

Final Submittal

(Blue Paper)

1. Senior Operator Written Examination References

**MCGUIRE OCTOBER 2003
EXAM 50-369 & 50-37012003-302**

OCTOBER 21, 2003

Questions with References

<u>Question</u>	<u>Reference</u>
1. 121.1	Technical Specification 5.2.2
2. 210.1	RP/0/A/5700/004 General Emergency
3. 1079	Technical Specification 3.3.1 and Table 3.3 1-1 RTS Instrumentation
4. 1082	EP/1/A/5000/F-0 Containment page 9
5. 1084	EP/1/A/5000/ECA-1.1 Loss of Emergency Coolant Recirc
6. 1087	Technical Specification 3.7.1 Main Steam Safety Valves
7. 1088	Data Book Curve 7.38 Pressurizer

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. EP/1/A/5000/ECA-1.1
Revision No. 008

REPARATION(2) Station McGuire Nuclear Station(3) Procedure Title Loss of Emergency Coolant Recirc**INFORMATION ONLY**(4) Prepared By Weiner, Michael R *Michael Weiner* Date June 3, 2003(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation.
Yes (New procedure or revision with major changes)☐ No (Revision with minor changes)☐ No (To incorporate previously approved changes)(6) Reviewed By S. Hackney (QR)Cross-Disciplinary Review By _____ (QR) NA Date 6/4/03Reactivity Mgmt. Review By _____ (QR) NA Date 6/4/03Mgmt. Involvement Review By _____ (OPS Supt.) NA Date 6/4/03

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval (if necessary)

BY _____ (OSM/QR) Date _____

By *Shank* _____ (QR) Date _____(9) Approved By _____ Date 6/10/03**PERFORMANCE** (Compare with Control Cop. every 14 calendar days while work is being performed.)

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification

☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?☐ Yes ☐ NA Required enclosures attached?☐ Yes ☐ NA Data sheets attached, completed, dated and signed?☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

(13) Procedure Completion Approved _____ Date _____

(14) Remarks (Attach additional pages, if necessary.)

A. Purpose

This procedure provides actions to restore emergency coolant recirc capability, to delay depletion of the FWST by adding makeup and reducing outflow, and to depressurize the **NC** System to minimize break flow.

B. Symptoms or Entry Conditions

This procedure is entered from:

- EP/1/A/5000/E-1 (Loss Of Reactor Or Secondary Coolant), Step 13, and EP/1/A/5000/ES-1.2 (Post LOCA Cooldown And Depressurization), Step 4, when Cold Leg Recirc capability can not be verified.
- EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), Foldout Page, if recirc flow cannot be aligned or maintained.
- EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), Step 3, if containment sump level less than setpoint.
- EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), Step 6, when at least one flow path from the sump can not be established or maintained.
- EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc), Step 11, if Cold Leg Recirc flow can not be verified.
- EP/1/A/5000/ECA-1.2 (LOCA Outside Containment), Step 3, when a LOCA outside containment cannot be isolated.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

C. Operator Actions

— 1. Monitor **Foldout** page.

2. Try to restore **Cold** Leg Recirc capability:

— a. Check any ND pump - ON.

a. Perform the following:

— 1j IF containment sump level is less than 3 ft, THEN GO TO Step 2.b.

2) Close the following:

- • 1ND-19A (A ND Pump Suct From FWST or NC)
- • 1ND-4B (B ND Pump **Suct** From FWST or NC).

NOTE Closing 1ND-19A and 1ND-4B meets one of the permissives to allow manual opening of associated sump valve.

3) WHEN 1ND-19A is closed, THEN attempt to open 1NI-185A (RB Sump To Train A ND & NS) as follows:

- • Place control permissive switch in "BYPASS" and open 1NI-185A.

4) WHEN 1ND-4B is closed, THEN attempt to open 1NI-184B (RB Sump To Train 6 ND & NS) as follows:

- • Place control permissive switch in "BYPASS" and open 1NI-184B.

5) IF sump valve opens, THEN start ND pump on same train.

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UNIT 1

LOSS OF EMERGENCY COOLANT RECIRC

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

IF

IF

IF

IF

___ d Check containment sump level -
GREATER THAN 3 FT

___ d. IF NC inventory **loss** occurring outside
containment, **THEN GO TO** Step 3.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2. (Continued)

— e. Check Cold Leg Recirc capability
RESTORED.

e. Perform the following:

1) Continue attempts to restore Cold Leg Recirc capability as follows:

— • Power restoration

— • Local valve operation

— • Other actions as specified by station management.

— 2) **IF** loss of Cold Leg Recirc capability is due to air binding of NV and NI pumps, **THEN** vent pumps **PER** Enclosure 2 (Venting NV and NI Suction for Cold Leg Recirc), prior to starting pumps.

— 3) **WHEN** Cold Leg Recirc capability is restored, **THEN GO TO** Step 2.f.

— 4) **GO TO** Step 3

— f. Check FWST level - LESS THAN 180 inches ("FWST LEVEL L O alarm)

— f. **RETURN TO** procedure and step in effect.

g. Check the following pumps - ON:

— g **WHEN** ND discharge is aligned to NI and NV pump suction in EP/1/A/5000/ES-1 3 (Transfer To Cold Leg Recirc). **THEN** restart NI and NV pumps as required by S/I Reinitiation Criteria on ES-1 3 foldout page

— • At least one NI pump

— • At least one NV pump.

— h. **GO TO** EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3. **Reset** the following:

___ a. S/I.

a. IF any reactor trip breaker is closed,
THEN:

___ 1) Dispatch operator to open Unit 1
reactor trip breakers.

___ 2) WHEN trip breakers open, THEN
reset S/I.

___ b. Sequencers

b. Dispatch operator to open breaker for
affected sequencer DC control power:

___ • A Train - 1EVDA Breaker 6

___ • B Train - 1EVDD Breaker 8.

___ c. IF AT ANY TIME a B/O signal occurs,
THEN restart S/I equipment previously
on.

4. Depress "**SS RESET**" for the following
valves:

___ ■ 1NI-184B (RB Sump To Train B ND &
NS)

___ • 1NI-185A (RB Sump To Train A ND &
NS).

5. Check if FWST level adequate:

___ a. FWST level - GREATER THAN
20 INCHES.

___ a. GO TO Step 31

___ b. IF AT ANY TIME while in this procedure
FWST level **goes** below 20 inches,
THEN GO TO Step 31

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6. Determine NS requirements:

- ___ a Check NS pump suction - ALIGNED TO FWST
- ___ a. GO TO Step 9
- ___ b. Determine number of NS pumps required from the following table:

FWST LEVEL	CONTAINMENT PRESSURE	NS PUMPS REQUIRED
GREATER THAN 33 inches ("FWST LO-LO LEVEL" alarm)	GREATER THAN 15 PSIG	2
	BETWEEN 10 PSIG AND 15 PSIG	1
	LESS THAN 10 PSIG	0
LESS THAN 33 inches ("FWST LO-LO LEVEL" alarm)	N/A	0

- ___ c. Check NS pumps running - EQUAL TO NUMBER REQUIRED
- c. Perform the following.
 - ___ 1) Reset Containment Spray
 - ___ 2) Operate NS pumps as required by table above.

7. Check criteria to align NS System for recirc:

- ___ a. Any NS pump - ON.
- ___ a. GO TO Step 8.
- ___ b. Check containment sump level. GREATER THAN 3 FT.
- b. Perform the following:
 - ___ 1) WHEN containment sump level greater than 3 ft. THEN perform Step 7.c.
 - 2) GO TO Step 8
- ___ c Align NS for recirc PER Enclosure 3 (NS Alignment To Containment Sump)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. Operate NS discharge isolation valves as follows:

a. Close NS spray valves on pumps that are off:

- 1A NS Pump:

- • 1NS-32A (A NS Pump Disch Cont Outside Isol)

- • 1NS-29A (A NS Pump Disch Cont Outside Isol).

- 1B NS Pump:

- • 1NS-12B (B NS Pump Disch Cont Outside Isol)

- • 1NS-15B (B NS Pump Disch Cont Outside Isol).

b. IF AT ANY TIME NS pumps are stopped or started, **THEN:**

- • Close associated NS pump discharge isolation valves after securing a pump.

- • Open associated NS pump discharge isolation valves prior to starting a pump.

— 9. Makeup to FWST **PER OP/1/A/6200/014** (Refueling Water System), Enclosure 4.2 (FWST Makeup Using Reactor Makeup Blender During Modes 1-5 or While Defueled).

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ACTION	EXPECTED RESPONSE		RESPONSE NOT OBTAINED
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— b. Check VI header pressure - GREATER THAN 60 PSIG.

— b. **IF** CA flow can not be throttled with CA control valves in subsequent steps, **THEN** control flow **PER** EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 16 (CA Flow Control With Loss of VI).

— c. Throttle feed flow to maintain all intact S/Gs N/R levels between 11% (32% ACC) and 50%.

— c. **IF** N/R level in any intact S/G continues to **go** up, **THEN stop** feed flow to that S/G.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11. Monitor shutdown margin during cooldown as follows:

a. **WHEN** the TSC is staffed, **THEN** request TSC to evaluate obtaining samples as follows:

1) Consider available cooling of sample HXs as follows:

— • KC will remain isolated to normal sample HXs for 10 hours, until KC is realigned to normal sample HXs and KF per AP/1/A/5500/41 (Loss Of Spent Fuel Cooling or Level).

— • **IF** sample is desired prior to aligning KC to KC aux bldg non-essential header, **AND** fuel damage is not expected, **THEN** evaluate obtaining sample **PER** OP/1/A/6200/011 (Unit 1 NM Sampling) Enclosure 4.6 (1NC Hot Leg with KC Non-essential Header Isolated).

— 2) Evaluate obtaining periodic NC System boron sample to check shutdown margin during cooldown.

NOTE Sample results are not required prior to initiating cooldown in subsequent steps.

b. **WHEN** each NC boron sample obtained, **THEN**:

— 1) Perform shutdown margin calculation for Cold Shutdown **PER** OP/0/A/6100/006 (Reactivity Balance Calculation).

— 2) Check shutdown margin ADEQUATE.

— 2) Notify station management

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- ___ 12. **WHEN** "P-11 PRESSURIZER S/I BLOCK PERMISSIVE" status light (1SI-18) lit, **THEN** depress "BLOCK on Low Pressure Steamline Isolation **block** switches.

NOTE After the Low Pressure Steamline Isolation signal is blocked, maintaining steam pressure negative rate **less** than 2 PSIG per second will prevent a Main Steam Isolation.

13. Initiate **NC** System cooldown to Cold Shutdown as follows:

a. Check condenser available:

___ a. **GO TO** RNO for Step 13.d

___ • "C-9 COND AVAILABLE FOR STEAM DUMP status light (1SI-18) - LIT

___ • MSIV on intact S/G(s) - OPEN

___ b. Check "STEAM DUMP SELECT" - IN STEAM PRESSURE MODE.

b. Perform the following to place steam dumps in steam pressure mode:

___ 1) Place "STM PRESS CONTROLLER" in manual

___ 2) Adjust "STM PRESS CONTROLLER" output to equal "STEAM DUMP DEMAND signal.

___ 3) Place "STEAM DUMP SELECT" in steam pressure mode.

___ c. **WHEN** "P-12 LO-LO TAVG" status light (1SI-18) lit, **THEN** place steam dumps in bypass interlock.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- d. Dump steam to condenser from intact S/Gs while maintaining cooldown rate in NC T-Colds as close as possible without exceeding 100° F in an hour.

- d. Perform the following:
 - 1) Ensure Main Steam Isolation reset.
 - 2) Ensure SM PORVs reset.
 - 3) Dump steam using all intact S/G(s) SM PORVs while maintaining ~~cooldown~~ rate in NC T-Colds as close as possible without exceeding 100° F in an hour.
 - 4) **IF** any intact S/G SM PORV closed, **THEN** dump steam using any of the following while maintaining cooldown rate in NC T-Colds less than 100° F in an hour:
 - a) Dispatch operator to operate intact S/G(s) SM PORV.
 - b) **IF** any intact S/G SM PORV is unavailable. **THEN** evaluate using the following to dump steam:
 - • Run TD CA Pump
 - • **Use** steam drains **PER** EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 19 (S/C Depressurization Using Steam Drains).
 - 5) **IF** no intact S/G available, **THEN** use faulted S/G.

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ACTIONiEXPECTED RESPONSE

RESPONSE NOT OBTAINED

— • 1NI-9A (NC Cold eg Inj From NV) -
OPEN

OR

— • 1NI-10B (NC Cold Leg Inj From NV) -
OPEN

OR

— • Any ND pump - ON WITH SUCTION
ALIGNED TO FWST OR
CONTAINMENT SUMP.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15. Establish one train of S/I flow:

— a. Check only one NV pump - ON.

a. Perform the following:

1) IF both NV pumps on, THEN perform the following:

— a) IF all NC pumps off, AND "REACTOR VESSEL LR LEVEL" is less than 60%, THEN GO TO Step 15.b. ,.

~~a)~~ Stop one NV pump

2) IF both NV pumps off, THEN ensure suction aligned to FWST as follows:

a) Ensure the following valves closed:

— • 1ND-58A (Train A ND To NV & NI Pumps)

— • 1NI-136B (B NI Pump Suction From ND)

— • 1NI-332A (NV & NI Pumps Suction X-Over)

— • 1NI-3338 (NV & NI Pumps Suction X-over).

b) Ensure the following valves open:

— • 1NV-221A (NV Pumps Suct From FWST)

— • 1NV-222B (NV Pumps Suct From FWST)

— c) Start one NV pump.

Handwritten notes:
1. If both NV pumps on, then perform the following:
a) If all NC pumps off, AND "REACTOR VESSEL LR LEVEL" is less than 60%, THEN GO TO Step 15.b.
b) Stop one NV pump
2) If both NV pumps off, THEN ensure suction aligned to FWST as follows:
a) Ensure the following valves closed:
• 1ND-58A (Train A ND To NV & NI Pumps)
• 1NI-136B (B NI Pump Suction From ND)
• 1NI-332A (NV & NI Pumps Suction X-Over)
• 1NI-3338 (NV & NI Pumps Suction X-over).
b) Ensure the following valves open:
• 1NV-221A (NV Pumps Suct From FWST)
• 1NV-222B (NV Pumps Suct From FWST)
c) Start one NV pump.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15. (Continued)

— b. Check only one NI pump - ON.

b. Perform the following:

1) IF both NI pumps on, THEN perform the following:

— a) IF all NC pumps off, AND "REACTOR VESSEL LR LEVEL" is less than 60%, THEN GO TO Step 15.c.

— b) Stop one NI pump.

2) IF both NI pumps off, THEN ensure suction aligned to FWST as follows:

a) Ensure the following valves closed:

— • 1ND-58A (Train A ND To NV & NI Pumps)

— • 1NI-136B (B NI Pump Suction From ND)

— ■ 1NI-332A (NV & NI Pumps Suction X-Over)

— • 1NI-333B (NV & NI Pumps Suction X-over).

— b) Ensure 1NI-100B (FWST To NI Pumps) open

c) WHEN NC pressure less than 1600 PSIG, THEN start one NI pump

— c Check NC pressure - LESS THAN 286 PSIG

c. Perform the following:

— 1) Stop ND pumps.

2) GO TO Step 16.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15. (Continued)

— d. Check only one ND pump - ON.

d. Perform the following:

— 1) **IF** both ND pumps on, **THEN** stop one pump.

— 2) **IF** both ND pumps off **AND** available suction source is currently aligned, **THEN** start one ND pump.

16. Check **flowpath from FWST** back to containment **sump** isolated:

a. A Train:

— 1) Check 1NI-185A (RB Sump To Train A ND & NS) - OPEN.

— 1) **GO TO** Step 16.b

— 2) Check 1ND-19A (A ND Pump Suct From FWST or NC) - CLOSED.

— 2) Close 1ND-19A.

b. B Train:

— 1) Check 1NI-184B (RB Sump To Train B ND & NS) - OPEN.

— 1) Observe Note prior to Step 17 and **GO TO** Step 17.

— 2) Check 1ND-4B (B ND Pump Suct From FWST or NC) - CLOSED.

— 2) Close 1ND-4B

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE Preference should be given to running 1B NC Pump first, then 1A NC Pump to provide Pzr spray capability.

17. Check **if an** NC pump should be **started**:

___ a. All NC pumps - OFF.

a. Perform the following:

___ 1) Stop all but one NC pump.

___ 2) Place Pzr spray valve in manual and close for stopped NC pump.

___ 3) **GO TO** Step 18.

___ b. NC subcooling based on core exit T/Cs
- GREATER THAN 0° F.

___ b. **GO TO** Step 18

c. Check if NC pump seal cooling has been maintained:

c. Perform **the** following:

___ • Seal injection flow

___ 1) Notify station management **to** perform a status evaluation prior **to** starting an NC pump.

OR

___ 2) **GO TO** Step 18.

___ • KC flow to thermal barrier.

___ d. Try to start one NC pump **PER**
EP/1/A/5000/G-1 (Generic
Enclosures), Enclosure 6 (NC Pump
Startup).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

a. Check RVLIS indication:

— a. **GO TO** Step 24.

