Draft Submittal

NORTH ANNA JUNE EXAM
50-338 & 50-339/2004-301

JUNE 17 - 25, 2004

1. Administrative Questions/JPMs ✓
2. In-plant JPMs ✓
3. Control Room JPMs (simulator JPMs) ✓
4. Administrative Topics Outline ES-301-1 ✓
5. Control Room Systems and Facility Walk-Through Test Outline ES-301-2 ✓

PART 2 OF 2

Adm. JPM Index

Tab 13 Perform A 1/M Plot And Evaluate For Continued Approach To Criticality.
Tab 14 Perform A Reactor Coolant System Leakrate Hand Calculation
Tab 15 Determine Stay Time And Dressout Requirements For A Given Task
Tab 16 Review And Approve A Work Request For Work Under An Existing Tagout.
Tab 17 Make State And Local Notifications In Accordance With EPIP 2.01, "Report Of Emergency To State and Local Governments."
Tab 18 Classify Per EPIP 1.01, "Emergency Manager Controlling Procedure."

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

ADMIN JPM

Perform A 1/M Plot And Evaluate For Continued Approach To Criticality.

CANDIDATE _____

EXAMINER _____

N RTH ANN POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Perform a 1/M plot in accordance with Attachment 7 of 1-OP-1.5, " UNIT STARTUP FROM MODE 3 TO MODE 2 " and evaluate for continued approach to criticality.

References:

1-OP-1.5, " UNIT STARTUP FROM MODE 3 TO MODE 2. "
Attachment 7 of 1-OP-1.5, " UNIT STARTUP FROM MODE 3 TO MODE 2. "

Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

1-OP-1.5, " UNIT STARTUP FROM MODE 3 TO **MODE** 2. "
Calculator
Straight edge

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit-I is in Mode 3 in the process of a reactor startup.

The following data has been taken:

TIME	ROD HEIGHT	N-31	N-32	N-35	N-36
0800	ARI	50	70	2 x 10-11	3 x 10-11
0808	D60	100	140	2 x 10-11	4 x 10-11
0814	D160	250	300	3 x 10 -11	6 x 10-11
0824	D180	525	600	6 x 10 -11	9 x 10-11

1-OP-1.5 has been completed to the point of reactor startup.

INITIATING CUES:

You *are* requested to perform a **1/M** plot and **evaluate** it for continued approach to criticality.

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator obtains a pattially-completedcopy of **1-OP-1.5,**" UNIT STARTUP FROM MODE 3 TO MODE 2. " COMMENTS:	___ SAT ___ UNSAT
STEP 2: Calculate and then plot the first doubling. (attach. 7) STANDARD: Operator uses data provided in initial conditions to fill in Attachment 7. The first 1/m plots are calculated. .5 for the source range and .75 for the intermediate range. Points are then plotted on the line corresponding to D Bank at 60 steps. COMMENTS: MOPES: Operator may fill in all the data from initial conditions at this time or as each doubling is calculated. Either way is permissible.	___ SAT ___ UNSAT
STEP 3: Calculate and plot the second doubling. (attach. 7) STANDARD: Operator uses data provided in initial conditions to fill in Attachment 7. The first 1/m plots are calculated. .233 for the source range and .5 for the intermediate range. Points are then plotted on the line corresponding to D Bank at **160** steps. COMMENTS:	___ SAT ___ UNSAT

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEP 4: Calculate and plot the third doubling. (attach. 7) STANDARD: Operator uses data provided in initial conditions to fill in Attachment 7. The first n plots are calculated. .116 for the source range and .33 for the intermediate range. Points are then plotted on the line corresponding to D Bank at 180 steps. COMMENTS:	___ SAT ___ UNSAT
STEP 5: Evaluate 1/M plot for continued approach to criticality STANDARD: Operator recognizes need to discontinue startup and insert the control rods. This is based on the reactor going critical above the upper limit. COMMENTS NOTES: This can be done using guidance in the body of 1-OP-1.5. It can aiso be done by performing attachment 3. Either way is acceptable. **END OF TASK**	___ SAT ___ UNSAT

Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit-1 is in Mode 3 in the process of a reactor startup

The following data has been taken:

TIME	ROD HEIGHT	N-31	N-32	N-35	N-36
0800	ARI	50	70	2 x 10-11	3 x 10-11
0808	D60	100	140	2 x 10-11	4 x 10-11
0814	D160	250	300	3 x 10 -11	6 x 10-11
0824	D180	525	600	6 x 10 -11	9 x 10-11

4-OP-1.5 has been completed to the point of reactor startup.

INITIATING CUES:

You are requested to perform a 1/M plot and evaluate it for continued approach to criticality.

Dominion

NORTH ANNA POWER STATION

PROCEDURE NO.	REVISION NO.
1-OP-1.5	60

PROCEDURE TYPE:	UNIT NO:
OPERATING PROCEDURE	1

PROCEDURE TITLE:

UNIT STARTUP FROM MODE 3 TO MODE 2

SURV REQ			ICCE II	EOP AP	REACT MGT	

REVISION SUMMARY:

Converted to FrameMaker using template 030.

- Incorporated DCP 01-007, Phase 2 PCS Installation and P-250 Removal - Unit 1:
  - Added DCP to references as Step 2.3.17.
  - Added new conditional lead-in Step 5.35.1 and moved existing Steps 5.35.1, 5.35.2, and 5.35.3 to substeps of new Step 5.35.1 for P-250 computer removal.

PROBLEMS ENCOUNTERED: ☐ NO ☐ YES **Note:** If YES, note problems in remarks.

REMARKS: _____

_____ (Use back for additional remarks.)

SHIFT SUPERVISOR:	DATE:

TABLE OF CONTENTS

Section		Page
1.0	PURPOSE	3
2.0	REFERENCES	8
3.0	INITIAL CONDITIONS	12
4.0	PRECAUTIONS AND LIMITATIONS	15
5.0	INSTRUCTIONS	18
ATTACHMENTS		
1	Secondary Drains Level Control Valve Operability Checklist	37
2	Criticality Imminent Below The ECP Lower Limit	42
3	Criticality Not Achieved Below The ECP Upper Limit	43
4	Deenergizing Source Range NI Detectors	44
5	Reactor Startup Data Sheet	46
6	Setting K0839 To 400 On Unit 1 PCS	47
7	1/M Plot	48

1.0 PURPOSE

To provide instructions for directing Unit startup from Hot Standby with K_{eff} less than 0.99 and T_{ave} at 547° F (Mode 3) to Startup with K_{eff} of at least 0.99, T_{ave} at 547"F, and the Reactor Critical at 5 percent power or less (Mode 2).

The following synopsis is designed as an aid to understanding the procedure, and is not intended to alter or take the place of the actual purpose, instructions, or text of the procedure itself.

This procedure starts up the Reactor. It ensures a safe evolution by ensuring that the startup is performed in a controlled manner and that criticality occurs within the projected ECP band and above the Insertion Limit. It raises Reactor power through the Point of Adding Heat to a stable point at or below 5 percent power.

The Point of Adding Heat (POAH) is achieved at approximately 2 x 10^{-6} amps on the Intermediate Range detectors. As power exceeds the POAH, the RCS will heat up causing an increase in secondary plant heat load. Steam dumps will need to be opened to control SG pressure. Startup rate should be low during approach to POAH (ideally 0.1 to 0.2 dpm.) Below the POAH, Control Rods and changes in Boron concentration control Reactor power. Above the POAH, steam demand controls Reactor power and Control Rods and changes in Boron concentration control RCS temperature. The following are indications of POAH:

- RCS temperature increases
- SG pressure increases
- PRZR level increases
- Steam Dump demand present
- Power Range NI indication coming on scale

The Steam Dumps must be in Steam Pressure Mode because there is no signal from T_{ref} available at this point. The Steam Dumps or SG PORVs must be operable to remove heat that will be produced when the reactor power level is above the Point of Adding Heat.

Steam Generators must be at normal operating levels because the SGs must be available as a heat sink when the reactor is started up.

Applicable steps of 1-OP-1C must be performed so that the ESTIMATED CRITICAL POSITION is known to allow a safe reactor startup.

The NI Periodic Test must have been performed to ensure that the NIs will indicate reactor power properly as power is increased.

Approval from Station Management is required before any reactor startup. Reactor Engineering must concur with any startup made under abnormal conditions, such as during coastdown. The specific requirements can be found in VPAP-1404, Reactor Control.

Tech Spec 3.4.4 requires that in Modes 1 or 2 all three RCS loops are in operation. Tech Spec 3.4.17 requires that in Mode 1, 2, 3 or 4 each RCS hot and cold leg isolation valve is open with power removed from each operator.

The Pre Job Brief is done to ensure that all participants in the startup are anticipating the events to occur during the startup and are familiar with the sequence and contingencies associated with the startup.

The Control Rod Fully Withdrawn position is no longer 228 steps necessarily; this is to allow the rods to be parked at different heights on different cycles to even out wear on the Control Rods. As a Reactor Safety concern, criticality should be anticipated at any time whenever positive reactivity is occumng. This reactivity addition can be as a result of pulling rods, diluting, or cooling down the RCS by any number of methods such as feeding SGs or increasing steam flow. The positive reactivity additions should be made cautiously to allow the operator time to respond to power changes.

If the rods have been withdrawn and criticality has not been achieved in 8 hours, then a Shutdown Margin calculation is necessary to ensure that the shutdown margin has not been lost by dilution, Xenon burnup and decay or other reasons.

CRDM cooling air is required when the RCS is above 350°F because the heat from the RCS will be conducted into the CRDM. This heat must be removed to prevent thermal damage to the CRDMs.

Below 50 percent power the tolerance for the difference between the IRPI and Group Step Counter is 24 steps instead of 12; this gives the operator more flexibility during the power escalation. During the power escalation, changing RCS temperature causes the IRPIs to drift. The IRPIs must be adjusted by the INST Department when this occurs and the power escalation temporarily suspended.

The basis for maintaining control rods above their insertion limit is to ensure that an adequate Shutdown Margin is maintained.

The Reactor Trip system instrumentation channels must be operable to ensure that a reactor trip will be initiated if any reactor trip setpoint is exceeded. Source and Intermediate Range Nuclear Instrumentation channels must be operable to monitor reactor power. These are verified prior to placing the first Rod Control MG set in operation; with no MG set in operation, control rod withdrawal is not possible.

Auxiliary Feedwater must be operable to ensure that the RCS can be cooled down to where RHR can be placed in service in the event of a loss of Offsite power.

The test of the MSTVs MSTV B/P valves and the MS NRVs (PT-212.9) is done while there is minimal heat production and steam flow because the MSTVs won't open against a ΔP and the MS system is used for heat removal.

The Turbine Stop Valve and Auto Stop Oil Turbine Trip signals are verified as a good practice in this procedure. Channel operational tests on the Low Auto Stop Oil Pressure turbine trip initiation of a reactor trip required by Tech Spec. 3.3.1, Table 3.3.1-1, Item 16 are done by the performance of 1-QP-15.1, with verification of operable status lights after the turbine was tripped in that procedure.

The MSRs are aligned for startup to verify that they don't put a large steam demand on the plant through the 1 inch warm-up lines. This can cause a ΔP across the MS NRVs and TVs; if they are cycled a SG swell transient would occur.

Secondary Drain level control operability checklist is performed to assist the operators in preparing the secondary plant for startup. In the past, a turbine trip occurred as a result of a 5th PT FW heater Hi-Hi level whish happened because. the air was isolated to the level control valves.

In preparation for the reactor startup the Reactor Trip Breakers are tested, an MG set must be placed in service and the reactor trip breakers closed. Prior to closing the Reactor Trip Breakers and making rods capable of withdrawal, the Reactor Trip Instrumentation must be verified operable in accordance with Tech Specs. Before control rods are moved, RCS total suspended solids must be less than their limit, to make sure that the crud in the coolant doesn't get into the CRDMs. The Chemistry Department uses CB-93.130, CHEMISTRY CONTROLS: UNIT STARTUP, to analyze the RCS and determine when rod motion is allowable.

The Shutdown Banks are withdrawn first in compliance with Tech Specs for insertion limits; the rods must be fully withdrawn in mode 1 or 2.

The estimated critical rod height is calculated so that the operator knows that the reactor will become critical above the insertion l i t and so that it can be assured that the reactor is responding to the positive reactivity addition from rod withdrawal in an expected, controlled manner. A 1/M plot is made to give the operators a visual change in the margin to criticality versus rod height to help ensure that the approach to criticality is controlled and proceeding as anticipated.

Contingencies are given to the operator to perform if the criticality is not occurring as projected. If criticality is projected below the insertion limit then the Tech Spec for shutdown margin is not met and a boration is performed as required by the Tech Spec action.

During control rod withdrawal, the operator closely monitors many affected parameters such as count rate, IRPI drift, startup rate, T_{ave} and rod position. Only a licensed Operator may perform the startup. Non-licensed individuals may not perform evolutions that change reactivity in accordance with NRC requirements. At 10^{-10} amps on both Intermediate Range detectors (P-6), the Source Range detectors arc deenergized, blocking the Source Range high level Reactor trip, then the Intermediate Range instrumentation is used. The blocking of the Source Range high level trip is performed at P-6 after ensuring both source range and intemiediate range channels have at least one decade of overlap by verifying both IR channels read $\geq 1x10^{-10}$ amps and both SR channels read on scale. This may occur before or after criticality. The basis for verifying the one decade of overlap is to provide assurance that the instrumentation (that will be used to monitor future reactivity additions) is responding as expected and is well into its normal range before the presently monitored instrumentation (that is being used to monitor current reactivity addition) is powered down.

If criticality is imminent below the ECP lower limit or criticality is not attained at the ECP upper limit, the unit will be placed in a stable, shutdown condition and the Reactor Engineer notified. The data used in the ECP calculation will be reviewed or verified. If the reason criticality was not attained within the ECP limits is NOT readily apparent, contact Nuclear Analysis and Fuel for resolution. SNSOC will review the reason for not attaining criticality within the ECP limits, new ECP calculations will be performed as required, and the startup will recommence.

Once criticality is achieved, reactor power is raised to and stabilized at 10^{-8} amps, so that critical data can be recorded. After the data is recorded, a check is performed to ensure blowdown of the hotwell is not in progress and if a second condensate pump is required. "hen power is increased to 5 percent or less and the stem dumps control the RCS temperature.

Control bank height should be about, or below, 120 steps at 10% power. This is due to a strong D Bank position effect on the Intermediate Range and Power Range Detectors. If D Bank rods are at 180 steps at 10% power, the IR Detector signal is approximately 25% greater than when the D Bank control rods are at 120 steps. The IR High Power Rod Stop and High Flux Trip setpoints were determined by the Reactor Engineer assuming D Bank was withdrawn 120 steps or less. Maintaining the control rods at this height at 10% power provides a larger margin to the IR High Power Rod Stop setpoint when power is increased and assist in preventing an inadvertent reinstatement of the low power trip setpoints due to quadrant tilt. If control rods are above this height while in Mode 2, then consideration should be given to diluting to achieve this rod height.

Chemistry Department will determine the Primary-Secondary leakrate in Modes 1-4 by measuring the concentration of tritium or other chemicals such as boron or lithium. Mode 2 entry is prohibited when Primary-to-Secondary leakrate exceeds Chemistry Department administrative limits.

2.0 REFERENCES

2.1 Source Documents

2.1.1 UFSAR, Sections 6, 7, 8, 9, and 10

2.2 Technical Specifications

2.2.1 Tech Spec 3.1.4

2.2.2 Tech Spec 3.1.5

2.2.3 Tech Spec 3.1.6

2.2.4 Tech Spec 3.1.7

2.2.5 Tech Spec 3.3.1

2.2.6 Tech Spec 3.3.1, Table 3.3.1-1

2.2.7 Tech Spec 3.3.2

2.2.8 Tech Spec 3.3.3

2.2.9 Tech Spec 3.4.2

2.2.10 Tech Spec 3.4.4

2.2.11 Tech Spec 3.4.17

2.2.12 Tech Spec 3.7.4

2.2.13 Tech Spec 3.7.5

2.3 **Technical References**

2.3.1 STD-GN-0008, Equipment Mark Numbers

2.3.2 DCP 88-01, Changed Unit 1 annunciators

2.3.3 Westinghouse Operating Procedures

2.3.4 Westinghouse Startup Procedures

2.3.5 NAPS PLS Document

2.3.6 OPAP-0004, Logs and Operating Records

2.3.7 Operating Procedures:

a. 1-OP-1C, Estimated Critical Position Calculation

b. 1-OP-1.5A, Mode Change Checklist Mode 3 to Mode 2

c. 1-OP-1.4, Unit Startup from Mode 3 to Mode 2

d. I-OP-2.1, Unit Startup from Mode 2 to Mode 1

e. 1-OP-3.1, Unit Shutdown from Mode 2 to Mode 4

f. 1-OP-8.3, Boron Concentration Control

g. 1-OP-28.3, Operation of the Moisture Separator Reheaters

h. 1-OP-58.1. Motor Generator Set Operation

i. 1-OP-58.2, Rod Control System Operation

j. 1-OP-58.4, Testing Reactor Trip Breakers

k. 1-OP-15.1, Operation of the Main Turbine

l. I-QP-1.7, Unit Startup From Mode 3 to Mode 2 Following Refueling

2.3.8 Periodic Test Procedures:

a. 1-PT-17.1, Control Rod Operability

b. 1-PT-30.1, NIS Intermediate Range Channel Operational Test

c. 1-PT-41.3, Safe Shutdown Equipment Control Location Verification

d. 1-PT-212.9, Valve Inservice Inspection (Main Steam)

e. 0-PT-92.0, Chi-square Test

f. 1-PT-30.5, NIS Source Range Channel Operational Test

g. 1-PT-30.7.1, Power Range Low Setpoint Channel I (N-41) Channel Operational Test

h. 1-PT-30.7.2, Power Range Low Setpoint Channel 11(N-42) Channel Operational Test

i. 1-PT-30.7.3, Power Range Low Setpoint Channel 111(N-43) Channel Operational Test

j. 1-IT-30.7.4, Power Range Low Setpoint Channel IV (N-44) Channel Operational Test

k. 1-PT-36.9, P-4 Interlock TADOT on Reactor Trip and Bypass Breakers

2.3.9 This procedure is referenced by the following emergency/abnormal procedures:

a. 1-ES-0.1, Reactor Trip Response

b. 1-ES-I.1, SI Termination

c. 1-ECA-0.1, Loss of All AC Power Recovery without SI Required

d. 1-AP-1.2, Dropped Rod

2.3.10 VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions

2.3.11 VPAP-1401, Conduct of Operations

2.3.12 Memorandum from R. M. Garver to M. D. Crist dated 02-09-94, AFW Testing Frequency Tech Spec Change Implementation (TS Change Request # 301)

2.3.13 Memorandum, R.G. McAndrew - J.R. Hayes, IR Rod Stop during recent Unit 2 Startup, June 29,1994 (see Revision 51 of 1-OP-2.1, Unit Startup From Mode 2 To Mode 1)

2.3.14 CH-93.130, Chemistry Controls: Unit Startup

2.3.15 DCP 96-005, P-250 Upgrade

2.3.16 DCP 01-005, ERF Computer System Replacement

2.3.17 DCP 01-007, Phase 2 PCS Installation and P-250 Removal - Unit 1

2.4 **Commitment Documents**

2.4.1 CTS Assignment 01-88-5141, Commitment 001

2.4.2 CTS Assignment 02-89-4056, Commitment 003, DK 89-1527

2.4.3 CTS Assignment 02-91-1802, Commitment 004, Revise procedures identified in COLR implementation Action Plan to include Tech Spec Amendment

2.4.4 CTS Assignment 02-91-0208, Commitment 002, Revise procedures to improve *SG* level control

2.4.5 DR N94-0084, Auto Stop Oil Reactor Trip Channel Functional Test methodology review, including memo from R. M. Garver to D. A. Heacock, dated 02-05-94 (Rev 42).

2.4.6 CTS Assignment 02-91-1805, Commitment 001, Tech Spec Amendment 149/133

2.4.7 CTS Assignment 02-91-2295, Commitment 001, Revise procedure to include recommendations of CNS Report No. 91-15-NAPS-E

2.4.8 SOER 91-01, Conduct of Infrequently performed Tests or Evolutions

2.4.9 CTS Assignment 02-92-2290, Commitment 002, Identify and revise applicable documents to maintain status control of Radiation Monitor Channel RMS-162.

2.4.10 CTS 02-92-2260, Item 113, Surveillance Review for TS 4.3.1.1.1, Table 4.3-1, Item 1

2.4.11 CTS Assignment 02-97-0200, Commitment 001, Reactor Vessel Level Dynamic Range Indication Inoperable on "A" Train Due to Procedural Error

2.4.12 CTS Assignment 02-96-4041, Commitment 007, implementation of TRMTR3.1

2.4.13 VPAP-2201, Nuclear Plant Chemistry Program, Table 27, Primary System Chemistry-Start-up

2.4.14 CTS Assignment 02-99-1801-003, Tech Spec Change 290

2.4.15 PI N-2000-1077, Transition from Mode 2 to Mode 1

3.0 INITIAL CONDITIONS

3.1 Reactor startup using 1-OP-1.7, Unit Startup From Mode 3 to Mode 2 Following Refueling, is NOT desired. (1-OP-1.7 is normally used for the initial startup following refueling as determined by the Reactor Engineer.)

