UNIT NO.: _____ DATE ___/___/___

UNIT COOLDOWN TO COLD SHUTDOWN

1.0 PURPOSE

This procedure provides instructions for maintaining hot standby following reactor trip, maintaining hot standby following reactor shutdown, taking the unit from hot standby to cold shutdown. Instructions are provided for maintaining conditions stable at points between.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 PRECAUTIONS

2.1.1 If this procedure is terminated prior to completion, the Unit Shift Supervisor (USS) should note the reason for the termination in the comments section.

2.1.2 The Reactor Coolant System (RCS) pressure and temperature shall be maintained within the operating region of RCS Pressure Temperature Limits (Plant Technical Data Book Tab 3.1).

2.1.3 Do not add positive reactivity by more than one controlled method at a time while the reactor is subcritical.

2.1.4 Whenever RCS temperature is above 160°F, at least one RCP should be in operation. Preferably Pump 4 to ensure best spray capability.

2.1.5 Prior to opening any portion of the RCS to the atmosphere, the hydrogen concentration in the affected portion must be reduced to less than 5cc/kg.

2.1.6 The boron concentration in the pressurizer should not be different from the RCS by more than 50 ppm. Pressurizer Backup Heaters may be energized as necessary to equalize the boron concentration.

2.1.7 The Control Rod Drive Mechanism (CRDM) Cooling System shall be operating when RCS temperature is greater than or equal to 350°F or when any CRDM is energized.

2.1.8 During cooldown, all Main Steam Isolation Valves (MSIVs) should be open or atmospheric reliefs balanced to allow uniform cooldown of all Reactor Coolant System (RCS) loops and Steam Generators (SGs). Steam dump is the preferred method of heat removal.

2.1.9 The Residual Heat Removal (RHR) Pump Suction Line should not be isolated from the RCS unless there is a steam bubble in the Pressurizer.

2.1.10 One Reactor Coolant Pump (RCP) should be running anytime RCS temperature is changed by more than 10°F in one hour.

2.1.11 Spray flow into the Pressurizer should not be initiated if the temperature difference between the Pressurizer steam space and the spray fluid exceeds 125°F.

2.1.12 Before auxiliary spray is initiated with a temperature difference between the pressurizer steam space and the spray fluid exceeding 320°F, notify the USS. (Technical Specification 5.7.1)

2.1.13 While in Hot Standby, feeding Steam Generators should be continuous to minimize thermal stresses on the Feedwater Nozzle.

2.1.14 Vacuum should be maintained on the Main Turbine following unit shutdown until the Turbine coasts down to approximately 66% rated speed (1200 rpm) unless an emergency dictates rapid coastdown of the Turbine Rotor.

2.1.15 If Main Turbine coastdown is in progress, then coastdown parameters should be monitored per 13800, "Main Turbine Operation" Sub-subsection 4.3.2.

2.1.16 The Main Turbine should be kept on Turning Gear until metal casing temperatures have returned to ambient. Bearing lube oil circulation must also be maintained.

2.1.17 During periods of operation with the RCS level below the Reactor Vessel Flange elevation (194 feet elevation), ongoing work activities should be closely scrutinized and any work activity limited that has the potential for reducing RHRS capability.

2.2 LIMITATIONS

2.2.1 The RCS pressure and temperature shall not exceed 425 psig and 350°F when open to the RHR system.

2.2.2 While in Modes 3 and 4, shutdown margin shall be greater than or equal to the limit specified in Technical Specification 3.1.1.2, Figure 3.1-1.

2.2.3 While in Mode 5, shutdown margin shall be greater than or equal to the limit specified in Technical Specification 3.1.1.2, Figure 3.1-2.

2.2.4 While in Mode 3, at least two RCS loops shall be in operation with the Reactor Trip Breakers closed and at least one in operation with the Reactor Trip Breakers open. (Technical Specifications 3.4.1.2)

2.2.5 While in Mode 4, at least two RCS loops and/or RHR trains shall be operable and at least one of the RCS loops and/or RHR trains shall be in operation. (Technical Specifications 3.4.1.3)

2.2.6 While in Mode 5 with the RCS loops filled, at least one RHR train shall be operable and in operation and either one additional RHR train operable or the secondary side water level of at least two steam generators shall be greater than 17% wide range. (Technical Specification 3.4.1.4.1)

2.2.7 While in Mode 5 with the RCS loops not filled, at least two RHR trains shall be operable and at least one RHR train shall be in operation. Reactor Makeup Water Valves 1208-U4-175, 1208-U4-176, 1208-U4-177, and 1208-U4-183 shall be closed and secured in position (by mechanical stops), except 1208-U4-176 and 1208-U4-177 may be opened for short periods of time for chemistry control provided the Hi Flux at Shutdown Alarm is operable with a setpoint of less than or equal to 2.30 times background. (Technical Specification 3.4.1.4.2)

2.2.8 While in Modes 4, 5, and 6 with the Reactor Vessel Head on, at least one of the following cold overpressure protection systems shall be operable:

a. Two PORVs with lift settings which do not exceed the limits established in Figure 1,

b. Two RHR suction Relief Valves each with a setpoint of 450 psig ±3%, or

c. The RCS depressurized with an RCS vent capable of relieving at least 670 gpm water flow at 470 psig. (Technical Specification 3.4.9.3)

2.2.9 While in Modes 5 and 6, at least one Charging Pump in the required boron injection flow path shall be operable. (Technical Specification 3.1.2.3)

2.2.10 The primary to secondary pressure differential shall not exceed 1600 psid or a secondary to primary pressure differential of 670 psid during unit operations or leak tests.

2.2.11 The maximum cooldown of the RCS shall be limited to 100°F in any one hour period. (Technical Specification 3.4.9.1)

2.2.12 The maximum cooldown of the pressurizer shall be limited to 200°F in any one hour period. (Technical Specification 3.4.9.2)

2.2.13 The maximum temperature differential between auxiliary spray water and pressurizer steam space is 625°F. (Technical Specification 3.4.9.2)

2.2.14 The temperature of both the primary and secondary coolant in the Steam Generators shall be greater than 70°F when the pressure of either coolant in the Steam Generator is greater than 200 psig. (Technical Specification 3.7.2)

2.2.15 While in Modes 3, 4 and 5, both channels of Source Range Nuclear Instrumentation shall be operable. (Technical Specifications Table 3.3-1, 6.B)

2.2.16 While in Modes 3, 4, and 5 at least one channel Source Range Nuclear Instrumentation should be selected to Recorder NR-45 and the CONTROL ROOM HI FLUX LEVEL AT SHUTDOWN alarm operable.

2.2.17 While in Modes 5 and 6, with the RCS level below Reactor Vessel Flange elevation (194 feet elevation), the RWST will be operable with a minimum volume of 99,404 gallons (9% of instrument span) of water at a boron concentration between 2400 and 2600 ppm.

3.0 INITIAL CONDITIONS

3.1 The reactor is shut down either following normal shutdown or reactor trip with Shutdown Rods either withdrawn or inserted.

3.2 RCS temperature is stabilized at no load Tavg under control of the steam dumps in Steam Pressure mode or by operation of the Steam Generator Atmospheric Relief Valves.