- • **IF** all NC pumps off, **THEN** check
"REACTOR VESSEL LR LEVEL".
GREATER THAN 60%

OR

- • **IF** one NC pump on, **THEN** check
"REACTOR VESSEL D/P".
GREATER THAN REQUIRED D/P
FROM TABLE BELOW:

RVLIS TRAIN	Required "REACTOR VESSEL D/P"			
	OPERATING NC PUMP			
	A	B	C	D
A	35%	15%	15%	15%
B	15%	15%	35%	15%

- b. NC subcooling based on core exit T/Cs
- GREATER THAN 50" F.

b. Perform the following:

- 1) Determine minimum S/I flow
required **PER** Enclosure 4 (Flow
Required to Match Decay Heat).
- 2) Minimize S/I flow by stopping one or
more S/I pumps while maintaining
greater than or equal to flow
required by Enclosure 4 (Flow
Required to Match Decay Heat).
- 3) **GO TO** Step 24.

19. Reset the following:

- • Phase A Isolation
- • Phase B Isolation

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

20. **Establish VI to containment:**

a. Open the following:

- • 1VI-129B (A ~~Ess~~ Hdr Cont Outside Isol)
- • 1VI-160B (B ~~Ess~~ Hdr Cont Outside Isol)
- • 1VI-150B (Lwr Cont Non ~~Ess~~ Cont Outside Isci).

- b. Check VI header pressure - GREATER THAN 85 PSIG.

b. Perform the following:

- 1) Align N₂ to all PORVs by opening:

- • 1NI-430A (Ernerg N₂ From CLA TO 1NC-34A)
- • 1NI-431B (Ernerg N₂ From CLA To 1NC-32B & 36B).

- 2) IF VI not available for CA flow control in subsequent steps, THEN control flow PER EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 16 (CA Flow Control With Loss of VI).

- 3) Restore VI PER AP/1/A/5500/22 (~~Loss Of~~ VI).

21. Stop the following **S/I** pumps:

- • ND pumps
- • NI pumps
- • All but one NV pump

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22. Isolate NV **S/I** flowpath:

a. Check NV pumps miniflow valves -
OPEN:

- ___ • 1NV-150B (NV Pumps Recirculation)
- ___ • 1NV-151A (NV Pumps Recirculation).

a. Perform the following:

- ___ 1) Open valves.
- ___ 2) **IF** both valves open, **THEN GO TO** Step 22.b.
- 3) **IF** either valve closed, **THEN**:
 - a) Dispatch operator to open valve(s):
 - ___ • 1NV-150B (aux bldg, 716+8, HH-55, room 627, NV pump room 1A, west of pump motor)
 - ___ • 1NV-151A (aux bldg. 716+9, HH-55, room 627, NV pump room 1A, west of pump motor).
 - ___ b) Realign charging **PER** EP/1/A/5000/G-1 (Generic Enclosures). Enclosure 18 (Aligning Normal Charging With NV Recirc Path Isolated).
 - ___ c) **WHEN** both 1NV-1508 and 1NV-151A open, **THEN** charging **flow** may be throttled to less than 60 GPM.
 - ___ d) **GO TO** Step 24

b. Close the following valves:

- ___ • 1NI-9A (NC Cold Leg Inj From NV)
- ___ • 1NI-10B (NC Cold Leg Inj From NV).

b. Dispatch operator to close valve(s):

- ___ • 1NI-9A (aux bldg, 733+12, JJ-52. room 730, VCT hallway 1 ft south of JJ-52)
- ___ • 1NI-10B (aux bldg. 733+4, JJ-51, room 730, VCT hallway 1 ft south of JJ-51).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23. Establish charging:

- a. Check VI header pressure - GREATER THAN 60 PSIG.

a. Perform the following:

- 1) Dispatch operators to perform the following and standby:

- • Loosen lock nut and throttle handwheel on 1NV-238 (Charging Line Flow Control) (aux bldg, 716+3, HH-54, room 629, PD Pump room) to maintain 6-10 GPM seal injection flow to each NC pump.

- • Loosen lock nut and close handwheel on 1NV-241 (Seal Inj Flow Control) (aux bldg, 716+9, HH-52, room 603, above BW pumps).

- 2) **WHEN** 1NV-241 is locally closed, **AND** 1NV-238 is locally throttled, **THEN**:

a) Open the following:

- • 1NV-244A (Charging Line Cont Outside Isol)
— • 1NV-245B (Charging Line Cont Outside Isol).

- b) **IF** 1NV-244A or 1NV-245B closed, **THEN** dispatch operator to open valve(s):

- • 1NV-244A (aux bldg, 716+10, HH-52, room 603, above BW pumps)
— • 1NV-245B (aux bldg, 716+11, HH-52, room 603, west of BW pumps).

- c) Place 1NV-238 (Charging Line Flow Control) controller in manual and fully open.

- d) Place 1NV-241 (Seal Inj Flow Control) manual loader fully open.

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3) IF AT ANY TIME charging flow is required to be controlled in subsequent steps, **THEN** have dispatched operators locally adjust flow rate as follows:

- • Slowly throttle handwheel on 1NV-241.
- • Throttle handwheel on 1NV-238 while maintaining NC pump seal injection flow.
- • Maintain charging flow less than 175 GPM.

— 4) GO TO Step 24.

— b. Throttle 1NV-238 (Charging Line Flow Control) to maintain 6-10 **GPM** seal injection flow to each NC pump.

— c. Close 1NV-241 (Seal Inj Flow Control).

d. Open the following valves:

- • 1NV-244A (Charging Line Cont Outside **Isol**)
- • 1NV-245B (Charging Line Cont Outside **Isol**).

e. IF AT ANY TIME charging flow is required to be controlled in subsequent steps, **THEN**:

- • Slowly throttle 1NV-241
- • Throttle 1NV-238 while maintaining NC pump seal injection flow.
- • Maintain charging flow **less** than 175 GPM.

d. Dispatch operator to open valve(s):

- • 1NV-244A (aux bldg, 716+10, HH-52, room 603, above BW pumps)
- • 1NV-245B (aux bldg, 716+11, HH-52, room 603, west of BW pumps).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

24. Check if NC System makeup flow is adequate:

a. Check RVLIS indication:

— a. Raise NC System makeup flow as required to maintain RVLIS indication

- • IF all NC pumps off, THEN check "REACTOR VESSEL LR LEVEL" - GREATER THAN 60%.

OR

- • IF one NC pump on, THEN check "REACTOR VESSEL D/P - GREATER THAN REQUIRED DIP FROM TABLE BELOW:

RVLIS TRAIN	Required "REACTOR VESSEL D/P"			
	OPERATING NC PUMP			
	A	B	C	D
A	35%	15%	15%	15%
B	15%	15%	35%	15%

— b. Core exit T/Cs - STABLE OR GOING DOWN.

— b. Raise NC System makeup flow as required to maintain core exit T/Cs stable or going down.

c. IF AT ANY TIME RVLIS indication goes below setpoint in Step 24.a, OR core exit T/Cs start going up, THEN raise NC System makeup flow as required to maintain:

- • RVLIS indication

- • Core exit T/Cs stable or going down

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

25. IF AT ANY TIME NC pump number 1 seal
DIP goes below 200 PSID OR number 1
seal leakoff flow goes below 0.2 GPM,
THEN:

- a. Stop affected NC pump(s)
- b. Place Pzr spray valve in manual and
close for stopped NC pump.

NOTE If all NC pumps are off, the upper head region may void during NC System
depressurization. This will cause Pzr level to rise rapidly.

26. Depressurize NC System to lower NC
subcooling as follows:

- a. Check NC subcooling based on core
exit T/Cs - GREATER THAN 10° F.
- a. GO TO Step 27.
- b. WHEN following criteria met, THEN
stop depressurization started in next
step:
 - • NC subcooling based on core exit
T/Cs - BETWEEN 0° F AND 10° F
 - OR
 - • Pzr level - GREATER THAN 76%
(58% ACC).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

— c. Depressurize NC System using normal Pzr spray until criteria above met.

c. Depressurize NC System as follows until criteria met:

1) IF a Pzr PORV is available, THEN:

— a) Depressurize NC System using one Pzr PORV.

b) IF AT ANY TIME during depressurization. NC subcooling based on core exit T/Cs goes below 0° F, THEN:

— (1) Ensure PORV is closed or isolated.

— (2) IF subcooling based on core exit T/Cs is still less than 0° F, THEN raise makeup flow as necessary to restore subcooling.

2) IF no Pzr PORV will operate, THEN:

a) Align N₂ to all PORVs by opening:

— • 1NI-430A (Emerg N₂ From CLA To 1NC-34A)

— • 1NI-431B (Emerg N₂ From CLA To 1NC-32B & 36B).

— b) Use one Pzr PORV until criteria met.

— 3) IF Pzr PORV available, THEN GO TO Step 27.

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

26. (Continued)

4) **IF** no Pzr PORV available, **THEN** use NV aux spray as follows:

a) Close Pzr spray valves:

- • 1NC-27 (A Loop PZR Spray Control)
- • 1NC-29 (B Loop PZR Spray Control).

— b) Open 1NV-21A (NV Spray To PZR Isol).

c) Close:

- • 1NV-13B (NV Supply To A NC Loop Isol)
- • 1NV-16A (NV Supply To D NC Loop Isol).

— d) Raise charging flow up to 175 GPM as desired to raise depressurization rate.

e) **WHEN** criteria to stop depressurization in Step 26.b is met, **THEN** isolate NV aux spray as follows:

- (1) Open 1NV-13B (NV Supply To A NC Loop Isol).
- (2) Close 1NV-21A (NV Spray To PZR Isol).
- (3) Ensure charging flow is less than 175 GPM.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

27. Check if **ND** can **be** placed in **RHR mode**:

a. Check the following:

— a. GO TO Step 28.

— • NC T-Hots - LESS THAN 350" F
(347" F ACC)

— • NC pressure - LESS THAN
385 PSIG.

— b. Consult station management to
~~determine~~ if ND should be placed in
RHR mode.

— c. **IF** station management decides to place
ND in RHR mode, **THEN REFER TO**
Enclosure 5 (Placing ND in RHR
Mode).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

___ a. Check at least two NC T-Hots - LESS THAN 354" F.

b. Place the power disconnect switches to "ENABLE and close the following:

- ___ • 1NI-54A (A CL Accum Disch Isol)
- ___ • 1NI-65B (B CL Accum Disch Isol)
- ___ • 1NI-76A (C CL Accum Disch Isol)
- ___ • 1NI-88B (D CL Accum Disch Isol).

___ c. **WHEN** valves indicate closed for at least 5 seconds, **THEN** return power disconnect switches to disconnect.

___ 29. Check NC temperature - GREATER THAN 200" F.

___ 30 Check **FWST** level - LESS THAN 20 INCHES.

a. Perform the following.

___ 1) **WHEN** at least two NC T-Hots less than 354" F, **THEN** perform Steps 28.b and 28.c.

___ 2) **GO TO** Step 29.

b. Vent any unisolated CLA as follows:

1) Open isolation valve on affected CLA:

- ___ • 1NI-50 (A CL Accum N2 Supply Isol)
- ___ • 1NI-61 (B CL Accum N2 Supply Isol)
- ___ • 1NI-72 (C CL Accum N2 Supply Isol)
- ___ • 1NI-84 (D CL Accum N2 Supply Isol).

___ 2) Open 1NI-83 (CL Accum N2 Hdr Atmos Vent Isol).

___ 3) Do not depressurize NC System below CLA pressure in subsequent steps until CLAs are isolated or vented.

___ 4) **IF** CLA cannot be isolated or vented, **THEN** contact TSC for guidance.

___ **GO TO** Step 39.

___ **RETURN TO** Step 1.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

31. Stop pumps as follows:
- a. Stop S/I pumps that are taking suction from FWST:
 - ___ • NDpumps
 - ___ • NI pumps
 - ___ • NV pumps.
 - b. **IF** either NS pump suction aligned to FWST. **THEN** perform the following on train aligned to FWST:
 - ___ 1) Reset Containment Spray
 - ___ 2) Stop NS pump(s).
 - ___ 3) Dispatch operator to remove control power fuses for NS pump(s) (1ETA, 1ETB swgr room).
 - c. Dispatch operator to open breakers to sequencer DC control power:
 - ___ • A Train - 1EVDA Breaker 6
 - ___ • B Train - 1EVDD Breaker 8.
32. Try to raise makeup to NC System from any available alternate source:
- a. VCT:
 - 1) Dispatch operator to realign makeup back to VCT:
 - ___ a) Close 1NV-172 (Boric Acid Blender Disch to NV & FW) (aux bldg, 733+6, KK-51, VCT hallway)
 - ___ b) Close 1NV-174 (Boric Acid Blender Disch to NV & FW) (aux bldg, 733+6, KK-51, VCT hallway)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

32. (Continued)

2) Check VCT makeup control system:

- a) Set **boric** acid flow control pot at 6.5.
- b) Ensure NC System makeup controller in "AUTO."
- c) Place NC System makeup switch to "START".
- d) Ensure VCT level is maintained.
- 3) Check VCT - AVAILABLE AS NV SUCTION SOURCE.

3) Perform the following:

- a) **WHEN** VCT available, **THEN** evaluate performing Step 32.a.
- b) **GO TO** Step 32.b

4) Open:

- • 1NV-141A (VCT Outlet Isol)
- • 1NV-142B (VCT Outlet Isol)

5) Close:

- • 1NV-221A (NV Pumps Suct From FWST)
- • 1NV-222B (NV Pumps Suct From FWST).
- 6) Close 1NV-241 (Seal Inj Flow Control).

7) Open:

- • 1NV-244A (Charging Line Cont Outside Isol)
- • 1NV-2456 (Charging Line Cont Outside Isol).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

32. (Continued)

8) Close:

- • 1NI-9A (NC Cold Leg Inj From NV)
- • 1NI-10B (NC Cold Leg Inj From NV).

— 9) Check if LOCA or steam break inside containment - HAS OCCURRED.

9) Perform the following:

a) Open:

- • 1NV-150B (NV Pumps Recirculation)
- • 1NV-151A (NV Pumps Recirculation).

— b) Place controller in manual and close **1NV-238** (Charging Line Flow Control).

— c) Start one NV pump

d) Control charging as follows:

- • Slowly throttle open 1NV-241.
- • Throttle 1NV-238 while maintaining NC pump seal injection flow 6-10 GPM.
- • Maintain charging flow less than 175 GPM.

— e) GO TO Step 32.b

— 10) Place controller in manual and fully open 1NV-238 (Charging Line Flow Control).

— 11) Start one NV pump

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

32. (Continued)

CAUTION Failure to maintain charging flow above 60 GPM will result in inadequate NV pump miniflow protection. This limit applies to all subsequent **EPs**.

12) Throttle 1NV-238 (Charging Line Flow Control) and 1NV-241 (Seal Inj Flow Control) to:

- ___ • Establish and control charging flow between 60 GPM and 175 GPM.
- ___ • Control NC pump seal injection flow between 6-10 GPM.

___ b. Check any NV pump - ON.

b. **IF** NC System depressurized, **THEN** evaluate aligning BAT/RMWST to NC System (through NV suction), using any of the following:

- ___ • Emergency **boration** to NV suction.

OR

- Use VCT overpressure:

- ___ • Maintain VCT level.

- ___ • Align NV suction to VCT.

- ___ • **IF** flowrate is too high for VCT makeup, **THEN** realign NV S/I flowpath to normal charging.

___ c. Start standby Makeup pump **PER** Enclosure 6 (Standby Makeup Pump Startup).

d. Consult with station management staff to evaluate pumping sump to FWST using the following flowpaths:

- ___ • ND pump recirc
- ___ • NS pump recirc.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

33. Depressurize intact **S/Gs** to **660 PSIG** as follows:

- a. Check all intact S/G pressures GREATER THAN 660 PSIG.
- b. Check condenser available:
 - • "C-9 COND AVAILABLE FOR STEAM DUMP status light (1SI-18) - LIT
 - • MSIV on intact S/G(s) - OPEN
- c. Check "STEAM DUMP SELECT" - IN STEAM PRESSURE MODE.
- d. **WHEN** "P-12 LO-LO TAVG" status light (1SI-18) lit, **THEN** place steam dumps in bypass interlock.

— a. **GO TO** Step 34.

— b. **GO TO** RNO for Step 33.e.

c. Perform the following to place steam dumps in steam pressure mode:

- 1) Place "STM PRESS CONTROLLER" in manual.
- 2) Adjust "**STM** PRESS CONTROLLER" output to equal "STEAM DUMP DEMAND" signal.
- 3) Place "STEAM DUMP SELECT" in steam pressure mode.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

— e. Dump steam from intact S/G(s) to condenser at maximum rate while attempting to avoid a Main Steam Isolation.

e. Dump steam using intact S/G SM PORVs as follows:

- 1) Ensure Main Steam Isolation reset.
- 2) Ensure SM PORVs reset
- 3) Dump steam using all intact S/G(s) SM PORVs at maximum rate.

4) **IF** any intact S/G SM PORV closed, **THEN** dump steam at maximum rate:

— a) Dispatch operator to operate intact S/G(s) SM PORV.

b) **IF** any intact S/G SM PORV is unavailable, **THEN** evaluate using **the** following to dump steam:

- • Run TD CA Pump.
- • **Use** steam drains **PER** EP/1/A/5000/G-1 (Genetic Enclosures), Enclosure 19 (S/G Depressurization Using Steam Drains).

