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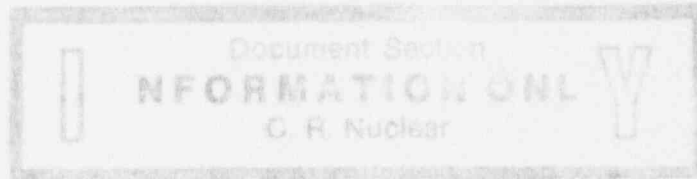
PLANT RUNBACK

1.0 ENTRY CONDITIONS

IF any of the following conditions exist:

- o Asymmetric rod
- o Loss of 1 RCP
- o Loss of 1 MFWP
- o Loss of 1 MFWBP,

THEN use this procedure.



This Procedure Addresses Safety Related Components		
Approved by MNPO <i>Gregory H. Hester</i> Date <u>6/2/94</u> (SIGNATURE ON FILE)		
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2.0 IMMEDIATE ACTIONS

ACTIONS

- 2.1 — Ensure plant is running back to \leq maximum % FP.

DETAILS

Runback Limits

Condition	Maximum % FP
Asymmetric rod	60% FP
Loss of 1 MFWP	55% FP
Loss of 1 MFWBP	55% FP
Loss of 1 RCP	75% FP

-
- 2.2 — IF runback is due to loss of 1 MFWP,
THEN ensure proper FW valve positions.

Ensure:

- o FWV-28 "FW DIS CROSS-TIE" is opening
- o FWV-29 B MBV is closing
- o FWV-30 A MBV is closing.

-
- 2.3 — Stabilize RCS PRESS between 2130 and 2180 psig.

Stabilize RCS PRESS using:

- o PZR heaters
- o PZR spray
- o PORV.

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3.0 FOLLOW-UP ACTIONS

ACTIONS

DETAILS

3.1 — Notify personnel of plant conditions as required.

— SOTA

— Plant operators

— SSOD to evaluate plant conditions for entry into the Emergency Plan

— System Dispatcher.

3.2 — IF an asymmetric condition exists on two or more control rods,
THEN trip the Rx
AND GO TO EOP-2, Vital System Status Verification, beginning with step 2.1.

3.3 — CONCURRENTLY PERFORM VP-540, Runback Verification Procedure.

3.4 — IF at any time while performing this procedure the Rx trips,
THEN GO TO EOP-2, Vital System Status Verification, beginning with Step 2.1.

3.5 — IF Rx power is > 75% FP,
AND one MFWBP trips,
THEN trip one MFWP.

3.4 IF the Rx trips,
THEN GO TO EOP-2,
Vital System Status Verification,
beginning with step 2.1.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.6 — IF RCP has tripped,
THEN ensure an oil lift
pump has Auto started.

3.7 — Maintain imbalance within
limits.

— Observe SPDS imbalance
— Adjust APSRs to
maintain imbalance
— Refer to the COLR for limits.

3.8 — Ensure Rx power stabilizes
at \leq maximum % FP.

Runback Limits

Condition	Maximum % FP
Asymmetric rod	60% FP
Loss of 1 MFWP	55% FP
Loss of 1 MFWBP	55% FP
Loss of 1 RCP	75% FP

3.9 — Ensure Tave stabilizes
between 577 and 581°F.

3.10 — Ensure PZR level
stabilizes between 200 and
240".

3.4 IF the Rx trips,
THEN GO TO EOP-2,
Vital System Status Verification,
beginning with step 2.1.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

Note

Changing Tc instruments may affect FW flows and Tave.

3.11 — IF 3 RCPs are operating,
THEN ensure narrow range
Tc is selected for the
operating RCP in the
affected loop.

Proper Tc for operating RCP:

Operating RCP in the affected loop	Narrow range Tc
RCP-1A	TT1
RCP-1B	TT3
RCP-1C	TT1
RCP-1D	TT3

3.12 — IF 3 RCPs are operating,
THEN ensure narrow range
RCS PRESS control is
selected to the loop with
single pump operation.

