCOMPLISH THIS STEP.

CAUTION 25

A RAPID INCREASE IN INJECTION INTO THE RPV MAY INDUCE A LARGE POWER EXCURSION AND RESULT IN SUBSTANTIAL CORE DAMAGE.

CAUTION 26

LARGE REACTOR POWER OSCILLATIONS MAY BE OBSERVED WHILE EXECUTING THIS STEP.

RPV CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to:

- Maintain adequate core cooling,
- Shut down the reactor, and
- Cool down the RPV to cold shutdown conditions (RPV temperature between 100°F and 212°F).

ENTRY CONDITIONS

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

- RPV water level below +12.5 inches (low level scram setpoint).
- RPV pressure above 1045 psig (high RPV pressure scram setpoint).
- Drywell pressure above 2 psig (high drywell pressure scram setpoint).
- A condition which requires MSIV isolation.
- A condition which requires reactor scram, and reactor power above 3% (APRM downscale trip) or cannot be determined.

OPERATOR ACTIONS

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

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

RC/L Monitor and control RPV water level.

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

- Isolation
- ECCS
- Emergency diesel generator

Initiate any of these which should have initiated but did not.

If while executing step RC/L-2:

- Boron Injection is required, enter the procedure developed from CONTINGENCY 7.

- RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter the procedure developed from CONTINGENCY 6.

- RPV Flooding is required, enter the procedure developed from CONTINGENCY 6.

RC/L-2 Restore and maintain RPV water level between +12.5 in. (low level scram setpoint) and +58 in. (high level trip setpoint) with one or more of the following systems:

9
10
11

- Condensate system 650-0 psig (RPV pressure range for system operation).
- Condensate/feedwater system 1717-0 psig (RPV pressure range for system operation)
- CRD system 1507-0 psig (RPV pressure range for system operation)
- RCIC system 1120-50 psig (RPV pressure range for system operation) 12
- HPCI system 1120-150 psig (RPV pressure range for system operation)
- CS system 435-0 psig (RPV pressure range for system operations)
- LPCI system 225-0 psig (RPV pressure range for system operation)

If RPV water level cannot be restored and maintained above +12.5 inches (low level scram setpoint), maintain RPV water level above -164.5 inches (top of active fuel).

If RPV water level can be maintained above -164.5 inches (top of active fuel) and the ADS timer has initiated, prevent automatic RPV depressurization by resetting the ADS timer.

If RPV water level cannot be maintained above -164.5 inches (top of active fuel), enter the procedure developed from CONTINGENCY 1.

If Alternate Shutdown Cooling is required, enter the procedure developed from CONTINGENCY 5.

RC/L-3 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions or as directed by Plant Management.

RC/P Monitor and control RPV pressure.

If while executing any step in RC/P:

- Emergency RPV Depressurization is anticipated, rapidly depressurize the RPV with the main turbine bypass valves. 13

- Emergency RPV Depressurization or RPV Flooding is required and less than 7 (number of SRVs dedicated to ADS) SRVs are open, enter the procedure developed from CONTINGENCY 2.

- RPV Flooding is required and at least 7 (number of SRVs dedicated to ADS) SRVs are open, enter the procedure developed from CONTINGENCY 6.

RC/P-1 If any SRV is cycling, manually open SRVs until RPV pressure drops to 927 psig (RPV pressure at which all turbine bypass valves are fully open).

If while executing steps RC/P-2, RC/P-3, or RC/P-4:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit (see Attachment 2), maintain RPV pressure below the Limit. 8 13 14

- Suppression pool water level cannot be maintained below the Suppression Pool Load Limit (see Attachment 3) maintain RPV pressure below the Limit. 13 14

- Steam Cooling is required, enter the procedure developed from CONTINGENCY 3.

If while executing steps RC/P-2, RC/P-3, or RC/P-4:

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

open MSIVs to re-establish the main condenser as a heat sink. 16

RC/P-2 Control RPV pressure below 1090 psig (lowest SRV lifting pressure) with the main turbine bypass valves. 14

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

- SRVs only when suppression pool water level is above 58 in. (elevation of top of SRV discharge device). If the continuous SRV pneumatic supply is or becomes unavailable, depressurize with sustained SRV opening. 15
- HPCI 12
- RCIC

- Steam Jet Air Ejectors
- Reactor Feed Pump Turbines
- RHR Steam Condensing
- Offgas Preheater
- Steam Seal System
- RWCU (recirculation mode) if no boron has been injected into the RPV.
- Main steam line drains
- RWCU (blowdown mode) if no boron has been injected into the RPV. Refer to post accident sampling procedures prior to initiating blowdown.

> If while executing steps RC/P-3 or RC/P-4, the reactor is not shutdown, return to Step RC/P-2.

RC/P-3 When either:

- All control rods except one are inserted to position 00 * (maximum subcritical banked withdrawal position), or
- 551.1 pounds (Cold Shutdown Boron Weight) (occurs at SLC tank indication of 19%) of boron have been injected into the RPV, or
- The reactor is shutdown and no boron has been injected into the RPV,

depressurize the RPV and maintain cooldown rate below 100°F/hr (RPV cooldown rate LCO). 14, 17

* This is an interim value which will be used until the generic calculation is completed by General Electric Co.

RC/P-4 When the RHR shutdown cooling interlocks clear, initiate the shutdown cooling mode of RHR. 18

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

If RPV cooldown is required but cannot be accomplished and all control rods except one are inserted to position 00 (maximum subcritical banked withdrawal position), ALTERNATE SHUTDOWN COOLING IS REQUIRED; enter the procedure developed from CONTINGENCY 5.

RC/P-5 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions or as directed by Plant Management.

RC/Q Monitor and control reactor power.

> If while executing any step in RC/Q:
>
> - All control rods except one are inserted to position 00 (maximum subcritical banked withdrawal position), terminate boron injection and enter the scram procedure.
> - The reactor is shutdown and no boron has been injected into the RPV, enter the scram procedure.

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

RC/Q-2 If the main turbine-generator is on-line and the MSIVs are open, confirm or initiate recirculation flow runback to minimum.

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

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

19

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

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

- CRD
- RWCU
- HPCI
- RCIC

RC/Q-4.1 If boron is not being injected into the RPV by RWCU, confirm automatic isolation of or manually isolate RWCU.

RC/Q-4.2 Continue to inject boron until 551.1 pounds (Cold Shutdown Boron Weight) (occurs at SLC tank indication of 19%) of boron have been injected into the RPV.

RC/Q-4.3 Enter the scram procedure.

RC/Q-5 Insert control rods as follows:

RC/Q-5.1 If any scram valve is not open:

- Remove:

  2H11-P609 2C71-F18A, E, C, G

  2H11-P611 2C71-F18B, F, D, H

  (fuses which de-energize RPS scram solenoids).

- Close 2C11-F095 (scram air header supply valve) and open 2C11-F008 (scram air header vent valve).

When control rods are not moving inward:

- Replace:

  2H11-P609 2C71-F18A, E, C, G

  2H11-P611 2C71-F18B, F, D, H

  (fuses which de-energize RPS scram solenoids).

- Close 2C11-F008 (scram air header vent valve) and open 2C11-F095 (scram air header supply valve).

RC/Q-5.2 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.

   If no CRD pump can be started, continue at step RC/Q-5.6.1.

2. Close 2C11-F034 (HCU accumulator charging water header valve).

3. Rapidly insert control rods manually until the reactor scram can be reset 20
4. Reset the reactor scram.
5. Open 2C11-F034 (HCU accumulator charging water header valve).

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

1. If control rods moved inward, return to Step RC/Q-5.2.
2. Reset the reactor scram.
   If the reactor scram cannot be reset, continue at step RC/Q-5.5.1.
3. Open the scram discharge volume vent and drain valves.

RC/Q-5.4 Individually open the scram test switches for control rods not inserted to position 00 (maximum subcritical banked withdrawal position).

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

RC/Q-5.5 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.
   If no CRD pump can be started, continue at step RC/Q-5.6.1.

2. Close 2C11-F034 (HCU accumulator charging water header valve).

RC/Q-5.6 Rapidly insert control rods manually until all control rods except one are inserted to position 00 (maximum subcritical banked withdrawal position). 20

If more than one control rod cannot be inserted to position 00 (maximum subcritical banked withdrawal position):

1. Individually direct the effluent from 2C11-F102 (CRD withdraw line vent valve) to a contained radwaste drain and open 2C11-F102 (CRD withdraw line vent valve) for each control rod not inserted to position 00 (maximum subcritical banked withdrawal position).
2. When a control rod is not moving inward, close its 2C11-F102 (CRD withdraw line vent valve).

PRIMARY CONTAINMENT CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to:

- Maintain primary containment integrity, and
- Protect equipment in the primary containment.

ENTRY CONDITIONS

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

- Suppression pool temperature above 95^{o}F (most limiting suppression pool temperature LCO)
- Drywell temperature above 135^{o}F (drywell temperature LCO)
- Drywell pressure above 2.0 psig (high drywell pressure scram setpoint)
- Suppression pool water level above 150 in. (maximum suppression pool water level LCO)
- Suppression pool water level below 146 in. (minimum suppression pool water level LCO).

OPERATOR ACTIONS

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

SP/T Monitor and control suppression pool temperature.

SP/T-1 Close all SORVs.

If any SORV cannot be closed scram the reactor.

SP/T-2 When suppression pool temperature exceeds 95°F (most limiting suppression pool temperature LCO), operate available suppression pool cooling. 18

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

SP/T-4 If suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit (see Attachment 2), maintain RPV pressure below the Limit. 8 13 14

If suppression pool temperature and RPV pressure cannot be restored and maintained below the Heat Capacity Temperature Limit (see Attachment 2), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SP/T.

DW/T Monitor and control drywell temperature.

DW/T-1 When drywell temperature exceeds 135°F (drywell temperature LCO) operate available drywell cooling. 6

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

DW/T-2 If drywell temperature near the cold reference leg instrument vertical runs reaches the RPV Saturation Temperature (see Attachment 4), RPV FLOODING IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with DW/T.

DW/T-3 Before drywell temperature reaches 340°F (drywell design temperature), but only if suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays. 18

If drywell temperature cannot be maintained below 340°F (drywell design temperature), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with DW/T.

PC/P Monitor and control primary containment pressure.

PC/P-1 Operate the following system, as required: 21

- SBGT only when the temperature in the space being evacuated is below 212^{o}F (Maximum Noncondensible Evacuation Temperature). Use SBGT operating procedures.

PC/P-2 Before suppression pool pressure reaches 17.1 psig (Suppression Pool Spray Initiation Pressure), but only if suppression pool water level is below 287 in. (elevation of suppression pool spray nozzles), initiate suppression pool sprays. 8, 18

PC/P-3 If suppression chamber pressure exceeds 17.1 psig (Suppression Chamber Spray Initiation Pressure) but only if suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays. 18

PC/P-4 If suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure (see Attachment 6), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

PC/P-5 If suppression chamber pressure cannot be maintained below the Primary Containment Design Pressure (see Attachment 7), RPV FLOODING IS REQUIRED.

PC/P-6 If suppression chamber pressure cannot be maintained below the Primary Containment Pressure Limit (see Attachment 8), then irrespective of whether adequate core cooling is assured:

- If suppression pool water level is below 287 in. (elevation of suppression pool spray nozzles), initiate suppression pool sprays.

- If suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

PC/P-7 If suppression chamber pressure exceeds the Primary Containment Pressure Limit, vent the primary containment in accordance with the Post Accident Venting Procedure to reduce and maintain pressure below the Primary Containment Pressure Limit (see Attachment 8). 22

SP/L Monitor and control suppression pool water level.

SP/L-1 Maintain suppression pool water level between 150 in. (maximum suppression pool water level LCO) and 146 in. (minimum suppression pool water level LCO). Refer to Suppression Pool sampling program prior to discharging water. 8, 9

If suppression pool water level cannot be maintained above 146 in. (minimum suppression pool water level LCO) execute Step SP/L-2.

If suppression pool water level cannot be maintained below 150 in. (maximum suppression pool water level LCO), execute Step SP/L-3.

SP/L-2 SUPPRESSION POOL WATER LEVEL BELOW 146 in. (minimum suppression pool water level LCO).

Maintain suppression pool water level above the Heat Capacity Level Limit (see Attachment 9).

If suppression pool water level cannot be maintained above the Heat Capacity Level Limit (see Attachment 9), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SP/L.

SP/L-3 SUPPRESSION POOL WATER LEVEL ABOVE 150 in. (maximum suppression pool water level LCO).

Execute Steps SP/L-3.1 and SP/L-3.2 concurrently.

SP/L-3.1 Maintain suppression pool water level below the Suppression Pool Load Limit (see Attachment 3).

If suppression pool water level cannot be maintained below the Suppression Pool Load Limit (see Attachment 3), maintain RPV pressure below the limit. 13 14

If suppression pool water level and RPV pressure cannot be maintained below the Suppression Pool Load Limit (see Attachment 3) but only if adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

If suppression pool water level and RPV pressure cannot be restored and maintained below the Suppression Pool Load Limit (see Attachment 3), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SP/L.

SP/L-3.2 Before suppression pool water level reaches 216 in. (elevation of bottom of Mark I internal suppression pool to drywell vacuum breakers less vacuum breaker opening pressure in feet of water), but only if adequate core cooling is assured, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

1. When suppression pool water level reaches 216 in. (elevation of bottom of Mark I internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water) but only if suppression chamber temperature and pressure are below the Drywell Spray Initiation Pressure Limit and if drywell temperature and pressure are below the Drywell Spray Initiation Pressure Limit (see Attachment 5), shut down recirculation pumps and drywell cooling fans and initiate drywell sprays. 18

2. If suppression pool water level exceeds 216 in. (elevation of bottom of Mark I internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water), continue to operate drywell sprays. 23

3. When primary containment water level reaches 103.5 ft. (Maximum Primary Containment Water Level Limit), terminate injection into the RPV from sources external to the primary containment irrespective of whether adequate core cooling is assured.

SECONDARY CONTAINMENT CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to:

- Protect equipment in the secondary containment,
- Limit radioactivity release to the secondary containment, and either:
- Maintain secondary containment integrity, or
- Limit radioactivity release from the secondary containment.

ENTRY CONDITIONS

The entry conditions for this guideline are any of the following secondary containment conditions (see Table II):

- Differential pressure at or above 0 in. of water
- An area temperature above the maximum normal operating temperature
- A HVAC cooler differential temperature above the maximum normal operating differential temperature
- A HVAC exhaust radiation level above the maximum normal operating radiation level
- An area radiation level above the maximum normal operating radiation level
- A floor drain sump water level above the maximum normal operating water level
- An area water level above the maximum normal operating water level

OPERATOR ACTIONS

If while executing the following steps secondary containment HVAC exhaust radiation level exceeds 15mr/hr Refuel floor or 50mr/hr Reactor Building (secondary containment HVAC isolation setpoint):

- Confirm or manually initiate isolation of secondary containment HVAC, and
- Confirm initiation of or manually initiate SBGT only when the space being evacuated is below 212°F.

If while executing the following steps:

- Secondary containment HVAC isolates, and
- Secondary containment HVAC exhaust radiation level is below 15mr/hr Refuel floor or 50mr/hr Reactor Building (secondary containment HVAC isolation setpoint),

restart secondary containment HVAC. 24

Irrespective of the entry condition, execute Steps SC/T, SC/R, and SC/L concurrently.

SC/T Monitor and control secondary containment temperatures.

SC/T-1 Operate available area coolers.

SC/T-2 If secondary containment HVAC exhaust radiation level is below 15mr/hr Refuel floor or 50mr/hr Reactor Building (secondary containment HVAC isolation setpoint), operate available secondary containment HVAC.

SC/T-3 If any area temperature exceeds its maximum normal operating temperature, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, or suppress a working fire.

SC/T-4 If a primary system is discharging into an area, then before any area temperature reaches its maximum safe operating temperature, enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SC/T.

SC/T-5 If a primary system is discharging into an area and an area temperature exceeds its maximum safe operating temperature in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/R Monitor and control secondary containment radiation levels.

SC/R-1 If any area radiation level exceeds its maximum normal operating radiation level, isolate all systems that are discharging into the area except systems required to shut down the reactor, assure adequate core cooling, or suppress a working fire.

SC/R-2 If a primary system is discharging into an area, then before any area radiation level reaches its maximum safe operating radiation level, enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SC/R.

SC/R-3 If a primary system is discharging into an area and an area radiation level exceeds its maximum safe operating radiation level in more than one area, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SC/L Monitor and control secondary containment water levels.

SC/L-1 If any floor drain sump or area water level is above its maximum normal operating water level, operate available sump pumps to restore and maintain it below its maximum normal operating water level.

If any floor drain sump or area water level cannot be restored and maintained below its maximum normal operating water level, isolate all systems that are discharging water into the sump or area except systems required to shut down the reactor, assure adequate core cooling, or suppress a working fire.

SC/L-2 If a primary system is discharging into an area, then before any floor drain sump or area water level reaches its maximum safe operating water level, enter procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with SC/L.

SC/L-3 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, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

TABLE II

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION	ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
Differential pressure on 2H11-P700-R604	(in.water)	(in.water)	psig
- Reactor Building/outside air	0	0	+0.25
- Refuel Floor/outside air	0	0	+0.25
Area temperature from 2H11-P614-R614	(°F)	(°F)	(°F)
- RWCU "A" pump room 158' 2G31-N016A	120	130	215
- RWCU "B" pump room 158' 2G31-N016B	120	130	215
- RWCU Hx room 158' at Hx.2G31-N016C	120	130	215
- RWCU Hx room 158' disch-H.W. 2G31-N016D	120	130	215
- RWCU phase sep. room 158' 2G31-N016E	120	130	215
- RWCU holding pump room 185 2G31-N016F	120	130	215
- NE Diagonal 2E11-N009A	175	175 *	214
- SE Diagonal 2E11-N009B	175	175 *	214
- HPCI room, area A 2E41-N024	150	175	214
- HPCI room, area B 2E41-N030A	150	175	214
- HPCI room, area C 2E41-N030B	150	175	214
- Torus room, westwall 2E51-N025A	150	175	214
- Torus room, eastwall 2E51-N025B	150	175	214
- Torus room, northwall 2E51-N025C	150	175	214
- Torus room, southwall 2E51-N025D	150	175	214
- Main steam tunnel 2B21-N014	160	200	215
- SE, Reactor 130 elev., area A 2E41-N046A	150	150 *	214
- SE, Reactor 130 elev., area B 2E41-N046B	150	150 *	214
- NW Diagonal, area A 2E51-N011	150	175	310
- NW Diagonal, area B 2E51-N023A	150	175	310
- NW Diagonal, area C 2E51-N023B	150	175	310

* Same as alarm setpoint.

TABLE II (Continued)

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION	ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
Steam Leak Detection System Area Differential Temperatures 2H11-P614	(°F)	(°F)	(°F)
- RWCU "A" Pump room 2G31-N022/N023A	50	75	99
- RWCU "B" Pump room 2G31-N022/N023B	50	75	99
- RWCU Hx Room 158' at Hxs 2G31-N022/N023C	50	75	99
- RWCU Hx Room 158' disch. to Hotwell 2G31-N022/N023D	50	75	99
- RWCU phase separator room 158' 2G31-N022/N023E	50	75	99
- RWCU holding pump room 185' 2G31-N022/N023F	50	75	99
- Torus Room, NW/West 2E51-N026/N027A	40	50	98
- Torus Room, NW/West 2E51-N026/N027B	40	50	98
- Torus Room, NW/West 2E51-N026/N027C	40	50	98
- Torus Room, NW/West 2E51-N026/N027D	40	50	102

* Same as alarm setpoint

TABLE II (Continued)

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION		ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
HVAC exhaust radiation level above		(mr/hr)	(mr/hr)	(mr/hr)
- Reactor Building		50	50	1250
- Refuel Floor		15	50	1250
Area radiation level				
- 158' Southeast Area	Ch 2	15	50	1250
- 158' Northeast Area	Ch 3	15	50	1250
- 158' Northwest Area	Ch 4	15	50	1250
- 130' Northeast Work Area	Ch 7	15	50	1250
- 130' Southwest Work Area	Ch 8	15	50	1250
- Decant Pump & Equipment Room	Ch 9	15	50	1250
- South CRD Hydraulic Units	Ch 11	15	50	1250
- Spent Fuel Pool Passageway	Ch 12	25	50	1250
- 185' Operating Floor	Ch 13	15	50	1250
- 185 Sample Panel Area	Ch 14	30	50	1250
- 185' RWCU Control Panel Area	Ch 16	10	50	1250
- Fuel Pool Denim Panel Area	Ch 23	10	50	1250
- CRD Repair Area	Ch 15	15	50	1250
- RCIC Equipment Area	Ch 17	20	50	1250
- CRD Pump Room SW	Ch 18	20	50	1250
- RHR & Core Spray Room Northeast	Ch 19	20	50	1250
- RHR & Core Spray Room Southeast	Ch 20	100	150	1250

TABLE II (Continued)

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

SECONDARY CONTAINMENT PARAMETER/LOCATION		ALARM	MAXIMUM NORMAL OPERATING VALUE	MAXIMUM SAFE OPERATING VALUE
Floor drain sump water level		(in.)	(in.)	(in.)
- Sump A (NE Diagonal)	T45-N006	38	47	N/A
- Sump B (NW Diagonal)	T45-N007	52	52	N/A
Area water level				
- CRD Compartment	2T45-N005	5	7	260
- RCIC Compartment	2T45-N004	5	7	22
- RB NE Corner RM	2T45-N003B	5	7	14
- RB SE Corner RM	2T45-N003A	5	7	15
- HPCI Compartment	2T45-N001	5	7	14
- Torus Compartment NW	2T45-N002D	5	7	11
- Torus Compartment NE	2T45-N002B	5	7	11
- Torus Compartment SE	2T45-N002A	5	7	11
- Torus Compartment SW	2T45-N002C	5	7	11

RADIOACTIVITY RELEASE CONTROL GUIDELINE

PURPOSE

The purpose of this guideline is to limit radioactivity release into areas outside the primary and secondary containments.

