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LEMPGES,T.E. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION
VASSALLO,D.B. Operating Reactors Branch 2

SUBJECT: Forwards marked-up procedures generation package for implementing symptom-based emergency operating procedures, per Suppl 1 to NUREG-0737 for comment.

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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

March 1, 1984

Director of Nuclear Reactor Regulation
Attention: Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Dear Mr. Vassallo:

Provided herein is the Nine Mile Point Unit 1 Procedures Generation Package for implementing the symptom based Emergency Operating Procedures. As outlined in Supplement 1 to NUREG-0737, the package includes:

(1) a description of the method for developing plant specific Emergency Operating Procedures from generic guidelines;

(2) the Emergency Operating Procedures Writer's Guide;

(3) a description of the Verification/Validation Program; and

(4) a description of the Training Program.

Supplement 1 to NUREG-0737 indicates that implementation of the Emergency Operating Procedures is not contingent on Nuclear Regulatory Commission review and approval of the Procedures Generation Package. However, Niagara Mohawk requests that significant comments be transmitted to us as expeditiously as possible to allow for consideration in the implementation process.

Sincerely,

NIAGARA MOHAWK POWER CORPORATION

T. E. Lempges
Vice President
Nuclear Generation

TEL/BDW:slw
Enclosure

A003
1/1

Nine Mile Point Unit 1
Procedures Generation Package

Niagara Mohawk Power Corporation
March 1, 1984

CONTENTS

ATTACHMENT 1

Method for Developing Plant Specific Emergency Operating Procedures from Generic Emergency Procedure Guidelines

Method for Developing Plant Specific Emergency Operating Procedures from Generic Emergency Procedure Guidelines

Niagara Mohawk Power Corporation is a participant in the Boiling Water Reactor Owners Group Committee for developing generic Emergency Procedure Guidelines. Revision 3 of the Guidelines has been reviewed and accepted by the Nuclear Regulatory Commission, as noted in the staffs' November 23, 1983 Safety Evaluation Report. The Boiling Water Reactor Owners Group generic Emergency Procedure Guidelines will form the basis for the Nine Mile Point Unit 1 specific Emergency Operating Procedures. Changes to the Emergency Procedure Guidelines will be appropriately incorporated into the Nine Mile Point Unit 1 plant specific Emergency Operating Procedures only after Nuclear Regulatory Commission review and acceptance has been obtained.

The personnel involved in developing the Nine Mile Point Unit 1 plant specific Emergency Operating Procedures are members of the plant's operating staff. Niagara Mohawk has participated in the Emergency Procedure Guideline Committee of the Boiling Water Reactor Owners Group since its inception. Therefore, familiarity with the plant and the generic Emergency Procedure Guidelines is assured.

Plant specific information will be reviewed for inclusion in the Emergency Operating Procedures during the conversion from the generic Guidelines. Sources for plant specific information include the Nine Mile Point Unit 1 Final Safety Analysis Report, Technical Specifications, existing Special Operating Procedures, normal Operating Procedures, and as built plant drawings. Extensive operating experience provides an additional source of information.

The generic Emergency Procedure Guidelines will be reviewed step by step, substituting in plant specific information as appropriate. This will result in plant specific Emergency Procedure Guidelines. The plant specific Emergency Procedure Guidelines will be reviewed for technical accuracy in accordance with the Emergency Operating Procedures Verification Program. This review will insure that plant design features and system configurations which have been incorporated into the plant specific guidelines are consistent with the underlying philosophy and technical basis of the generic Emergency Procedure Guidelines. Calculations performed to determine or support plant specific numbers, limits, or curves will receive an independent review, in accordance with Niagara Mohawk's Quality Assurance Program. The plant specific Emergency Operating Procedures will then be generated in accordance with the methods described in the Writers Guide. For illustrative purposes, a marked-up copy of the "RPV Control" section from the generic Emergency Procedure Guidelines and a preliminary draft of the plant specific Emergency Procedure Guidelines are attached.

As described in subsequent sections, the Emergency Operating Procedures will be subject to verification and validation programs prior to implementation.

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT 1
NUCLEAR STATION

~~PREPUBLICATION DRAFT~~

EMERGENCY PROCEDURE GUIDELINES

Revision 0

February, 1984

~~BWR 1 through 6~~

~~December 8, 1982~~

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT 1
NUCLEAR STATION

~~PREPUBLICATION DRAFT~~

EMERGENCY PROCEDURE GUIDELINES

Revision 0

February, 1984

~~BWR 1 through 6~~

~~December 8, 1982~~

TABLE I

ABBREVIATIONS

ADS	-	Automatic Depressurization System
APRM	-	Average Power Range Monitor
CRD	-	Control Rod Drive
EC	-	Emergency Condenser
ECCS	-	Emergency Core Cooling System
EVS	-	Emergency Ventilation System
HCU	-	Hydraulic Control Unit
~~HPCI~~	~~-~~	~~High Pressure Coolant Injection~~ NA
~~HPCS~~	~~-~~	~~High Pressure Core Spray~~ NA
HVAC	-	Heating, Ventilating and Air Conditioning
~~IC~~	~~-~~	~~Isolation Condenser~~ (see EC)
LCO	-	Limiting Condition for Operation
LOCA	-	Loss of Coolant Accident
~~LPCI~~	~~-~~	~~Low Pressure Coolant Injection~~ NA
LPCS	-	Low Pressure Core Spray
MSIV	-	Main Steamline Isolation Valves
NDTT	-	Nil-Ductility Transition Temperature
NPSH	-	Net Positive Suction Head
~~RCIC~~	~~-~~	~~Reactor Core Isolation Cooling~~ NA
~~RHR~~	~~-~~	~~Residual Heat Removal~~ NA
RPS	-	Reactor Protection System
RPV	-	Reactor Pressure Vessel
~~RSCS~~	~~-~~	~~Rod Sequence Control System~~ NA
RWCU	-	Reactor Water Cleanup
~~SBGT~~	~~-~~	~~Standby Gas Treatment~~ (see EVS)
SLC	-	Standby Liquid Control
SORV	-	Stuck Open Relief Valve
~~SPMS~~	~~-~~	~~Suppression Pool Makeup System~~ NA
SRV	-	Safety Relief Valve

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 a [procedure developed from the Emergency Procedure Guidelines] occurs, enter that procedure. When it is determined that an emergency no longer exists, enter [normal 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.

NO LPCI system

CAUTION #~~3~~ 4

Suppression pool temperature is determined by averaging the indicated values of the bulk suppression pool temperature meters located on "K" panel. ~~[procedure for determining bulk suppression pool water temperature].~~ Drywell temperature is determined by ~~[procedure for determining drywell atmosphere average temperature].~~ Containment temperature is determined by ~~[procedure for determining Mark III containment atmosphere average temperature].~~ averaging the indicated values of the Drywell Temperature meters located on "L" panel.

CAUTION #~~4~~ 5

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

Temperature[*]	Indicated Level	Instrument	
any	617 in.	Shutdown Range Level	(500 to 900 in.)
107°F	-107 in.	Wide Range Level	(-150 to +60 in.)
310°F	19 in.	Narrow Range Level	(0 to +60 in.)
545°F	168 in.	Fuel Zone Level	(200 to 500 in.)

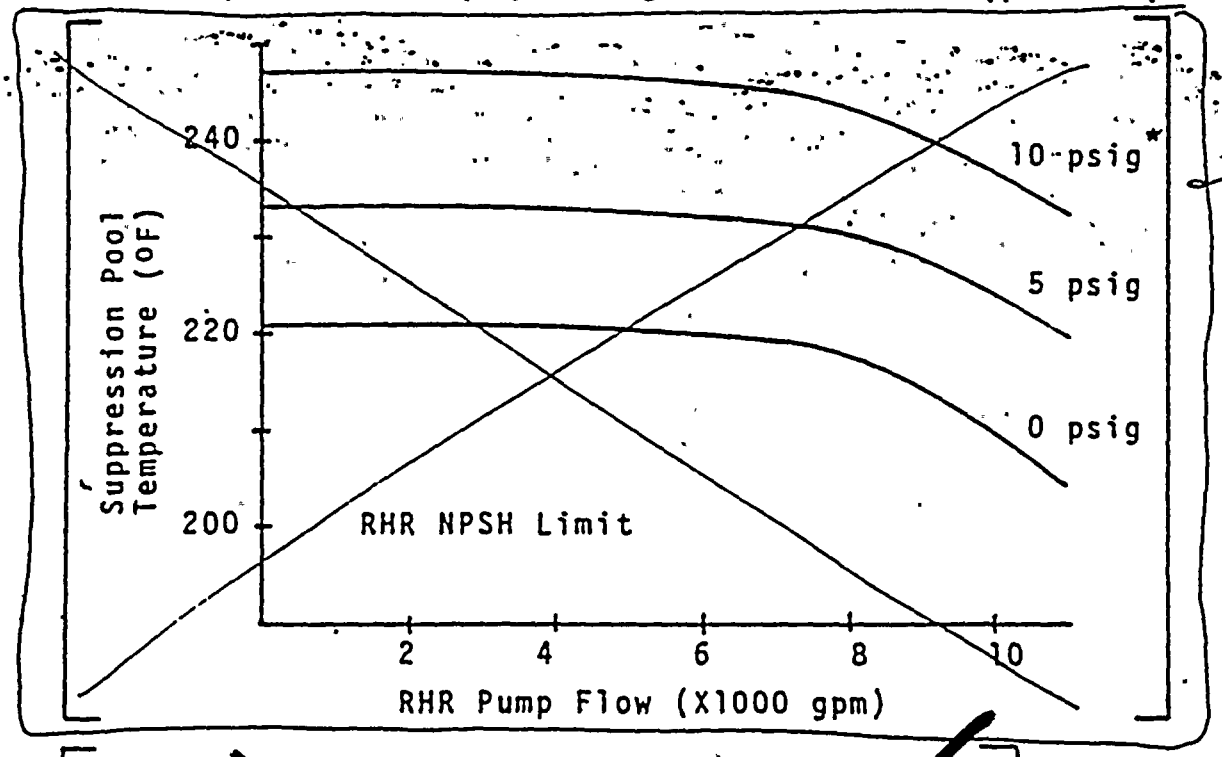
[*List in order of increasing temperature.]

CAUTION #~~5~~ 6

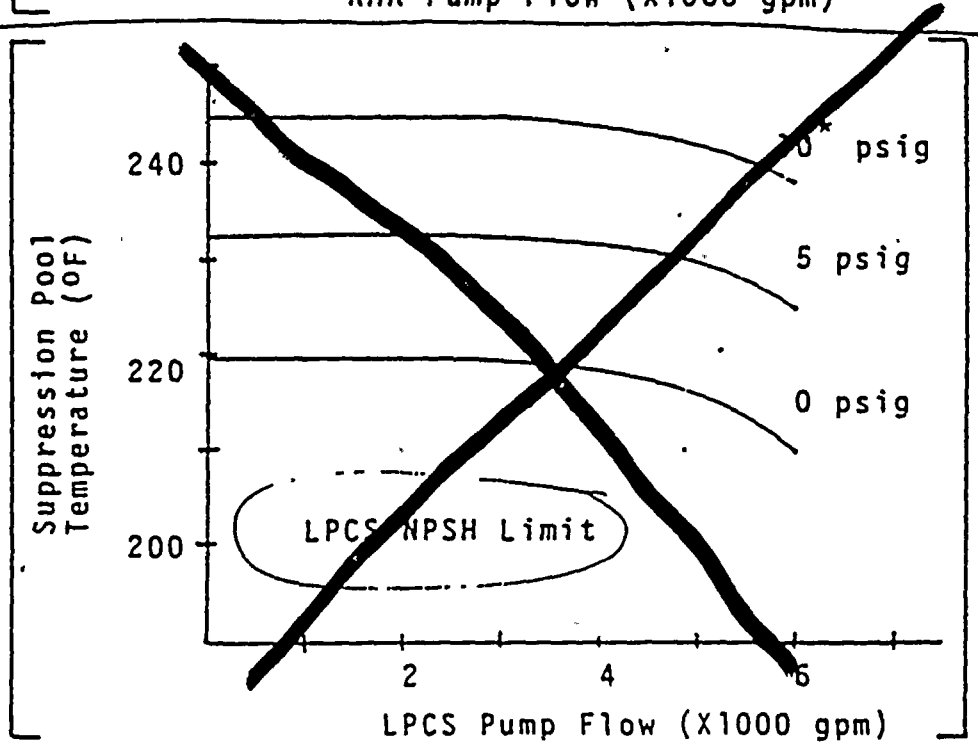
Rosemont/Yarway ~~[Heated reference leg instrument]~~ indicated RPV water levels are not reliable during rapid RPV depressurization below 500 psig. For these conditions, utilize Wide Range GEMAC instruments ~~[cold reference leg instruments]~~ to monitor RPV water level.

CAUTION #7

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



NO RHR Pump



*Suppression chamber pressure
Suppression pool at normal water level

~~CAUTION #9~~

~~If signals of high suppression pool water level [12 ft. 7 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, HPCS, and RCIC suction from the condensate storage tank to the suppression pool.~~

NO HPCI, HPCS RCIC

SPECIFIC

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

CAUTION #~~10~~ 9 7

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~~ 8 8

If a high drywell pressure ECCS initiation signal (~~2.0~~ 3.5 psig) ~~(drywell pressure which initiates ECCS)~~ occurs or exists while depressurizing, prevent injection from those LPCS ~~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 LPCS ~~and LPCI~~ to AUTOMATIC/STANDBY mode.

No LPCI

NO HPCI or RCIC Steam turbine

CAUTION #12

Do not throttle HPCI or RCIC systems below [2200 rpm (minimum turbine speed limit per turbine vendor manual)].

CAUTION #13 ~~#9~~ 9

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 or RCIC low pressure isolation setpoint, whichever is higher)] unless motor driven pumps sufficient to maintain RPV water level are running and available for injection.

No HPCI or RCIC steam turbine

CAUTION #18 ~~#15~~ 10

Open SRVs in the following sequence if possible: ~~[SRV opening sequence]~~ #111, #112, #113 or if any fail to open, their associated backup relief valve #121, #122, and #123.

CAUTION #16 ~~#16~~ 11

Bypassing low RPV water level ~~[ventilation system and]~~ MSIV isolation interlocks may be required to accomplish this step.