3.3 RCS pressure is stable at normal operating pressure.

3.4 At least one RCP is operating.

3.5 Pressurizer level is at approximately or returning to the program level with either the Positive Displacement (PD) Pump or a Centrifugal Charging Pump (CCP) operating to supply normal charging and RCP seal injection flow.

3.6 SG levels are at 45% to 55% NR level with Auxiliary Feedwater (AFW) operating.

3.7 The main Turbine is tripped and either coasting down or on the Turning Gear.

4.0 INSTRUCTIONS

NOTES

a. This procedure is divided into sections which permit either cooldown or maintaining stable conditions within a specified mode. Section E may be performed concurrently with Sections A,B,C,D.

b. Asterisk (*) steps beside INITIAL steps indicates steps that generate additional documents.

c. This procedure is written using Train A designations. Train B component designations are shown in parenthesis.

The sections of this procedure are:

A. Hot Standby Following Reactor Shutdown or Trip.

B. Cooldown to not less than 350°F.

C. Cooldown to not less than 205°F.

D. Cooldown to Cold Shutdown (less than 200°F).

E. Secondary Plant Shutdown.

UNIT NO. _____

SECTION A: Hot Standby Following Reactor Shutdown or Trip

A4.1 OPERATING IN HOT STANDBY FOLLOWING REACTOR SHUTDOWN OR TRIP:

INITIALS

A4.1.1 If this procedure has been entered from a reactor trip, then perform the following:

a. INITIATE 10006-C, "Reactor Trip Review", _____*

b. If entering this procedure from SI termination, then perform 11886, "Recovery From ESF Actuation", _____

c. MONITOR Main Turbine coastdown parameters per 13800, "Main Turbine Operation" and:

(1) ENSURE that the Turning Gear Motor Control Handswitch is in AUTO/PULL-TO-LOCK position, _____

(2) When Turbine Rotor reaches zero speed, VERIFY all Lift Pumps, Turning Gear Oil Pumps ON and Turning Gear engagement. _____

d. If applicable, ENSURE that TDAFW Pump has been stopped per 13610, "Auxiliary Feedwater System" and returned to STANDBY per 13610, Checklist 2, _____*

e. If not performed in the previous 92 days, COMPLETE 14423, "Source Range NIS Channel Analog Operational Test" (Technical Specification Table 4.3.1 item 6), _____*

UNIT NO. _____ INITIALS

f. When Source Range channels indication stabilize PLACE CONTROL ROOM HI FLUX LEVEL AT SHUTDOWN alarm in operation by performing the following:

(1) NOTIFY I&C and if necessary, RESET the HI FLUX AT SHUTDOWN alarm setpoint per 24695 and 24696, "N.I. System Source Range Channel Calibration", _____

(2) ENABLE THE HI FLUX AT SHUTDOWN alarm by placing the HIGH FLUX AT SHUTDOWN NORMAL/BLOCK switches to the NORMAL, _____

(3) VERIFY annunciator SOURCE RNG HI SHUTDOWN FLUX ALARM BLOCKED ALB-10 B01 resets, _____

(4) SELECT both channels of Source Range indication on Recorder NR-45, _____

ANNOTATE chart to reflect channels selected,

g. CALCULATE SHUTDOWN MARGIN per 14005, "Shutdown Margin Calculations", _____*

h. If necessary, BORATE the RCS per 13009, "CVCS Reactor Makeup Control System", _____

i. SHUT DOWN the CVCS BTRS System by performing the following:

(1) PLACE the CVCS BTRS SELECTOR Switch HS-10351 in the OFF position, _____

(2) CLOSE the BTRS Demineralizer Flow Control HV-0387 to the FULLY CLOSED position, _____

UNIT NO. _____ INITIALS

j. DIRECT Chemistry to sample the RCS hydrogen, gas activity concentrations and PERFORM an RCS Iodine sample analysis per the required frequencies of Technical Specifications Table 4.4-4, _____

Person Contacted _____ Date _____ Time _____

k. MAXIMIZE CVCS letdown purification flow rate per 13006, "Chemical And Volume Control System Startup And Normal Operation", _____

_____ / _____
Date Time

l. If required, INITIATE STARTUP of the Auxiliary Boiler per 13760-C, "Auxiliary Steam Boiler System", _____

NOTIFY Chemistry Department,

m. At the Steam Generator Blowdown Panel, slowly LOWER Steam Generator Cooling Water To The Heater Drain Tank temperature to 200°F by adjusting the setpoints on the Steam Generator Blowdown temperature Control Valves Controllers TIC-1191, 1192, 1193 and 1194, _____

n. STOP both Heater Drain Pumps, _____

o. STOP all but one Condensate Pump, _____

p. REDUCE in-service Condensate Demineralizer Powdex Vessels as applicable per 13616, "Condensate Filter Demineralizer System",

UNIT NO. _____ INITIALS

q. PLACE the Condensate and Feedwater System on Long cycle recirc per 13615, "Condensate And Feedwater Systems", or if a return to power is anticipated, OPEN MFP A & B BYPASS:

UNIT 1: 1-1305-U4-655

UNIT 2: 2-1305-U4-655

or at least one MFP Discharge MOV and VERIFY condensate/feedwater chemistry is acceptable for feeding Steam Generators by obtaining concurrence from Chemistry Department, _____

r. NOTIFY Chemistry to initiate placing condensate and feedwater into proper chemical wet layup, _____

s. If necessary, SHUT DOWN all but one Circulating Water Pump, _____

t. If necessary, SHUT DOWN all but one River Makeup Pump and RECORD time in the Unit Control Log Book, _____

u. ENSURE SG Blowdown Isolation Valves 1-HV-7603A(B, C, D) open. _____

A4.1.2 If No-Load Tavg cannot be maintained due to excessive steam demand, REDUCE steam demand by performing the following:

a. ENSURE MSR Heating Steam Supply Valves HS-6015 and HS-6030 closed, _____

b. TRANSFER the Auxiliary Steam System steam supply to the Auxiliary Boiler per 13761, "Auxiliary Steam System", _____

c. TRANSFER the Turbine Steam Seal supply to the Auxiliary Steam Supply per 13825, "Turbine Steam Seal System", _____

d. TRANSFER the SJAE steam supply to the Auxiliary Steam Supply per 13620, "Condenser Air Ejection System", _____

UNIT NO. _____ INITIALS

e. If Main Generator is to be shut down for more than two days, then to prevent overheating relay 360A, OPEN links TBR 28, 29 and 30, located in Protective Relay Panel Bay 4, per 00306-C, "Temporary Jumper And Lifted Wire Control", _____

f. If the Generator Regulator Panel (1328-P5-GRC) is to be de-energized for maintenance, then OPEN links TBR 56 and 57 and TBS 4 and 5 located in Protective Relay Panel Bay 4, per 00306-C, "Temporary Jumper and Lifted Wire Control". This will prevent tripping Lockout Relays 386 G9 and 386 G10 which trip Generator Output Breakers, _____

g. At the Main Transformer Control Cabinets, de-energize the Transformer Oil Pumps and Fans per 13800, "Main Turbine Operation" Sub-subsection 4.3.1. _____

A4.1.3 At the USS's discretion, DISABLE the MFPT trip circuitry to AFWAS by removing and tagging the following fuses on the applicable unit:

UNIT 1: Train A - Aux Relay Panel 1NCPAR2, Fuse FU-4 _____

_____ IV

Train B - Aux Relay Panel 1NCPAR4, Fuse FU-1 _____

_____ IV

UNIT 2: Train A - Aux Relay Panel 2NCPAR2, Fuse FU-4 _____

_____ IV

Train B - Aux Relay Panel 2NCPAR4, Fuse FU-1 _____

_____ IV

UNIT NO. _____ INITIALS

A4.1.4 Either OPERATE unit systems as necessary to maintain the unit at Hot Standby, or PROCEED to either Section B to initiate unit cooldown or 12003-C, "Reactor Startup" to return to power.

