

DOCUMENT TRANSMITTAL FORM 63752
FOR DOCUMENTS TRANSMITTED TO DC DESK (NRC)*

DATE: 17 DEC 1991
BATCH: 100

DOCUMENT NUMBER SHEET NUMBER REVISION NUMBER COPY NUMBER

VP 580 19 20

INSTRUCTIONS TO THE ADDRESSEE

COMPLETE EACH OF THE INSTRUCTIONS BELOW WHICH ARE MARKED WITH AN " X "

- (1) VERIFY THE DOCUMENTS RECEIVED AGREE WITH THE ABOVE DESCRIPTION
- (2) INCORPORATE THE TRANSMITTED DOCUMENTS INTO YOUR FILES
- (3) DESTROY DOCUMENTS OR PORTIONS OF DOCUMENTS SUPERSEDED BY THE ABOVE
- (4) SIGN AND DATE IN THE SPACES BELOW INDICATING THAT YOU COMPLETED THESE INSTRUCTIONS.
- (5) SIGN BELOW INDICATING THAT YOU HAVE READ AND UNDERSTOOD THE CHANGES AS IDENTIFIED:
- (6) RETURN TO DOCUMENT CONTROL, CRYSTAL RIVER UNIT 3, MAC# NA1C
NR2A SA1G _____ FLORIDA POWER CORP., P.O. BOX 219
CRYSTAL RIVER FLA 32623

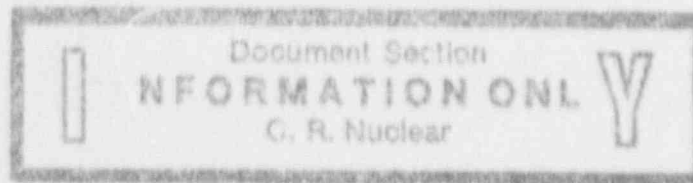
SIGNATURE OF ADDRESSEE _____ DATE _____

INDEPENDENT VERIFICATION _____ DATE _____ (OPS)

A045

PSVP	REV 19	DATE 12/16/91	VP-580
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PLANT SAFETY VERIFICATION PROCEDURE



This Procedure Addresses Safety Related Components			
Approved by NOS <i>[Signature]</i> Date <u>12-16-91</u>			
VP-580	REV 19	PAGE 1 of 17	PSVP

1.0 REACTIVITY CONTROL

ACTIONS

DETAILS

1.1 IF Rx tripped,
THEN verify Immediate Actions
of AP-580, Rx Trip,
are completed

- o CRD Groups 1 thru 7 are fully inserted.
- o Intermediate range flux decreasing.
- o TVs or GVs closed.
- o "MAIN FW BLOCK"s closed.
- o "LO LOAD FW BLOCK"s closed.
- o PZR level ≥ 50 ".
- o Steam Hdr PRESS = 1010 psig.
- o Output Bkrs open.
- o Ensure ICS and NNI power is available.

1.2 IF Rx is NOT tripped,
THEN observe plant parameters
AND determine if Rx should be
tripped.

- o RPS setpoint exceeded.
- o PZR level ≥ 290 ".
- o 2 or more MSIVs are closed.
- o All MFW is lost $\geq 15\%$ FP.
- o 2 or more CRDM stator TEMPs $\geq 150^{\circ}\text{F}$
- o $1 < 1$ ft. and level cannot be restored.
- o SW flow is lost and cannot be restored.
- o PZR level cannot be maintained > 100 " during SGTR with HPI.

1.0 REACTIVITY CONTROL (CONT'D)

ACTIONS

DETAILS

- 1.3 IF Rx should NOT be tripped,
THEN GO TO Step 2.1 in
this procedure.

Note

NI-14-N11 and NI-15-N11, neutron flux monitors, may not be reliable under accident conditions, due to cable assemblies possibly leaking.

- 1.4 Verify IR flux is decreasing
to Source Range.

IF Neutron flux is
NOT decreasing,
THEN verify Emergency Boration.

Refer to EP-140, Emergency
Reactivity Control.

- 1.5 Verify 480V Bkrs are closed:

- o Bkr 3305,
 - o Bkr 3312.
-

- 1.6 IF any safety or regulating
control rod is NOT fully
inserted,
THEN verify boron
requirements to ensure
 \geq 1% shutdown margin.

