1POP05-EO-FRS1 REV. 3

RESPONSE TO NUCLEAR POWER GENERATION/ATWS

STATION PROCEDURE

SAFETY RELATED

PLANT MANAGER — 11/15/88 DATE APPROVED — 1-15-89 DATE EFFECTIVE

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

PURPOSE

This procedure provides actions to add negative reactivity to the reactor core which is observed to be critical when expected to be shutdown.

SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from :

1. 1POP05-EO-E000, REACTOR TRIP OR SAFETY INJECTION, Step 1.0, when Rx Trip is not verified and manual trip is not effective.

2. 1POP05-EO-_001, SUBCRITICALITY, CRITICAL SAFETY FUNCTION STATUS TREE on either a Red or Orange condition.

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

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* CAUTION
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* An ATWS represents a potential ALERT as per
* OEPP01-ZA-0001, EMERGENCY CLASSIFICATION.
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NOTE

Steps 1.0 through 4.0 are Immediate Action Steps

NOTE

Operator Addenda should be handed out.

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[P]___1.0 VERIFY Rx Trip:	
___1.1 Rods on bottom. PRI IND - MCB (1-CP005) ALT IND - NONE DIGITAL ROD POSITION INDICATION SYSTEM RB lights	a. Manually trip Reactor by MCB handswitch. (1-CP005 or 1-CP007) RX TRIP b. IF the Reactor Trip Breakers will NOT open, THEN insert control rods manually AND
___1.2 Rx Trip AND Bypass BKRs - Open. PRI IND - MCB (1-CP005) ALT IND - NONE R NORM S NORM R BYP S BYP	b.1. OPEN 480V LC Feeder Breakers for 1K1 AND 1L1. (1-CP010) 13.8KV AUX BUS 1G FDR BKR TO XFMR 1K1, 1L2, & 1P 13.8KV AUX BUS 1H FDR BKR TO XFMR 1J1, 1L1 & 1S b.2. WHEN Control Rods are on bottom, THEN CLOSE 480V LC Feeder Breakers for 1K1 and 1L1.
___1.3 CHECK Neutron Flux decreasing on Extended Range NI. PRI IND - QDPS(S) ALT IND - MCB (1-CP018) ERFDADS(S) EXTENDED RANGE	

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

[S]___2.0 VERIFY Turbine Trip:

___2.1 All Turbine throttle and governor valves closed.
PRI IND - MCB (1-CP007)
ALT IND - NONE

THROT VLV POSIT	GOV VLV POSIT
TV-1	GV-1
TV-2	GV-2
TV-3	GV-3
TV-4	GV-4

a. TRIP the Turbine from MCB. IF Turbine trips, THEN GO to Step 3.0.

(1-CP007)
TURB TRIP

b. IF Turbine will NOT trip from the MCB, THEN:

b.1. TRIP the EH Control Oil pumps AND PLACE in "Pull to Lock".

(1-CP007)
EHC SPLY PUMP 11
EHC SPLY PUMP 12

c. Manually run back turbine at maximum rate from Turbine Control Panel.

(1-CP007)

c.1. IF Turbine can NOT be run back, THEN CLOSE the MSIVs and MSIBs.

(S/G 1A)	1-MS-FSV-7414	MSIV
	1-MS-FV-7412	MSIB
(S/G 1B)	1-MS-FSV-7424	MSIV
	1-MS-FV-7422	MSIB
(S/G 1C)	1-MS-FSV-7434	MSIV
	1-MS-FV-7432	MSIB
(S/G 1D)	1-MS-FSV-7444	MSIV
	1-MS-FV-7442	MSIB

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[S]___3.0 CHECK AFW pumps running. PRI IND - MCB(1-CP006) ALT IND - ERFDADS(AF)	
___3.1 CHECK Motor Driven AFW pumps - running. AFW PUMP 11 AFW PUMP 12 AFW PUMP 13	START Motor Driven AFW pumps.
___3.1.1 CHECK valves for running pumps - open. (S/G 1A) 1-AF-MOV-0048 - OCIV 1-AF-FV-7525 - AFW REG (S/G 1B) 1-AF-MOV-0065 - OCIV 1-AF-FV-7524 - AFW REG (S/G 1C) 1-AF-MOV-0085 - OCIV 1-AF-FV-7523 - AFW REG	Manually OPEN valves.
___3.2 CHECK steam supply to AFW Pump 14 - open. MN STM ISOL 1-MS-MOV-0143 TURB TRIP/THROT 1-MS-MOV-0514	OPEN steam supply to AFW Pump 14.