END OF SECTION A

UNIT NO. _____

SECTION B: Cooldown to not less than 350° F

NOTE

This section directs cooldown to 375°F or any point between without crossing the boundary for Mode 4 at 350°F.

B4.1 PREPARATION FOR UNIT COOLDOWN

INITIALS

B4.1.1 If required to cooldown secondary systems, then INITIATE Section E of this procedure.

B4.1.2 If Condenser vacuum is being maintained, then INITIATE placing a steam blanket on the MSR's per 13800, "Main Turbine Operation". _____

B4.1.3 INITIATE pressurizer and RCS boron equalization by energizing Pressurizer Backup Heaters. _____

B4.1.4 MAXIMIZE CVCS letdown purification flowrate.

_____
date/time _____

B4.1.5 INITIATE Borating the RCS to the cold shutdown boron concentration per 13009, "CVCS Reactor Makeup Control System". _____

If applicable, PERFORM 14835, "Boric Acid Injection Check Valve Cold Shutdown Inservice Test" during the boration. _____*

B4.1.6 DIRECT Chemistry to sample the RCS and Pressurizer boron concentration. _____

B4.1.7 If withdrawn, INSERT all Shutdown Banks to the fully inserted position. _____

B4.1.8 OPEN the Reactor Trip breakers. _____

UNIT NO. _____ INITIALS

B4.1.9 If not currently in progress, INITIATE RCS gaseous activity degas by performing the following:

a. ENSURE that the Pressurizer Steam Space Sample line is in operation by verifying that the PRZR STM SAMPLE IRC/ORC Valves HV-3513/HV-3514 are open, _____

b. NOTIFY Chemistry to adjust the pressurizer steam space sample flow rate to maximum, _____

c. While maintaining hydrogen cover gas, DEGAS the RCS by raising VCT gas purge flow rate to the Gaseous Waste Processing System to approximately 1.2 scfm using HIC-1094, as limited by the Hydrogen Recombiners. _____

B4.1.10 When notified by Chemistry that the RCS gaseous activity has been reduced to an acceptable level, TRANSFER VCT cover gas to Nitrogen and INITIATE RCS Hydrogen degas per 13007, "VCT Gas Control And RCS Chemical Addition". _____

NOTE

Prior to opening the RCS to containment the hydrogen concentration shall be less than 5 cc/kg.

B4.1.11 START both Containment Pre-access Filter Units using CTB PREACCESS FLTR UNIT-1/2 FAN HS-2620/2621.

_____ _____
date/time

B4.1.12 If it is planned to cool down to Cold Shutdown, and if not performed in the previous three months, COMPLETE 14748, "AFW Check Valve Shutdown Inservice Test". _____ *

UNIT NO. _____ INITIALS

B4.2 RCS COOLDOWN TO 375°F

B4.2.1 COMMENCE RCS/Pressurizer pressure and temperature trending at 30 minute intervals using Data Sheet 1 and ERF computer. (Technical Specification 4.4.9.1, 4.4.9.2)

Data taking and plotting may be suspended during holds in the cooldown if the duration is expected to exceed one hour.

CAUTION

To reduce thermal stratification in the Pressurizer Surge Line maintain the Delta-T between the RCS and the Pressurizer Steam Space as low as practical. The Delta-T of 320°F should not be exceeded.

NOTE

It is recommended that the RCS temperature be maintained 100°F ±25°F below Pressurizer steam space temperature. (See Figure 1.)

B4.2.2 COMMENCE the cooldown to 375°F and 540 psig at a recommended rate of approximately 50°F per hour by performing the following:

a. REDUCE the number of operating RCPs to two per 13003, "Reactor Coolant Pump Operation", _____

Pumps 4 and 1 are the preferred running pumps,

b. INITIATE Pressurizer cooldown and depressurization by slowly opening the Pressurizer Spray Valves, _____

If necessary, selectively DE-ENERGIZE Pressurizer Back-up Heaters by placing Control Switches to PULL-TO-LOCK.

UNIT NO. _____ INITIALS

CAUTION

RCS temperature and pressure shall be maintained within the acceptable operating region of Figure 1.

c. Slowly ADJUST the Steam Dump Controller setpoint or if applicable the Atmospheric Relief Valves to initiate RCS cooldown. _____

B4.2.3 At approximately 2185 psig, OBSERVE PRZR PORV BLOCK VALVES HV-8000A and HV-8000B auto close. _____

NOTE

Depending on the rate of RCS cooldown and depressurization, Step B4.2.5 may occur before Step B4.2.4.

B4.2.4 At approximately 550°F RCS temperature PERFORM the following:

a. VERIFY status light LO LO TAVG TRAIN A STEAM DUMP INTL P12 illuminated, _____

b. BYPASS the LO LO TAVG interlock by momentarily placing the Train A and B Steam Dump Interlock Selector Switches to the BYPASS INTERLOCK position, _____

If operating on Steam Dumps, then VERIFY Steam Dump Cooldown Valves PV-0507A,B and C are open by observing ZLB-2 on QMCB. _____

UNIT NO. _____ INITIALS

CAUTION

If the RCS is allowed to pressurize above P11 and SG pressure is below 585 psig, Safety Injection and Steam Line Isolation will occur.

B4.2.5 At approximately 1970 psig, manually BLOCK Pressurizer Pressure and Steam Line Pressure Safety Injection and Steam Line Pressure Steam Line Isolation signals by performing the following:

a. It is is planned to cool down for refueling, then PERFORM 14710, "Remote Shutdown Panel Transfer Switch And Control Circuit 18 Month Surveillance Test" Data Sheets 3A and 3B in lieu of the following substeps, _____

b. VERIFY Block Permissive Status Light PRZR LO PRESS SI BLOCK PERM P11 illuminates, _____

c. BLOCK the Low Pressurizer Pressure Safety Injection signal using PRZR PRESS SI BLOCK/RESET A and B handswitches HS-40012 and 40013, _____

d. OBSERVE Status Lights PRZR TRAIN A/B SI BLOCKED illuminated, _____

e. BLOCK the Low Steam Line Pressure Safety Injection signal using LOW STM PRESS SI/SLI BLOCK RESET handswitches HS-40068 and 40069, _____

f. OBSERVE Status Lights STMLINE ISO TRAIN A/B SI BLOCKED illuminated. _____

B4.2.6 CHECK that Pressurizer level is between 20% and 40%. _____

B4.2.7 As RCS pressure lowers, OPEN additional Letdown Orifice Isolation Valves and ADJUST PIC-131 setpoint to maintain desired letdown flowrate.

B4.2.8 During RCS depressurization, MAINTAIN all RCP seal injection flow rates between 8 and 13 gpm by adjusting the Charging Header Flow Controller HC-0182.