Proper RCS PRESS instrument:

Loop with single RCP operation	Narrow range Channel Selection
A	RPS A NNI CAB3 RC-3A-PIR2
B	RPS B NNI CAB3 RC-3B-PIR2

3.4 IF the Rx trips,
THEN GO TO EOP-2,
Vital System Status Verification,
beginning with step 2.1.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.13 — Ensure ΔT_c stabilizes between -5 and +5°F.

3.14 — Ensure MS Hdr PRESS stabilizes between 870 and 900 psig.

3.15 — Verify quadrant power tilt is within limits.
IF NOT,
THEN refer to ITS 3.2.4, Quadrant Power Tilt.

Refer to Computer Group 59.

3.16 — IF runback was due to Loss of 1 MFWP or Loss of 1 MFWBP, AND FWV-28 is open, THEN align EFIC MFWI for FWV-28 open operation.

1 — Refer to ITS 3.7.3, Condition C

2 — Select "EFIC CHANNEL A MAIN FW ISOLATION MAIN FW PUMP TRIP" key switch to "BOTH" located in CRD Room, RR3A

3 — Select "EFIC CHANNEL B MAIN FW ISOLATION MAIN FW PUMP TRIP" key switch to "BOTH" located in B EFIC Room, RR5B1

3.17 — IF a RCP is tripped, THEN refer to ITS 3.4.1, RCS pressure, Temperature, and Flow departure from nucleate boiling (DNB) limits.

3.4 IF the Rx trips,
THEN GO TO EOP-2,
Vital System Status Verification,
beginning with step 2.1.

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.18 — IF asymmetric rod exists,
AND the Rx remains
critical,
THEN ensure Rx power is
 \leq 60% of allowable power
based on RCPs,
AND notify the Reactor
Engineer.

Refer to:

- ITS 3.1.1, Shutdown Margin
- ITS 3.1.4, Control Rod Group
Alignment Limits
- ITS 3.2.5, Power Peaking
Factors.

3.19 — IF an asymmetric rod
exists
AND the Reactor is
determined to be
subcritical,
THEN, at a minimum, insert
rod groups 5, 6, and 7 to
establish Mode 3
reactivity conditions.

- o Insert control rods manually
- OR
- o Trip the Reactor and
THEN GO TO EOP-2, Vital System
Status Verification, beginning
with step 2.1.

3.20 — IF power reduction was
 \geq 15% FP in 1 hr,
THEN notify Chemistry.

3.21 — GO TO OP-204, Power
Operation.

TURBINE TRIP

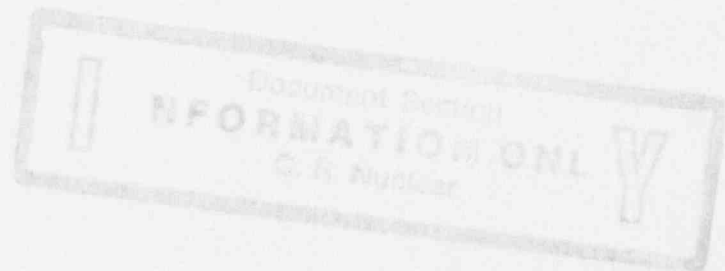
1.0 ENTRY CONDITIONS

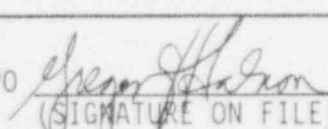
IF Rx power is < 45% FP,

AND any of the following conditions exist:

- o Turbine trip
- o $\geq 50^{\circ}\text{F}$ ΔT between condensers
- o $\geq 55^{\circ}\text{C}$ Generator Avg cold gas TEMP
- o $\geq 104^{\circ}\text{C}$ Generator stator bar discharge TEMP
- o Condenser vacuum is ≥ 10 in-Hg absolute,

THEN use this procedure.



This Procedure Addresses Safety Related Components		
Approved by MNPO	 (SIGNATURE ON FILE)	Date <u>6/2/94</u>
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2.0 IMMEDIATE ACTIONS

ACTIONS

DETAILS

2.1 ___ Depress "TURB AUTO STOP TRIP" push button.