3.2 The unit is at Hot Standby with one of the following completed:

- 1-OP-1.4, Unit Startup from Mode 4 to Mode 3
- 1-OP-3.1, Unit Shutdown from Mode 2 to Mode 3
- 1-ES-0.1, Reactor Trip Response, if recovering from a Reactor Trip
- 1-ECA-0.1, Loss of All AC Power Recovery without SI Required
- 1-ES-1.1, SI Termination, if recovering from a Reactor Trip and Safety Injection

3.3 The Condenser Steam Dump System is operable in STEAM PRESS Mode OR the Atmospheric Dumps are operable.

3.4 SGs are at normal operating levels.

3.5 Applicable steps of 1-OP-1C, Estimated Critical Position Calculation, have been completed.

3.6 The following PTs have been performed within the last 92 days:

- 1-PT-30.7.1, Power Range Low Setpoint Channel I (N-41) Channel Operational Test
- 1-PT-30.7.2, Power Range Low Setpoint Channel II (N-42) Channel Operational Test
- 1-PT-30.7.3, Power Range Low Setpoint Channel III (N-43) Channel Operational Test
- 1-PT-30.7.4, Power Range Low Setpoint Channel IV (N-44) Channel Operational Test
- 1-PT-30.1, NIS Intermediate Range Channel Operational Test
- 1-PT-30.5, NIS Source Range Channel Operational Test

3.7 All Reactor Coolant Loops are in operation with power removed from the Loop Stop Valve Operators.

3.8 The Shift Supervisor has conducted a Re-Job-Brief for starting up the Reactor plant with all of the individuals required to support this procedure as follows:

3.8.1 The following items and the items indicated on the Detailed Pre-Job Briefing Checklist, form No. 721961, have been discussed:

- I-OP-IC, Estimated Critical Position Calculation
- Avoidance of Control Room activities, such as high noise level, shift turnover, and surveillance testing, that could distract Operators and Supervisors involved with the startup
- IRPIs to Rod Bank Limits of Tech Specs
- 1-OP-1.5, Unit Startup from Mode 3 to Mode 2
- Strict procedural compliance and conservative Operator action required at all times
- Other pertinent details relating to the startup, such as Abnormal Status and Action Statements

3.8.2 A Detailed Pre-Job Briefing Checklist, form No. 721961, has been completed and is attached to this procedure.

3.8.3 A startup has been performed on the Simulator with conditions, such as core burnup, xenon and boron, modeled as close as possible, given the current simulator core model, to the expected conditions for unit criticality. IF desired to waive this step, THEN the Superintendent of Operations has approved the waiver.

3.9 The Control Rod fully withdrawn position is available from the Core Operating Limits Report. (Reference 2.4.6)

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Comply with the following guidelines when marking steps N/A:

- IF the conditional requirements of a step do not require the action to be performed, THEN mark the step N/A.
- IF any other step is marked N/A, THEN have the **Shift** Supervisor (or designee) approve the N/A and justify **the** N/A on the Procedure Cover Sheet.

4.2 **WHENEVER** positive reactivity is added to the core, THEN criticality should be anticipated.

4.3 Do NOT make sudden changes in the **RCS** temperature or boron concentration at low power or during **startup.**

4.4 IF the Control **Bank** Rods are withdrawn **and** criticality has NOT been achieved in **at** least 8 hours, THEN insert the Control **Bank Rods** and perform **a** Shutdown Margin Calculation.

4.5 WHEN RCS temperature is greater than 350°F, THEN Control Rod Drive Mechanism Cooling air is required.

4.6 Operations not requiring the completion of preceding steps may be performed out of sequence **at** the discretion of the **Shift** Supervisor.

4.7 The unit should not be taken critical outside the Administrative Limits for the Estimated Critical Position calculated in 1-OP-1C. IF criticality is imminent and the control rods are below the Low Administrative Limit OR Criticality was NOT attained with the control rods **at** the High Administrative Limit, THEN the unit should be placed in a stable shutdown condition AND the startup evaluated before criticality is again approached.

4.8 Consider uncertainties in the 1/M measurement before declaring criticality imminent below the Low Administrative ECP Limit This will avoid unnecessary halts in control rod withdrawal.

4.9 Changing plant conditions such as RCS temperature, Xenon worth, or RCS boron concentration may affect the ECP calculations.

4.10 The Chemistry Department will be contacted to obtain at least two RCS boron concentration samples which shall be taken from the same sample line at least 10 minutes apart. The first sample will be used in the ECP calculations and will be taken at least 20 minutes after any borations or dilutions to the RCS or make-up additions to the VCT. The last sample will be taken within two hours of pulling the control banks to begin the approach to criticality. The last sample must be within 10 ppm of the saniple used in the ECP calculations to ensure that the RCS boron concentration is not changing.

4.11 Starting up the Reactor plant is an evolution that has the potential to degrade safety due to the complexity of the process. Therefore this evolution is considered a Category II ICCE. **(Reference 2.3.10)**

4.12 ICCE controls must be established by satisfying the ICCE category II requirements in accordance with Section 6.2.4 of VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions. **(Reference 2.4.8)**

4.13 Unit 1 Rod Drive Room ventilation system should be in service and should maintain an acceptable Rod Drive Room temperature of ≤ 95°F.

4.14 The following requirements apply:

- Tech Spec **3.1.4,** Rod Group Alignment Limits
- Tech Spec 3.1.5, Shutdown **Rank** Insertion Limits
- Tech Spec **3.1.6,** Control **Bank** Insertion Limits
- Tech Spec **3.1.7,** Rod **Position** Indication Operating
- Tech Spec 3.3.1, Reactor Trip System Instrumentation
- Tech Spes **3.3.2,** ESFAS Instrumentation
- Tech Spec **3.3.3,** Post Accident Monitoring Instrumentation
- Tech Spec **3.4.2,** RCS **Minimum** Temperature for Criticality
- Tech Spec **3.4.4,** RCS Loops - Modes 1 and 2
- Tech Spec **3.4.17,** RCS Loop Isolation Valves
- Tech Spec **3.1.4,** Steam Generator PORVs
- Tech Spec **3.7.5,** Auxiliary Feedwater System

Init	Verif	
		5.0 INSTRUCTIONS
JY		**5.1** Verify that Initial Conditions are satisfied.
JY		**5.2** Review Precautions and Limitations.
JY		**5.3** Initiate 1-OP-1.5A, Mode Change Checklist Mode **3** to Mods 2.
		5.4 IF **RVLIS** dynamic range level indication was NOT checked in **1-OP-1.4,** Unit **Startup** From Mode **4 to** Mode **3,** THEN do the following: **(Reference 2.4.11)**
N/A		**5.4.1** Check the RVLIS dynamic range level indication for Train **A** and Train B.
		5.4.2 IF either RVLIS dynamic range level indication **is** NOT indicating **98%** to **102%,** THEN do the following:
N/A		• IF either **RVLIS** dynamic range level indication is indicating less than **96%** OR greater than 104%, THEN declare the out **of** tolerance RVLIS Train inoperable and enter the Action of Tech Spec **3.3.3** AND initiate a Work Request to have the out **of** tolerance RVLIS Train normalized.
N/A		• IF either **RVLIS** dynamic range level indication **is** indicating 96% to less than **98%** OR greater than **102%** to 104%, THEN initiate **a** Work Request to have the out **of** tolerance RVLIS Train normalized.
N/A		**5.5** IF **1-PT-212.9,** Valve Inservice Inspection (Main Steam), has NOT been done in the last **31** days AND the unit has been in Mode **5,** THEN do **1-PT-212.9.**

NOTE The Manipulator Crane Radiation Monitor is normally disabled at power to avoid damaging the detectors.

N/A 5.6 IF desired, THEN verify that the Instrument Department has disabled 1-RM-RMS-162using 1-IPM-RPS-G-001, Instrument Systems Setup And Recovery For Modes 5 and 6. **(Reference** 2.4.9)

5.7 Verify Turbine Stop Valves are closed by verifying the following: **(Reference 2.4.5)**

JY • Panel N A-1, MAIN TURB STOP VLV NO. 1 CLSD, is LIT.

JY • Panel N A-2, MAIN TURB STOP VLV NO. 2 CLSD, is LIT.

JY • Panel N A-3, MAIN TURB STOP VLV NO. 3 CLSD, is LIT.

JY • Panel N A-4, MAIN TURB STOP VLV NO. 4 CLSD, is LIT.

JY • Computer readout Y0391D is in ALARM.

JY • Computer readout Y0393D is in ALARM.

JY • Computer readout Y0392D is in ALARM.

JY • Computer readout Y0394D is in ALARM.

5.8 Verify Auto Stop Oil pressure is less than setpoint by verifying the following:

JY • Panel N B-1, TURB AUTO STOP OIL **LO** PRESS CHNL **I,** is LIT.

JY • Panel N B-2, **TURB** AUTO STOP OIL LO PRESS **CHNL** II, **is** LIT.

JY • Panel N B-3, **TURB AUTO** STOP OIL LO PRESS **CHNL** III, is **LIT.**

JY 5.9 Do 1-IT-41.3, Safe Shutdown Equipment Control Location Verification.

JY 5.10 Verify the Reheat Steam System is aligned for startup using 1-OP-28.3, Operation of the Moisture Separator Reheaters.

NOTE Performance of Attachment **1,** Secondary Drains Level Control Valve Operability Checklist, may not be required for short duration shutdowns.

N/A 5.11 IF required, THEN initiate Attachment **1,** Secondary Drains Level Control Valve Operability Checklist. IF NOT required, THEN mark **this** step N/A.

5.12 IF this procedure has been entered upon completion **of** 1-ES-0.1, Reactor Trip Response or 1-ES-1.1, **SI** Termination, THEN do the following:

N/A 5.12.1 Reset the **NIS** Rate Trips, one for each drawer, as required.

N/A 5.12.2 Reset the FW Bypass Valve Reset buttons for Train **A and** Train B.

5.13 IF the Reactor Trip Breakers ape open, THEN to prevent tripping the PCS Computer Historical File, have the STA verify the following PCS Computer Points are DELETED FROM PROCESSING:

	Point ID	ID Mark No.	Description
STA	• X1RD033D	52-BYB	Bypass Reactor Trip Breaker
STA	• X1RD035D	52-RTA	Reactor Trip Breaker
STA	• X1RD034D	52-BYA	Bypass Reactor Trip Breaker
STA	• X1RD036D	52-RTB	Reactor Trip Breaker

N/A 5.14 IF the Reactor Trip Breakers are open AND have NOT been tested in the last 7 days, THEN test the breakers using 1-OP-58.4, Testing Reactor Trip Breakers.

NOTE: The following step is a surveillance required for each cycle of the reactor trip breakers for Tech Spec SR 3.3.2.10, Trip Actuating Device Operational Test (TADOT) for the P-4 interlock as required by Tech Spec 3.3.2, Table 3.3.2-1, Item 8a.

N/A 5.15 IF the reactor trip breakers ape open, THEN perform the "open breaker" sections of 1-PT-36.9, P-4 Interlock TADOT on Reactor Trip and Bypass Breakers, for Train "A" and Train "B".

5.16 Verify the following Reactor Trip Instrumentation is operable prior to control rods being capable of withdrawal. (Reference 2.4.10)

SRO • Manual Reactor Trip

SRO • Source Range

SRO • Intermediate Range

SRO • Reactor Trip Breakers

SRO • Bypass Trip Breakers

SRO • Automatic Trip Logic

5.17 Place one Rod Control MG Set in operation using 1-OP-58.1, Motor Generator Set Operation.

5.18 Close the Reactor Trip Breakers.

NOTE The following step is a surveillance required for each cycle of the reactor trip breakers for Tech Spec SR 3.3.2.10, Trip Actuating Device Operational Test (TADOT) for the P-4 interlock as required by Tech Spec 3.3.2, Table 3.3.2-1, Item Xa.

5.19 WHEN the reactor trip breakers are closed, THEN perform the "ciosed breaker" sections of 1-PT-36.9, P-4 Interlock TADOT on Reactor Trip and Bypass Breakers, for Train "A" and Train "B".

JY

5.20 IF available, THEN place the second Rod Control MG Set in operation **using 1-OP-58.1, Motor** Generator Set Operation.

5.21 IF the **Startup** Reset Buttons for Group Step Counters and Control System Logic have NOT been reset, THEN perform the following:

JY

5.21.1 Ensure Rod Control switch is in manual.

JY

5.21.2 Simultaneously push both Startup Reset buttons for the Group Step Counters and Control System Logic.

JY

5.22 Place **the** highest reading Source Range Channel and the highest reading Intermediate Range Channel on **NR-4%** at fast speed.

NOTE: Control Rods should NOT be moved until RCS total suspended solids are within the limits of CH-93.130, Chemistry Controls: Unit Startup. **(Reference 2.3.14)**

N/A

5.24 IF one of the following conditions applies, THEN verify the Reactor Coolant sample obtained in **1-OP-1.4,** Unit Startup from Mode **4** to Mode **3, is** within limits:

- The **RCS** has been shutdown for maintenance and Hydrogen Peroxide has been added to the RCS.
- All RCPs have been stopped.

JY

5.24 Perform **1-PI'-17.1,** Control Rod Operability, as Control Rods are being pulled.

JY

5.25 Withdraw the Shutdown **Rod** Banks using **1-OP-58.2,** Rod Control System Operation.

JY

5.26 Block the High **Flux** at Shutdown **Alarm.**

CAUTION

Chemical addition through the Chemical Mixing Tank is NOT allowed during Reactor startup. Chemical Addition will cause a dilution of the boron concentration in the Reactor Coolant system because PG is used to flush the chemicals from the Chemical Mixing Tank into the CVCS system.

NOTE: Due to the effects of dilution during startup, the reactor coolant dissolved hydrogen concentration may range between 15 and 25 cc/Kg. Although the Action level clock **starts** at < 25 cc/Kg, startup should continue as long as the hydrogen concentration is ≥ 15cc/Kg. (Reference **2.4.10)**

5.27 Do the following:

5.27.1 Contact Chemistry Department to determine if lithium hydroxide or other RCS chemical addition is required at this time OR will be required during the time that the Reactor startup is projected ***to*** occur.

5.27.2 IE lithium hydroxide or other RCS chemical addition is required, THEN coordinate with Chemistry Department and ensure that all additions are completed prior to commencing the Reactor startup.

&

5.27.3 Gas the VCT as required to maintain adequate hydrogen concentration in the RCS.

5.28 Verify 1-OP-1C, Estimated Critical Position Calculation, has been completed through the review requirements.

5.29 Dilute OR borate the RCS **as** determined by I-OP-IC.

CAUTION

0-PT-92.0, Chi-square Test, cannot be perfomed during control rod movement OR borations or dilutions to the RCS.

5.30 Nave the STA or Engineer do 0-PT-92.0, Chi-square Test, on each Source Range Detector.

STA/ENG

- N-31, CH-I Source Range Detector

STA/ENG

- N-32, CH-II Source Range Detector

SRO

5.31 Have an SRO verify that 1-OP-1.5A, Mode Change Checklist Mode 3 to Mode 2, has been completed.

5.32 Verify 1-OP-1C, Estimated Critical Position Calculation, is current within 4 hours of projected criticality.

5.33 Verify any changes in unit conditions such as RCS temperature, borations or dilutions to the RCS, or Xenon worth have NOT affected the Estimated Critical Rod Position. **(Reference 2.4.7)**

SS

5.34 Have the Shift Supervisor evaluate on going Secondary Plant evolutions for possible adverse effects on feed flow to the Steam Generators and thus an adverse effect on RCS temperature. IF any evolution could adversely effect Steam Generator feed flow, THEN secure the evolution. **(Reference 2.4.15)**

NOTE: The following step must be performed prior to entering Mode 2.

5.35 Do the following to ensure that the Automatic Rod Position Deviation Monitor will be operating:

5.35.1 IF the Unit 1P-250 Computer has NOT been removed by DCP 01-007, THEN do the following:

N/A a. Using the "PRINT VALUE" function, print the value for the Unit 1 P-250 computer constant K0839, Low Temperature Cutoff Point.

N/A b. Verify that the Unit 1 P-250 computer constant K0839 is set at 400.

N/A SV c. IF K0839 is NOT set to 400 on the Unit 1 P-250, THEN using the "ENTER VALUE" function, set K0839 to 400.

5.35.2 Do the following at the Unit 1 PCS:

JY a. Display the value for K0839.

N/A SV b. IF K0839 is NOT set to 400, THEN perform Attachment 6, Setting K0839 To 400 On Unit 1 PCS.

5.36 Have the STA verify the following PCS Computer Points are RESTORED TO PROCESSING:

	Point ID	ID Mark No.	Description
STA	• X1RD033D	52-BYB	Bypass Reactor Trip Breaker
STA	• X1RD035D	52-RTA	Reactor Trip Breaker
STA	• X1RD034D	52-BYA	Bypass Reactor Trip Breaker
STA	• X1RD036D	52-RTB	Reactor Trip Breaker

5.37 Record the following information from 1-OP-1C: **(References 2.4.3 and 2.4.7)**

JY • Estimated Time of Criticality: 1 hr from now

JY • Applicable Time Interval for ECP: 1 hr ago To 2 hrs from now

JY • Lower limit: Steps 42 **Bank** D

JY • Predicted position: steps 100 **Bank** D

JY • **Upper limit:** **Steps** 125 **Bank** D

JY • Low-Low Insertion Limit Steps C Bank 118

JY 5.38 Record the Rod Height from the Core Operating Limits Report: Control Rod fully withdrawn position: 228 steps **(Reference 2.4.6)**

5.39 Review the following:

JY 5.39.1 Within **15** minutes of withdrawing any rods in Control Ranks A, B, C, or **D** when approaching Reactor Criticality, the Shutdown Rod **Banks** must be verified to be fully withdrawn.

JY 5.39.2 The lowest operable RCS T_{ave} must be at least **541°F** within **30** minutes of achieving Reactor Criticality.

JY 5.39.3 Criticality must be anticipated at any time during a positive reactivity addition.

JY 5.39.4 A licensed CRO or SRO will always directly control the withdrawal of Control Rods to achieve Criticality.

5.39.5 IF criticality will be achieved with Control **Rods** below the Rod Insertion Limit, THEN the following must be done immediately:

_____ a. Start a boration of at least 10 gpm and continue until the required SDM is restored.

_____ b. Insert all Control Banks to Zero steps.

_____ c. **Perform 1-PI'-10,** Shutdown Margin Determination.

_____ d. Enter the Action Statement of Tech Spec **3.1.6** for Surveillance Requirement 3.1.6.1.

_____ e. Notify the Superintendent of Operations or the Operations Manager On Call before continuing.

CAUTION

Uncertainties in the 1/M measurement should be considered before declaring criticality imminent.

_____ 5.39.6 IF criticality is imminent below the ECP Lower Limit, THEN **GO TO** Attachment **2,** Criticality Imminent Below The ECP Lower Lnnit.

_____ **5.39.7** WHEN approaching criticality. THEN all attendant instrumentation, such as NIs, **NR-45,** audio count-rate, annunciators, and IRPIs, must be closely monitored.

_____ 5.39.8 To allow neutron indication to stabilize, continuous rod motion must be minimized and enough time must elapse between rod withdrawals to allow the neutron population to stabilize **during** the approach to criticality.

_____ 5.39.9 The **STA** and the Reactor Engineer must be. present in the Control Room during Reactor Startup, in accordance with **TAP-1404.**

5.40 Notify the Reactor Engineer to initiate trending of Intermediate Range Detector response data.

NOTE: Due to the effects of dilution during startup, the reactor coolant dissolved hydrogen concentration may range between 15 and 25 cc/Kg. Although the Action level clock starts at < 25 cc/Kg, startup should continue as long as the hydrogen concentration is ≥15 cc/Kg. **(Reference 2.4.13)**

5.41 Ensure that the reactor coolant dissolved hydrogen concentration 215 cc/Kg. **(Reference 2.4.13)**

NOTE: Starting up the Reactor plant from Mode 3 to Mode 2 is an evolution that has the potential to degrade safety due to the complexity of the process. Therefore this evolution is considered a Category II ICCE. **(Reference 2.3.10)**

5.42 Have the Shift Supervisor establish ICCE controls using VPAP-0108, Infrequently Conducted or Complex Tests or Evolutions, as follows: **(Reference 2.4.8)**

SS

5.42.1 Activate the Operations and Test Organization for Performing an ICCE, as outlined in Attachment 1 of VPAP-0108.

SS

5.42.2 Ensure the ICCE Category II requirements as outlined by Section 6.2.4 of VPAP-0108, are satisfied.

SS

5.42.3 Ensure the Management Expectations Pre-Job Briefing Checklist for an ICCE, (form No. 722089) of VPAQ-0108, is completed by the Operations Manager on Cali, in charge of this ICCE, and the form is attached to this procedure.

SS

5.42.4 Conduct a Re-Job-Brief for starting up the Reactor plant from Mode 3 to Mode 2 and complete a Detailed Pre-Job Briefing Checklist, (front and back of form No. 721961) of VPAP-1401, Conduct of Operations, and attach to this procedure. **(Reference 2.3.11)**

5.43 Begin Reactor Startup as follows:

_____ **5.43.1** Plot the Rod Height information of Step **5.37** on the horizontai axis (0.0) of Attachment **7,** 1/M Plot.

_____ **5.43.2** Initiate Attachment **5,** Reactor Startup Data Sheet, AND record data every **15** minutes until criticality is reached.

_____ **5.43.3** Announce on the Gai-Tronics: Attention all personnel, unit 1 Reactor Startup is Commencing. Attention all personnel, Unit 1 Reactor Startup is Commencing.

5.43.4 Start withdrawing Control Rods as follows:

_____ a. Record **starting** time: _____

NOTE: IF any Control Rod *is* known to be greater than **12** steps out of alignment, THEN appropriate action must be taken to return the Control Rod to within **12** steps.

_____ **b.** Hold Rod Control Lever in the OUT direction and verify the following:

- IRPIs are within **24** steps of the Group Step Counters.
- Group 1 and Group **2** are within **1** step **of** each other.
- IRPIs indicate rods are moving in the OUT direction.

_____ c. WHEN Control Bank **A** indicates **129** steps, THEN verify Control Bank B is moving OUT.

_____ d. WHEN Control **Rank** A is at the fully withdrawn position as recorded *in* Step 5.38, THEN stop rod withdrawal. **(Reference 2.4.6)**

_____ e. Record entering Mode **2** in the **Unit** 1-narrative **log.**

5.43.5 Record initial 1/M data on Attachment 7, 1/M Plot.

_____ 5.43.6 WHEN I x 10^{-10} amps is indicated OR both Intermediate Range Channels, THEN stop rod withdrawal and GO TO Attachment 4, Deenergizing Source Range NI Detectors.

5.43.7 Continue rod withdrawal and do the following steps as the conditions occur:

_____ a. WHEN Control Bank B indicates 129 steps, THEN verify Control Bank C is moving OUT.

_____ b. WHEN Control Bank B is fully withdrawn, THEN verify the position is the same as recorded in Step 5.38. **(Reference 2.4.6)**

_____ c. BEFORE withdrawing Control Bank D, estimate what time the unit should attain criticality.

_____ d. IF it appears that the Unit will attain criticality outside the Applicable Time Interval recorded in Step 5.37 AND additional ECP calculations are available from 1-OP-1C, THEN do the following:

1. Record the following information below:

_____ • Estimated Time of Criticality:_____

_____ • Applicable Time Interval for ECP calculation: _____To _____

_____ • Lower limit: steps _____Bank_____

_____ • Predicted position: Steps _____Bank_____

_____ • Upper limit: Steps _____Bank_____

_____ 2. Plot the Rod Height information on the horizontal axis (0.0) of Attachment 7.

_____ e. WHEN the initial count rate recorded on Attachment 7 approximately doubles, THEN do the following:

1. Stop rod withdrawal.
2. Allow count rate to stabilize.
3. Record and plot the 1/M data on Attachment 7.
4. Continue rod withdrawal until the count rate recorded in Step 5.43.7.e.3 approximately doubles.
5. Stop rod withdrawal.
6. Allow count rate to stabilize.
7. Record and plot the 1/M data on Attachment 7.
8. Continue rod withdrawal and plotting 1/M data until rods are within the ECP Window.