No ventilation interlock

CAUTION #17 ~~#17~~ 12

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

CAUTION #18

If continuous LPCI operation is required to assure adequate core cooling, do not divert all RHR pumps from LPCI mode.

NO LPCI mode

CAUTION ~~#19~~ ~~#21~~ 13

Confirm automatic trip or manually trip SLC pumps at ~~[0% (low level e trip)]~~ 0 (zero) gallons in the SLC tank.

~~CAUTION #20~~

~~Defeating RSCS interlocks may be required to accomplish this step.~~

No RSCS interlocks exist

~~CAUTION #21~~

~~Elevated suppression chamber pressure may trip the RCIC turbine on high exhaust pressure.~~

No RCIC Turbine

CAUTION ~~#22~~ ~~#23~~ 14

Defeating isolation interlocks may be required to accomplish this step.

~~CAUTION #23~~

~~Do not initiate drywell sprays if suppression pool water level is above [17 ft. 2 in. (elevation of bottom of Mark I internal suppression chamber to drywell vacuum breakers less vacuum breaker opening pressure in feet of water)].~~

No internal vacuum breakers

~~CAUTION #24~~

~~Bypassing high drywell pressure and low RPV water level secondary containment HVAC isolation interlocks may be required to accomplish this step.~~

No such secondary containment HVAC interlocks

CAUTION ~~#25~~ ~~#26~~ 15

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

CAUTION ~~#26~~ ~~#27~~ 16

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 (100°F < RPV water temperature < 212°F ~~(cold shutdown conditions)~~).

ENTRY CONDITIONS

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

- RPV water level below + 53 ~~12~~ in. ~~(low level scram setpoint)~~
- RPV pressure above 1080 ~~1045~~ psig ~~(high RPV pressure scram setpoint)~~
- Drywell pressure above 3.5 ~~2.0~~ 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]~~ ~~Offsite power~~ Backfeed (EDG AUTO START ON LOW BUS VOLTAGE ONLY)

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

If while executing the following step:

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

RC/L-2 Restore and maintain RPV water level between ~~[+12 in. (low level scram setpoint)]~~ +53 in. and ~~[+56~~ +95 in. ~~(high level trip setpoint)]~~ with one or more of the following systems:

#9 #10 #11 #8 #9

- Condensate/feedwater system (1110 - 0 psig) ~~(RPV pressure range for system operation)]~~
- CRD system (1110 - 0 psig) ~~(RPV pressure range for system operation)]~~
- ~~RCIC system [1110 - 50 psig (RPV pressure range for system operation)]~~

#12 No RCIC

- ~~HPCI system [1110 - 100 psig (RPV pressure range for system operation)]~~ NO HPCI

- ~~HPCS system [1110 - 0 psig (RPV pressure range for system operation)]~~ NO HPCS

- LPCS system (365 ~~325~~ - 0 psig) ~~(RPV pressure range for system operation)]~~

- ~~LPCI system [250 - 0 psig (RPV pressure range for system operation)]~~ NO LPCI

If RPV water level cannot be restored and maintained above ~~[+12~~ +53 in. ~~(low level scram setpoint)]~~, maintain RPV water level above ~~[-164~~ -86.4 in. ~~(top of active fuel)]~~.

If RPV water level can be maintained above ~~[-164~~ -86.4 in. ~~(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~~ -86.4 in. ~~(top of active fuel)]~~, enter [procedure developed from CONTINGENCY #1].

If Alternate Shutdown Cooling is required, enter [procedure developed from CONTINGENCY #5].

When OP-43, "Startup and Shutdown Procedure," is entered from RC/P-5,

RC/L-3 A Proceed to cold shutdown in accordance with ~~[procedure for cooldown to cold shutdown conditions]~~ OP-43, "Startup and Shutdown Procedure."

(This modification coordinates exit from RC/L with exit from RC/P)

RC/P Monitor and control RPV pressure.

If while executing the following steps:

- Emergency RPV Depressurization is anticipated, rapidly depressurize the RPV with the main turbine bypass valves. #10 ~~#23~~

- Emergency RPV Depressurization or RPV Flooding is required and less than ~~{7 (number of SRVs dedicated to ADS)}~~ 3 SRVs are open, enter [procedure developed from CONTINGENCY #2].

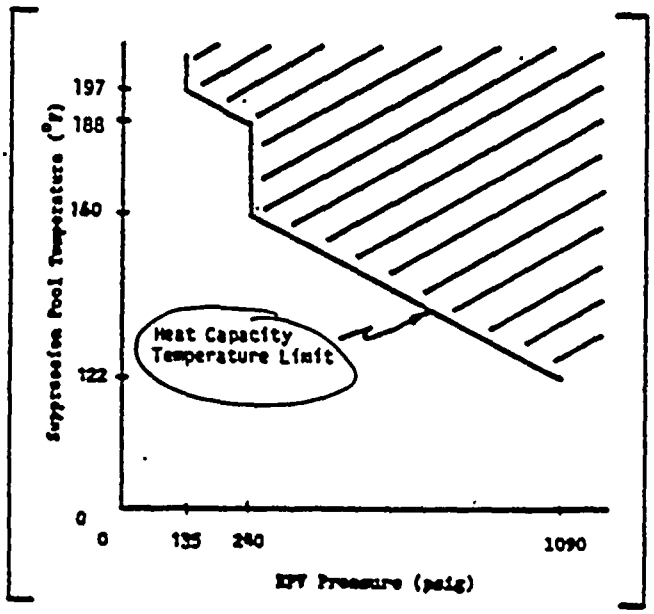
- RPV Flooding is required and at least ~~{7 (number of SRVs dedicated to ADS)}~~ 3 SRVs are open, enter [procedure developed from CONTINGENCY #6].

RC/P-1 If any SRV is cycling, initiate ~~IC~~ EC and manually open SRVs until RPV pressure drops to ~~{935~~ 950 psig. ~~(RPV pressure at which all turbine bypass valves are fully open)}.~~

If while executing the following steps:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the Limit.

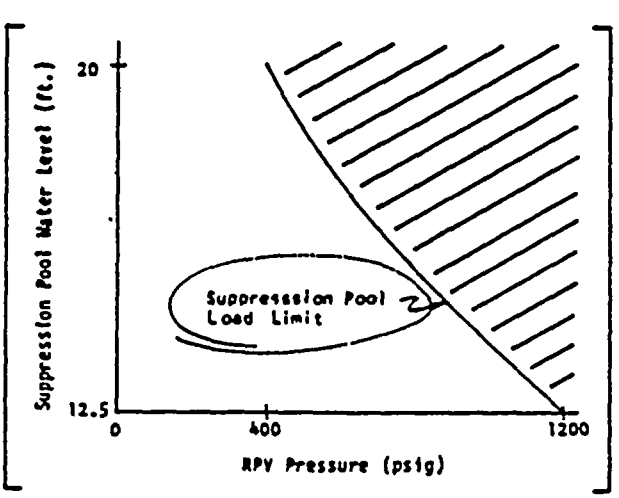
#8 #13 #14



insert Plant-specific curve

- Suppression pool water level cannot be maintained below the Suppression Pool Load Limit, maintain RPV pressure below the Limit.

#9 #13 #14



insert plant-specific curve

- Steam Cooling is required, enter [procedure developed from CONTINGENCY #3].

If while executing the following steps:

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

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

#12 ~~#16~~

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

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

- ~~IC~~ EC
- SRVs only when suppression pool water level is above [~~ft. in. (elevation of top of SRV discharge device)~~ 6ft 0 in reference to bottom of torus]. If the continuous SRV pneumatic supply is or becomes unavailable, depressurize with sustained SRV opening. #11 ~~#15~~

Ch 11, 12 torus water level meter PRL K

- ~~HPCI~~ No HPCI ~~#17~~
- ~~RCIC~~ NO RCIC
- ~~[Other steam driven equipment]~~ None available

- 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 [sampling procedures] prior to initiating blowdown.~~

No blowdown lineups can be made

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

RC/P-3 When either:

- All control rods are inserted beyond position ~~[06 (maximum subcritical banked withdrawal position)]~~, or 00

- ~~[280~~ 291.5 pounds ~~(Cold Shutdown Boron Weight)]~~ of boron have been injected into the RPV, or

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

depressurize the RPV and maintain cooldown rate below 100°F/hr. ~~(RPV cooldown rate LCO)].~~

#13

~~#14, #15~~

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

~~#18~~

No RHR

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

If RPV cooldown is required but cannot be accomplished and all control rods are inserted beyond position ~~[06 (maximum subcritical banked withdrawal position)]~~ 00, ALTERNATE SHUTDOWN COOLING IS REQUIRED; enter [procedure developed from CONTINGENCY #5].

RC/P-5 Proceed to cold shutdown in accordance with ~~[procedure for cooldown to cold shutdown conditions]~~. OP-43, "Startup and Shutdown Procedure."

RC/Q Monitor and control reactor power.

If while executing the following steps:

- All control rods are inserted beyond position ~~[06 (maximum subcritical banked withdrawal position)]~~ 00, terminate boron injection and enter [scram procedure].
- The reactor is shutdown and no boron has been injected into the RPV, enter ~~[scram procedure]~~ SOP-16, "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]~~ NA, confirm or initiate recirculation flow runback to minimum. (TG can only be on-line if MSIVs are open)

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)]~~ 105°, 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:~~ using a Hydro pump.

- ~~CRD~~
- ~~HPCS~~
- ~~RWCU~~
- ~~Feedwater~~
- ~~HPCI~~
- ~~RCIC~~
- ~~Hydro pump~~

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 ~~[280 pounds (Cold Shutdown Boron Weight)]~~ 291.5 pounds of boron have been injected into the RPV.

RC/Q-4.3 Enter ~~[scram procedure],~~ SOP-16, "Scram Procedure."

RC/Q-5 Insert control rods as follows:

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

- Remove:

  ~~H11-P609 C71-F18A,E,G,C~~ FUSE CKT 8 in Cab. 15-53

  ~~H11-P611 C71-F18B,F,D,H~~ and FUSE CKT 8 in Cab. 15-55 in relay room

  ~~(fuses which de-energize RPS scram solenoids)~~.

- Close ~~[C11-F095 (scram air header supply valve)]~~ IA-207 and remove vent pipe cap at IA-207.

  ~~and open [C11-F008 (scram air header vent valve)]~~.

When control rods are not moving inward:

- Replace:

  ~~H11-P609 C71-F18A,E,C,G~~ FUSE CKT 8 in Cab 15-53 and

  ~~H11-P611 C71-F18B,F,D,H~~ FUSE CKT 8 in Cab 15-55 in relay room

  ~~(fuses which de-energize RPS scram solenoids)~~.

- ~~Close [C11-F008 (scram air header vent valve)]~~ Replace vent pipe cap at IA-207 (scram air header supply valve) and open ~~[C11-F095 (scram air header supply valve)]~~. IA-207.

RC/Q-5.2 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.

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

2. Close ~~{C11-F034 (~~HCU accumulator charging water header valve~~)}~~. 301-69.

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

4. Reset the reactor scram.

5. Open ~~{C11-F034 (~~HCU accumulator charging water header valve~~)}~~. 301-69.

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 in this procedure 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 beyond position ~~{06 (maximum subcritical banked withdrawal position)}~~. 00.

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 in this procedure at [Step RC/Q-5.6.1].

2. Close ~~{C11-F034 (~~HCU accumulator charging water header valve~~)}~~. 301-69.

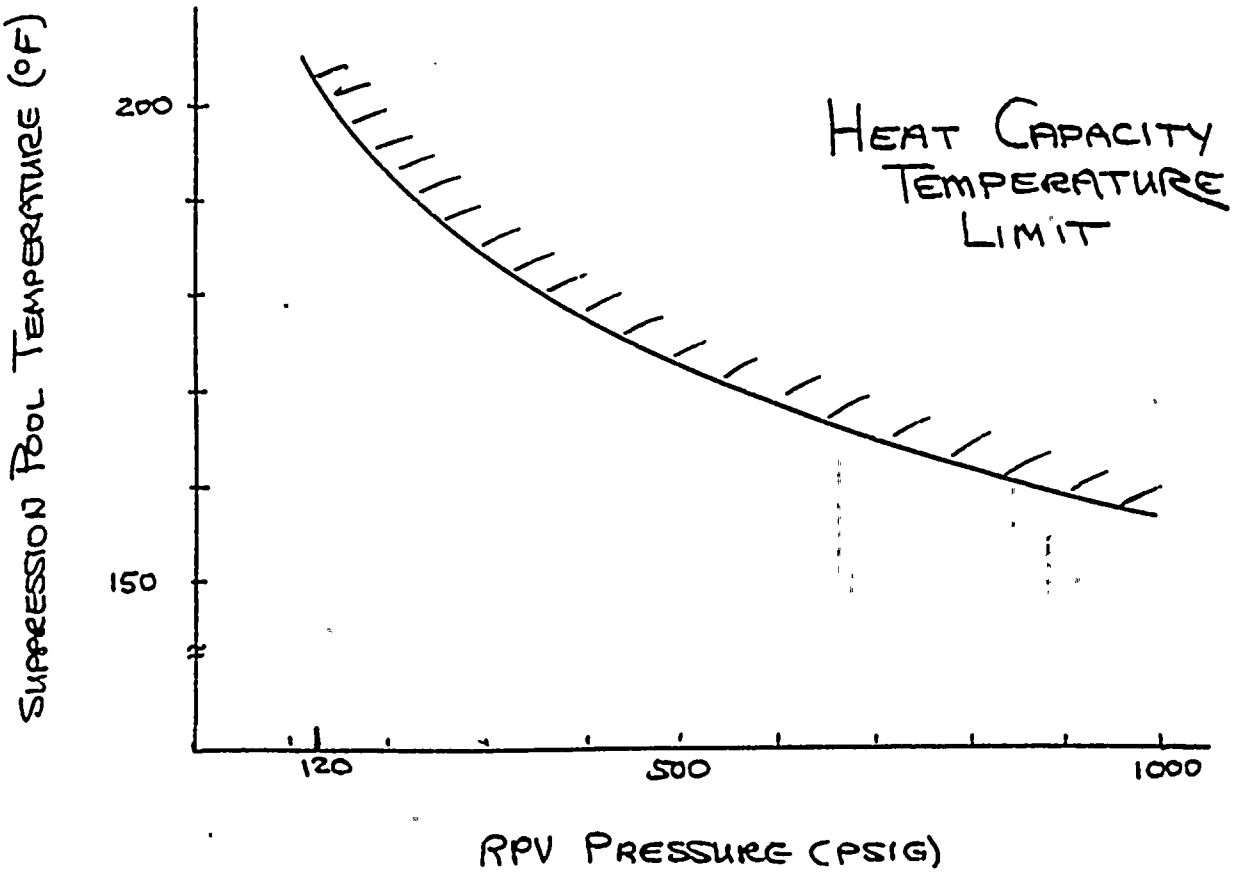
RC/Q-5.6 Rapidly insert control rods manually until all control rods are inserted beyond position 00. ~~{06 (maximum subcritical banked withdrawal position)}.~~