— f. Check S/G pressures - LESS THAN 660 PSIG.

— f. RETURN TO Step 33.b.

— g. Stop S/G depressurization.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

IF

RVLIS TRAIN	Required "REACTOR VESSEL DIP"			
	OPERATING NC PUMP			
	A	B	C	D
A	35%	15%	15%	15%
e	15%	15%	35%	15%

___ **b** Check S/G pressures - LESS THAN 110 PSIG

___ **b** RETURN TO Step 34 a

___ **c.** Stop S/G depressurization.

UNIT 1

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

— a. Check at least two NC T-Hots - LESS THAN 354" F.

b. Place the power disconnect switches to "ENABLE and close the following:

- • 1NI-54A (A CL Accum Disch Isol)
- • 1NI-65B (B CL Accum Disch Isol)
- • 1NI-76A (C CL Accum Disch Isol)
- • 1NI-88B (D CL Accum Disch Isol).

— c. WHEN valves indicate closed for at least 5 seconds, THEN return power disconnect switches to disconnect

a. Perform the following:

— 1) WHEN at least two NC T-Hots less than 354° F, THEN perform Steps 35.b and 35.c.

— 2) GO TO Step 36

b. Vent any unisolated CLA as follows:

1) Open isolation vaive on affected CLA:

- • 1NI-50 (A CL Accum N2 Supply Isol)
- • 1NI-61 (BCL Accum N2 Supply Isol)
- • 1NI-72 (C CL Accum N2 Supply Isol)
- • 1NI-84 (D CL Accum N2 Supply Isol).

— 2) Open 1NI-83 (CL Accum N2 Hdr Atmos Vent Isol).

— 3) Do not depressurize NC System below CLA pressure in subsequent steps until CLAs are isolated or vented.

— 4) IF CIA cannot be isolated or vented, THEN contact TSC for guidance.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

36. **IF AT ANY TIME NC** pump number 1 seal **D/P** goes below **200 PSID** **OR** number 1 seal leakoff flow goes below **0.2 GPM**,
T :

- a. Stop affected NC pump(s)
- b. Place Pzr spray valve in manual and close for stopped NC pump.

37. **Depressurize** intact S/Gs to atmospheric pressure as follows:

- a. Check "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) - LIT.

- a. Perform the following:

- 1) Ensure Main Steam Isolation reset
- 2) Ensure **SM** PORVs reset.
- 3) Dump steam using **all** intact S/G(s) **SM** PORVs while maintaining **cooldown** rate in **NC T-Colds** as close **as** possible without exceeding 100" F in an hour.

- 4) **IF** any intact S/G SM PORV closed, **THEN** dump steam using any of the following while maintaining cooldown rate in NC T-Colds **less** than 100" F in an hour:

- a) Dispatch operator to operate intact S/G(s) SM PORV.

- b) **IF** any intact S/G SM PORV is unavailable, **THEN** evaluate using the following to dump steam:

- • Run TD CA Pump
- • Use steam drains **PER** EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 19 (S/G Depressurization Using Steam Drains).

- 5) **GO TO** Step 38

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

37. (Continued)

___ b. Check MSIVs on intact S/Gs - OPEN.

b. Perform the following:

1) Reset Main Steam Isolation signals:

___ a) Main Steam Isolation.

___ b) SMPORVs.

___ c) MSIV Bypass Valves

___ 2) **IF** intact S/G MSIVs required closed to isolate leak, **THEN GO TO** RNO for Step 37.e.

___ 3) Place "STEAM DUMP SELECT" in steam pressure mode.

___ 4) Place "**STM PRESS** CONTROLLER" in manual and **close**.

___ 5) **Open** MSIV **bypass** valves on intact S/Gs to **equalize** pressure across MSIVs.

6) **WHEN** pressure equalized, **THEN**:

___ a) Open all MSIVs on intact S/Gs.

___ b) Close all MSIV bypass valves.

___ c) Perform Steps 37.d and 37.e.

___ 7) **GO TO** Step 38.

___ c. Check "STEAM DUMP SELECT" - IN STEAM PRESSURE MODE.

c. Perform the following to place steam dumps in steam pressure mode:

___ 1) Place "STM PRESS CONTROLLER" in manual.

___ 2) Adjust "STM PRESS CONTROLLER" output to equal "STEAM DUMP DEMAND" signal.

___ 3) Place "STEAM DUMP SELECT" in steam pressure mode.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

37. (Continued)

— d. **WHEN** "P-12 LO-LO TAVG" status light (1SI-18) lit, **THEN** place steam dumps in bypass interlock.

— e. Dump steam to condenser from intact S/Gs while maintaining cooldown rate in NC T-Colds as close as possible without exceeding 100° F in an hour.

e. Perform the following:

— 1) Dump steam using all intact S/G(s) SM PORVs while maintaining cooldown rate in NC T-Colds as close as possible without exceeding 100° F in an hour.

2) **IF** any intact S/G SM PORV closed, **THEN** dump steam using any of the following while maintaining cooldown rate in NC T-Colds less than 100° F in an hour:

— a) Dispatch operator to operate intact S/G(s) SM PORV.

b) **IF** any intact S/G SM PORV is unavailable, **THEN** evaluate using the following to dump steam:

— • Run TD CA Pump.

— • Use steam drains **PER** EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 19 (S/G Depressurization Using Steam Drains).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

38 Check **if ND** can **be** placed in **RHR** mode:

a. Check the following:

— a. **RETURN TO** Step 37

— • All NC T-Hots - LESS THAN 350" F
(347" F ACC)

— • NC System pressure - LESS THAN
385 PSIG.

— b. Consult station management to
determine if ND should **be** placed in
RHR mode.

— c. **IF** station management decides to place
ND in RHR mode, **THEN REFER**
Enclosure 5 (Placing ND in RHR
Mode).

UNIT 1

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

39. Maintain **NC** System heat removal:

— a. **IF** ND in RHR mode, **THEN** initiate cooldown with ND System.

— b. Check "C-9 COND AVAILABLE FOR STEAM DUMP" status light (1SI-18) - LIT.

b. Perform the following:

— 1) Ensure Main Steam Isolation reset

— 2) Ensure SM PORVs reset

— 3) Dump steam using intact S/G(s) SM PORVs.

4) **IF** any intact S/G SM PORV closed, **THEN** dump steam as follows:

— a) Dispatch operator to operate intact S/G(s) SM PORV.

b) **IF** any intact S/G SM PORV is unavailable, **THEN** evaluate using the following to dump steam:

— • Run TD CA Pump.

— • Use steam drains **PER** EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 19 (S/G Depressurization Using Steam Drains).

— 5) **IF** no intact S/G available **AND** ND not in RHR mode, **THEN** use faulted S/G.

— 6) **GO TO** Step 40.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

39 (Continued)

___ c. Check MSIVs on intact S/Gs - OPEN.

c. Perform ~~the~~ following:

1) Reset Main Steam Isolation signals:

___ a) Main Steam Isolation

___ b) SMPORVs.

___ c) MSIV Bypass Valves

___ 2) IF intact S/G MSIVs required closed to isolate leak, THEN GO TO RNO for Step 39.f.

___ 3) Place "STEAM DUMP SELECT" in steam pressure mode.

___ 4) Place "STM PRESS CONTROLLER" in manual and **close**.

___ 5) Open MSIV bypass **valves** on intact S/Gs to equalize pressure across MSIVs.

6) WHEN pressure equalized, THEN:

___ a) Open all MSIVs on intact S/Gs.

___ b) Close all MSIV bypass valves.

___ c) Perform Steps 39.e and 39.f.

___ 7) GO TO Step 40.

___ d. Check "STEAM DUMP SELECT" - IN STEAM PRESSURE MODE.

d. Perform the following *to* place steam dumps in steam pressure mode:

___ 1) Place "STM PRESS CONTROLLER" in manual.

___ 2) Adjust "STM PRESS CONTROLLER" output *to* equal "STEAM DUMP DEMAND" signal.

___ 3) Place "STEAM DUMP SELECT" in steam pressure mode,

ACTIONiEXPECTED RESPONSE

RESPONSE NOT OBTAINED

39 (Continued)

— e **WHEN** "P-12 LO-LO TAVG" status light (1SI-18) lit, **THEN** place steam dumps in bypass interlock

— f. Dump steam to condenser from intact S/Gs.

f. Perform the following:

— 1) Dump steam using intact S/G(s) SM PORVs.

2) **IF** any intact S/G SM FGRV closed, **THEN** dump steam as follows:

— a) Dispatch operator to operate intact S/G(s) SM PORV.

b) **IF** any intact S/G SM PORV is unavailable, **THEN** evaluate using the following to dump steam:

— • Run TD **CA Pump**

— • Use steam drains **PER** EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 19 (S/G Depressurization Using Steam Drains).

— 3) **IF** no intact S/G available **AND** ND not in RHR mode, **THEN** use faulted S/G.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

— d. Check H₂ igniters - ON.

d. WHEN the following conditions met,
THEN place H₂ igniters in service:

— • NF AHUs off

— • H₂ concentration less than 6%

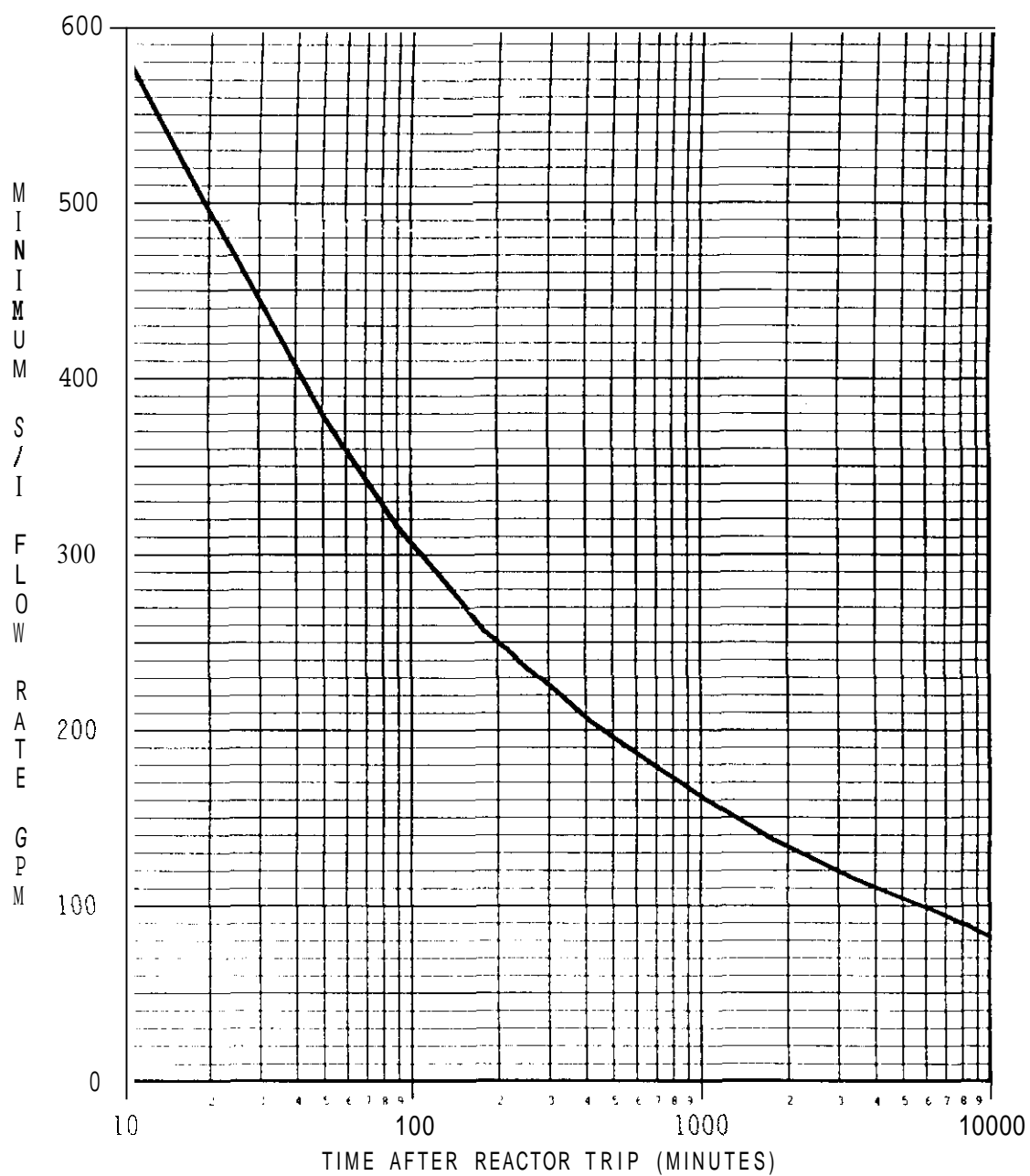
— e. Check H₂ concentration - LESS
THAN 0.5%.

— e. Dispatch operator to place H₂
recombiners in service PER
EP/1/A/5000/G-1 (Generic
Enclosures), Enclosure 4 (Placing
H₂ Recombiners In Service).

— 41. Consult station management staff for
further actions.

END

1. Emergency Coolant Recirc Capability Restoration:
 - WHEN Cold Leg Recirc capability is restored, THEN GO TO Step 2.f in body of this procedure.
2. ECCS Suction Monitoring Criteria:
 - IF FWST level goes below "FWST LEVEL LO-LO" alarm setpoint (33 inches), AND NS pumps are taking suction from the FWST, THEN:
 - a. Reset Containment Spray.
 - b. Stop both **NS** pumps.
 - IF FWST level goes below 20 inches, THEN stop all pumps taking suction from the FWST.
 - IF suction source is lost to any NV, NI, ND, or NS pump, THEN stop pump.
3. CA Suction Sources:
 - IF CA Storage Tank (water tower) goes below 1.5 ft, THEN perform EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 20 (CA Suction Source Realignment).



3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 The MSSVs shall be OPERABLE as specified in Table 3.7.1-1 and Table 3.7.1-2.

APPLICABILITY: MODES 1.2, and 3.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required MSSVs inoperable.	A.1 Reduce power to less than or equal to the applicable % RTP listed in Table 3.7.1-1.	4 hours
	<u>AND</u> A.2 Reduce the Power Range Neutron Flux High Trip Setpoints to the % RTP value listed in Table 3.7.1-1.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met. <u>OR</u> One or more steam generators with less than two MSSVs OPERABLE.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.1.1 -----NOTE----- Only required to be performed prior to entry into MODE 2. Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within $\pm 1\%$.	In accordance with the Inservice Testing Program

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
Maximum Allowable Power Range Neutron Flux High
Setpoints in Percent of RATED THERMAL POWER

MINIMUM NUMBER OF MSSVs PER STEAM GENERATOR REQUIRED OPERABLE	MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINTS (% RTP)
4	≤ 58
3	≤ 39
2	≤ 19

Table 3.7.1-2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

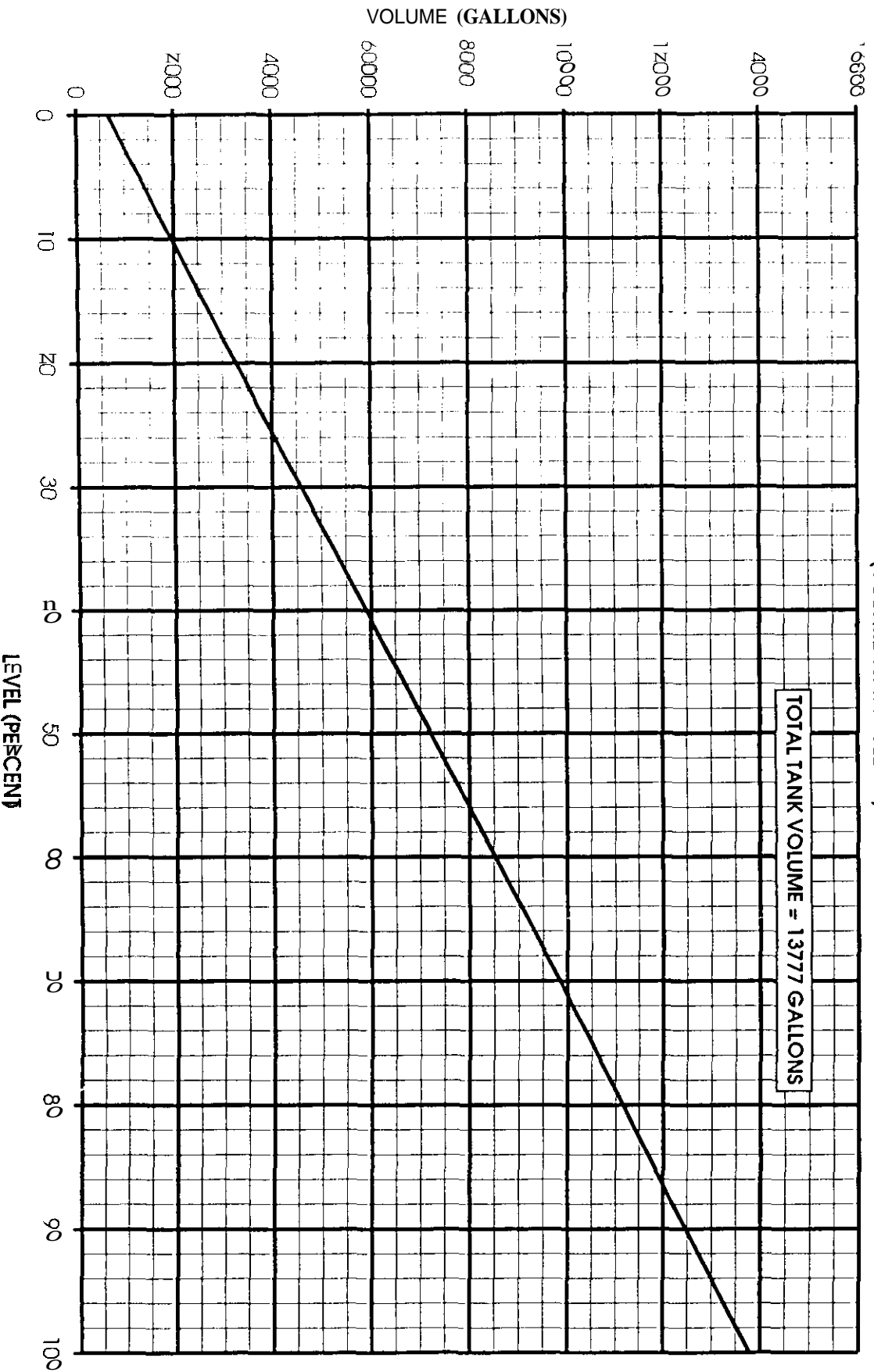
VALVE NUMBER				LIFT SETTING (psig ± 3%)
<u>STEAM GENERATOR</u>				
sv-20	SV-14	SV-8	sv-2	
sv-21	SV-15	sv-9	sv-3	
sv-22	SV-16	sv-10	sv-4	
SV-23	sv-17	sv-11	sv-5	
SV-24	SV-18	SV-12	SV-6	

UNIT 1

OP/1/A/6100/22
ENCLOSURE 4.3

CURVE 7.38
PRESSURIZER

(VOLUME vs. TANK LEVEL)



This data is also available on the OAC.