_____ f. WHEN Control Bank C indicates 129 steps, THEN verify Control Bank D is moving OUT.

_____ g. WHEN Control Bank C is fully withdrawn, THEN verify the position is the same as recorded in Step 5.38. (Reference 2.4.6)

_____ 5.44 IF the Reactor is NOT critical at the ECP Upper Limit, THEN GO TO Attachment 3, Criticality Not Achieved Below The ECP Upper Limit.

_____ 5.45 IF the Reactor is critical within the ECP band, THEN record the time Reactor Criticality was achieved

Date ___-_____ Time: _____

5.46 IE the Reactor is critical with T_{ave} less than 547° F AND Annunciator Panel B-A7, Median / Hi T_{ave} <> T_{ref} Deviation, is LIT, THEN do the following:

_____ 5.46.1 Continue to verify T_{ave} is at least 541° F.

_____ 5.46.2 Record the temperature on Attachment **5** every 30 minutes **until** T_{ave} exceeds 547°F OR Annunciator Panel B-A7, Median / Hi T_{ave} <> T_{ref} Deviation, resets.

_____ 5.47 Establish a stable SUR of less than 1 dpm.

_____ 5.48 Level the neutron flux at approximately 1 x IO-* amps as indicated on the highest reading Intermediate Range Channel.

5.49 Do the following:

_____ 5.49.1 Have Chemistry Department obtain an RCS boron sample.

_____ 5.49.2 Record the following Critical Conditions:

- Date and Time _____
- Control **Bank** C position: _____ steps
- Control **Bank** D position: _____ steps
- Median/Hi T_{ave}: _____ °F
- Intermediate Range N35: _____ amps
- Intermediate Range N36: _____ amps
- RCS Boron Concentration: _____ ppm

_____ 5.49.3 Record the Critical Rod height and RCS Boron **Concentration** in the Unit 1 Narrative Log. (Reference **2.3.5**)

_____ 5.50 Place the highest reading Intermediate Range and Power Range. Channels on NR-45.

_____ 5.51 IF Startup Physics Testing will be performed, THEN place NR-45 in slow speed.

_____ 5.52 Select the highest reading Intermediate Range Channel on the Startup Rate Channel Selector Switch.

_____ 5.53 IF this is the initial startup following refueling, THEN perform the required Startup Physics Testing.

_____ 5.54 IF Startup Physics Testing was performed, THEN place NR-45 in fast speed.

_____ 5.55 Prior to increasing Reactor power ensure hotwell blowdown is secured in accordance with 1-OP-30.1, Operation Of Condensate System, Section for Control of Hotwell Chemistry Using Bleed and Feed. **(Reference 2.4.15)**

_____ 5.56 Prior to increasing Reactor power above the point of adding heat, perform a walkdown of the Secondary System evaluating the need to start a second Condensate pump based on the following parameters: **(Reference 2.4.15)**

- Condensate Pump discharge pressure
- Condensate Recirculation valve position
- condensate Recirculation flow
- Feedwater header pressure
- Feedwater Recirculation valve position
- Feedwater flow

NOTE: Control Bank D height should be below about 120 steps at 10% power. This will reduce the potentia1 of the Intermediate Range Rod Stop actuating before placing the Intermediate Range Block Switches in BLOCK. Consideration should be given, at this time, to insert Control Rods and dilute while maintaining Reactor Power Constant. **(Reference 2.3.13)**

NOTE: Startup rate should be low during approach to POAH (approximately 2×10^{-6} amps on the Intermediate Range detectors) ideally 0.1 to 0.2 dpm.

_____ 5.57 Increase Reactor Power to 5 percent or less as indicated on the highest reading Power Range Channel, then stabilize Reactor Power.

_____ 5.58 Place the power (toggle) switch on the Source Range NI Scaler / Timer drawer to the OFF (down) position.

5.59 Place NR-45 in slow speed.

_____ 5.60 Observe the Stem Dump System for proper response.

5.61 Open the following MSR I-inch Warm-up Valves: **(Reference 2.4.4)**

_____ • I-MS-473, A MSR

• 1-MS-474. B MSR

• 1-MS-475, C MSR

_____ • I-MS-476, D MSR

_____ 5.62 IF Attachment I was initiated, THEN verify Attachment 1, Secondary Drains Level Control Valve Operability Checklist, has been complete or is complete to the extent necessary to support continued plant operation. IF Attachment 1 was not required, THEN mark this step N/A.

5.63 Close the following valves to ensure an adequate. Bearing Cooling System pressure is maintained to secondary components:

_____ • I-BC-268, Inlet Isolation Valve to Flash Evaporator bypass, I-BC-TV-103

_____ • 1-BC-269, Outlet Isolation Valve to Flash Evaporator bypass, 1-BC-TV-103

_____ OMOC 5.64 Have the Operations Manager On Call (OMOC), activated in Step 5.42, evaluate relaxing ICCE controls established in Step 5.42.

_____ 5.65 GO TO 1-OF-2.1, Unit Startup from Mode 2 to Mode 1, or 1-OF-3.1, Unit Shutdown from Mode 2 to Mode 3.

Completed by: _____ Date: _____

(Page 1 of 5)

Attachment 1

Secondary Drains Level Control Valve Operability Checklist

NOTE: This Attachment may be N/A for short duration shutdowns. See Step 5.11 of procedure text.

I. Verify the Secondary Drain System LCVs listed below are properly aligned and indicate supply air pressure. IF air pressure is NOT indicated, THEN determine the cause and align air supply.

2. Have an Instrument Technician verify valve movement.

Init	Verif			Init	Verif		
		1-SD-LCV-100A				**1-SD-LCV-100B**	
_____		1-SD-24.5 Inlet	*CLOSED	_____		1-SD-309 Inlet	*CLOSED
_____		I-SD-246 Outlet	OPEN	_____		1-SD-310 Outlet	OPEN
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____		HLD Controlling	YES	_____		HLD Controlling	YES
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-101A				**1-SD-LCV-101B**	
_____		1-SD-248 Inlet	OPEN	_____		1-SI)-312 Inlet	OPEN
		1-SD-249 Outlet	OPEN	_____		1-SD-313 Outlet	OPEN
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-100C				**1-SD-LCV-100D**	
_____		1-SD-278 Inlet	*CLOSED	_____		1-SD-342 Inlet	OPEN
_____		1-SD-279 Outiet	OPEN	_____		1-SD-343 Outlet	*CLOSED
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____		HLD controlling	YES	_____		HLD Controlling	YES
_____ INST		Vaive Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-101C				**1-SD-LCV-101D**	
_____		1-SD-282 Inlet	OPEN	_____		1-SD-346 Inlet	OPEN
_____		1-SD-283 Outlet	OPEN	_____		1-SD-347 Outlet	OPEN
_____		Suppy Air	INDICATED	_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Vdve Movement	YES

NOTE: * Valve position established in 1-QP-28.4, Startup of the Moisture Separator Reheaters.

(Page 2 of 5)

Attachment 1
Secondary Drains Level Control Valve Operability Checklist

Init	Verif			Init	Verif		
		1-SD-LCV-106A				1-SD-LCV-106B	
_____		1-SD-13 Inlet	OPEN	_____		1-SD-30 Inlet	OPEN
_____		1-SD-14 Outlet	OPEN	_____		1-SD-31 Outlet	OPEN
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-106C				1-SD-LCV-107C	
_____		1-SD-47 Inlet	OPEN	_____		1-SD-114 Inlet	OPEN
_____		1-SD-48 Outlet	OPEN	_____		1-SD-115 Outlet	OPEN
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-107A				1-SD-LCV-107B	
_____		1-SD-72 Inlet	OPEN	_____		1-SD-94 Inlet	OPEN
_____		I-SD-73 Outlet	OPEN	_____		1-SD-95 Outlet	OPEN
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-103A				1-SD-LCV-103B	
_____		1-SD-138 Inlet	*CLOSED	_____		1-SD-168 Inlet	*CLOSED
_____		1-SD-I39 Outlet	OPEN	_____		1-SD-169 Outlet	OPEN
_____		Suppy Air	INDICATED	_____		Supply Air	INDICATED
_____		HLD Controlling	YES	_____		HLD Controlling	YES
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES

NOTE: * Valve position established in 1-OP-2.1, Unit Startup from Mode 2 to Mode 1.

(Page 3 of 5)

Attachment 1
Secondary Drains Level Control Valve Operability Checklist

Init	Verif		
		1-SD-LCV-142A	
_____		1-SD-140 Inlet	OPEN
_____		1-SD-141 Outlet	OPEN
_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES
		1-SD-LCV-143A	
_____		1-SD-192 Inlet	OPEN
_____		I-SD-193 Outlet	OPEN
_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES
		1-SD-LCV-128A	
_____	_____	1-SD-407 Inlet	OPEN
_____	_____	I-SD-408 Outlet	OPEN
		Supply Air	INDICATED
_____ INST		Valve Movement	YES
		1-SD-LCV-124A	
		I-SD-458 Inlet	OPEN
		1-SD-459 Outlet	OPEN
_____		Supply Air	INDICATED
INST		Value Movement	YES
		1-SD-LCV-123A	
		1-SD-397 Inlet	OPEN
		1-SD-398 Outlet	OPEN
		Supply Air	INDICATED
INST		Valve Movement	**YES**

Init	Verif		
		1-SD-LCV-142R	
		I-SD-170 Inlet	OPEN
		1-SD-171 Outlet	OPEN
		Supply Air	INDICATED
_____ INST		Valve Movement	YES
		1-SD-LCV-143B	
_____		1-SD-215 Inlet	OPEN
_____		1-SD-216 Outlet	OPEN
		Supply Air	INDICATED
_____ INST		Valve Movement	YES
		1-SD-LCV-128R	
_____		1-SD-409 Inlet	OPEN
_____	_____	1-SD-410 Outlet	OPEN
_____	_____	Supply Air	INDICATED
_____ INST		Valve Movement	YES
		1-SD-LCV-124B	
_____		1-SD-549 Inlet	OPEN
		1-SD-580 Outlet	OPEN
		Supply Air	INDICATED
_____ INST		Value Movement	YES
		1-SD-LCV-123R	
		1-SD-403 Inlet	OPEN
		1-SD-404 Outlet	OPEN
		Supply Air	INDICATED
_____ INST		Valve Movement	YES

(Page 4 of 5)

Attachment 1
Secondary Drains Level Control Valve Operability Checklist

Init	Verif			Init	Verif		
		1-SD-LCV-121A				**1-SD-LCV-121B**	
		1-SD-395 Inlet	OPEN	_____		1-SD-401 Inlet	OPEN
		1-SD-396 Outlet	OPEN	_____		1-SD-402 Outlet	OPEN
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-120A				**1-SD-LCV-120B**	
_____		1-SD-393 Inlet	OPEN	_____		1-SB-399 Inlet	OPEN
_____		1-SD-394 Outlet	OPEN	_____		1-SD-400 Outlet	OPEN
_____		Supply Air	INDICATED			Supply Air	INDICATED
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES
		1-SD-LCV-122A				**1-SD-LCV-122R**	
_____		1-SD-355 Inlet	OPEN	_____		I-SD-373 Inlet	OPEN
_____		1-SD-356 Outlet	*CLOSED	_____		1-SD-374 Outlet	*CLOSED
_____		Supply Air	INDICATED	_____		Supply Air	INDICATED
_____		HLD Controlling	YES			HLD Controlling	YES
_____ INST		Valve Movement	YES	_____ INST		Valve Movement	YES

NOTE Valve position established in I-OP-34.1.1, Low Pressure Heater Brain System Startup.

(Page 5 of 5)

Attachment 1
Secondary Drains Level Control Valve Operability Checklist

This list of mark numbers and noun names is provided for reference.

MARK NUMBER	NOUN NAME
1-SD-LCV-100 A/B/C/D	Reheater Drain Receiver Normal Level Control
1-SD-LCV-101 A/B/C/D	Reheater Drain Receiver High Level Divert
1-SD-LCV-103 A/B	1A/B FW Htr Normal Level Control
1-SD-LCV-142 A/B	1A/B FW Htr High Level Divert
1-SD-LCV-143 A/B	2A/B FW Htr High Level Divert
1-SD-LCV-106 A/B	2A/B FW Htr Drain Receiver Normal Level Control (HP Drain Pump Disch)
1-SD-LCV-106 C	MSR Drain Receiver Normal Level Control (HP Drain Pump Disch)
1-SD-LCV-107 A/B	2A/B FW Htr Drain Receiver High Level Divert
1-SD-LCV-107 C	MSR Drain Receiver High Level Divert
1-SD-LCV-120 A/B	3A/B FW Htr Normal Level Control
1-SD-LCV-121 A/B	3A/B FW Htr High Level Divert
1-SD-LCV-122 A/B	4A/B FW Htr Normal Level Control
1-SD-LCV-123 A/B	4A/B FW Htr High Level Divert
1-SD-LCV-124 A/B	5A/B FW Htr Normal Level Control
1-SD-LCV-128 A/B	5A/B FW Htr High Level Divert

(Page I of 1)

Attachment 2
Criticality Imminent Below The ECP Lower Limit

IF criticality is imminent below the ECP Lower Limit, THEN do the following:

_____ 1. Insert all Control Banks *to* Zero steps.

2. Continue to record temperature and Shutdown Bank data on Attachment *5.*

_____ 3. Perform 1-PT-10, Shutdown Margin Determination.

_____ SS 4. Before continuing, notify the Superintendent of Operations or the Operations Manager On Call.

_____ SS 5. Notify Reactor Engineering.

_____ STA/ENG 6. Review or verify data used to calculate 1-OP-1C.

SS 7. Evaluate the cause. IF the cause is NOT readily apparent, THEN contact Nuclear Analysis and Fuel for resolution.

_____ SS 8. Record the reason for imminent criticality below the ECP Lower Administrative Limits:

_____

_____

SS 9. Wave SNSOC review the reason for imminent criticality outside the ECP Window.

10. IF required, THEN perform 1-OP-IC using new data.

(Page 1 of 1)

Attachment 3
Criticality Not Achieved Below The ECP Upper Limit

IF the Reactor is NOT critical at the ECP Upper Limit, THEN do the following:

_____ 1. Insert all Control Banks to Zero steps.

_____ 2. Continue to record temperature and Shutdown Bank data on Attachment 5.

_____ SS 3. Notify Reactor Engineering.

_____ STA/ENG 4. Review or verify data used to calculate 1-OP-1C.

_____ SS 5. Evaluate the cause, IF the cause is NOT readily apparent, THEN contact Nuclear Analysis and Fuel for resolution.

SS 6. Record the reason why criticality was missed:

_____

_____

_____

_____ SS 7. Rave SNSOC review the reason for the missed Reactor Criticality.

_____ 8. IF required, THEN perform 1-OP-1C using new data.

(Page 1 of 2)

Attachment 4
Deenergizing Source Range NI Detectors

WHEN 1 x 10^{-10} amps is indicated on both Intermediate Range Channels, THEN do the following:

1. Verify the following:

   - Panel L F-1, NIS IR > 10^{-10} TRIP PERM P-6 CHNL I, is LIT.

   - Panel L F-2, NIS IR > 10^{-10} TRIP PERM P-6 CHNL II, is LIT.

   - Panel P D-1, P-6 PERM IR > 10^{-10} BLK SR TRIP, is LIT.

2. Ensure 1 decade of overlap exists between both pair of NI channels by verifying the following:

   - Both IR Channels indicate ≥ 1×10^{-10} amps

   - Both SR Channels indicate on scale

3. Place both SOURCE RANGE BLOCK AND RESET switches in BLOCK.

4. Verify the loss of Source Range Detector Voltage.

5. Place both Intermediate Range Channels on NR-45 at fast speed.

6. Using the STARTUP RATE CHANNEL SELECTOR switch at the COMPARATOR AND RATE drawer, select the highest reading Intermediate Range Detector. Mark the remaining channel N/A.

   - N-35

   - N-36

(Page 2 of 2)

Attachment 4
Deenergizing Source Range NI Detectors

7. Do one of the following:

   - IF the Reactor is NOT Critical, THEN RETURN TO Step 5.42.

   - IF the Reactor is Critical, THEN GO TO Step 5.45.

(Page 1 of 1)

Attachment 5
Reactor Startup Data Sheet

Every 15 minutes until criticality is achieved, log Shutdown Rank rod position and lowest operating loop RCS T_{ave}.

Acceptable Conditions: Shutdown Rods fully withdrawn AND lowest operating loop T_{ave} at least 541° F.

Time	SDBA Steps	SDBB Steps	Lowest Tave

(Page 1 of 1)

Attachment 6

Setting K0839 To 400 On Unit 1 PCS

_____ _____ SV 1. Select Points, by Point ID.

_____ _____ SV 2. Type in K0839, then press OK.

_____ _____ SV 3. Left click on the K0839 value.

_____ _____ SV 4. Right click on the KO839 value.

_____ _____ SV 5. Select Update Constant.

_____ _____ SV 6. Backspace to erase the old value.

_____ _____ SV 7. Type in 400.

_____ _____ SV 8. Fill out the changed _y and reason _oxes at the bottom.

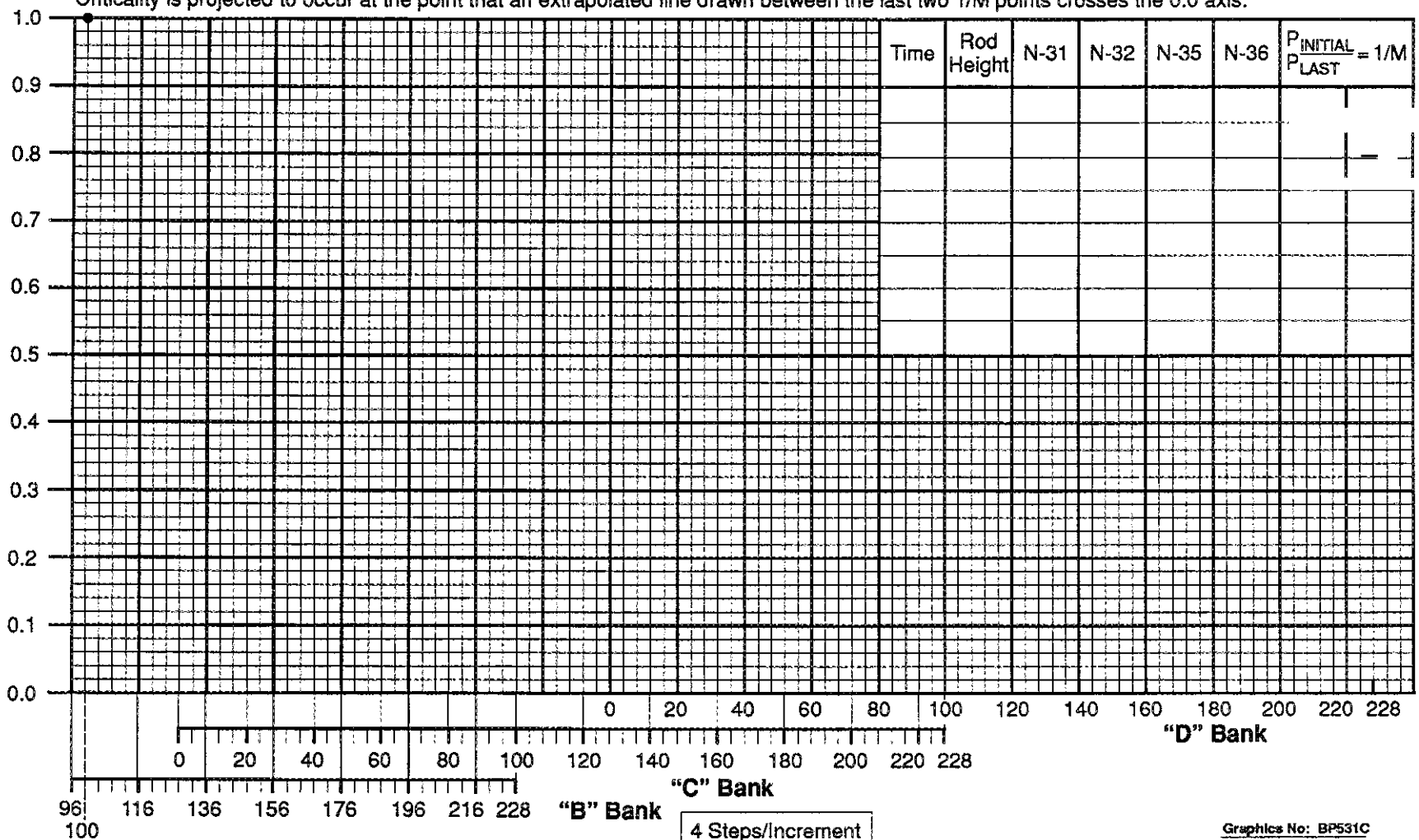
_____ _____ SV 9. Select Execute

(Page 1 of 1)

Attachment 7

1/M Plot

Criticality is projected to occur at the point that an extrapolated line drawn between the last two 1/M points crosses the 0.0 axis.