ENTRY CONDITIONS

The entry condition for this guideline is:

- Offsite radioactivity release rate above 3 Ci/sec (release rate which requires an Alert).

OPERATOR ACTIONS

RR-1 Isolate all primary systems that are discharging into areas outside the primary and secondary containments except systems required to assure adequate core cooling or shut down the reactor.

RR-2 If offsite radioactivity release rate approaches or exceeds 91 Ci/sec (release rate which requires a General Emergency) and a primary system is discharging into an area outside the primary and secondary containments, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter the procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with RR.

CONTINGENCY 1

LEVEL RESTORATION

If while executing any step in Contingency 1:

- Boron Injection is required, enter the procedure developed from CONTINGENCY 7.
- RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter the procedure developed from CONTINGENCY 6.
- RPV Flooding is required, enter procedure developed from CONTINGENCY 6.

C1-1 Line up for injection and start pumps in 2 or more of the following injection subsystems:

- Condensate
- LPCI LOOP A
- LPCI LOOP B
- CS LOOP A
- CS LOOP B

If less than 2 of the injection subsystems can be lined up, commence lining up as many of the following alternate injection subsystems as possible:

- RHR service water crosstie
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

C1-2 Monitor RPV pressure and water level. Continue in this Contingency at the step indicated as follows:

RPV PRESSURE REGION

435 psig [1] | 100 psig [2]

		HIGH	INTERMEDIATE	LOW
RPV LEVEL	INCREASING	C1-3	C1-4	C1-5
	DECREASING	C1-6	C1-6	C1-7

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

[2](HPCI low pressure isolation setpoint).

If while executing steps C1-3, C1-4, C1-5, C1-6, or C1-7:

- The RPV water level trend reverses or RPV pressure changes region, return to Step C1-2.
- RPV water level drops below -146 inches (ADS initiation setpoint), prevent automatic initiation of ADS.

C1-3 RPV WATER LEVEL INCREASING, RPV PRESSURE HIGH

Enter the procedure developed from the RPV Control Guideline at Step RC/L.

C1-4 RPV WATER LEVEL INCREASING, RPV PRESSURE INTERMEDIATE

If HPCI and RCIC are not available and RPV pressure is increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV pressure is decreasing, enter the procedure developed from the RPV Control Guideline at Step RC/L.

If HPCI and RCIC are not available and RPV pressure is not increasing, enter the procedure developed from the RPV Control Guideline at Step RC/L.

Otherwise, when RPV water level reaches +12.5 inches (low level scram setpoint), enter the procedure developed from the RPV Control Guideline at Step RC/L.

C1-5 RPV WATER LEVEL INCREASING, RPV PRESSURE LOW

If RPV pressure is increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV pressure is decreasing, enter the procedure developed from the RPV Control Guideline at Step RC/L. Otherwise, enter the procedure developed from the RPV Control Guideline at Step RC/L.

C1-6 RPV WATER LEVEL DECREASING, RPV PRESSURE HIGH OR INTERMEDIATE

If HPCI or RCIC is not operating, restart whichever is not operating.
If no injection subsystem is lined up for injection with at least one pump running, start pumps in alternate injection subsystems which are lined up for injection.

When RPV water level drops to -164.5 inches (top of active fuel):

- If no system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, STEAM COOLING IS REQUIRED. When any system, injection subsystem or alternate injection subsystem is lined up with at least one pump running, return to Step C1-2.
- Otherwise, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV water level is increasing or RPV pressure drops below 100 psig (HPCI low pressure isolation setpoint), return to Step C1-2.

C1-7 RPV WATER LEVEL DECREASING, RPV PRESSURE LOW

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

If RPV pressure in increasing, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

When RPV water level drops to -164.5 inches (top of active fuel), enter the procedure developed from CONTINGENCY 4.

CONTINGENCY 2

EMERGENCY RPV DEPRESSURIZATION

C2-1 When either: 13, 14

- Boron Injection is required and all injection into the RPV except from boron injection systems and CRD has been terminated and prevented, or
- Boron Injection is not required,

C2-1.1 If suppression pool water level is above 58 in. (elevation of top of SRV discharge device):

- Open all ADS valves.
- If any ADS valve cannot be opened, open other SRVs until 7 (number of SRVs dedicated to ADS) valves are open.

C2-1.2 If less than 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs are open and RPV pressure is at least 50 psig (minimum SRV re-opening pressure) above suppression chamber pressure, rapidly depressurize the RPV using one or more of the following systems (use in order which will minimize radioactive release to the environment): 22

- Main condenser
- RHR (steam condensing mode)
- Steam Jet Air Ejectors
- Reactor Feed Pump Turbines
- Main steam line drains
- HPCI steam line
- RCIC steam line
- Head vent

If RPV Flooding is required, enter the procedure developed from CONTINGENCY 6.

C2-2 Enter the procedure developed from the RPV Control Guideline at Step RC/P-4.

CONTINGENCY 3

STEAM COOLING

> If while executing any step in Contingency 3 Emergency RPV Depressurization is required or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter the procedure developed from CONTINGENCY 2.

C3-1 When RPV water level drops to -265.5 in. (Minimum Zero-Injection RPV Water Level) or if RPV water level cannot be determined, open one SRV.

> When RPV pressure drops below 700 psig (Minimum Single SRV Steam Cooling Pressure), enter the procedure developed from CONTINGENCY 2.

CONTINGENCY 4

CORE COOLING WITHOUT LEVEL RESTORATION

C4-1 Open all ADS values. 13

If any ADS valve cannot be opened, open other SRVs until 7 (number of SRVs dedicated to ADS) valves are open.

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

When at least one core spray subsystem is operating with suction from the suppression pool and RPV pressure is below 113 psig (RPV pressure for rated CS flow) terminate injection into the RPV from sources external to the primary containment.

C4-3 When RPV water level is restored to -164.5 inches (top of active fuel), enter the procedure developed from the RPV Control Guideline at Step RC/L.

CONTINGENCY 5

ALTERNATE SHUTDOWN COOLING

C5-1 Initiate suppression pool cooling.

C5-2 Close the RPV head vents, MSIVs, main steam line drain valves, and HPCI and RCIC isolation valves.

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

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

C5-5 Start one CS or LPCI pump with suction from the suppression pool.

C5-6 Slowly increase CS or LPCI injection into the RPV to the maximum.

C5-6.1 If RPV pressure does not stabilize at least 94.6 psig (Minimum Alternate Shutdown Cooling RPV Pressure) above suppression chamber pressure, start another CS or LPCI pump.

C5-6.2 If RPV pressure does not stabilize below 193 psig (Maximum Alternate Shutdown Cooling RPV Pressure), open another SRV.

C5-6.3 If the cooldown rate exceeds 100°F/hr (maximum RPV cooldown rate LCO), reduce CS or LPCI injection into the RPV until the cooldown rate decreases below 100°F/hr (maximum RPV cooldown rate LCO) or RPV pressure decreases to within 50 psig (Minimum SRV Re-opening Pressure) of suppression chamber pressure, whichever occurs first.

C5-7 Control suppression pool temperature to maintain RPV water temperature above 70°F (head tensioning limit).

C5-8 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions, or as directed by Plant Management.

CONTINGENCY 6

RPV FLOODING

C6-1 If at least 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs can be opened, close the MSIVs, main steam line drain valves, HPCI, RCIC and RHR steam condensing isolation valves.

C6-2 If two or more control rods are at other than position 00 (maximum subcritical banked withdrawal position):

C6-2.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

Number of Open SRVs	Minimum Alternate RPV Flooding Pressure (psig)
7 or more	134
6	159
5	194
4	246
3	333
2	506
1	1027

If less than 1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRV can be opened, continue in this procedure.

> If while executing step C6-2.2, RPV water level can be determined and RPV Flooding is not required, enter the procedure developed from CONTINGENCY 7 and the procedure developed from the RPV Control Guideline at Step RC/P-4 and execute them concurrently.

C6-2.2 Commence and slowly increase injection into the RPV with the following systems until at least 1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure: 25

- Condensate pumps
- CRD
- LPCI

If at least 1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRV is not open or RPV pressure cannot be increased to above the Minimum Alternate RPV Flooding Pressure, commence and slowly increase injection into the RPV with the following systems until at least 1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure:

- CS
- RHR service water crosstie
- ECCS keep-full systems

C6-2.3 Maintain at least 1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRV open and RPV pressure above the Minimum Alternate RPV Flooding Pressure by throttling injection.

C6-2.4 When:

- All control rods, except one, are inserted to position 00 (maximum subcritical banked withdrawal position), or
- The reactor is shutdown and no boron has been injected into the RPV,

continue in this contingency.

C6-3 If RPV water level cannot be determined:

C6-3.1 Commence and increase injection into the RPV with the following systems until at least 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs are open and RPV pressure is not decreasing and is at least 68 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure.

- CS
- LPCI
- Condensate pumps
- CRD
- RHR service water crosstie
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

C6-3.2 Maintain at least 3 (Minimum Number of SRVs Required for Emergency Depressurization) SRVs open and RPV pressure at least 68 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure by throttling injection.

C6-4 If RPV water level can be determined, commence and increase injection into the RPV with the following systems until RPV water level is increasing:

- CS
- LPCI
- Condensate pumps
- CRD
- RHR service water crosstie
- ECCS keep-full systems
- SLC (test tank)
- SLC (boron tank)

C6-5 If RPV water level cannot be determined:

C6-5.1 Fill all RPV water level instrumentation reference columns.

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

> If while executing steps C6-5.3 or C6-5.4, RPV water level can be determined, continue at step C6-6.

C6-5.3 If it can be determined that the RPV is filled or if RPV pressure is at least 68 psig (Minimum RPV Flooding Pressure) above suppression chamber pressure, terminate all injection into the RPV and reduce RPV water level.

C6-5.4 If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit (see Attachment 10) after commencing termination of injection into the RPV, return to Step C6-3.

C6-6 When suppression chamber pressure can be maintained below the Primary Containment Design Pressure (see Attachment 7), enter the procedure developed from the RPV Control Guideline at Steps RC/L and RC/P-4 and execute these steps concurrently.

CONTINGENCY 7

LEVEL/POWER CONTROL

> If while executing any step in Contingency 7 RPV Flooding is required or RPV water level cannot be determined, control injection into the RPV to maintain reactor power above 8% (Reactor Flow Stagnation Power) but as low as practicable. However, if reactor power cannot be determined or maintained above 8% (Reactor Flow Stagnation Power), RPV FLOODING IS REQUIRED; enter the procedure developed from CONTINGENCY 6.

C7-1 If:

- Reactor power is above 3% (APRM downscale trip) or cannot be determined, and
- Suppression pool temperature is above 110°F (Boron Injection Initiation Temperature), and
- Either an SRV is open or opens or drywell pressure is above 2.0 psig (high drywell pressure scram setpoint),

lower RPV water level by terminating and preventing all injection into the RPV except from boron injection systems and CRD until either: 26

- Reactor power drops below 3% (APRM downscale trip), or
- RPV water level reaches -164.5 inches (top of active fuel), or
- All SRVs remain closed and drywell pressure remains below 2.0 psig (high drywell pressure scram setpoint).

If while executing steps C7-2 or C7-3 Emergency RPV Depressurization is required, continue at step C7-2.1.

If while executing steps C7-2 or C7-3:

- Reactor power is above 3% (APRM downscale trip) or cannot be determined, and
- RPV water level is above -164.5 inches (top of active fuel), and
- Suppression pool temperature is above 110°F (Boron Injection Initiation Temperature), and
- Either an SRV is open or opens or drywell pressure is above 2.0 psig (high drywell pressure scram setpoint),

return to Step C7-1.

C7-2 Maintain RPV water level either: 9, 10, 11, 25

- If RPV water level was deliberately lowered in Step C7-1, at the level to which it was lowered, or
- If RPV water level was not deliberately lowered in Step C7-1, between +12.5 inches (low level scram setpoint) and +58 inches (high level trip setpoint),

with the following systems:

- Condensate System 650-0 psig (RPV pressure range for system operation)
- Condensate/feedwater system 1717-0 psig (RPV pressure range for system operation)
- CRD system 1507-0 psig (RPV pressure range for system operation)
- RCIC system 1120-50 psig (RPV pressure range for system operation) 12
- HPCI system 1120-150 psig (RPV pressure range for system operation)
- LPCI system 225-0 psig (RPV pressure range for system operation)

If RPV water level cannot be so maintained, maintain RPV water level above -164.5 inches (top of active fuel).

If RPV water level cannot be maintained above -164.5 inches (top of active fuel), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

C7-2.1 Terminate and prevent all injection into the RPV except from boron injection systems and CRD until RPV pressure is below the Minimum Alternate RPV Flooding Pressure.

Number of Open SRVs	Minimum Alternate RPV Flooding Pressure (psig)
7 or more	134
6	159
5	194
4	246
3	333
2	506
1	1027

If less than 1 (minimum number of SRVs for which the Minimum Alternate RPV Flooding Pressure is below the lowest SRV lifting pressure) SRV can be opened, continue in this Contingency.

C7-2.2 Commence and slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above -164.5 inches (top of active fuel): 25

- Condensate/feedwater system
- CRD
- RCIC
- HPCI
- LPCI

If RPV water level cannot be restored and maintained above -164.5 inches (top of active fuel), commence and slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above -164.5 inches (top of active fuel):

- CS
- RHR service water crosstie
- ECCS keep-full systems

If while executing step C7-3 reactor power commences and continues to increase, return to Step C7-1.

C7-3 When 262.1 pounds (Hot Shutdown Boron Weight) (occurs at SLC tank indicatic of 45%) of boron have been injected or all control rods, except one, are inserted to position 00 (maximum subcritical banked withdrawal position), restore and maintain RPV water level between +12.5 inches (low level scram setpoint) and +58 inches (high level trip setpoint).

If RPV water level cannot be restored and maintained above +12.5 inches (low level scram setpoint), maintain RPV water level above -164.5 inches (top of active fuel).

If RPV water level cannot be maintained above -164.5 inches (top of active fuel), EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; return to Step C7-2.1.

If Alternate Shutdown Cooling is required, enter the procedure developed from CONTINGENCY 5.

C7-4 Proceed to cold shutdown in accordance with the procedure for cooldown to cold shutdown conditions, or as directed by Plant Management.

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GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 2)	REVISION: 0
ATTACHMENT TITLE: NPSH REQUIREMENTS	

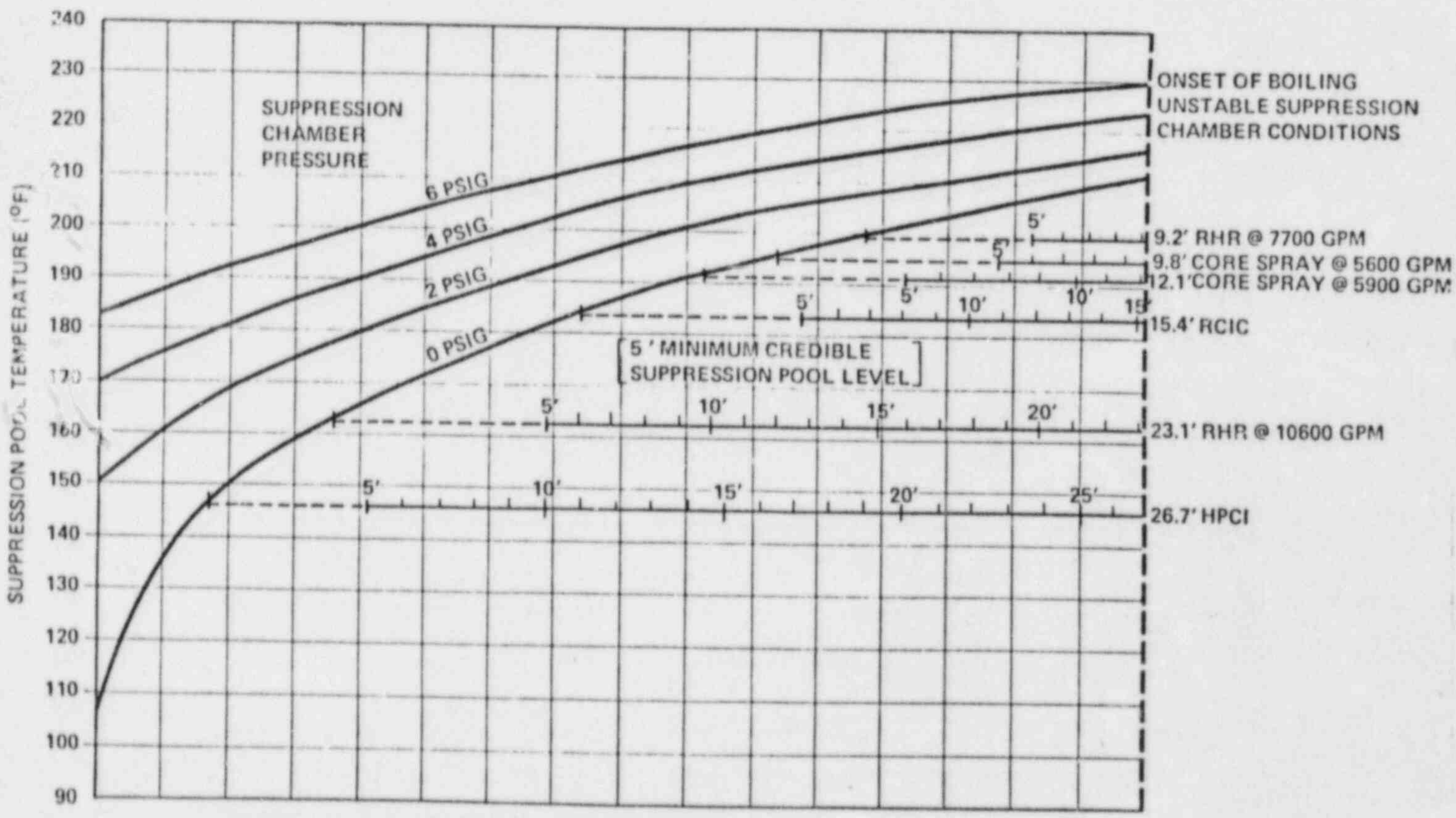

FIGURE 2 HATCH UNIT 2. MINIMUM SUPPRESSION POOL LEVEL WHICH MEETS REQUIRED NPSH FOR ECC'S PUMPS TAKING SUCTION FROM TORUS.