UNIT NO. _____ INITIALS

B4.2.9 At approximately 950 psig, ISOLATE ECCS Accumulators by performing the following:

a. REMOVE TAG, UNLOCK and CLOSE the Accumulator Discharge Isolation Valve 480V MCC Breakers on the applicable unit:

UNIT 1

ACCUM-1	1ABE-19	_____
ACCUM-2	1BBC-19	_____
ACCUM-3	1ABC-19	_____
ACCUM-4	1BBE-19	_____

UNIT 2

ACCUM-1	2ABE-19	_____
ACCUM-2	2BBC-19	_____
ACCUM-3	2ABC-19	_____
ACCUM-4	2BBE-19	_____

b. CLOSE the Accumulator Isolation Valves,

ACCUM-1 HV-8808A,	_____
ACCUM-2 HV-8808B,	_____
ACCUM-3 HV-8808C,	_____
ACCUM-4 HV-8808D.	_____

c. OPEN, LOCK and TAG the Accumulator Discharge Isolation Valves 480V MCC Breakers on the applicable unit,

UNIT 1

ACCUM-1	1ABE-19	_____
		_____ IV
ACCUM-2	1BBC-19	_____
		_____ IV
ACCUM-3	1ABC-19	_____
		_____ IV
ACCUM-4	1BBE-19	_____
		_____ IV

UNIT NO. _____ INITIALS

UNIT 2

ACCUM-1	2ABE-19	_____	
		_____	IV
ACCUM-2	2BBC-19	_____	
		_____	IV
ACCUM-3	2ABC-19	_____	
		_____	IV
ACCUM-4	2BBE-19	_____	
		_____	IV

d. OPEN and TAG MCC Relay K2 Links for the above MCC breakers. _____

B4.2.10 When steam pressure falls too less than 550 psig, at the USS's discretion the Steam Generators may be supplied by the running Condensate Pump per Section E4.2 of this procedure.

B4.2.11 Either OPERATE unit systems as necessary to maintain RCS within the following parameter values or PROCEED to either Section C to continue the cooldown or 12002-C, "Unit Heatup to Normal Operating Temperature and Pressure" to commence a heatup.

RCS temperature	375°F ±10°F
RCS pressure	540 psig ±25 psig
Pressurizer level	at program level

END OF SECTION B

SECTION C: Cooldown to not less than 205°F

NOTE

This section directs cooldown to 225°F or any point between without crossing the boundary for Mode 5.

C4.1 PREPARATION FOR CONTINUING UNIT COOLDOWN.

INITIALS

C4.1.1 If required to cooldown secondary systems and break condenser vacuum, then INITIATE SECTION E of this procedure.

CAUTION

Maintain pressurizer cold calibration level greater than 17%.

C4.1.2 If it is planned to cool down to cold shutdown, then ALLOW pressurizer level to rise to approximately 65% during the cooldown but not greater than 80% cold calibrate.

CAUTION

To reduce thermal stratification in the Pressurizer Surge Line maintain the Delta-T between the RCS and the Pressurizer Steam Space as low as practical. The Delta-T of 320°F should not be exceeded.

C4.1.3 COMMENCE RCS/Pressurizer pressure and temperature trending at 30 minutes intervals using Data Sheet 1 and ERF computer. (Technical Specification 4.4.9.1, 4.4.9.2)

Plotting may be suspended during holds in the cooldown if the duration is expected to exceed one hour.

UNIT NO. _____ INITIALS

C4.2 RCS COOLDOWN TO 225°F.

NOTE

It is recommended that the RCS temperature be maintained 100°F ±25°F below Pressurizer steam space temperature. (See Figure 1.)

C4.2.1 COMMENCE the cooldown to 225°F and 250 psig at a recommended rate of approximately 50°F per hour by performing the following:

a. CONTINUE the pressurizer cooldown and depressurization by slowly opening the Pressurizer Spray Valves, _____

If necessary, selectively DE-ENERGIZE Pressurizer Backup Heaters by placing Control Switches to PULL-TO-LOCK,

CAUTION

RCS temperature and pressure shall be maintained within the acceptable operating region of Figure 1.

b. Slowly ADJUST the Steam Dump Controller Setpoint or if applicable the Atmospheric Relief Valves to initiate RCS cooldown. _____

C4.2.2 If it is planned to cool down for refueling, then prior to reaching 350°F, REQUEST confirmation from Engineering/Maintenance that actions have been taken to preclude Reactor Vessel Seismic Tie Rod Binding. _____

C4.2.3 Prior to reaching 350°F, ISOLATE PERMS CVCS Letdown Monitor RE-48000. _____

UNIT NO. _____ INITIALS

C4.2.4 Prior to reaching 350°F, PLACE the Cold Overpressure Protection System (COPS) in operation by performing the following:

a. If not performed in the previous three months, PERFORM 14860, "PORV Cold Shutdown Inservice Test", _____*

b. ARM the A and B COPS by placing the PRZR PORV BLOCK VLV COLD OVERPRESSURE CNTL handswitches HS-8000G and 8000H to the ARM position, _____

c. VERIFY the following annunciators alarmed upon arming COMS:

A COLD OP ACTU VLV HV-8000A NOT FULL OPEN (ALB12 E06), _____

B COLD OP ACTU VLV HV-8000B NOT FULL OPEN (ALB12 F06), _____

d. ENSURE PRZR PORVs PV-455A and 1-PV-456A are closed and the handswitches in AUTO, _____

e. ENSURE OPEN PRZR PORV BLOCK Valves HV-8000A and 8000B, _____

NOTE

Step f satisfies Technical Specification surveillance 4.4.9.3.1.c

f. VERIFY the following annunciators reset:

A COLD OP ACTU VLV HV-8000A NOT FULL OPEN (ALB12 E06), _____

B COLD OP ACTU VLV HV-8000B NOT FULL OPEN (ALB12 F06). _____

C4.2.5 At 350°F, LOG time and date of entry into Mode 4 in the Unit Control Log Book.

_____ _____
date/time

UNIT NO. _____ INITIALS

C4.2.6 Within 4 hours after entering Mode 4 and prior to reaching 325°F PERFORM the following:

a. RACK OUT and TAG both safety Injection Pump Breakers on the applicable unit, (Technical Specification 4.5.3.2)

UNIT 1: SI PMP-A 1AA02-16 _____

_____ IV

SI PMP-B 1BA03-17 _____

_____ IV

UNIT 2: SI PMP-A 2AA02-16 _____

_____ IV

SI PMP-B 2BA03-17 _____

_____ IV

UNIT NO. _____ INITIALS

NOTE

AFWAS should be defeated to the SG Blowdown Valves, Sample Valves and MDAFW Pump Discharge Valves to accommodate MFP activities and/or SG draining/ filling operations without resulting in impacting those activities.

b. At the USS's discretion, REMOVE and TAG the following fuses on the applicable unit:

UNIT 1: Train A - Aux Relay Panel 1ACPAR6, Fuse FU-2 _____

_____ IV

Train B - Aux Relay Panel 1BCPAR7, Fuse FU-6 _____

_____ IV

UNIT 2: Train A - Aux Relay Panel 2ACPAR6, Fuse FU-2 _____

_____ IV

Train B - Aux Relay Panel 2BCPAR7, Fuse FU-6 _____

_____ IV

c. PLACE standby MDAFW Pumps handswitch in PULL-TO-LOCK, _____

d. If the TDAFW Pump is not being utilized, CLOSE HV-5122, 5125, 5127 and 5120. _____

UNIT NO. _____ INITIALS

C4.2.7 When the RCS pressure is less than 365 psig, and RCS temperature is less than 340°F, PLACE at least one RHR Train in operation per 13011, "Residual Heat Removal System". _____

a. OPERATE RHR HX Outlet Valves HV-0606(0607) and Bypass Valves FV-0618(0619) to control RCS temperature as necessary and RHR flow at a minimum total flow of 3000 gpm.

b. If applicable, PERFORM 14896, "ECCS Check Valve Cold Shutdown Inservice Test", _____*

c. ENSURE RHR Suction Isolation surveillance is initiated each shift per 14000, "Shift And Daily Surveillance Logs". _____

CAUTION

While in Mode 5 with the Reactor Coolant Loops filled, with 1 RHR Train inoperable, the secondary side water level of at least two Steam Generators shall be greater than 17% WR.