Time	Rod Height	N-31	N-32	N-35	N-36	$\frac{P_{INITIAL}}{P_{LAST}} = 1/M$

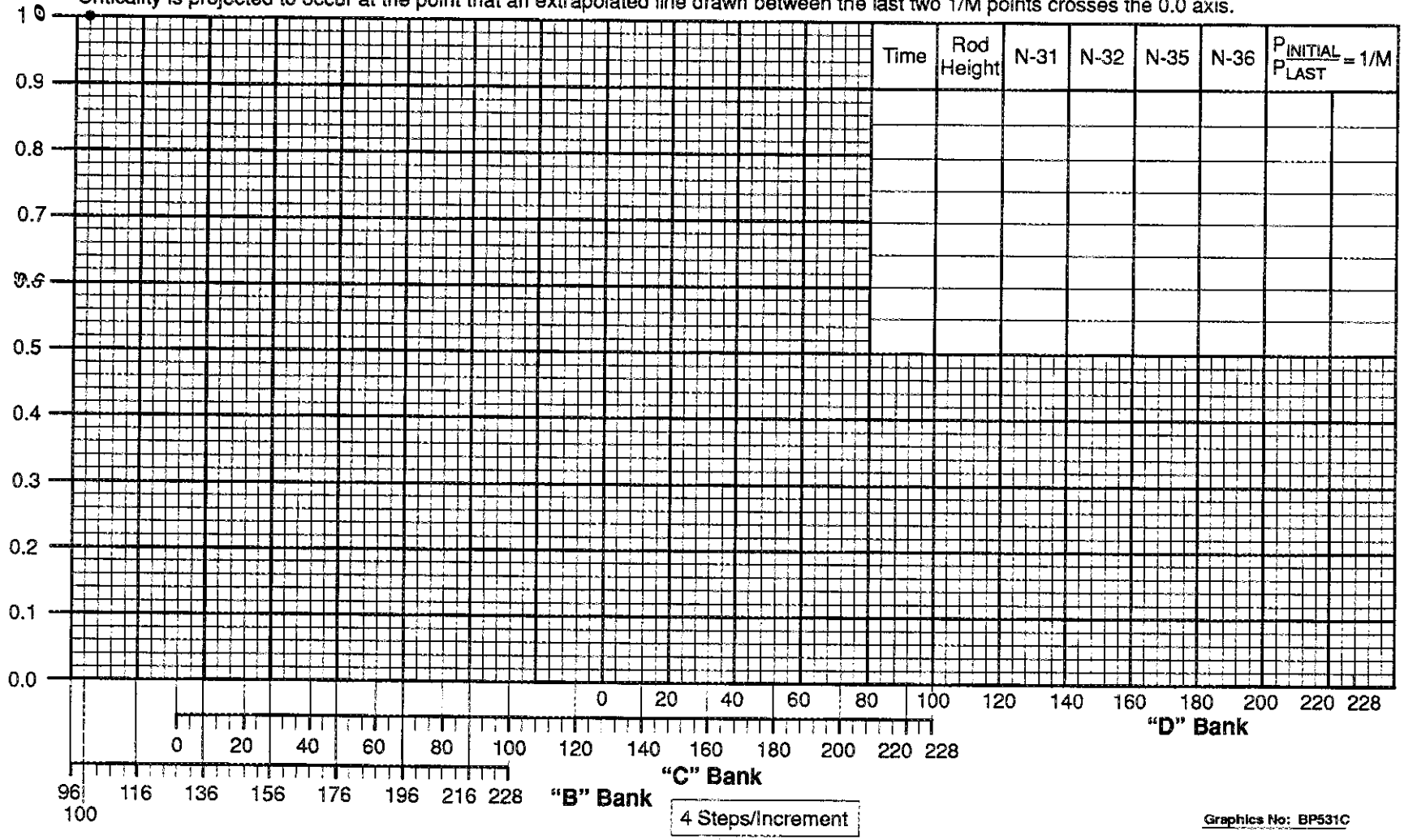
Graphics No: BP531C

(Page 1 of 1)

Attachment 7

1/M Plot

Criticality is projected to occur at the point that an extrapolated line drawn between the last two 1/M points crosses the 0.0 axis.

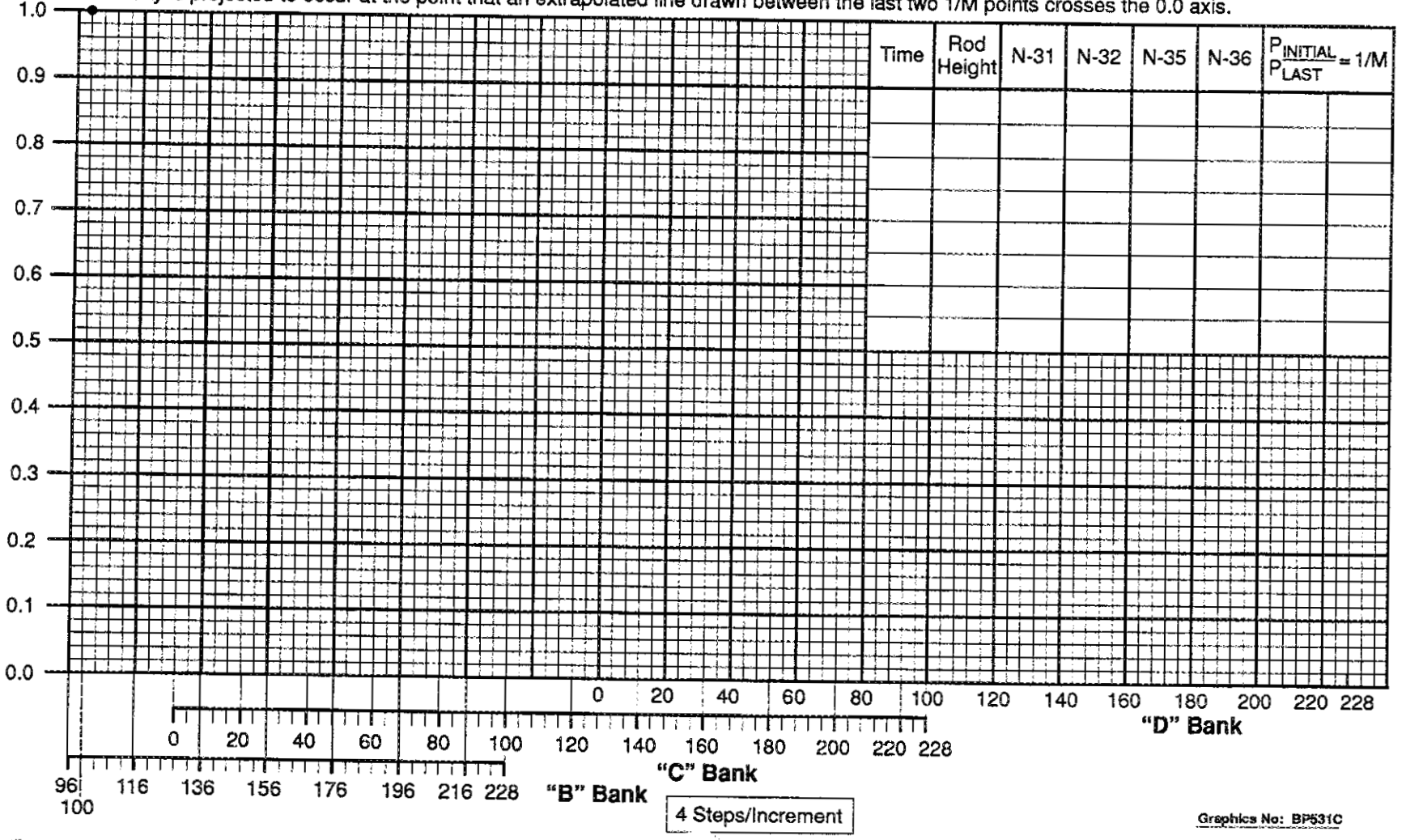


(Page 1 of 1)

Attachment 7

1/M Plot

Criticality is projected to occur at the point that an extrapolated line drawn between the last two 1/M points crosses the 0.0 axis.



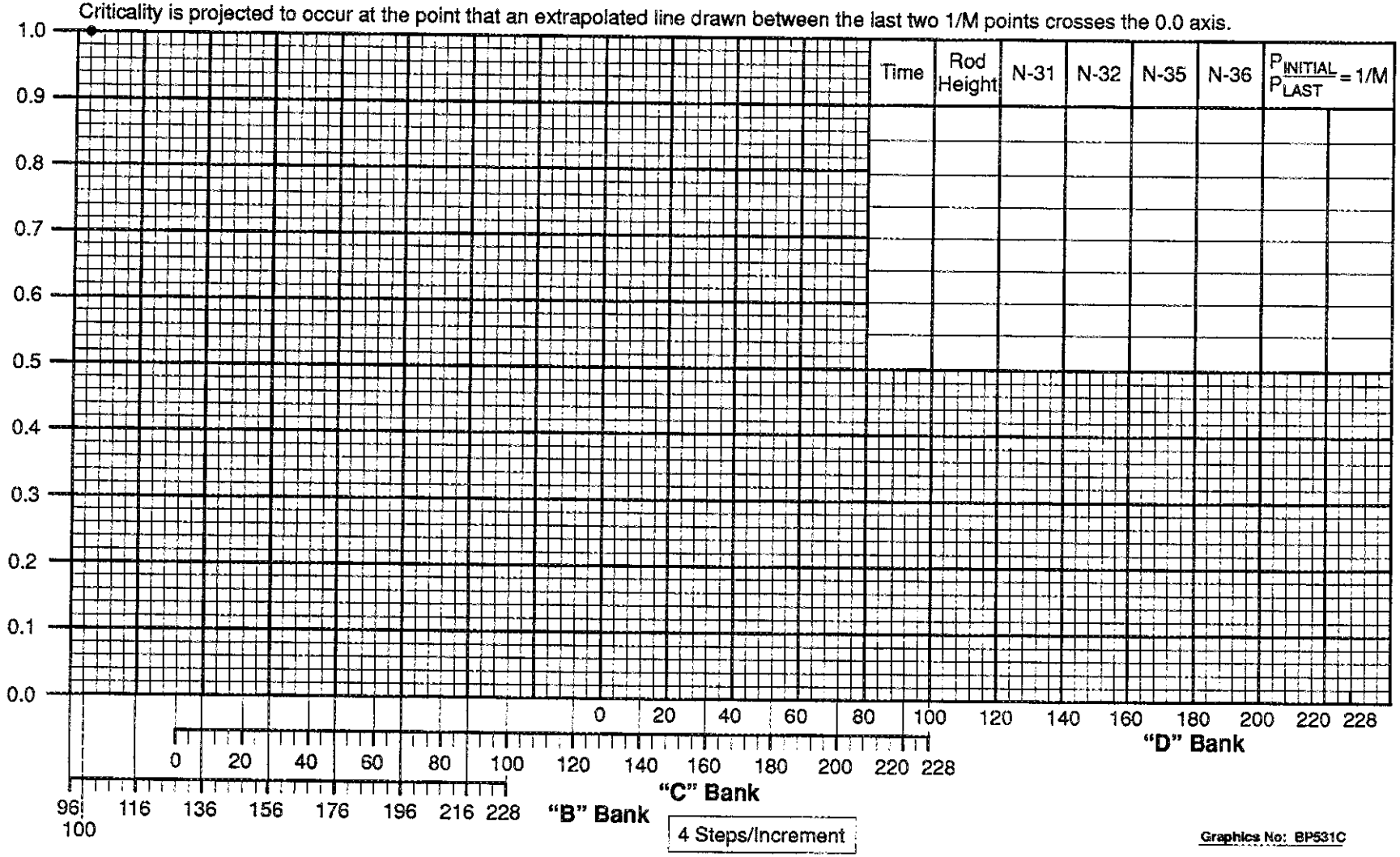
Time	Rod Height	N-31	N-32	N-35	N-36	$\frac{P_{INITIAL}}{P_{LAST}} = 1/M$	

(Page 1 of 1)

Attachment 7

1/M Plot

Criticality is projected to occur at the point that an extrapolated line drawn between the last two 1/M points crosses the 0.0 axis.



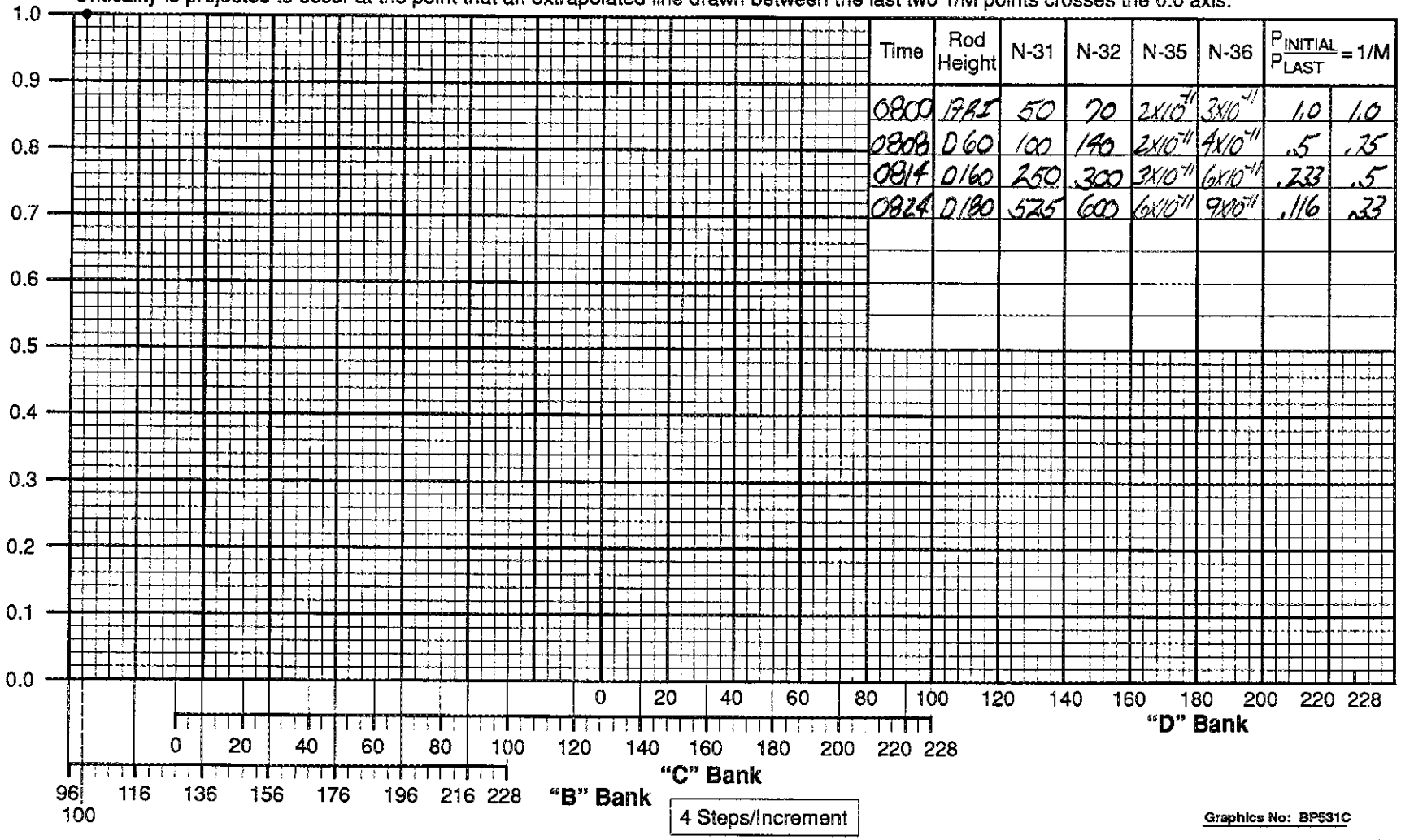
Time	Rod Height	N-31	N-32	N-35	N-36	$\frac{P_{INITIAL}}{P_{LAST}} = 1/M$	

(Page 1 of 1)

Attachment 7

1/M Plot

Criticality is projected to occur at the point that an extrapolated line drawn between the last two 1/M points crosses the 0.0 axis.



Time	Rod Height	N-31	N-32	N-35	N-36	$\frac{P_{INITIAL}}{P_{LAST}}$	= 1/M
0800	PRI	50	70	2×10^{-11}	3×10^{-11}	1.0	1.0
0808	D 60	100	140	2×10^{-11}	4×10^{-11}	.5	.25
0814	D 160	250	300	3×10^{-11}	6×10^{-11}	.233	.5
0824	D 180	525	600	6×10^{-11}	9×10^{-11}	.116	.33

Graphics No: BP531C

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

ADMIN JPM

Perform A Reactor Coolant System
Leakrate Hand Calculation

CANDIDATE _____

EXAMINER _____

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Perform a RCS leakrate hand calculation in accordance with attachment 3 of 1-PT-52.2, "Reactor Coolant System Hand Leak Rate."

References:

1-PT-52.2, "Reactor Coolant System Leak Rate (Hand Calculation)," Rev. 23, P-I
Plant Curve Book

Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____/_____
NAME SIGNATURE BATE

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

1-PT-52.2, "Reactor Coolant System beak Rate (Hand Calculation)," Rev. 23, P-1 Calculator

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit-1 is stable at 100% power.

The following plant data has been taken at 1600 on 6/14/2004:

Accumulator Levels:	"A" Accumulator	LI-1920 56.4%	LI-1922 56.7%
	"B" Accumulator	LI-1924 60.1%	LI-1926 60.1%
	"C" Accumulator	LI-1928 62.3%	LI-1930 62.2%

PRT Level	1-RC-LI-1470 77%
PZR Level	1-RC-LI-1459A 52.5%
VCT Level	1-CH-LI-1112-1 46.2
PDTT Level	1-DG-LI-101 17.5%

The following data was taken again at 2000 on 6/14/2004

Accumulator Levels:	"A" Accumulator	LI-1920 56.2%	LI-1922 56.6%
	"B" Accumulator	LI-1924 60.1%	LI-1926 60.0%
	"C" Accumulator	LI-1928 62.3%	LI-1930 62.2%

PRT Level	1-RC-LI-1470 78%
PZR bevel	1-RC-LI-1459A 53.0%
VCT Level	1-CH-LI-1112-1 38.1
PDTT Level	1-DG-LI-101 18%

1-PT-52.2 has been completed to the point of performing the leak rate calculations.

INITIATING CUES:

You are requested to perform a hand calculation of the Reactor Coolant System leakrate in accordance with 1-PT-52.2, attachment 3.

STEP 1: Obtain a copy of the appropriate procedure. **STANDARD:** Operator obtains a partially-completed copy of 1-PT-52.2. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Calculate the change in PRZR volume. (attach. 3) **STANDARD:** Operator subtracts the initial PRZR level (52.5%) from the final PRZR level (53%), multiplies the result times 45.9 gal/%, then enters the product in blank (22.95)(a). COMMENTS:	___ SAT ___ UNSAT
STEP 3: Calculate the change in VCT volume. (attack. 3) **STANDARD:** Operator subtracts the initial VCT level (46.2%) from the final VCT level (38.1%), multiplies the result times 14.1 gal/%, then enters the product in blank (-111.39) (b). COMMENTS:	___ SAT ___ UNSAT
STEP 4: Calculate the change in PDTT volume. (attach. 3) **STANDARD:** Operator enters the initial and final **PDTT** volumes (in gallons) from **I-SC-5.9,** subtracts the initial PDTT volume(88.42 gal) from the final **PDTT** volume (91.75gal), then enters the result in blank (3.33 gal) (c). COMMENTS:	___ SAT ___ UNSAT

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEP 5:	Calculate the change in **RCS** volume due to RCS temperature change. (attach. 3)	___ SAT
STANDARD:	Operator subtracts the initial RCS temperature (580.8) from the final RCS temperature (580.7), muitiplies by the correction factor from attachment 2 (78.25), then enters the product in blank (7.825) (d).	___ UNSAT
COMMENTS:		
STEP 6:	Calculate the total leak rate. (attach. 3)	___ SAT
STANDARD:	Operator subtracts the change in **PRZR** volume and VCT volume from the change in **RCS** volume, divides the result by 60 and enters the result in the "Total beak Rate" blank. (.432)	___ UNSAT
COMMENTS:		
STEP 7:	Calculate Accumulator Leakage. (attach. 5)	___ SAT
STANDARD:	Operator averages the six level indicators for both the beginning (59.63%) and the final readings (59.57%). The initial (59.63%) is substracted from the final (59.57%) and divided by 240 minutes to yield (-.00537 gpm) (e).	___ UNSAT
COMMENTS:		
	Calculate PWT Leakage. (attach. 5)	___ SAT
STANDARD:	Operator obtains initial and finai PRT levels using plant curve book (initial 7894.25 gals, final 7798.15 gals). Operator then subtracts initial from final level and divides by 240 minutes to obtain leakage (-.4004 gpm) (f)	___ UNSAT
COMMENTS:		

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEP 9:	Calculate the identified leak rate. (attach. 3)	CRITICAL STEP
STANDARD:	Operator divides the change in PDW volume by 60 and adds the result to accumulator leakage, PRT leakage, and "other leakage," and enters the sum in the "Identified beak Rate" blank (.4089gpm).	___ SAT
COMMENTS:		___ UNSAT
STEP 10:	Calculate the unidentified leak rate. (attach. 3)	CRITICAL STEP
STANDARD:	Operator subtracts the identified leak rate from the total leak rate and enters the result in the "Unidentified Leak Rate" blank 9 (-.0057 gpm).	___ SAT
COMMENTS:		___ UNSAT
STEP 11:	Sign-off the completed procedure attachment. (attach. 3)	___ SAT
STANDARD:	Operator signs attachment 1 and states that he/she has completed the task.	___ UNSAT
COMMENTS:		
	END OF TASK	

Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS

Unit-1 is stable at 100% power.

The following plant data ha5 been taken at 1600 on 6/14/2004:

Accumulator Levels:	"A" Accumulator	LI-1920 56.4%	LI-1922 56.7%
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1-PT-52.2 has been completed to the point of performing the leak rate calculations.

INITIATING CUES:

You are requested *to* perform a hand calculation of the Reactor Coolant System leakrate in accordance with 1-PT-52.2, attachment 3.

Dominion	PROCEDURE NO: 1-PT-52.2
NORTH ANNA POWER STATION	REVISION NO: 32
PROCEDURE TYPE: **OPERATIONS PERIODIC TEST**	UNIT NO: 1

PROCEDURE TITLE:

REACTOR COOLANT SYSTEM PEAK RATE (HAND CALCULATION)

TEST FREQUENCY:	UNIT CONDITIONS REQUIRING TEST:
18 months or as determined by 1-PT-52.2A	Modes 1, 2, 3, and 4

SPECIAL CONDITIONS: None

SURV REQ				EOP AP		

REVISION SUMMARY:

Converted to FrameMaker using Template Rev. 030.

- Reformatted Attachment 7 to 3 column format, duplicating P-250 points in PCS column that will be moved to PCS. Added "*" to points in PCS column that are not on Phase 1.5 PCS with explanation at top of PCS column. Moved Control Room Indications into 3rd column.
- Added additional PCS points for RCS Temperatwe and VCT Level on Attachment 7 that are currently available on Phase 1.5 PCS.
- Added additional PCS points and Control Room indications for SI Accumulator Level on Attachment 7, similar to 2-PT-52.2.