If any control rod cannot be inserted beyond position 00. ~~{06 (maximum subcritical banked withdrawal position)}:~~

1. Individually direct the effluent from ~~{C11-F102 (~~CRD withdraw line vent valve~~)}~~ (Located at the HCU) to a contained radwaste drain and open ~~{C11-F102 (~~CRD withdraw line vent valve~~)}~~ for each control rod not inserted beyond position 00. ~~{06 (maximum subcritical banked withdrawal position)}.~~

2. When a control rod is not moving inward, close its ~~{C11-F102 (~~CRD withdraw line vent valve~~)}~~.

NMP1 PLANT-SPECIFIC CURVES



NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION
UNIT #1

EMERGENCY PROCEDURE GUIDELINES

Revision 0

FEBRUARY, 1984

DRAFT

TABLE I

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RPV	-	Reactor Pressure Vessel
RWCU	-	Reactor Water Cleanup
SLC	-	Standby Liquid Control
SORV	-	Stuck Open Relief Valve
SRV	-	Safety Relief Valve

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 a [procedure developed from the Emergency Procedure Guidelines] occurs, enter that procedure. When it is determined that an emergency no longer exists, enter normal 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
Suppression pool temperature is determined by averaging the indicated values of the bulk suppression pool temperature meters located on "K" panel. Drywell temperature is determined by averaging the indicated values of the Drywell Temperature meters located on "L" panel

CAUTION #5

Whenever drywell temperature at Elevation 330 ft. (Drywell Temperature meter on "L" panel) exceeds the temperature in the table and the instrument reads below the indicated level in the table, the actual RPV water level may be anywhere below the elevation of the lower instrument tap.

Temperature	Indicated Level	Instrument
[Later]	[Later]	[Later]
[Later]	[Later]	[Later]
[Later]	[Later]	[Later]
[Later]	[Later]	[Later]

CAUTION #6

Rosemont/Yarway indicated RPV water levels are not reliable during rapid RPV depressurization below 500 psig. For these conditions, utilize Wide Range GEMAC instruments to monitor RPV water level.

SPECIFIC

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

CAUTION #7

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 #8

If a high drywell pressure ECCS initiation signal (3.5 psig) occurs or exists while depressurizing, prevent injection from those LPCS pumps not required to assure adequate core cooling prior to reaching their maximum injections pressures. When the high drywell pressure ECCS initiation signal clears, restore LPCS to AUTOMATIC/STANDBY mode.

CAUTION #9

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

CAUTION #10

Open SRVs in the following sequence if possible: #111, #112 and #113 or if any fail to open, their associated back-up relief valves #121, #122 and #123.

CAUTION #11

Bypassing RPV low water level MSIV isolation interlocks may be required to accomplish this step.

CAUTION #12

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

CAUTION #13

Confirm automatic trip or manually trip SLC pumps at 0 (zero) gallons in the SLC tank.

CAUTION #14

Defeating isolation interlocks may be required to accomplish this step.

CAUTION #15

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

CAUTION #16

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 (100°F <RPV water temperature <212°F).

ENTRY CONDITIONS

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

- RPV water level below +53 in.
- RPV pressure above 1080 psig
- Drywell pressure above 3.5 psig
- A condition which requires MSIV isolation
- A condition which requires reactor scram, and reactor power above 3% 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:

- o Isolation
- o ECCS

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

If while executing the following step:

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

RC/L-2 Restore and maintain RPV water level between +53 in. and +95 in. with one or more of the following systems: | #7 | #8 |

- o Condensate/feedwater (1110 - 0 psig)
- o CRD (1110 - 0 psig)
- o LPCS (365 - 0 psig)

If RPV water level cannot be restored and maintained above +53 in., maintain RPV water level above -86.4 in.

If RPV water level can be maintained above -86.4 in. and the ADS timer has initiated, prevent automatic RPV depressurization by resetting the ADS timer.

If RPV water level cannot be maintained above -86.4 in. enter [procedure developed from CONTINGENCY #1].

If Alternate Shutdown Cooling is required, enter [procedure developed from CONTINGENCY #5].

RC/L-3 When OP-43, "Startup and Shutdown Procedure" is entered from [Step RC/P-5], proceed to cold shutdown in accordance with OP-43 "Startup and Shutdown Procedure.

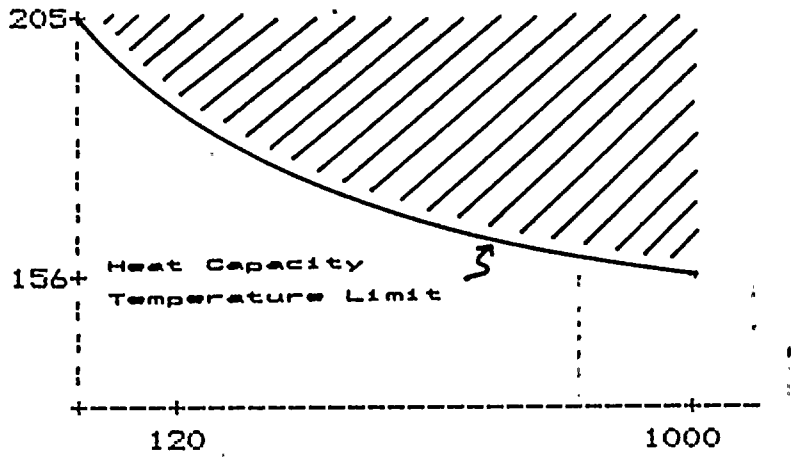
RC/P Monitor and control RPV pressure.

If while executing the following steps:	
o Emergency RPV Depressurization is anticipated and Boron Injection is not required, rapidly depressurize the RPV with the main turbine bypass valves.	---- ! #9 ! ----
o Emergency RPV Depressurization or RPV Flooding is required and less than 3 SRVs are open, enter [procedure developed from CONTINGENCY #2].	
o RPV Flooding is required and at least 3 SRVs are open, enter [procedure developed from CONTINGENCY #6].	

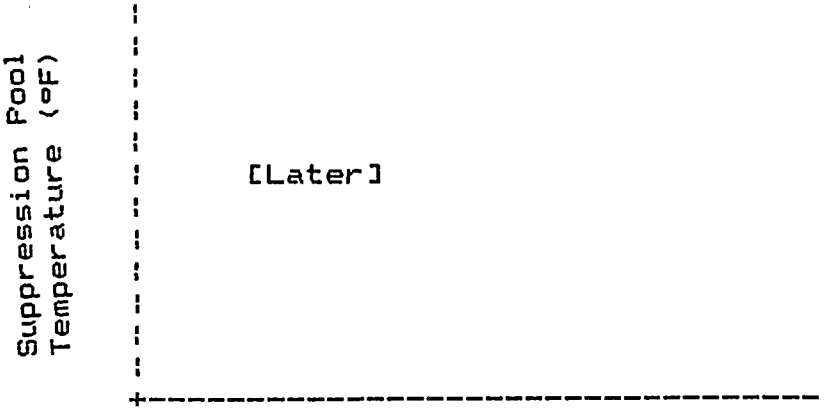
RC/P-1 If any SRV is cycling, initiate EC and manually open SRVs until reactor pressure drops to 950 psig.

If while executing the following steps:

- Suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the Limit. (#7 #9)



- Suppression pool water level cannot be maintained below the Suppression Pool Load Limit, maintain RPV pressure below the Limit. (#9)



- Steam Cooling is required, enter [procedure developed from CONTINGENCY #3].

If while executing the following steps: o Boron Injection is required, and o The main condenser is available, and o There has been no indication of gross fuel failure or steam line break, open MSIVs to re-established the main condenser as a heat sink. ----- #11 -----

RC/P-2 Control RPV pressure below 1090 psig with the main turbine bypass valves.

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

- o EC
- o SRVs, only when suppression pool water level is above 6 ft. 0 in. (referenced to the bottom of the torus; channels 11 and 12 of Torus Water Level meters on "K" panel) ----- #10 -----
- o Main steam line drains
- o RWCU (recirculation mode) if no boron has been injected into the RPV.

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

RC/P-3 When either:

- o All control rods are inserted beyond position 00, or
- o 291.5 pounds of boron have been injected into the RPV, or
- o The reactor is shutdown and no boron has been injected into the RPV,

Depressurize the RPV and maintain cooldown rate below 100°F/hr ----- | #12 | -----

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

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

If RPV cooldown is required but cannot be accomplished and all control rods are inserted beyond position 00, ALTERNATE SHUTDOWN COOLING IS REQUIRED; enter [procedure developed from CONTINGENCY #5].

RC/P-5 Proceed to cold shutdown in accordance with OP-43, "Startup and Shutdown Procedure."

RC/Q Monitor and control reactor power.

If while executing the following steps:

- All control rods are inserted beyond position 00, terminate boron injection and enter SOP-16 "Scram Procedure."
- The reactor is shutdown and no boron has been injected into the RPV, enter SOP-16, "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, confirm or initiate recirculation flow runback to minimum.

RC/Q-3 If reactor power is above 3% 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 IS REQUIRED; inject boron into the RPV with SLC and prevent automatic initiation of ADS. #13

If boron cannot be injected with SLC, inject boron into the RPV using a hydro pump.

RC/Q-4.1 Confirm automatic isolation of or manually isolate RWCU.

RC/Q-4.2 Continue to inject boron until 291.5 pounds of boron has been injected into the RPV.

RC/Q-4.3 Enter SOP-16, "Scram Procedure."

RC/Q-5 Insert control rods as follows:

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

- o Remove:

  Fuse CKT 8 in cabinet 15-53 and
  Fuse CKT 8 in cabinet 15-55 in relay room

- o Close IA-207 (scram air header supply valve) and remove vent pipe cap at IA-207.

When control rods are not moving inward:

- o Replace:

  Fuse CKT 8 in cabinet 15-53 and
  Fuse CKT 8 in cabinet 15-55 in relay room .

- o Replace the vent cap at IA-207 (scram air header supply valve) and open IA-207.

RC/Q-5.2 Reset the reactor scram.

If the reactor scram cannot be reset:

1. Start all CRD pumps.

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

2. Close HCU accumulator charging water header valve 301-69.

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

4. Reset the reactor scram.

5. Open HCU accumulator charging water header valve 301-69.

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 in this procedure 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 beyond position 00.

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 in this procedure at [Step RC/Q-5.6.1].

2. Close HCU accumulator charging water header valve 301-69.

RC/Q-5.6 Rapidly insert control rods manually until all control rods are inserted beyond position 00.

If any control rod cannot be inserted beyond position 00:

1. Individually direct the effluent from the CRD withdraw line vent valve (located at the HCU) to a contained radwaste drain and open the CRD withdraw line vent valve for each control rod not inserted beyond position 00.

2. When a control rod is not moving inward, close its 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 80°F
- Drywell temperature above 135°F
- Drywell pressure above 3.5 psig
- Suppression pool water level above 4 ft. 6 in.
- Suppression pool water level below 3 ft. 0 in.

OPERATOR ACTIONS

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

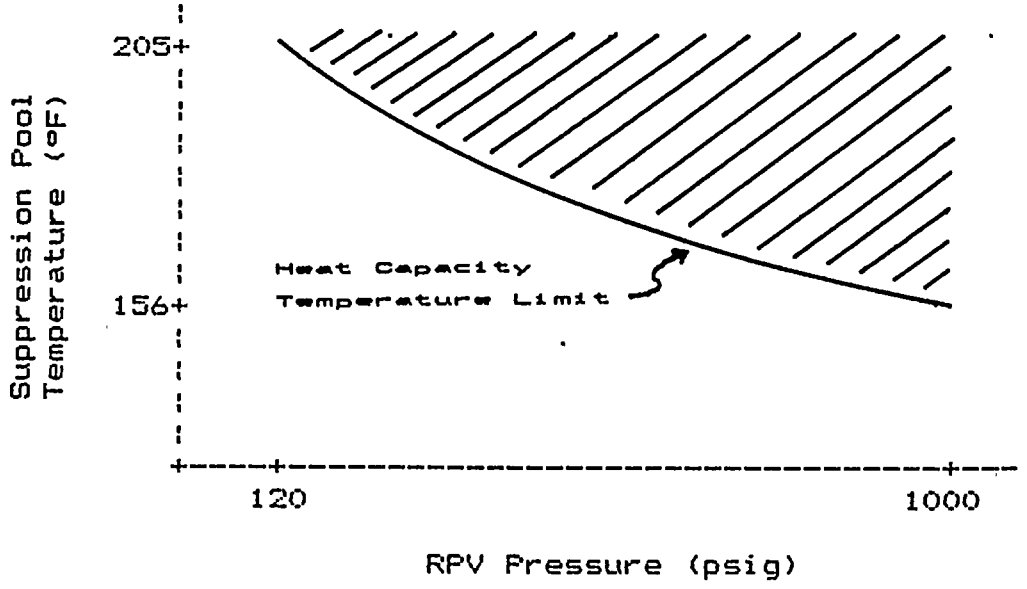
SP/T Monitor and control suppression pool temperature.

SP/T-1 Close all SORVs.

SP/T-2 When suppression pool temperature exceeds 80°F, operate available suppression pool cooling.

SP/T-3 Before suppression pool temperature reaches 110°F, scram the reactor.

SP/T-4 If suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit, maintain RPV pressure below the Limit; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.