- o IF 1 control rod is stuck,
THEN refer to OP-103C, Curve 18
- o IF > 1 control rod is stuck,
THEN continue boration until
either of the following:

- o Actual boron concentration
 \geq 1925 ppmB

OK

- o Actual boron concentration
 \geq value determined by the
Reactor Engineer or his
designee.

2.0 THERMAL CONTROL

ACTIONS

DETAILS

2.1 IF RX is tripped
AND RCS PRESS is > 2400 psig,
THEN verify PORV
OR high point vents are
 used to restore RCS PRESS
 within limits.

Refer to SPDS AND abnormal or
 emergency operating procedures
 in use to determine RCS PRESS
 limits.

2.2 IF incres indicate superheated
 conditions,
THEN verify EP-290,
 Inadequate Core Cooling,
 ic being performed
AND monitor RCS inventory.

Instrumentation for monitoring
 RCS inventory:

- o Reactor Coolant Inventory Tracking System - will be affected by HPI, LPI, or Natural Circulation flow.
- o Reactor Coolant Pump Void Trend Monitoring System - effective only when RCP(s) are operating.

2.3 IF Adequate subcooling margin
 does NOT exist,
THEN verify:

Tsat Monitor
 Adequate Subcooling Margin

- o Full HPI or LPI flow,
- o No RCPs operating,
- o OTSGs at 95%.

Reactor Coolant	MARGIN
> 1500 psig	30°F
≤ 1500 to > 250 psig	50°F
≤ 250 to > 150 psig	70°F
≤ 150 psig	SPDS
≤ 200°F	N/A

- o Refer to AP-380, ES Actuation.
- o Refer to AP-360, Loss of DHR.

2.0 THERMAL CONTROL (CONT'D)

ACTIONS

DETAILS

2.4 IF Subcooling Margin is $> 100^{\circ}\text{F}$,
THEN verify operation in accordance
with abnormal and emergency
operating procedure in use:

- o HPI
- o LPI
- o MFW, EFW, EFIC
- o OTSG PRESS and level

Note

IF HPI flow is ≥ 200 gpm for any nozzle, as indicated on the
narrow range HPI flow instrument,
THEN use the wide range HPI flow instrument for that nozzle
on ES Section of the Main Control Board.

2.5 Verify available HPI flows are
balanced.

2.6 Verify required OTSG level.

IF EFW and MFW is NOT
available,
THEN verify HPI/PORV cooling.

Required OTSG levels

Condition	Level
Inadequate subcooling margin	95%
NO RCPs and adequate subcooling margin	65%
RCPs and adequate subcooling margin	Low Level Limits

IF OTSG Tube leak exists,
AND adequate subcooling margin
does NOT exist,
AND ≥ 2 HPI pumps are available,
THEN verify affected OTSG is NOT
being fed.

2.0 THERMAL CONTROL (CONT'D)

ACTIONS

DETAILS

- 2.7 IF any of the following conditions exist:
- o RCPs NOT operating, AND HPI flow exists through any nozzle while RCS TEMP is < 500°F.
 - o STS cooldown rate limits exceeded while RCS TEMP is < 380°F.

STS cooldown rate limits:

RCS TEMP °F	RATE LIMIT
> 280	≤ 50°F ½ hr
280 to 151	≤ 25°F ½ hr
≤ 150	≤ 10°F/hr

THEN verify EP-220, PTS, is being performed.

- 2.8 IF RCPs are NOT operating, THEN verify Nat Circ.
- IF Nat Circ is NOT verified AND adequate subcooling margin exists, THEN refer to AP-530, Nat Circ.

Indications of Nat Circ:

- o Verify $T_c = T_{sat}$ of OTSG.
- o Verify core ΔT develops and stabilizes.
- o Verify incore TEMPs follows T_h within 10°F.
- o WHEN OTSG PRESS is lowered, THEN verify T_c , incore TEMPs, and T_h lower.

- 2.9 IF OTSG Tube Rupture has occurred, THEN verify proper cooldown rate.

Refer to EP-390, OTSG Tube Leak.

2.0 THERMAL CONTROL (CONT'D)

ACTIONS

DETAILS

Note

Enclosure 2 contains EFW inventory requirements during a loss of offsite power cooldown to DHR.