UNIT 1

5.2 Organization (continued)

5.2.2 Unit Staff

The unit staff organization shall include the following:

- a. A non-licensed operator shall be assigned to each reactor containing fuel and an additional non-licensed operator shall be assigned for each control room from which a reactor is operating in MODES 1, 2, 3, or 4.

A total of three non-licensed operators are required for the two units.

- b. At least one licensed Reactor Operator (RO) shall be present in the control room when fuel is in the reactor. In addition, while the unit is in MODE 1, 2, 3, or 4, at least one licensed Senior Reactor Operator (SRO) shall be present in the control room.
- c. Shift crew composition may be less than the minimum requirement of 10 **CFR 50.54(m)(2)(i)** and 5.2.2.a and 5.2.2.g for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements.
- d. A Radiation Protection Technician shall be on site when fuel is in the reactor. The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position.
- e. Administrative procedures shall be developed and implemented to limit the working hours of station staff who perform safety related functions (e.g., licensed SROs, licensed ROs, radiation protection technicians, auxiliary operators, and key maintenance personnel).

Adequate shift coverage shall be maintained without routine heavy use of overtime. The objective shall be to have operating personnel work a 12 hour day with alternating **48** hour and **36** hour weeks while the unit is operating. However, in the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance, or plant modification, on a temporary basis the following guidelines shall be followed:

- 1. An individual should not be permitted to work more than **16** hours straight, excluding shift turnover time;

(continued)

5.2 Organization

5.2.2 Unit Staff (continued)

2. An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 28 hours in any 48 hour period, nor more than 72 hours in any 7 day period, all excluding **shift** turnover time;
3. A break of at least 8 hours should be allowed between work periods, including shift turnover time;
4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on a shift.

Any deviation from the above guidelines shall be authorized in advance by the Station Manager or his designee, in accordance with approved administrative procedures, or by higher levels of management, in accordance with established procedures and with documentation of the basis for granting the deviation.

Controls shall be included in the procedures such that individual overtime shall be reviewed monthly by the Station Manager or his designee to ensure that excessive hours have not been assigned. Routine deviation from the above guidelines is not authorized.

- f. The Operations Manager shall hold or have held an **SRO** license.
- g. The Shift Technical Advisor (STA) shall provide advisory technical support to the Control Room Senior Reactor Operator (**CRSRO**) in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the unit.

(continued)

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No RP/0/A/5700/004

Revision No 017

PREPARATION

(2) Station McGuire Nuclear Station

(3) Procedure Title General Emergency

(4) Prepared By J M Cooke Date 7-3-02

(5) Requires NSD 228 Applicability Determination?

☒ Yes (New procedure or revision with major changes)

☐ No (Revision with minor changes)

☐ No (To incorporate previously approved changes)

(6) Reviewed By [Signature] (QR) Date 7/24/02

Cross-Disciplinary Review By _____ (QR) NA 9/1 Date 7/24/02

Reactivity Mgmt. Review By _____ (QR) NA 9/1 Date 7/24/02

Mgmt. Involvement Review By _____ (Ops.Supt.) NA 9/1 Date 7/24/02

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval (if necessary)

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By K.L. Murray Date 10-1-02

PERFORMANCE (Compare with control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification

☐ Yes ☐ N/A Check lists and/or blanks initialed, signed, dated or filled in NA, as appropriate?

☐ Yes ☐ N/A Required enclosures attached?

☐ Yes ☐ N/A Data sheets attached, completed, dated and signed?

☐ Yes ☐ N/A Charts, graphs, etc. attached, dated, identified, and marked?

☐ Yes ☐ N/A Procedure requirements met?

Verified By _____ Date _____

Procedure Completion Approved _____ Date _____

(14) Remarks (attach additional pages, if necessary)

Duke Power Company McGuire Nuclear Station General Emergency Reference Use	Procedure No RP/0/A/5700/004
	Revision No. 017
	Electronic Reference No MC0048M7

General Emergency

1. Symptoms

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential **for** loss **of** containment integrity.

2. Immediate Actions

NOTE: • The Immediate Actions and part of the Subsequent Actions have been separated into position specific enclosures to enhance timely completion and consistent execution.

2.1 The following Enclosures should be given to the appropriate personnel:

- The OSM should execute Enclosure 4.9 (OSM Immediate and Subsequent Actions) in a timely manner.
- The WCC SRO, or another SRO designated by the OSM should execute Enclosure 4.10 (WCC SRO Immediate and Subsequent Actions) in a timely manner.
- The STA should execute Enclosure **4.11** (STA Immediate and Subsequent Actions) in a timely manner.

3. Subsequent Actions

3.1 Follow-up Notifications

NOTE: **IF** changes to the initial Protective Action Recommendations are recognized and approved by the Emergency Coordinator, these changes shall be transmitted to the offsite agencies within 15 minutes. (PIP-M-00-02138)

- 3.1.1 Assess protective action recommendations made to the State and Counties in the previous notification. Refer to Enclosure 4.2, page 1 of 4.
- 3.1.2 The Emergency Coordinator shall make follow-up notifications to State and County authorities utilizing Enclosure 4.1 (Emergency Notification Form):
- Every hour until the emergency is terminated
 - OR**
 - If there is any significant change to the situation
 - OR**
 - As agreed upon with &individual agency. Documentation shall be maintained **for** any agreed **upon** schedule change and the interval shall not be greater than **2** hours to **any** agency.
- 3.1.3 Complete Enclosure 4.1 (Emergency Notification Form) in accordance with Enclosure 4.5, Section 1.
- 3.1.4 Make follow-up notification lo State and County authorities using the Emergency Notification Form in accordance with Enclosure 4.5, Section 2.

- _____ 3.2 Ensure completion of Enclosure 4.7 (Emergency Coordinator / Emergency Operations Facility Director Turnover Checklist) prior to turnover of Emergency Coordinator responsibilities

NOTE: A TSC preprogrammed fax button is available on the Control Room fax machine.

IF changes to the initial Protective Action Recommendations are recognized during the turnover, the turnover should not be completed until the Control Room transmits this notification to the offsite agencies. {PIP-M-0-00541}

OR

- _____ • Fax turnover sheet to the TSC

- _____ 3.4 In the event that a worker's behavior or actions contributed to an actual or potential substantial degradation of the level of safety of the plant (incidents resulting in an Alen or higher emergency declaration), the supervisor must consider and establish whether or not a for cause drug/alcohol screen is required. The FFD Program Administrator or designee is available to discuss/assist with the incident.

3.5 Protective Actions Onsite

- _____ 3.5.1 Evacuate non-essential personnel from the site after all personnel have been accounted for via Site Assembly. Refer to RP/0/A/5700/011 (Conducting a Site Assembly, Site Evacuation or Containment Evacuation).

- _____ 3.5.2 **IF** a situation which is immediately hazardous to life or valuable property exists, **THEN** evaluate potential dose rates by one of the following methods:

- a. Contact RP Shift at Ext. 4282
- b. Assess area monitors

- _____ 3.5.3 Complete Enclosure 4.8 (Request for Emergency Exposure), prior to dispatch of emergency workers if emergency situation precludes documentation.

3.6 Using Section **D** of the Emergency Plan (EAL Basis). assess the emergency condition:

_____ **3.6.1** Remain in a General Emergency,

OR

_____ **3.6.2** Terminate the emergency. **REFER TO** RP/0/A/5700/012 (Activation of the Technical **Support** Center {TSC}), Enclosure **4.19** for termination criteria.

3.7 Termination Notifications

NOTE Enclosure 4.6 has instructions for completion and transmission of termination notifications.

_____ **3.7.1** Complete Enclosure **4.1** (Emergency Notification Form) in accordance with Enclosure **4.6**, Section 1

_____ **3.7.2** Make termination notification to State and County authorities using the Emergency Notification Form in accordance with Enclosure **4.6**, Section 2.

4. Enclosures

4.1 Emergency Notification Form.

4.2 Guidance for Offsite Protective Actions

4.3 Initial Notification Completion/Transmission

4.4 NRC Event Notification Worksheet

4.5 Follow-up Notification Completion/Transmission

4.6 Termination Notification Completion/Transmission

4.7 Emergency Coordinator / Emergency Operations Facility Director Turnover Checklist

4.8 Request for Emergency Exposure

4.9 OSM Immediate and Subsequent Actions {PIP0-M97-4638}

4.10 WCC SRO Immediate and Subsequent Actions {PIP 0-M97-4638}

4.11 STA Immediate and Subsequent Actions {PIP0-M97-4638}

5. EMERGENCY CLASSIFICATION:

NOTIFICATION OF UNUSUAL M N T

☐ ALERT

☐ SITE AREA EMERGENCY

☐ GENERAL EMERGENCY

8. PLANT CONDITION ☐ IMPROVING ☐ STABLE ☐ DEGRADING

9. REACTOR STATUS. ☐ SHUTDOWN: TIME/DATE: _____ / _____ / _____ ☐ _____ % POWER
(Eastern) mm dd yy

10. EMERGENCY RELEASE(S):

☐ NONE (Go to item 14.) ☐ POTENTIAL (GO TO ITEM 14.) ☐ IS OCCURRING ☐ HAS OCCURRED

**11. TYPE OF RELEASE: ☐ ELEVATED ☐ GROUND LEVEL

☐ AIRBORNE: Started: _____ / _____ / _____

Stopped: _____ / _____ / _____
Time (Eastern) Date

☐ LIQUID: Started: _____ / _____ / _____

Stopped: _____ / _____ / _____
Time (Eastern) Date

**12. RELEASE MAGNITUDE: ☐ CURIES PER SEC. ☐ CURIES NORMAL OPERATING LIMITS: ☐ BELOW ☐ ABOVE

☐ NOBLE GASES _____

☐ IODINES _____

☐ PARTICULATES _____

☐ OTHER _____

**13. ESTIMATE OF PROJECTED OFFSITE DOSE:

☐ NEW

☐ UNCHANGED

PROJECTION TIME: _____ (Eastern)

TEDE
mrem

Thyroid CDE
mrem

ESTIMATED DURATION: _____ HRS.

SITE BOUNDARY

2 MILES

5 MILES

10 MILES

**14. METEOROLOGICAL DATA:

☐ WIND DIRECTION (from) _____ °

☐ SPEED (mph) _____

☐ STABILITY CLASS _____

☐ PRECIPITATION (type) _____

15. RECOMMENDED PROTECTIVE ACTIONS:

☐ NO RECOMMENDED PROTECTIVE ACTIONS

☐ EVACUATE _____

☐ SHELTER IN PLACE _____

☐ OTHER _____

Emergency
Coordinator

APPROVED BY: _____

(Name)

(Title)

TIME/DATE: _____ / _____ / _____
(Eastern) mm dd yy

If items 8-14 have not changed, only items 1-7 and 15-16 are required to be completed.

** Information may not be available on initial notifications.

GOVERNMENT AGENCIES NOTIFIED

Record the name, date, time and agencies notified:

1. _____
(name)

(date) _____ (time) _____
(agency) **NC State**
EOC Sel Sig 314
EOC Bell Line (919) 733-3943
2. _____
(name)

(date) _____ (time) _____
(agency) **Mecklenburg County**
WP Sel. Sig. 118
WP Bell line 943-6200
3. _____
(name)

(date) _____ (time) _____
(agency) **Gaston County**
WP Sel. Sig. 112
WP Bell Line (704) 866-3300
4. _____
(name)

(date) _____ (time) _____
(agency) **Lincoln County**
WP Sel. Sig. 113
WP Bell line (704) 735-8202
5. _____
(name)

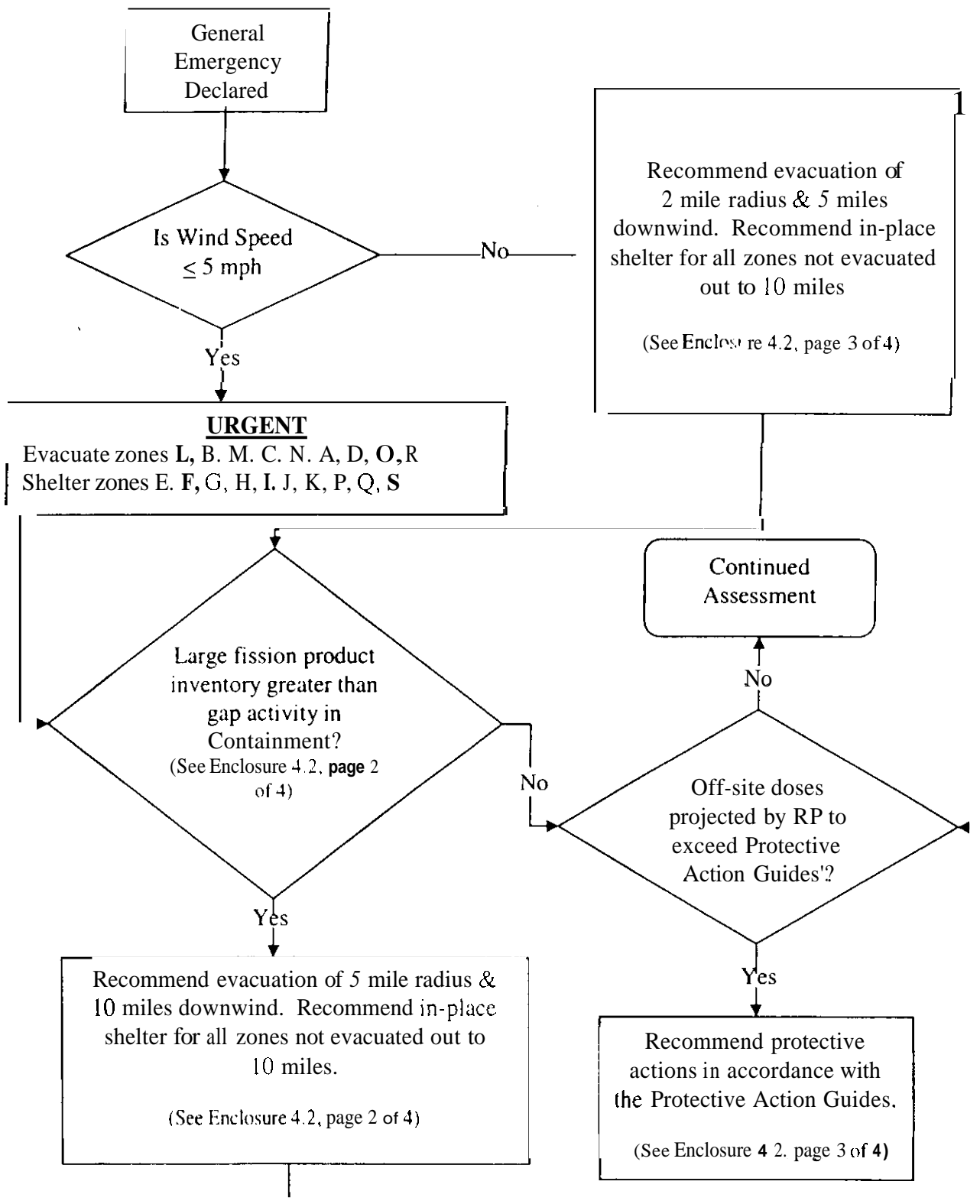
(date) _____ (time) _____
(agency) **Iredell County**
WP Sel. Sig. 114
WP Bell line (704) 878-3039
6. _____
(name)

(date) _____ (time) _____
(agency) **Catawba County**
WP Sel Sig 118
WP Bell line (828) 464-3112
7. _____
(name)

(date) _____ (time) _____
(agency) **Cabarrus County**
WP Sel. Sig. 119
WP Bell line (704) 788-3108

Enclosure 4.2
Guidance for Off-site Protective Actions

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Page 1 of 4



Guidance for Off-site Protective Actions

GUIDANCE FOR DETERMINATION OF GAP ACTIVITY

NOTE: Fission product inventory inside containment is greater than **gap** activity if the containment radiation level exceeds the levels in the table below.