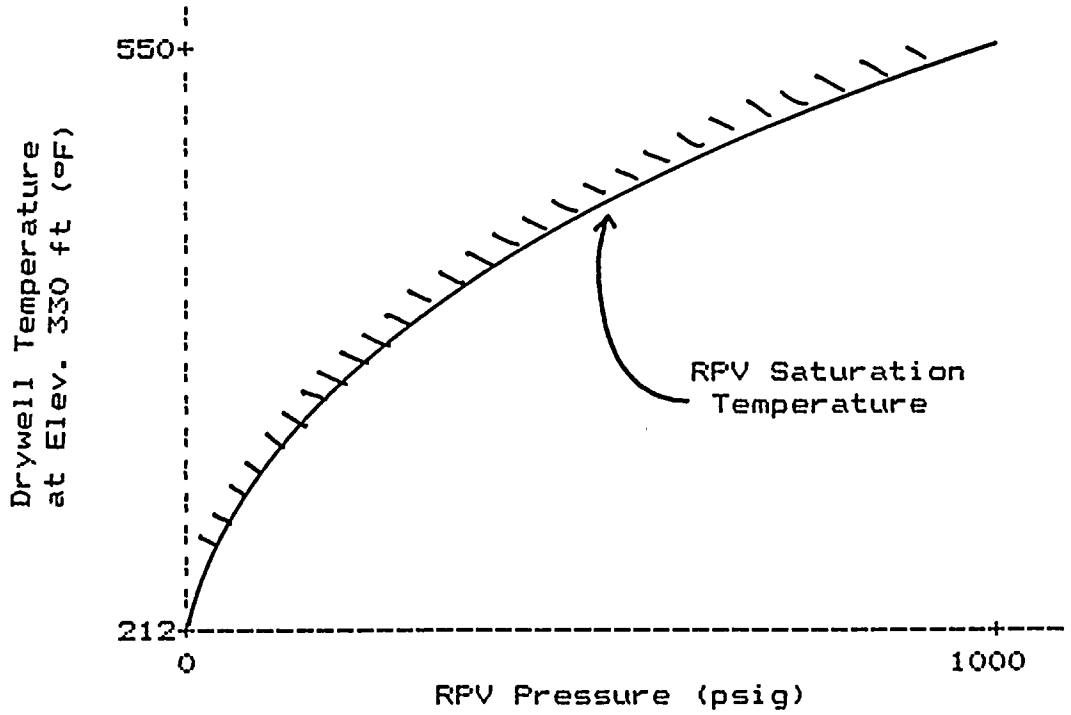
If suppression pool temperature and RPV pressure cannot be restored and maintained below the Heat Capacity Temperature Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

DW/T Monitor and control drywell temperature.

DW/T-1 When drywell temperature exceeds 135°F, operate available drywell cooling. #5

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

DW/T-2 If drywell temperature at Elev. 330 ft. (Drywell Temperature meter located on "L" panel) reaches the RPV Saturation Temperature, RPV FLOODING IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.



DW/T-3 Before drywell temperature reaches 301°F, but only if suppression chamber temperature and drywell pressure are below the Drywell Spray Initiation Pressure Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.

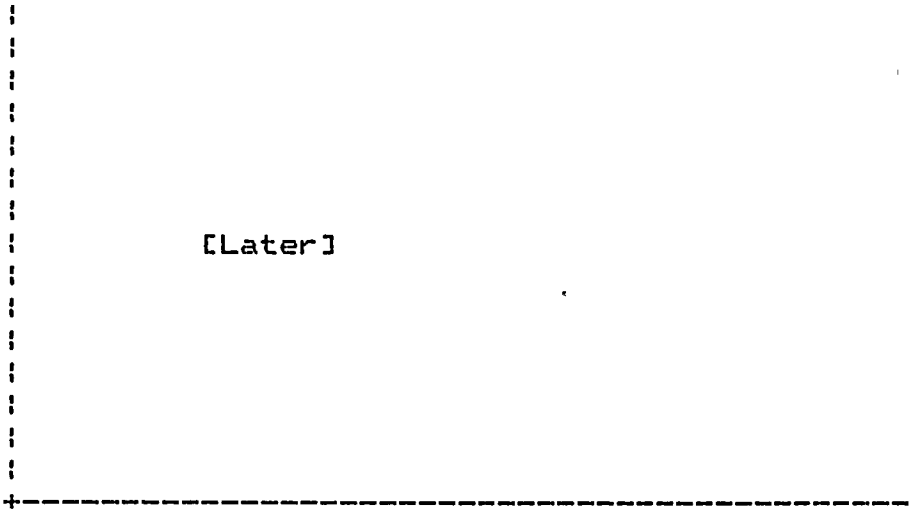
[Later]

If drywell temperature cannot be maintained below 301°F, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

PC/P Monitor and control primary containment pressure.

PC/P-1 Operate EVS, only when the temperature in the space being evacuated is below 212°F. Use N1-OP-9, "Drywell and Torus Inerting and Venting Procedure," Sections G and H.

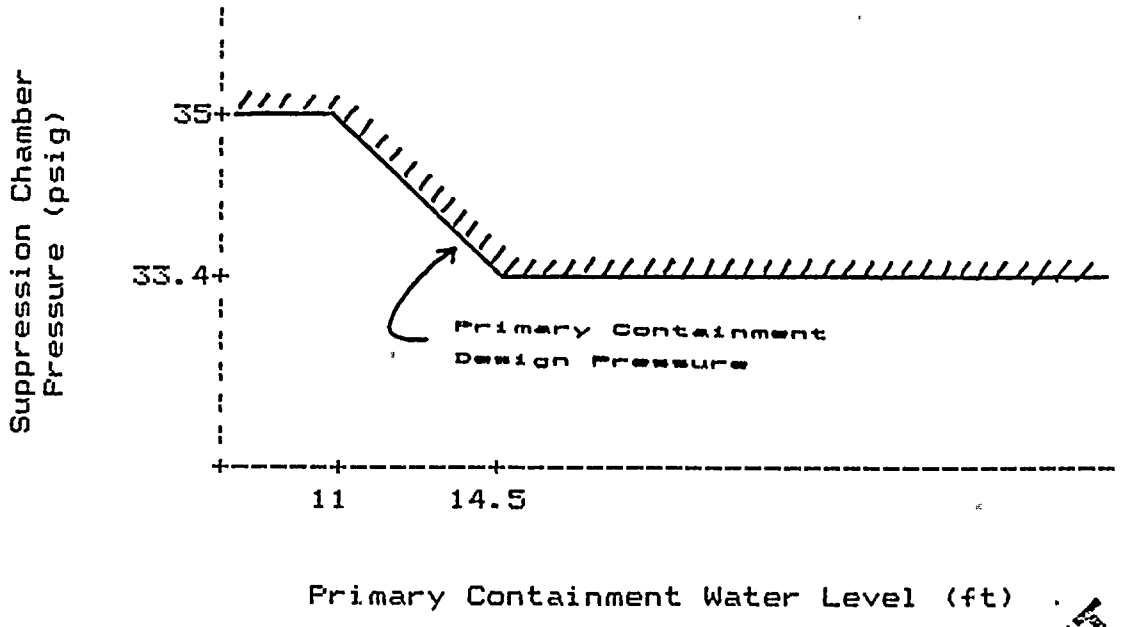
PC/P-2 If suppression chamber pressure exceeds [Later] but only if suppression chamber temperature and drywell pressure are below the Drywell Spray Initiation Pressure Limit, shut down recirculation pumps and drywell cooling fans and initiate drywell sprays.



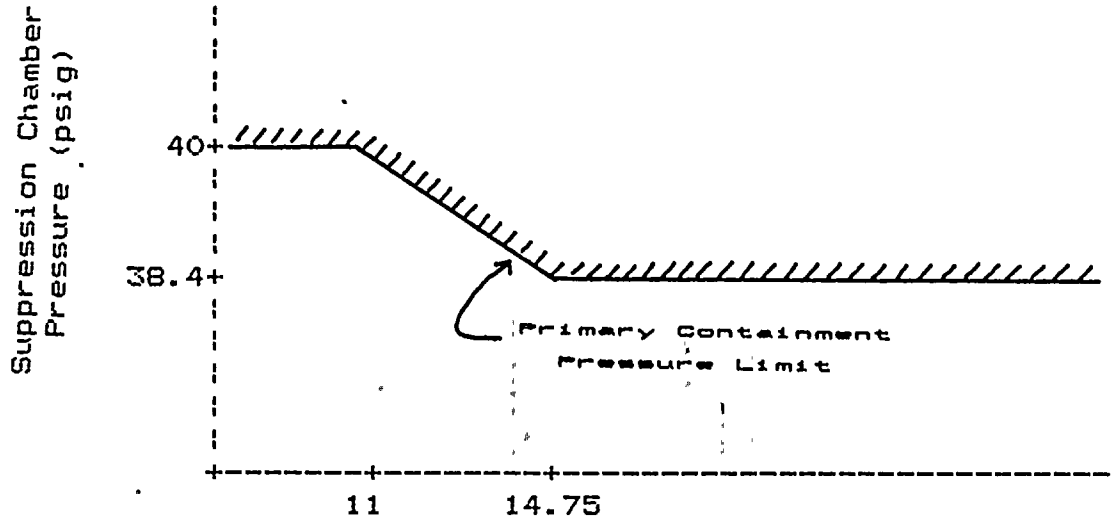
PC/P-3 If suppression chamber pressure cannot be maintained below the Pressure Suppression Pressure, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

[Later]

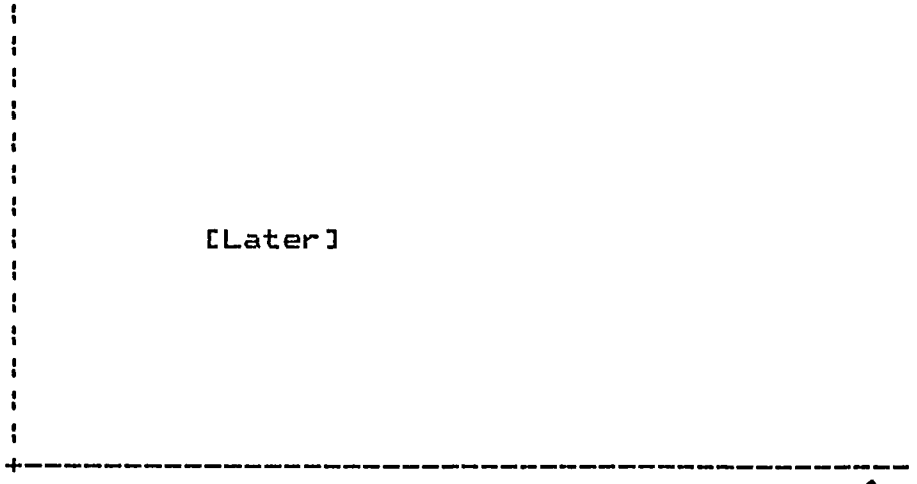
PC/P-4 If suppression chamber pressure cannot be maintained below the Primary Containment Design Pressure, RPV FLOODING IS REQUIRED.



PC/P-5 If suppression chamber pressure cannot be maintained below the Primary Containment Pressure Limit, then irrespective of whether adequate core cooling is assured:



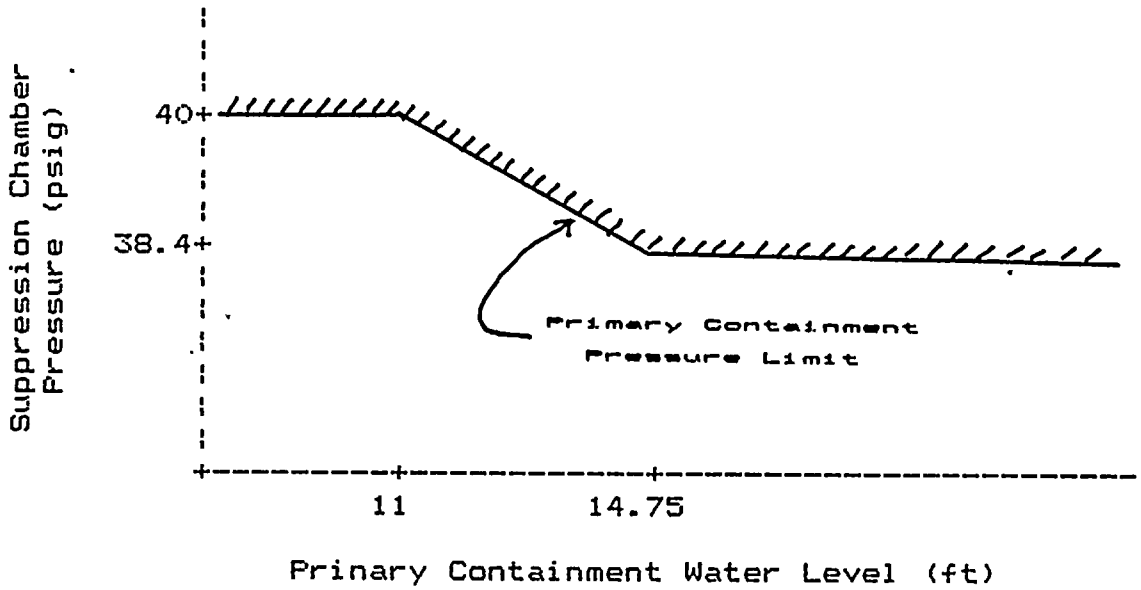
- If suppression chamber temperature and drywell pressure are below the Drywell Spray Initiation Pressure Limit, shutdown recirculation pumps and drywell cooling fans and initiate drywell sprays.



DRAFT

PC/P-6 If suppression chamber pressure exceeds the Primary Containment Pressure Limit, vent the primary containment in accordance with N1-OP-9, "Drywell and Torus Inerting and Venting Procedure," Sections G and H, to reduce and maintain pressure below the Primary Containment Pressure Limit.

----- ! #14 ! -----



SP/L Monitor and control suppression pool water level.