2.2 ___ Ensure TVs OR GVs are closed.

IF NOT,
THEN close MSIVs.

1. Select all MSIVs closed:

___ Close MSV-411

___ Close MSV-412

___ Close MSV-413

___ Close MSV-414

2 ___ Control OTSG PRESS using ADVs:

o MSV-25 "STM GEN A ADV"

o MSV-26 "STM GEN B ADV"

2.3 ___ Stabilize RCS PRESS.

Stabilize RCS PRESS using:

___ PZR heaters

___ PZR spray

___ PORV

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3.0 FOLLOW-UP ACTIONS

<u>ACTIONS</u>	<u>DETAILS</u>
3.1 — Notify personnel of plant conditions as required.	— SOTA — Plant operators — SSOD to evaluate plant conditions for potential entry into the Emergency Plan — System Dispatcher
3.2 — CONCURRENTLY PERFORM VP-540, Runback Verification Procedure.	
3.3 — Ensure ICS runback to $\leq 15\%$ FP.	
3.4 — Ensure output Bkrs are open. <u>IF NOT,</u> <u>THEN</u> select the Backup Trip Coils and attempt to open the Output Bkrs. <u>IF</u> Output Bkrs fail to open using Backup Trip Coils, <u>THEN</u> notify Dispatcher to separate CR-3 from the 500KV grid.	o Ensure open Bkr 1661 o Ensure open Bkr 1662 1 — At rear of MCB TGF, select "BKR TRIP COIL SELECTOR SWITCH" to "BACKUP": o Bkr 1661 on "BACKUP" o Bkr 1662 on "BACKUP" 2 — Open Output Bkrs: o Bkr 1661 open o Bkr 1662 open.
3.5 — Ensure RCS PRESS stabilizes from 2130 to 2180 psig.	Stabilize RC PRESS using: — PZR Heaters — PZR Spray — PORV.

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3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.6 — IF at any time while performing this procedure, the Rx trips, THEN GO TO EOP-02, Vital System Status Verification, beginning with step 2.1.

3.7 — Ensure the main generator "FIELD BKR" is open.

3.8 — Select the "VOLT REG" to "OFF".

3.9 — Ensure the main turbine oil pumps have Auto started.

Ensure started:

- o TBP-2 "TG BRG OIL PP AC"
 - o TBP-8 "HP SEAL OIL B/U PUMP".
-

3.10 — Isolate the MSR high pressure bundles.

1 — Depress "RESET" push button on RH control panel.

2. Isolate MS to the high pressure bundles by closing:

- ___ MSV-29 "RH TK 3A ISO"
- ___ MSV-30 "RH TK 3B ISO"
- ___ MSV-31 "RH TK 3C ISO"
- ___ MSV-32 "RH TK 3D ISO".

Applicable Carry-over steps:

3.6 IF the Rx trips, THEN GO TO EOP-02...

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.11 — Ensure MS Hdr PRESS stabilizes 870 to 900 psig.

3.12 — Maintain PZR level 200 to 240".

- o Adjust "PZR LEVEL CONTROL" "SETPOINT" to adjust PZR level.
 - o Adjust MUV-51 "LETDOWN FLOW" controller to adjust letdown flow.
-

3.13 — Ensure Tave stabilizes 577 to 581°F.

3.14 — Ensure OTSG levels are maintained at LLL.

3.15 — Notify SPO to isolate DFT vent to atmosphere.

SPO to close HVV-103 DFT vent to atmosphere.

3.16 — Notify SPO to isolate FWHE-5A and FWHE-5B drains to DFT.

— SPO to close:

- o HDV-47 FWHE-5A drain to DFT
- o HDV-48 FWHE-5B drain to DFT.

Applicable Carry-over steps:

3.6 IF the Rx trips, THEN GO TO EOP-02...

3.0 FOLLOW-UP ACTIONS (CONT'D)

ACTIONS

DETAILS

3.17 ___ Ensure Turbine Drain Valves are open.