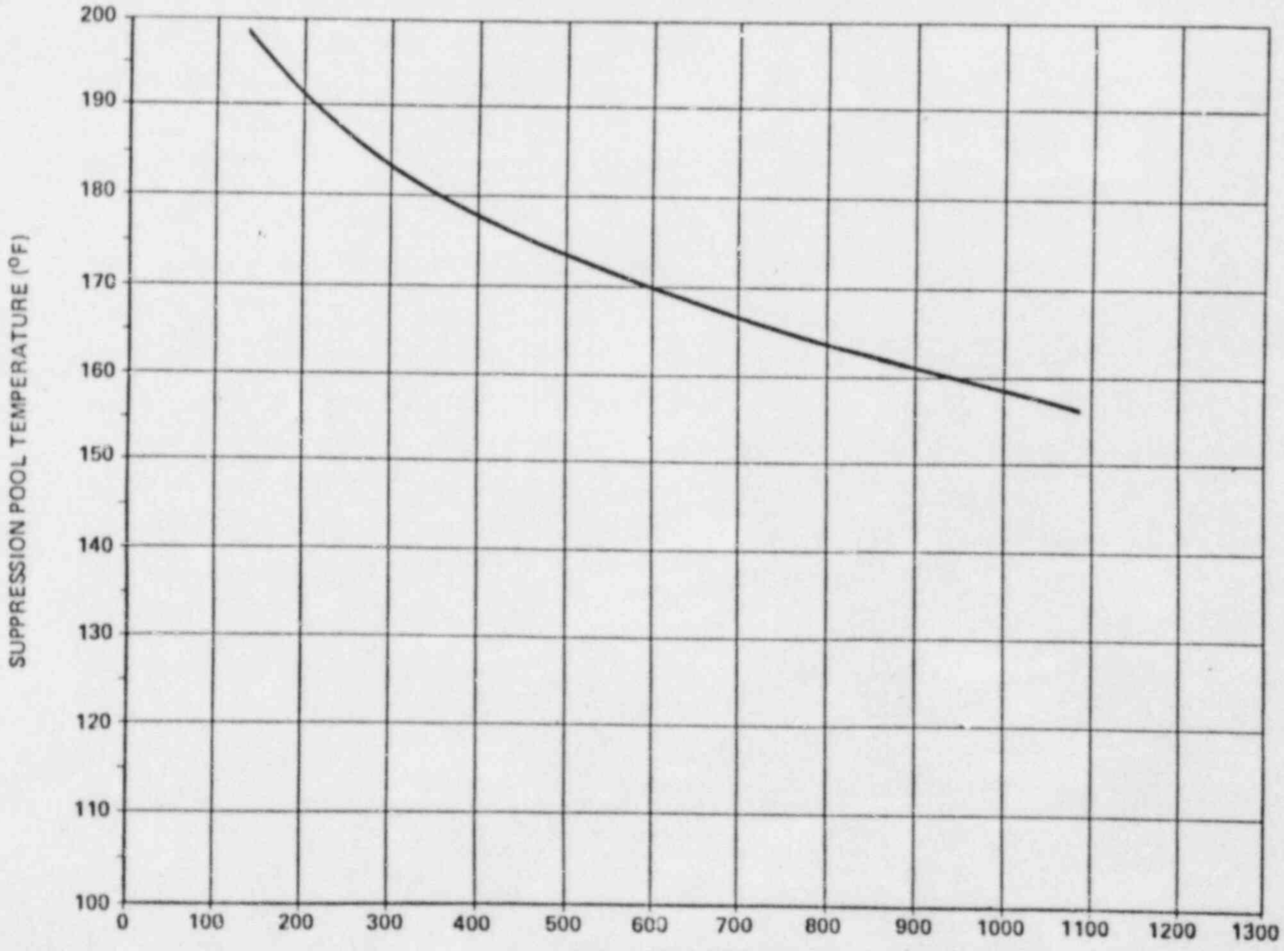

FIGURE C3-4
HEAT CAPACITY TEMPERATURE LIMIT

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 2)	REVISION: 0
ATTACHMENT TITLE: SUPPRESSION POOL LOAD LIMIT	

(TO BE PROVIDED LATER)

GEORGIA POWER COMPANY
HATCH NUCLEAR PLANT
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES
PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 2)
ATTACHMENT TITLE:
REACTOR PRESSURE VESSEL SATURATION LIMIT

ATTACHMENT
PAGE 1 OF 1
REVISION:
0

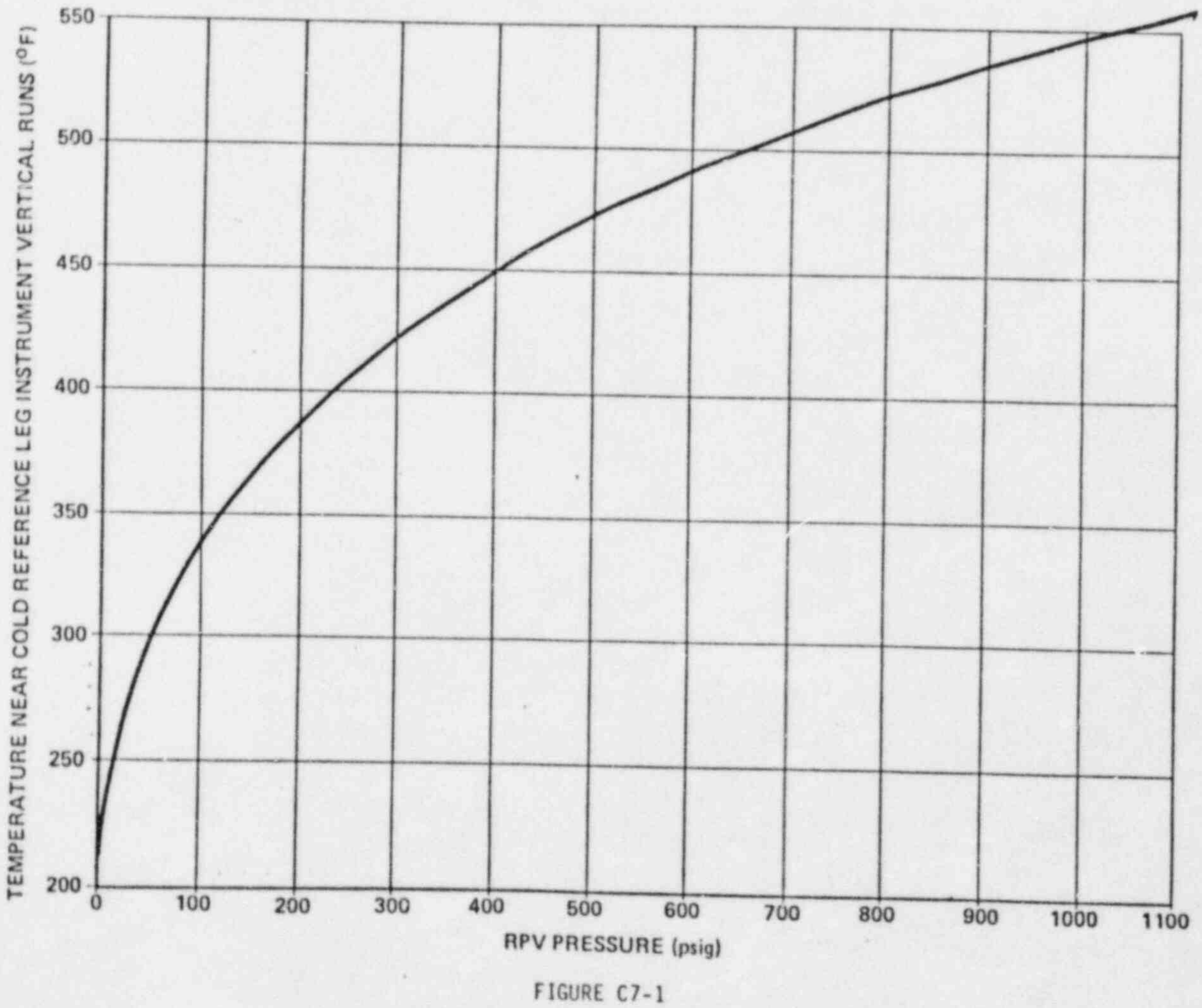

FIGURE C7-1
RPV SATURATION TEMPERATURE

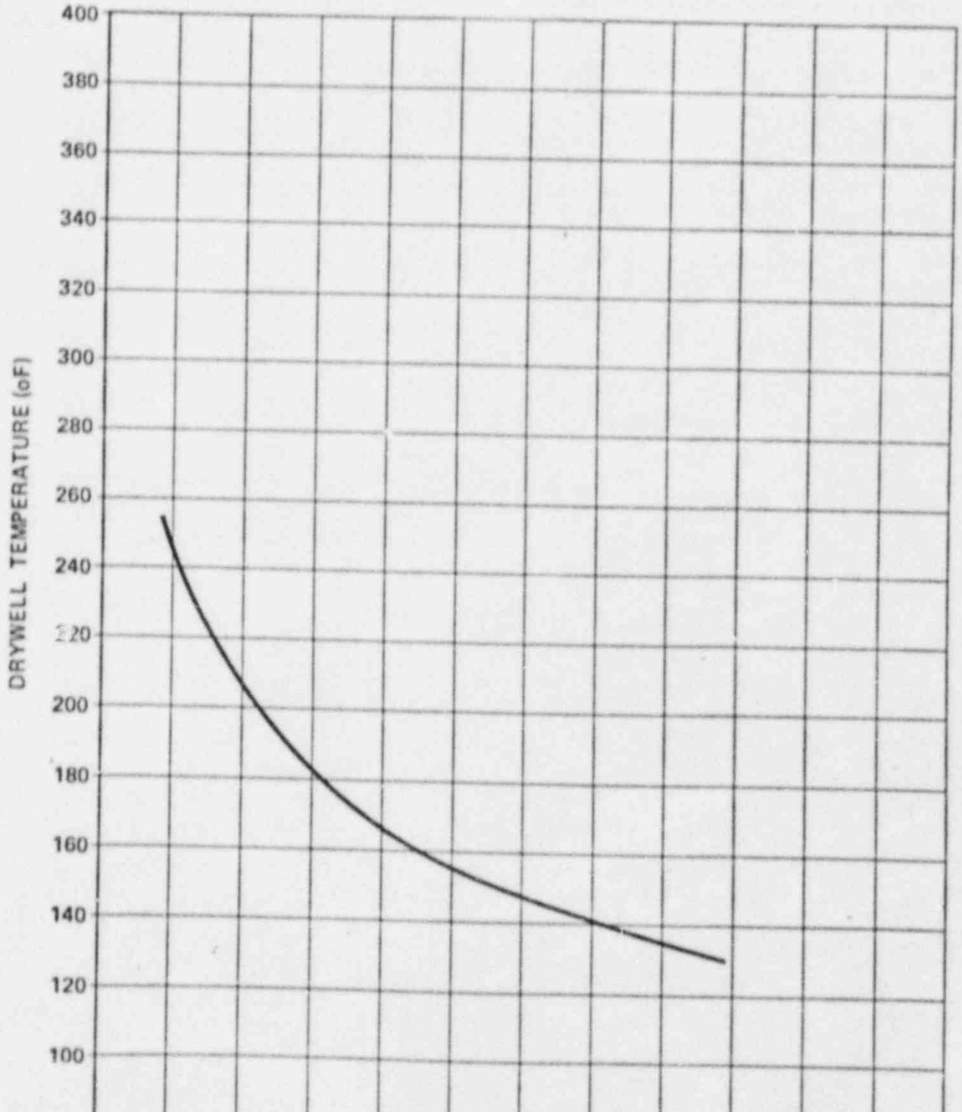

FIGURE C9-1

DRYWELL SPRAY INITIATION PRESSURE LIMIT

(C9.I. WETWELL-TO-DRYWELL ΔP LIMIT)

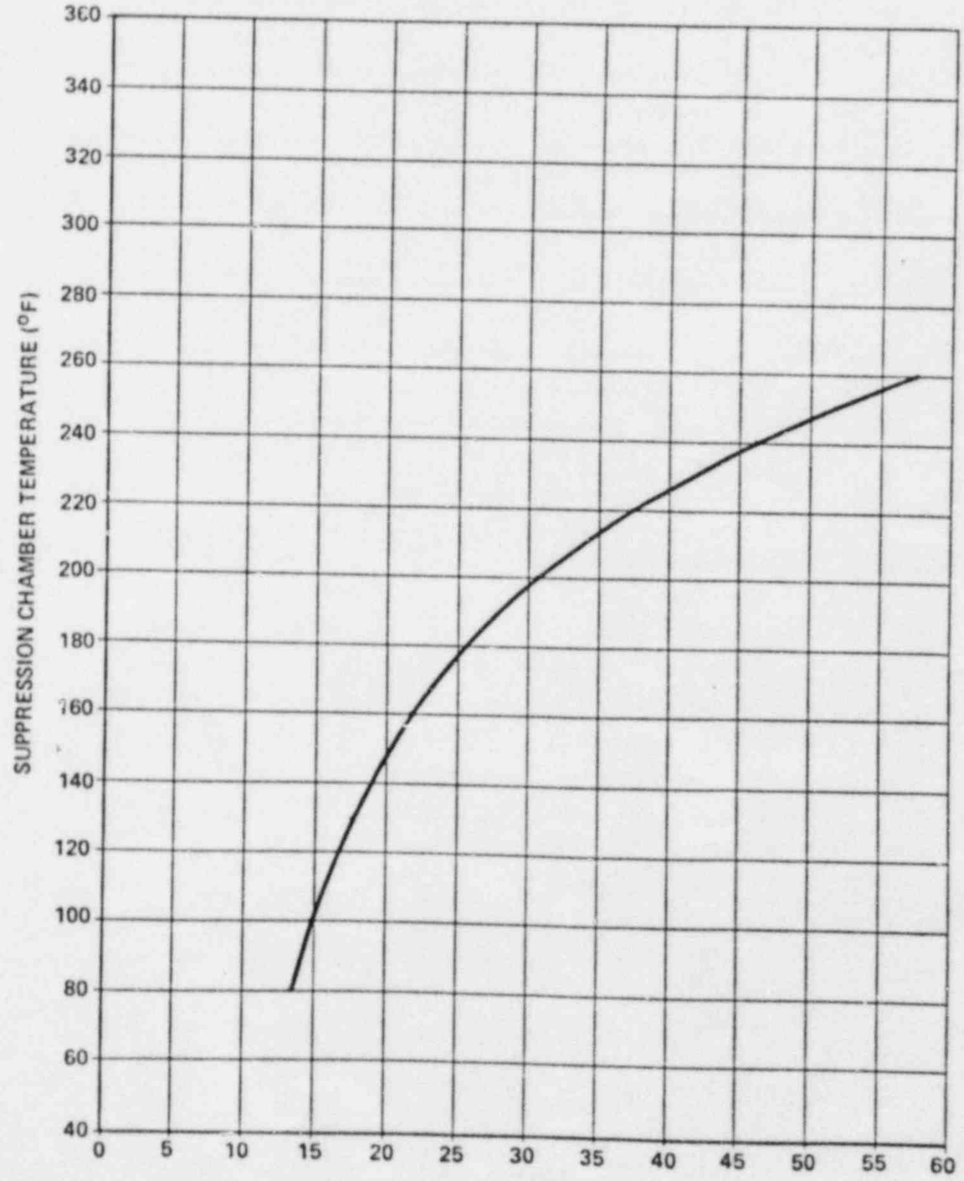

FIGURE C9-2

DRYWELL SPRAY INITIATION PRESSURE LIMIT

(C9.II.A. CONTAINMENT-TO-RB ΔP LIMIT FOR RELATED SPRAY)

ATTACHMENT TITLE:
PRESSURE SUPPRESSION PRESSURE

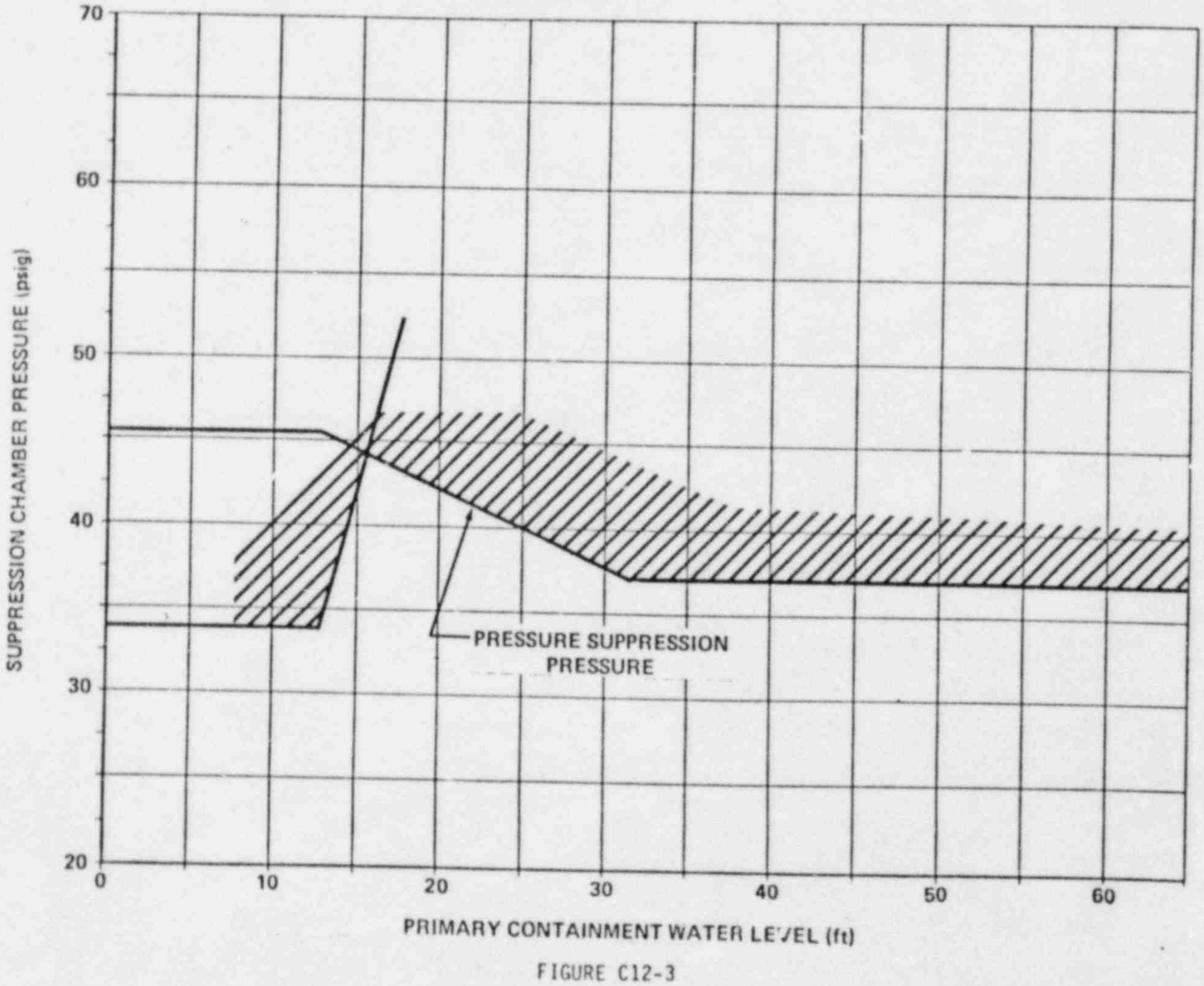

FIGURE C12-3
PRESSURE SUPPRESSION PRESSURE

ATTACHMENT TITLE:
PRIMARY CONTAINMENT DESIGN PRESSURE

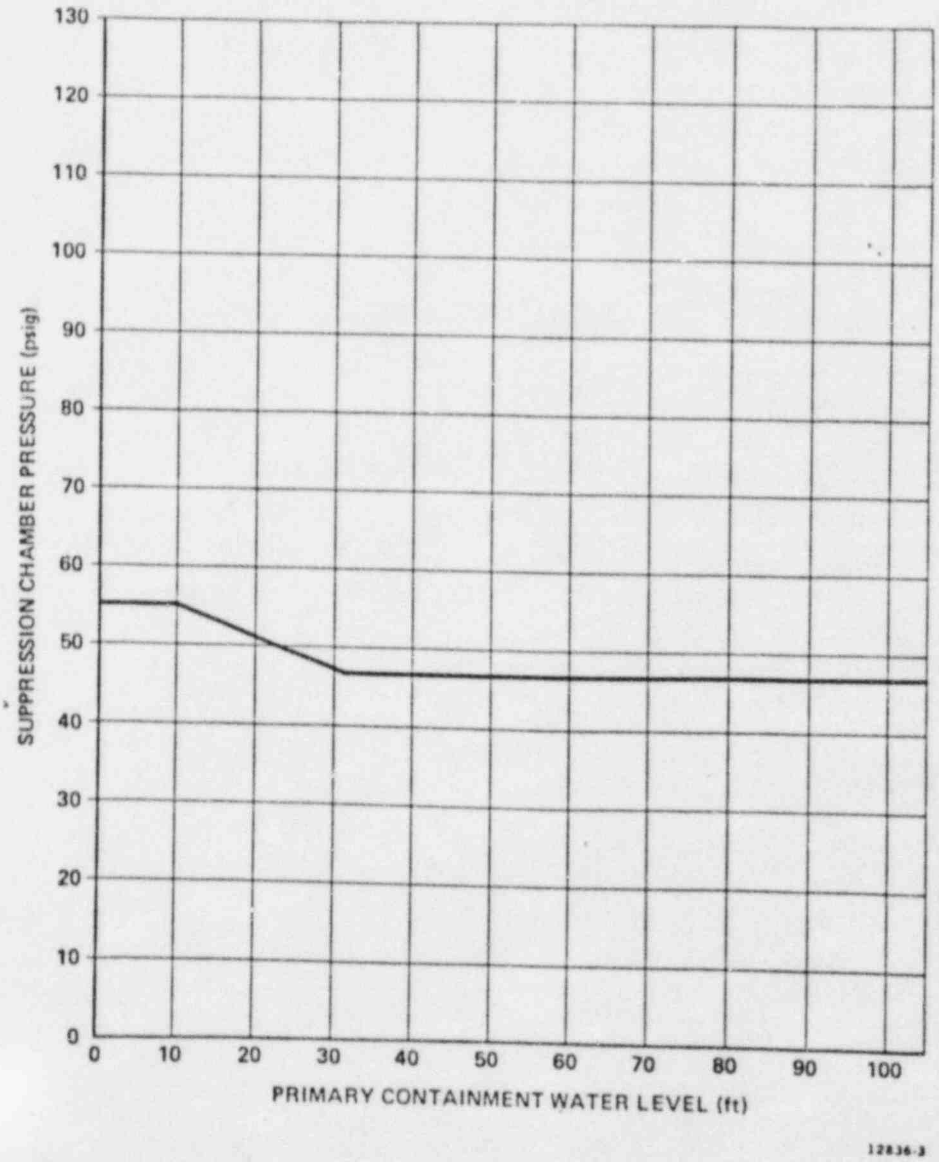

FIGURE C13-2
PRIMARY CONTAINMENT DESIGN PRESSURE

ATTACHMENT TITLE:
PRIMARY CONTAINMENT PRESSURE LIMIT

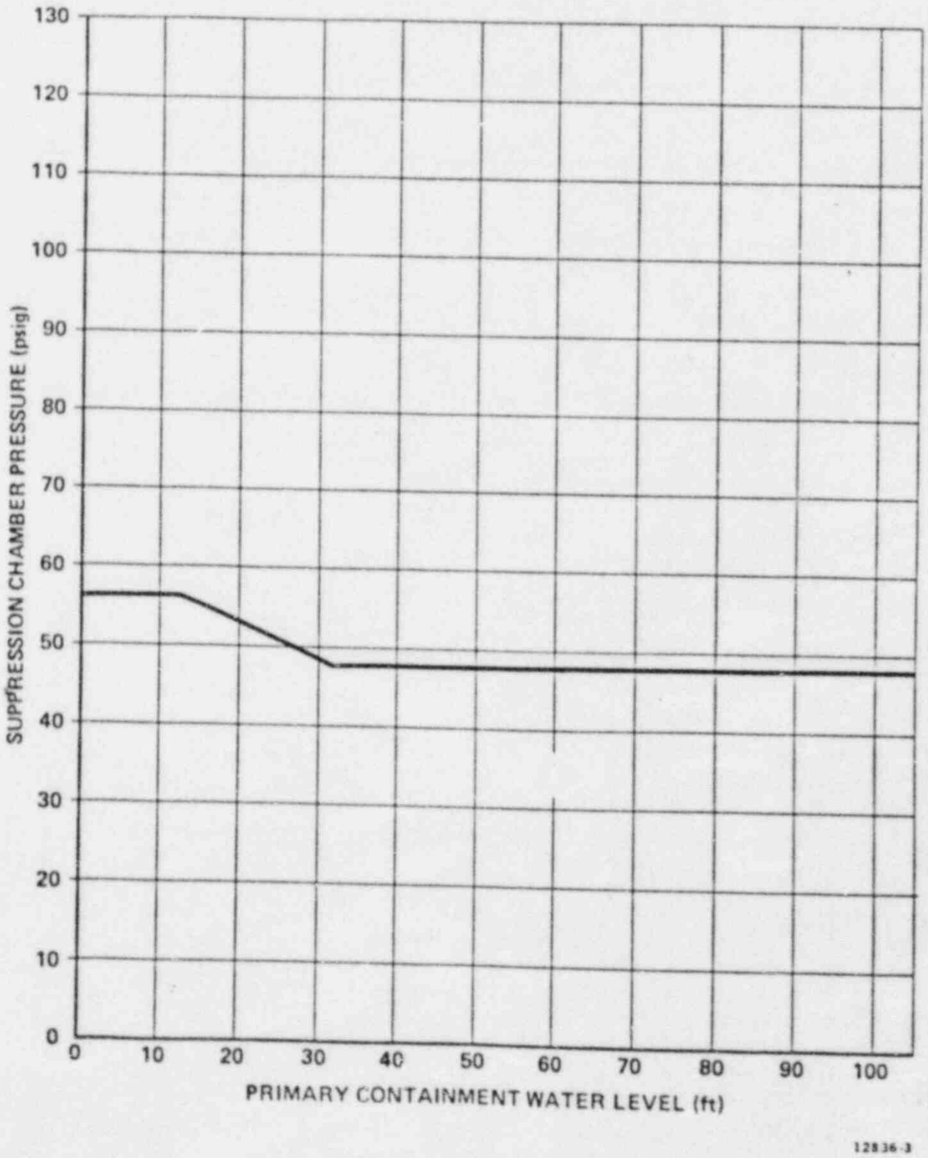

FIGURE C14-1
PRIMARY CONTAINMENT PRESSURE LIMIT

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	PAGE 92 OF 93 ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 2)	REVISION: 0
ATTACHMENT TITLE: HEAT CAPACITY LEVEL LIMIT	