----- If the OAC is available, call **up** the following computer points based on need:

Unit 1 OAC
M1A0829 1EMF51A
M1A0835 1EMF51B

Unit 2 OAC
M2A0829 2EMF51A
M2A0835 2EMF51B

TIME AFTER
SHUTDOWN (HOURS)

CONTAINMENT MONITOR READING (R/HR)
EMF 51A or S1B (100% GAP Activity Release)

0	2,340
0-2	864
2-4	624
4-8	450
> 8	265

Protective Action Zones Determination

For Containment Radiation Levels Exceeding GAP Activity

Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction	Evacuate 5 Mile Radius-10 Mile Downwind	Shelter
0 - 22.5	L,B,M,C,N,A,D,O,R,E,S,F	G,H,I,J,K,P,Q
22.6 - 45.0	L,B,M,C,N,A,D,O,R,E,Q,S	F,G,H,I,J,K,P
45.1 - 67.5	L,B,M,C,N,A,D,O,R,E,Q,S	F,G,H,I,J,K,P
67.6 - 90.0	L,B,M,C,N,A,D,O,R,P,Q,S	E,F,G,H,I,J,K
90.1 - 112.5	L,B,M,C,N,A,D,O,R,K,P,Q,S	E,F,G,H,I,J
112.6 - 135.0	L,B,M,C,N,A,D,O,R,I,K,P,Q,S	E,F,G,H,J
135.1 - 157.5	L,B,M,C,N,A,D,O,R,I,K,P,Q	E,F,G,H,J,S
157.6 - 180.0	L,B,M,C,N,A,D,O,R,I,J,K,P	E,F,G,H,Q,S
180.1 - 202.5	L,B,M,C,N,A,D,O,R,G,H,I,J,K,P	E,F,Q,S
202.6 - 225.0	L,B,M,C,N,A,D,O,R,G,H,I,J,K,P	E,F,Q,S
225.1 - 247.5	L,B,M,C,N,A,D,O,R,F,G,H,I,J	E,K,P,Q,S
247.6 - 270.0	L,B,M,C,N,A,D,O,R,F,G,H,I,J	E,K,P,Q,S
270.1 - 292.5	L,B,M,C,N,A,D,O,R,E,F,G,H,J	I,K,P,Q,S
292.6 - 315.0	L,B,M,C,N,A,D,O,R,E,F,G	H,I,J,K,P,Q,S
315.1 - 337.5	L,B,M,C,N,A,D,O,R,E,F,G	H,I,J,K,P,Q,S
337.6 - 359.9	L,B,M,C,N,A,D,O,R,E,F,S	G,H,I,J,K,P,Q

Protective Action Zones Determination

Wind Speed Greater than 5 Miles per Hour		
Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction	Evacuate 2 Mile Radius-5 Mile Downwind	Shelter
0 - 22.5	L,B,M,C,D,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
22.6 - 45.0	L,B,M,C,D,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
45.1 - 67.5	L,B,M,C,D,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
67.6 - 90.0	L,B,M,C,D,O,R,N	A,E,F,G,H,I,J,K,P,Q,S
90.1 - 112.5	L,B,M,C,O,R,N	A,D,E,F,G,H,I,J,K,P,Q,S
112.6 - 135.0	L,B,M,C,O,N,R,A	D,E,F,G,H,I,J,K,P,Q,S
135.1 - 157.5	L,B,M,C,O,A,N	D,E,F,G,H,I,J,K,P,Q,R,S
157.6 - 180.0	L,B,M,C,A,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
180.1 - 202.5	L,B,M,C,A,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
202.6 - 225.0	L,B,M,C,A,N,D	E,F,G,H,I,J,K,O,P,Q,R,S
225.1 - 247.5	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
247.6 - 270.0	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
270.1 - 292.5	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
292.6 - 315.0	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
315.1 - 337.5	L,B,M,C,D,R	A,E,F,G,H,I,J,K,N,O,P,Q,S
337.6 - 359.9	L,B,M,C,D,R	A,E,F,G,H,I,J,K,N,O,P,Q,S

GUIDANCE FOR OFFSITE PROTECTIVE ACTIONS

PAGs
(Projected Dose)

Total Effective Dose Equivalent (TEDE)	Committed Dose Equivalent (CDE) Thyroid	Recommendation
< 1 rem	< 5 rem	No Protective Action is required based on projected dose.
≥ 1 rem	≥ 5 rem	Evacuate affected zones and shelter the remainder of the 10 mile EPZ not evacuated.

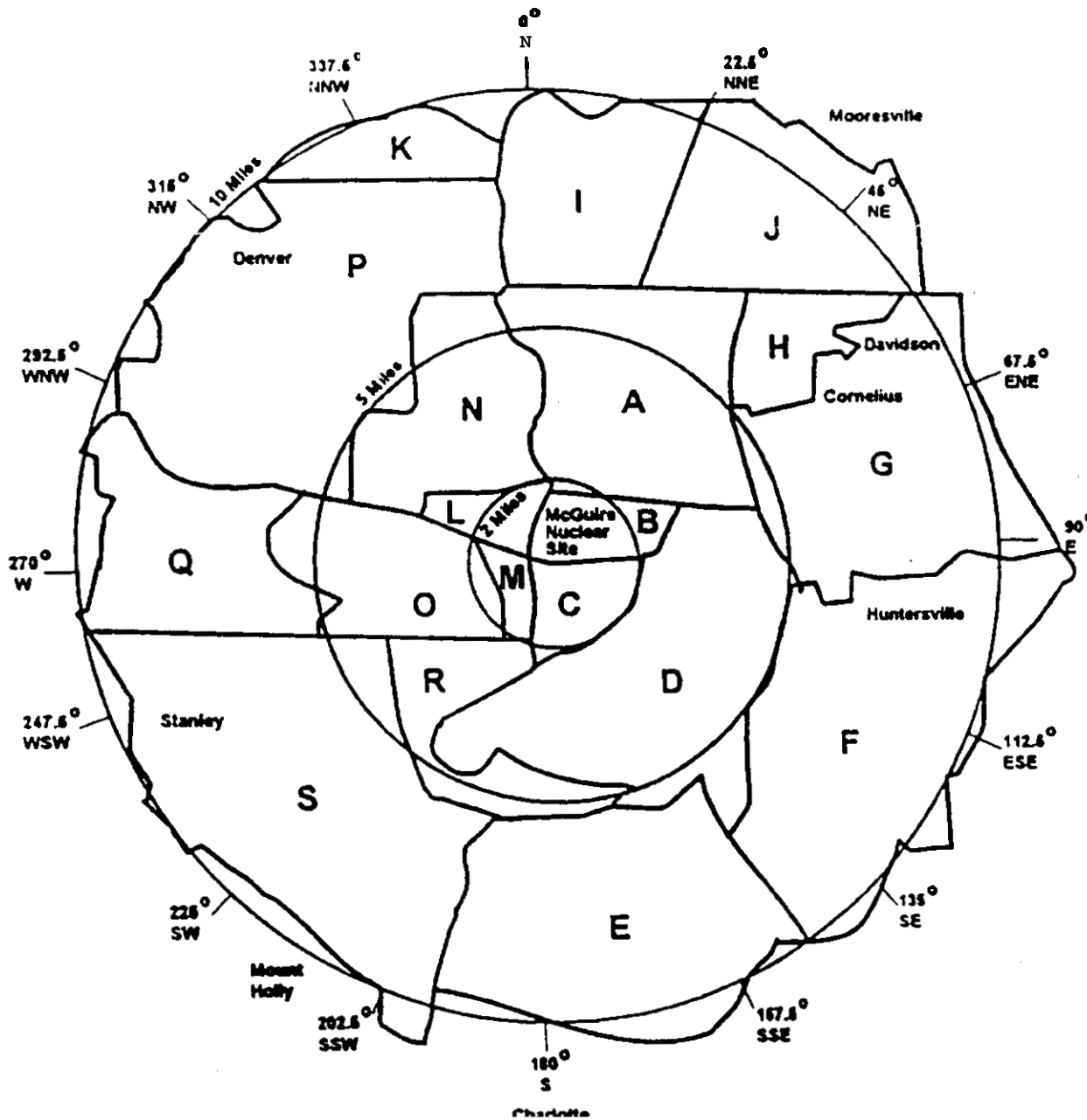
Protective Action Guides (PAGs) are levels of radiation dose at which prompt protective actions should be initiated and are based on EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents.

Enclosure 4.2
Guidance for Off-site Protective Actions

RP/0/A/5700/004
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McGUIRE PROTECTIVE ACTION ZONES
(2 and 5 mile radius, inner circles)

10 MILE EPZ



Enclosure **4.3**
Initial Notification
Completion/Transmission

RP/0/A/5700/004
Page 1 of 9

1. Completion of the Emergency Notification Form

NOTE: ONLY Items 1 - 10, 15 and 16 are required.
Items 11 - 14 may be skipped.

1.1 Complete Enclosure 4.1 (Emergency Notification Form) as follows:

NOTE: Message #'s should be sequentially numbered throughout the drill/emergency.

_____ Item 1 Check **A** for Drill **OR B** for Actual Emergency **AND**
Check INITIAL **AND**
Write in message number.

NOTE: Certain events could occur at the plant site such that both units are affected. These may include: Enclosure **4.3** (Abnormal Rad Levels/Radiological Effluent), Enclosure 4.6 (Fires/Explosions and Security Events) and Enclosure **4.7** (Natural Disasters, Hazards and Other Conditions Affecting Plant Safety) from RP/0/A/5700/000, (Classification of Emergency). Consider this when completing the "unit designation" on line **2** of the Emergency Notification Form. { PIP0-M97-4638 }

REPORTED BY: is the Communicator's name.

_____ Item 2 Write in the unit(s) **AND** Communicator's name.

NOTE: Information for Items **3** and **4** will be completed during transmission of the Emergency Notification Form.

_____ Item 3 Write in the transmittal time **AND** date.

_____ Item 4 Write in appropriate number **AND** codeword.

_____ Item 5 Check D for GENERAL EMERGENCY.

_____ Item 6 Check A for Emergency Declaration At: **AND**
Write the time **AND** date the classification **was** declared.

Enclosure 4.3
Initial Notification
Completion/Transmission

RP/0/A/5700/004
Page 2 of 9

NOTE: Reference RP/0/A/5700/000, (Classification of Emergency)

Item 7 Enter EAL Number and Emergency Description of the reason for declaring the emergency classification (in layman's terms, if possible). **DO NOT** use system abbreviations, acronyms or jargon which may cause confusion. Instead, write out the description in long hand. Be sensitive to the fact that certain descriptive technical terms may elicit unanticipated reactions from others. {PIP0-M98-2065}

_____ Item 8 Check the appropriate plant condition. (PIP0-M97-4210 NRC-I)

- **A Improving:** Emergency conditions are improving in the direction of a lower classification or termination of the event.
- **B Stable:** The emergency situation is under control. Emergency core cooling systems, equipment, plans, etc., are operating as designed.
- **C Degrading:** Given current and projected plant conditions/equipment status, recovery efforts are not expected to prevent entry into a higher emergency Classification or the need to upgrade offsite Protective Action Recommendations.

Item 9 Check **A SHUTDOWN AND** write the time and date of Reactor Shutdown

OR

Check B **AND** write in the Reactor Power level

Enclosure 4.3
Initial Notification
Completion of Transmission

RP/0/A/5700/004
Page 3 of 9

- NOTE:**
1. **An emergency release is any unplanned, quantifiable discharge to the environment associated with a declared emergency event.** (This definition is based on an NRC commitment made on 11/30/90 following McGuire's Steam Generator Tube Rupture.) (PIP0-M97-4256)
 2. Notify the OSM if box C or box D is checked.
 3. Base the determination of emergency release on:
 - EMF readings,
 - containment pressure and other indications,
 - field monitoring results,
 - knowledge of the event and its impact on systems operation and resultant release paths.
 4. **An emergency release is occurring if any one or more of the following bulleted conditions are met associated with a declared emergency:**
 - Either containment particulate, gaseous, iodine monitor (EMFs 38, 39 and/or 40) readings indicate an increase in activity.

OR

Containment monitor (EMFs 51A and/or 51B) readings indicate greater than 1.5R/hr,

AND

Either containment pressure is greater than 0.3 psig,

OR

An actual containment breach is known to exist.
 - Unit vent particulate, gaseous, iodine monitor (EMFs 35, 36, and/or 37) readings indicate an increase in activity.
 - Condenser air ejector exhaust monitor (EMF 33) or other alternate means indicate Steam Generator tube leakage.
 - Confirmed activity in the environment reported by Field Monitoring Team(s)
 - Knowledge of the event and its impact on systems operation and resultant release paths

- Item 10 Check the appropriate box for emergency release.
- **A NONE:** clearly no emergency release is occurring or has occurred
 - **B POTENTIAL:** discretionary option for the EC or EOFD.
 - **C IS OCCURRING:** meets the specified conditions.
 - **D HAS OCCURRED:** previously met the specified conditions.

Enclosure 4.3
Initial Notification
Completion/Transmission

RP/0/A/5700/004
Page 4 of 9

- _____ Item 15 Check B **AND** write affected zones for evacuation
 AND
 Check C **AND** write the letter designation for all other zones not evacuated.
- _____ Item 16 Have the Emergency Coordinator approve the message **AND**
 Write in the time **AND** date the message was approved.

2. TRANSMISSION OF THE EMERGENCY NOTIFICATION FORM

- NOTE:**
1. All initial notifications are **verbal**. Avoid using abbreviations or jargon likely to be unfamiliar to the State and Counties. If any information is not available or not applicable, write out "Not Available" or "Not Applicable" in the margin or other space as appropriate. Do not abbreviate "N.A.".
 2. The backup means of communications are the Bell line or County Emergency Response Radio. RP/0/A/5700/014, Enclosure 4.1 is available for needed backup numbers.
 3. Refer to page 6 of 9 of this Enclosure for instructions on how to use the County Emergency Response Radio if selective signaling **or** Bell line is not available.

- 2.1 Use the Selective Signaling telephone by dialing *1 and depressing the push to talk button
- 2.2 **IF** Selective Signaling Group Call fails, **THEN** go to RP/0/A/5700/014, Enclosure 4.1 for manual selective signaling numbers.

NOTE: The time when the first party is contacted should be recorded on Line 3.

- _____ 2.3 **As** the State and Counties answer, check them off on the back of the notification form. At least one attempt using the individual selective signaling code must be made for any missing agencies. **Proceed with the notification promptly following an attempt to get missing agencies on the line.**
- _____ 2.4 Check the State and Counties arc on the line, document this time in item #3 on the form. This time should not exceed 15 minutes from the time of declaration (Item # 6).
- _____ 2.5 Tell them you have an emergency notification from the McGuire Control Room and to get out the Emergency Notification Form.
- _____ 2.6 Read the complete message *slowly*, line by line, beginning with Item # 1, allowing ample time to copy.

Enclosure 4.3
Initial Notification
Completion of Transmission

RP/0/A/5700/004
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NOTE: Refer to page 7 of 9 of this enclosure for the authentication codeword list.

- 2.7 When you reach item #4, ask the State or a County to authenticate the message. The agency should give you a number and you should provide the appropriate codeword. Write the number and codeword on the form.
- 2.8 After communicating the initial message, ask if there are any questions. Record individuals' names and times on the back of the form. This time is the same time as Item #3.
- 2.9 After verbally transmitting the message. **FAX** 3 copy (front page only) to the agencies. Refer to pages 8 of 9 and 9 of 9 of this Enclosure for FAX operation.
- 2.10 Continuous attempts to contact missing agencies must be made if unable to complete the notification per step 2.3. Document the time these agencies were contacted on the back of the notification form.

Enclosure 4.3
Initial Notification
Completion of Transmission

RP/0/A/5700/004
Page 6 of 9

COUNTY EMERGENCY RESPONSE RADIO

NOTE: This radio will only contact the County warning points. The State cannot be contacted on this radio. Have one of the Counties relay the message to the State.

Group Call:

1. Press **20** to activate all County radio units.
2. When the ready light comes on, press the bar on the transmitter microphone and say:

"This is McGuire Control Room to all Counties, **do** you copy?"

Once all Counties respond, begin transmitting the message using step 2.3 through 2.10 of this enclosure.

Proceed with the notification promptly following an attempt to get missing agencies on the air.

NOTE: RP/0/A/5700/014, Enclosure 4.1 is available for needed individual radio codes.

3. If a County fails to respond on the group call, press their individual code on the encoder and say:

"This is McGuire Control Room to (Agency you are calling). do you copy?"