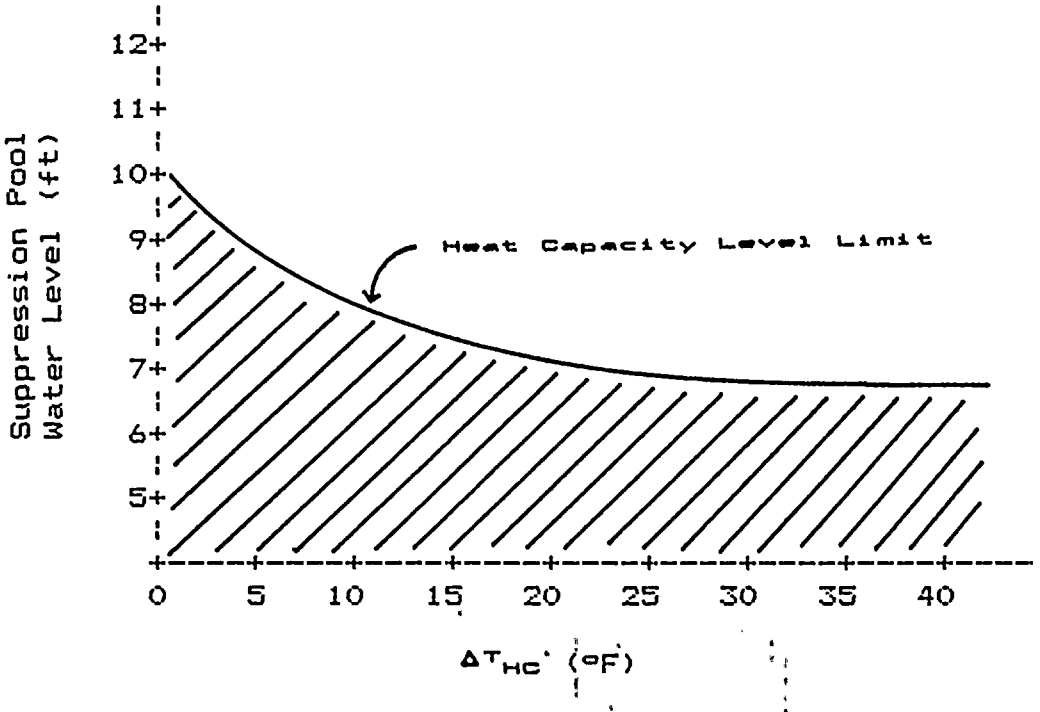
SP/L-1 Maintain suppression pool water level between 4 ft. 6 in. and 3 ft. 0 in. Refer to N1-PSP-13, "Post LOCA Sampling Procedure," prior to discharging water.

If suppression pool water level cannot be maintained above 3 ft. 0 in. execute [Step SP/L-2].

If suppression pool water level cannot be maintained below 4 ft. 6 in. execute [Step SP/L-3].

SP/L-2 SUPPRESSION POOL WATER LEVEL BELOW 3 ft. 0 in.

Maintain suppression pool water level above the Heat Capacity Level Limit.



Where ΔT_{HC} = Heat Capacity Temperature Limit minus suppression pool temperature.

If suppression pool water level cannot be maintained above the Heat Capacity Level Limit, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SP/L-3 SUPPRESSION POOL WATER LEVEL ABOVE 4 ft. 6 in.

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.

[Later]

If suppression pool water level cannot be maintained below the Suppression Pool Load Limit, maintain RPV pressure below the Limit; enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure. # 9

If suppression pool water level and RPV pressure cannot be maintained below the Suppression Pool Load Limit 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, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

SP/L-3.2 Before suppression pool water level reaches 100.5 ft., but only if adequate core cooling is assure, terminate injection into the RPV from sources external to the primary containment except from boron injection systems and CRD.

SP/L-3.3 When primary containment water level reaches 100.5 ft., 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:

- Differential pressure at or above 0.0 in. of water
- An area temperature above the high temperature alarm setpoint
- Reactor Building HVAC exhaust radiation level above 5 mr/hr
- An area radiation level above the high radiation level alarm setpoint
- A floor drain sump water level above the high water level alarm setpoint

If while executing the following steps Reactor Building HVAC exhaust radiation level exceeds 5 mr/hr: o Confirm or manually initiate isolation of Reactor Building HVAC, and o Confirm initiation of or manually initiate EVS. If while executing the following steps: o Reactor Building HVAC isolates, and o Reactor Building HVAC exhaust radiation level is below 5 mr/hr, restart Reactor Building HVAC.

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 reactor building HVAC exhaust radiation level is below 5 mr/hr, operate available reactor building HVAC.

SC/T-3 If any area temperature exceeds its high temperature alarm setpoint, 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 and any area temperature exceeds its high temperature alarm setpoint, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SC/T-5 If a primary system is discharging into an area and the high temperature alarm setpoint is exceeded 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 high radiation level alarm setpoint, 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, and any area radiation level exceeds its high radiation level alarm setpoint, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SC/R-3 If a primary system is discharging into an area and the high radiation level alarm setpoint is exceeded 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 exceeds its high water level alarm setpoint, operate available sump pumps to restore and maintain it below its high water level alarm setpoint.

If any floor drain sump cannot be restored and maintained below its high water level alarm setpoint, 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, and any floor drain sump cannot be restored and maintained below its high water level alarm setpoint, enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SC/L-3 If a primary system is discharging into an area and more then one floor drain sump water level exceeds it high water level alarm setpoint, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

TABLE I

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

Secondary Containment Parameter/Location	Alarm Setpoint
o Floor Drain Sump Wtr Lvls	
11-Sump Pump (N.W.Corner)	+3 in.
12-Sump Pump (S.W.Corner)	+3 in.
13-Sump Pump (N.E.Corner)	+3 in.
14-Sump Pump (S.E.Corner)	+3 in.
15-Sump Pump (N.W.Corner)	+1 ft. 6in.
16-Sump Pump (N.E.Corner)	+1 ft. 6in.
o H.V.A.C. Exhaust Radiation	mr/hr
Reactor Building	5
o Reactor Building Area Radiation Monitors	mr/hr
Fresh Fuel Storage Vault	10
T.I.P. Room	300
Fuel Pool Bridge - Hi Range	1000
Fuel Pool Bridge - Lo Range	50
Reactor Operating Floor El. 340' Hatch Area	5
Equipment Drain Tank Area	20
R.B.C.L.C. Area	20
Reactor Water C.U. Pump Area	20
El. 281' Near Fuel Pool Filters	5
Control Rod Drive Module Area	20
Spent Fuel Pool Area (East End)	15
Containment Spray Heat Exchanger Area	5
North Instrument Room El. 237'	20

TABLE I
(Continued)

OPERATING VALUES OF SECONDARY CONTAINMENT PARAMETERS

Secondary Containment Parameter/Location	Alarm Setpoint
o Area Temperatures	°F
[Later]	[Later]

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:

- o Offsite radioactivity release rate above the off-site 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 the off-site 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 [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

CONTINGENCY #1

LEVEL RESTORATION

If while executing the following steps:
o Boron Injection is required, enter [procedure developed from CONTINGENCY #7].
o RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter [procedure developed from CONTINGENCY #6].
o RPV Flooding is required, enter [procedure developed from CONTINGENCY #6].

C1-1 Initiate EC.

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

- o Condensate and feedwater
- o LPCS - LOOP #11
- o LPCS - LOOP #12

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

- o Containment Spray Raw Water valved to Core Spray (Use N1-OP-2, "Core Spray System Procedure," Section G.)
- o Fire system (Use N1-OP-16, "Feedwater System Procedure," Section g.)

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

		RPV PRESSURE REGION	
		365 psig	
		HIGH	LOW
RPV WATER LEVEL	INCREASING	C1-4	C1-5
	DECREASING	C1-6	C1-7

If while executing the following steps:

- The RPV water level trend reverses or RPV pressure changes region, return to [Step C1-3].
- RPV water level drops below -10 in., prevent automatic initiation of ADS.

C1-4 RPV WATER LEVEL INCREASING, RPV PRESSURE HIGH

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

Otherwise, enter [procedure developed from the RPV Control Guideline] at [Step RC/L].

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

If no injection system 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 -86.4 in:

- 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 C1-3].
- Otherwise, EMERGENCY RPV DEPRESSURIZATION IS REQUIRED. When RPV water level is increasing return to [Step C1-3].

C1-7 RPV WATER LEVEL DECREASING, RPV PRESSURE LOW

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

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

When RPV water level drops to -86.4 in., enter [procedure developed from CONTINGENCY #4].

CONTINGENCY #2

EMERGENCY RPV DEPRESSURIZATION

C2-1 When either: ---- ! #9 ! ----

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

C2-1.1 Initiate EC.

C2-1.2 If suppression pool water level is above 6 ft. 0 in. (referenced to the bottom of the torus; channels 11 and 12 of Torus Water Level meters on "K" panel)

- o Open all ADS valves.
- o If any ADS valve cannot be opened, open other SRVs until 3 valves are open.

C2-1.3 If less than 2 SRVs are open and RPV pressure is at least 50 psig 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): ----- ! #14 ! -----

- o Main condenser
- o Main steam line drains
- o Head vent
- o EC tube side vent

! If RPV Flooding is required, enter [procedure developed from CONTINGENCY #6]. !

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

DRAFT

CONTINGENCY #3

STEAM COOLING

C3-1 Confirm initiation of EC.

If while executing the following steps Emergency RPV Depressurization is required or any system, injection subsystem, or alternate injection subsystem is lined up for injection with at least one pump running, enter [procedure developed from CONTINGENCY #2].

If EC cannot be initiated:

When RPV water level drops to -174 in. or if RPV water level cannot be determined, open one SRV.

When RPV pressure drops below 700 psig, enter [procedure developed from CONTINGENCY #2].

CONTINGENCY #4

CORE COOLING WITHOUT LEVEL RESTORATION

C4-1 Open all ADS valves.

| #9 |

If any ADS valve cannot be opened, open other SRVs until 3 valves are open.

C4-2 Operate LPCS 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 110 psig, terminate injection into the RPV from sources external to the primary containtment.

C4-3 When RPV water level is restored to -86.4 in., enter [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, EC steam line isolation valves, and main steam line drain valves.

C5-3 Place the control switch for [Later] SRV[s] in the OPEN position.

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

C5-5 Start one LPCS pump with suction from the suppression pool.

C5-6 Slowly increase LPCS injection into the RPV to the maximum.

C5-6.1 If RPV pressure does not stabilize at least [Later] psig above suppression chamber pressure, start another LPCS pump.

C5-6.2 If RPV pressure does not stabilize below [Later] psig, open another SRV.

C5-6.3 If the cooldown rate exceeds 100°F/hr, reduce LPCS injection into the RPV until the cooldown rate decreases below 100°F/hr or RPV pressure decreases to within 50 psig of suppression chamber pressure, whichever occurs first.

C5-7 Control suppression pool temperature to maintain RPV water temperature above 125°F.

C5-8 Proceed to cold shutdown in accordance with OP-43, "Startup and Shutdown Procedure."

CONTINGENCY #6

RPV FLOODING

C6-1 If at least 2 SRVs can be opened or if motor driven feedwater pumps are available for injection, close the MSIVs, main steam line drain valves, and emergency condenser steam line isolation valves.

C6-2 If any control rod is not inserted beyond position 00:

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 Pressue (psig)
3	325
2	465
1	950

If no SRV can be opened, continue in this procedure.

If while executing the following step, RPV water level can be determined and RPV Flooding is not required, enter [procedure developed from CONTINGENCY #7] and [procedure developed from the RPV Control Guideline] at [Step RC/P-4] and execute these procedures concurrently.

C6-2.2 Commence and slowly increase injection into the RPV with the following systems until at least 1 SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure: ----- ! #15 ! -----

- o Motor driven feedwater pumps
- o Condensate booster pumps
- o Condensate pumps
- o CRD

If at least 1 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 SRV is open and RPV pressure is above the Minimum Alternate RPV Flooding Pressure:

- o LPCS
- o Containment Spray Raw Water valved to Core Spray (Use N1-OP-2, "Core Spray System Procedure," Section G.)
- o Fire System (Use N1-OP-16, "Feedwater System Procedure," Section G.)

C6-2.3 Maintain at least 1 SRV open and RPV pressure above the Minimum Alternate RPV Flooding Pressure by throttling injection.

C6-2.4 When:

- o All control rods are inserted beyond position 00, or
- o The reactor is shutdown and no boron has been injected into the RPV,

continue in this procedure.

C6-3 If RPV water level cannot be determined:

C6-3.1 Commence and increase injection into the RPV with the following systems until at least 2 SRVs are open and RPV pressure is not decreasing and is at least [Later] psig above suppression chamber pressure.

- o Motor driven feedwater pumps
- o LPCS
- o Condensate booster pumps
- o Condensate pumps
- o CRD
- o Containment Spray Raw Water valved to Core Spray (Use N1-OP-2, "Core Spray System Procedure," Section G.)
- o Fire System (Use N1-OP-16, "Feedwater System Procedure," Section G.)

C6-3.2 Maintain at least 2 SRVs open and RPV pressure at least [Later] psig above suppression chamber pressure by throttling injection.

C6-4 If RPV water level cannot be determined, commence and increase injection into the RPV with the following systems until RPV water level is increasing:

- o Motor driven feedwater pumps
- o LPCS
- o Condensate booster pumps
- o Condensate pumps
- o CRD
- o Containment Spray Raw Water valved to Core Spray (Use N1-OP-2, "Core Spray System Procedure," Section G.)
- o Fire System (Use N1-OP-16, "Feedwater System Procedure," Section G.)