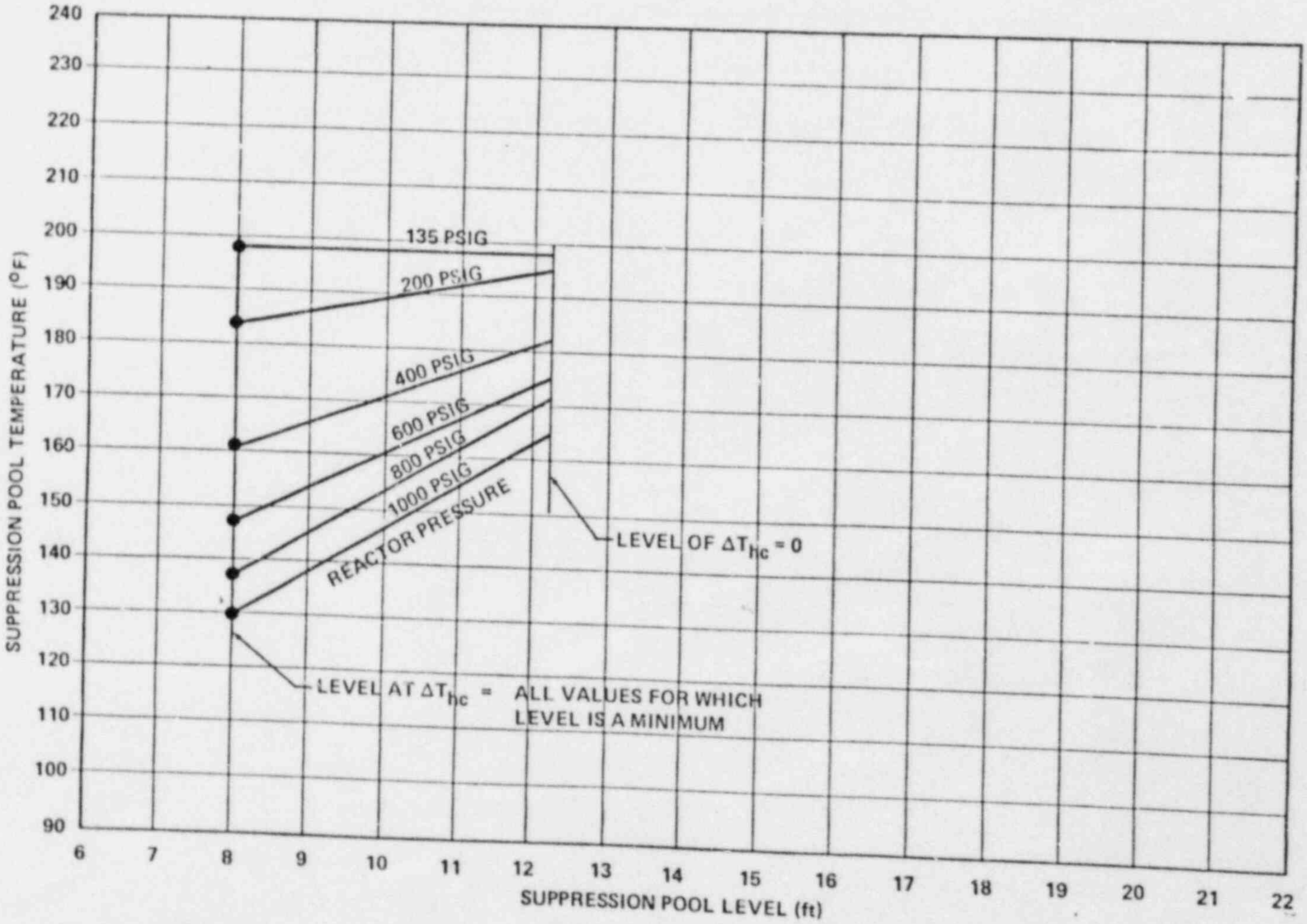

FIGURE 4 HATCH UNIT 2

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	PAGE 93 OF 93 ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT SPECIFIC TECHNICAL GUIDELINE (UNIT 2)	REVISION: 0
ATTACHMENT TITLE: MAXIMUM CORE UNCOVERY TIME LIMIT	

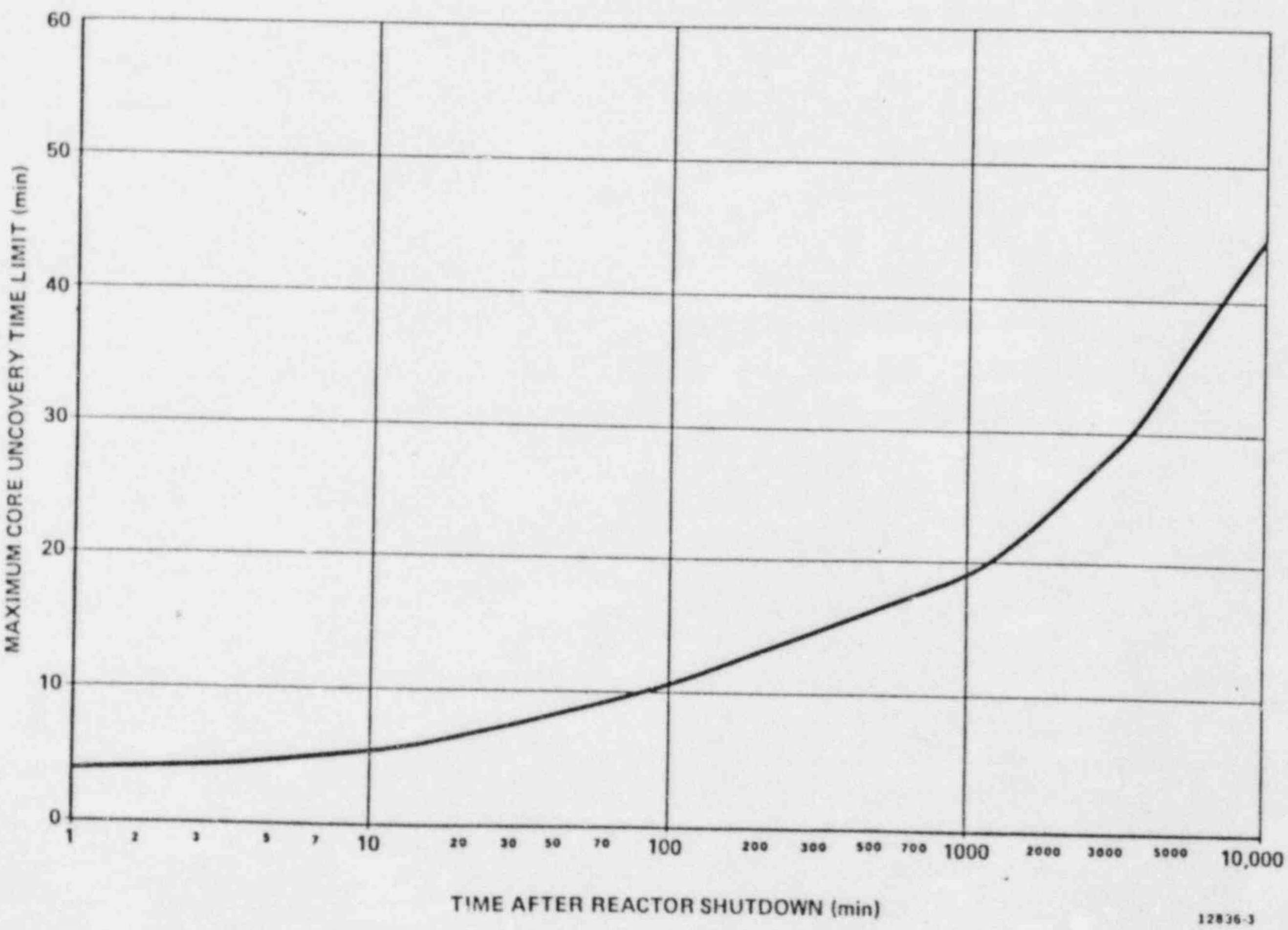

FIGURE C23-1

MAXIMUM CORE UNCOVERY TIME LIMIT

HATCH NUCLEAR PLANT

EMERGENCY OPERATING PROCEDURES

PLANT-SPECIFIC WRITER'S GUIDE

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1.0 OBJECTIVE

This Procedure outlines the content and format necessary to implement the requirements set forth in NUREG 0899, Guidelines for the Preparation of Emergency Operating Procedures, and result in stand-alone, user-oriented procedures. The purpose of this Procedure is to provide administrative and technical guidance on the preparation of Emergency Operating Procedures, and to serve as a Writer's Guide.

1.1 SCOPE

By broad definition, Emergency Operating Procedures (EOPs) are those procedures that direct actions necessary to mitigate the consequences of transients and accidents that have caused plant parameters to exceed reactor protection system set points, engineered safety feature set points, or other established limits. As specifically applied to Plant Hatch procedures, Abnormal Operating Procedures contain pre-scram actions and Emergency Operating Procedures contain post-scram actions. This Procedure pertains only to the Emergency Operating Procedures, with Abnormal Operating Procedures covered by 10AC-MGR03-0, Preparation and Control of Procedures.

1.2 RELATIONSHIP OF EOPS TO OTHER PLANT PROCEDURES

The information contained in the EOPs should be compatible with the information contained in other plant procedures that support the EOPs. Format for EOPs differs slightly from the format specified for other procedures as outlined in 10AC-MGR03-0. The format of the EOPs, with Flow Charts for symptoms and immediate operator actions, and End Path Manuals for subsequent operator actions, makes the EOPs uniquely identifiable.

Attachment 1 and Attachment 2 depict the overall relationship of the EOPs to other plant procedures. However, all instances are not covered by the attachments since the intent is to show that procedural flow is accomplished throughout the procedure structure to ensure safety function knowledge and ultimately plant safety and recovery.

1.3 WHAT CONSTITUTES AN EOP

1.3.1 An EOP shall consist of a cover procedure, five symptom-oriented procedures which are to be in Flow Chart format, and End Path Manuals which are to be in the written or prose format.

1.3.2 There is nothing else that constitutes an EOP.

1.4 THE INTRODUCTION TO FLOW CHARTS PROCEDURE (COVER PROCEDURE)

The cover procedure provides the operator with the general cautions and ties the cautions to the EOP Flow Charts and End Path Manual. The cover procedure will contain the objective and entry conditions for the Flow Charts. The cover procedure's procedure section will contain an introduction to the Flow Chart methodology, an explanation of Flow Chart ties to the End Path Manual, and an overall method to use the Flow Charts with the End Path Manual.

1.5 THE FLOW CHARTS

The Flow Charts provide the operator with a systematic and explicit means for determining the safety status of the plant for emergency situations triggered by any automatic or required manual scram regardless of the combination of initiating events. The Flow Charts contain the immediate operator actions to effectively bound multiple-event sequences and bring the plant to a known stable state. Restoration of reactor and containment parameters and systems recovery can be accomplished via the End Path Manuals. The End Path Manuals, entered from the Flow Charts, provide the guidance to complete the safe recovery of the plant and provide conditions from which repairs and return to power operation can be accomplished. Regardless of the event-specific initiating sequences, the symptom-based flow charts have built into them numerous "verification of action" steps to assist the operator in diagnosis of the initiating events.

1.6 THE END PATH MANUALS

The End Path Manuals are entered from the Flow Charts when the operator has completed a particular path on the Flow Chart he is utilizing. Each Flow Chart will indicate which End Path Manual and contained procedure are to be entered. The End Path procedures are made up of information derived from the previous event specific procedures (e.g., HNP 1900 Series), contingency action, emergency procedure guidelines, system recovery procedures, primary and secondary containment control procedures, reactivity control guidelines, Reactor Pressure Vessel (RPV) control guidelines, and radioactivity release control guidelines.

2.0 APPLICABILITY

This Procedure (Writer's Guide) applies to the writing of all Plant Hatch Emergency Operating Procedures, consisting of Flow Charts and End Path Manuals.

3.0 REFERENCES

3.1 DEVELOPMENTAL REFERENCES

3.1.1 10CFR50 Appendix B, Criterion V, Instructions, Procedures and Drawings

3.1.2 10CFR50.34, Contents of Applications: Technical Information

3.1.3 ANSI-N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

3.1.4 Regulatory Guide 1.33, Revision 2, Appendix A, Quality Assurance Program Requirements (Operation)

3.2 IMPLEMENTING REFERENCES

3.2.1 INPO 82-017 Emergency Operating Procedures Writing Guideline, July 1982

3.2.2 BWR Emergency Procedure Guidelines, BWR1-6, Revision 3, December 8, 1982

3.2.3 NRC Safety Evaluation Report dated November 23, 1983.

3.2.4 NUREG-0899, August 1982, Guidelines for the Preparation of Emergency Operating Procedures

3.2.5 10AC-MGR03-0, Revision 0, Preparation and Control of Procedures

4.0 <u>RESPONSIBILITIES</u>

The review and approval requirements for Emergency Operating Procedures are to be in accordance with the requirements of Hatch Nuclear Plant's Administrative Control Procedure, Preparation and Control of Procedures (10AC-MGR03-0). The Manager of Operations has primary responsibility for the procedures generated as Emergency Operating Procedures.

5.0 REQUIREMENTS

5.1 PERSONNEL REQUIREMENTS

Personnel developing or performing reviews of the EOP's shall be knowledgeable in the disciplines and bases of the Emergency Procedure Guidelines (EPG's). Because of the vast areas of information and expertise involved, writing a successful EOP is a team effort. The team should include, but not be limited to, people who are skilled in the areas of technical writing, power plant operations, operator training, engineering design and human factors.

5.2 MATERIAL AND EQUIPMENT

N/A - Not applicable to this procedure.

5.3 SPECIAL REQUIREMENTS

5.3.1 Generic BWR Emergency Procedure Guidelines

The background information shall consist of appendices to the Generic BWR Emergency Procedure Guidelines and shall be documented both as a learning tool and as an aid for verification of actions/analyses performed to achieve the level of accuracy in the technical guidelines. This documentation shall include, but not be limited to the following: assumptions made, references to information, references to results of analyses, and information leading to the adaptation of generic technical guidelines.

5.3.2 Plant Specific Technical Guidelines

5.3.2.1 The plant specific technical guidelines will be identical to the generic emergency procedure guidelines except that Hatch Plant specific data will be used in the various limits, tables, and graphs; references to systems not found at Plant Hatch will be deleted.

5.3.2.2 The generic and plant specific guidelines are oriented so that emergency operating procedures written from them can be used by an operator to mitigate the consequences of an emergency without first having to diagnose the event or event combination causing the emergency. The generic and plant specific guidelines are based upon the requirements of NUREG-0737, Clarification of TMI Action Plan Requirements, and will be the latest revision approved by the NRC.

6.0 PRECAUTIONS/LIMITATIONS

6.1 PRECAUTIONS

N/A - Not applicable to this procedure.

6.2 LIMITATIONS

N/A - Not applicable to this procedure.

7.0 PREREQUISITES

N/A - Not applicable to this procedure.

8.0 PROCEDURE

8.1 ORGANIZATION OF AN EOP

8.1.1 The EOPs will be organized in the following general sections:

Title Page (1)

Objective of EOP (2)

Entry Condition (3)

Procedure Body (4)

8.1.2 The three parts of the EOP will contain the sections from the list above, as follows:

EOP PART	SECTIONS CONTAINED
Cover Procedure	(1), (2), (3), (4)
Flow Charts	(1)*, (4)*
End Path Manual Procedures	(1), (2), (3), (4)

* As modified for Flow Chart methodology and implementation

8.1.3 Title Page

The title page of an EOP will be identical to that shown in Attachment 3 of this Writer's Guide.

8.1.4 Objective of an EOP

The objective of an EOP (which is the purpose of the EPG) will be a precise and simply stated paragraph of what the EOP is to accomplish.

8.1.5 Entry Conditions

The single entry condition for all Flow Charts shall be "Any Scram".

8.1.6 Procedure Body

8.1.6.1 The cover procedure is intended to introduce the flow chart methodology and general cautions. It also explains the ties between the cover procedure, Flow Charts, and End Path Manuals, and contains the objective and entry conditions for the Flow Charts.

8.1.6.2 The Flow Charts body shall contain operator immediate actions and verification and check statements to ensure that the indicated automatic system action is accomplished.

8.1.6.3 The End Path Manual shall contain End Path Procedures which have subsequent action steps that the operator takes to return the plant to a normal steady-state condition or to provide for a safe extended shutdown period. Additionally, the End Path Manual will contain the following:

8.1.6.3.1 Cover Procedure

The cover procedure will be placed at the front of the End Path Manual, for convenience to the operator.

8.1.6.3.2 Contingencies

This section of the End Path Manual shall contain the contingency actions of the BWR Emergency Procedure Guidelines.

8.1.6.3.3 System Recovery Procedures

This section of the End Path Manual shall contain the procedural guidance to recover systems that were lost either during the initiating event sequence or as a result of the initiating event sequence.

8.1.6.3.4 Containment Control Procedures

This section of the End Path Manual shall contain the bulk of the BWR Emergency Procedure Guidelines dealing with primary and secondary containment control.

8.1.6.3.5 Reactivity Control Procedures

This section of the End Path Manual shall contain reactivity control guidance of the BWR Emergency Procedure Guidelines.

8.1.6.3.6 Radioactivity Release Control Guidance

Those BWR Emergency Procedure Guideline actions not amenable to being placed in the Hatch Nuclear Plant Emergency Plan will be incorporated into the Containment Control Procedure section.

8.2 ORGANIZATION OF FLOW CHARTS

The Flow Charts shall consist of 5 symptom-oriented decision tree action paths. The Cover Procedure shall contain the objective and introduction to the Flow Charts and shall describe how these instructions are to be used by the plant operators to handle emergency or potential emergency situations.

8.2.1 Designation and Numbering

8.2.1.1 The Flow Charts are the procedures that govern the plant operation during emergency conditions and specify immediate operator actions to be taken to bound the problem and to return the plant to a stable condition. Each Flow Chart shall be uniquely identified (see Attachment 4). This identification (acting as the title page) permits easy administration of the process of procedure revision, distribution, and operator use.

8.2.1.2 The various Paths will have some overlapping information on them as required to ensure each can stand alone, but they can be generally described as follows:

Path 1 - Malfunction of reactivity control system

Path 2 - Reactor transients or failure of vital equipment (from low reactor power)

Path 3 - Reactor transients or failure of vital equipment (from high reactor power)

Path 4 - High steam line radiation, loss of vital power, failure of vital equipment, or loss of coolant (under degraded conditions)

Path 5 - High radiation, loss of coolant, and control of primary containment integrity (under degraded conditions)

The Flow Charts shall not have identifying titles. The philosophy is for the operator to immediately enter any Flow Chart when the entry condition occurs. Once the operator enters the Flow Chart, it will lead to the proper procedural steps.

8.2.2 Revision and Authorization

Each Flow Chart shall include the current revision number and authorizing signatures. This information shall be located at the upper right of each Flow Chart (see Attachment 4).

8.2.3 Identification for Flow Charts

There shall be site identification and unit identification for the Flow Charts as shown on Attachment 4. The identification block shall be printed black-on-white for Unit 1 and white-on-black for Unit 2 to allow easy identification.

8.2.4 Page Identification

There shall be no page identification on the Flow Charts, since each Flow Chart shall be contained on a single page. The Flow Charts will be identified by Path (i.e. Path 1, Path 2, etc.). (See subsection 8.2.1.)