Once the County responds, begin transmitting the message using step 2.3 through 2.10 of this enclosure.
4. After you have finished transmitting the message, conclude by saying:
"This is WQC700 base clear."
5. Continuous attempts to contact missing agencies must be made if unable to complete the notification per step 2. Document the time these agencies were contacted on the back of the notification form.

**Enclosure 4.3
Initial Notification
Completion/Transmission**

**RP/0/A/5700/004
Page 7 of 9**

AUTHENTICATION CODEWORD LIST

This page is left intentionally blank.

Enclosure 4.3
Initial Notification
Completion of Transmission

RP/0/A/5700/004
Page 8 of 9

OPERATION OF THE FAX

A. GROUP FAX

- NOTE:**
1. The FAX will dial each agency in sequence. If the FAX is busy, it will try again after completing the other calls.
 2. This sends a FAX to all County Warning Points, State EOC, TSC, EOF, News Group and JIC.

- _____ 1. Insert the Emergency Notification Form face down into the FAX.
- _____ 2. Press GROUP FAX button.
- _____ 3. Press "SEND/RECEIVE" button

B. INDIVIDUAL FAX

- _____ 1. Insert the Emergency Notification Form face down into the FAX
- _____ 2. Select location(s) to receive the fax:
 - _____ • Press News Group
 - _____ • Press TSC.
 - _____ • Press State of North Carolina EOC.
 - _____ • Press Mecklenburg County Warning Point,
 - _____ • Press Gaston County Warning Point.
 - _____ • Press Lincoln County Warning Point
 - _____ • Press Iredell County Warning Point.
 - _____ • Press Catawba County Warning Point
 - _____ • Press Cabarrus County Warning Point
 - _____ • Press EOF.
 - _____ • Press JIC.
3. **WHEN** the appropriate individual location is selected, **THEN** press the "SEND/RECEIVE" button.

Enclosure 4.3
Initial Notification
Completion/Transmission

RP/0/A/5700/004
Page 9 of 9

NOTE: RP/0/A/5700/014, Enclosure 4.1 <i>is</i> available for needed manual FAX numbers.

C. To send a FAX to a single location dialing manually:

- _____ 1. Insert the document face down into the FAX.
- _____ 2. Using the keypad, dial the number that you wish to call
- _____ 3. Press "SEND/RECEIVE" button.

NAME/DATE		ENS 1-888-270-0173 or (704) - 875-6044	
EVENT TYPE & ZONE Region II (time) (zone)	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER

EVENT CLASSIFICATIONS
GENERAL EMERGENCY
SITE AREA EMERGENCY
ALERT
UNUSUAL EVENT
50.72 NON-EMERGENCY
PHYSICAL SECURITY (73.71)
TRANSPORTATION (10 CFR 20)
MATERIAL/EXPOSURE (10 CFR 20)
OTHER

1-Hr Non-Emergency 10 CFR 50.72(b)(1)
(50.72 b1 (I)(B)) TS Deviation
1 Hr Non-Emergency
(70.52) (a) and (b) Accidental Criticality OR (72.74) (a) Loss or theft of SNM
(50.36) Violation of a safety limit
MNS Facility Operating License Conditions

8-Hr Non-Emergency 10 CFR 50.72(b)3
(50.72 b3 (II)(A)) Degraded Condition
(50.72 b3 (II)(B)) Unanalyzed Condition
(50.72 b3 (IV)(A)) Valid Actuation of System listed in Encl. 4.3.
(50.72 b3 (V)(A)) Safe S/D Capability
(50.72 b3 (V)(B)) RHR Capability
(50.72 b3 (V)(C)) Control of Rad Release
(50.72 b3 (V)(D)) Accident Mitigation
(50.72 b3 (X)(III)) Lost ENS
(50.72 b3 (X)(III)) Lost Other Assess /Comms
(50.72 b3 (X)(III)) Emergency Siren INOP
(50.72 b3 (XII)) Offsite Medical

4-Hr Non-Emergency 10 CFR 50.72(b)(2)
(50.72 b2 (I)) TS Required S/D
(50.72 b2 (IV)(A)) ECSS Discharge to RCS
(50.72 b2 (IV)(B)) RPS Actuation - critical scram
(50.72 b2 (XI)) Offsite Notification
(72.75)(b1) Rad exposure & release action impairment.
(72.75)(b2) Spent Fuel Storage SSC defect.
(72.75)(b3) Spent Fuel Storage degradation.
(72.75)(b4) Fuel Storage License deviation.
(72.75)(b5) Fuel Storage related offsite medical.
(72.75)(b6) Fire/Explosion damage to Spent Fuel Storage.

24-Hr. Non-Emergency
McGuire Facility Operating License Conditions
Material/Exposure (10 CFR 20)
26.73 Significant events involving fitness for duty.
(72.75)(c1) Contamination event restrictions.
(72.75)(c2) Fuel Storage equipment failure.

EVENT DESCRIPTION
Include: Systems affected, actuations & their initiating signals, causes, effect of event on plant, actions taken or planned, etc.
Continue on Enclosure 4.4 page 2 of 2 if necessary.

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD? <input type="checkbox"/> YES <input type="checkbox"/> NO
NRC RESIDENT				(Explain above)
STATE(s)				DID ALL SYSTEMS FUNCTION AS REQUIRED YES <input type="checkbox"/> NO <input type="checkbox"/>
LOCAL				(Explain above)
GOV AGENCIES				MODE OF OPERATION
PRESS RELEASE				UNTIL CORRECTED
				EST RESTART DATE
				ADDITIONAL INFOR ON BACK <input type="checkbox"/> YES <input type="checkbox"/> NO

APPROVED BY _____
Operations Shift Manager/Emergency Coordinator

TIME/DATE _____
(eastern) mm dd yy

Enclosure 4.4
NRC Event Notification Worksheet

RP/0/A/5700/004
Page 2 of 2

BIOLOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)

LIQUID RELEASE	GASEOUS RELEASE	UNPLANNED RELEASE	PLANNED RELEASE	ONGOING	TERMINATED
MONITORED	UNMONITORED	OFFSITE RELEASE	T.S. EXCEEDED	RM ALARMS	AREAS EVACUATED
PERSONNEL EXPOSED OR CONTAMINATED	OFFSITE PROTECTIVE ACTIONS RECOMMENDED			State release path in description	

NOTE: Contact Radiation Protection Shift to obtain the following information.

IF the notification is due and the information is not available,
THEN mark "Not Available" and complete the notification.

	Release Rate (Ci/sec)	% T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT	HOO GUIDE
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 uCi/sec			0.01 Ci
Particulate			1 uCi/sec			1 mCi
Liquid (excluding tritium & dissolved noble gases)			10 uCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

RECORD MONITORS IN ALARM	PLANTSTACK (EMF 35, 36,37)	CONDENSEW AIR EJECTOR (EMF 33)	MAIN STEAM LINE (UNIT 1-EMF24,25,26,27 UNIT 2-EMF 10, 11, 12,13)	SG BLOWDOWN (EMF 34)	OTHER
MONITOR READINGS:					
SETPOINTS: TRIP II					
T.S. LIMIT (If applicable)		NOT APPLICABLE		NOT APPLICABLE	

RCS OR SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)

LOCATION OF THE LEAK (e.g. SG#, valve, pipe, etc.):

LEAK RATE: gpm/gpd	T.S. LIMITS EXCEEDED	SUDDEN OR LONG TERM DEVELOPMENT:
LEAK START DATE: TIME:	COOLANT ACTIVITY: PRIMARY (Last Sample: Xe eq _____ mCi/ml	SECONDARY Xe eq _____ mCi/ml
	Iodine eq _____ mCi/ml	Iodine eq _____ mCi/ml

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:

EVENT DESCRIPTION (Continued from Enclosure 4.4 page 1 of 2)

Enclosure 4.5
Follow-Up Notification
Completion~ransmission

RP/0/A/5700/004
Page 1 of 6

1. Completion of the Emergency Notification Form

NOTE: If items 8 - 14 have not changed from the previous message, only items 1 - 7, 15 and 16 are required to be completed. Avoid using abbreviations or jargon likely to be unfamiliar to the State and Counties. If any information is not available or not applicable, write out "Not Available" or "Not Applicable" in the margin or other space as appropriate. Do not abbreviate "N.A.".

1.1 Complete Enclosure 4.1 (Emergency Notification Form as follows):

NOTE: Message #'s should be sequentially numbered throughout the drill/emergency.

Item 1 Check A for Drill **OR** B for Actual Emergency **AND**
Check FOLLOW-UP **AND**
Write in message number.

NOTE: Certain events could occur at the plant site such that both units are affected. These may include: Enclosure 4.3 (Abnormal Rad Levels/Radiological Effluent), Enclosure 4.6 (Fires/Explosions and Security Events) and Enclosure 4.7 (Natural Disasters, Hazards and Other Conditions Affecting Plant Safety) from RP/0/A/5700/000, (Classification of Emergency). Consider this when completing the "unit designation" on line 2 of the Emergency Notification Form. {PIP 0-M97-4638}

REPORTED BY: is the Communicator's name.

_____ Item 2 Write in the unit(s) **AND** Communicator's name.

NOTE: Transmittal time is the time you FAX the form to the agencies.

Item 3 Write in the transmittal time **AND** date.

Item 4 Authentication is not required when faxing.

_____ Item 5 Check D for GENERAL EMERGENCY.

_____ Item 6 Check A for Emergency Declaration At: **AND**
Write the time **AND** date the classification was declared

Enclosure **4.5**
Follow-Up Notification
Completion/Transmission

RP/0/A/5700/004
Page 2 of 6

NOTE: Reference RP/0/A/5700/000, (Classification of Emergency)

Item 7 Enter EAL Number and Emergency Description of the reason for declaring the emergency classification (in layman's terms, if possible). **DO NOT** use system abbreviations, acronyms or jargon which may cause confusion. Instead, write out the description in long hand. Be sensitive to the fact that certain descriptive technical terms may elicit unanticipated reactions from others. (PIP0-M98-2065}

In addition, provide a description of changes in plant conditions since the last notification. Items to be considered for inclusion are as follows: [PIP0-M98-2065}

- o Other unrelated classifiable events (for example, during an Alert, an event which, by itself would meet the conditions for an Unusual Event)
- Major/Key Equipment Out of Service
- Emergency response actions underway
- Fire(s) onsite
- Flooding related to the emergency
- Explosions
- Loss of Offsite Power
- o Core Uncovery
- Core Damage
- o Medical Emergency Response Team activation related to the emergency
- o Personnel injury related to the emergency or death
- o Transport of injured individuals offsite - specify whether contaminated or not
- o Site Evacuation/relocation of site personnel
- o Saboteurs/Intruders/Suspicious devices/Threats
- o Chemical or Hazardous Material Spills or Releases
- o Extraordinary noises audible offsite
- o Any event causing/requiring offsite agency response
- o Any event causing increased media attention
- o Remember to "close the loop" on items from previous notifications.

Enclosure **4.5**
Follow-Up Notification
Completion/Transmission

RP/0/A/5700/004
Page **3 of 6**

- Item 8 Check the appropriate plant condition. {**PIPM-097-4210NRC-1**)
- **A. Improving:** Emergency conditions are improving in the direction of a lower classification or termination of the event.
 - **B. Stable:** The emergency situation **is** under control. Emergency core cooling systems, equipment, plans, etc., are operating **as** designed.
 - **C. Degrading:** Given current and projected plant conditions/equipment status, recovery efforts are not expected to prevent entry into a higher emergency classification or the need to upgrade offsite Protective Action Recommendations.

_____ Item 9 Check A SHUTDOWN **AND** write the time and date of Reactor Shutdown

OR

Check B **AND** write in the Reactor Power level

Enclosure 4.5
Follow-Up Notification
Completion/Transmission

RP/0/A/5700/004
Page 4 of 6

- NOTE:**
1. **An emergency release is any unplanned, quantifiable discharge to the environment associated with a declared emergency event.** (This definition is based on an NRC commitment made on 11/30/90 following McGuire's Steam Generator Tube Rupture.) (PIP0-M97-4256)
 2. Notify the OSM if box C or **box D** is checked
 3. Base the determination of emergency release on:
 - EMF readings.
 - containment pressure and other indications,
 - field monitoring results,
 - knowledge of the event and its impact on systems operation and resultant release paths.
 4. **An emergency release is occurring if any one or more of the following bulleted condition! are met associated with a declared emergency:**
 - Either containment particulate, gaseous, iodine monitor (EMFs 38, 39 and/or 40) readings indicate an increase in activity.

OR

Containment monitor (**EMFs 51A** and/or 51B) readings indicate greater than 1.5R/hr,

AND

Either containment pressure is greater than 0.3 psig.

OR

An actual containment breach is known to exist.
 - Unit vent particulate, gaseous, iodine monitor (EMFs 35, 36, and/or 37) readings indicate an increase in activity.
 - Condenser air ejector exhaust monitor (EMF 33) or other alternate means indicate Steam Generator tube leakage.
 - Confirmed activity in the environment reported by Field Monitoring Team(s)
 - Knowledge of the event and its impact on systems operation and resultant release paths

- ____ Item 10 Check the appropriate box for emergency release.
- **A NONE:** clearly no emergency release is occurring or has occurred
 - **B POTENTIAL:** discretionary option for the EC or EOFD.
 - **C IS OCCURRING:** meets the specified conditions.
 - **D HAS OCCURRED:** previously met the specified conditions.

Enclosure 4.5
Follow-Up Notification
Completion of Transmission

RP/0/A/5700/004
Page 5 of 6

____ 1.2 **IF** follow-up notification is due and information for Items 11 through 14 cannot be obtained from RP shift, **THEN** mark each item "Not Available" and go to Item 15.

____ Item 11 Check GROUND LEVEL **AND**
Check **A** for AIRBORNE **OR** **B** for LIQUID **AND**
Write in the time **AND** date the release started **AND** stopped if available

____ Item 12 Check CURIES PER SECOND **AND**
Check BELOW **OR** ABOVE normal operating limits **AND**
Check the appropriate blocks **A, B, C, D** **AND** write in the value(s).

NOTE: If unchanged from the previous notification, the information does not have to be repeated.

____ Item 13 Check NEW **OR** UNCHANGED **AND**
Write in the projection time **AND**
Write in the estimated duration **AND**
Write in the TEDE and Thyroid CDE values.

Item 14 Check **A, B, C, D** **AND** provide values for each.

____ Item 15 Check **B** **AND** write affected zones for evacuation

AND

Check **C** **AND** write the letter designation for **all** other zones not evacuated

Item 16 Have the Emergency Coordinator approve the message **AND**
Write in the time **AND** date the message was approved.

Enclosure 4.5
Follow-Up Notification
Completion/Transmission

RP/0/A/5700/004
Page 6 of 6

2. Transmission of the Emergency Notification Form

NOTE: For routine, follow-up notifications, FAX a copy of the notification form instead of verbally transmitting the message (front page only). This applies **only** if the message **does not** involve a change in the emergency classification or the protective action recommendations or a termination of the emergency. Call each agency to verify they received the message.

- **2.1** Insert the Emergency Notification Form (front page only) face **down** into the FAX
- 2.2** Press "GROUP FAX" button.
- 2.3** Press "SEND/RECEIVE" button.
- **2.4** **IF** programmed functions fail, **THEN** go to RP/0/A/5700/014, Enclosure **4.1** for manual FAX numbers.
- 5** Ensure the State and Counties received the FAX by calling them.

Ask if there are any questions on the Emergency Notification Form, then record individuals' names and times on the back of the form.

Enclosure 4.6
Termination Notification
Completion of Transmission

RP/0/A/5700/004
Page 1 of 6

1. Completion of the Emergency Notification Form

NOTE: A termination message should be marked as FOLLOW-UP on the Emergency Notification Form.

1.1 Complete Enclosure 4.1 (Emergency Notification Form) as follows:

Item 1 Check **A** for Drill **OR** B for Actual Emergency **AND**
Check FOLLOW-UP **AND**
Write in message number.

NOTE: Certain events could occur at the plant site such that both units are affected. These may include: Enclosure 4.3 (Abnormal Rad Levels/Radiological Effluent), Enclosure 4.6 (Fires/Explosions and Security Events) and Enclosure 4.7 (Natural Disasters, Hazards and Other Conditions Affecting Plant Safety) from RP/0/A/5700/000, (Classification of Emergency). Consider this when completing the "unit designation" on line 2 of the Emergency Notification Form. (PIP0-M97 4638}

REPORTED BY: is the Communicator's name.

_____ Item 2 Write in the unit(s) **AND** Communicator's name

NOTE: Information for Items 3 and 4 will be completed during transmission of the Emergency Notification Form

Item 3 Write in the transmittal time **AND** date

— Item 4 Write in appropriate number **AND** codeword

Item 5 Check D for GENERAL EMERGENCY

Item 6 Check B for Termination At: **AND**
Write the time **AND** date the classification was terminated.

_____ Item 16 Have the Emergency Coordinator approve the message **AND**
Write in the time **AND** date the message was approved.