Ensure turbine drain valves are open and not isolated:

Turbine Drain Valves

___ TDV-1	___ TDV-6
___ TDV-2	___ TDV-7
___ TDV-3	___ TDV-8
___ TDV-4	___ TDV-9
___ TDV-5	___ TDV-10
TDV isolation valves	
___ TDV-104	___ TDV-106

3.18 ___ IF power reduction was $\geq 15\%FP$ in 1 hr, THEN notify chemistry to perform ITS required RCS sampling.

3.19 ___ Notify SPO to isolate MSR high pressure and LP bundle vents to FWHEs.

SPO to select "CLOSE" at "MSR REHEATER DRAINS CONTROL PANEL" located 119 ft TB.

High Pressure and LP Vents to FWHEs:

___ HDV-539	___ HDV-540
___ HDV-543	___ HDV-544
___ HDV-547	___ HDV-548
___ HDV-551	___ HDV-552

Applicable Carry-over steps:

3.6 IF the Rx trips, THEN GO TO EOP-02...

3.0 FOLLOW-UP ACTIONS (CONT'D)

<u>ACTIONS</u>	<u>DETAILS</u>
3.20 ___ Notify SPO to isolate MSR high pressure drain tank drains to FWHEs.	SPO to close locally: ___ HDV-1 ___ HDV-3 ___ HCV-5 ___ HDV-7.
3.21 ___ <u>WHEN</u> "TURB AT ZERO SPEED" alarm is actuated, <u>THEN</u> ensure turbine goes on turning gear.	1 ___ Ensure turning gear control switch is in "AUTO". 2 ___ Ensure TBP-6, "TG BRG OIL LIFT PUMP" is running. <u>IF</u> turning gear does <u>NOT</u> Auto engage, <u>THEN</u> select "TG TURNING GEAR MOTOR" control switch to "MAN", <u>AND</u> notify SPO to engage turning gear locally.
3.22 ___ <u>IF</u> turbine was tripped due to exceeding condenser vacuum limits, <u>THEN</u> notify Systems Engineering to evaluate per vendor instructions.	
3.23 ___ <u>IF</u> plant shutdown is required, <u>THEN</u> GO TO OP-208, Plant Shutdown. <u>IF</u> NOT, <u>THEN</u> GO TO OP-203, Plant Startup.	

RUNBACK VERIFICATION PROCEDURE

1.0 ENTRY CONDITIONS

IF any of the following conditions exist:

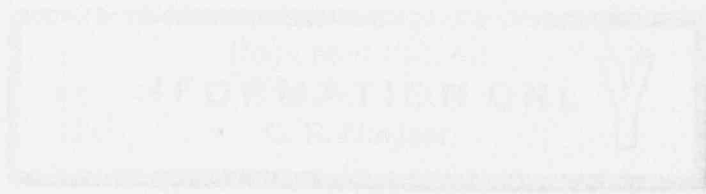
- o ICS automatic runback is in progress
- o An operator controlled manual runback is in progress
- o Use of VP-540 is directed by another procedure,

THEN use this procedure.

2.0 IMMEDIATE ACTIONS

Note

There are no immediate actions for this procedure.



This Procedure Addresses Safety Related Components

Approved by MNPO [Signature] Date 6/2/14
 (SIGNATURE ON FILE)

3.0 FOLLOW-UP ACTIONS

VERIFICATION

DETAILS

NOTE

During the runback, some parameters are constantly changing and cannot be verified until the new power level is reached and the unit has stabilized. This procedure is written assuming that performance of this procedure is begun while the runback is in progress. If it is not, then later steps may be more important than those that are listed first, and may be performed out of order.

3.1 Verify Rx power is < limit for plant conditions.

Selected limiting parameters:

- o IF an asymmetric rod exists,
THEN verify $\leq 60\%$ FP for the RCP combination
- o IF 1 MFWP or 1 MFWBP has tripped,
THEN verify $\leq 55\%$ FP
- o IF only 3 RCPs are operating,
THEN verify $\leq 75\%$ FP
- o IF 1 MSIV has closed,
THEN verify $\leq 60\%$ FP
- o IF 1 CWP has tripped,
THEN verify FP has been reduced to limit condenser ΔT to $21^\circ F$
- o IF 1 CDP has tripped,
THEN verify FP has been reduced to prevent trip of MFWBPs from low DFT level at ≤ 2 ft 10".