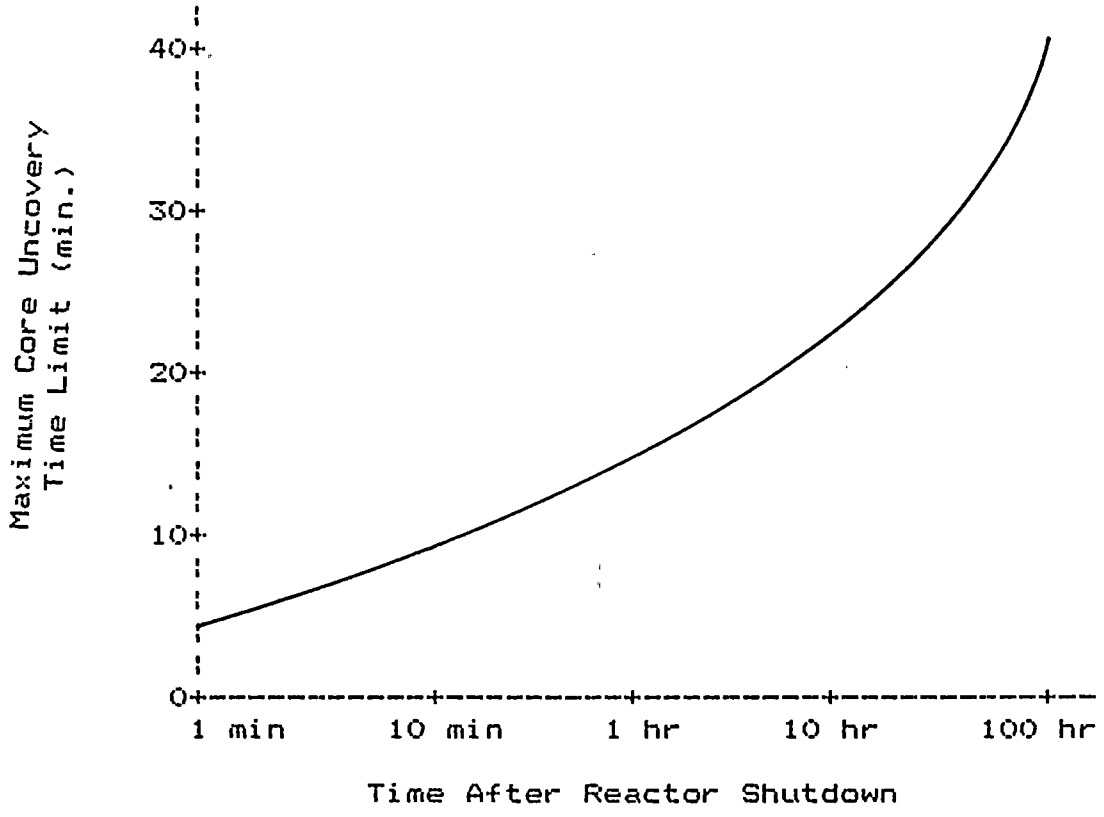
C6-5 If RPV water level cannot be determined:

C6-5.1 Continue injecting water into the RPV until drywell temperature at Elev. 330 ft. (Drywell Temperature meter on "L" panel) is below 212°F and RPV water level instrumentation is available.

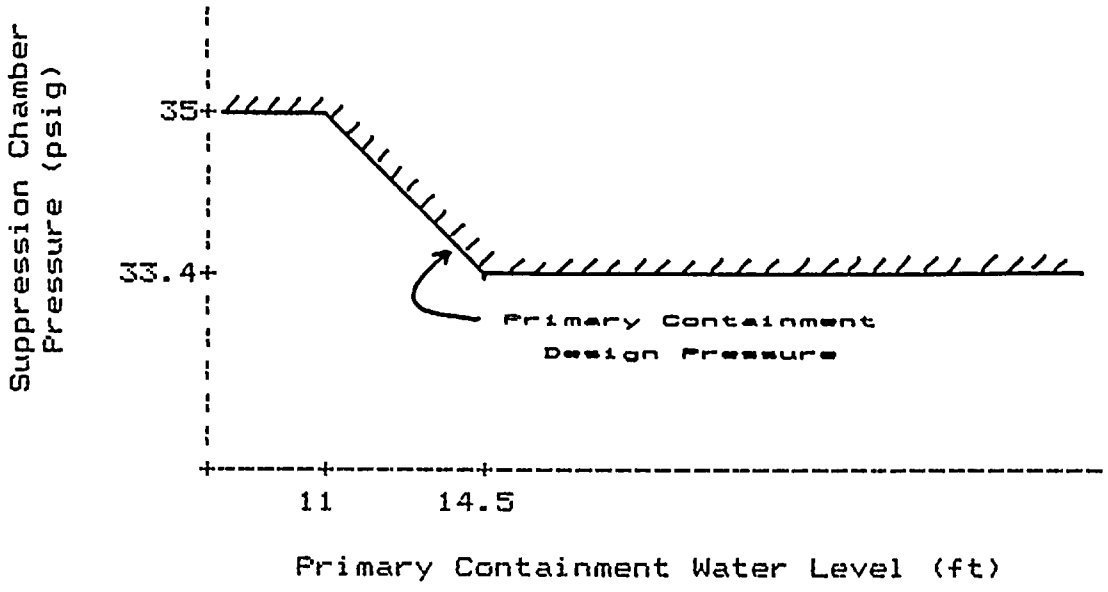
If while executing the following steps, RPV water level can be determined, continue in this procedure at [Step C6-6].

C6-5.3 If it can be determined that the RPV is filled or if RPV pressure is at least [Later] psig above suppression chamber pressure, terminate all injection into the RPV and reduce RPV water level.

C6-5.4 If RPV water level indication is not restored within the Maximum Core Uncovery Time Limit after 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, enter [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 the following steps:
o RPV water level cannot be determined, RPV FLOODING IS REQUIRED; enter [procedure developed from CONTINGENCY #6].
o RPV Flooding is required, enter [procedure developed from CONTINGENCY #6].

C7-1 If:

- o Reactor power is above 3% or cannot be determined, and
- o Suppression pool temperature is above 110 °F, and
- o Either an SRV is open or opens or drywell pressure is above 3.5 psig,

lower RPV water level by terminating and preventing all injection into the RPV except from boron injection systems and CRD until either: #16

- o Reactor power drops below 3% or
- o RPV water level reaches -86.4 in., or
- o All SRVs remain closed and drywell pressure remains below 3.5 psig

If while executing the following steps Emergency RPV Depressurization is required, continue in this procedure at [Step C7-2.1].

If while executing the following step: o Reactor power is above 3% or cannot be determined, and o RPV water level is above -86.4 in. and o Suppression pool temperature is above 110 °F, and o Either an SRV is open or opens or drywell pressure is above 3.5 psig, return to [Step C7-1].

C7-2 Maintain RPV water level either: | #7, #8, #15 |

- o If RPV water level was deliberately lowered in [Step C7-1], at the level to which it was lowered, or
- o If RPV water level was not deliberately lowered in [Step C7-1], between +53 in. and +95 in.,

with the following systems:

- o Condensate/feedwater (1110 - 0 psig)
- o CRD (1110 - 0 psig)

If RPV water level cannot be so maintained, maintain RPV water level above -86.4 in.

If RPV water level cannot be maintained above -86.4 in. 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)
3	325
2	465
1	950

If no SRV can be opened, continue in this procedure.

C7-2.2 Commence and slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above -86.4 in.: #15

- Condensate/feedwater
- CRD

If RPV water level cannot be resored and maintained above -86.4 in., commence and slowly increase injection into the RPV with the following systems to restore and maintain RPV water level above -86.4 in.:

- LPCS
- Containment Spray Raw Water valved to Core Spray (Use N1-OP-2, "Core Spray System Procedure," Section G.)
- Fire System (Use N1-OP-16, "Feedwater System Procedure," Section G.)

If while executing the following step reactor power commences and continues to increase, return to [Step C7-1].

C7-3 When 163 pounds of boron have been injected or all control rods are inserted beyond position 00, restore and maintain RPV water level between +53 in. and +95 in.

If RPV water level cannot be restored and maintained above +53 in., maintain RPV water level above -86.4 in.

If RPV water level cannot be maintained above -86.4 in. EMERGENCY RPV DEPRESSURIZATION IS REQUIRED; return to [Step C7-2.1].

If Alternate Shutdown Cooling is required, enter [procedure developed from CONTINGENCY #5].

C7-4 When OP-43, "Startup and Shutdown Procedure," is entered from [Step RC/P-5], proceed to cold shutdown in accordance with OP-43, "Startup and Shutdown Procedure."

ATTACHMENT 2

Writer's Guide

NINE MILE POINT 1
EMERGENCY OPERATING PROCEDURE
WRITER'S GUIDE

DOCUMENT NO. 8309-1

REVISION 0

February, 1984

PREPARED FOR

NIAGARA MOHAWK POWER CORPORATION

BY

OPERATIONS ENGINEERING, INC.

39273 Liberty Street, Suite N

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LIST OF TABLES

1.0 INTRODUCTION

1.1 Purpose

This document specifies the conventions to be employed in the preparation of NMP-1 Emergency Operating Procedures (EOPs). These conventions are established to ensure consistency in the organization, format, style, and content of the EOPs.

1.2 Scope

The guidelines contained herein address the specifics of procedure identification, format, and content, and are applicable to all NMP-1 EOPs.

This document is not intended to supplant existing NMP administrative procedures governing procedure preparation, revision, and control.

2.0 PROCEDURE IDENTIFICATION

Each EOP shall be clearly and uniquely identified to facilitate the location and use of the procedure by the operator. Identification shall consist of a procedure title, procedure number, and revision number as described below.

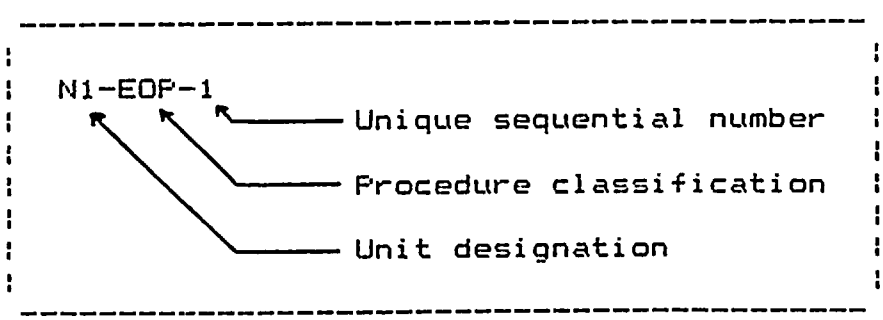
2.1 Title Page

Each EOP shall have a title page which supplies the following information (refer to the sample title page in Figure 1):

1. Company name
2. Station name and unit designation
3. Procedure classification (Emergency Operating Procedure)
4. Procedure number
5. Procedure title
6. Approval signatures
7. Date and initial blanks for revision approvals
8. A tabulation of the pages included and their publication dates
9. Latest date through which the procedure remains effective

2.2 Procedure Numbering

Each EOP shall be assigned an identification number having the following form:



NINE MILE POINT NUCLEAR STATION (2)

SITE ADMINISTRATIVE PROCEDURES (3)

PROCEDURE NO. APN-1 (4)

PROCEDURE FOR ADMINISTRATIVE CONTROLS (5)

(6) APPROVALS	SIGNATURES	(7) DATE AND INITIALS REVISION 8	REVISION 9	REVISION 10
Station Superintendent NMPNS Unit 1 T. W. Roman		7/6/83		
Station Superintendent NMPNS Unit 2 R. B. Abbott		7/6/83		
General Superintendent Nuclear Generation Chairman of S.O.R.C. T. J. Perkins		7/8/83		
Quality Assurance Concurrence Supervisor, QA NMP #1 D. R. Palmer		7/8/83		

Summary of Pages Effective 6/7/83

Page	Revision 8 Date
1-3,5,7-10	November 1981
6	September 1982
4	June 1983

(8)

NIAGARA MOHAWK POWER CORPORATION (1)

(9) THIS PROCEDURE NOT TO BE USED AFTER June 1985, SUBJECT TO PERIODIC REVIEW.

Figure 1. EOP Title Page

2.2 Procedure Numbering (Continued)

The procedure identification number shall be typed in boldface print within the title block on each page of the EOP as specified in Section 3.5.

2.3 Procedure Title

Each EOP shall be assigned a unique title which is descriptive of the procedure content. The title shall be typed in boldface print within the title block on each page of the EOP as specified in Section 3.5.

2.4 Revision Identification

Procedure revisions shall be distinguished through use of sequential revision numbers.

The procedure title page shall list all pages included in the current revision and indicate the date each page was issued. The date of issue shall also be placed in the bottom left corner of each page of the EOP as specified in Section 3.5.

Whenever the content of any page is changed for any reason, the new issue date shall be shown on the revised page and the "Summary of Pages Effective" on the title page shall be updated. Revised text on the page shall be identified with vertical bars in the page margin adjacent to the change. Change bars from previous revisions shall be deleted.

3.0 PROCEDURE FORMAT

The EOPs shall be formatted in accordance with the conventions outlined below. Standards for step numbering, spacing, and page layout are illustrated in Figure 2.

3.1 Procedure Organization

Each EOP shall contain the following sections:

A. ENTRY CONDITIONS

B. OPERATOR ACTIONS

Section titles shall be typed in upper-case letters and underlined. Alphabetic designations "A" and "B" shall be used to designate section headings as indicated above.

3.2 Instructional Step Format

Instructional steps shall be complete sentences presented in a single column format. Footnotes shall not be used.

Division of the text of a step between two pages should be avoided. If a step must be divided, the step number shall be repeated at the top of the next page, followed by the word "Continued" placed in parentheses.

Example:

5.2 (Continued)

3.3 Step Numbering

Instructional steps shall be numbered as follows (see example in Figure 2):

1. Steps shall be designated by sequential Arabic numerals.

TITLE: RPV FLOODING NO. 1-EOP-7

A. ENTRY CONDITIONS

[Text of Entry Conditions]

B. Operator Actions

1. [Text of step]

2. [Text of step]

2.1 [Text of substep]

2.2 [Text of substep]

1. [Text of substep]

2. [Text of substep]

2.3 [Text of substep]

- o [Item]
- o [Item]
- o [Item]

3. [Etc.]

Date 2/30/84 Page 1 of 31

F'gure 2. EOP Format

3.3 Step Numbering (Continued)

2. Substeps shall be designated by sequential decimal numbers (3.1, 3.2, 3.3, etc.). If further subdivision is necessary, single digit numbers or "bullets" shall be used. In general, numbers shall be used for action statements, bullets for conditional statements. (Refer to Section 3.4 below for a discussion of conditional statements.)

Example 1 (subdivision of an action statement):

4.3 WHEN .... boron injection has been initiated,

THEN .... 1. Confirm automatic isolation of or manually isolate RWCU.

2. Continue to inject boron into the RPV until 640 pounds of boron have been injected.

Example 2 (subdivision of a conditional statement):

3.9 Start pumps in alternate injection subsystems which are lined up for injection into the RPV.

- IF ..... RPV pressure is increasing,
  THEN .... EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

- WHEN .... RPV water level drops to 0.0 in.,
  THEN .... continue in this procedure at Step 3.11.

3.3 Step Numbering (Continued)

3. Lists appearing as part of an instructional step shall have entries designated as follows:

   - Lists of systems or components shall be itemized with bullets.