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ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
___3.2.1 CHECK valves for AFW Pump 14 - open. (S/G 1D) 1-AF-MOV-0019 - OCIV 1-AF-FV-7526 - AFW REG	Manually OPEN valves.

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[P]___4.0 INITIATE Emergency Boration until Extended Range NI indicates <5% power AND SUR is zero OR negative. PRI IND - QDPS(S) ALT IND - MCB(1-CP018) ERFDADS(S) EXTENDED RANGE	a. IF Emergency Boration can NOT be initiated, THEN transfer the Charging pump suction to the RWST. (1-CP004) a.1. VERIFY at least one Centrifugal Charging pump is running. CHARGING PUMP 1A CHARGING PUMP 1B a.2. OPEN the RWST outlet to Charging pump suction. RWST ISOL 1-CV-MOV-0112C RWST ISOL 1-CV-MOV-0113C
___4.1 VERIFY at least one Centrifugal Charging pump is running. (1-CP004) CHARGING PUMP 1A CHARGING PUMP 1B	a.3. VERIFY the Charging pumps' discharge isolations are open. (1-CP004) DISCH ISOL 1-CV-MOV-8377A 1-CV-MOV-8377B a.4. OPEN the Charging flow control valve for maximum flow. CHG FLOW CONT 1-CV-FCV-0205
___4.2 VERIFY the Charging pumps' discharge isolations are open. (1-CP004) DISCH ISOL 1-CV-MOV-8377A 1-CV-MOV-8377B	

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ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

___4.3 START one (1) Boric Acid Transfer pump.

(1-CP004)

BA PUMP 1A

BA PUMP 1B

___4.4 OPEN the Alternate Boration isolation.

(1-CP004)

ALT BORATION ISOL

1-CV-MOV-0218

___4.5 OPEN either Charging flowpath isolation.

(1-CP004)

LOOP 1A ICIV	LOOP 1C ICIV
1-CV-MOV-0003	1-CV-MOV-0006

___4.6 OPEN Charging flow control valve.

(1-CP004)

CHG FLOW CONT

1-CV-FCV-0205

___4.7 VERIFY >30 gpm Alternate Boration flow.

(1-CP004)

ALT BORATE FLOW

1-CV-FI-0120A

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

[P]___5.0 CHECK PRZR PRESS - < 2335 psig.

PRI IND - MCB(1-CP004)
ALT IND - QDPS(RCS-2)
ERFDADS(8122)

PRESS
1-RC-PI-0455
1-RC-PI-0456
1-RC-PI-0457
1-RC-PI-0458

PERFORM the following:

a. VERIFY PRZR PORVs AND ISOL VLVs - Open.
PRI IND - MCB(1-CP004)
ALT IND - ERFDADS (8102)

ISOL	PORV
1-RC-MOV-0001A	1-RC-PCV-0655A
1-RC-MOV-0001B	1-RC-PCV-0656A

a.1. IF NOT, THEN OPEN PORV ISOL VLVs AND PORVs as necessary until PRZR PRESS < 2335 psig.

b. VERIFY CNTMT VENT ISOL. - Closed
PRI IND - MCB(1-CP022)
ALT IND - ERFDADS (4103, 4104)

CNTMT PURGE

NORMAL	SUPPL
SPLY ISOL DMPR	SPLY ISOL DMPR
1-HC-MOV-0007	1-HC-FV-9776
1-HC-MOV-0008	1-HC-MOV-0003
EXH ISOL DMPR	EXH ISOL DMPR
1-HC-MOV-0010	1-HC-FV-9777
1-HC-MOV-0009	1-HC-MOV-0005

b.1. IF Containment Ventilation Isolation has not occurred, THEN manually initiate AND VERIFY the above dampers close.
(1-CP005)
CIA/CVI

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

[F&S] ___ 6.0 CHECK if the following Trips have occurred:

___ 6.1 Reactor Trip and Bypass Breakers are Open.

(1-CP005)

R_NORM	
S_NORM	
R_BYP	
S_BYP	

DISPATCH RPO to locally open the Reactor Trip and Bypass Breakers.
(EAB EL 60' Room 323)

REACTOR_TRIP_BREAKER_R
REACTOR_TRIP_BREAKER_S
BYPASS_BREAKER_R
BYPASS_BREAKER_S

___ 6.2 Turbine throttle and governor valves are closed.

(1-CP007)