8.2.5 Format

The Flow Charts shall utilize logic symbols as specified on Attachment 5. These symbols shall be arranged in a decision tree type Flow Chart that provides the operator with guidance intended to bound the problem and get the plant into a safe condition quickly, systematically and consistently (see Attachment 6). Information in the logic symbols shall be of typewriter quality and all CAPS so that readability is maintained on the reduced charts.

8.2.6 Decision Symbol

8.2.6.1 This symbol shall contain a question which the operator is to answer YES or NO. The question shall pertain to a plant parameter, setpoint, switch position, or system condition.

8.2.6.2 If the particular step is designated as a "key" or "path specific" parameter, it shall have an action symbol superimposed over the standard decision symbol and the decision symbol shall be in bold lines. This identifies steps which require the operator to return to the top of the chart and restart in the event this "key" parameter changes state after having been passed. A normal decision block changing state after having been passed only requires the operator return to that one decision block and continue from there.

8.2.7 Action Step Symbol (Sequence Sensitive)

This symbol shall contain a specific action or command which the operator performs, and must be performed in the sequence indicated.

8.2.8 Action Step Symbol (Sequence Insensitive)

This symbol shall contain a specific action or command which the operator performs, and may be performed at the operator's option prior to reaching the step on the Flow Chart.

8.2.9 Information Symbol

This symbol shall contain information which may be useful to assist the operator in diagnosing plant conditions. The symbol is also used to provide operator cautions (as shown on Attachment 5)

8.2.10 Arrow Symbols

There shall be two basic types of arrow symbols used on the Flow Charts (see Attachment 5). The path-to-path arrows guide the operator from one Flow Chart to another. The path-to-end-path arrows shall guide the operator from the Flow Chart Immediate Action Steps to End Path Procedures. Attachment 6 shows how the path-to-path arrows are individually modified to key the operator to a specific corresponding arrow on the new path, and how the grid locations are noted (see subsection 8.2.17).

8.2.11 Connecting Lines

There shall be two basic line widths used to guide the operator through the Flow Chart. The operator should follow these lines always entering the symbols at the top and exiting the symbols at the side or bottom.

The wide line represents the expected plant response for each Flow Chart for normal plant recovery. All lines are equally important. They represent possible response of the plant for many situations on each Flow Chart. No lines shall cross or intersect on the Flow Charts, except where two or more enter the same symbol.

8.2.12 Entry Condition

The entry condition for each Flow Chart is identical (see Attachment 6) and is identified in the cover procedure. The entry condition shall be "Any Scram", and is contained in an information symbol.

8.2.13 Flow Chart Initial Format

Each Flow Chart shall have an identical initial series of symbols as shown on Attachment 6. The placement of YES/NO and type of connecting line will vary according to individual path requirements. This initial sequence establishes priority of actions and guides the operator to the appropriate Flow Chart.

8.2.14 Automatic Actions

Important safety systems automatic initiation verifications shall be included in the Flow Charts. The following statement enclosed within an action symbol is an example of operator verification of automatic actions: "Verify Auto or Manually Start HPCI".

8.2.15 Immediate Operator Actions

The initial steps on the Flow Charts are the Immediate Operator Action Steps. These operator actions are taken to stop further degradation of existing conditions and to mitigate their consequences or to bound the problem. The immediate operator actions shall be visible at all times to the operator; therefore, there is no need for the operator to memorize these actions.

8.2.16 Operator Cautions

Operator cautions may be included on the Flow Charts where appropriate. The caution will precede the procedural step to which it applies, and shall be highlighted as shown in Attachment 5.

8.2.17 Grid System

Each Flow Chart shall have a series of letters along the sides and arabic numerals along the top and bottom to act as a grid locator system (see Attachment 6). The grid shall not be drawn on the chart as a series of lines. The resulting intersecting areas (1B for example) should be arranged to encompass approximately 3 Flow Chart symbols. The grid system is used for path-to-path arrows and to allow operators to indicate to other personnel where they currently are in the chart. EXAMPLE: to allow the managers in the Technical Support Center to follow progress on the Flow Charts.

8.2.18 Preparing and Mounting Flow Charts

The Flow Charts will require off-site assistance to prepare since the are extensively color-coded and may be computer-generated. The completed charts shall be reduced to approximately 20" x 35" (as appropriate for use in the control room) and mounted on lightweight boards such as styrofoam. Each board will then be laminated with a thin, transparent plastic material. Each Flow Chart board may be framed with lightweight aluminum for additional strength. The Control Room Flow Charts shall have at least a one half inch blank border on all sides to increase readability.

8.2.19 Reproduction of Flow Charts

Reproduction of the Flow Charts may be done on a standard blueprint copier. Reduced Flow Charts on film (mylar) may be used for the original. Computer-generated or colored charts may require more advance techniques (i.e. photographic reproduction).

8.2.20 Revisions to Flow Charts

The revision process for the Flow Charts requires the same administrative controls as all other procedures, in accordance with 10AC-MGR03-0.

The current revision of each Flow Chart shall be maintained in accordance with Hatch procedures for control of procedures.

8.2.21 Color Coding

On any given Path 1 through 5, yellow indicates the expected, though unverified response path, and is used exclusively for the mainpath down the chart. Green is a deviation, but is otherwise normal. Orange is also a deviation; however, a degraded plant response may be involved. Red is a deviation with definite degradation of plant equipment. The color of a logic symbol indicates the degradation associated with that specific sequence of actions. Connecting lines should be the same color as the logic symbol from which they originate.

8.3 END PATH MANUAL AND COVER PROCEDURE PREPARATION

8.3.1 Purpose

This section assembles a set of general criteria for preparing and reviewing EOPs assigned to nuclear facility Plant Operating Manuals, subject to some specific qualifications and exemptions for individual types of procedures as described herein. These criteria shall ensure continuing incorporation of the results of human factors studies in the design of procedures.

8.3.2 Procedure Identification

Proper identification of procedures is necessary to avoid errors in selection and implementation. Complete identification of a procedure includes its title, number, facility (i.e., HNP), revision and type.

8.3.2.1 Procedure Title

Each procedure will be given a title which accurately reflects its intended purpose. Within this constraint, procedure titles shall be kept as short and concise as possible.

8.3.2.2 Procedure Designation

The ten significant character alphanumeric designator for the Emergency Operating Procedures shall be in accordance with 10AC-MGR03-0.

8.3.2.3 Procedure Numbers

8.3.2.3.1 Each procedure will be assigned a unique and permanent number within its associated Path and Section of the End Path Manual. Whenever a procedure is deleted, the associated procedure number will not normally be reassigned for the ensuing 2-year period. If reassignment is made within this period, consideration should be given to user retraining to avoid confusion or error.

8.3.2.3.2 Procedure numbering shall be controlled as follows:

Sections 1.10-1.19 - End Path Manual Procedures from Flow Charts - Path 1, 10-19

Sections 2.20-2.29 - End Path Manual Procedures from Flow Charts - Path 2, 20-29

Sections 3.30-3.39 - End Path Manual Procedures from Flow Charts - Path 3, 30-39

Sections 4.40-4.49 - End Path Manual Procedures from Flow Charts - Path 4, 40-49

Sections 5.50-5.59 - End Path Manual Procedures from Flow Charts - Path 5, 50-59

NOTE

"X" in Section Number indicates the End Path Manual number (i.e. which Flow Chart was exited).

Sections X.00-X.09 - Cover Procedures

Sections X.60-X.79 - Generic System Recovery Procedures

Sections X.80-X.99 - Contingency Procedures

Sections X.100-X.119 - ATWS Recovery Procedures

Sections X.120-X.139 - Containment Control Guide

8.3.3 Page Identification

Beginning with the Title Page, the top of each page of each procedure will bear the procedure designation, current revision number and page number as an aid to validation by the user. Each procedure shall begin with a new page.

The title page format will be as shown in Attachment 3.

8.3.3.1 Revision Number

The revision number shall be a one or two digit number indicating the current approved revision.

8.3.4 Page Numbering

Each page of each procedure shall be numbered sequentially beginning with the Title Page. If pages are added to a procedure, complete renumbering of all pages shall be performed.

The page number shall appear in the following format:

PAGE ___ OF _____

Likewise, when pages are deleted by revision, the procedure pages shall be renumbered.

8.3.5 Identification of Revised Material

Revised material shall be identified with a vertical line in the right-hand margin opposite the revised text. Vertical lines from any previous revision shall be deleted.

8.3.6 General Writing Techniques

The following section provides a set of standards which shall be considered in the preparation and review of all EOPs. In considering these guidelines, writers shall keep in mind that some are more important than others for different sections of procedures. The writer shall always consider the conditions under which the procedure will be implemented, the time available for its implementation, and the possible consequences of errors in implementation.

8.3.6.1 Multiple-Unit Procedures

Procedures which contain multiple sets of equipment identifications for use with more than one unit are more difficult to read and comprehend than procedures dedicated to a single unit. Therefore, a unique set of procedures for each unit shall be developed. To ease identification, color coding may be used wherever appropriate.

8.3.6.2 Page Format

A single or dual column format may be used, however, the procedure shall be in one format only, either all single or all dual. If the dual column format is to be used, then the left-hand column shall be designated for operator actions, and the right-hand column shall be designated for contingency actions to be taken when the expected response is not obtained. A sample dual column page format is presented in Attachment 7. In either format, the general appearance of procedural pages contributes significantly to comprehension and the elimination of confusion and error. Information on pages shall be displayed with minimum clutter, sufficient spacing between lines and adequate margins. Margins shall be sufficient to ensure that binding will not interfere with reading the text and that subsequent reproduction will not cut off any of the procedure content or page identification.

8.3.6.3 Step Numbering, Indenting, and Checkoffs

Instructional steps must be readily identifiable by the user. Step numbering, indenting, and checkoffs are used to assist procedure users in keeping track of step sequence and subordination. The following guidelines apply:

Only Arabic numerals shall be used in step numbering.

The same step numbering and indenting scheme will be applied consistently to all procedures.

The acceptable numbering scheme is as follows with the optional checkoff spaces shown:

1.0 ____

  1.1 ____

    1.1.1 ____

      1.1.1.1 ____

        1.1.1.1.1 ____

Numbering and indenting beyond the section of the example above shall not be used. If necessary, procedures should be reorganized to produce an acceptable number of subsections. Subsection numbers should be indented two spaces from the preceding section or subsection number margin.

Checkoff spaces shall be placed as shown for all steps requiring an operator action, and may be used elsewhere if it will enhance the operator's ability to keep track of his place in the procedure.

8.3.6.4 Step Sequencing

Instructional steps will be presented in the sequence most appropriate for the situation. Instructional steps which can be performed concurrently shall be listed in order of relative importance. When the sequence of actions is critical, the phrase "in the order given" or similar phrase shall be used in the step introducing the actions. On the flow charts, all steps are understood to be performed "in the order given", except those contained in the special symbol which allows out of sequence performance.

8.3.6.5 Caution Statements

8.3.6.5.1 Cautionary information can be considered in two fundamental categories, those that apply to the entire procedure and those that apply to a portion or a specific step of the procedure. Those that apply to the entire procedure are called "General Cautions" and will be contained in the cover procedure. Those that apply to a portion of a procedure are called "CAUTIONS" and are placed immediately before the procedural steps to which they apply.

8.3.6.5.2 Cautions shall extend across the entire page and shall be highlighted as shown in the Example CAUTION. This placement of cautions helps ensure that the procedure user observes the caution before performing the step. A caution <u>cannot</u> be used instead of an instructional step. It should be used to denote a potential hazard to equipment or personnel associated with or consequent to the subsequent instructional step. The caution shall be capitalized with the word <u>CAUTION</u> underlined. Caution statements shall be written so that they can be read completely without interruption by page turning.

EXAMPLE:

<u>CAUTION</u>

CAUTIONS SHALL BE TYPED IN ALL CAPITAL LETTERS ONLY

8.3.6.6 Notes

A note provides descriptive or explanatory information intended to aid personnel in performing an instructional step. Notes shall not contain action steps. Notes shall be as close to the applicable instruction as possible. If dual column format is used, the note shall be located in the right-hand column. If single column format is used, the note shall be approximately aligned with the text of the applicable instruction step as shown in the Example. The word NOTE shall be capitalized and underlined, and shall be highlighted as shown in the Example.

Example:

NOTE

Notes shall be typed in structured sentences.

8.3.6.7 Calculations

Mathematical calculations should be avoided in EOPs. If a value has to be determined in order to perform a procedural step, a chart or graph should be used whenever possible. When calculations are required, they shall be as simple as possible, and space shall be provided for the calculations.

8.3.6.8 Referencing and Branching

8.3.6.8.1 Referencing implies that an additional procedure or additional steps will be used as a supplement to the procedure presently being used. Referencing other steps within the procedure being used, either future steps or completed steps, should be minimized. When only a few steps are involved in the referencing, the steps should be stated in the procedure wherever they are needed.

8.3.6.8.2 To minimize potential operator confusion, branching will be used when the operator is to leave one procedure or step and use another procedure or step. Use the key words "go to". Therefore, the operator will know to leave the present step and not return until directed. Use quotation marks to emphasize the title of the referenced or branched procedure; examples: Go to E-1, "Loss of Reactor Coolant". Go to Step 20.

8.3.6.9 Style of Expression

Style of expression refers to the way in which instruction steps are written. Steps will be written in a style that presents information in a simple, familiar and clear manner. The following guidance shall be followed:

8.3.6.9.1 Use words that are common in ordinary conversation.

8.3.6.9.2 Use terms personnel are trained to use and which are standard in the industry.

8.3.6.9.3 Use action verbs that describe exactly what the user is to do. Ensure that these verbs are understood and used consistently throughout procedures. Samples of action verbs are given in Attachment 8.

8.3.6.9.4 When there are more than two objects of an action verb, list them below the instruction step rather than in the step.

EXAMPLE: USE

3.2.9 open the following valves:

2B21-F016

2B21-F019

2B21-F038

EXAMPLE: DO NOT USE

3.2.9 open valves 2B21-F016, 2B21-F019 and 2B21-F038

8.3.6.9.5 Use short, direct sentences. Establish a style of sentence construction suitable for the procedure type and use it consistently.

8.3.6.9.6 Number of actions per step shall be minimized, and limited to one action where possible. Where two actions are included in one step, use the connective AND rather than two sentences.

8.3.6.9.7 Avoid adverbs that have imprecise meanings.

Example: Use "every 5 minutes until...."
rather than "frequently until.."

8.3.6.10 Instrumentation Values

When specifying instrumentation values, an appropriate range, tolerance or limit will be used rather than a single point value. Avoid the use of mathematical symbols ($<$; $>$) in specifying these ranges. Instead, use phrases such as "greater than", "less than", "between", "greater than or equal to", "less than or equal to", etc.

8.3.6.11 Equipment, Controls, and Display

Nomenclature used shall assist personnel in quick location or identification of equipment, controls, and displays. Use a consistent system of identification which corresponds precisely with component identifications posted on equipment and control panels. Location information will also be included as follows:

For shutdown outside the control room, location information will be provided for every valve, switch, pump, panel, etc. For shutdown inside the control room, location information will be provided for those components not normally used by the operator.

EXAMPLE:

2.22.7 Open condensate demineralizer bypass valve at panel 2H21-P216

Adequacy of this information will be checked during the procedure validation program.

8.3.6.12 Abbreviations, Letter Symbols, and Acronyms

8.3.6.12.1 Abbreviations may be used where necessary to save time and space, and when their meaning is unquestionably clear to the intended reader. Write in the full meaning of the abbreviation before the first use of the abbreviation and whenever in doubt. Maintain consistency throughout the procedure, including use of capitalization in the abbreviations. If the abbreviation is comprised of lower case letters, it should appear in lower case in a title or heading. Omit the period in abbreviations except in cases where the omission would result in confusion. Where an abbreviation is not currently used in plant procedures, the abbreviation will be discussed in the training program.

8.3.6.12.2 Letter symbols may be used to represent operations, quantities, elements, relations, and qualities.

8.3.6.12.3 An acronym is a type of symbol formed by the initial letter or letters of each of the successive parts or major parts of a compound term. Acronyms may be used if they are defined or commonly used.

8.3.6.12.4 Abbreviations, symbols, and acronyms should not be overused. Their use should be for the benefit of the reader. They can be beneficial by saving reading time, ensuring clarity when space is limited, and communicating mathematical ideas.

8.3.6.13 Level of Detail

8.3.6.13.1 Too much detail in EOPs should be avoided in the interest of being able to effectively execute the instructions in a timely manner. The level of detail required is the detail that a newly trained and licensed operator would desire during an emergency condition. To assist in determining the level of EOP detail, the following general rules apply: For each control with a number engraved on the control panel placard, the number may be included in parentheses within the instructional step where necessary for clarity. EXAMPLE: "Start RCIC Water Leg Pump (S33)." For control circuitry that executes an entire function upon actuation of the control switch, the action verb appropriate to the component suffices without further amplification of how to manipulate the control device. EXAMPLE: "Close FEED PUMP A SUCTION VALVE (F028A)".

8.3.6.13.2 Recommended action verbs are as follows:

For power-driven rotating equipment, use Start, Stop.

For valves, use Open, Close, Throttle Open, Throttle Close, Throttle.

For power distribution breakers, use Synchronize and Close, Close, and Trip.

For control switches with a positional placement that establishes a standby readiness condition, the verb "Set" should be used, along with the engraved name of the desired position. Positional placements are typically associated with establishing readiness of automatic functions and are typically named AUTO or NORMAL; for example, "Set the GLAND SEAL AIR COMPRESSOR Control Switch (S15) in AUTO".

For multiposition control switches that have more than one position for a similar function, placement to the desired position should be specified; for example, "Place DIESEL FIRE pump selector switch to TEST No. 2".

8.3.6.13.3 Standard practices for observing abnormal results need not be prescribed within procedural steps. For example, observation of noise, vibration, erratic flow, or discharge pressure need not be specified by steps that start pumps.

8.3.6.14 Equipment Status

Equipment status should be denoted as follows:

8.3.6.14.1 Operable/operability - See definition contained in Unit 2 Technical Specifications, section 1.0, Amendment 14.

8.3.6.14.2 Operating - This word means that a system, subsystem, train, component, or device is in operation and is performing its specified function(s), and that "Out of Service Cards" or other conditions do not prevent it from maintaining that service.

8.3.6.14.3 Available - This word means that a system, subsystem, train component, or device is capable of performing its specified function(s) in the intended manner, but does NOT necessarily imply that all redundant support systems are in service.

EXAMPLE: If RFPT A DC oil pumps are out of service but the RFPT is otherwise normal, RFPT A would not be considered operable, but would be considered available.

8.3.7 Instructional Steps

8.3.7.1 Instruction Step Length and Content

8.3.7.1.1 Instruction steps shall be concise and precise. Conciseness denotes brevity; preciseness means exactly defined. Thus, instructions shall be short and exact.

8.3.7.1.2 Instruction steps shall deal with only one idea. Short, simple, sentences shall be used in preference to long, compound, or complex sentences. Complex evolutions shall be prescribed in a series of steps, with each step made as simple as practicable.

8.3.7.1.3 Objects of operator actions shall be specifically stated. This includes identification of exactly what is to be done and to what.

8.3.7.1.4 Each action step shall be wholly contained on a single page.

8.3.7.1.5 For instructional steps that involve an action verb, relating to three or more objects, the objects shall be listed with space provided for operator checkoff.

8.3.7.1.6 Limits shall be expressed quantitatively whenever possible (see Subsection 8.3.6.10).

8.3.7.1.7 Identification of components and parts shall be complete.

8.3.7.1.8 When system response dictates a time frame within which the instruction must be accomplished, prescribe such time frame. If possible, however, avoid using time to initiate operator actions; operator actions shall be, where possible, related to plant parameters.

8.3.7.1.9 When actions are required based upon receipt of an annunciated alarm, list the setpoint of the alarm for ease of verification. When requiring resetting or restoration of an alarm or trip, list the expected results immediately following the resetting or restoration if it would be beneficial to the operator.

8.3.7.1.10 Expected results of routine tasks need not be stated. When considered beneficial to the user for proper understanding and performance, describe the system response time associated with performance of the instruction. When anticipated system response may adversely affect instrument indications, describe the conditions that will likely introduce instrument error and means of determining if instrument error has occurred by using a NOTE.

8.3.7.1.11 When additional confirmation of system response is considered necessary, prescribe the backup readings to be made.

8.3.7.2 Instruction Columns

When the dual-column format is used, the left-hand column of the dual-column format will contain the operator instructional steps. The following rules are established for this left-hand column, in addition to the general rules above. Operator actions in the left-hand column should be appropriate for the expected indications. Expected indications shall be presented in the left-hand column.

8.3.7.3 Contingency Actions

When the dual-column format is used, contingency actions will be presented in the right-hand column of the dual-column format. Contingency actions are operator actions that should be taken in the event a stated condition, event, or task does not represent or achieve the expected results. The need for contingency action occurs in conjunction with tasks involving verification, observation, confirmation, and monitoring. Contingency actions will be specified for each circumstance in which the expected results or actions might not be achieved. The contingency actions shall identify, as appropriate, directions to override automatic controls and to initiate manually what is normally automatically initiated.

8.3.7.4 Use of Logic Terms

8.3.7.4.1 The logic terms AND, OR, NOT, IF, IF NOT, WHEN, and THEN are often necessary to describe precisely a set of conditions or sequence of actions. When logic statements are used, logic terms will be highlighted by capitalization and underlining so that all the conditions are clear to the operator.

8.3.7.4.2 The use of AND and OR within the same action shall be avoided. When AND and OR are used together, the logic can be very ambiguous.