C4.2.8 If desired, REDUCE the number of operating RCPs to one per 13003, "Reactor Coolant Pump Operation". _____

Pump 4 is the preferred running pump to ensure best spray capability.

C4.2.9 When SG pressure falls to 25 psig INITIATE aligning Nitrogen to the SG's per 13601, "Steam Generator And Main Steam System Operation" with regulators set at 2 to 5 psig.

C4.2.10 If it is intended to perform maintenance on the RAT's during the outage, then NOTIFY Maintenance to initiate work towards backfeeding through the Main Transformer and UAT's per 13417, "Main And Unit Auxiliary Transformer Backfeed To The 13.8kV And 4160V Non-1E Busses". _____

INITIALS

C4.2.11 Either OPERATE unit systems as necessary to maintain RCS within the following parameter values or PROCEED to either Section D to continue the cooldown or 12001-C, "Unit Heatup to Hot Shutdown" to commence a heatup.

CAUTION

Ensure running RCP seal differential pressure is maintained greater than 200 psid.

RCS temperature	225 F ±10°F
RCS pressure	250 psig ±25 psig

END OF SECTION C

UNIT NO. _____

SECTION D: Cooldown to Cold Shutdown (less than 200°F).

NOTE

This section directs cooldown to Mode 5 and maintains temperature between 130°F and 80°F.

D4.1 PREPARATION FOR CONTINUING UNIT COOLDOWN

INITIALS

D4.1.1 If required to cool down secondary systems and break condenser vacuum, then INITIATE Section E of this procedure.

CAUTION

To reduce thermal stratification in the Pressurizer Surge Line maintain the Delta-T between the RCS and the Pressurizer Steam Space as low as practical. The Delta-T of 320°F should not be exceeded.

D4.1.2 COMMENCE RCS/Pressurizer pressure and temperature trending at 30 minute intervals using Data Sheet 1 and ERF Computer. (Technical Specification 4.4.9.1, 4.4.9.2)

Plotting may be suspended during holds in the cooldown if the duration is expected to exceed one hour.

D4.1.3 ENSURE RHR letdown is in operation with flow rate greater than or equal to 75 gpm. _____

D4.1.4 If not previously performed, RAISE Pressurizer level to approximatley 65%. _____

UNIT NO. _____ INITIALS

D4.2 RCS COOLDOWN TO BETWEEN 130°F and 80°F

D4.2.1 COMMENCE the cooldown at a recommended rate of approximately 50°F per hour by performing the following:

a. Slowly ADJUST the RHR Outlet Valves HV-0606(0607) to reduce RCS temperature, _____

CAUTION

Ensure running RCP seal differential pressure is maintained greater than 200 psid.

b. MAINTAIN Pressurizer pressure at 250 psig, ±25 psig, by selective use of Pressurizer Backup Heaters. _____

D4.2.2 At 200°F, LOG time and date of entry into Mode 5 in the Unit Control Log Book. _____

_____
time/date

D4.2.3 RACK OUT and TAG the Containment Spray pump breakers on the applicable unit.

UNIT 1: CS PMP-A 1AA02-14 _____

CS PMP-B 1BA03-14 _____

UNIT 2: CS PMP-A 2AA02-14 _____

CS PMP-B 2BA03-14 _____

D4.2.4 As directed by the USS, PLACE the Containment Pre-access Purge System in operation per 13125, "Containment Purge System". _____*

D4.2.5 To facilitate personnel ingress and egress, during cold shutdown, NOTIFY Maintenance to bypass the Containment Personnel Lock Interlock System.

If desired the Containment Equipment Hatch Missile Shield may be moved at this time.

D4.2.6 NOTIFY Work Planning Group to schedule and initiate mode dependent Fire Protection Surveillances. _____

UNIT NO. _____ INITIALS

D4.2.7 If it is intended to drain the RCS to below 17% pressurizer level, then REQUEST Engineering to defeat the RHR Suction Valves Autoclosure Interlock per 54840, "Installation And Removal Instructions For The RCS Temporary Level Indication Tygon Tube And The Defeat Of The Residual Heat Removal Suction Valve Auto Closure Interlock". _____

D4.2.8 When the RCS temperature is between 120°F to 180°F and if it is intended to take the RCS solid and cooldown the Pressurizer, then PERFORM the following:

a. ENERGIZE all Pressurizer Heaters and maintain RCS pressure at 250 psig ±25 psig by use of Pressurizer Spray Valves, _____

b. ENSURE all CVCS Letdown Orifices are in operation, _____

CAUTION

Expect rapid Pressurizer pressure rise with charging flow greater than letdown flow at the point of going solid. Be prepared to reduce charging flow or raise letdown flow to prevent extreme pressure fluctuations.

NOTE

During the filling process, monitor Pressurizer liquid and steam space temperature. If liquid temperature lowers toward RCS temperature, then the Pressurizer fill rate should be reduced.

c. RAISE Pressurizer level by raising charging flow rate and/or lowering RHR letdown flow rate at a maximum filling rate of 30 gpm, _____

UNIT NO. _____ INITIALS

d. When the pressurizer is solid as indicated by rising RCS pressure or if PIC-131 is in AUTO rising letdown flow rate, then PERFORM the following:

(1) BALANCE charging and letdown flow rates using HV-0128 and/or PIC-131 to maintain RCS pressure at 250 psig ±25 psig, _____

NOTE

Charging flow may remain greater than letdown flow as a result of coolant contraction during the cooldown.

(2) Charging/RHR letdown flow rate should be adjusted so that RHR letdown purification flow is maintained greater than or equal to 75 gpm, _____

e. CONTINUE the Pressurizer cooldown by selectively de-energizing Pressurizer Heaters while maintaining Pressurizer spray. _____

D4.2.9 When the RCS temperature is less than 140°F, PERFORM the following:

a. If withdrawn, INSERT all Shutdown Banks to the fully inserted position, _____

b. OPEN the Reactor Trip Breakers, _____

c. STOP the CRDM Cooling Fans using the following handswitches:

CRDM UNIT - FAN 1 HS-12273A,
CRDM UNIT - FAN 2 HS-12274A,
CRDM UNIT - FAN 3 HS-12275A,
CRDM UNIT - FAN 4 HS-12276A. _____

d. If it is intended to remain in cold shutdown for greater than 4 days, then PLACE the SG's in wet layup as specified by Chemistry Department per 13601, "Steam Generator and Main Steam System Operation". _____

UNIT NO. _____ INITIALS

NOTE

The RCP(s) shall be run for one or more hours after reaching the desired RCS temperature plateau to enhance SG and RCS temperature equalization.