3.2 Verify control rod index will remain in the acceptable region of the insertion limit curve of the COLR during the runback.

Immediately notify the SSOD if the control rod index will be in the restricted or unacceptable regions of the curve.

3.0 FOLLOW-UP ACTIONS (CONT'D)

VERIFICATION

DETAILS

3.3 Verify that imbalance is within limits.

- o Observe SPDS imbalance display
- o Refer to COLR for imbalance limit.

3.4 Verify RCS heat production is balanced to OTSG heat removal.

- o SPDS indicates stable TEMP and PRESS parameters are within normal operating box
- o See Enclosure 1 for Total Feedwater Flow Rates vs. Reactor Power
- o IF NOT balanced, THEN determine cause of mismatch and make appropriate recommendations.

3.5 Verify DNB parameters are within limits.

DNB Limits

4 RCPs	3 RCPs
Th \leq 604°F	Th \leq 604°F
RC PRESS \geq 2062 psig	RC PRESS \geq 2062 psig
RC Flow \geq 140 mlb/hr	RC Flow \geq 105 mlb/hr

IF NOT,
THEN refer to ITS 3.4.1, DNB Parameters.

3.0 FOLLOW-UP ACTIONS (CONT'D)

VERIFICATION

DETAILS

NOTE

The following steps need to be performed after the runback is complete and the unit stabilized. Because of the transient nature of a runback condition, the order of performance of these steps may need to be adjusted to the individual transient.

3.6 Verify control rod status.

- o Verify all rods aligned within $\pm 6.5\%$ of group position
 - o Verify all Safety Rods are 100% withdrawn
 - o Verify that APSRs are within insertion limits of the COLR.
-

3.7 Verify runback endpoint core thermal power.

Selected limiting parameters:

- o IF an asymmetric rod exists, THEN verify $\leq 60\%$ FP for the RCP combination
- o IF 1 MFWP or 1 MFWBP has tripped, THEN verify $\leq 55\%$ FP
- o IF only 3 RCPs are operating, THEN verify $\leq 75\%$ FP
- o IF 1 MSIV has closed, THEN verify $\leq 60\%$ FP
- o IF 1 CWP has tripped, THEN verify FP has been reduced to limit condenser ΔT to $21^\circ F$
- o IF 1 CDP has tripped, THEN verify FP has been reduced to prevent trip of MFWBPs from low DFT level at ≤ 2 ft 10".

Ex-core NIs are consistent with core thermal power.

Total Feedwater Flow vs Reactor Power, Enclosure 1, is consistent with core thermal power.

3.0 FOLLOW-UP ACTIONS (CONT'D)

VERIFICATION

DETAILS

3.8 Verify core ΔT is consistent with core thermal power.

Expected core ΔT s.

- o With 4 RCPs running:
 - 100% \approx 44 °F ΔT
 - 75% \approx 33 °F ΔT
 - 60% \approx 26.4 °F ΔT
 - 55% \approx 24.2 °F ΔT .
- o With 3 RCP's running:
 - 75% \approx 44 °F ΔT
 - 55% \approx 32.7 °F ΔT
 - 45% \approx 26.4 °F ΔT .

3.9 Verify quadrant power tilt within steady state limits.

- o Refer to Computer group 59 which updates once every 6 min
- o Perform quadrant power tilt calculation using Ex-core NIs if computer unavailable. See Enclosure 2, Quadrant Power Tilt Calculation
- o IF NOT,
THEN refer to ITS 3.2.4, Quadrant Power Tilt.

3.10 Observe radiation monitors and recorders for unexplained trends.

- o IF any atmospheric radiation monitor is in alarm,
THEN refer to AP-250, Radiation Monitor Actuation
- o Observe annunciator monitor display for alarm or warning conditions
- o Observe radiation monitors and recorders on back of MCB including RB high range monitors.