REASON FOR TEST (CHECK APPROPRIATE BOX):
☐ Surveillance ☐ Post-Maintenance Work Order Number (Post-Maintenance Only): _____

TEST PERFORMED BY (SIGNATURE):	DATE STARTED:	DATE COMPLETED:

TEST RESULT (CHECK APPROPRIATE BOX): ☐ Satisfactory ☐ Unsatisfactory ☐ Partial	WORK REQUEST NUMBERS AND DATE:

THE FOLLOWING PROBLEM(S) WERE ENCOUNTERED AND CORRECTIVE ACTIONS TAKEN:

_____

_____

_____

_____

_____ (Use back for additional remarks.)

COGNIZANT SUPERVISOR or DESIGNEE:	DATE:
ADDITIONAL REVIEWS:	DATE:

TABLE OF CONTENTS

Section		Page
1.0	PURPOSE	3
2.0	REFERENCES	4
3.0	INITIAL CONDITIONS	5
4.0	PRECAUTIONS AND LIMITATIONS	6
5.0	SPECIAL TOOLS AND EQUIPMENT	10
6.0	INSTRUCTIONS	11
7.0	FOLLOW-ON	16
ATTACHMENTS		
1	Unit 1 P-250 Leak Rate Data Sheet	21
2	Unit 1 PCS Leak Rate Data Sheet	22
3	Leak Rate Data Sheet Without Using The Unit 1 P-250 Or PCS Computers	23
4	RCS Volume/Temperature Correction Factors (Gal/°F)	24
5	SI Accumulators And PRT Leakage	26
6	Other Identified Leakage	27
7	Useful Computer Points And Control Room Indications	28

1.0 PURPOSE

To provide instructions for performing a Reactor Coolant System leakage determination in accordance with Tech Spec SR 3.4.13.I.

The following synopsis is designed as an aid to understanding the procedure, and is not intended to alter or take the place of the actual purpose, instructions, or text of the procedure itself.

Industry operating experience has noted an increase in the frequency of ieakage involving leakage from the reactor coolant system (RCS) piping, penetrations, or components. Events reported include leakage from control rod drive housings, and penetrations, hot leg nozzles, reactor coolant pump and reactor vessel flanges. The majority of the leaks were caused by stress corrosion cracking. In most cases, the leakage was only identified during containment inspections for boric acid residue. Few, if any, of the leaks were detected by the installed RCS leak detection equipment because the amount of leakage was far below the minimum detectable values. Corrosion of carbon steel components can occur rapidly when exposed to boric acid. An early detection and prompt response is deemed necessary to mitigate adverse trends in RCS leakage. Rigorous monitoring of KCS leakage trends and prompt notification to management is necessary even if leakage rates remain well below *the* Tech Spec thresholds for action. **(Reference 2.4.6)**

In this procedure's Follow-On Tasks, two trigger points have been established that initiate actions and notifications: **(References 2.3.10 and 2.4.6)**

- When Unidentified Leak Rate increases by more than 0.2 gpm since the last performance of 1-PT-46.21. The 0.2 gpm increase is an absolute value; if the Ieakrate increases from -0.1 gpm to +0.1 gpm, leakrate has increased by 0.2 gpm.
- When the Unidentified Leak Rate is greater than 0.2 gprn.

Notifications will occur when any symptom *of* RCS leakage exists such as even a slight change to the leakrate baseline or an adverse trend, or when Unidentified Leak Rate doubles since the last performance of I-PT-46.21.

2.0 REFERENCES

2.1 Source Documents

2.1.1 Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants

2.1.2 Standing Order No. 179 Rev 1, Primary-to-Secondary Leakage Limitations

2.2 Technical Specifications

2.2.1 Tech Spec 3.4.13

2.2.2 Tech Spec SR 3.4.13.1

2.2.3 TRM TR 3.4.4

2.2.4 TRM TR 3.4.5

2.3 Technical References

2.3.1 Calculational Basis approved, 05-13-88 (Rev. 15)

2.3.2 1-PT-52.2A, Reactor Coolant System Leak Rate (Computer Calculation)

2.3.3 1-AP-42, Loss of Prodac-250 Computer

2.3.4 1-PT-46.21, Components Affected by RCS Leakage

2.3.5 DCP 96-005, P-250 Upgrade

2.3.6 VPAP-0815, Maintenance Rule Program

2.3.7 Maintenance Rule Function RC002 (Engineering Transmittal CEP 97-0018, Rev. 1, 09-24-97)

2.3.8 DCP 01-005, ERF Computer System Replacement

2.3.9 El' NAF 2002-0092, Rev. 0, Evaluation of Negative *Leak* Rates Observed During Performance of RCS Leak Rate PT

2.3.10 ET N 02-127, Rev. 0, RCS Unidentified Leak Rate Threshold Value.

2.3.11 DCP 01-007, Phase 2 PCS Installation and P-250 Removal- Unit 1

2.4 **Commitment Documents**

2.4.1 CTS 02-93-1000, Item 001, IN 88-023-51, Potential for Gas Binding of High Pressure Safety Injection Pumps During a Loss of Coolant Accident

2.4.2 LER 91-11-0 (LER Commitments closed out)

2.4.3 CTS Assignment 02-94-1202, Commitment 001, Revise procedures such that when RCS leakage is observable, but its source cannot be positively confirmed, a formal evaluation must be completed before characterizing the leakage as "identified" as defined by Tech Specs.

2.4.4 DR N-96-2495, Non-conservative leak rate calculation

2.4.5 CTS Assignment 02-97-2251, Commitment 002, Condition Monitoring for the Maintenance Rule

2.4.6 Standing Order No. 235, Rev 0, Monitoring Plan for Increased RCS Leakage.

Init Verif

3.0 INITIAL CONDITIONS

_____ 3.1 Notify the Shift Supervisor of this test.

_____ 3.2 Verify the Reactor Coolant System is in steady state operation.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Comply with the following guidelines when marking steps N/A:

- IF the conditional requirements of a step do not require the action to be perfomed, THEN mark the step N/A.
- IF this test is being performed as a Post-Maintenance Test, THEN mark inappropriate steps N/A.
- IF any other step is marked N/A, THEN have the Shift Supervisor (or designee) approve the N/A and submit a Procedure Action Request *(PAR).*

4.2 Closely monitor the VCT level during this test to ensure an automatic Lo-Lo Level Charging Pump suction transfer to the RWST does not occur.

4.3 IF any VCT makeup or PDTT pump occurs during this test, THEN the test is void and must be started again.

4.4 Allow at least 1 hour between initial and final data readings unless conditions require a shorter period.

4.5 Maintain the Reactor Coolant System at steady state operation throughout this test. Steady state operation is defined as:

- Power changes less than 1 percent of rated thermal power.
- RCS pressure changes less than 5 psi when RCS pressure is greater than 1000 psig. At low temperatures and pressures, water compression is insignificant. However, at 580°F and 2235 psig, a 10-psi change in RCS pressure would result in a 0.14-gpm error in a 60-minute leak rate test.
- RCS temperature changes less than 2°F.
- No changes in letdown or makeup systems occur (for example, no Blender makeups, Charging Pump starts, ion exchangers placed in or removed from service).
- No changes in RHR System operation occur.
- Pressurizer level changes less than 2 percent.
- No RCP starts or stops occur.
- No RCP Standpipe fills occur.
- No H_2 addition to the VCT occurs.
- Boron Recovery System Gas Stripper pressure is stable between 0 and 3 psig.
- VCT Pressure is maintained at greater than or equal to 23 psig to prevent potential RWST isolation valve leakage.

4.6 IF Unit 1 and Unit 2 are sharing a gas stripper, THEN Unit 2 may be isolated from the gas stripper until this procedure is completed.

4.7 Usually, PRT and Accumulator leakage is based on 8 to 24 hours as defined below:

- The beginning of the ieakage monitoring period should be within 25 hours of this test.
- IE plant conditions require a leak rate to be calculated on short notice, THEN the PRT and Accumulator leakage may be based on a shorter time period.
- PRT and Accumulator leakage from the previous performances of this test may be used if appropriate and available,
- No makeup or sampling of the PRT or Accumulators may be perfomed during this period. Sluicing the Accumulators is allowed.

4.8 Tech Spec 3.4.13, RCS Operational Leakage, applies.

4.9 IF primary-to-secondary leakage is suspected, THEN **1-AP-24,** Steam Generator Tube Leak, or 1-AP-24.1, Shutdown Steam Generator Tube Leak, and TRM TR **3.4.4** must be referred to.

4.10 IF using the Unit 1 P-250 Computer and any leak-rate point is off-scan or is unreliable, THEN contact the System Engineer (or designee) to supply an alternate Unit 1 P-250 point, PCS point, or Control Room gauge.

4.11 IF using the Unit I PCS and any leak-rate point is deleted-from-processing or is unreliable, THEN contact the System Engineer (or designee) to supply an alternate Unit 1 PCS point or Control Room gauge.

4.12 IF the Unit 1 P-250 Computer is inoperable, THEN Control Room gauges or Unit I PCS may be used to obtain the needed data:

- Unit 1PCS points are preferable to Control Room gauges because of increased accuracy.
- IE Control Room gauges or Unit I PCS points are used, THEN contact the System Engineer, or designee, to ensure that the most accurate and precise methods are used.

_____ 4.13 IF using the Unit I P-250 Computer and alternate Unit 1 P-250 points, PCS points, or Control Room gauges are used, THEN indicate what alternate points are used in Attachments I and 5 and record on the Cover Sheet. A Procedure Action Request does not need to be generated if alternate points are used because of inoperable equipment.

_____ 4.14 IF using the Unit 1 F-250 Computer AND performing this procedure concurrently with 1-PT-52.2A, THEN, to obtain the best consistency of data between 1-PT-52.2 and 1-PT-52.2A and to allow for the 10 minute initialization period of the Computer Leak Rate Program, the Digital Trend Block for 1-PT-52.2 data should be setup on a 10 minute trend and the Computer *Ixak* Rate Program for 1-PT-52.2A started immediately after the trend block printout. Hand Leak Rate Initial data should be taken from the printout that occurs 10 minutes after starting the Computer Leak Kate Program. Hand Leak Rate Final data should be taken from the printout at the same time that the final data is collected for 1-PT-52.2A.

_____ 4.15 IF using the Unit 1 PCS AND performing this procedure concurrently with 1-PT-52.2A, THEN, to obtain the best consistency of data between 1-PT-52.2 and 1-PT-52.2A and to allow for the initialization period of the RCS *Leak* Rate Program, the Hand Leak Rate Initial data should be taken from the initial leak-rate calculation of the RCS *Leak* Rate Program. Hand *Leak* Rate Final data should be taken from the final leak-rate calculation of the RCS *Leak* Rate Program.

_____ **4.16** IF using the Unit 1 PCS AND alternate Unit 1 PCS points or Control Room gauges are used, THEN indicate what alternate points are used in Attachments 2 arid 5 and record on the Cover Sheet. A Procedure Action Request does not need to be generated if alternate points are used because of inoperable equipment.

_____ 4.17 Whenever RCS ieakage is observable, but its source cannot be positively confirmed, formal evaluation and documentation (including documentation that the leakage is NOT pressure boundary leakage) MUST be completed prior to characterizing the leakage as "identified" as defined in Tech Specs. **(Reference 2.4.3)**

4.18 To prevent the Unit 1 VCT from diverting to the Gas Stripper while the Gas Stripper is isolated, the setpoint of 1-CH-LCV-1112C, VCT Level Control VCT Divert, will be set at 71 percent, while the VCT level will be at approximately 50 Percent. This will prevent overpressurization of the piping between 1-CH-LCV-1115, VCT Level Control Valve and the Gas Stripper.

4.19 If the "A" Gas Stripper is aligned to Unit 2, the setpoint of 2-CH-LCV-2112C, VCT Level Control VCT Divert, will be adjusted to 71 percent (potentiometer setting of 7.1) to prevent the Unit 2 VCT from diverting to the isolated Gas Stripper. This will prevent overpressurization of the piping between 2-CH-LCV-2115, VCT Level Control Valve and the Gas Stripper.

4.20 Since PG may be the source of PRT Inleakage, a conservative value of zero (0) should be used unless the PRT Inleakage has been identified as CONFIRMED leakage from the RCS to the PRT. Alternate indications should be used to confirm the source of leakage such as increasing PRZR Safety Valve or PORV tailpipe temperatures, or increasing PRT pressure or temperature.

4.21 IF the Unit I P-250 Computer is inoperable AND the Unit 1 PCS is inoperable, THEN Control Room gauges may be used to obtain the needed data. Contact the System Engineer, or designee, to ensure that the most accurate and precise methods are used.

4.22 Negative unidentified RCS leak rates with magnitude as large as -0.1 gpm are to be considered "essentially zero gpm." (Reference 2.3.9)

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 INSTRUCTIONS

6.1 IF all the following conditions are met, THEN perform 1-PT-52.2A concurrently with this procedure.

- The Unit 1 PCS is operable OR the Unit 1 P-250 Computer is operable (if P-250 not removed by DCP 01-007).
- RHR System is secured.
- RCS temperature is at least 195°F.

CAUTION

Whenever RCS leakage is observable, but its source cannot be positively confirmed, formal evaluation and documentation MUST be completed prior to characterizing the leakage as "identified" as defined in Tech Specs. **(Reference 2.4.3)**

6.2 Do the following: **(Reference 2.4.4)**

6.2.1 IF the Unit 1 P-250 Computer will be used, THEN ensure the computer point to be used in Attachment 5, SI Accumulators And PRT Leakage, is reliable.

6.2.2 IF the Unit 1 PCS will be used, THEN ensure the computer point to be used in Attachment 5, SI Accumulators And PRT Leakage, is GOOD (green).

6.2.3 Complete Attachment 5 and Attachment 6, Other Identified Leakage.

6.2.4 IF Accumulator leakage is greater than or equal to 1 gpm absolute value, THEN do the following: **(Reference 2.4.4)**

a. Immediately contact Engineering to evaluate Accumulator Leakage.

b. Do NOT continue with this procedure until notified by Engineering.

6.3 Notify Chemistry that the RCS cannot be sampled during this test.

6.4 Ensure the following Sample System trip valves are closed:

- 1-SS-TV-103A, RHR SAMPLE ISOL
- 1-SS-TV-103B, RIB SAMPLE ISOL
- 1-SS-TV-106A, PRIMARY COOLANT HOT LEG INSIDE ISOL
- 1-SS-TV-106B, PRIMARY COOLANT BOT LEG OUTSIDE ISOL
- 1-SS-TV-102A, PRIMARY COOLANT COLD LEG INSIDE ISOL
- 1-SS-TV-102B, PRIMARY COOLANT COLD LEG OUTSIDE ISOL
- 1-SS-TV-100A, PRZR LIQUID SPACE INSIDE ISOL
- 1-SS-TV-100B, PRZR LIQUID SPACE OUTSIDE ISOL
- 1-SS-TV-101A, PRZR VAPOR SPACE INSIDE ISOL
- 1-SS-TV-101B, PRZR VAPOR SPACE OUTSIDE TSOL

6.5 Pump the PDTT to the lowest attainable level.

_____ 6.6 Ensure 1-RC-HCV-1523, PRZR RELIEF TANK DRAIN ISOL, is closed.

CAUTION

To prevent the Unit 1 VCT from diverting to the Gas Stripper while the Gas Stripper is isolated, the setpoint of 1-CH-LCV-1112C, VCT Level Control VCT Divert, will be set at 71 percent.

_____ 6.7 Adjust the setpoint of 1-CH-LCV-1112C, VCT Level Control VCT Divert, to 71 percent (potentiometer setting of 7.1).

_____ 6.8 Raise VCT level to approximately 50 percent.

CAUTION

IF the "A" Gas Stripper is aligned to Unit 2, THEN to prevent the Unit 2 VCT from diverting to the Gas Stripper while the Gas Stripper is isolated, the setpoint of 2-CH-LCV-2112C, VCT Level Control VCT Divert, will be set at 71 percent.

6.9 IF leakage past 1-CH-LCV-1115A, VCT LEVEL CONTROL VALVE, is suspected AND it is desired to isolate. Unit 1 from the Gas Stripper, THEN do the following:

_____ 6.9.1 IF the "A" Gas Stripper is aligned to Unit 2, THEN notify the Unit 2 CRO that Unit 2 will also be isolated from the Gas Stripper.

6.9.2 IF the "A" Gas Stripper is aligned to Unit 2, THEN have the Unit 2 CRO adjust the setpoint of 2-CH-LCV-2112C, VCT Level Control VCT Divert, to 71 percent (potentiometer setting of 7.1) to prevent the. Unit 2 VCT from diverting to the isolated Gas Stripper.

_____ 6.9.3 IF the " A Gas Stripper is aligned to Unit I, THEN close 2-BR-TV-lll A, "A" GAS STRIPPER INLET.

6.9.4 IF the "B' Gas Stripper is aligned to Unit 1, THEN close 1-BR-TV-123, GAS STRIPPER X-CONNECT.

6.9.5 Ensure a current Work Request or Work Order is active on 1-CH-LCV-11MA, that identifies the valve as having internal leak-by.

6.10 IF leakage past the trip valve seats is suspected, THEN close 1-BR-33, Prim Coolant Letdown to 6A Stripper Feed HX Isol, and 1-BR-34, Prim Cool Letdown Unit 1 to Unit 2 XConn Valve.

6.11 IF using the Unit 1P-250 Computer, THEN do the following:

6.11.1 Ensure the computer points to be used in Attachment 1, Unit 1 P-250 Leak Rate Data Sheet, are reliable.

6.11.2 IF performing this procedure concurrently with 1-PT-52.2A, Reactor Coolant System Leak Rate (Computer Caiculation), THEN coordinate the procedures as specified in Precautions and Limitations Step 4.14.

6.11.3 IF NOT performing this procedure concurrently with 1-PT-52.2A, THEN wait at ieast 5 minutes before beginning Step 6.11.4.

6.11.4 Obtain the initial data and record on Attachment 1 in the Initial column.

NOTE At least 1 hour must elapse between initial and final readings unless a VCT makeup or PDTT level change must be performed.

6.11.5 Wait at least 1 hour before continuing with this test.

6.11.6 Obtain the final data and record on Attachment 1 in the Final column.

6.11.7 Perform the calculations shown on Attachment 1.

6.11.8 Obtain an Independent Review of the Calculations on Attachment 1.

6.12 IF using the Unit 1 PCS, THEN do the following:

_____ 6.12.1 Ensure the computer points to be used in Attachment 2, Unit 1 PCS Leak Rate Data Sheet, are GOOD (green).

_____ 6.12.2 IF performing this procedure concurrently with 1-PT-52.2A, Reactor Coolant System Leak Rate (Computer Calculation). THEN coordinate the procedures as specified in Precautions and Limitations Step 4.15.

6.12.3 IF NOT performing this procedure concurrently with 1-PT-52.2A, THEN wait at least 5 minutes before beginning Step 6.12.4.

NOTE: IF performing this procedure concurrently with 1-PT-52.2A, THEN the time period before the initial data is available will be dependent upon the Time Basis setting of the RCS *Leak* Rate Program.

6.12.4 Obtain the initial data and record on Attachment 2 in the Initial column.

NOTE: At least 1 hour must elapse between initial and final readings unless a VCT makeup or PDTT level change must be performed.

_____ 6.12.5 Wait at least 1 hour before continuing with this test.

6.12.6 Obtain the final data and record on Attachment 2 in the Final column.

6.12.7 Perform the calculations shown on Attachment 2.

_____ 6.12.X Obtain an Independent Review of the Calculations on Attachment 2.

6.13 IF BOTH the Unit 1 P-250 Computer and Unit 1 PCS are NOT available, THEN do the following:

6.13.1 While referring to P&I. Step 4.21, select the appropriate instrumentation that will be used to collect data on Attachment 3, Leak Rate Data Sheet Without Using The Unit I P-250 Or PCS Computers.

6.13.2 Obtain the Initial Data and record on Attachment 3 in the Initial column.

NOTE: At least 1 hour must elapse between initial and final readings unless a VCT makeup or PDTT level change must be performed.

6.13.3 Wait at least one hour before continuing with this test.

6.13.4 Obtain the Final Data and record on Attachment 3 in the Final column.

6.13.5 Perform the calculations shown on Attachment 3.

6.13.6 Obtain an Independent Review of the Calculations on Attachment 3.

6.14 Open the stripper inlet valves closed in Step 6.9 unless otherwise directed by the Shift Supervisor.

6.15 IF closed in Step 6.10, THEN open the following valves:

- 1-BR-33, Prim Coolant Letdown to 6A Stripper Feed HX Isol
- 1-BK-34, Prim Cool Letdown Unit 1 to Unit 2 XConn Valve

7.0 FOLLOW-ON

7.1 Acceptance Criteria

7.1.1 RCS identified leakage is less than 9.000 gpm. **(Reference 2.4.4)**

7.1.2 The limit of 1 gpm Unidentified Leak Rate from the RCS has not been exceeded.

7.2 Follow-On Tasks

7.2.1 IF the Unidentified Leak Rate is greater than 0.2 gpm, THEN_ do Substep 7.2.1.a OR Substep 7.2.1.b below. (References 2.1.1 and 2.3.10)

a. Do the following:

_____ 1. Initiate a walkdown of the Containment and the Auxiliary Building.

_____ 2. Perform the applicable portions of 1-PT-46.21, Components Affected by RCS Leakage, to determine and quantify the source of any RCS leakage and any components that may be affected by potential boric acid accumulation.

_____ 3. Notify the STA to monitor RWST level to determine if there is any inleakage. IF there is inleakage, THEN notify System Engineering of the inleakage so that the LNSI lines can be evaluated for gas accumulation. (Reference 2.4.1)

_____ 4. Notify the Operations Manager On-Call.

_____ 5. Notify System Engineering.

_____ 6. Record on the Cover Sheet.

b. Do the following:

_____ 1. Obtain permission from the Operations Manager On Call to not perform Containment and the Auxiliary Building walkdown and 1-PT-46.21.