   Example:

   5.2 Commence and slowly increase injection into the RPV with the following systems:

   - o Condensate booster pumps
   - o Condensate pumps
   - o CRD

   - Lists of conditions or step numbers shall be itemized with lower-case letters.

   Example 1 (list of conditions):

   2. IF .... any one or more of the following conditions occur:

      a. Off-site whole body dose rate is projected to exceed 1 Rem OR

      b. Off-site child thyroid dose is projected to exceed 5 Rem OR

      c. Site boundary whole body dose rate approaches or exceeds 50 mR/hr for 1/2 hour

3.3 Step Numbering (Continued)

3. (Continued)

Example 2 (list of step numbers):

2. Execute the following steps concurrently: a. Step 3 .... RPV water level control b. Step 4 .... RPV pressure control c. Step 5 .... reactor power control

- Bullets and letter designators shall be indented two spaces to the right of the left margin of the main text of the associated step (see examples above).

3.4 Conditional Statements

When an operator action is contingent upon the existence of certain plant conditions, the step shall be presented in the form of a conditional statement incorporating highlighted logic terms to clarify the distinction between conditions and actions. The following conventions shall be followed (refer to the examples presented in Table 1 and to Section 4.4 below):

1. The conditional part of the step shall be stated first, followed by the contingent action.

2. Logic terms shall be typed in upper-case letters and vertically aligned, separated from the remainder of their respective clauses by a series of periods.

3. The ends of clauses shall be punctuated with commas.

4. Conditional statements provided as contingency actions shall be indented so that the logic terms are aligned with the left margin of the text of the preceding step (see Example 5 below).

3.4 Conditional Statements (Continued)

5. If an action prescribed in a step is to be performed until certain specified conditions occur, the conditions shall be prefaced by the word "UNTIL" typed in capital letters and shall be listed separately following the action statement (see Example 5 below).

Example 1:

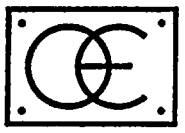
IF ..... a reactor scram has not been initiated, THEN .... initiate a reactor scram.

Example 2:

IF ..... the main turbine-generator is on-line, AND IF .. the MSIVs are open, THEN .... confirm or initiate recirculation flow runback to minimum.

Example 3:

IF ..... reactor power is above 2.5%, OR IF ... reactor power cannot be determined, THEN .... trip all recirculation pumps.



3.4 Conditional Statements (Continued)

Example 4:

WHEN .... RPV water level drops to 0.0 in.,
THEN .... continue in this procedure at Step 3.11.

Example 5:

IF ..... suppression pool water level is above 5.5 ft.,
THEN .... open all ADS valves.
IF ..... any ADS valve cannot be opened,
THEN .... open other SRVs
UNTIL ... 7 valves are open.

3.5 Page Layout and Identification

Each page of each EOP shall contain the following information (see example in Figure 2 on Page 6):

1. A title block extending from margin to margin across the top of the page containing:

   - Procedure title (upper left corner)

   - Procedure number (upper right corner)

2. Issue date (lower left corner)

3.5 Page Layout and Identification (Continued)

4. Page number and total number of pages in the procedure (lower right corner)

Example:

Page 12 of 32

The following page layout conventions shall be observed:

1. Each EOP shall begin on a new page.

2. Both sides of the pages shall be used and numbered. Entry conditions and instructional steps shall be located on the right hand pages. Override statements and figures shall be located on the left hand pages. (Refer to Section 3.6 below for a discussion of override statements.)

3. Left hand pages containing no override statements shall contain the words, "THIS PAGE INTENTIONALLY BLANK," typed in upper-case letters and centered on the page.

4. Text shall begin on the third line below the title block.

5. The section title, "OPERATOR ACTIONS," need not be repeated on each page of Section B. However, to enhance the organization of the more complex EOPs, major subsection headings (e.g., "Monitor and control RPV water level") shall be placed at the top of each page containing applicable steps.

6. Page rotation should be avoided. If page rotation is required to accommodate graphs, tables, or figures, page margins, headings, and footings shall not be rotated.

7. Foldouts and oversized pages shall not be used.

3.6 Override Statements

Conditional statements applicable to a series of steps or actions are herein designated "override" statements. (e.g., "While executing Steps 8.2 and 8.3, if RPV water level can be determined, then continue in this procedure at Step 9.") The following conventions shall apply to the use of overrides in the EOPs (refer to the illustration in Figure 3):

1. Override statements shall be boxed and placed on the left hand pages, even with the first steps to which they apply.

2. Override statements shall be repeated on subsequent left hand pages if the steps to which they apply continue on following pages.

3. Arrows pointing to the left shall be placed immediately to the left of the step numbers of steps having associated override statements.

4. The top of the box where an override statement first appears shall be a double line ending with an arrow aligned with the arrow adjacent to the number of the step to which it applies. The text of the override statement, the double line forming the top of the box, and the arrow adjacent to the associated step number shall be printed in boldface type. On subsequent pages, the text and the arrows shall be in regular type and the top of the box shall be a single line, also in regular type.

5. The text of the override statement shall specify the exact steps to which it applies.

6. An arrow extending down from the left side of the box containing an override statement shall be used to graphically identify the steps to which the statement is applicable. The arrow shall extend from the top of the box to a point even with the last line of the last step to which the statement applies. The end point shall be marked with a horizontal double line.

3.7 Cautions and Notes

Each caution applicable to the EOPs shall be identified with a number and succint title, descriptive of the caution content. The full texts of all EOP cautions shall be separately listed in N1-EOP-1, "EOP Cautions."

Left Page

TITLE: RPV CONTROL (Boron Injection Not Required) NO. N1-EOP-2

While executing this procedure:

IF .... Boron injection is required,

OR IF . boron has been injected,

THEN .. enter F-EOP-3.

While executing Steps 5.1 through 5.4:

WHEN..all control rods are inserted beyond position 00

OR

WHEN..the reactor is shut down and no boron has been injected into the RPV,

THEN..enter F-AOP-1, "Reactor Scram."

Date 2/17/84 Page 26 of 33

Right Page

TITLE: RPV CONTROL (Boron Injection Not Required) NO. N1-EOP-2

<-- 5. Monitor and control reactor power:

<------ 5.1 Confirm or place the reactor mode switch in the SHUTDOWN position.

<------ 5.2 IF ..... the main turbine-generator is on-line

AND IF .. the MSIVs are open,

THEN .... confirm or initiate recirculation flow runback to minimum.

<------ 5.3 IF ..... reactor power is above 2.5%

OR IF ... reactor power cannot be determined,

THEN .... trip all recirculation pumps.

<------ 5.4 Execute F-AOP-34, "Alternate Control Rod Insertion," concurrently with this procedure.

<------ 5.5 IF ..... the reactor cannot be shut down before suppression pool water temperature reaches 110°F,

THEN .... BORON INJECTION IS REQUIRED; enter F-EOP-3, "RPV Control (Boron Injection Required)."

Date 2/17/84 Page 27 of 33

Figure 3. Override Statements

3.7 Cautions and Notes (Continued)

Within an EOP, the number and title of cautions applicable to a particular step shall be typed in upper-case letters in a box to the right of that step.

Example:

2.4	IF	suppression pool temperature cannot be maintained below the Heat Capacity Temperature Limit,	CAUTION # 8 OBSERVE NPSH LIMITS CAUTION #13 RAPID MAY BE REQD CAUTION #14 CHECK MOTOR DRIVEN PUMPS AVAIL
	THEN	maintain RPV pressure below the Limit.	

Notes, where appropriate, shall be typed in italics, between the margins of the associated step. The word "NOTE" shall be typed in upper-case letters centered over the text of the note.

Example:

NOTE

Defeating RSCS interlocks may be required to accomplish the following step:

3.8 Figures and Tables

Figures and tables referenced within an EOP shall be grouped together and placed at the end of the EOP as an attachment. The following conventions shall be observed:

1. A table of contents shall be included on the attachment cover sheet.

2. Tables shall be placed before figures.

3. Tables and figures shall each be numbered sequentially, in the order referenced, using a prefix corresponding to the number of the applicable procedure followed by a decimal numeral. The symbol "#" and the abbreviation "No." shall not be used. Example: Figure N1-EOP-1.2

4. Each figure and table shall have a title. Figure titles shall be capitalized and centered below the figures, together with the figure numbers. Table titles shall be typed in upper-case letters and centered above the tables, together with the table numbers.

5. A reference to a figure or table within the text of a procedure shall specify the page on which the figure or table may be found.

6. Figures should be clear, simple, and easily readable.

7. Graphs shall incorporate the following features:

   - Axes shall be labeled with parameters, units, and numerical values.

   - Grid lines shall be provided; numbered lines shall be bolder than unnumbered lines.

   - Axes shall be scaled so as to match the scales of the corresponding control room instruments.

   - As a supplement to the full size figures provided in the attachment, small reproductions of each graph shall be placed within the body of the EOP on the left hand page opposite the associated step. These reproductions shall be labeled with the figure title, typed in boldface, upper-case letters, and the figure number, enclosed in parentheses. Only major scale divisions need be shown.

3.8 Figures and Tables (Continued)

8. Tables shall incorporate the following features:

   - Tables shall be placed within boxes.
   - A heading shall be provided for each column.
   - Headings shall be in upper-case letters centered over the columns.
   - A horizontal line shall be placed below the column headings.
   - Columns shall be divided by vertical lines.
   - Entries shall be separated by blank lines.

3.9 Use of Emphasis Techiques

Boldface print, upper-case letters, and underlines shall be used for emphasis throughout the EOPs. The following conventions shall be observed:

1. Boldface print shall be used in the following applications:

   - Procedure numbers and titles in title blocks
   - Figure titles on left hand pages
   - First occurrences of override statements

2. Upper-case letters shall be used in the following applications:

   - Logic terms
   - Caution titles
   - Note headings
   - Identification of as-labeled component designations and annunciator engravings
   - Table and figure titles and headings

3.9 Use of Emphasis Techiques (Continued)

2. (Continued)

   - Acronyms
   - Section headings
   - Identification of a requirement for Emergency RPV Depressurization, Steam Cooling, RPV Flooding, Alternate Shutdown Cooling, or Boron Injection.

   Example:

o IF	suppression pool temperature and RPV pressure cannot be restored and maintained below the Heat Capacity Temperature Limit,
THEN	EMERGENCY RPV DEPRESSURIZATION IS REQUIRED.

3. Underlining shall be used in the following applications:

   - Caution titles
   - Section titles
   - Emphasis of individual words, where appropriate, within procedure steps.

3.10 Typing Instructions

The EOPs shall be typed in accordance with the following instructions (refer also to the EOP format illustrated in Figure 2 on Page 6):

1. Paper size shall be 8-1/2 x 11 inches.

3.10 Typing Instructions (Continued)

2. Margins shall be maintained as follows:

   Left: 1-1/4 inches

   Right: 1 inch

   Top: 1 inch

   Bottom: 1/2 inch

3. Text shall begin on the third line below the title block.

4. Double line spacing shall be used. Two blank lines shall be inserted between steps and before and after section headings.

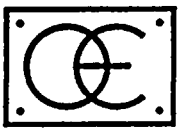
5. Section titles shall be typed in upper-case letters and underlined. The letter designations for section headings shall be aligned with the left margin. Two spaces shall be inserted between the period following the letter designation and the section title.

6. Step numbers shall be vertically aligned under the first letter of the section title. Two spaces shall be inserted between the period following the step number and the beginning of the text of the step. If the text of the step occupies more than one line, the first words of all lines shall be vertically aligned on the left.

7. Substep numbers shall be indented so as to be vertically aligned under the first letter in the text of the preceding step. Two spaces shall be inserted between the substep number and the beginning of the text of the substep. If the substep occupies more than one line, the first words of all lines shall be vertically aligned on the left.

8. Division of words at the ends of lines should be avoided. Division of words between pages is not allowed.

9. Excessive indentation should be avoided.



4.0 PROCEDURE CONTENT

4.1 General

Each EOP shall contain the following sections:

A. ENTRY CONDITIONS

B. OPERATOR ACTIONS

The ENTRY CONDITIONS section of an EOP shall contain a statement of the conditions requiring entry into that procedure.

Example:

A. ENTRY CONDITIONS

Entry into this procedure is required whenever any of the following conditions occur:

	Parameter	Condition
1.	RPV water level	below 177 in.
2.	RPV pressure	above 1045 psig
3.	[Etc.]	

The OPERATOR ACTIONS section of an EOP shall contain the sequential steps of the procedure. Short, concise instructions giving appropriate directions to the user shall be provided. Any required verification of automatic plant response shall be included as an instructional step. A mandatory step sequence shall be assumed unless otherwise stated.

4.2 Level of Detail

The level of detail presented in the EOPs shall be established in accordance with the following considerations:

1. The level of detail should be consistent with the knowledge and capabilities of the least experienced intended user.

2. The relative complexity and familiarity of the required evolutions should be considered.

3. Excessive detail should be avoided. Expected results of routine actions need not be stated.

4. Where general instructions are specified, the user should be able to explain the step in detail.

5. Where appropriate, the following information shall be included:

   - System response times
   - Equipment limitations
   - Instrument inaccuracies
   - Alternate or backup instrumentation
   - Contingency actions
   - Manual override instructions
   - Methods of verifying correct plant response

4.3 Step Construction

Instructional steps shall be written in accordance with the following considerations:

1. The procedure shall be easily readable and interpretable.

2. Directions shall be written in the second person imperative mood with an implicit subject.

3. Instructions should be succint and precise. Short, simple sentences should be used.

4.3 Step Construction (Continued)

4. Generally, each step should address only one idea. Complex evolutions should be addressed in a series of steps.

5. The objects of actions should be specifically stated (i.e., it should be obvious exactly what is to be done to what). Multiple objects should be listed separately.

   Example:

   Commence and slowly increase injection into the RPV with the following systems:

   - o CS
   - o CS keep-full
   - o Condensate transfer

6. Actions which must be performed concurrently shall be specifically identified.

7. Limits should be expressed quantitatively. Annunciator setpoints should be specified when appropriate.

8. Arithmentical calculations should be avoided.

9. Terminology should be consistent with the guidelines presented in Section 4.9 below.

4.4 Conditional Statements

Logic terms in conditional statements shall be selected and applied consistent with the usage defined in Table 1.