2. Transmission of the Emergency Notification Form

- NOTE:
1. All termination notifications are verbal. Avoid using abbreviations or jargon likely to be unfamiliar to the State and Counties. If any information is not available or not applicable, write out "Not Available" or "Not Applicable" in the margin or other space as appropriate. Do not abbreviate "N.A.".
 2. The backup means of communications are the Bell line or County Emergency Response Radio. RP/0/A/5700/014, Enclosure 4.1 is available for needed backup numbers.
 3. Refer to page 3 of 6 of this enclosure for instructions on how to use the County Emergency Response Radio if selective signaling or Bell line is not available.

- _____ 2.1 Use the Selective Signal telephone by dialing *1 and depressing the push to talk button
- _____ 2.2 **IF** Selective Signaling Group Call fails, **THEN** go to RP/0/A/5700/014, Enclosure 4.1 for manual selective signaling numbers.
- 2.3 **As** the State and Counties answer, check them off on the back of the notification form. At least one attempt using the individual selective signaling code must be made for any missing agencies. Proceed with the notification promptly following an attempt **to** get missing agencies on the line.
- _____ 2.4 Check the State and Counties are on the line, document this time in item #3 on the form
- _____ 2.5 Tell them you have an emergency notification from the McGuire Control Room and to get out the Emergency Notification Form.
- _____ 2.6 Read the complete message *slowly*, line by line, beginning with Item # 1, allowing ample time to copy.

NOTE: Refer to page **4 of 6** of this Enclosure for the authentication codeword list.

- 2.7 When you reach item **#4**, ask the State or a County to authenticate the message. The agency should give you a number and you should provide the appropriate codeword. Write the number and codeword on the form.
- 2.8 After communicating the message, ask if there are any questions. Record individuals' names and times on the back of the form. This time is the same time as Item #3.
- 2.9 After verbally transmitting the message, FAX a copy (front page only) to the agencies. Refer to page 5 of 6 and 6 of 6 of this enclosure for FAX operation.

**Termination Notification
Completion/Transmission**

- 2.10 Continuous attempts to contact missing agencies must be made if unable to complete the notification per step 2.3. Document the time these agencies were contacted on the back of the notification form.

COUNTY EMERGENCY RESPONSE RADIO

NOTE: This radio will only contact the County warning points. The State cannot be contacted on this radio. Have one of the Counties relay the message to the State.

Group Call:

1. Press **20** to activate all County radio units
2. When the ready light comes on, press the bar on the transmitter microphone and say:

"This is McGuire Control Room to all Counties, do you copy?"

Once all Counties respond, begin transmitting the message using step 2.3 through 2.10 of this enclosure.

Proceed with the notification promptly following an attempt to get missing agencies on the air.

NOTE: RP/0/A/5700/014, Enclosure 4.1 is available for needed individual radio codes.

3. If a County fails to respond on the group call, press their individual code on the encoder and say:

"This is McGuire Control Room to (Agency you are calling), do you copy?"

Once the County responds, begin transmitting the message using step 2.3 through step 2.10 of this enclosure.

4. After you have finished transmitting the message, conclude by saying:

"This is WQC700 base clear."

5. Continuous attempts to contact missing agencies must be made if unable to complete the notification per Step 2. Document the time these agencies were contacted on the back of the notification form.

Enclosure 4.6
Termination Notification
Completion/Transmission

RP/0/A/5700/004
Page 4 of 6

AUTHENTICATION CODEWORD LIST

This page is left intentionally blank.

Enclosure **4.6**
Termination Notification
Completion/Transmission

RP/0/A/5700/004
Page 5 of 6

OPERATION OF THE FAX

A. GROUPFAX

- NOTE:
1. The FAX will dial each agency in sequence. If the **FAX** is busy, it will try again after completing the other calls.
 2. This sends a FAX to all County Warning Points, State EOC, TSC, EOF, News Group and JIC.

- _____ 1. Insert the Emergency Notification Form face down into the FAX.
- _____ 2. Press "GROUP FAX" button.
- _____ 3. Press "SENDIRECEIVE" button.

B. INDIVIDUAL FAX

1. Insert the Emergency Notification Form face down into the FAX.
2. Select location(s) to receive the fax:
 - _____ • Press News Group.
 - _____ • Press TSC.
 - _____ • Press State of North Carolina EOC.
 - _____ • Press Mecklenburg County Warning Point
 - _____ • Press Gaston County Warning Point.
 - _____ • Press Lincoln County Warning Point.
 - _____ • Press Iredell County Warning Point.
 - _____ • Press Catawba County Warning Point.
 - _____ • Press Cabarrus County Warning Point.
 - _____ • Press EOF.
 - _____ • Press JIC.
3. **WHEN** the appropriate individual location is selected, **THEN** press the "SENDIRECEIVE" button.

Enclosure 4.6
Termination Notification
Completion of Transmission

RP/0/A/5700/004
Page 6 of 6

OPERATION OF THE FAX

NOTE: RP/0/A/5700/014, Enclosure 4.1 is available for needed manual FAX numbers .

C. To send a **FAX to** a single location dialing manually:

- _____ 1. Insert the document face down in the **FAX**.
- _____ 2. Using the keypad, dial the number that you **wish to** call.
- _____ 3. Press "SEND/RECEIVE" button.

Enclosure 4.8
Request for Emergency Exposure (a)

RP/0/A/5700/004
Page 1 of 1

<u>Activity</u>	<u>Total Effective Dose Equivalent (TEDE)</u>	<u>Lens of Eye</u>	<u>Other Organs (b)</u>
All	5 rem	15 rem	50 rem
Protecting Valuable Property	10 rem	30 rem	100 rem
Life saving or Protection of Large Populations	25 rem	75 rem	250 rem
Life saving or Protection of Large Populations (c)	> 25 rem	> 75 rem	> 250 rem

(a) Excludes declared pregnant women

(b) Includes skin and body extremities

(c) Only **on** a volunteer basis to persons fully aware of the risks involved. All factors being equal, select volunteers above the age of **45** and those who normally encounter little exposure.

RP Badge No.	Name	Age	Employer	Signature of Individual

My signature indicates my acknowledgement **that** I have been informed that I may be exposed to the levels of radiation indicated above. I have been fully briefed on the task to be accomplished and on the risks of this exposure.

I, _____ acknowledge this planned Emergency Exposure _____
(RPM or designee, signature or note of verbal authorization) Date/Time

I, _____ approve this planned Emergency Exposure at _____
(Emergency Coordinator or EOF Director, signature or note of verbal authorization) Date/Time

Subsequent Radiation Protection Action:

- Determine need for medical evaluation
- Initiate reporting requirements per 10CFR20
- Copy to Individual's Exposure History File

Enclosure 4.9
OSM Immediate and Subsequent Actions

RP/0/A/5700/004
Page 1 of 4

1. Immediate Actions

Initial

_____ 1.1 The Operations Shift Manager or designee **SHALL ANNOUNCE** the event over the plant P.A. system **by** performing the following:

1.1.1 Turn on the outside page speakers.

NOTE:

- For drill purposes, state “This is a drill. This is a drill.”
- Any plant phone in the Control Room horse shoe area or extension **4021** is programmed to access 710, site all call. { PIP0-M98-2545 }

1.1.3 Repeat the preceding announcement one time.

1.1.4 Turn off the outside page speakers.

Enclosure 4.9
OSM Immediate and Subsequent Actions

RP/0/A/5700/004
Page 2 of 4

- NOTE:**
1. Initial notification to the State and Counties **must** be made within 15 minutes of the event declaration, using Enclosure 4.1.
 2. Enclosure 4.3 has instructions for completion/transmission of the Emergency Notification Form

- 1.2 The Emergency Coordinator shall recommend to offsite authorities in the initial notification the following:

- NOTE:**
1. To obtain the wind speed, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed).
 2. To obtain the wind direction, use chart recorder 1EEBCR9100, point #8 (Average Upper Wind Direction).
 3. If either point on 1EEBCR9100 is unavailable, obtain needed data from one of the following sources in order of sequence:
 - A. DPC Meteorological Lab(8-594-0341)
 - B. National Weather Service in Greer, S.C. (864-879-1085 or 1-800-268-7785)
 - C. Catawba Nuclear Station Control Room (8-831-5345).

NOTE: **IF** changes to the initial Protective Action Recommendations are recognized and approved by the Emergency Coordinator, these shall be transmitted to the offsite agencies within 15 minutes. {PIP-M-00-01238}

- _____ 1.2.1 **IF** containment radiation levels exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, **THEN**:

- _____ • Evacuate the 5-mile radius **AND** 10 miles downwind as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction

AND

- _____ • Shelter remaining zones as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction.

Enclosure 4.9
OSM Immediate and Subsequent Actions

RP/0/A/5700/004
Page 3 of 4

1.2.2 **IF** containment radiation levels **DO NOT** exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, **THEN** perform one ~~of~~ the following:

IF wind speed less than or equal to 5 MF", **THEN**:

- _____ • Evacuate zones L, B, M, C, N, A, D, O, R

AND

- _____ • Shelter zones E, F, G, H, I, J, K, P, Q, S.

OR

IF wind speed greater than 5 MPH, **THEN**:

- _____ • Evacuate the 2-mile radius **AND** 5 miles downwind as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction

AND

- _____ • Shelter remaining zones as shown on Enclosure 4 2, page 3 of 4, Protective Action Zones Determination. using wind direction

_____ 1.3 **IF** valid trip II alarm occurs on any one of the following:

1 **OR** 2 EMF36(L)

1 EMF24, 25, 26, 27

2 EMFIO, 11, 12, 13

THEN immediately contact RP shift at 4282 to perform HP/0/B/1009/029 (Initial Response On-Shift Dose Assessment).

1.4 **IF** box C (IS OCCURRING) or box D (HAS OCCURRED) from **Item 10** (EMERGENCY RELEASE) on Enclosure **4.1**, (Emergency Notification Form) is checked, **THEN** immediately contact RP shift at 4282 to perform HP/0/B/1009/029 (Initial Response On-Shift Dose Assessment).

2. Subsequent Actions

NOTE: Site Assembly is a required on-site protective action in response to an Alert or higher declaration.

- 2.1 **IF** a site assembly has not already ~~been~~ initiated, **THEN** refer to RP/0/A/5700/011 (Conducting a Site Assembly, Site Evacuation or Containment Evacuation) to evaluate and initiate a site assembly.
- _____ 2.2 Augment shift resources to assess and respond to the emergency situation as needed
- _____ 2.3 **GO TO** Step 3.1 in the body of this procedure and continue with the prescribed subsequent actions.

Enclosure 4.10
WCC SRO Immediate and Subsequent
Actions

RP/0/A/5700/004
Page 1 of 2

1. Immediate Actions

Initial

- NOTE:**
1. Initial notification to the State and Counties **must** be made within 15 minutes of the event declaration, using Enclosure 4.1.
 2. Enclosure 4.3 has instructions for completion/transmission of the Emergency Notification Form.

- 1.1 The Emergency Coordinator shall recommend to offsite authorities in the initial notification the following:

- NOTE:**
1. To obtain the wind speed, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed).
 2. To obtain the wind direction, use chart recorder 1EEBCR9100, point #8 (Average Upper Wind Direction).
 3. If either point on 1EEBCR9100 is unavailable, obtain needed data from one of the following sources in order of sequence:
 - A. DPC Meteorological Lab (8-594-0341)
 - B. National Weather Service in Greer, S.C. (864-879-1085 or 1-800-268-7785).
 - C. Catawba Nuclear Station Control Room (8-831-5345)

- NOTE:** **IF** changes to the initial Protective Action Recommendations are recognized and approved by the Emergency Coordinator, these shall be transmitted to the offsite agencies within 15 minutes. {PIP-M-00-01238}

- 1.1.1 **IF** containment radiation levels exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, **THEN**:

- Evacuate the 5-mile radius **AND** 10 miles downwind as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction

AND

- Shelter remaining zones as shown on Enclosure 4.2, page 7 of 4, Protective Action Zones Determination, using wind direction.

Enclosure **4.10**
WCC SRO Immediate and Subsequent
Actions

RP/0/A/5700/004
Page 2 of 2

- 1.1.2 If containment radiation levels **DO NOT** exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, **THEN** perform one of the following:

IF wind speed less than or equal to 5 MPH, **THEN**:

- _____ • Evacuate zones L, B, M, C, N, **A**, D, O, R

AND

- _____ • Shelter zones E, F, G, **H**, I, J, K, **P**, Q, S

OR

IF wind speed greater than 5 MPH, **THEN**:

- _____ • Evacuate the 2-mile radius **AND** 5 miles downwind as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction

AND

- _____ • Shelter remaining zones as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction.

- _____ 1.2 Complete items 1 -10, 15 and 16 on Enclosure 4.1 (Emergency Notification Form) in accordance with Enclosure 4.3, Section 1.

- 1.3 Make initial notification to State and County authorities using the Emergency Notification Form in accordance with Enclosure 4.3, Section 2.

2. Subsequent Actions

- _____ 2.1 Notify the NRC Operations Center by completing Enclosure **4.4** and transmitting immediately but no later than 1 hour of the event declaration using RP/0/A/5700/014, Enclosure 4.2.

- 2.2 Inform the OSM when this enclosure has been completed, reporting any deficiencies or problems encountered.

1. Immediate Actions

Initial

NOTE: For a Drill, the Community Alert Network (CAN) is not activated.

1.1 For a security event, go to steps **1.4**, **1.5**, and **1.6**.

1.2 Activate the Emergency Response Organization by contacting Security via the ringdown phone to the CAS/SAS, or at extension 2688 or 4900 and issue the following message:

1.2.1 For a Drill "Activate the **TSC/OSC/EOF** pagers. McGuire Delta, General Emergency declared at _____ (time)."

1.2.2 For an Emergency "Activatethe **TSC/OSC/EOF** pagers, McGuire Echo, General Emergency declared at _____ (time)."
AND
"Activate the CAN system."

NOTE:

- For a Drill, the Emergency Response Data System (ERDS) is not activated.
- ERDS can only be activated / deactivated from designated computer terminals with SDS access. These are located in the Shift Work Manager's office, the Data Coordinators' room in the TSC and all within the Control Room horseshoe area.

1.3 For an Emergency, activate the Emergency Response Data System (ERDS) as soon as possible, but not later than one hour after the emergency declaration per the following:

1.3.1 Ensure SDS is running on the selected terminal.

1.3.2 Click on MAIN.

1.3.3 Click on GENERAL.

1.3.4 Click on ERDS.

1.3.5 Click on ACTIVATE.

1.3.6 Record the time and date ERDS was activated. TIME/DATE _____ / /
Eastern mm dd yy

1.3.7 Inform the OSM that ERDS was activated.

1.3.8 **IF** ERDS failed to activate after five (5) attempts, **THEN** have an Offsite Agency Communicator notify the NRC via **ENS** or other available means.

- _____ 1 For a ll, **IF** a security event exists and offsite ERO staging is desired before giving instructions to report to the **TSC** and OSC, **THEN** contact Security via the ringdown phone to the **CAS/SAS**, or at extension **2688** or 4900, and give instructions to activate the TSC/OSC, according to the Emergency Response Pager Instructions for a security event drill.
- _____ 1.5 For an actual emergency, **IF** a security event exists and offsite ERO staging **is** desired before giving instructions to report to the **TSC/OSC**, **THEN** contact Security via the ringdown phone to the **CAS/SAS**, or at extension 2688 or 4900. and give instructions to activate the **TSC/OSC**, according to the Emergency Response Pager Instructions for a security event emergency.
- 1.6 When the security event is stabilized to the point that ERO members can come on site, go to step 1.2.

2. Subsequent Actions

- _____ 2.1 Notify one of the NRC Resident Inspectors using RP/0/A/5700/014, Enclosure 4.2.
- _____ 2.2 Contact **Duke** Management using RP/0/A/5700/014, Enclosure 4.3 as soon **as** possible following event declaration.
- 2.3 Inform the OSM when this enclosure has been completed, reporting any deficiencies or problems.