_____ 2. Notify the STA to monitor RWST level to determine if there is any inleakage. IF there is inleakage, THEN notify System Engineering of the inleakage so that the LHSI lines can be evaluated for gas accumulation. (Reference 2.4.1)

3. Notify System Engineering.

4. Document the reason for not performing the walkdowns and 1-PT-46.21 in the Narrative Log.

5. Record on the Cover Sheet.

NOTE The 0.2 gpm increase is an absolute value. IF the leakrate increases from -0.1 gpm to +0.1 gpm, THEN the leakrate has increased by 0.2 gpm. **(Reference 2.3.10)**

7.2.2 IF the Unidentified Leak Rate increased by more than 0.2 gpni since the last performance of 1-PT-46.21, THEN do the following: **(References 2.1.1** and **2.4.6)**

a. Record on the Cover Sheet.

b. Initiate a walkdown of Auxiliary Building or Containment if required.

c. Perform the applicable portions of 1-PT-46.21 to determine and quantify the source of any RCS leakage and any components that may be affected by potential boric acid accumulation.

d. Notify the STA to monitor RWST level to determine if there is any inleakage. IF there is inleakage, THEN notify System Engineering of the inleakage so that the LHSI lines can be evaluated for gas accumulation. **(Reference 2.4.1)**

e. Notify System Engineering.

f. Notify the Operations Manager On-Call.

7.2.3 IF any symptom of RCS leakage exists such **as** even a slight change to the leakrate baseline or an adverse trend, THEN do the following: **(Reference 2.4.6)**

- Promptly report the increased leakage to the Operations Manager On-Call and System Engineering.

- Promptly investigate the symptoms **of** increased RCS leakage.

7.2.4 IF the Unidentified Leak Rate doubles since the last performance of 1-PT-46.21 OR exceeds 0.2 gpm, THEN do the following: **(Reference 2.4.6)**

- Promptly report the increased leakage to the Operations Manager On-Call and System Engineering.

- Request the OMOC evaluate conducting an Operations Decision Making review in accordance with 0-GOP-9.6, Operational Decision Making and Emergent Issue Procedure and Checklist.

7.2.5 IF the Identified Leak Rate recorded is greater than **10** gpm, THEN refer to the Action Statement **of** Tech Spec 3.4.13.

7.2.6 IF the Unidentified Leak Rate is greater than **1** gpm, THEN refer to the Action Statement **of** Tech Spec **3.4.13.**

7.2.7 IF the Identified Leak Rate recorded is greater than 5.0 gpm, THEN submit a Plant Issue. **(References 2.3.7 and 2.4.5)**

7.2.8 IF the Unidentified Leak Rate **is** greater than 0.5 gpm, THEN submit a Plant **Issue. (References 2.3.7 and 2.4.5)**

7.2.9 IF the Unidentified *Leak* Rate is more negative than -0.1 gpm, THEN submit a Plant Issue. **(Reference 2.3.9)**

7.2.10 IF the Acceptance Criteria was satisfied and 1-PT-52.2A was not required by Step 6.1, THEN coversheet 1-PT-52.2A, Reactor Coolant System Leakrate (Computer Calculation)

7.2.11 Record the following information in the Unit 1 Narrative Log:

- Identified leak rate
- Unidentified leak rate
- Containment sump inleakage
- Reading on 1-RM-RMS-159, Containment Particulate Radiation Monitor
- Reading on I-RM-RMS-160, Containment Gaseous Radiation Monitor

7.3 Completion Notification

Notify the Shift Supervisor this test is complete.

Completed by: _____ Date: _____

(Page 1 of 1)

Attachment 1
Unit 1 P-250 beak Rate Data Sheet

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	_____		_____						
Time:	_____		_____		_____	minutes			
PZR Level: (U0483)	_____%	-	_____%	=	_____%	x	(45.9 gal/%)	=	_____(a)
VCT Level: (L0112A)	_____%	-	_____%	=	_____%	x	(14.1 gal/%)	=	_____(b)
PDTT Level: (Y2015A) (Use 1-SC-5.9):	_____% _____gal	-	_____% _____gal	=					_____(c)
RCS Temp: (U0484, U0486 or U0489)*	_____°F	-	_____°F	=	_____°F	x	_____ (Attachment 4)	=	_____(d)

Total Leak Rate $= \frac{(d) - (b) - (a)}{(\text{mintues})} =$ _____ gpm

Accumulator Leakage (Attachment 5) = _____ gpm(e)

PRT Leakage (Attachment 5) = _____gpm(f)

Other Leakage (Attachment 6) = _____ gpm(g)

Identified Leak Rate $= (e) + (f) + (g) + \left[\frac{(c)}{\text{minutes}}\right] =$ _____ gpm

Unidentified Leak Rate = Total Leak Rate – Identified Leak Kate = _____ gpm

Prepared By: _____ **Date:** _____

Reviewed By: _____ **Date:** _____

*Use U0484 when Tavg is greater than 535°F. Use U0486 or U0489 when T_{avg} is less than or equal to 535°F.

(Page 1 of 1)

Attachment 2
Unit 1 PCS Leak Rate Data Sheet

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	_____		_____						
Time:	_____		_____		_____ minutes				
PZR Level: (U0683)	_____%	-	_____%	=	_____%	x	(45.9 gal/%)	=	_____(a)
VCT Level: (L1CH001A)	_____%	-	_____%	=	_____%	x	(14.1 gal/%)	=	_____(b)
PDTT Level: (Y2015A) (Use 1-SC-5.9):	_____% _____gal	-	_____% _____gal	=					_____(c)
RCS Temp: (U0684, U0689*)	_____°F	-	_____°F	=	_____°F	x	_____ (Attachment 4)	=	_____(d)

Total Leak Rate = $\frac{(d) - (b) - (a)}{(\text{mintues})}$ = _____ gpm

Accumulator Leakage (Attachment 5) = _____ gpm(e)

PRT Leakage (Attachment 5) = _____ gpm(f)

Other Leakage (Attachment 6) = _____ gpm(g)

Identified Leak Rate = (e) + (f) + (g) + $\left[\frac{(c)}{\text{minutes}}\right]$ = _____ gpm

Unidentified Leak Rate = Total Leak Rate − Identified Leak Rate = _____ gpm

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

*Use U0684 when Tavg is greater than 535°F. Use U0689 when Tavg is less than or equal to 535°F.

(Page 1 of 1)

Attachment 3

beak Rate Data Sheet Without Using The Unit ▮ P-250 Or PCS Computers

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	_____		_____						
Time:	_____		_____		_____	minutes			
PZR Level:	_____%	-	_____%	=	_____%	x	(45.9 gal/%)	=	_____(a)
VCT Level:	_____%	-	_____%	=	_____%	x	**(14.1 gal/%)**	=	_____(b)
PDTT Level:	_____%		_____%						
(Use 1-SC-5.9):	_____gal	-	_____gal	=					_____(c)
RCS Temp:	_____°F	-	_____°F	=	_____°F	x	_____ (Attachment 4)	=	_____(d)

$$\text{TotalLeakRate} = \frac{(d) - (b) - (a)}{(\text{minutes})} = \_\_\_\_\_ \text{ gpm}$$

. ıccumulator Leakage (Attachment 5) = _____ gpm(e)

PRT Leakage (Attachments) = _____ gpm(f)

Other **Leakage** (Attachment 6) = _____ gpm(g)

$$\text{Identified Leak Rate} = (e) + (f) + (g) + \frac{(c)}{[\text{minutes}]} = \_\_\_\_\_ \text{ gpm}$$

Unidentified Leak Kate = Total Leak **Rate** − Identified ***Leak*** Rate = _____ gpm

Prepared **By:** _____ Date: _____

Reviewed By: _____ Date: _____

(Page 1 of 4)

Attachment 3
Leak Rate Data Sheet Without Using The Unit 1 P-250 Or PCS Computers

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	_____		_____						
Time:	_____		_____		_____ minutes				
PZR Level:	_____%	-	_____%	=	_____%	x	(45.9 gal/%)	=	_____(a)
VCT Level:	_____%	-	_____%	=	_____%	x	(14.1 gal/%)	=	_____(b)
PDTT Level:	_____%		_____%						
(Use 1-SC-5.9):	_____gal	-	_____gal	=					_____(c)
RCS Temp:	_____°F	-	_____°F	=	_____°F	x	_____ (Attachment 4)	=	_____(d)

$$\text{TotalLeakRate} = \frac{(d) - (b) - (a)}{(\text{minutes})} = \_\_\_\_\_ \text{ gpm}$$

Accumulator Leakage (Attachment 5) = _____ gpm(e)

PRT Leakage (Attachments) = _____ gpm(f)

Other Leakage (Attachment 6) = _____ gpm(g)

$$\text{Identified Leak Rate} = (e) + (f) + (g) + \frac{(c)}{[\text{minutes}]} = \_\_\_\_\_ \text{ gpm}$$

Unidentified Leak Rate = Total Leak Rate − Identified Leak Rate = _____ gpm

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

(Page 1 of 1)

Attachment 3

Leak Rate Data Sheet Without Using The Unit 1 P-250 Or PCS Computers

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	_____		_____						
Time:	_____		_____		_____	minutes			
Em Level:	_____ %	-	_____ %	=	_____ %	x	(45.9 gal/%)	=	_____ (a)
VCT Level:	_____ %	-	_____ %	=	_____ %	x	(14.1 gal/%)	=	_____ (b)
PDTT Level:	_____ %		_____ %						
(Use 1-SC-5.9):	_____ gal	-	_____ gal	=					_____ (c)
RCS Temp:	_____ °F	-	_____ °F	=	_____ °F	x	_____ (Attachment 4)	=	_____ (d)

$$\text{TotalLeakRate} = \frac{(d) - (b) - (a)}{(\text{minutes})} = \_\_\_\_\_ \text{ gpm}$$

Accumulator Leakage (Attachment 5) = _____ gpm(e)

PRT Leakage (Attachment 5) = _____ gpm(f)

Other Leakage (Attachment 6) = _____ gpm(g)

$$\text{Identified Leak Rate} = (e) + (f) + (g) + \left[\frac{(c)}{\text{minutes}}\right] = \_\_\_\_\_ \text{ gpm}$$

Unidentified Leak Rate = Total Leak Rate – Identified Leak Rate = _____ gpm

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

(Page 1 of 1)

Attachment 3

Leak Rate Data Sheet Without Using The Unit 1 P-250 Or PCS Computers

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	_____		_____						
Time:	_____		_____		_____	minutes			
PZR Level:	_____%	-	_____%	=	_____%	x	(45.9 gal/%)	=	_____(a)
VCT Level:	_____%	-	_____%	=	_____%	x	(14.1 gal/%)	=	_____(b)
PDTT Level:	_____%		_____%						
(Use 1-SC-5.9):	_____gal	-	_____gal	=					_____(c)
RCS Temp:	_____°F	-	_____°F	=	_____°F	x	_____ (Attachment 4)	=	_____(d)

$$\text{TotalLeakRate} = \frac{(d) - (b) - (a)}{(\text{minutes})} = \_\_\_\_\_ \text{ gpm}$$

Accumulator Leakage (Attachment 5) = _____ gpm(e)

PRT Leakage (Attachment 5) = _____ gpm(f)

Other Leakage (Attachment 6) = _____ gpm(g)

$$\text{Identified Leak Rate} = (e) + (f) + (g) + \left[\frac{(c)}{\text{minutes}}\right] = \_\_\_\_\_ \text{ gpm}$$

Unidentified Leak Rate = Total Leak Rate − Identified Leak Rate = _____ gpm

Prepared By: _____ Date: _____

Reviewed By: _____ Date: _____

(Page 1 of 1)

Attachment 3

Leak Rate Data Sheet Without Using The Unit 1 P-250 Or PCS Computers

Parameter	Final		Initial		Difference		Multiplier		Gallons
Date:	6-14-04		6-14-04						
Time:	2000		1600		240	minutes			
PZR Level:	53 %	-	52.5 %	=	.5 %	x	(45.9 gal/%)	=	22.95 (a)
VCT Level:	38.1 %	-	46.2 %	=	%	x	(14.1 gal/%)	=	-111.39 (b)
PDTT Level:	18 %		17.5 %						
(Use 1-SC-5.9):	91.25 gal	-	88.42 gal	=					(c)
RCS Temp:	580.8 °F	-	580.7 °F	=	.1 °F	x	78.25 (Attachment 4)	=	7.825 (d)

$$\text{TotalLeakRate} = \frac{(d) - (b) - (a)}{(\text{minutes})} = .4032 \text{ gpm}$$

Accumulator Leakage (Attachment 5) = -.00537 gpm(e)

PRT Leakage (Attachment 5) = +.4004 gpm(f)

Other Leakage (Attachment 6) = None gpm(g)

$$\text{Identified Leak Rate} = (e) + (f) + (g) + \left[\frac{(c)}{\text{minutes}}\right] = .4089 \text{ gpm}$$

Unidentified Leak Rate = Total Leak Rate − Identified Leak Rate = -.0057 gpm

Prepared By: Joe Operator Date: 6-14-04

Reviewed By: _____ Date: _____

(Page 1 of 2)

Attachment 4

RCS Volume/Temperature Correction Factors (Gal/°F)

RHR Isolated

Temp*	Factor	Temp*	Factor	Temp*	Factor
100	13.14	250	28.94	400	42.25
110	14.64	260	29.77	410	43.25
120	16.02	270	30.61	420	44.28
130	17.31	280	31.44	430	45.36
140	18.53	290	32.28	440	46.47
150	19.67	300	33.14	450	47.63
160	20.76	310	34.00	460	48.85
170	21.79	320	34.88	470	50.12
180	22.78	330	35.79	480	51.46
190	23.73	340	36.72	490	52.86
200	24.65	350	37.67	500	54.35
210	25.54	360	38.54	510	56.33
220	26.41	370	39.43	520	58.49
230	27.26	380	40.35	530	60.88
240	28.11	390	41.28		

Temp**	Factor	Temp**	Factor	Temp**	Factor
540	63.53	557	68.84	574	75.48
541	63.82	558	69.19	575	75.92
542	64.10	559	69.54	576	76.37
543	64.39	560	69.90	577	76.83
544	64.69	561	70.26	578	77.30
545	64.98	562	70.63	579	77.77
546	65.28	563	71.00	580	78.25
547	65.58	564	71.38	581	78.74
548	65.89	565	71.76	582	79.24
549	66.20	566	72.15	583	79.74
550	66.52	567	72.55	584	80.26
551	66.84	568	72.95	585	80.78
552	67.16	569	73.36	586	81.31
553	67.49	570	73.77	587	81.85
554	67.82	571	74.19	588	82.40
555	68.15	572	74.61	589	82.96
556	68.49	573	75.04		

* Temperature values may be rounded to the nearest multiple of 10.

** Temperature values may be rounded to the nearest integer.

(Page 2 of 2)

Attachment 4

RCS Volume/Temperature Correction Factors (Gal/°F)

RHR Operating

Temp*	Factor	Temp*	Factor
100	13.94	240	29.81
110	15.52	250	30.70
120	16.99	260	31.58
130	18.36	270	32.46
140	19.65	280	33.35
150	20.86	290	34.24
160	22.02	300	35.14
170	23.11	310	36.06
180	24.16	320	37.00
190	25.17	330	37.96
200	26.14	340	38.94
210	27.08	350	39.96
220	28.01	360	40.88
230	28.92		

*Temperature values may be rounded to the nearest multiple of IO.

(Page 1 of 1)

Attachment 5
SI Accumulators And PRT Leakage

NOTE When in Mode 5 only one level channel for each SI Accumulator is required to be recorded in the table below.

1. IF in Mode 5 AND only one channel for a SI Accumulator will be recorded, THEN, in both the Initial and Final Time columns, mark N/A the same channel which will NOT be recorded.

SI ACCUMULATORS

Initial			Final		
Date: 6-14-04		Time: 1600	Date: 6-14-04		Time: 2000
Accumulator	Level (percent)		Accumulator	Level (percent)	
A	LI-1920: 56.4	LI-1922: 56.7	A	LI-1920: 56.2	LI-1922: 56.6
B	LI-1924: 60.1	LI-1926: 60.1	B	LI-1924: 60.1	LI-1926: 60.0
C	LI-1928: 62.3	LI-1930: 62.2	C	LI-1928: 62.3	LI-1930: 62.2
Average	59.63 percent		Average	59.57 percent	

Time Difference = 240 minutes

AccumulatorLeakage = $\frac{\text{(Final - Initial)(21.48 gal/\%)}}{\text{(minutes)}}$ = -.00537 gpm

PRT

(Use 1-SC-5.11)

Initial		Final	
Date:	Time:	Date:	Time:
PRT Level (see Attachment 7): 77 percent		PRT Level (see Attachment 7): 78 percent	
PRT Level:* 7894.25 gallons		PRT Level:* 7798.15 gallons	

Time Difference = * minutes

PRT Leakage = $\frac{\text{(Final - Initial)}}{\text{(minutes)}}$ = -.4004 gpm

*IF there is no change in PRT level, THEN mark applicable blanks NA AND PRT Leakage as 0 gpm.

Prepared By: Joe Operator Date: 6-14-04

Reviewed By: _____ Date: _____

(Page 1 of 1)

Attachment 6
Other identified Leakage

In the spaces below, fill in the indicated data and total the leak rates for any other identified leak in the **KCS.** Any significant Primary to **Secondary** Leakage may be included.

CAUTION:

Whenever RCS leakage is observable, **but** its source cannot be positively confirmed, formal evaluation and documentation MUST be completed prior **to** characterizing the leakage as "identified" as defined in Tech Specs. **(Reference 2.4.3)**

NOTE: Leakage data recorded in 1-LOG-20, ECCS Leakage, should not be recorded below. IF leakage that is recorded in 1-LOG-20 will be classified as Identified Leakage, THEN formal evaluation and documentation must be completed.

Date Measured	Source	Leak Rate (gpm)	Method of Measurement	WR No.
	None.			

Total of Other Identified Leak Rate: _____gpm

(Page 1 of 1)

Attachment 7

Useful Computer Points And Control Room Indications

Unit 1 P-250 points (If P-250 not removed by DCP 01-007)	Unit 1 PCS points (Items with * not available on Phase 1.5 PCS)	Control Room Indications
RCS Temperature	RCS Temperature	RCS Temperature
U0484 (Average T_{avg}) U0486 (Average Wide Range Thot) U0489 (Averae Wide Range Tcold)	T1RC024C (Average Loop Temp) T1RC022C (Thot Average) T1RC023C (Tcold Average) U0684 (RCS combined loops T_{avg}) U0689 (RCS cold leg temps avg) T1RC002C (RCS Loop A Tave) T1RC003C (RCS Loop B Tave) TIRCWC (RCS Loop C Tave)	1-RC-TI-1412D 1-RC-TI-1422D 1-RC-TI-1432D
PRT Level	PRT Level	PRT Level
L0485A	L1RC005A * L0485A	1-RC-LI-1470
VCT Level	VCT Level	VCT Level
L0112A	L1CH001A L1CH002A * L0112A	1-CH-LI-1112-1 1-CH-LI-1115
Pressurizer Level	Pressurizer Level	Pressurizer Level
U0483 (Average) L0480A L0481A L0482A	U0683 (Average) L1RC001A L1RC002A L1RC003A * L0480A * L0481A * L0482A	1-RC-LI-1459A 1-RC-LI-1460 1-RC-LE1461
PDTT Level	PDTT Level	PDTT Level
Y2015A	Y2015A	1-DG-LI-101
SI Accumulator Level	SI Accumulator Level	SI Accumulator Level
	A. L1SI001A, L1SI002A B: L1SI003A, L1SI004A C: L1SI005A, L1SI006A	1-SI-LI-1920, 1-SI-LI-1922 1-SI-LI-1924, 1-SI-LI-1926 I-SI-LI-1928, 1-SI-LI-1930

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

ADMIN JPM

Determine Stay Time And Dressout Requirements For A Given Task.

CANDIDATE _____

EXAMINER _____

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Determine Stay Time and Dressout Requirements For A Given Task

References:

RWP; **Survey Maps, BRWT**

Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

Correct RWP
Correct Survey Map

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit-1 Non-Regen Hx. has been tagged out for maintenance.

Maintenance requests your assistance in the northwest comer of the Non-Regen Hx cube to determine why water is still in the Hx.

INITIATING CUES:

You are requested to determine your allowed stay time in the area allowed by RWP 04-1-0005 and to determine the dressout requirements for the job.

STEP 1:	Obtain a copy of RWP 04-1-0005 and survey map for Unit 1 Non-Regen & Seal Water Hx. Cubes.	___ SAT
STANDARD:	From the reference book provided, the operator obtains RWP 04-1-0005 and the correct survey map (Unit 1 Non-Regen & Seal Water Hx. Cubes).	___ UNSAT
COMMENTS:		
STEP 2:	Use survey map and RWP to determine stay time.	___ SAT
STANDARD:	Operator uses RWP io determine dose allowed is 10 mRem. Operator uses survey map to determine general area *close* rate is 40 mr/hr. Operator then divides 10 by 40 to obtain a stay time of 15 minutes.	___ UNSAT
COMMENTS:		
NOTES:	.25 hrs/15 minutes/a quarter of an hour are all acceptable	
STEP 3:	Determine dressout requirements to perform the job.	___ SAT
STANDARD:	Operator uses survey map Operator determines area is Hot Particle Area Operator uses survey map to determine dressout requirements are: Hood, Coveralls, Outer Rubber Boots, High Top Shoe Covers, Cotton Inserts, Rubber Gloves, Disposable Hood, **Gloves,** Coveralls, Plastic Shoe Covers, and Tape all Outer Seams.	___ UNSAT
COMMENTS:		

END OF TASK

*****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit-1 Non-Regen Hx. has been tagged out for maintenance.

Maintenance requests your assistance in the northwest corner of the Non-Regen Hx cube to determine why water is still in the Hx.

INITIATING CUES:

You are requested to determine your allowed stay time in the area allowed by RWP 04-1-0005 and to determine the dressout requirements for the job.

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
8E	AB 244' Unit 1 Nonregen & Seal Water Hx Cubes	04-02-04	2030

Purpose: ☑ Routine ☐ Non-Routine ☐ RWP Prep., for RWP No. #

Type: ☑ Gamma ☐ Beta ☐ Neutron ☑ Smear, GA ☑ Smear, LA ☐ Smear, HP ☐ Air Sample

Reactor Power	
Unit 1	Unit 2
100%	100%

Instrument Model	Serial #
TELE	111993
RM-14	8647
BC-4	1064, 1068

☑ All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.