THROT_VLV_POSIT	GOV_VALVE_POSIT
TV-1	GV-1
TV-2	GV-2
TV-3	GV-3
TV-4	GV-4

DISPATCH RPO to locally trip the Turbine at the governor pedestal.
(TGB EL 68', South end of HP turbine)

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

[S]___7.0 CHECK S/G levels.
PRI IND - MCB(1-CP006)
ALT IND - QDPS(H)
ERFDADS(H)

____7.1 N/R level in at least one S/G > 5% [21% adverse CNTMT].

SG LVL	
(S/G 1A)	(S/G 1B)
1-FW-LI-0519	1-FW-LI-0529
1-FW-LI-0571	1-FW-LI-0572
(S/G 1C)	(S/G 1D)
1-FW-LI-0539	1-FW-LI-0549
1-FW-LI-0573	1-FW-LI-0574

a. PERFORM the following:
(1-CP006)

a.1. VERIFY total AFW flow > 1100 gpm.

FLOW	
(S/G 1A)	1-AF-FI-7525
(S/G 1B)	1-AF-FI-7524
(S/G 1C)	1-AF-FI-7523
(S/G 1D)	1-AF-FI-7526

a.2. IF total AFW flow is < 1100 gpm, THEN START AFW pumps AND ALIGN valves as necessary.

a.2.a. OPEN the valves for the pumps started:

(S/G 1A)	
1-AF-MOV-0048	- OCIV
1-AF-FV-7525	- AFW REG
(S/G 1B)	
1-AF-MOV-0065	- OCIV
1-AF-FV-7524	- AFW REG
(S/G 1C)	
1-AF-MOV-0085	- OCIV
1-AF-FV-7523	- AFW REG
(S/G 1D)	
1-AF-MOV-0019	- OCIV
1-AF-FV-7526	- AFW REG

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ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

___ 7.2 CONTROL AFW flow to maintain S/G N/R levels between 5% [21% adverse CNTMT] and 50%.
(1-CP006)

	FLOW
(S/G 1A)	1-AF-FI-7525
(S/G 1B)	1-AF-FI-7524
(S/G 1C)	1-AF-FI-7523
(S/G 1D)	1-AF-FI-7526

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[P]___8.0 VERIFY all dilution paths are isolated. PRI IND - MCB(1-CP004) ALT IND - NONE	
___8.1 VERIFY Letdown demineralizer is bypassed - VCT light is ON. DIVERT 1-CV-TCV-0143	PLACE Letdown demineralizer bypass valve, TCV-0143, in the VCT position. VCT
___8.2 STOP Reactor Makeup water pumps AND PLACE IN "Pull to Lock". RMW PUMP 1A RMW PUMP 1B	
___8.3 VERIFY BTRS is bypassed. DEMIN OUTL TO VCT - Open 1-CV-FV-3127 DEMIN OUTL TO BTRS - Closed 1-CV-FV-3381	BYPASS BTRS by placing BTRS BYPASS CONT in BYPASS.

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[P]___9.0 CHECK for reactivity insertion from uncontrolled RCS cooldown.	STOP any controlled cooldown AND GO to Step 13.0.

___9.1 RCS temperatures - Decreasing in an uncontrolled manner.
PRI IND - QDPS(RCS-3)
ALT IND - MCB (1-CP018)
ERFDADS (8123)

LOOP	TEMP
1-RC-TR-0413	(Loop 1)
1-RC-TR-0423	(Loop 2)
1-RC-TR-0433	(Loop 3)
1-RC-TR-0443	(Loop 4)

OR

___9.2 Any S/G pressure - Decreasing in an uncontrolled manner.
PRI IND - MCB(1-CP006)
ALT IND - QDPS(SEC-2)
ERFDADS(3022)

STM	PRESS
(S/G 1A)	1-MS-PI-0514
	1-MS-PI-0515
(S/G 1B)	1-MS-PI-0524
	1-MS-PI-0525
(S/G 1C)	1-MS-PI-0534
	1-MS-PI-0535
(S/G 1D)	1-MS-PI-0544
	1-MS-PI-0545

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[S]___10.0 CHECK MSIVs and MSIBs - Closed. PRI IND - MCB(1-CP006) ALT IND - ERFDADS (MS) (S/G 1A) 1-MS-FSV-7414 - MSIV 1-MS-FV-7412 - MSIB (S/G 1B) 1-MS-FSV-7424 - MSIV 1-MS-FV-7422 - MSIB (S/G 1C) 1-MS-FSV-7434 - MSIV 1-MS-FV-7432 - MSIB (S/G 1D) 1-MS-FSV-7444 - MSIV 1-MS-FV-7442 - MSIB	CLOSE MSIVs and MSIBs.