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

-----**NOTE**-----
Separate Condition entry *is* allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately
B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status	48 hours
	<u>OR</u> B.2 Be in MODE 3.	54 hours
C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u> C.2 Open reactor trip breakers (RTBs).	49 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One channel inoperable	<p>-----NOTE----- One channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. -----</p>	
	D.1.1 Place channel in trip.	6 hours
	AND	
	D.1.2 Reduce THERMAL POWER to $\leq 75\%$ RTP.	12 hours
	OR	
	D.2.1 Place channel in trip.	6 hours
	AND	
	Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable.	
	D.2.2 Perform SR 3.2.4.2	Once per 12 hours
	OR	
	D.3 Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One channel inoperable.	----- NOTE ----- One channel may be bypassed for up to 4 hours for surveillance testing. -----	
	E.1 Place channel in trip.	6 hours
	<u>OR</u> E.2 Be in MODE 3.	12 hours
F. THERMAL POWER > P-6 and < P-10, one Intermediate Range Neutron Flux channel inoperable.	F.1 Reduce THERMAL POWER to < P-6.	2 hours
	<u>OR</u> F.2 Increase THERMAL POWER to > P-10.	2 hours
G. THERMAL POWER > P-6 and < P-10, two Intermediate Range Neutron Flux channels inoperable.	G.1 Suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u> G.2 Reduce THERMAL POWER to < P-6.	2 hours
H. THERMAL POWER < P-6, one or two Intermediate Range Neutron Flux channels inoperable.	H.1 Restore channel(s) to OPERABLE status.	Prior to increasing THERMAL POWER to > P-6

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION	COMPLETION TIME
I.	One Source Range Neutron Flux channel inoperable.	1.1 Suspend operations involving positive reactivity additions.	Immediately
J.	Two Source Range Neutron Flux channels inoperable.	J.1 Open RTBs.	Immediately
K.	One Source Range Neutron Flux channel inoperable.	K.1 Restore channel to CP ERAELE status.	48 hours
		<u>OR</u> K.2 Open RTBs.	49 hours
L.	Required Source Range Neutron Flux channel inoperable.	L.1 Suspend operations involving positive reactivity additions.	Immediately
		<u>AND</u> L.2 Close unborated water source isolation valves.	1 hour
		L.3 Perform SR 3.1.1.1.	1 hour
			<u>AND</u> Once per 12 hours thereafter

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>M. One channel inoperable</p>	<p>----- NOTE ----- One channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>-----</p> <p>M.1 Place channel in trip.</p> <p>OR</p> <p>M.2 Reduce THERMAL POWER to < P-7.</p>	<p>6 hours</p> <p>12 hours</p>
<p>N. One Reactor Coolant Flow - Low (Single Loop) channel inoperable.</p>	<p>----- NOTE ----- One channel may be bypassed for up to 4 hours for surveillance testing.</p> <p>N.1 Place channel in trip.</p> <p>OR</p> <p>N.2 Reduce THERMAL POWER to < P-8.</p>	<p>6 hours</p> <p>10 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. One Turbine Trip - Low Fluid Oil Pressure channel inoperable.	<p>-----NOTE----- One channel may be bypassed for up to 4 hours for surveillance testing. -----</p> <p>O.1 Place channel in trip.</p> <p>OR</p> <p>O.2 Reduce THERMAL POWER to < P-8.</p>	<p>3 hours</p> <p>10 hours</p>
P. One or more Turbine Trip - Turbine Stop Valve Closure channels inoperable.	<p>2.1 Place channel in trip.</p> <p>OR</p> <p>P.2 Reduce THERMAL POWER to < P-8.</p>	<p>1 hours</p> <p>0 hours</p>
Q. One train inoperable.	<p>-----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -----</p> <p>Q.1 Restore train to OPERABLE status</p> <p>OR</p> <p>Q.2 Be in MODE 3</p>	<p>3 hours</p> <p>2 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
R. One RTB train inoperable.	1. One train may be bypassed for up to 2 hours for surveillance testing, provided the other train is OPERABLE.	
	2. One RTB may be bypassed for up to 2 hours for maintenance on undervoltage or shunt trip mechanisms, provided the other train is OPERABLE.	
	----- R.1 Restore train to OPERABLE status.	1 hour
	OR R.2 Be in MODE 3.	7 hours
S. One or more channel(s) inoperable.	S.1 Verify interlock is in required state for existing unit conditions.	1 hour
	OR S.2 Be in MODE 3.	7 hours

(continued)

ACTIONS (continued)

CONDITION		REQUIRED ACTION	COMPLETION TIME
T.	One or more channel(s) inoperable.	T.1 Verify interlock is in required state for existing unit conditions.	1 hour
		<u>OR</u>	
		T.2 Be in MODE 2.	7 hours
U.	One trip mechanism inoperable for one RTB.	J.1 Restore inoperable trip mechanism to OPERABLE status.	48 hours
		<u>OR</u>	
		U.2 Be in MODE 3.	54 hours
V.	Two RTS trains inoperable.	V.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----

Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. Adjust NIS channel if absolute difference is > 2% RTP. 2. Not required to be performed until 12 hours after THERMAL POWER is \geq 15% RTP. <p>.....</p> <p>Compare results of calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output.</p>	24 hours
SR 3.3.1.3	<p>-----NOTES-----</p> <ol style="list-style-type: none"> 1. Adjust NIS channel if absolute difference is \geq 3% AFD. 2. Not required to be performed until 24 hours after THERMAL POWER is \geq 15% RTP. <p>-----</p> <p>Compare results of the incore detector measurements to NIS AFD.</p>	31 effective full power days (EFPD)

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.4 -----NOTES----- This Surveillance must be performed on the reactor trip bypass breaker prior to placing the bypass breaker in service.</p> <p>Perform TADOT.</p>	<p>31 days on a STAGGERED TEST BASIS</p>
<p>SR 3.3.1.5 Perform ACTUATION LOGIC TEST.</p>	<p>31 days on a STAGGERED TEST BASIS</p>
<p>SR 3.3.1.6 -----NOTES----- Not required to be performed until 24 hours after THERMAL POWER is \geq 75% RTP. -----</p> <p>Calibrate excore channels to agree with incore detector measurements.</p>	<p>32 EFPD</p>
<p>SR 3.3.1.7 -----NOTES----- Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. -----</p> <p>Perform COT.</p>	<p>32 days</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.8</p> <p>This Surveillance shall include verification that interlocks P-6 (for the Intermediate Range channels) and P-10 (for the Power Range channels) are in their required state for existing unit conditions.</p> <p>-----</p> <p>Perform COT.</p>	<p>-----NOTE-----</p> <p>Only required when not performed within previous 92 days</p> <p>-----</p> <p>Prior to reactor startup</p> <p><u>AND</u></p> <p>Four hours after reducing power below P-10 for power and intermediate range instrumentation</p> <p><u>AND</u></p> <p>Four hours after reducing power below P-6 for source range instrumentation</p> <p><u>AND</u></p> <p>Every 92 days thereafter</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.9 -----NOTES----- Verification of setpoint is not required. ----- Perform TADOT.</p>	92 days
<p>SR 3.3.1.10 -----NOTES----- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. ----- Perform CHANNEL CALIBRATION.</p>	18 months
<p>SR 3.3.1.11 -----NOTES----- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Power and Intermediate Range Neutron Flux detector plateau voltage verification is not required to be performed prior to entry into MODE 1 or 2. ----- Perform CHANNEL CALIBRATION.</p>	18 months
<p>SR 3.3.1.12 Perform CHANNEL CALIBRATION.</p>	18 months
<p>SR 3.3.1.13 Perform COT.</p>	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.14 -----NOTES----- Verification of setpoint is not required. ----- Perform TADOT.</p>	<p>18 months</p>
<p>SR 3.3.1.15 -----NOTES----- Verification of setpoint is not required. ----- Perform TADOT.</p>	<p>-----NOTE----- Only required when not performed within previous 31 days ----- Prior to reactor startup</p>
<p>SR 3.3.1.16 -----NOTES----- Neutron detectors are excluded from response time testing. Verify RTS RESPONSE TIME is within limits.</p>	<p>18 months on a STAGGERED TEST BASIS</p>
<p>SR 3.3.1.17 Verify RTS RESPONSE TIME for RTDs is within limits.</p>	<p>18 months</p>

Table 3.3.1-1 (page 1 of 7)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA	NA
	3(a), 4(a), 5(a)	2	C	SR 3.3.1.14	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 110% RTP	109% RTP
b. Low	1(b), 2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 26% RTP	25% RTP
3. Power Range Neutron Flux Rate						
High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.11	≤ 5.5% RTP with time constant ≥ 2 sec	5% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SA 3.3.1.11	≤ 30% RTP	25% RTP
	2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 30% RTP	25% RTP
5. Source Range Neutron Flux	2(d)	2	I,J	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.3 E5 cps	1.0 E5 cps
	3(a), 4(a), 5(a)	2	J,K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.3 E5 cps	1.0 E5 cps
	3(e), 4(e), 5(e)	1	L	SR 3.3.1.1 SR 3.3.1.11	N/A	N/A

(continued)

- (a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.
 (b) Below the P-10 (Power Range Neutron Flux) interlocks.
 (c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.
 (d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
 (e) With the RTBs open. In this condition, source range Function does not provide reactor trip but does provide indication.

Table 3.3.1-1 (page 2 of 7)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REWired CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT	
6. Overtemperature ΔT	1.2	4	E	SR3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR3.3.1.7 SR 3.3.1.12 SR 3.3.1.16 SR 3.3.1.17	Refer to Note 1 (Page 3.3.1-18)	Refer to Note 1 (Page 3.3.1-18)	
7. Overpower ΔT	1.2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16 SR 3.3.1.17	Refer to Note 2 (Page 3.3.1-19)	Refer to Note 2 (Page 3.3.1-19)	
8. Pressurizer Pressure							
a. Low	1(f)	4	M	SR3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 1935 psig	1945 psig	
b. High	1.2	4	E	SR391.1 SR391.7 SR 3.3.1.10 SR331.16	≤ 2385 psig	2385 psig	
9. Pressurizer Water Level - High	1(f)	3	M	SR 3.3.1.1 SR 3.3.1.7 SR331.10	$\leq 93\%$	92%	
10. Reactor Coolant Flow - Low							
a. Single Loop	1(g)	3 per loop	N	SR 3.3.1.1 SR331.7 SR 3.3.1.10 SR 3.3.1.16	$\geq 90\%$	91%	
b. Two Loops	1(h)	3 per loop	M	SR 3.3.1.1 SR33.1.7 SR 3.3.1.10 SR 3.3.1.16	$\geq 90\%$	91%	
11. Undervoltage RCPs	1(f)	1 per bus	M	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 5016 V	5082 V	

(continued)

(f) Above the P-7 (Low Power Reactor Traps Block) interlock.

(g) Above the P-8 (Power Range Neutron Flux) interlock.

(h) Above the P-7 (Low Power Reactor Traps Block) interlock and below the P-8 (Power Range Neutron Flux) interlock.

Table 3.3.1-1 (page 3 of 7)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
12. Underfrequency RCPs	1(f)	1 per bus	M	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 55.9 Hz	56.4 Hz
13. Steam Generator (SG) Water Level - Low LOW	1,2	4 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 15%	16.7%
14. Turbine Trip						
a. Low Fluid Oil Pressure	1(g)	3	O	SR 3.3.1.10 SR 3.3.1.15	≥ 42 psig	45 psig
b. Turbine Stop Valve Closure	1(g)	4	P	SR 3.3.1.10 SR 3.3.1.15	≥ 1% open	≥ 1% open
15. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	Q	SR 3.3.1.5 SR 3.3.1.14	NA	NA
16. Reactor Trip System Interlocks						
a. Intermediate Range Neutron Flux, P-6	2(d)	2	S	SR 3.3.1.11 SR 3.3.1.13	≥ 4E-11 amp	1E-10 amp
b. Low Power Reactor Trips Block, P-7	1	1 per train	T	SR 3.3.1.5	NA	NA
c. Power Range Neutron Flux, P-8	1	4	T	SR 3.3.1.1.1 SR 3.3.1.13	≤ 49% RTP	48% RTP
d. Power Range Neutron Flux, P-10	1,2	4	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7% RTP and ≤ 11% RTP	10% RTP
e. Turbine Impulse Pressure, P-13	1	2	T	SR 3.3.1.12 SR 3.3.1.13	≤ 11% turbine impulse pressure equivalent	10% turbine impulse pressure equivalent

(continued)

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

(g) Above the P-8 (Power Range Neutron Flux) interlock.

Table 3.3.1-1 (page 4 of 7)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REWired CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
17 Reactor Trip Breakers ⁽ⁱ⁾	1.2	2 trains	R, V	SR3.3.1.4	NA	NA
	3(a), 4(a), 5(a)	2 trains	C	SR 3.3.1.4	NA	NA
18 Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1.2	1 each per RTB	U	SR3.3.1.4	NA	NA
	3(a), 4(a), 5(a)	1 each per RTB	C	SR 3.3.1.4	NA	NA
13 Automatic Trip Logic	1.2	2 trains	Q, V	SR 3.3.1.5	NA	NA
	3(a), 4(a), 5(a)	2 trains	C	SR 3.3.1.5	NA	NA

(a) With RTBs closed and Rod Control System capable of rod withdrawal

(i) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB

Table 3.3.1-1 (page 5 of 7)
Reactor Trip System Instrumentation

Note 1: Overtemperature AT

The Overtemperature AT Function Allowable Value shall not exceed the following NOMINAL TRIP SETPOINT by more than 4.4% of RTP.

$$\Delta T \frac{(1 + \tau_1 s)}{(1 + \tau_2 s)} \left(\frac{1}{1 + \tau_3 s} \right) \leq \Delta T_0 \left\{ K_1 - K_2 \frac{(1 + \tau_4 s)}{(1 + \tau_5 s)} \left[T \frac{1}{(1 + \tau_6 s)} - T' \right] + K_3 (P - P') - f_1(\Delta I) \right\}$$

Where: AT is measured RCS AT by loop narrow range RTDs, °F

ΔT_0 is the indicated AT at RTP, °F.

s is the Laplace transform operator, sec⁻¹

T is the measured RCS average temperature, °F.

T' is the nominal Tavg at RTP, < 585.1 °F.

P is the measured pressurizer pressure, psig

P' is the nominal RCS operating pressure, = 2235 psig

K_1 = Overtemperature AT reactor trip NOMINAL TRIP SETPOINT, as presented in the COLR.

K_2 = Overtemperature AT reactor trip heatup setpoint penalty coefficient, as presented in the COLR.

K_3 = Overtemperature AT reactor trip depressurization setpoint penalty coefficient, as presented in the COLR.

τ_1, τ_2 = Time constants utilized in the lead-lag controller for AT, as presented in the COLR,

τ_3 = Time constants utilized in the lag compensator for AT, as presented in the COLR,

τ_4, τ_5 = Time constants utilized in the lead-lag controller for T_{avg} , as presented in the COLR,

τ_6 = Time constants utilized in the measured T_{avg} lag compensator, as presented in the COLR. and.

$f_1(\Delta I)$ = a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests such that

- (i) for $q_t - q_b$ between the "positive" and "negative" $f_1(\Delta I)$ breakpoints as presented in the COLR. $f_1(\Delta I) = 0$, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER,

(continued)

Table 3.3 1-1 (page 6 of 7)
Reactor Trip System Instrumentation

- (ii) for each percent imbalance that the magnitude of $q_i - q_b$ is more negative than the $f_1(\Delta I)$ 'negative' breakpoint presented in the COLR, the AT Trip Setpoint shall be automatically reduced by the $f_1(\Delta I)$ 'negative' slope presented in the COLR; and
- (iii) for each percent imbalance that the magnitude of $q_i - q_b$ is more positive than the $f_1(\Delta I)$ 'positive' breakpoint presented in the COLR, the AT Trip Setpoint shall be automatically reduced by the $f_1(\Delta I)$ "positive" slope presented in the COLR.

Note 2: Overpower AT

The Overpower AT Function Allowable Value shall not exceed the following NOMINAL TRIP SETPOINT by more than 3.0% of RTP.

$$\Delta T \frac{(1 + \tau_1 s)}{(1 + \tau_2 s)} \left(\frac{1}{1 + \tau_3 s} \right) \leq \Delta T_0 \left\{ K_4 - K_5 \frac{\tau_7 s}{1 + \tau_7 s} \left(\frac{1}{1 + \tau_6 s} \right) T - K_6 \left[T \frac{1}{1 + \tau_6 s} - T' \right] - f_2(\Delta I) \right\}$$

Where: AT is measured RCS AT by loop narrow range RTDs, °F.

ΔT_0 is the indicated AT at RTP, °F.

s is the Laplace transform operator, sec^{-1} .

T is the measured RCS average temperature, °F.

T' is the nominal T_{avg} at RTP, ≤ 585.1 °F.

- K_4 = Overpower AT reactor NOMINAL TRIP SETPOINT as presented in the COLR,
- K_5 = 0.02/°F for increasing average temperature and 0 for decreasing average temperature,
- K_6 = Overpower AT reactor trip heatup setpoint penalty coefficient as presented in the COLR for $T > T'$ and $K_6 = 0$ for $T \leq T'$,
- τ_1, τ_2 = Time constants utilized in the lead-lag controller for AT, as presented in the COLR.
- τ_3 = Time constants utilized in the lag compensator for AT, as presented in the COLR,
- τ_6 = Time constants utilized in the measured T_{avg} tag compensator, as presented in the COLR,
- τ_7 = Time constant utilized in the rate-lag controller for T as presented in the COLR, and
- $f_2(\Delta I)$ = a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers: with gains to be selected based on measured instrument response during plant startup tests such that:

(continued)

Table 3.3.1-1 (page 7 of 7)
Reactor Trip System Instrumentation

- (i) for $q_t - q_b$ between the "positive" and "negative" $f_2(\Delta I)$ breakpoints as presented in the COLR; $f_2(\Delta I) = 0$, where q_t and q_b are percent RATED THERMAL POWER in the top and bottom halves of the core respectively, and $q_t + q_b$ is total THERMAL POWER in percent of RATED THERMAL POWER;
 - (ii) for each percent imbalance that the magnitude of $q_t - q_b$ is more negative than the $f_2(\Delta I)$ "negative" breakpoint presented in the COLR, the AT Trip Setpoint shall be automatically reduced by the $f_2(\Delta I)$ "negative" slope presented in the COLR; and
 - (iii) for each percent imbalance that the magnitude of $q_t - q_b$ is more positive than the $f_2(\Delta I)$ "positive" breakpoint presented in the COLR, the AT Trip Setpoint shall be automatically reduced by the $f_2(\Delta I)$ "positive" slope presented in the COLR.
-