8.3.7.4.3 The dual-column format, when used, equates to the logic: IF NOT the action in the left-hand column, THEN follow the action specified in the right-hand column.

8.3.7.4.4 When attention should be called to combinations of conditions, the word AND shall be placed between the description of each condition. The word AND shall not be used to join more than three conditions. If four or more conditions need to be joined, a list format shall be used.

8.3.7.4.5 The word OR shall be used when calling attention to alternative combinations of conditions. The use of the word OR shall always be in the inclusive sense. To specify the exclusive "OR", the following may be used: "either A OR B but NOT both." When action steps are contingent upon certain conditions or combinations of conditions, the step shall begin with the words IF or WHEN followed by a description of the condition or conditions, a comma, the word THEN, followed by the action to be taken. WHEN is used for an expected condition. IF is used for an unexpected but possible condition. Use of IF NOT should be limited to those cases in which the operator must respond to the second of two possible conditions. IF should be used to specify the first condition. THEN shall not be used at the end of an action step to instruct the operator to perform the next step because it runs actions together.

8.3.7.5 Use of Underlining

Underlining will be used for emphasis of logic terms and CAUTION and NOTE.

8.3.7.6 Component Identification

With respect to identification of components, the following rules are to be followed:

8.3.7.6.1 Equipment, Controls, and Displays will be identified in specific terms. These terms shall always match engraved names on panels. When the engraved names and numbers on panel placards and alarm windows are specifically the item of concern in the procedure, the engraving shall be quoted verbatim and emphasized by using all capitals.

8.3.7.6.2 The names of plant system titles are also emphasized by capitalization. When the word "system" is deleted from the title because of brevity and is understood because of the context, the title is also emphasized by capitalization.

8.3.7.6.3 If the component is seldom used or it is felt that the component would be difficult to find, location information shall be given in parentheses following the identification.

8.3.8 Printed Operator Aids

When information is presented using graphs, charts, tables, and figures, these aids must be self-explanatory, legible, and readable under the expected conditions of use and within the reading precision of the operator.

8.3.8.1 Units of Measure

Units of measure on figures, tables, and attachments shall be given for numerical values that represent observed data or calculated results. A virgule (slant line) should be used instead of "per".

EXAMPLES: ft/sec, lbs/hr.

8.3.8.2 Titles and Headings

Capitalization of first letter shall be used for references to specific tables and figures, titles of tables and figures within text materials, and column headings within a table.

EXAMPLES: Refer to Figure 201 for..........

as shown in Table 201, Equipment Power Supplies, the .....

8.3.8.3 Figure, Table, and Attachment Numbering

8.3.8.3.1 Sequential arabic numerals shall be assigned to figures, tables, and attachments in separate series. The sequence shall correspond with the order of their reference in the text. The symbol "#" and abbreviation "No." are unnecessary and shall not be used.

8.3.8.3.2 Page identification for attachments shall consist of a block of information that identifies (1) procedure number, (2) attachment number, (3) page number, and (4) revision number. Page numbering of attachments shall meet the requirements of Subsection 8.3.4.

8.3.8.3.3 Where standard forms are used from other procedures, they should be referenced and used in preference to complete duplication, where possible.

8.3.9 Mechanics of Style

8.3.9.1 Spelling

Spelling should be consistent with modern usage.

8.3.9.2 Hyphenation

Hyphens are used between elements of a compound word when usage calls for it. The following rules shall be followed for hyphenation. When doubt exists, the compound word shall be restructured to avoid hyphenation.

Hyphens shall be used in the following circumstances:

In fractions, examples: one-half, two-thirds;

In compound numerals from twenty-one to ninety-nine, example: one hundred thirty-four;

To separate chemical elements and their atomic weight, examples: Uranium-235, U-235;

When a letter is linked with a noun, examples: x-ray, O-ring, U-bolt, I-beam;

In compounds with "self", examples: self-contained, self-lubricated;

When misleading or awkward consonants would result by joining the words, example: bell-like;

To avoid confusion with another word, examples: re-cover to prevent confusion with recover, pre-position to avoid confusion with preposition.

8.3.9.3 Punctuation

Punctuation should be used only as necessary to aid reading and prevent misunderstanding. Word order shall be selected to require a minimum of punctuation. When extensive punctuation is necessary for clarity, the sentence should be rewritten and possibly made into several sentences. Punctuation shall be in accordance with the following rules:

Brackets - do not use brackets.

Colon - use a colon to indicate that a list of items is to follow.

Comma - use of many commas is a sign the instruction is too complex and needs to be rewritten. Therefore, evaluate the number of commas to ensure the instruction is not too complex. Use a comma after conditional phrases for clarity and ease of reading. EXAMPLE: <u>WHEN</u> level decreases to 60 inches, <u>THEN</u> start pump....

Parentheses - parentheses shall be used to indicate alternative items in a procedure, instruction, or equipment number.

Period - use a period at the end of complete sentences and for indicating the decimal place in numbers.

Dash - may be used to set off items in a list.

8.3.9.4 Vocabulary

Use simple words. Simple words are usually short words of few syllables. Simple words are generally common words. Words used in procedures shall be selected to convey precise understanding to the trained person.

8.3.9.5 Numerical Values

The use of numerical values should be consistent with the following rules:

Arabic numerals shall be used.

For numbers less than one, the decimal point shall be preceded by a zero. EXAMPLE: 0.1.

The number of significant digits should be equal to the number of significant digits available from the display and the reading precision of the operator.

Engineering units should always be specified for numerical values of process variables. They should be the same as those used on the control room displays. EXAMPLE: psig instead of psi.

Acceptance values should be specified in such a way that addition and subtraction by the user are avoided if possible. This can generally be done by stating acceptance values as limits. EXAMPLES: 510°F maximum, 300 psig minimum, 580° to 600°F. For calibration points, statement of the midpoint and its lower and upper limits for each data cell would accomplish the same purpose; for example, 10 milliamperes (9.5 to 10.5). Avoid using ±.

8.3.10 Typing Format

8.3.10.1 Page Arrangement

Page margins shall be such as to facilitate readability, approximately one-half to one inch in width on all sides.

8.3.10.2 Heading and Text Arrangement

Block style, as illustrated in Attachment 7, is to be used with the dual-column format. Otherwise, the expanded block style used herein is to be used.

8.3.10.3 Breaking of Words

Breaking of words shall be avoided to facilitate operator reading.

8.3.10.4 Rotation of Pages

Pages should not be rotated. Tables and figures should be readable with the page arranged vertically.

8.3.10.5 Printed Operator Aids (graphs, drawings, diagrams, tables and illustrations)

8.3.10.5.1 The figure field must not violate specified page margins. The essential message shall be clear; simple presentations are preferred. The figure number and its title are placed below the figure field (refer to Subsection 8.3.8).

8.3.10.5.2 The figure field shall be of sufficient size to offer good readability.

8.3.10.5.3 In general, items within the figure shall be labeled. Typed labels shall be used, where possible. Handwritten labels shall be printed, using all capitals, with letters and numbers at least 1/8 inch high. Labeling of items within the figure shall be accompanied by arrows pointing to the item.

8.3.10.5.4 Grid lines of graphs shall be at least 1/8 inch apart.

8.3.10.5.5 The items within the figure shall be oriented naturally insofar as possible. For example, height on a graph should be along the vertical axis.

8.3.10.5.6 Tables shall be typed using the following rules: Type style and size shall be the same as that for the rest of the procedure. A heading shall be entered for each column and centered within the column; the first letter of words in the column headings shall be capitalized. The table number and title shall be located above the table field.

8.3.10.5.7 Tabular headings shall be aligned as follows: Horizontally by related entries, vertically by decimal point for numerical entries, and vertically by first letter for word entries. However, run-over lines shall be indented.

8.3.10.5.8 There shall not be a vacant cell in the table. If no entry is necessary, "N.A." shall be entered to indicate not applicable.

8.3.10.5.9 Double spacing between horizontal entries suffices to segregate such entries, although horizontal lines may also be used if desired.

8.3.10.6 Cautions and Notes

The applicable heading "NOTE" and "CAUTION" shall be capitalized and centered. The text of the note or caution shall be block format, double spaced. All words in cautions shall be capitalized. Examples are presented in Subsections 8.3.6.5 and 8.3.6.6.

8.3.10.7 Use of Foldout Pages

When used, a foldout page is treated as a single page. It shall follow the same format as a standard page as described in this procedure except the width is different. The page shall be folded so that a small margin exists between the fold and the right-hand edge of standard pages, to reduce wear of the fold. Foldout pages shall not be used if the foldout section will cover any other procedures as placed in the End Path Manual.

8.3.10.8 Reverse Page Printing

Reverse page printing may be beneficial in order to keep certain curves or limits associated with the procedural text. If this is the case, the curve or limit shall be printed on the reverse side of the previous page in the same orientation as the text page so that it is directly readable by the operator. No text will be placed on the reverse side of a figure so printed, except for standard page header information and the statement "[figure name] printed on reverse side - turn page".

8.4 USE OF EOPs

The EOPs are to be utilized as a set with the Flow Charts as the "entering" media. If no automatic or manual scram signal is present, the operator will utilize his abnormal, annunciator, or normal operating procedures for guidance. If, at any time, the entry condition exists, the operator is directed to utilize the EOPs.

8.5 USE OF OPERATOR AIDS

Operator aids (such as Flow Charts and Checkoffs) will be used to assist the operator in returning the plant to a controlled condition.

8.5.1 Flow Charts

Flow Charts will be used as a job performance aid for immediate operator actions in place of written procedures. They will be plastic coated so that a grease pencil or marker can be used to track progress. Reduced, paper copies of Flow Charts can then be marked up to include in a post scram report.

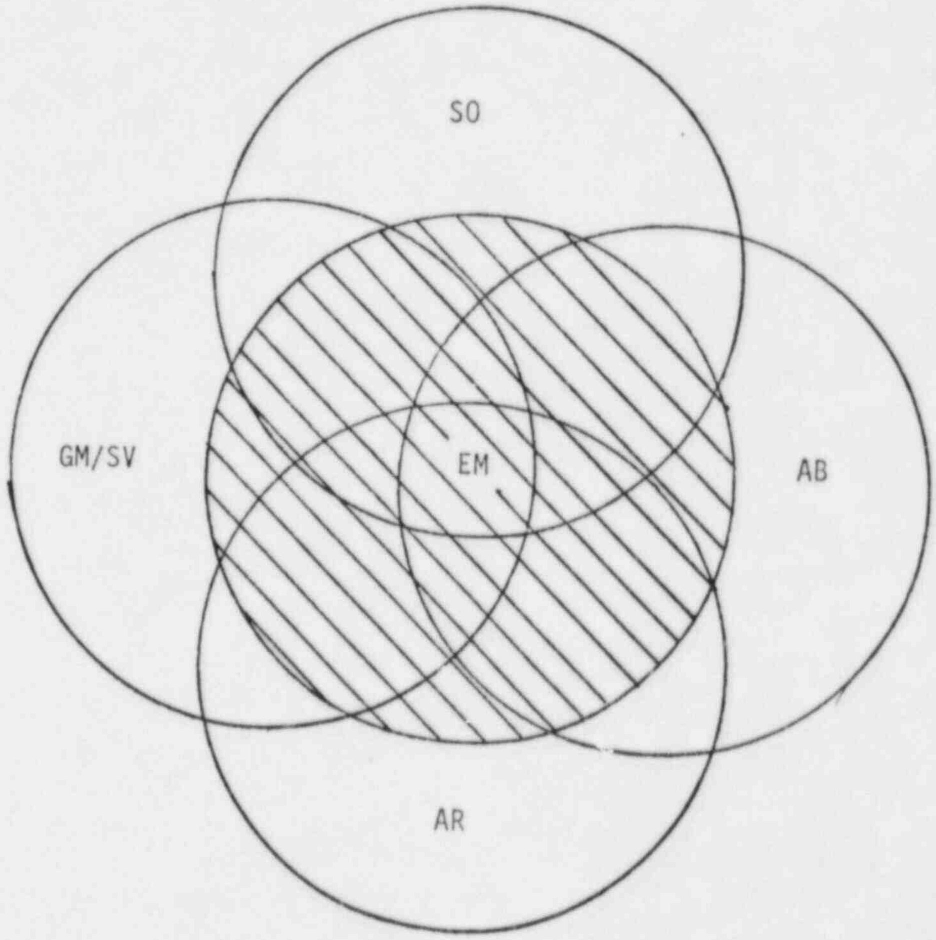
8.5.2 Check Offs

The End Path Manuals will have places for operator initials to track position in the procedure, as specified in section 8.3.6.3.

8.6 EXCEPTIONS

This procedure, a Writer's Guide for the development of Emergency Operating Procedures, should be considered as a guide. Minor variations from these requirements are allowed, such as margins less than one-half inch, caution box not precisely centered, or figure name above the figure vice below. All procedures or revisions written in accordance with this procedure must be individually reviewed and approved by the Plant Review Board, thus ensuring that exceptions will be reasonable.

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: RELATIONSHIP OF EOPs TO OTHER PLANT PROCEDURES	



SO - SYSTEM OPERATING PROCEDURES

AB - ABNORMAL OPERATING PROCEDURES

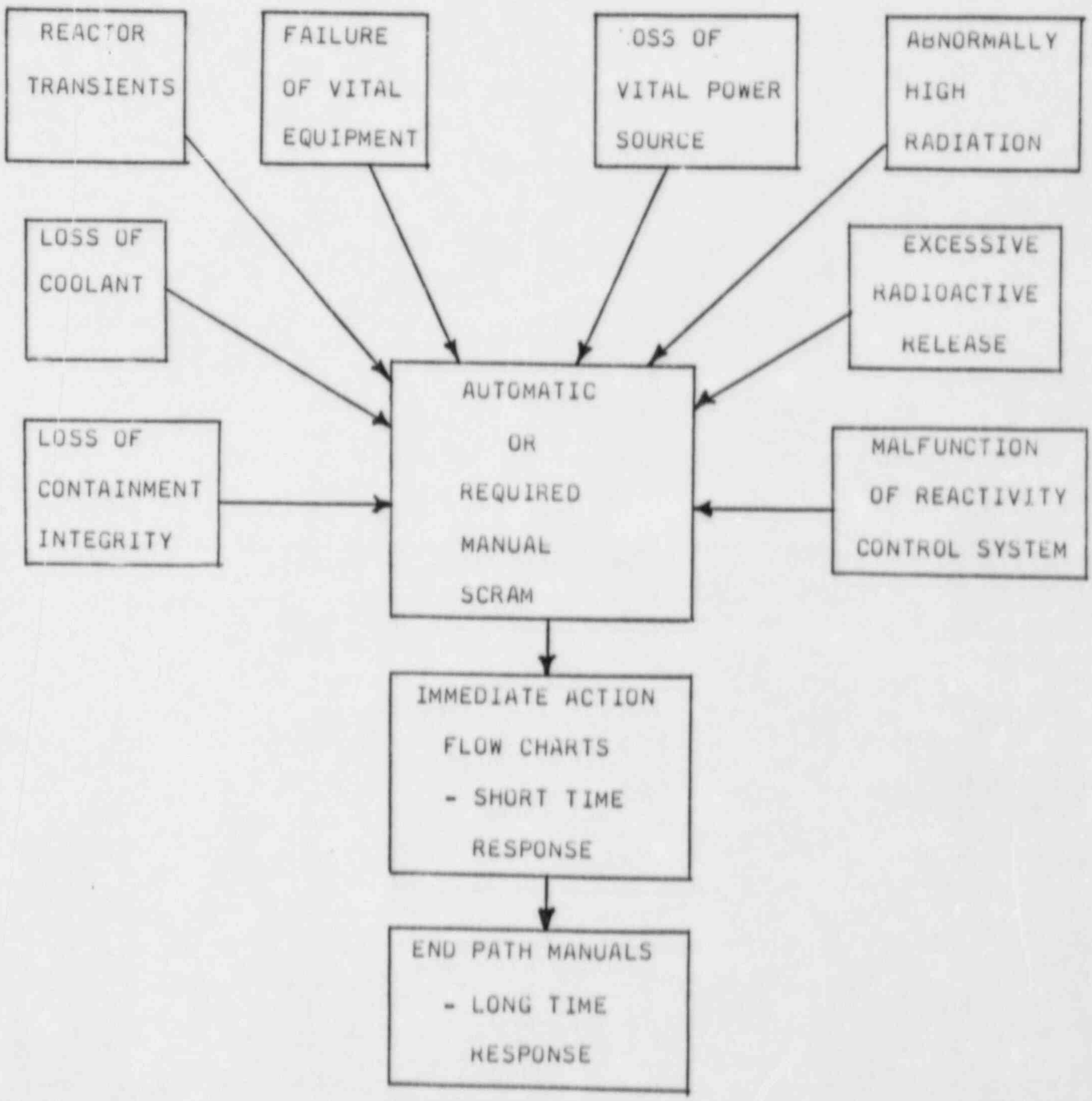
EM - EMERGENCY OPERATING PROCEDURES

AR - ANNUNCIATOR RESPONSE PROCEDURES

GM/SV- GENERAL MAINTENANCE OR SURVEILLANCE PROCEDURES

GEORGIA POWER COMPANY	ATTACHMENT
HATCH NUCLEAR PLANT	PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0

ATTACHMENT TITLE: ENTRY CONDITIONS AND INTERRELATIONSHIP OF EOP FLOW CHARTS AND END PATH MANUALS



GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 2
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: TITLE PAGE FORMAT FOR EOP'S	

INSTRUCTIONS

Block 1 - Procedure page identifier: Page (what) of (how many)

Block 2 - Type of procedure

Block 3 - Complete procedure title

Block 4 - Procedure number

Block 5 - Revision Number (0 for original; 1,2,3, etc. for revisions) (2 locations)

Block 6 - Safety related classification

Block 7 - Approved date

Block 8 - Effective date

Block 9 - Expiration date. If not applicable, enter N/A

Block 10 - General description of the revision

Block 11 - Responsible department manager's signature

Block 12 - Date approved by department manager

Block 13 - General Manager's signature, indicating approval. If not applicable, enter N/A

Block 14 - Date approved. If not applicable, enter N/A

Block 15 - Path number and section number

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 2 OF 2
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: TITLE PAGE FORMAT FOR EOP'S	

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	PAGE OF (1)
DOCUMENT TYPE: (2)	DOCUMENT NUMBER: (4)
DOCUMENT TITLE: (3)	REVISION: (5)
END PATH MANUAL , SECTION (15)	

____ SAFETY RELATED (6)

____ NON-SAFETY RELATED

APPROVED DATE (7) ____

EFFECTIVE DATE: (8) ____

EXPIRATION DATE (9) ____

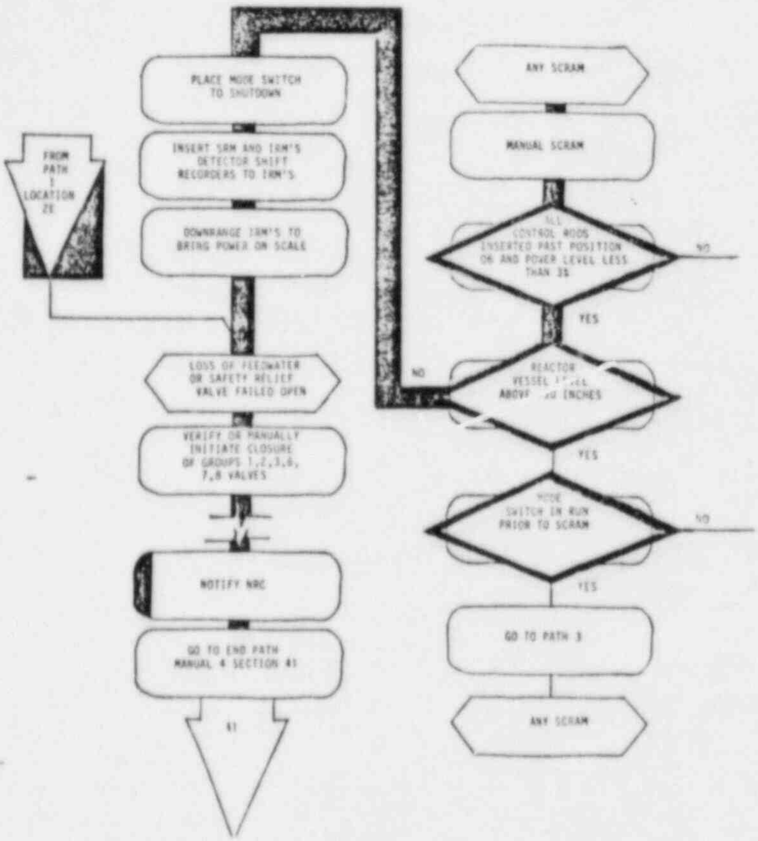
REV. NO. (5)	DESCRIPTION (10)	APPROVED DEPT. MGR. (11)	DATE (12)	APPROVED GEN. MGR. (13)	DATE (14)

SAMPLE

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: DESIGNATION AND NUMBERING OF FLOW CHARTS	

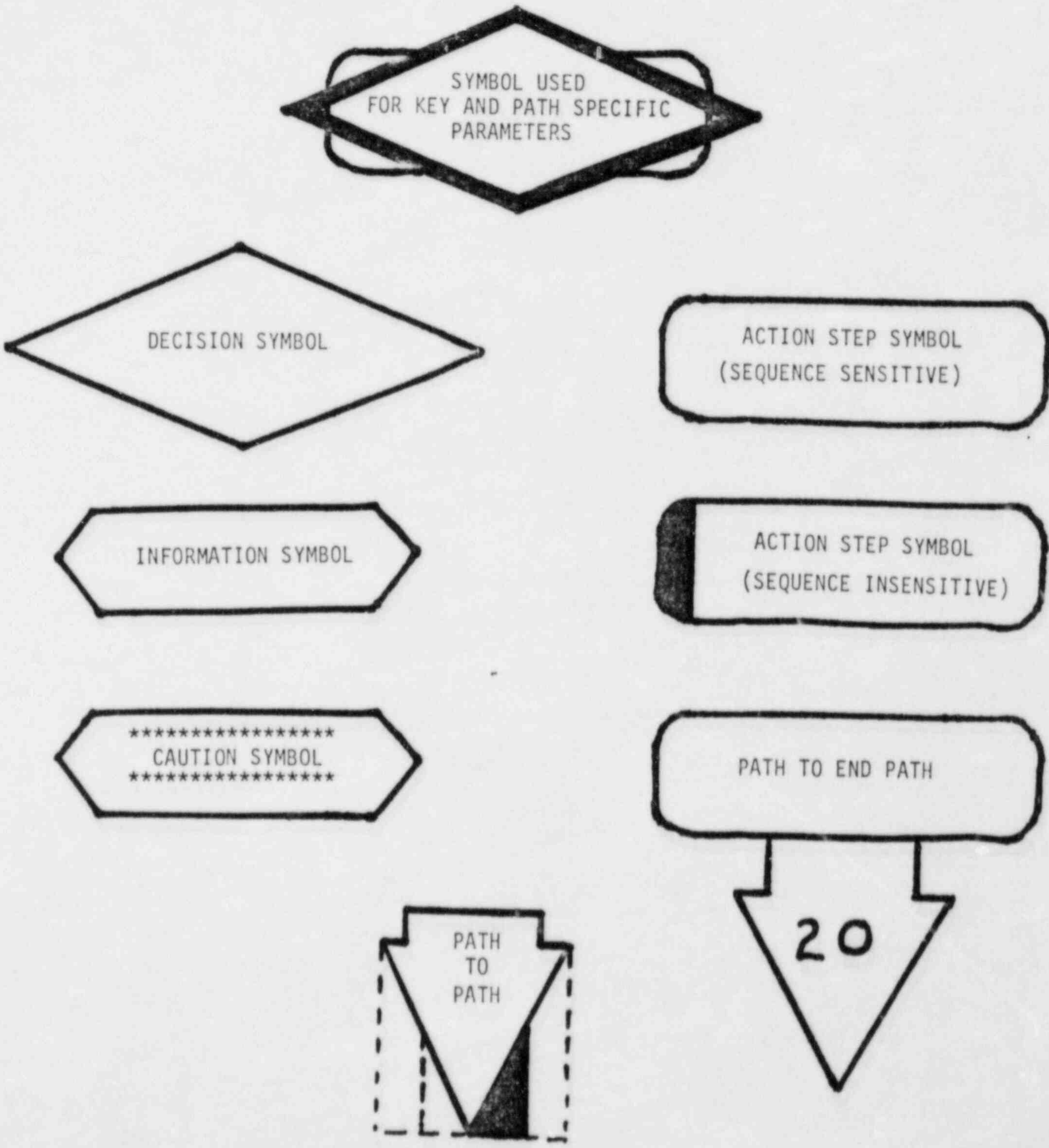
REVISION	DATE
APPROVED BY	DATE
DEPT. MGR.	
GEN. MGR.	