3.0 FOLLOW-UP ACTIONS (CONT'D)

VERIFICATION

DETAILS

3.11 Observe MS radiation monitors and RMA-12 for indications of a OTSG tube leak.

- o IF any radiation monitor trend indicates OTSG tube leakage, THEN refer to EOP-06, Steam Generator Tube Rupture.

3.12 Observe for increased RCS leakage.

Observe:

- o RCP seal PRESS and dumpster frequency
- o PZR and MUT level trends
- o RB sump and RCDT level trends
- o MU flow control valve position and MU flow
- o IF RCS leakage is suspected, THEN use Enclosure 3 for RCS leakage calculation.

3.13 Determine status of:

- o PORV
- o PZR reliefs
- o PZR HPVs
- o RCS HPVs

- o Acoustic monitors
- o Annunciator alarms
- o Computer points for tailpipe TEMPs:
 - ___ RCV-8 R205
 - ___ RCV-9 R206
 - ___ RCV-10 R207
- o White lights used for flow indicators on ES panels for HPVs.

3.14 Determine status of MSSVs.

- o Observe video monitor
- o Observe tailpipe rope indicator.

3.0 FOLLOW-UP ACTIONS (CONT'D)

VERIFICATION

DETAILS

3.15 Determine availability of all and 4160V and 6900V buses.

- o Volt meters and breaker indications on MCB
- o Annunciator alarms.

3.16 IF any equipment malfunctions during transient, THEN determine if required per ITS.

3.17 Review alarm summaries for unexplained alarms.

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

3.18 Determine if entry into the Emergency Plan is required per EM-202.

3.19 Determine reporting requirements.

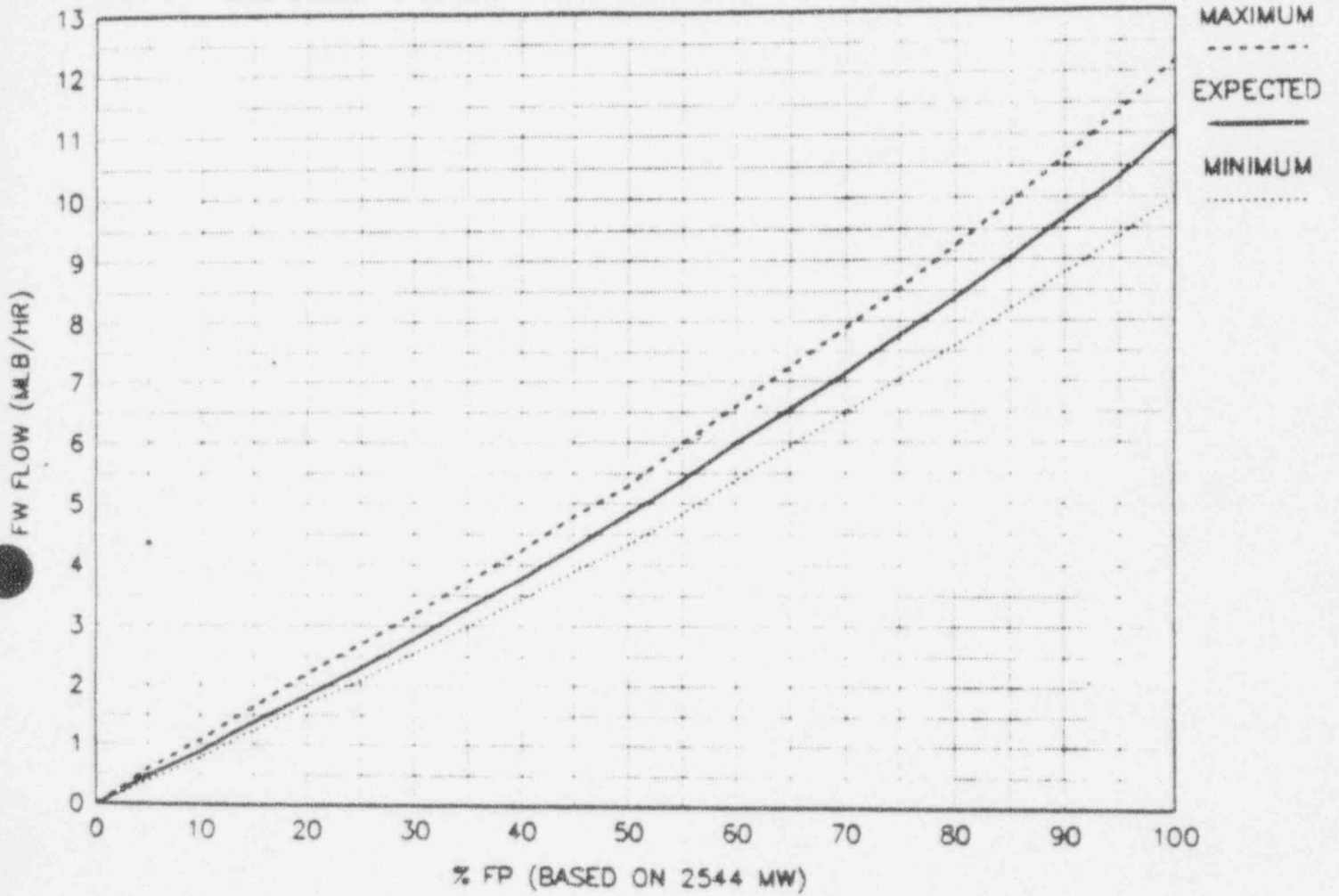
- o Refer to CP-111, Initiation And Processing of Precursor Cards And Problem Reports
- o Refer to AI-500, Conduct of Operations
- o Determine if a Nuclear Network entry is required for the event
- o Refer to SP-296, Documentation of Allowable Operating Transient Cycles.