- 2.10 IF Nat Circ exists,
THEN verify proper Nat Circ
cooldown rate.

Nat Circ Cooldown Rates

RCS Tc	°F/hr
$\geq 290^{\circ}\text{F}$	10
280 to 150°F	5
$\leq 150^{\circ}\text{F}$	2.5
*	50

* Only to be used if RCS PRESS is maintained above Nat Circ cooldown curve.

Note

Due to possible high radiation conditions, Th and Tc indications may become unreliable 24 hrs after a LOCA.

- 2.11 Verify RCS PRESS and TEMP
are maintained within limits.

Observe SPDS Post Trip Display for
RCS PRESS and Incore TEMP.

IF SPDS is NOT operable,
THEN record RCS PRESS and TEMP on
Enclosure 1 until plant is stable
for ≈ 30 min.

IF unexplained and significant RC
pressure decrease exists,
THEN ensure proper operation of:

- o RCV-10, PORV
- o RCV-14, PZR Spray Valve
- o PZR Heaters

2.0 THERMAL CONTROL (CONT'D)

ACTIONS

DETAILS

2.12 — IF adequate subcooling margin does not exist, AND RCS pressure \leq 200 psig, THEN verify boron precipitation actions are complete within 1.5 hours of event.

OP-404, Decay Heat Removal System, Section 4.13, Long-Term Post-Accident Cooling.

3.0 RADIOACTIVE INVENTORY CONTROL

ACTIONS

DETAILS

3.1 Observe radiation monitors for unexplained trends.

IF any monitor is in alarm, THEN refer to AP-250, Radiation Monitor Actuation.

3.2 Observe MS radiation monitors for unexplained trends.

IF any MS radiation monitor trend indicates OTSG leakage, THEN refer to EP-390, Steam Generator Tube Leak.

3.3 Observe for increased RCS leakage.

- o Observe:
 - o RCP seals and dumpsters,
 - o PZR level,
 - o RCDT level,
 - o MUT level,
 - o RB sump level,
 - o Relief valve tailpipe TEMPs.
- o Refer to STS 3.4.6.2, Operational Leakage.

3.4 Verify fuel integrity.

Observe RML-1 Alarms and trends.

3.5 Verify MWST level rise is < 1%/hr.

Time	MWST Level
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4.0 EQUIPMENT AVAILABILITY

ACTIONS

DETAILS

4.1 Verify availability of borated water sources for MUPs and DHPs.

- o MU^T level between 30" and 100".
- o BWSI level \geq 4 ft.

IF NOT,
THEN refer to:

- o If in Modes 1, 2 or 3,
AP-380, ES Actuation,
- o If in Modes 4, 5 or 6,
AP-360, Loss of DHR.

4.2 IF RCS PRESS is $<$ 600 psig
AND adequate subcooling margin
does NOT exist,
THEN verify CFT level lowers.

4.3 Verify water sources for OTSG cooling.

- o EF Tank \geq 15 ft.
- o CST level \geq 5 ft.
- o Hotwell level at 7 to 9 ft. (84 to 109").
- o See Enclosure 2 for EFW requirements.
- o See Enclosure 3 for other sources of water.

4.4 Verify SW Cooling.

IF NOT,
THEN ensure AP-330,
Loss of SW, is being performed.

- o SW PRESS \geq 110 psig.
- o Stable SWP Motor Current

5.0 EQUIPMENT AVAILABILITY (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
4.5 Verify DC Cooling, if required. <u>IF NOT</u> , <u>THEN</u> ensure AP-360, Loss of DH, is being performed.	o Stable DCP motor current. o Stable discharge PRESS. o DC Heat Exchanger Outlet TEMP < 105°F.
4.6 Verify RW available.	o Stable RWP motor current. o RW ΔT across DH Seawater heat exchanger.
4.7 Verify Instrumentation power available.	o NNI X o NNI Y o ICS
4.8 Verify ES busses are energized.	o ES 4160V "A" o ES 4160V "B" o ES 480V "A" o ES 480V "B"
4.9 <u>IF</u> offsite power is <u>NOT</u> available, <u>AND</u> offsite power will <u>NOT</u> be restored within 2 hours, <u>THEN</u> verify EDG operation is within fuel oil consumption limits and fuel oil reserves are adequate.	<u>IF</u> within 2 hours offsite power has <u>NOT</u> been restored, <u>AND</u> 2 EDGs are running <u>THEN</u> notify the SSOD to: o Order additional fuel oil for emergency delivery within next 10 hours o Reduce and maintain combined EDG loads to ≤ 2330 KW within next 10 hours