GEORGIA POWER COMPANY
HATCH NUCLEAR PLANT
EOP- I PATH I UNIT I

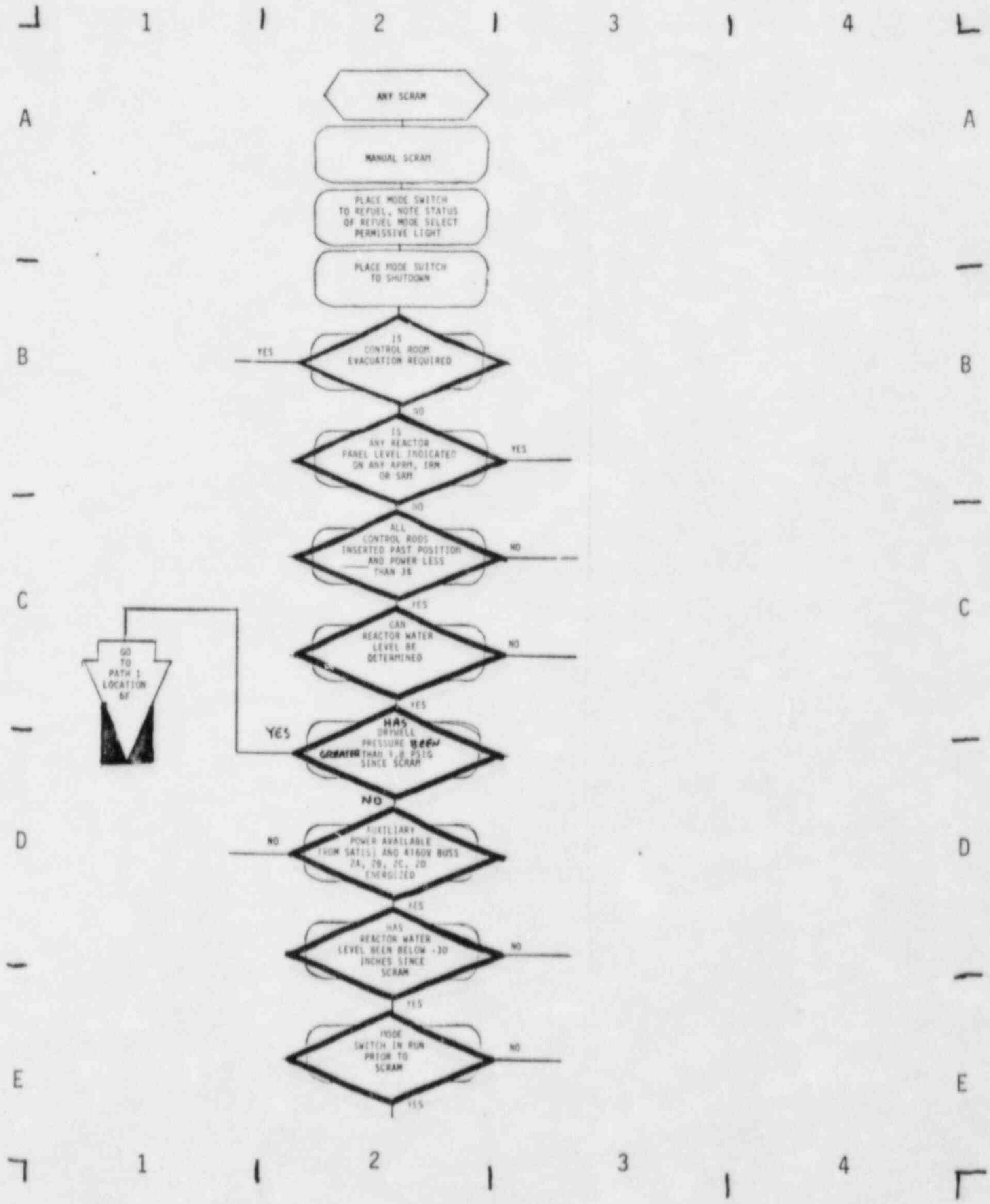


GENERAL CAUTIONS

GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: FLOW CHART LOGIC SYMBOLS	



GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: EXAMPLE DECISION TREE UTILIZING STANDARD LOGIC SYMBOLS	



GEORGIA POWER COMPANY HATCH NUCLEAR PLANT	ATTACHMENT PAGE 1 OF 1
DOCUMENT TITLE: EMERGENCY OPERATING PROCEDURES PLANT-SPECIFIC WRITER'S GUIDE	REVISION: 0
ATTACHMENT TITLE: EXAMPLE DUAL COLUMN PAGE FORMAT	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTION: MONITOR PARAMETERS CLOSELY	
1.0	Check RCS Average Temperature a. Temperature - DECREASING to ___°F	a. Dump steam 1. Manually open condenser steam dump valves
	b. Temperature - less than ____°F 1. Verify feedwater flow control valves CLOSED	
	c. Temperature - STABILIZES at ____°F	c. Stop dumping steam. IF cooldown continues, THEN close main steamline valve
2.0	Establish AFW Flows a. Start AFW pumps b. Align AFW valves OPEN or CLOSE	
	c. Verify AFW flow	c. IF AFW flow NOT verified, THEN go to FR-H-1. LOSS OF SECONDARY HEAT SINK
3.0	Verify all control rods fully inserted	IF two or more control rods NOT fully inserted, THEN emergency borate 5 ppm for each control rod not fully inserted

Left hand column -basic action sequence

Right hand colur -contingencies and transitions

Caution - critical and precautionary information

Contingency action when expected respons not obtained

Transition to another guidelir number and title

Logic statements emphasized IF..THEN

VERB	MEANING/APPLICATION
Adjust	To regulate or bring to a more satisfactory state. EXAMPLE: "Adjust Reactor Water Level setpoint to +36 inches".
Align	To place a system in proper or desired configuration for an intended purpose. EXAMPLE: "Align CAD vaporized to Reactor Building"
Allow	To permit a stated condition to be achieved prior to proceeding. EXAMPLE: "allow discharge pressure to stabilize"
Check	To perform a physical action which determines the state of a variable or status of equipment without directing a change in status. EXAMPLE: "check for satisfactory lube oil level"

VERB	MEANING/APPLICATION
Close	To change the physical position of a mechanical device to the closed position so that it prevents fluid flow or permits passage of electric current. EXAMPLE: "close valve 2B21-F019"
Complete	To accomplish specific procedural requirements. EXAMPLE: "complete valve check-off list 3.7.1", "complete data report QA-1", "complete steps 7 through 9 of Section III"
Establish	To make arrangements for a stated condition. EXAMPLE: "establish communication with control room"
Isolate	To close one or more valves in a system for the purpose of separating or setting apart a complete system or a portion of the system from the rest of the system or plant. EXAMPLE: "isolate interruptible instrument air header by shutting valve 2P51-F011"

VERB	MEANING/APPLICATON
Inspect	To measure, observe, or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included. EXAMPLE: "visually inspect for leaks"
Maintain	To keep in an existing state. EXAMPLE: "maintain the reactor vessel water level between +15 and +55 inches, with one or more of the following systems...."
Open	To change the physical position of a mechanical device to the open position so that it allows fluid flow or prevents passage of electrical current, EXAMPLE: "open valve 2B21-F016". Unless specifically directed otherwise, open means fully open.
Place	To put in a particular position. EXAMPLE: "place mode switch to Shutdown"

VERB	MEANING/APPLICATON
Record	To document specified condition or characteristic. EXAMPLE: "record discharge pressure"
Reduce	To cause a parameter to decrease in value. EXAMPLE: "reduce reactor pressure with bypass valve manual jack"
Set	To physically adjust to a specified value on adjustable feature. EXAMPLE: "set diesel speed to ....rpm"
Start	To energize an electro-mechanical device by manipulation of a start switch or button. EXAMPLE: "start a second CRD pump"
Stop	Opposite of start. EXAMPLE: "stop admitting steam by shutting valve 2B21-F044"
Synchronize	To make synchronous in operation. EXAMPLE: "Synchronize the Diesel Generator to 4160V Bus 2E"

VERB	MEANING/APPLICATON
Throttle	To operate a valve in an inter diate position to obtain a certain flow rate. EXAMPLE: "throttle valve 2B21-F077 to obtain 2000 lb/hr flow"
Trip	To manually activate a semi-automatic feature. EXAMPLE: "trip breaker..."
Vent	To permit a gas or liquid confined under pressure to escape at a vent. EXAMPLE: "vent the heat exchanger before placing it in service"
Verify	To prove to be true, exact, or accurate by observation of a condition or characteristic for comparison with an original or procedural requirement. EXAMPLE: "verify discharge pressure"

HATCH NUCLEAR PLANT

EMERGENCY OPERATING PROCEDURES

PROCEDURES GENERATION PACKAGE

ATTACHMENTS:
1) PLANT-SPECIFIC WRITER'S GUIDE
2) PLANT-SPECIFIC TECHNICAL GUIDELINES UNIT 1
3) PLANT-SPECIFIC TECHNICAL GUIDELINES UNIT 2

TABLE OF CONTENTS

SECTION PAGE

1.0 Introduction

This implementation plan describes the elements of the Hatch Nuclear Plant program for implementing the new symptom-based Emergency Operating Procedures, based upon the generic guidelines for Emergency Operating Procedures, and addresses the concerns identified in NUREG 0899 and Supplement 1 to NUREG 0737. These elements were identified and evaluated by the Emergency Operating Procedures Implementation Assistance (EOPIA) Review Group in accordance with the Activity Network described in the EOPIA Program Description (INPO 82-013). The elements presented are not to be construed as an exhaustive list and are considered to be generic to most plants and organizations. The elements have been reviewed by Georgia Power and are presented herein specifically for Hatch Nuclear Plant Units 1 and 2.

This plan also acts as the cover document for the Hatch Procedures Generation Package required by NUREG 0899, section 7.0. A description of the Validation, Verification, and Operator Training Programs are contained herein, while the Plant Specific Technical Guidelines and Writer's Guide are attached as separate documents.

2.0 Definitions

2.1 Activity Network

The system by which products resulting from the EOPIA Review Group are developed and reviewed by the representatives of the nuclear industry.

2.2 Emergency Operating Procedures (EOPs)

Plant procedures directing operator actions necessary to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system setpoints, engineered safety feature setpoints, or other appropriate technical limits. As implemented at Hatch, EOP's will be post-scram procedures, and will be supplemented by Abnormal Operating Procedures for pre-scram emergency conditions.

2.3 EOPIA Review Group

Representatives from the four owners group subcommittees chartered with the development of Emergency Procedure Guidelines (EPGs), as well as representatives from NSSS vendors, and INPO. See the EOPIA Program (INPO 82-013) for further information.

2.4 Safety Function

A safety function is a function specifically required to keep the plant in a safe condition so that public health and safety will not be endangered.

2.5 Event-Oriented EOPs

Event-oriented EOPs require that the operator diagnose the specific event causing the transient or accident in order to mitigate the consequences of that transient or accident.

2.6 Symptom-Oriented EOPs

Symptom-oriented EOPs provide the operator guidance on how to verify the adequacy of critical safety functions and how to restore and maintain these functions when they are degraded.

Symptom-oriented emergency operating procedures are written in a way that the operator need not diagnose an event, such as a LOCA, to maintain a plant in a safe condition.

2.7 Writer's Guide

The writer's guide provides detailed instructions on how to prepare text and visual aids for Emergency Operating Procedures so that they will be complete, accurate, convenient, and readable to control room personnel. Its recommendations address all aspects of writing these procedures from a human factors standpoint.

2.8 Technical Guidelines

Technical guidelines are documents that identify the equipment or systems to be operated and list the steps necessary to mitigate the consequences of transients and accidents and restore safety functions. Technical guidelines represent the translation of engineering data derived from transient and accident analyses into information presented in such a way that it can be used to write EOPs. There are two types of technical guidelines, as defined below.

2.9 Generic Technical Guidelines

Generic technical guidelines are guidelines prepared for a group of plants with a similar design.

2.10 Plant-Specific Technical Guidelines (PSTG)

Prepared from the Generic Guidelines but reflecting Hatch Nuclear Plant Units 1 and 2 plant specific data, limits, operations and systems.

2.11 HNP

Hatch Nuclear Plant

2.12 Verification

The process/procedure used to verify that:

- The EOPs are technically correct and accurately reflect the technical guidelines
- The EOPs are written correctly and accurately reflect the writer's guide requirements
- The controls and instrumentation called out in the EOPs actually exist and verbatim nomenclature has been used

This process will be performed prior to implementation.

2.13 Validation

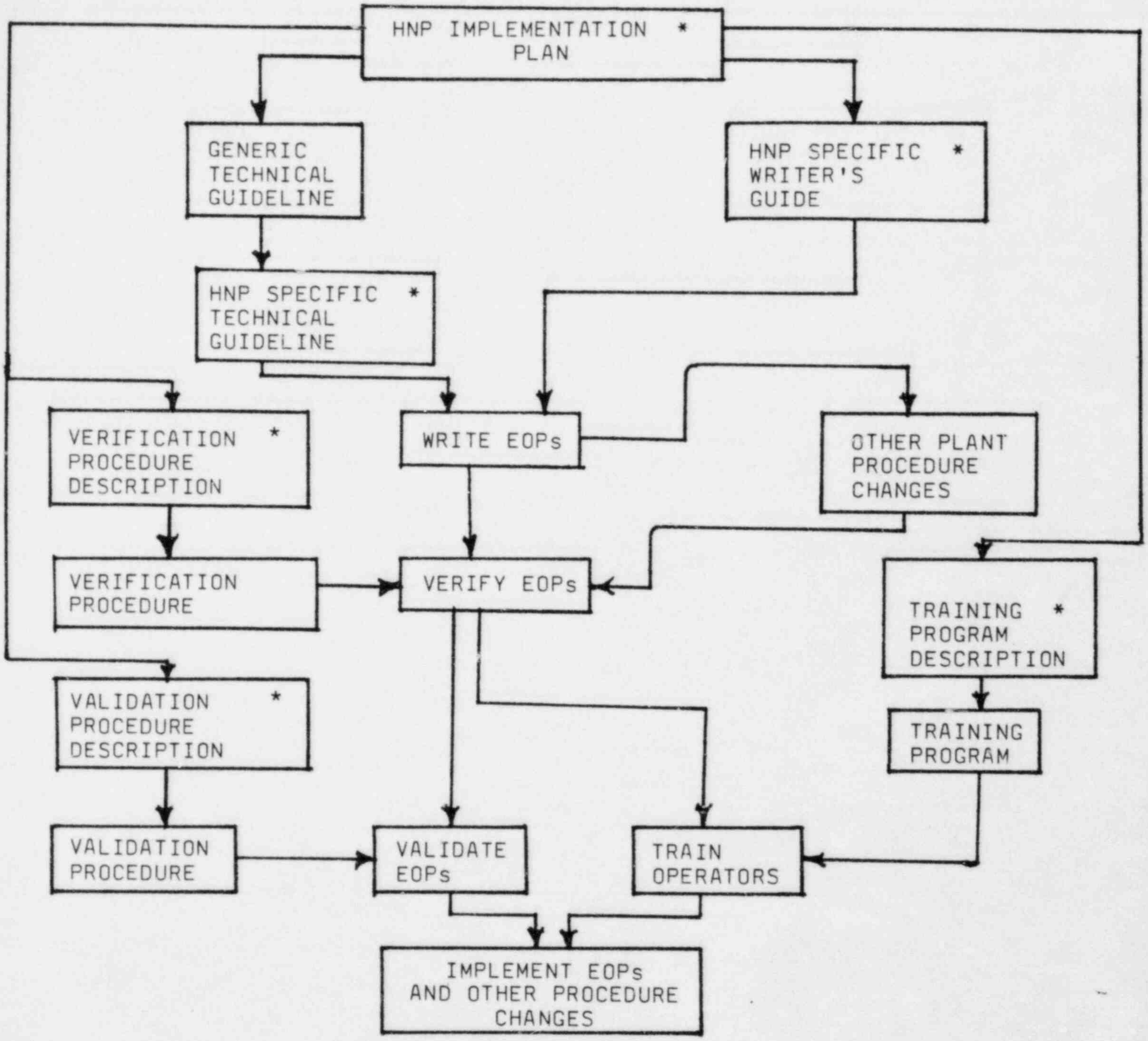
The process/procedure used to determine that:

- The EOPs are usable in that they can be understood and followed without confusion, delays, errors, etc.
- The operations called out in the EOPs can be performed
- The language and level of information presented in the EOPs is compatible with the minimum number, qualification, training, and experience of the operating staff
- There is a high level of assurance that the procedures will provide the operator the guidance he needs to mitigate the effects of transients and accidents

This process will be performed in parallel with operator training and during EOP development.

3.0 Implementation Elements

3.1 Organization of Implementation Elements



* In Procedures Generating Package

3.2 Crew and Shift Policy Characteristics

The scope and structure of the EOPs must be compatible with the crew and shift staffing levels, the crew and shift composition, and the control room layout.

3.2.1 Control Room Staffing and Division of Responsibilities

The division of responsibility and leadership among the control room personnel, differing staff capabilities between shifts, and the turnover in control room shift crews, make the goals of this section difficult to achieve. However, the following guidelines are important to the efficient and accurate development and execution of EOPs, and have been followed to the extent possible.

3.2.2 Division of Responsibility

During an emergency, it is vital that the actions of the control room staff be carried out efficiently and accurately. This will be determined in part by the quality of the EOPs and the training of the operators. However, for the benefit of good procedures and training to be realized, it is important that control room personnel operate as a team with pre-established leadership roles and divisions of responsibility.

3.2.3 Staffing of the Control Room

The number and qualifications of personnel available in the control room will determine the number of sequential actions, concurrent actions and other responsibilities that can be carried out, and the efficiency with which they can be carried out. The following goals have been considered in writing the EOPs.