3.20 WHEN VP-540 is stopped, THEN notify SSOD.

ENCLOSURE 1

TOTAL FEEDWATER FLOW VS. REACTOR POWER

TOTAL FEEDWATER FLOW VS POWER



ENCLOSURE 2

QUADRANT POWER TILT CALCULATION

IF COMPUTER GROUP 59 IS NOT AVAILABLE THEN PERFORM HAND CALCULATION

NI-5=_____ NI-6=_____ NI-7=_____ NI-8=_____

$\frac{NI-5 + NI-6 + NI-7 + NI-8}{4} =$ _____ = AVERAGE POWER

$\frac{\quad + \quad + \quad + \quad}{4} =$ _____

$\frac{\text{LARGEST POSITIVE QUADRANT POWER}}{\text{AVERAGE POWER}} - 1 \times 100 =$ QUADRANT POWER TILT

_____ - 1 X 100 = _____

Ex-core NI Calibration

If [Heat Balance - NI Power] is $\geq 0.8\%$ RTP notify the SSOD. At no time shall Heat Balance exceed NI power by more than 2.0% on any operable NI power range channel.

(a) Heat Balance (from group 59) _____

(b) NI-5=_____ NI-6=_____ NI-7=_____ NI-8=_____

Heat Balance	-	NI-5	=	_____
Heat Balance	-	NI-6	=	_____
Heat Balance	-	NI-7	=	_____
Heat Balance	-	NI-8	=	_____

ENCLOSURE 3

RCS Leakage Calculation

$$\text{HPI FLOW} = \text{MU-23-FI8-1/FI4} + \text{MU-23-FI6-1/FI2} + \text{MU-23-FI5-1/FI1} + \text{MU-23-FI7-1/FI3}$$

$$\text{MAKEUP FLOW} + \text{RCP SEAL FLOW} + \text{HPI FLOW} - \text{LETDOWN FLOW} = \text{RCS LEAK RATE}$$

$$\frac{\text{MU-24-FI}}{\text{MU-27-FI}} + \frac{\text{HPI FLOW}}{\text{MU-4-FI}} - \frac{\text{LETDOWN FLOW}}{\text{RCS LEAK RATE}}$$