4.0 EQUIPMENT AVAILABILITY (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
4.10 Verify Instrument Air pressure available.	o SAP-1A o SAP-1B o SAP-1C o SAP-1D o IAP-1A o IAP-1B o SA-4-PI o IA-4-PI
4.11 Observe RB conditions <u>AND</u> notify SSOD of parameters which have exceeded normal limits.	o RB TEMP < 130°F o RB PRESS < 4 psig o RB H2 concentration, if available from Chemistry.
4.12 <u>IF</u> RCS PRESS > 200 psig <u>AND</u> RB Spray actuation is present, <u>THEN</u> verify BST-1 is isolated.	BST-1 isolation valves: o BSV-11 o BSV-12
4.13 <u>IF</u> a OTSG tube leak exists <u>AND</u> BWST level is \leq 35 ft, <u>THEN</u> notify SSOD to begin makeup to the BWST.	Makeup water can be obtained from: o SF pools, o DW and boric acid.

4.C EQUIPMENT AVAILABILITY (CONT'D)

ACTIONS

DETAILS

4.14 IF EFWs are on minimum recirc, THEN determine their need to be running

- o EFW is required when:
 - o no RCPs operating,
 - o Adequate subcooling margin does not exist.
- o OTSG Heat Removal does not exist.
- o Time EFWs are on recirc should be limited to:
 - 1 EFW running - ≤ 3 hours/event
 - 2 EFWs running - ≤ 1 hours/event

4.15 Review alarm summaries for unexplained alarms.

- o Review annunciator alarm summary.
- o Review computer alarm summary.

4.16 Verify proper notification are completed.

- o Refer to CP-111, Processing Problem Reports which are Reportable or Plant/Personnel Safety Concerns.
- o Refer to CP-211, Problem Reporting.
- o Refer to AI-500, Conduct of Operations.
- o Refer to EM-202, Duties of the Emergency Coordinator.
- o IF any of the following conditions have occurred:
 - o loss of RCP SW flow
 - o loss of RCP seal return flow
 - o Aux Pzr spray from MU

THEN notify NPSE.