D4.2.10 When RCS temperature is less than 110°F, the remaining RCPs may be stopped per 13003, "Reactor Coolant Pump Operation". _____

D4.2.11 CONTINUE the Pressurizer cooldown by opening Pressurizer Auxiliary Spray Valve HV-8145. _____

a. INITIATE AUX SPRAY/PRZR DELTA-T surveillance per 14915, "Special Conditions Surveillance Logs", (Technical Specification 4.4.9.2), _____ *

b. If pressurizer auxiliary spray water delta-T exceeds 320°F, then LOG the spray valve operation in the Unit Control Log and NOTIFY Technical Support to log the cycle per 83101-C, "Component Cyclic or Transient Limits", _____ *

c. CLOSE the open Charging Isolation Valve HV-8146 or HV-8147, _____

d. Continue CHARGING through the Pressurizer auxiliary spray line until pressurizer steam space temperature is less than 190°F. _____

D4.2.12 MAINTAIN RCS temperature between 130°F and 80°F using RHR HX Outlet Valves HV-0606(0607). _____

NOTIFY Technical Support to log the unit cooldown per 83101-C, "Component Cyclic or Transient Limits". _____ *

UNIT NO. _____ INITIALS

CAUTION

Ensure all RCP's are shutdown.

D4.2.13 If it is desired to depressurize the RCS, then PERFORM the following:

a. INITIATE Lowering RCS pressure to atmospheric (50 psig as indicated on PI-408, 418, 428 or 438) using letdown pressure control PIC-131, _____

b. When RCS pressure reaches 100 psig (150 psig as indicated on PI-408, 418, 428, 438), CLOSE all RCP Seal Leakoff Isolation valves HV-8141A, B, C, D, _____

c. ENSURE PRT nitrogen pressure is maintained greater than 0.5 psig. _____

NOTE

SI Pmp Cold Leg Isolation Valves are closed to preclude inadvertent draining of RWST to the RCS while the RCS is depressurized and partially drained.

D4.2.14 ISOLATE the Safety Injection Cold legs by performing the following:

a. CLOSE SI PMP-A TO COLD LEG ISO VLV HV-8821A, _____

b. CLOSE SI PMP-B TO COLD LEG ISO VLV HV-8821B, _____

c. OPEN and TAG the following SI Cold Leg Isolation Valves MCC breakers on the applicable unit:

UNIT 1:	1-HV-8821A	1ABD-15	_____
	1-HV-8821B	1BBD-15	_____
UNIT 2:	2-HV-8821A	2ABD-15	_____
	2-HV-8821B	2BBD-15	_____

d. OPEN and TAG MCC Relay K2 Links for the above MCC breakers. _____

UNIT NO. _____ INITIALS

CAUTION

Prior to opening any portion of the RCS to the atmosphere, the hydrogen concentration in the affected portion must be reduced to less than 5cc/kg.

D4.2.15 When required, INITIATE RCS draining by performing the following:

a. If it is intended to drain down to perform maintenance on Reactor Head, SG's or RCP seals, then the following RCS level controls shall be placed into effect:

(1) DETERMINE closure status of Containment Equipment Hatch and ENSURE hatch is capable of being closed within 57 minutes or ENSURE hatch is closed prior to reducing RCS level below three feet below the Reactor Vessel Flange (191 ft. el.), _____

(2) A review of all Containment penetrations addressed in 14210, "Containment Building Penetrations - Refueling" should be accomplished to determine those which have been opened by manual means and an info LCO generated for those identified. _____

(3) If SG Nozzle Dams are to be installed and no cold leg opening is to be established, a vent path is required from the Reactor Vessel upper plenum.

This vent path can be satisfied by:

(a) Removing a pressurizer manway, or

(b) Removing a Steam Generator manway on a hot leg that will not be dammed, or

(c) Removing three pressurizer code safeties. _____

UNIT NO. _____ INITIALS

(4) If SG Nozzle Dams are to be installed and a cold leg opening is to be established, a vent path is required from the Reactor Vessel Upper Plenum by removing an SG manway on an HL that will not be dammed.

(5) If it is intended to operate at one foot above mid-nozzle level, the preferred RHR configuration is one train operating with a flow of 3000 gpm, _____

(6) If it is intended to operate below 191 ft. el., then:

(a) A minimum of two incore thermocouples shall be available during periods where the Reactor Head is installed, _____

(b) REQUEST I&C reset the designated ERF incore thermocouples alarm setpoint to alarm at 10°F above desired temperature per 00410-C, "Computer Software Control". _____

(7) I&C should be notified to install temporary remote RCS level monitoring in the Control Room, _____

(8) Tygon tube watch is required any time the RCS level is being changed while the RCS level is below 17% (approximately 207 feet elevation) pressurizer level, _____

(9) Periodic comparison checks should be made every 4 hours between the Control Room Temporary RCS Level Monitors and the Tygon tube, _____

(10) The Control Room Monitors should agree within 7 percent of scale with the Tygon tube,

UNIT NO. _____ INITIALS

(11) Two out of three Level Monitors must agree before draining RCS below the top of the hot leg (188 feet 3 inches),

(12) If neither Control Room RCS Level Monitor is available, then a continuous Tygon tube watch should be established while RCS level is below 17% pressurizer level, _____

(13) While operating with SG Nozzle Dams installed, ENSURE one Safety Injection Pump is capable of being racked in and operated in the hot leg injection mode if needed,

(14) While level is in the region of the hot legs, TREND RHR Pump parameters on ERF for early detection of possible RHR Pump degradation due to vortexing,

(15) Minimum RCS level is one foot above mid-nozzle (188 feet 0 inches elevation) except for Steam Generator burping during initial drain down. For effective SG tube draining, RCS level should be lowered to 187 feet 6 inches. Upon completion of SG burping, RAISE RCS level to 188 feet - 0 inches and MAINTAIN at this level thereafter, _____

(16) A minimum of 4 Containment Cooling Units will be operable and capable of being started if required while RCS level is below 191 feet elevation.

UNIT NO. _____ INITIALS

NOTE

Dose Equivalent Iodine should be below 0.1 uCi/gm, Xe-133 and Co-58 below 0.05 uCi/gm prior to opening the RCS to the containment atmosphere.

b. OBTAIN Chemistry concurrence that RCS chemistry is appropriate for draining the RCS. _____

c. INITIATE draining the RCS per 13005, "Reactor Coolant System Draining".