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
[S]___11.0 IDENTIFY faulted S/G(s):	
___11.1 CHECK pressure in all S/G(s):	GO to Step 13.0.
___11.1.1 Any S/G pressure decreasing in an uncontrolled manner.	
OR	
___11.1.2 Any S/G completely depressurized.	

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

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* *
* CAUTION *
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* At least one (1) S/G must be maintained *
* available for RCS cooldown. *
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* *
* CAUTION *
* *
* IF all S/Gs are faulted, THEN a minimum of *
* 100 gpm feed flow should be maintained to *
* each S/G. *
* *
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[S]___12.0 ISOLATE faulted S/G(s).
(1-CP006)

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ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
___12.1 CLOSE FW Isolation valves on faulted S/G(s). (S/G 1A) 1-FW-FV-7141 - FWIV 1-FW-FV-7148A - FWIB (S/G 1B) 1-FW-FV-7142 - FWIV 1-FW-FV-7147A - FWIB (S/G 1C) 1-FW-FV-7143 - FWIV 1-FW-FV-7146A - FWIB (S/G 1D) 1-FW-FV-7144 - FWIV 1-FW-FV-7145A - FWIB	a. IF faulted S/G FW Isolation valves can NOT be closed, THEN CLOSE FW CONT VLV and FW CONT BYP VLV. NORM / LOW PWR (S/G 1A) 1-FW-FV-0551 / 1-FW-FV-0551A (S/G 1B) 1-FW-FV-0552 / 1-FW-FV-0552A (S/G 1C) 1-FW-FV-0553 / 1-FW-FV-0553A (S/G 1D) 1-FW-FV-0554 / 1-FW-FV-0554A b. IF faulted S/G FW CONT and BYP valves can NOT be closed, THEN CLOSE 11A and 11B FW HTR Outlet valves and bypass valve. (1-CP008) 1-FW-MOV-0106 - FW HTR 11A OUTLET 1-FW-MOV-0107 - FW HTR 11B OUTLET 1-FW-MOV-0108 - BYPASS

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ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

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*
* CAUTION *
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* Reaching Step 12.2 Contingency Action *
* represents a potential GENERAL EMERGENCY *
* according to 0EPP01-ZA-0001, EMERGENCY *
* CLASSIFICATION. *
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___12.2 CLOSE AFW ISOL VLVs on faulted S/G(s).

(S/G 1A)
1-AF-MOV-0048 - OCIV

(S/G 1B)
1-AF-MOV-0065 - OCIV

(S/G 1C)
1-AF-MOV-0085 - OCIV

(S/G 1D)
1-AF-MOV-0019 - OCIV

IF AFW ISOL valves on faulted S/G can NOT be closed, THEN DISPATCH RPO to UNLOCK and CLOSE AFW Manual Block VLVs in IVC Elev. 22'.
(S/G 1A) 1-AF-0043 - Room 103
(S/G 1B) 1-AF-0061 - Room 102
(S/G 1C) 1-AF-0080 - Room 101
(S/G 1D) 1-AF-0014 - Room 104

___12.3 IF S/G 1D is the faulted S/G, THEN CLOSE steam supply valve to turbine driven AFW Pump 14.
MN STM ISOL
1-MS-MOV-0143.

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ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION
___12.4 VERIFY S/G PORV for faulted S/G - Closed. PRI IND - MCB(1-CP006) ALT IND - QDPS(SEC-2) ERFDADS (MS) PORV (S/G 1A) 1-MS-PV-7411 (S/G 1B) 1-MS-PV-7421 (S/G 1C) 1-MS-PV-7431 (S/G 1D) 1-MS-PV-7441	IF faulted S/G PORV can NOT be closed, THEN DISPATCH RPO to unlock and close PORV Manual Block VLV in IVC EL 58' 6". (S/G 1A) 1-MS-0021 - Room 503 (S/G 1B) 1-MS-0038 - Room 502 (S/G 1C) 1-MS-0055 - Room 501 (S/G 1D) 1-MS-0072 - Room 504

ACTION / EXPECTED RESPONSE	CONTINGENCY ACTION

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*
* CAUTION
*
* Boration should continue to obtain adequate
* shutdown margin during subsequent actions.
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[P]___13.0 VERIFY Rx Subcritical on Extended Range NI's.
PRI IND - QDPS (S)
ALT IND - MCB(1-CP018)
ERFDADS(S)
EXTENDED RANGE

a. CONTINUE to Borate.

b. IF boration is NOT available, THEN ALLOW RCS to heat up.

c. PERFORM actions of other Function Restoration Procedures in effect which do NOT cooldown OR otherwise add positive reactivity to the reactor core.