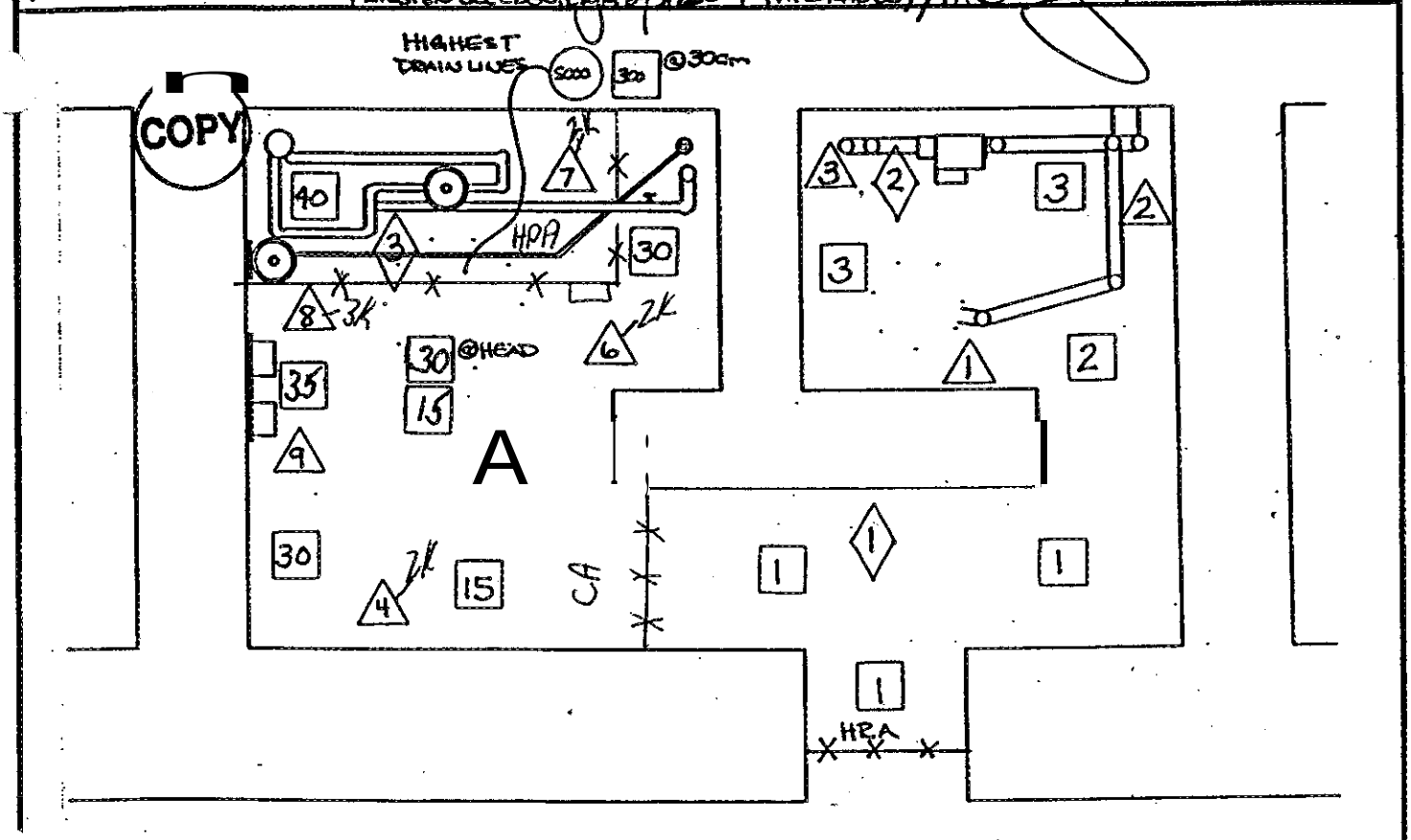
☐ All GA Smears < 1000 DPM/100 cm²
☑ All LA smears < 1000 DPM/ft²
☐ All HP smears < 1 HP/smear
☐ Air particulate + I₂ < 0.1 DAC
☑ SMEARS COUNTED ON BC-4 LLD
☐

☐ All GA smears in DPM/100 cm²
☑ All HP smears in HPs/smear
☑ All gamma readings in mrem/hr
☐ All neutron readings in mrem/hr
☐ All beta readings in mrad/hr
☐

Comments

Survey RWP: 04-2-1506

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
1	KIESTED BREEDED, [signature]	M. BRADLEY / M3	4-2-04



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
Ⓕ - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

☐ Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~XXX~~ Barrier

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
6	Auxiliary Building 274'	4/19/04	0200

Purpose: ☑ Routine ☐ Non-Routine ☐ RWP Prep., for RWP No. #

Type: ☑ Gamma ☐ Beta ☐ Neutron ☑ Smear, GA ☑ Smear, LA ☐ Smear, HP ☑ Air Sample

Reactor Power	
Unit 1	Unit 2
100	100

Instrument Model	Serial #
E-520	3927
RM-14	8647
HB09V	7991
BC-4	664/668

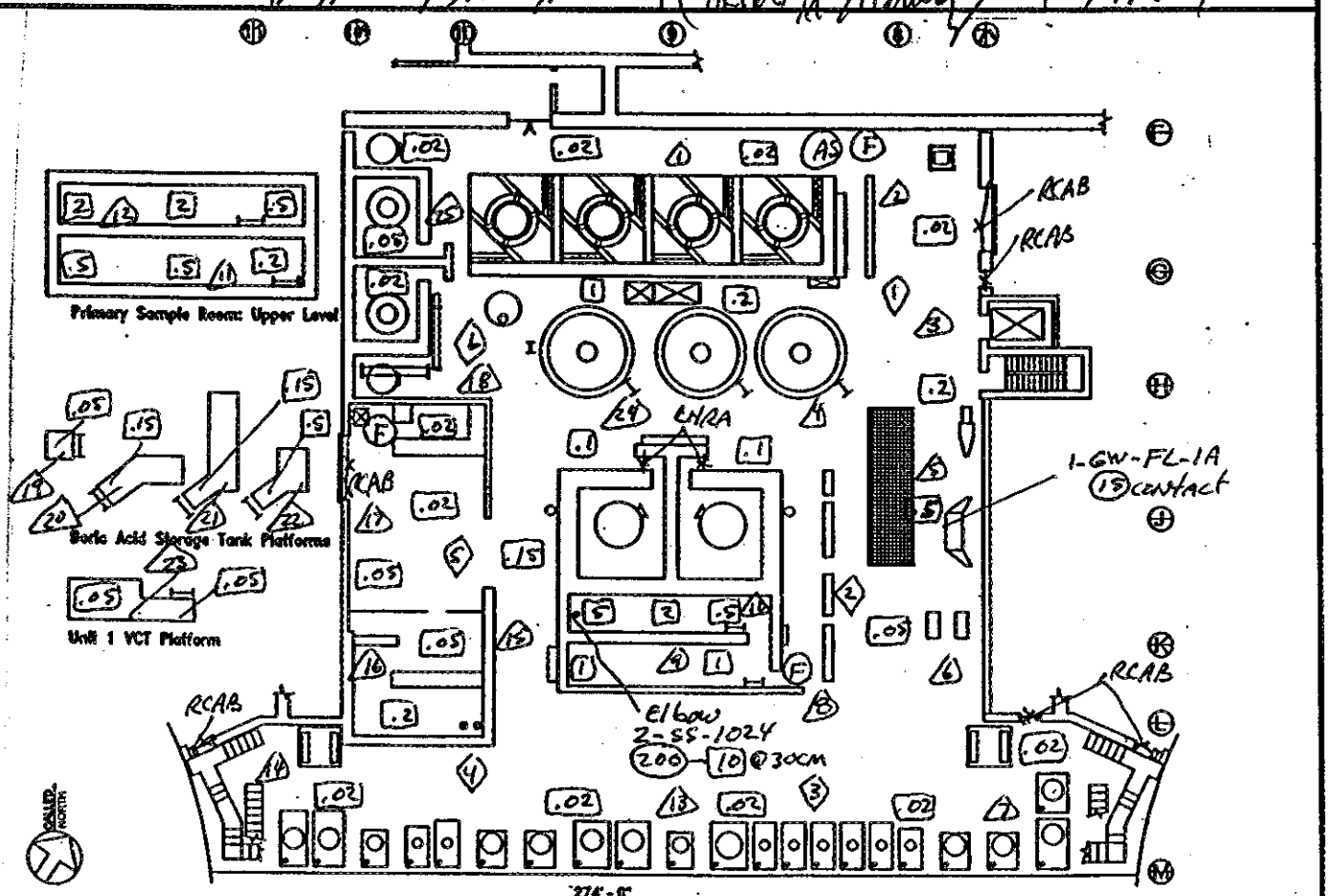
- ☐ All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
- ☑ All GA Smears < 1000 DPM/100 cm²
- ☑ All LA smears < 1000 DPM/ft²
- ☐ All HP smears < 1 HP/smear
- ☑ Air particulate + I₂ < 0.1 DAC
- ☑ SMEARS ON BC-4 < LLD
- ☐
- ☐ All GA smears in DPM/100 cm²
- ☐ All HP smears in HPs/smear
- ☑ All gamma readings in mrem/hr
- ☐ All neutron readings in mrem/hr
- ☐ All beta readings in mrad/hr
- ☐

COPY

Comments

Survey RWP: 04-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
1	T.G. Hudson / [signature]	[signature]	4-19-2004



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
Ⓕ - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

☐ Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; **AS** Air Sample Location; **LCK** Locked Gate; ~~XXX~~ Barrier

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
8B	AB 244', Unit 1 Penetration Area	4-24-04	2000

Purpose: [X] Routine [ ] Non-Routine [ ] RWP Prep., for RWP No. #

Type: [X] Gamma [ ] Beta [ ] Neutron [X] Smear, GA [X] Smear, LA [ ] Smear, HP [ ] Air Sample

Reactor Power	
Unit 1	Unit 2
100	100

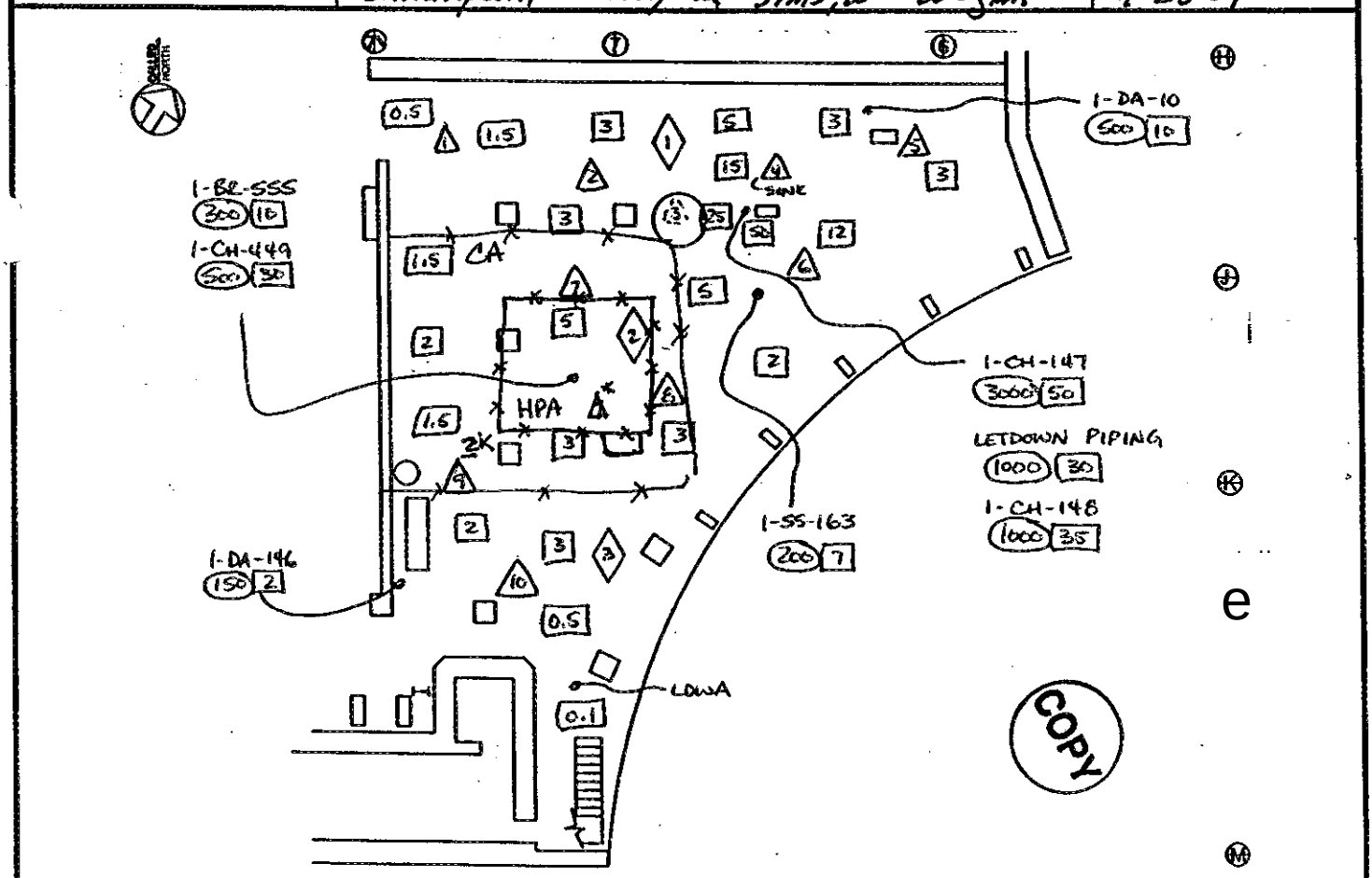
Instrument Model	Serial #
TELETECTOR	92949
RM-14	8647
BC-4	664, 668

- [ ] All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
- [X] All GA Smears < 1000 DPM/100 cm²
- [X] All LA smears < 1000 DPM/ft²
- [ ] All HP smears < 1 HP/smear
- [ ] Air particulate + I₂ < 0.1 DAC
- [X] All GA smears <LLD on BC-4
- [ ]
- [ ] All GA smears in DPM/100 cm²
- [X] All HP smears in HPs/smear
- [X] All gamma readings in mrem/hr
- [ ] All neutron readings in mrem/hr
- [ ] All beta readings in mrad/hr
- [ ]

Comments

Survey RWP: 04-2-1506

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
1	B. Thompson, BThompson	Sims, W WCSims	4-25-04



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
Ⓕ - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

] Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~XXX~~ Barrier

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
5	Auxiliary Building 291'	4/19/04	0020

Purpose: [x] Routine [ ] Non-Routine [ ] RWP Prep., for RWP No. #

Type: [x] Gamma [ ] Beta [ ] Neutron [x] Smear, GA [x] Smear, LA [ ] Smear, HP [x] Air Sample

Reactor Power	
Unit 1	Unit 2
100	100

Instrument Model	Serial #
E-520	3927
RM-14	8647
H809V	7991
BC-4	664/668

[ ] All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
[x] All GA Smears < 1000 DPM/100 cm²
[x] All LA smears < 1000 DPM/ft²
[ ] All HP smears < 1 HP/smear
[x] Air particulate + I₂ < 0.1 DAC
[x] Smears on BC-4 < LLD
[ ]

[ ] All GA smears in DPM/100 cm²
[ ] All HP smears in HPs/smear
[x] All gamma readings in mrem/hr
[ ] All neutron readings in mrem/hr
[ ] All beta readings in mrad/hr
[ ]

COPY

Comments

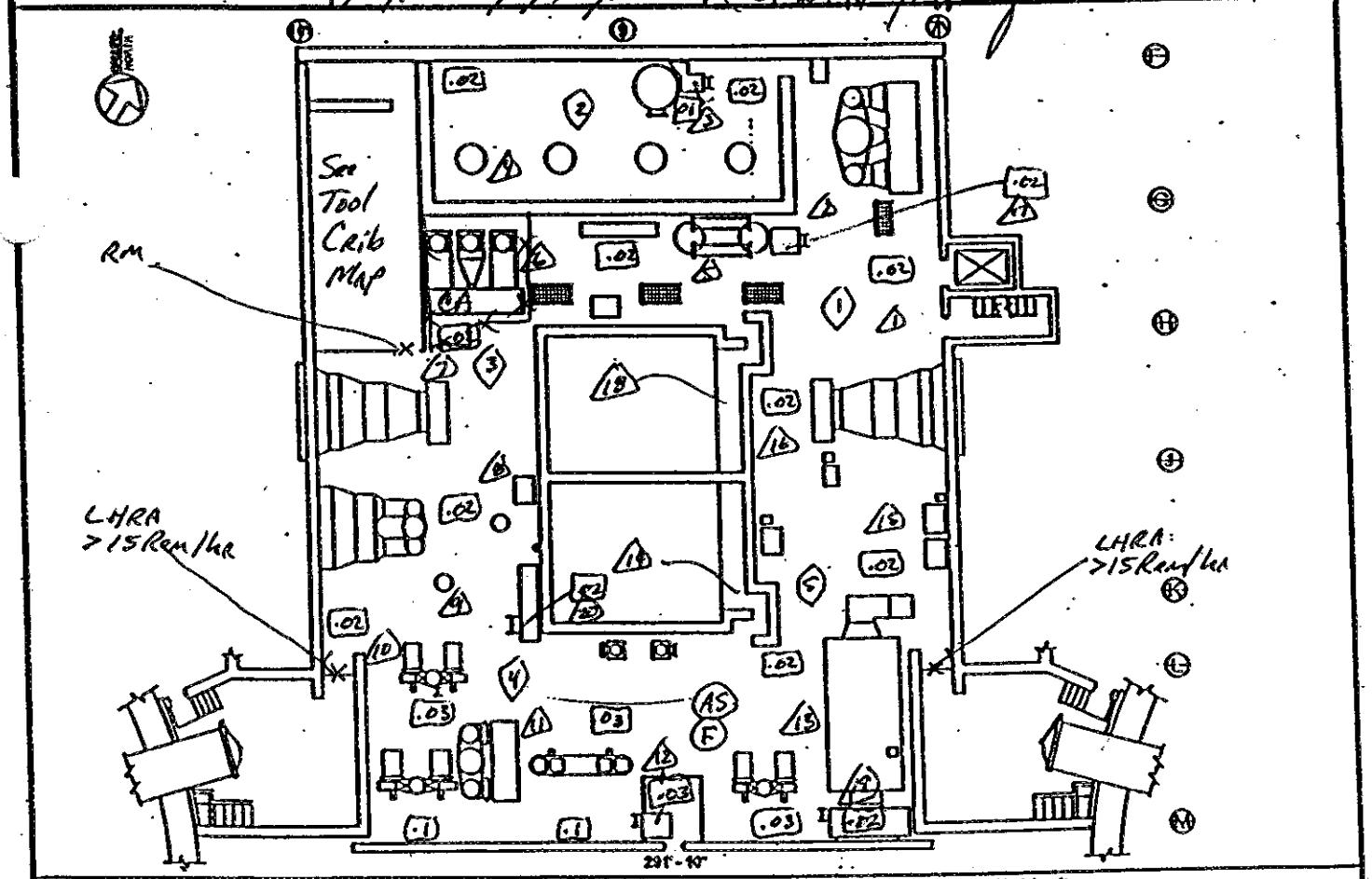
Survey RWP: 04-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated): 0

Submitted By (Printed Name, Signature): T.G. Hudson / [signature]

Reviewed By (Printed Name, Signature): ORIGINAL [signature]

Date: 4-19-2004



LDWA - Low Dose Walking Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
(F) - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

[ ] Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~X-X-X~~ Barrier

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
7	Auxiliary Building 259'	4/19/04	0310

Purpose: ☑ Routine ☐ Non-Routine ☐ RWP Prep., for RWP No. #

Type: ☑ Gamma ☐ Beta ☐ Neutron ☑ Smear, GA ☑ Smear, LA ☐ Smear, HP ☑ Air Sample

Reactor Power: Unit 1 100 | Unit 2 100

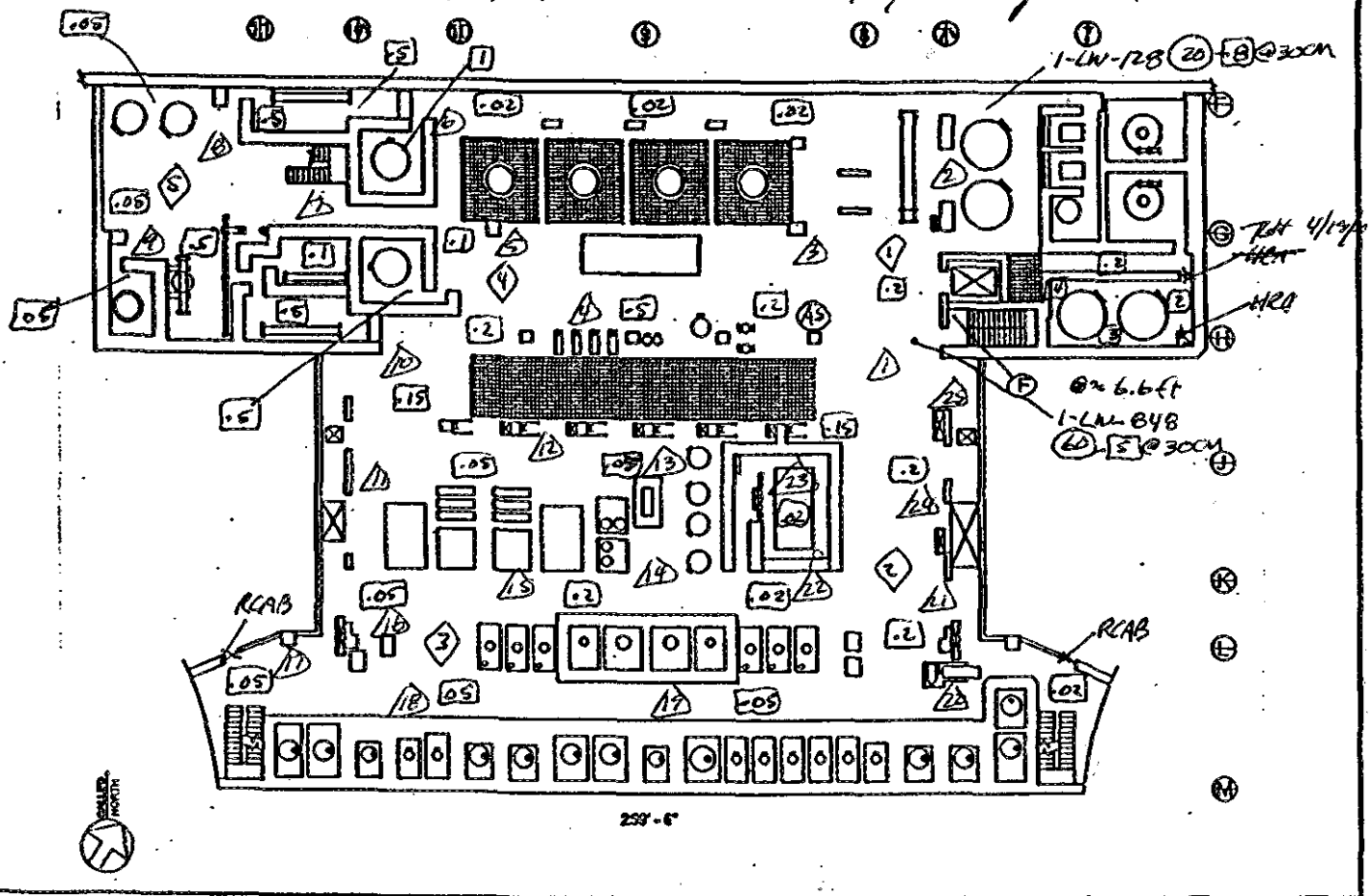
Instrument Model	Serial #
E-520	3927
RM-14	8647
HB09V	7991
BC-4	664/668