D4.2.16 If it is intended to drain the RCS to less than 25% cold calibrate pressurizer level, then prior to reaching 25% ISOLATE potential dilution flow paths by performing the following:

a. CLOSE, LOCK and TAG the following valves on the applicable unit:

(1) UNIT 1: CVCS ISOLATION RMW TO BA BLEND, 1-1208-U4-175 _____

CVCS ISOLATION RMW TO CVCS, 1-1208-U4-177 _____

(2) UNIT 2: CVCS ISOLATION RMW TO CVCS, 2-1208-U4-177 _____

CVCS ISOLATION RMW TO BA BLEND, 2-1208-U4-175 _____

b. ENSURE CLOSED, LOCKED and TAGGED the following valves on the applicable unit:

(1) UNIT 1: CVCS OUTLET CHEM MIXING TK, 1-1208-U4-181 _____

CVCS SUPPLY RMW TO CHEM MIXING TK, 1-1208-U4-176 _____

CVCS FLUSH RMW TO TRN A EMERG BORATION, 1-1208-U4-183 _____

RMWST TO BTRS ISO, 1-1208-U6-226 _____

UNIT NO. _____ INITIALS

(2) UNIT 2: CVCS SUPPLY RMW TO CHEM MIXING TK, 2-1208-U4-176 _____

CVCS OUTLET CHEM MIXING TK, 2-1208-U4-181 _____

CVCS FLUSH RMW TO TK A EMERG BORATION, 2-1208-U4-183 _____

RMWST TO BTRS ISO, 2-1208-U6-226 _____

c. When necessary, makeup to the VCT by performing the following:

(1) OPEN RWST TO CCP A & B SUCTION Valves LV-0112D and LV-0112E,

(2) CLOSE VCT OUTLET ISOLATIONS, LV-0112B and LV-0112C,

(3) ENSURE Letdown to VCT or Hold-up Tank Valve LV-0112A is in the VCT position,

(4) When VCT level has been returned to normal, OPEN LV-0112B and LV-0112C then CLOSE LV-0112D and LV-0112E.

D4.2.17 OPERATE unit systems as necessary to maintain the above conditions.

a. If required to break condenser vacuum, then PROCEED to Section E,

b. If it is intended to proceed to Mode 6, then GO to 12007-C, "Refueling Entry",

c. If it is intended to commence unit heat up, then GO to 12001-C, "Unit Heatup to Hot Shutdown".

END OF SECTION D

UNIT NO. _____

SECTION E. Secondary Plant Shutdown

NOTE

This section directs secondary plant activities during unit shutdown and can be used in conjunction with primary system cooldown operations.

The subsections of this section are:

E4.1 Transfer From Steam Dumps to Atmospheric Relief valves.

E4.2 Feeding Steam Generators With Condensate Pump.

E4.3 Breaking Condenser Vacuum.

E4.4 Secondary Systems activities.

E4.1 TRANSFER FROM STEAM DUMPS TO ATMOSPHERIC RELIEF VALVES

INITIALS

E4.1.1 TRANSFER to the SG Atmospheric Relief Valves by performing the following:

a. Slowly OPEN each atmospheric relief while verifying a reduced steam dump demand signal on UI-507, _____

b. VERIFY that the Steam Dump Control Valves close if PIC-507 is in AUTO or if operating in MANUAL, slowly CLOSE the Steam Dump Control Valves while opening each atmospheric relief, _____

c. When all Steam Dump Control Valves are closed, ENSURE PIC-507 is in MANUAL, _____

d. BALANCE the positions of each atmospheric relief while maintaining Tavg as desired. _____

UNIT NO. _____ INITIALS

E4.2 FEEDING STEAM GENERATORS WITH CONDENSATE PUMP

E4.2.1 At the USS's discretion, INITIATE feeding Steam Generators with the running Condensate Pump by performing the following:

a. VERIFY SG pressure is less than 550 psig, _____

b VERIFY that lube oil pressure to the reset MFP and MFP Turbine Fearings is 10 to 12 psig by local indications, _____

c. OPEN the reset MFP Discharge Valve by placing the Control Switch in OPEN-PULL-TO-LOCK at the Main Control Panel QMCB: _____

SGFP A HS-5208,

SGFP B HS-5209.

d. If not previously performed, RESET both trains of Feedwater Isolation:

(1) HS-40049 for Train A, _____

(2) HS-40050 for Train B. _____

e. OPEN all BFIV's, _____

f. CONTINUE maintaining desired SG level utilizing the BFRV's. _____

UNIT NO. _____ INITIALS

E4.3 BREAKING CONDENSER VACUUM

E4.3.1 If necessary, TRANSFER the Auxiliary Steam System steam supply to the alternate unit or Auxiliary Boiler per 13761, "Auxiliary Steam System". _____

E4.3.2 TRANSFER the Turbine Steam Seal supply to the Auxiliary Steam Supply per 13825, "Turbine Steam Seal System". _____

E4.3.3 TRANSFER the SJAE steam supply to the Auxiliary Steam Supply per 13620, "Condenser Air Ejection System". _____

E4.3.4 CLOSE the MSIVs and Bypasses. _____

CAUTION

Breaking condenser vacuum will result in a MFPT Low Vac Trip. If AFWAS has not been defeated, then both MFPs tripped will result in a AFWAS initiation.

E4.3.5 PLACE the standby MDAFW Pump(s) Handswitches in PULL-TO-LOCK. _____

E4.3.6 BREAK condenser vacuum and SHUT DOWN the Steam Jet Air Ejectors and the Condenser Vacuum Pumps per 13620, "Condenser Air Ejection System".

E4.3.7 PERFORM the following to reset the AFWAS signal:

a. RESET the AFWAS by resetting one MFPT Low Vacuum Trip by momentarily placing the MFPT-A(B) VAC TRIP BYPASS Handswitch to RESET position and MFPT A(B) TRIP RESET HS-3169 (3170) to the RESET position, _____

b. If running a MDAFW Pump, then THROTTLE the AFW Flow Control Valves to the pre-initiation flow rate, _____

UNIT NO. _____ INITIALS

c. If applicable, ENSURE the SG Blowdown Isolation Valves HV-7603A(B,C,D) open. _____

E4.3.8 After the condenser pressure reaches atmospheric, SHUT DOWN the Turbine Steam Seal System per 13825, "Turbine Steam Seal System". _____

E4.3.9 MAINTAIN the main Turbine and MFPTs on Turning Gear per 13800, "Main Turbine Operation" and 13615, "Condensate and Feedwater Systems".

E4.4 SECONDARY SYSTEM ACTIVITIES

E4.4.1 If condensate and feedwater cleanup is not anticipated, then when condensate and feedwater metal temperatures are less than 200°F, SHUT DOWN the Condensate and Feedwater System per 13615, Condensate And Feedwater Systems". _____

E4.4.2 NOTIFY Chemistry and SHUT DOWN the Condensate Filter Demineralizer System per 13616, "Condensate Filter Demineralizer System". _____

E4.4.3 If the secondary outage is planned to exceed 10 days, then PERFORM the following:

a. When condensate and feedwater metal temperature is between 90°F and 200°F, COORDINATE with Chemistry and PLACE the Feedwater Heaters in wet layup, _____

b. When Turbine metal temperatures reach ambient, REMOVE Turbine from Turning Gear per 13800, "Main Turbine Operation", _____

c. During the unit outage, once a week, PLACE the Turbine on Turning Gear for 4 to 6 hours.

UNIT NO. _____ INITIALS

E4.4.4 If required, PLACE a steam blanket on the MSRs per 13800, "Main Turbine Operation". _____

E4.4.5 If required, for Condenser Waterbox or Circulating Water System maintenance, SHUT DOWN the Circulating Water System per 13724, "Circulating Water System". _____

If required for maintenance or inspection, then INITIATE draining of the Condenser Waterboxes per 13724, "Circulating Water System". _____

E4.4.6 If main generator maintenance or inspection is planned, then INITIATE purging the main generator per 13810, "Generator Gas System". _____

If hydrogen atmosphere is to be maintained, then MINIMIZE usage during the outage by reducing hydrogen pressure to not less than 5 psig.