___13.1 < 5% Power.

d. RETURN to Step 4.0.

___13.2 Startup Rate - Negative.

[P]___14.0 IF 480V LC 1K1 and 1L1 were deenergized, THEN DISPATCH TGB and AUX RPOs to restore loads as per Addendum 3.

[P]___15.0 RETURN to procedure and step, in effect.

ADDENDUM 3
ALTERNATE REACTOR TRIP-RESTORATION
OF ELECTRICAL LOADS

CUBICLE	480V LOAD CENTER 1K1	POSITION
2E	480V MCC 1K1 (9-E-PFAC-01)	CLOSED
3E	MECHANICAL AUX BLDG MAIN EXHAUST FAN (11B)	PER S.S. DIRECTION
3F	FUEL HANDLING BLDG HEATING COIL	PER S.S. DIRECTION
4D	MAB CHILLED WATER PUMP (11B)	PER S.S. DIRECTION
4E	MAB CHILLED WATER PUMP (11D)	PER S.S. DIRECTION
4F	RCB NORMAL PURGE SUPPLY FAN (11B)	PER S.S. DIRECTION
	480V LOAD CENTER 1L1	
1E	HOT MACHINE SHOP DIST PNL	PER S.S. DIRECTION
2E	LAUNDRY RM DIST PNL DP1091	PER S.S. DIRECTION
3E	MECHANICAL AUX BLDG MAIN EXHAUST FAN (11C)	PER S.S. DIRECTION
3F	REACTOR COOLANT PURIFICATION PUMP (11A)	PER S.S. DIRECTION
4D	EAB AIR HANDLING UNIT HEATING COIL	PER S.S. DIRECTION
4E	REACTOR BLDG POLAR CRANE	OPEN
4F	480V MCC 1L2 (9-E-PFAF-01)	CLOSED
	480V LOAD CENTER 1J1	
1E	480V MCC-1J3 (9-E-PFAT-01)	CLOSED
2E	480V MCC-1J1 (9-E-PFAA-01)	CLOSED
3E	RCB NORMAL PURGE SUPPLY FAN (11A)	PER S.S. DIRECTION
3F	NORMAL PURGE SUPPLY HEATING COIL	PER S.S. DIRECTION
4E	EAB AIR HANDLING UNIT HEATING COIL	PER S.S. DIRECTION
4F	RCB CHILLED WTR PUMP (11A)	PER S.S. DIRECTION

CUBICLE		POSITION
	480V LOAD CENTER 1L2	
1B	EAB OUTSIDE AIR REHEAT COIL	PER S.S. DIRECTION
2B	480V MCC 1L4 (9-E-PFAY-01)	CLOSED
3B	MAB CHILLED WATER PUMP (11C)	PER S.S. DIRECTION
3C	RCB CHILLED WATER PUMP (11C)	PER S.S. DIRECTION
4A	FUEL HANDLING BLDG HEATING COIL	PER S.S. DIRECTION
4B	480V MCC 1L3 (9-E-PFAX-01)	CLOSED
4C	MECHANICAL AUX BLDG SUPPLY FAN	PER S.S. DIRECTION
	480V LOAD CENTER 1P	
3C	480V MCC 1J4 (9-E-PFAU-01)	CLOSED
4B	PRESSURIZER HEATER GROUP D - DIST PNL	PER S.S. DIRECTION
4C	480V MCC 1L1 (9-E-PFAE-01)	CLOSED
	480V LOAD CENTER 1S	
3C	480V MCC 1J2 (9-E-PFAB-01)	CLOSED
4B	480V MCC 1S1 (9-E-PFBA-01)	CLOSED
4C	RCFC CHILLED WATER PUMP (11B)	PER S.S. DIRECTION
4D	LOCKER ROOM/OFFICE SUPPLY FAN	PER S.S. DIRECTION
5B	LOCKER RM MISC OFFICE & LAB AHU	PER S.S. DIRECTION