4.0 EQUIPMENT AVAILABILITY (CONT'D)

ACTIONS

DETAILS

4.17 Verify Shutdown Margin is $\geq 1\%$.

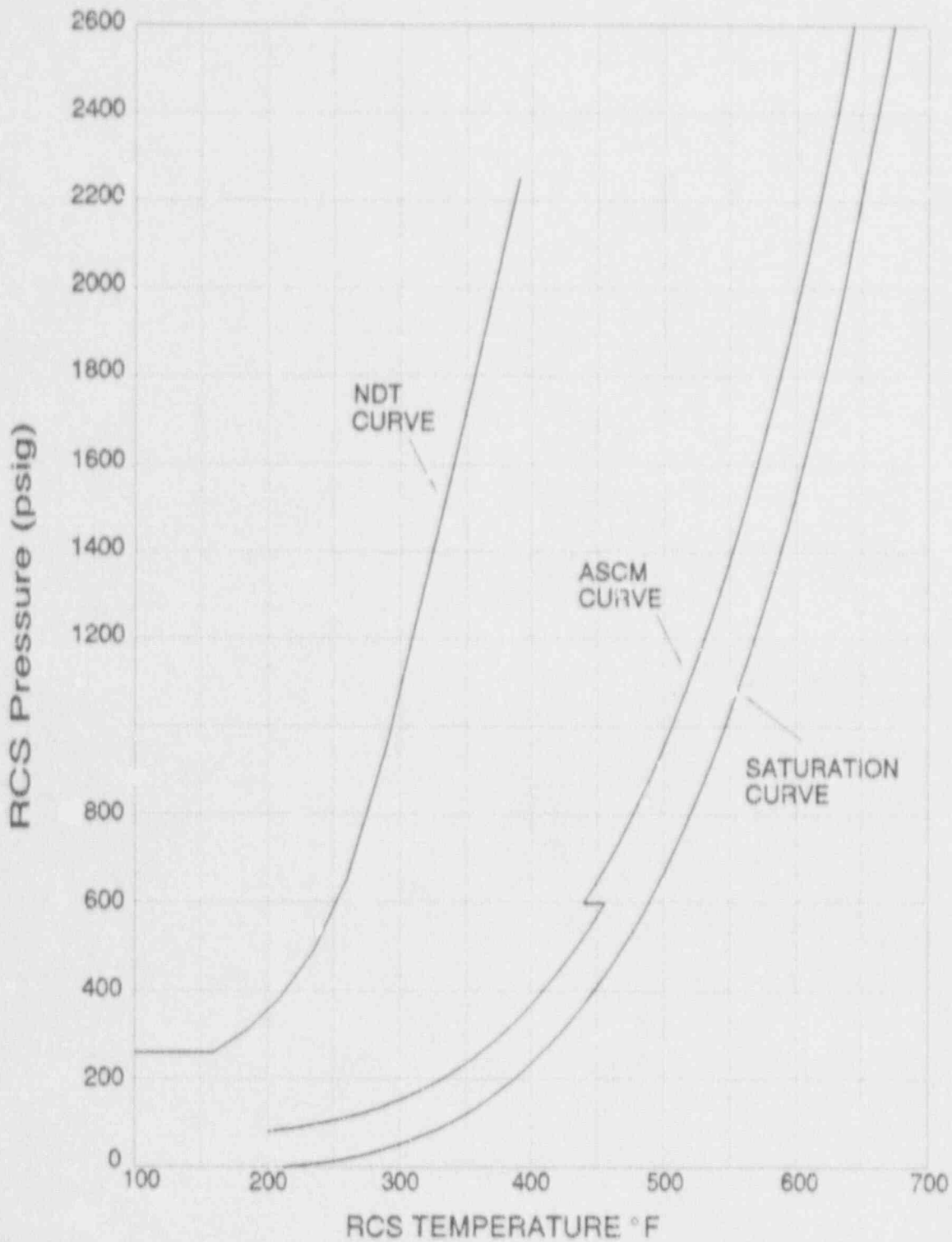
IF in Modes 3, 4, or 5,
THEN refer to SP-421, Reactivity
Balance Calculations.

IF in Mode 6,
THEN verify the requirements of
STS 3.9.1 are met.

4.18 WHEN VP-580 is stopped,
THEN notify SSOD.

ENCLOSURE 1

RCS Pressure and Temperature Cooldown Limits



Acceptable region is:

- o below and to the right of the NDT curve
- o above and to the left of the Adequate Subcooling Margin curve

ENCLOSURE 2

Cooldown Requirements Vs. Nat Circ Cooldown Rates

- 1) FW requirements and the time to cooldown are controlled primarily by the characteristics of the ADVs and the cut-in conditions for the DHR system.
- 2) The time to cooldown from Rx trip is about 150 hrs.
- 3) The FW requirement to cooldown is about 735,000 gal.
- 4) The minimum cooldown rate consistent with the above minimum time and FW requirements is about 8.5°F/hr.
- 5) Cooldown rates in excess of 8.5°F/hr do not decrease the FW or time requirements for cooldown.
- 6) Cooldown rates less than 8.5°F/hr increase both the FW and the time requirements for cooldown.
- 7) A time delay of 28 hours from Rx trip will not significantly affect FW or time requirements if a cooldown rate of 50°F/hr is then utilized. For smaller time delays smaller cooldown rates may be utilized.

Sources of Emergency Feedwater (EFW) at the Crystal River Site

Condensate - Grade Sources

<u>Source</u>	<u>Volume (gal)</u>
Dedicated EFW Tank (EFT-2)	150,000
Condensate Storage Tank	139,000
Condenser Hotwells	150,000
DW Storage Tank, Unit 3	450,000
DW Storage Tank, Unit 1	147,000
DW Storage Tank, Unit 2	147,000
DW Storage Tank, Unit 4/5	500,000
CD Storage Tank, Unit 4	500,000
CD Storage Tank, Unit 5	500,000
AB DW Storage Tank, Unit 3	5,000