Table 1

APPLICATION OF LOGIC TERMS

Conditional statement logic terms shall be selected and applied consistent with the usage defined below:

Logic Term	Definition
AND	Indicates a combination of conditions. Identifies the second and subsequent elements of a set of conditions.
IF	Indicates that the action prescribed in the step is contingent upon the stated conditions. Identifies the condition as possible, but not necessarily expected.
ONLY IF	Qualifies a conditional statement. Emphasizes that the action is not to be performed unless the stated condition occurs.
OR	Designates an alternative condition. Indicates that the action is to be performed if either of two conditions occur. (Always used in the inclusive sense.)
THEN	Distinguishes the action portion of the step.
WHEN	Indicates that the action prescribed in the step is contingent upon an expected condition.

4.5 Cautions and Notes

Cautions shall be used to identify a potential hazard to personnel or equipment. Notes shall be used to provide supplementary information related to a particular step.

Use of both cautions and notes shall be minimized. Neither shall contain instructional steps.

4.6 Branching Instructions and Cross-References

Branching instructions shall be used to direct the operator to either exit a given step of a procedure and enter a new step or procedure, or to perform an additional step or procedure concurrently with the given step. The instructions shall take one of the following forms, as appropriate:

(a) Enter Procedure X at Step Y

Indicates that the operator must exit the procedure containing the instructions and enter the new procedure at the specifed step.

(b) Enter Procedure X at Step Y and perform it concurrently

Indicates that the operator must perform an additional series of steps concurrently with the procedure containing the instruction.

(c) Continue in this procedure at Step Y

Indicates that the operator is to exit the step containing the instruction and proceed in accordance with the instructions contained in the specified step. Used to branch to a subsequent step.

(d) Return to Step Y of this procedure

Indicates that the operator is to exit the step containing the instruction and proceed in accordance with the instructions contained in the specified step. Used to branch to a previous step.

4.6 Branching Instructions and Cross-References (Continued)

Forward and backward branching within the same procedure should be minimized. When intra-procedure branching is necessary, the page numbers of the branch steps shall be specified. The section designation "B" is considered implicit in the step number for operator actions and need not be included in the reference.

Cross-references shall be specified where additional procedures or steps are to be used as a supplement to a particular step. Use of cross-references shall be minimized; if only a few, relatively simple actions are involved, the referenced instructions shall be incorporated into the step itself.

When cross-references are appropriate, procedures shall be referenced by both number and title, with the title enclosed in quotation marks.

Figures and tables referenced within a procedure shall be identified by both number and title. The page on which the reference is found shall be specified.

4.7 Component Identification

Components shall be clearly and completely identified within the procedures. The following conventions shall be observed:

1. If the step refers to a specific panel control or instrument, the as-labeled designation shall be used, typed in upper-case letters. Otherwise, common-usage designations shall be used.

2. System titles shall be capitalized. The word "system" need not be included in the title.

3. Component locations shall be specified if the components are infrequently used or if there would otherwise be a possibility of confusion.

4.8 Spelling, Grammar, and Punctuation

Spelling, grammar, and punctuation shall be consistent with standard rules and modern usage. In addition, the following specific guidelines shall be considered:

1. Excessive use of commas should be avoided.
2. Use of definite articles should be minimized.
3. Use of pronouns should be minimized. Personal pronouns shall not be used.
4. Use of adverbs should be minimized.

4.9 Nomenclature, Vocabulary, and Abbreviations

Words and abbreviations shall have consistent meanings throughout the EOPs. The following conventions shall be observed:

1. Simple, common words shall be used.
2. Words shall have specifc, precise meanings. Ambiguous terms such as "slowly" should be avoided.
3. The standard definitions listed in Table 2 (Page 28) shall be adopted.
4. Use of abbreviations shall be minimized. Only those immediately recognizable shall be used. (A list of approved abbreviations is provided in Table 3 on Page 30.)
5. A period shall be omitted from abbreviations except when such omission would introduce confusion (e.g., "inch" shall be abbreviated "in.").
6. Acronyms shall be typed in upper-case letters.

4.10 Numerical Values

Limits and values of operating parameters shall be expressed quantitatively in the EOPs. The following conventions shall be observed:

1. Arabic numerals shall be used.

2. Parameter values shall include the units of measurement. Units shall be the same as those displayed on associated panel instrumentation.

3. Parameter values shall be expressed to a precision consistent with the intent of the step and the accuracy and precision of associated instrumentation.

4. Acceptance values shall be expressed in terms of a range rather than a tolerance band to obviate the need for mental arithmentic.

   Example: 20 in. to 30 in., rather than 25 in. $\pm$5 in.

5. A virgule shall be used in place of the word "per."

6. Numbers between zero and one shall be expressed in decimal form with a zero preceding the decimal point.

   Example: 0.12

Table 2

STANDARD NOMENCLATURE AND DEFINITIONS

Available: The state or condition of being ready to be placed into operation.

Before: Prior to; does not imply any specific margin.

Cannot be determined: The value of the specified parameter cannot be defined using available indications.

Cannot be maintained: The value of the specified parameter cannot be kept above or below the applicable limit. Implies an evaluation based on system performance and availability considered in relation to parameter values and trends; does not necessarily imply that the parameter has actually exceeded the limit.

Cannot be restored: The value of the specified parameter cannot be returned to within the specified limit. Implies an evaluation based on system performance and availablility considered in relation to parameter values and trends. Does not imply any specific time limit, but does not permit prolonged operation in excess beyond the limit.

Close: To position a valve or damper so as to prevent flow of the process fluid.

Confirm: Use available indications to verify that the specified state exists or that the specified actions have occurred. Does <u>not</u> imply an instruction to take action.

Control: Take action, as necessary, to maintain the value of the specified parameter within applicable limits.

Enter: Commence performing, in sequence, the steps of the identified procedure. Unless concurrent execution is specifically directed, implies an instruction to exit the procedure containing the statement.

Execute: Perform the actions prescribed in the identified step.

Initiate: Operate the necessary controls so as to establish the specified system or plant condition.

Table 2

STANDARD NOMENCLATURE AND DEFINITIONS (Continued)

Line up: Establish the prerequisites necessary for system operation.

Maintain: Take action, as necessary, to keep the value of the specified parameter within the applicable limits.

Monitor: Observe and evaluate at a frequency sufficient to remain appraised of the value, trend, and rate of change of the specified parameter.

Open: To position a valve or damper so as to allow flow of the process fluid.

Operable: Capable of performing an intended function.

Operating: Performing an intended function.

Place: To align a switch to a specified position.

Prevent: Take action to forestall or avert the state, condition, or action addressed by the step.

Restore: Take action, as necessary, to return the value of the specified parameter to within applicable limits.

Set: To position a control to a specified scale value.

Shut: To position a breaker so as to permit the flow of current in the associated circuit.

Start: To energize a pump or fan motor.

Stop: To deenergize a pump or fan motor.

Terminate: Stop and prevent the stated action or evolution.

Throttle: To position a valve or damper so as to partially restrict flow of the process fluid.

Trip: To position a breaker so as to interrupt or prevent the flow of current in the associated circuit.

Vent: To reduce the pressure in an enclosed volume.

Table 3

STANDARD ABBREVIATIONS

The following abbreviations are approved for use in the NMP-1 EOPs:

Abbreviation	Meaning
ADS	Automatic Depressurization System
CRD	Control Rod Drive
EC	Emergency Condenser
ECCS	Emergency Core Cooling System
EVS	Emergency Ventilation System
ft	Feet
HCU	Hydraulic Control Unit
HX	Heat exchanger
in.	Inch
LPCS	Low Pressure Core Spray
MSIV	Main steam isolation valve
NPSH	Net positive suction head
psig	Pounds per square inch (guage)
RPM	Revolutions per minute
RPV	Reactor Pressure Vessel
RWCU	Reactor Water Cleanup
SLC	Standby Liquid Control
SORV	Stuck open relief valve
SRV	Safety/relief valve

ATTACHMENT 3

Verification/Validation Program Description

Verification Program Description

1. Overview

Emergency Operating Procedure (EOP) verification is a comparative evaluation addressing the written correctness and technical accuracy of Emergency Operating Procedures. It is one of the activities which must be completed prior to implementation of revised EOPs.

The EOP Verification Program will include:

1. An evaluation of the EOPs for consistency with applicable source documents

2. An evaluation of the EOPs with respect to accepted human factors criteria pertaining to the presentation of procedural information

3. An evaluation of the EOPs for consistency with the controls and instrumentation provided in the control room

The results of the evaluation will be documented. As appropriate, recommendations for correcting deficiencies and improving the procedures will be provided.

2. Preparation of the EOP Verification Program Plan and Implementation Procedures

An EOP Verification Program Plan and the necessary procedures for implementing the program and documenting the program and documenting the program results will be prepared in advance of conducting formal EOP verification. In combination, the Program Plan and the Implementation Procedures will provide the specific definitions, instructions, evaluation criteria, checklists, and documentation forms necessary for carrying out EOP verification.

The guidance provided in INPO Report 83-004, "Emergency Operating Procedures Verification Guideline" will be considered in the preparation of the Program Plan and Implementation Procedures. Both the Plan and the Procedures will be approved by the Nine Mile Point Unit 1 Operations Staff prior to use.

3. EOP Verification Program Scope

The EOP Verification Program scope will include:

1. An evaluation of the technical accuracy and adequacy of the EOPs (i.e., an assessment of the EOPs with respect to applicable source documentation, including that provided in the generic BWR Emergency Procedure Guidelines and the Nine Mile Point 1 plant-specific Emergency Procedure Guidelines

3. EOP Verification Program Scope (cont'd)

2. An assessment of the EOPs' adherence to the instructions contained in the EOP Writer's Guide and additional plant administrative requirements applicable to procedure writing

3. A review of the EOPs for compliance with accepted human factors principles for writing emergency operating procedures; this review will include an evaluation of procedure characteristics relating to ease of reading and comprehension under their anticipated conditions of use

4. An evaluation of the EOPs compatibility with control room hardware (both instrumentation and controls)

Results of the evaluations and reviews will be documented, including the identification of procedural discrepancies and deficiencies, and forwarded to the Nine Mile Point Unit 1 operations staff for consideration. Where appropriate, recommendations for procedural improvements will be provided by those performing the verification.

Validation Program Description

1. Overview

Emergency Operating Procedures (EOP) validation is a performance evaluation addressing the usability and operational correctness of emergency operating procedures. The Validation Program objective is to assure that the emergency operating procedures provide adequate instructions for managing emergency conditions. As such, the full set of emergency operating procedures is evaluated in combination with each other, and with the other plant procedures which are used in concert with the emergency operating procedures. Validation is one of the activities which must be completed prior to implementation of revised EOPs.

The EOP Validation Program will include:

1. An assessment of the adequacy of the EOPs' level of detail
2. An evaluation of the understandability of the EOPs
3. An evaluation of the EOPs with respect to their correctness and usability for mitigating the consequences of transient and accidents

The results of the evaluations will be documented. As appropriate, recommendations for correcting deficiencies and improving the procedures will be provided.

2. Preparation of the EOP Validation Program Plan and Implementation Procedures

An EOP Validation Program Plan and the necessary procedures for implementing the program and documenting the program results will be prepared in advance of conducting formal EOP validation. In combination, the Program Plan and the Implementation Procedures will provide the specific defintions, instructions, evaluation criteria, checklists, and documentation forms necessary for carrying out EOP validation.

The guidance provided in INPO Report 83-006, "Emergency Operating Procedures Validation Guideline" will be considered in the preparation of the Program Plan and Implementation Procedures. Both the Plan and the Procedures will be approved by the Nine Mile Point Unit 1 Operations Staff prior to use.

3. EOP Validation Program Scope

The EOP Validation Program will employ two methods of validating procedures, both of which are described in INPO Report 83-006:

1. Table-Top

2. Walk-Through

Station Shift Supervisors will participate in the Table-Top validation process. Operator actions for responding to various transient and accident scenarios will be discussed and the EOPs evaluated with respect to the adequacy of the instructions provided. An evaluation of the EOPs understandability and usability will also be performed.

Walk-throughs using the EOPs will be performed in either the Nine Mile Point Unit 1 control room or plant specific simulator to evaluate procedure, plant, and crew compatibility. EOP usability and operational correctness will also be evaluated as part of this EOP validation activity.

Feedback from licensed operators participating in EOP classroom and simulator training will also be incorporated into the EOP Validation Program.

Results of EOP validation evaluations and reviews will be documented, including the identification of procedural discrepancies and deficiencies, and forwarded to the Nine Mile Point Unit 1 operations staff for consideration. Where appropriate, recommendations for procedural improvements will be provided by those performing the validation.

ATTACHMENT 4

Training Program Description

Training Program Description

The Training Program established to support implementation of the Emergency Operating Procedures will be based on the following goals:

- to enable the operators to understand the structure of the Emergency Operating Procedures,
- to enable the operators to understand the technical bases of the Emergency Operating Procedures, and
- to enable the operators to use the Emergency Operating Procedures under operational conditions.

To accomplish these goals a combination of self study, classroom, and plant specific simulator training will be used. Self study and classroom training will familiarize the operators with the historical development and technical bases behind the Emergency Operating Procedures. Simulator training will emphasize use of Emergency Operating Procedures during operational conditions.

As the Emergency Operating Procedures are developed and approved, they will be incorporated into Operator Requalification Training to provide preliminary familiarization with the concept and content of the Emergency Operating Procedures. When all of the Emergency Operating Procedures have been developed and verified, the Training Staff will be trained in the Emergency Operating Procedures. To accomplish this, a consultant familiar with the background of the Emergency Operating Procedures has been contracted to provide lesson plans, handout material and instructor training.

To accomplish the training of licensed staff and operators, the annual Simulator Requalification Program will be expanded from three to an anticipated five days. During this time a program of integrated classroom/simulator training will be conducted to train licensed staff and operators as a shift/crew/plant unit. It is anticipated that this can be completed in three days of each training week. Tentatively, the remaining two days would be utilized to complete requalification requirements. This projection will be firmed up as the Emergency Operating Procedures become available and lesson plans are developed.

Requalification training will be completed in a similar manner. Changes to Emergency Operating Procedures will be addressed in Operator Requalification and by routing. Annual Simulator Training will be integrated into the annual simulator requalification.

Operator Training on the Emergency Operating Procedures will be completed prior to actual implementation.