E4.4.7 SHUT DOWN the Isophase Bus Duct Cooling System by performing the following:

a. At 480V AC SWGR NB03, OPEN Isophase Bus Duct Heater Breaker on the applicable unit:

UNIT 1: 1NB03-16, _____

UNIT 2: 2NB03-16. _____

b. At local Panel PLCB, STOP the running fan using HS-16550 for Fan No. 1 and/or HS-16551 for Fan No. 2.

Completed _____
Signature Date/Time

Reviewed _____
Signature Date/Time

Comments _____

_____

_____

5.0 REFERENCES

5.1 PROCEDURES

5.1.1 00410-C, "Computer Software Control"

5.1.2 10006-C, "Reactor Trip Review"

5.1.3 12001-C, "Unit Heatup To Hot Shutdown"

5.1.4 12002-C, "Unit Heatup To Normal Operating Temperature And Pressure"

5.1.5 12003-C, "Reactor Startup"

5.1.6 13003, "Reactor Coolant Pump Operation"

5.1.7 13005, "Reactor Coolant System Draining"

5.1.8 13006, "Chemical And Volume Control System Startup And Normal Operation"

5.1.9 13007, "VCT Gas Control And RCS Chemical Addition"

5.1.10 13009, "CVCS Reactor Makeup Control System"

5.1.11 13010, "Boron Thermal Regeneration System"

5.1.12 13011, "Residual Heat Removal System"

5.1.13 13120, "Containment Building Cooling Systems'

5.1.14 13125, "Containment Purge System"

5.1.15 13601, "Steam Generator And Main Steam System Operation"

5.1.16 13605, "Steam Generator Blowdown Processing System"

5.1.17 13610, "Auxiliary Feedwater System"

5.1.18 13615, "Condensate And Feedwater Systems"

5.1.19 13616, "Condensate Filter Demineralizer System"

5.1.20 13617, "Feedwater Heater Extraction, Vent And Drain System"

5.1.21 13620, "Condenser Air Ejection System"

5.1.22 13724, "Circulating Water System"

5.1.23	13760,	"Auxiliary Steam Boiler System"
5.1.24	13761,	"Auxiliary Steam System"
5.1.25	13800,	"Main Turbine Operation"
5.1.26	13810,	"Generator Gas System"
5.1.27	13825,	"Turbine Steam Seal System"
5.1.28	14000,	"Operations Shift and Daily Surveillance Logs"
5.1.29	14005,	"Shutdown Margin Calculations"
5.1.30	14210,	"Containment Building Penetrations - Refueling"
5.1.31	14748,	"AFW Check Valve Cold Shutdown Inservice Test"
5.1.32	14915,	"Special Conditions Surveillance Logs"
5.1.33	24695,	"N.I. System Source Range Channel Calibration"
5.1.34	24696,	"N.I. System Source Range Channel Calibration"

END OF PROCEDURE TEXT

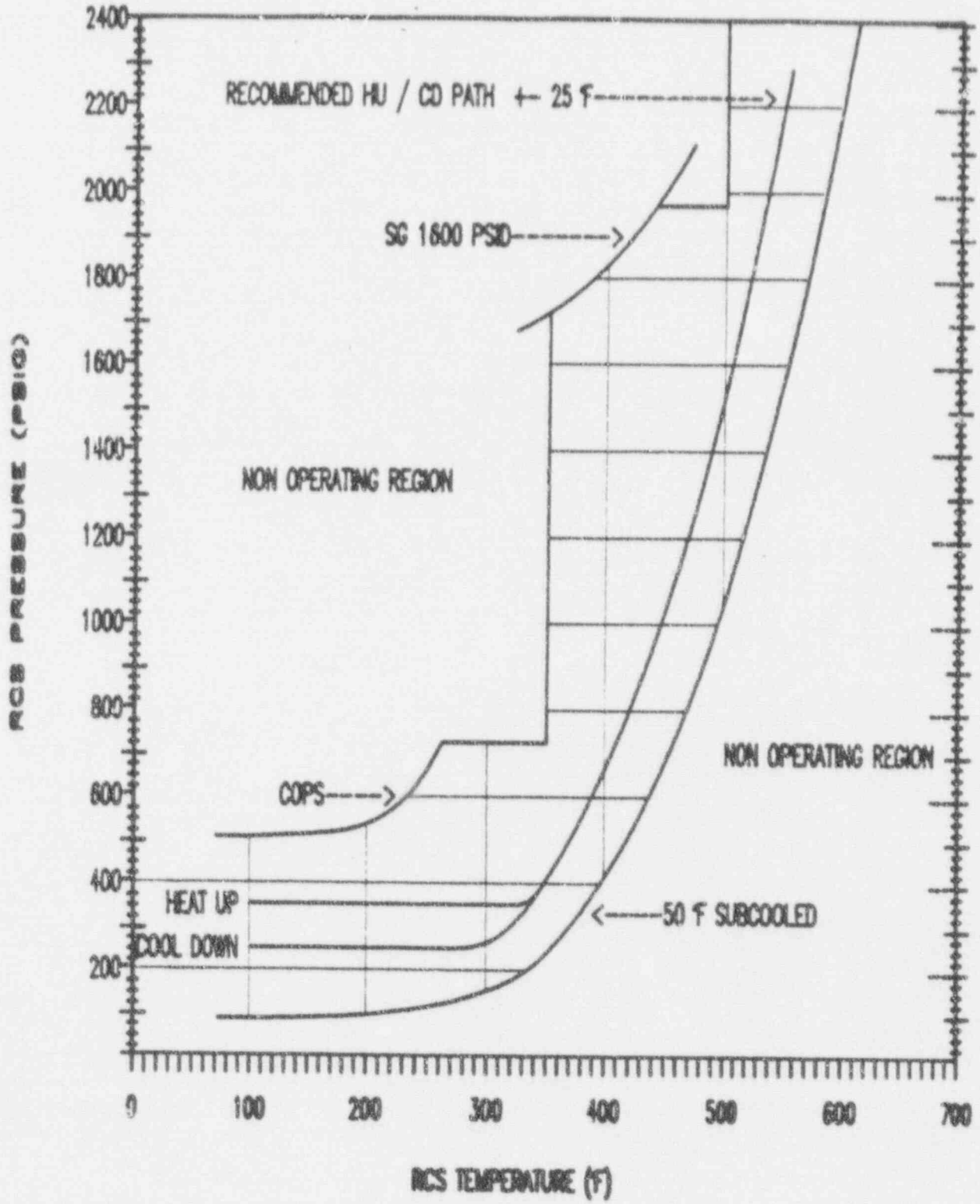

FIGURE 1 - RCS PRESSURE TEMPERATURE LIMITS

Sheet 1 of 1

UNIT NO. _____ DATE ___/___/___

RCS/PRZR TEMPERATURE AND PRESSURE

DATA SHEET 1

TIME	Lowest Channel of TI-0413B TI-0423B TI-0433B TI-0443B RCS TEMP	PRZR TEMP TI-0454	PRZR TEMP TI-0453	PI-438LR or PI-405WR PRZR PRESS	PRZR/RCS DELTA T

Completed _____
Signature Date/Time

Reviewed _____
Signature Date/Time

Comments _____