- Minimizing physical conflicts between personnel (carrying out actions at the same locations at the same time, or crossing paths)
- Avoiding unintentional duplication of tasks by control room personnel
- Ensuring that the control room supervisor is able to keep up with staff actions and plant status

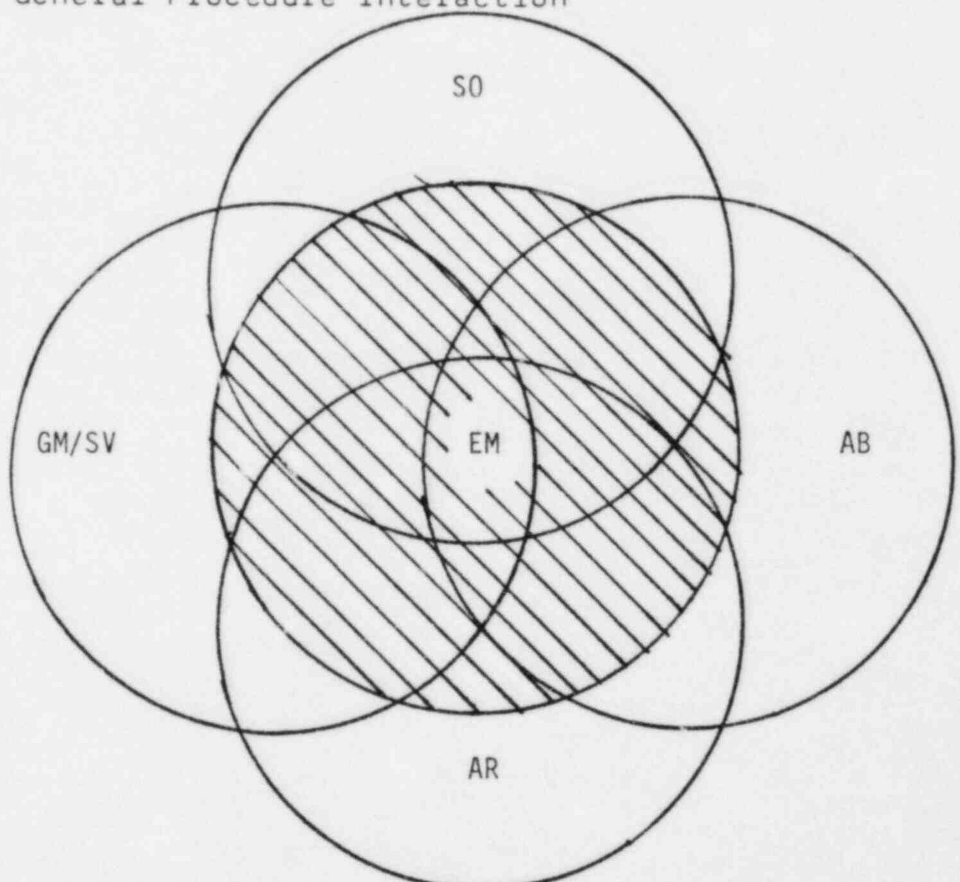
3.2.4 Consistency Between Staffing and Procedures

The EOPs have been structured so that the number of people required to carry out sequential actions, concurrent actions, and other responsibilities, does not exceed the minimum shift staffing required by the Technical Specifications.

3.3 Procedures System and Network

EOPs are but one of many types of procedures within the plant procedures system. Their relationship to other plant procedures is the procedure network (shown pictorially below). This network has been considered during EOP development to ensure continuity of the EOPs and other plant procedures.

3.3.1 General Procedure Interaction



SO - System Operating Procedures

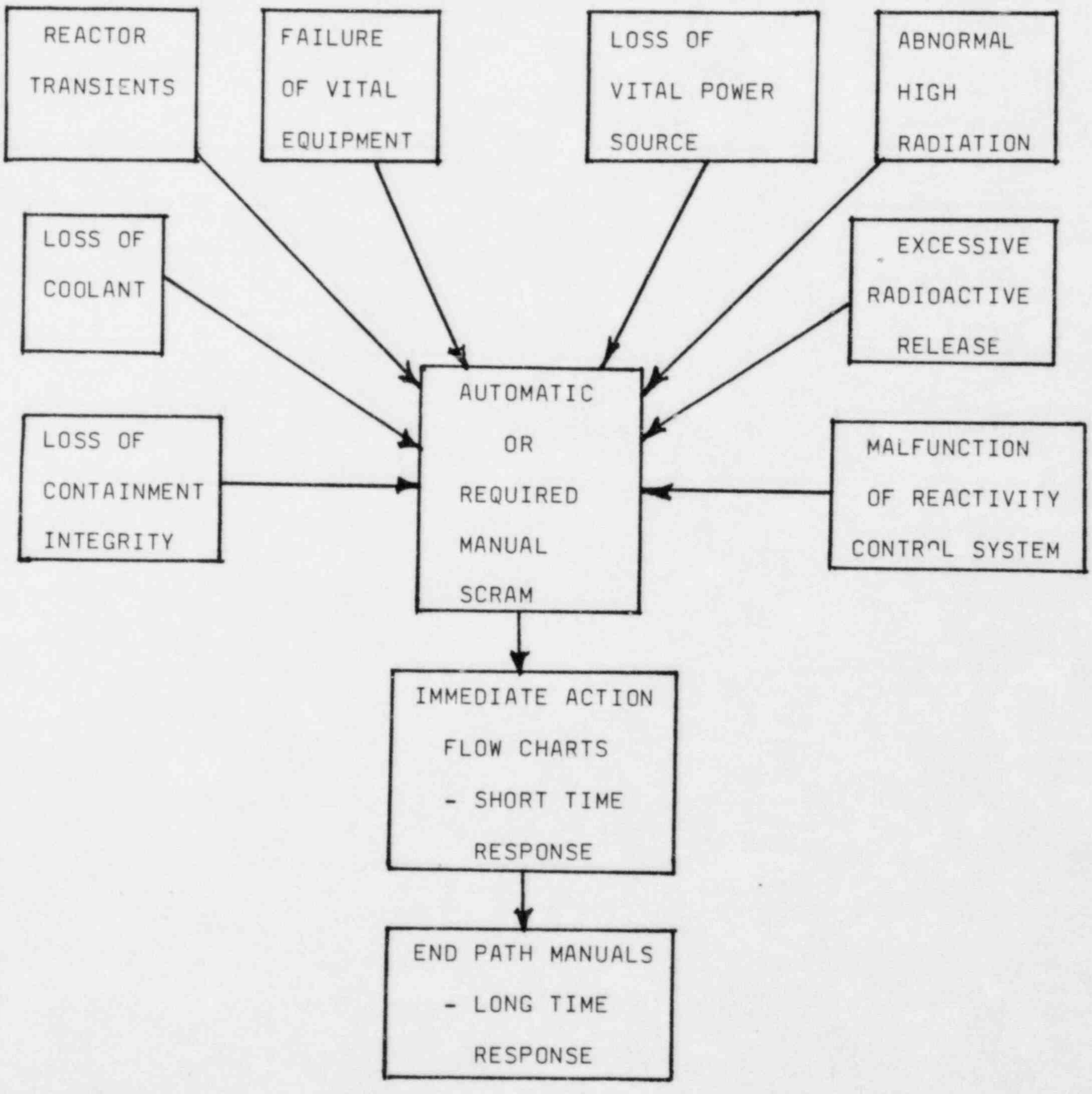
AB - Abnormal Operating Procedures

AR - Annunciator Response Procedures

GM/SV-General Maintenance or Surveillance Procedures

EM - Emergency Operating Procedures

3.3.2 EOP Entry Conditions and Interrelationship of EOP Flow Charts and End Path Manuals.



3.3.3 Existing Event Procedures and EOP Support Procedures

A review of existing HNP procedures series 1000, 1100-1700, 1900 and 2000 will be made with the following objectives:

- Identification and development of plant procedure revisions essential to support implementation of the EOPs
- Identification and review of plant procedures referenced by the EOPs that must be changed prior to EOP implementation
- Identification and reclassification of existing procedures within the procedure system network

3.4 Technical Guideline Use

To effectively use the information provided by technical guidelines, the methodology used to convert this material into EOPs must be adequately detailed in describing how the technical guidelines will be used.

Plant Hatch will use the two types of technical guidelines (generic and plant-specific) as follows:

3.4.1 Generic Technical Guidelines

Technical guidelines prepared by a group of plants or by owners groups for plants with a similar design. These guidelines, validated and supported by extensive engineering analysis, will be the document from which the plant-specific technical guidelines are derived. The Georgia Power QA Program will be utilized to verify that the plant-specific technical guidelines are true to the generic technical guidelines.

3.4.2 Plant-Specific Technical Guidelines (PSTG)

Technical guidelines will be prepared for Plant Hatch from the generic technical guidelines formulated by the BWR Owners Emergency Procedure Subgroup. These generic guidelines (Revision 3) have been reviewed and approved by the NRC in SER dated November 23, 1983. The Plant-Specific Technical Guideline will be used to develop the EOPs and other support procedures. This process will be verified and validated per section 3.6 and 3.7.

3.5 Writer's Guide for EOPs

This document is part of the Procedures Generation Package, prepared in accordance with the guidance provided by INPO and NUREG 0899, and will be controlled as a Hatch procedure 30AC-OPS04-0.

3.6 EOP Verification

EOP Verification will consist of ensuring that the EOP's are technically correct (accurately reflecting the plant-specific technical guidelines), that they are written correctly (accurately reflecting the plant-specific writer's guide requirements), and that controls and instrumentation called out in the EOP's actually exist and verbatim nomenclature has been used. EOP verification will be performed prior to the start of operator training, and will be performed in accordance with supplement 1 of NUREG 0737 (and NUREG 0899 and INPO guidelines for EOP verification as they apply). This process will identify any deviation from the PSTG, and describe any analysis performed to determine the safety significance of the deviation, and provide a technical justification to the plant specific approach, as required. Note that the generic EPG's identify all available BWR equipment, regardless of plant model. The EPG instructions specify that for any equipment so identified, but not existing in the plant of interest, the reference to it should simply be deleted. For example, EPG step RC/L-2 requires the operator to restore and maintain Reactor Water level with one or more of the following systems: condensate/feed, CRD, RCIC, HPCI, HPCS, LPCS, and LPCI. Plant Hatch does not have a HPCS, and deleting it from the PSTG in accordance with EPG instruction on page I-2 (Rev. 3) does not alter the safety significance of the step, and no additional plant unique analysis is necessary.

Additionally, during the development of the EOP's using the EPG's, plant specific information will be inserted between guideline steps to enable the operator to perform the steps properly. For example, to feed the Reactor vessel with the condensate/feed system following a scram from high power, the startup level control valve needs to be put into service to ensure that, should an SRV stick open and reactor pressure fall below the shutoff head of the condensate booster pumps, the vessel and steam lines will not be flooded, preventing thermal shock to the vessel and damage due to water hammer. Therefore, the steps necessary to put the startup level control valve in service to meet RC/L-2 will be inserted into the Emergency Operating Procedures with step RC/L-2. Since these types of additions do not change the sequence of steps or the intent of the generic EPG's as reflected in the PSTG, additional analysis or technical justification need not be provided. The actual verification process will be performed by Plant Hatch Shift Technical Advisors, and will be fully documented by writing a Plant Review Board-approved procedure and executing the procedure. This will also support efforts at implementation of future NRC-approved revisions to the EPG and subsequent re-verification of subsequent EOP revisions.

Since verification will be completed prior to initial EOP implementation at Plant Hatch, any discrepancies found during verification will also be completely resolved prior to approval and implementation of Rev 0 of the EOP's. Note that verification is a two-phase process. Phase 1 is performed prior to start of operator training and covers the entire set of EOP's. Phase 2 is the verification of individual revisions entered during training resulting from the validation program.

3.7 EOP Validation

EOP Validation will consist of ensuring that the language and level of information presentation in the EOPs are compatible with the qualifications, training and experience of the operating staff,and that there is a high level of assurance that the procedures will work, i.e., the procedures guide the operator in mitigating transients and accidents. EOP Validation will be performed in parallel with operator training, and will be performed in accordance with supplement 1 of NUREG 0737 (and NUREG 0899 and INPO guidelines for EOP validation as they apply). An estimated 20 man-weeks will be spent in the Hatch plant-specific simulator, with participation by Hatch STA's and reactor operators, developing and validating the EOP's (utilizing multiple-event scenarios extensively) before operator training begins. This work will be fully documented including a list of scenarios run and significant results. During operator training (approximately 1 year period), many additional man-weeks will be spent in the simulator with evaluation of operator response and operator feedback included in the validation.

Actual plant walk-throughs will be conducted on a case basis to ensure that the simulator represents the plant correctly and that in-plant name plates are used for proper nomenclature of equipment. Extensive table-top reviews will be performed during development, especially utilizing the STA/reactor operator member of the development team, and a record of problems and resolution will be kept. Additionally, initial operator training will be in-classroom table-top use of the EOP's, and operator feedback will be recorded. Note that simulator scenarios will be chosen randomly until all possible paths down the EOP Flow Charts are followed, thus ensuring complete coverage.

Documentation will include records of operator comments, changes made as a result, exam results, simulator records, and operator simulator performance records.

3.8 EOP Training

The following elements will be included in the EOP Training Program:

- Type of operator training (initial, refresher)
- Method of operator training (simulator, self-study, classroom)
- Operator knowledge and skill level requirements
- Procedure limitations requiring operator decision-making
- Training material needed
- Method for operator feedback into the training program and EOP development
- Consideration of the effect on current plant operation while training operators on [illegible]'s not yet in place at the plant

3.8.1 Course Description

3.8.1.1 Course Title: Initial Training Course for Symptomatic Emergency Operating Procedures at Hatch Nuclear Plant.

3.8.1.2 Description: An introduction to the new concept of Symptomatic Emergency Operating Procedures which are to replace the current Emergency Operating Procedures.

During this course, the background for the new type procedures will be discussed including the events that led up to the changes and why it was necessary to make these changes.

The course will be conducted in the classroom and at the simulator.

3.8.1.3 Duration: Approximately 168 hours

3.8.1.4 Objectives: upon satisfactory completion of this course, the participant will be able to:

- Explain the background that led up to the development of the new procedures and why the change was made from "Event Based" Procedures to "Symptom Based" Procedures.
- Demonstrate an acceptable level of skill in the use of the new procedures during simulated emergency conditions.
- Understand basis for and be able to use the various new graphs and limits in the new EOPs.

3.8.1.5 Prerequisites: Should have Reactor Operator (RO) level of knowledge of GE-BWR plant operation for Module 1. Modules must be taken in order given here, since each module assumes the information of previous modules.

3.8.1.6 Participant Eligibility: This course is appropriate for licensed Reactor Operators (RO), Senior Reactor Operators (SRO), individuals who are in training for an operator's license and other plant personnel who are familiar with plant operation and frequently monitor or review operational events.

3.8.1.7 Materials Required:

- Instructional Handout for this Course
- Chalkboard
- Overhead Projector
- Current HNP Procedures
- New Symptomatic Emergency Operating Procedures Including Flowcharts and End Path Manuals
- Generic Emergency Procedure Guidelines
- HNP Specific Technical Guidelines
- All changed HNP Procedures
- Appendices to Emergency Procedure Guidelines that contain bases.

3.8.2 Module 1

BACKGROUND

- ANS STANDARDS FOR EMERGENCY PROCEDURES ANS 3.2
- THREE MILE ISLAND ACCIDENT
- NRC GUIDANCE FOLLOWING THE TMI ACCIDENT
- ESSEX CORPORATIONS REVIEW OF TMI
- BWR (GE) OWNERS' GROUP
- STUDY
- QUIZ

TIME

MODULE	-	4 hours
STUDY	-	1 hour
QUIZ	-	1/2 hour

3.8.3 Module 2

EXISTING EVENT ORIENTED PROCEDURES

- REVIEW INSTRUCTIONS CURRENTLY USED BY OPERATIONS PERSONNEL
- PHILOSOPHY OF EMERGENCY INSTRUCTIONS - WHAT ACTUALLY CONSTITUTES AN EMERGENCY
- SYMPTOM ORIENTED VERSUS EVENT ORIENTED EMERGENCY INSTRUCTIONS
- USE OF CURRENT EMERGENCY INSTRUCTION IN THE EVENT OF MULTIPLE FAILURES
- DISADVANTAGES OF CURRENT EMERGENCY INSTRUCTIONS
- SUMMARY
- STUDY
- QUIZ

TIME

MODULE	-	4 hours
STUDY	-	1 hour
QUIZ	-	1/2 hour

3.8.4 Module 3

BWR (GE) OWNERS' GROUP GUIDELINES AND HNP SPECIFIC GUIDELINE

- INTRODUCTION TO GUIDELINES
  - HNP SPECIFIC GUIDELINE
  - HNP SPECIFIC GUIDELINE APPENDIX
- OPERATOR CAUTIONS
- REACTOR PRESSURE VESSEL CONTROL GUIDELINES
- PRIMARY CONTAINMENT CONTROL GUIDELINES
- SECONDARY CONTAINMENT CONTROL GUIDELINES
- RADIOACTIVITY RELEASE CONTROL GUIDELINE
- CONTINGENCIES
- SUMMARY
- STUDY
- QUIZ

TIME

MODULE - 16 hours

STUDY - 6 hours

QUIZ - 3 hours

3.8.5 Module 4

BASES FOR EOP

GUIDELINES, CURVES, LIMITS

- BASIS FOR GENERAL CAUTIONS.
  - HOW GENERAL CAUTIONS ARE USED
- BASIS FOR SPECIFIC CAUTIONS
  - HOW SPECIFIC CAUTIONS ARE USED
- BASIS FOR GUIDELINE STEPS
- BASIS FOR ALL CURVES AND LIMITS
  - HOW TO READ, INTERPRET AND USE
- SUMMARY
- STUDY
- QUIZ

<u>TIME</u>

MODULE - 24 hours

STUDY - 4 hours

QUIZ - 2 hours

3.8.6 Module 5

APPROACH TO BWR OWNERS' GROUP GUIDELINES AND NEW EOPs

- FLOWCHARTS
- END PATH PROCEDURES
- SYSTEM RECOVERY
- CONTINGENCIES
- CONTAINMENT CONTROL GUIDE
- ANTICIPATED TRANSIENT WITHOUT SCRAM - ATWS
- HOW EXISTING PROCEDURES ARE TO BE MODIFIED
- SUMMARY
- STUDY
- QUIZ

<u>TIME</u>

MODULE - 16 hours

STUDY - 4 hours

QUIZ - 2 hours

3.8.7 Module 6

USE OF NEW EMERGENCY PROCEDURES

- SYMBOLS USED ON FLOWCHARTS
- GENERAL DESCRIPTION OF THE FIVE FLOWCHARTS - PATHS
- TECHNIQUES FOR CHART AND END PATH PROCEDURE USE
- SINGLE FAILURE EVENT - CHART AND END PATH EXERCISE
- MULTIPLE FAILURE EVENT - CHART AND END PATH EXERCISE
- ADVANTAGES OF NEW PROCEDURES
- SUMMARY
- STUDY
- QUIZ

<u>TIME</u>

MODULE - 24 hours

STUDY - 6 hours

QUIZ - 2 hours

3.8.8 Module 7

SIMULATOR TRAINING USING NEW SYMPTOMATIC EMERGENCY PROCEDURES

- ENTRY CONDITION - REACTOR SCRAM
- SYMPTOMS
- IMMEDIATE ACTIONS
- END PATH MANUALS
- PATH CHANGES
- FLOWCHART EXERCISES
  - SINGLE EVENT
  - MULTIPLE EVENT
- CONTINGENCIES
- SIMULATOR EVALUATION OF EACH TRAINEE

<u>TIME</u>

MODULE - 40 hours

3.8.9 Module 8

COURSE REVIEW

- SUMMARY OF MODIFIED PROCEDURES
- SUMMARY OF FLOW CHARTS
- SUMMARY OF END PATH MANUALS
- RESPONSE TO QUESTIONS/COMMENTS FROM ATTENDEES THROUGHOUT COURSE
- SUMMARY OF CURVES/LIMITS
- STUDY
- FINAL EXAM

TIME

MODULE - 4 hours

STUDY - 1 hour

FINAL EXAM - 3 hours

3.9 Revision, Review and Approval Process

Revision, review and approval of the EOPs and new support procedures will be in accordance with the existing Plant Hatch procedure "Preparation and Control of Procedures" (10AC-MGR03-0).

3.10 EOP Control

EOPs will be controlled within the existing plant document control system and in accordance with the Hatch procedure "Preparation and Control of Procedures" (10AC-MGR03-0) and "Emergency Operating Procedures Program (Writer's Guide)" (30AC-OPS04-0).

3.11 Supporting Documentation Control

The process used to develop the Plant Specific Technical Guidelines will be documented in sufficient detail to show the flow of information from its analytical base to its use in the development of technical guidelines, thereby providing a complete documentation package. The development process includes documentation of the assumptions, references to the results of the analysis, and a description of the actual process used to generate the technical guidelines. This information, to be incorporated into an appendix to the HNP Specific Technical Guideline, will become, along with the guidelines themselves (Generic and Plant Specific), controlled documents subject to the existing plant procedures for control of these types of documents.

3.12 Experience Feedback

To ensure that the EOPs are maintained in a manner that is responsive to operating experience, the existing HNP procedures will be used to incorporate applicable recommendations derived from review of operating experiences and operator comments. Procedure change recommendations may be provided by plant operators, NSSS vendors, owners groups, other utility groups, industry groups, utilities and the NRC. Plant Hatch assesses these recommendations and makes appropriate changes in accordance with administrative procedures for control of changes to procedures (see section 3.9). In addition, feedback from operator training and from plant audits will be considered as potential input for procedure modifications.

3.12.1 On-Going Evaluation

The EOP's will be subject to the normal periodic review of all Hatch procedures in accordance with 10AC-MGR03-0.

3.13 Updating EOP's

When changes occur in the plant design, Technical Specifications, Technical Guidelines, Writer's Guide, other plant procedures or control room that will affect the EOPs, the EOPs will be revised on a timely basis to reflect these changes. In addition, when operating and training experience, simulator exercises, control room walk-throughs, or other information indicate that incorrect or incomplete information exists in the EOPs, the EOPs should be revised on a timely basis. These changes should be reviewed to ensure consistency with the Technical Guidelines and the Writer's Guide. Operators have been encouraged to suggest improvements to EOPs.