☐ All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
☑ All GA Smears < 1000 DPM/100 cm²
☑ All LA smears < 1000 DPM/ft²
☐ All HP smears < 1 HP/smear
☑ Air particulate + I₂ < 0.1 DAC
☑ Smears on BC-4 < LLD
☐ All GA smears in DPM/100 cm²
☐ All HP smears in HPs/smear
☑ All gamma readings in mrem/hr
☐ All neutron readings in mrem/hr
☐ All beta readings in mrad/hr

COPY

Comments _____ Survey RWP 04-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
0	T. Hudson / [signature]	[signature]	4-19-2004



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
(F) - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

☐ Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~XXX~~ Barrier

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
27	Charging Pumps	4-5-04	2105

Purpose: [✓] Routine [ ] Non-Routine [ ] RWP Prep., for RWP No. #

Type: [✓] Gamma [ ] Beta [ ] Neutron [✓] Smear, GA [✓] Smear, LA [ ] Smear, HP [ ] Air Sample

Reactor Power	
Unit 1	Unit 2
100	100

Instrument Model	Serial #
Rm-14	8647
Tele	111992
BC4	664, 668

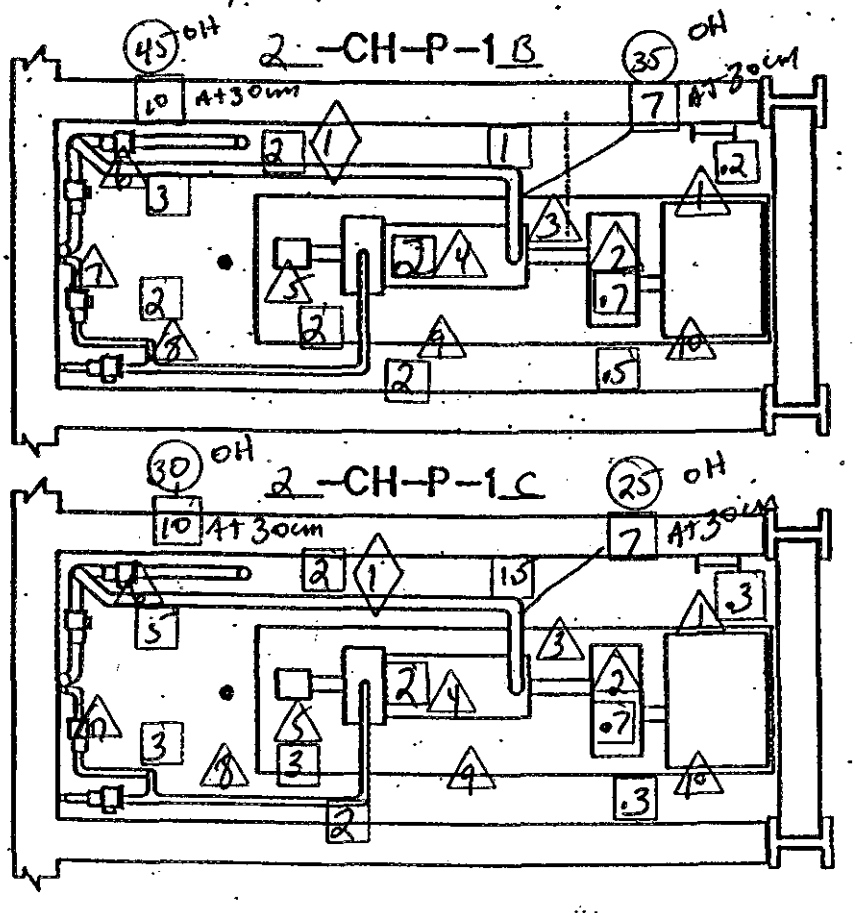
- [ ] All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
- [✓] All GA Smears < 1000 DPM/100 cm²
- [✓] All LA smears < 1000 DPM/ft²
- [ ] All HP smears < 1 HP/smear
- [ ] Air particulate + I₂ < 0.1 DAC
- [✓] All Smears < LLD on BC4
- [ ]
- [ ] All GA smears in DPM/100 cm²
- [ ] All HP smears in HPs/smear
- [✓] All gamma readings in mrem/hr
- [ ] All neutron readings in mrem/hr
- [ ] All beta readings in mrad/hr
- [ ]

COPY

Comments OH - OVER HEAD

Survey RWP 04-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
<1	Smetts, T / Smetts, T	Sims, W. / WC Sims	4-6-04



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
Ⓕ - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

☐ Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; -X-X-X Barrier

(Page 1 of 2)

Attachment 1
Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
27	Charging Pumps	4-5-04	2130

Purpose: [x] Routine [ ] Non-Routine [ ] RWP Prep., for RWP No. #

Type: [x] Gamma [ ] Beta [ ] Neutron [x] Smear, GA [x] Smear, LA [ ] Smear, HP [ ] Air Sample

Reactor Power	
Unit 1	Unit 2
100	100

Instrument Model	Serial #
Tele 6112B	111993/111992
RM-14	8647
BC-4	664; 668

[ ] All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
[x] All GA Smears < 1000 DPM/100 cm²
[x] All LA smears < 1000 DPM/ft²
[ ] All HP smears < 1 HP/smear
[ ] Air particulate + I₂ < 0.1 DAC
[x] Smears counted on BC-4 <LLD.
[ ]

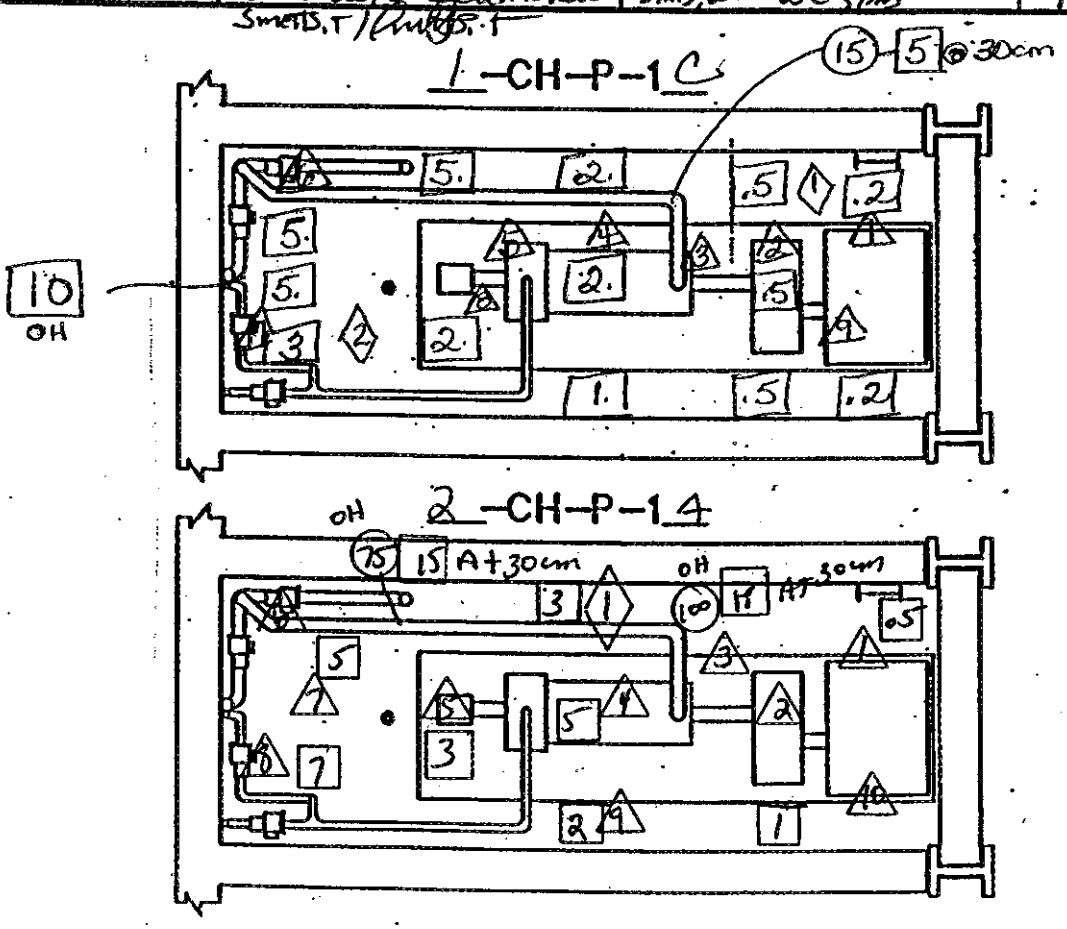
[ ] All GA smears in DPM/100 cm²
[ ] All HP smears in HPs/smear
[x] All gamma readings in mrem/hr
[ ] All neutron readings in mrem/hr
[ ] All beta readings in mrad/hr
[ ]

COPY

Comments OH = Overhead

Survey RWP: 04-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
<0	Edmonds, J. / Edmonds Smith, T / Smith, T	Sims, W. / WC Sims	4-6-04



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
Ⓕ - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

[ ] Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~XXX~~ Barrier

(Page 1 of 2)

Attachment 1

Radiological Survey Map And Record

Map Number	Location/Description	Date	Time
27	Charging Pumps	4-5-04	2130

Purpose: [x] Routine [ ] Non-Routine [ ] RWP Prep., for RWP No. #

Type: [x] Gamma [ ] Beta [ ] Neutron [x] Smear, GA [x] Smear, LA [ ] Smear, HP [ ] Air Sample

Reactor Power	
Unit 1	Unit 2
100	100

Instrument Model	Serial #
Tele 6112B	111993
RM-14	8647
BC-4	664; 668

[ ] All GA Smears < 1000 DPM/100 cm² Except as noted on map or smear worksheet.
[x] All GA Smears < 1000 DPM/100 cm²
[x] All LA smears < 1000 DPM/ft²
[ ] All HP smears < 1 HP/smear
[ ] Air particulate + I₂ < 0.1 DAC
[x] Smears counted on BC-4 <LLD.
[ ]

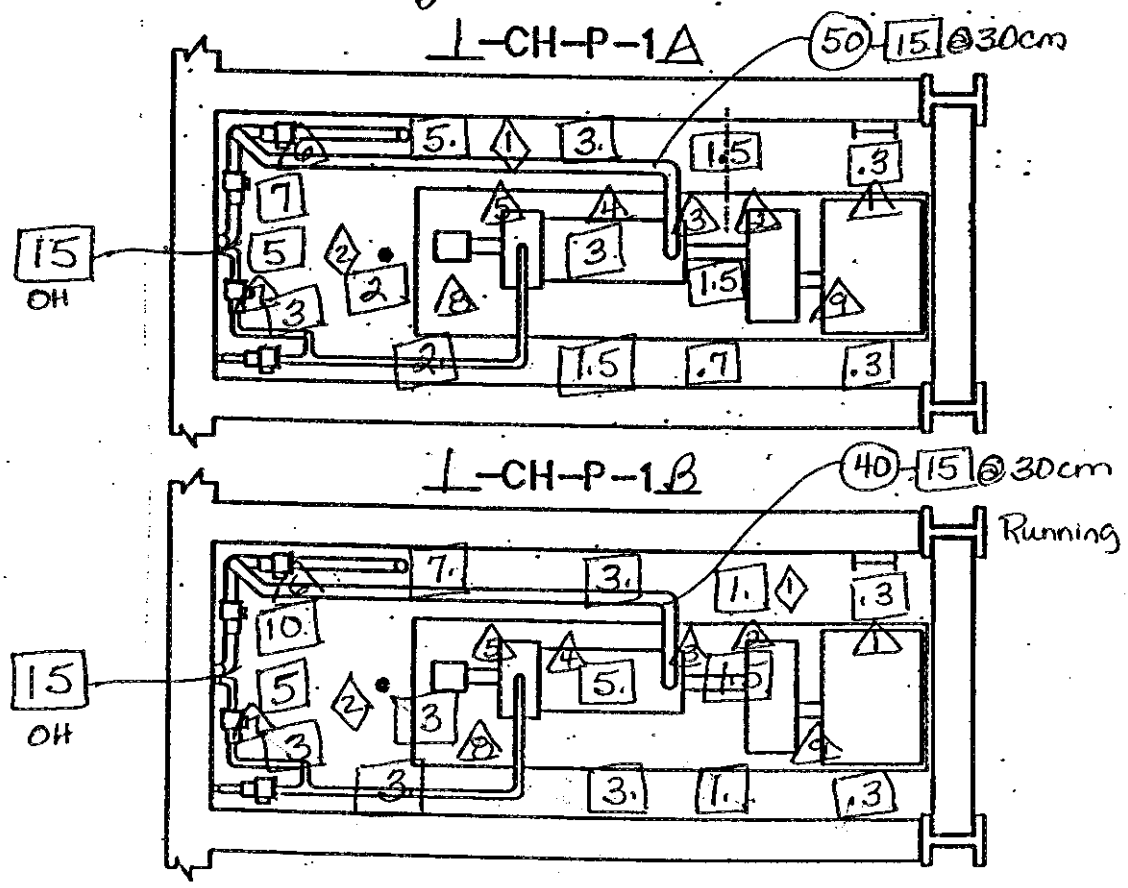
[ ] All GA smears in DPM/100 cm²
[ ] All HP smears in HPs/smear
[x] All gamma readings in mrem/hr
[ ] All neutron readings in mrem/hr
[ ] All beta readings in mrad/hr
[ ]

COPY

Comments OH = Overhead

Survey RWP: 04-1-0002

Survey Team Dose, mrem (SRD/DAD or calculated)	Submitted By (Printed Name, Signature)	Reviewed By (Printed Name, Signature)	Date
1	Edmonds, J. J Edmonds	Sims, W W C Sims	4-6-04



LDWA - Low Dose Waiting Areas
LHRA - Locked High Radiation Area
HRA - High Radiation Area
RA - Radiation Area
HPA - Hot Particle Area
CA - Contaminated Area
ARA - Airborne Radioactivity Area
RM - Radioactive Material (s)
CAM - Continuous Air Monitor
(F) - Frisking Station
RCAB - Radiological Control Area Boundary
NDC - Neutron Dose Calculation Required

[ ] Gen. Area; ○ Contact; Δ GA Smear; ◊ LA Smear; Δ* HP Smear; AS Air Sample Location; LCK Locked Gate; ~~X X X~~ Barrier

POWER STATION

RADIATION WORK PERMIT 04-1-0005

VALID FROM 01/01/2004 TO 12/31/2004 **RWP 04-1-0005** **REV. NO 2**

DAD DOSE RATE ALARM : 90 mRem/Hr	**PROJECTED EXPOSURE : 1311 mRem**
DAD DOSE LIMIT ALARM : 10 mRem	**ALARA EVALUATION # :04-002**

JOB LOCATION : Station Property excluding Unit 1 and Unit 2 Reactor Containments.

COPY

JOB DESCRIPTION : Routine duties by Operations personnel.

TRAINING USE ONLY

THE MAXIMUM **POSTED AREA THAT CAN BE ENTERED ON THE RWP IS:**
High Radiation Area.

RADIOLOGICAL CONDITIONS :

GENERAL AREA RADIATION LEVELS (mRem/Hr) : See current RCA surveys.

CONTACT/HOT SPOT RADIATION LEVELS (mRem/Hr) : See current RCA surveys.

CONTAMINATION LEVELS (dpm/100cm2) : See current RCA surveys.

AIRBORNE RADIOACTIVITY (DAC) : <.30

EQUIRED JOB COVERAGE : Routine

1.0 Continuous HP coverage, ARW with a dose rate instrument, or a DAD with worker knowledge of work area dose rates required for entry into "High Radiation Area".

DOSIMETRY REQUIREMENTS : TLB DAD/SRD

1.0 An alternate means of DAB alarm recognition is required.

PROTECTIVE CLOTHING REQUIREMENTS:

HEAD AND BODY	FEET	HANDS
Hood (1)	Outer Rubber Boots	Cotton Inserts
Coveralls (1)	High Top Shoe Covers	Rubber Gloves (1 pair)

1.0 Protective Clothing requirements may be modified by HPSS.
2.0 Protective Clothing requirements as stated are for entry into "Contaminated Areas" only.
3.0 Labcoat, high top shoe covers, rubbers boots, cotton inserts, and rubber gloves may be worn as specified by the Health Physics Shift Supervisor.

Prepared by :	**Joseph Rudmann**	**Date . 11/19/2003**	**Approved By :**	**Date :**
Revised by :	**ROBERT MCNUTT**	**Date : 03/02/2004**	**Approved By :** T Kasper	**Date :** 3/2/4
minated by :		**Date :**	**Approved By :**	**Date :**

RADIATION WORK PERMIT 04-1-0005

4.0 Protective clothing requirements for Hot Particle Areas(in addition to those stated above)

4.1 HPA - disposable hood, gloves, and and coveralls, plastic shoe covers and tape all outer seams.

4.2 Workers interfacing with individuals/equipment in a HPA - Gioves and face shield.

RESPIRATORY REQUIREMENTS :

A RWP PRE-JOB BRIEFING IS REQUIRED.

MINIMUM TRAINING REQUIRED TO USE THIS RWP : BRWII

RADIATION WORK PERMIT 04-1-0005

ORKER INSTRUCTIONS :

1.0 Upon receiving any DAB alarm, ensure equipment is left in a safe condition and leave the area and report to the Health Physics office.
2.0 Workers are responsible for notifying the HPSS prior to venting\draining systems, that may affect Radiological Conditions in an area, to ensure proper Health Physics Monitoring.
3.0 HPA exit instructions:
  3.1 Use extreme care in removing PCs and frisking.
  3.2 Workers(including those interfacing with workers/equipment in HPA) are to proceed directly to the RCA exit for whole body monitoring.
  3.3 Workers that will remain in the RCA will be monitored by HP upon exiting the HPA.
4.0 Do not remove any items from HPA until authorized by HP.
5.0 Notify HP-Ops prior to entry into any area posted equivalent to "Neutron dose monitoring required for entry".
6.0 Review ALARA action pian prior to initial entry under this RWP.
7.0 No entry into any overhead area of the RCA will be made unless HP has evaluated the radiological conditions in the area and approved the entty.
8.0 Unless continuous Health Physics coverage is provided, workers shall read their SRD/DAD at least once every 15 minutes.

HEALTH PHYSICS INSTRUCTIONS :

.0 HPA monitoring requirements:
  1.1 Workers exposed skin shall be monitored by HP every 2 hours(unless specified by the HPSS) while the worker is in the HPA.
    1.1.1 Workers wearing respirators shall have face monitored as soon as possible after removing the respirator.
  1.2 Personnel monitoring for workers exiting HPAs will consist of a whole body scan within 1/2 inch using: 1) RM-14 (with HP-210 background <10,000 cpm);or 2) RO-2 (open window background e1.0 mrem/hr).
    1.2.1 Individual release criteria: a net reading of <18,000 cpm or <2.0 mrem/hr.
2.0 Neutron Dose determination is required for all entries into areas posted equivalent to "Neutron Dose Calculation Required for Entry".
  2.1 Neutron Bubble Dosimeter should be used for all ISFSI activities such as loading, deconning, transporting the loaded cask, and ISFSI inner fence entries.
  2.2 Neutron and Noble Gas Dose Calculation Record should be used for containment power entries, equipment hatch PTs, use of the AmBe source in HRCL, and ISFSI work if bubble dosimetry fails during use or is not availbable.

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

ADMIN JPM

Review And Approve A Work Request For Work Under An Existing Tagout

CANDIDATE _____

EXAMINER _____

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Review and approve a work request to be worked under an existing tag out.

References:

DNAP-2000, "Dominion Work Management Process"
VPAP-1402. "Control of Equipment, Tag-outs, and Tags"
Work Package for 1-SI-RV-1845B
Tagout for Low Head SI Pump.
11715FM 096A SHT 1 and 2

Candidate: _____
NAME

Performance Rating: SAT _____ UNSAT _____

Examiner: _____ _____ / _____
NAME SIGNATURE BATE

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

Copy of work order for I-SI-RV-18458
1715FM 096A Sht1&2
DNAP 2000, "Dominion Work Management Process

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shaii be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

A tag-out is hanging on 1-SI-P-IB, "B" Low Head Safety Injection Pump.
A copy of the tag-out is on your desk.

INITIATING CUES:

A mechanic comes to your desk requesting approval of a work order on 1-SI-RV-1845B. The mechanic requests to work this package under the tagout for the 1B Low Head SI Pump. You are to review the work order in accordance with DNAP 2000 to determine the following:

1. Is the tag-out boundary adequate for the work?
2. If an adequate boundary is established whether by this tag-out or creating a separate one, would you approve this request. State your reasons for approving or not approving this work package.

STEP 1: Take a copy of the tag-out and use a print to establish existing boundary. **STANDARD:** Operator obtains a print and identifies current boundary. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Operator locates 1-SI-RV-1845B and determines if an adequate boundary exists. **STANDARD:** Operator locates valve on the print and determines it cannot be worked under ths existing tag-out. COMMENTS: NOTES:	___ SAT ___ UNSAT
STEP 3: Based on an adequate boundary as stated in the initial conditions, review the work package for approval. **STANDARD:** Work package not approved because it did not have a **PMT** sheet. Without it the operator could not verify **PMT** requirements. This is required per **DNAQ** 2000, "Dominion Work Management Process." COMMENTS: **END TASK**	___ SAT ___ UNSAT

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

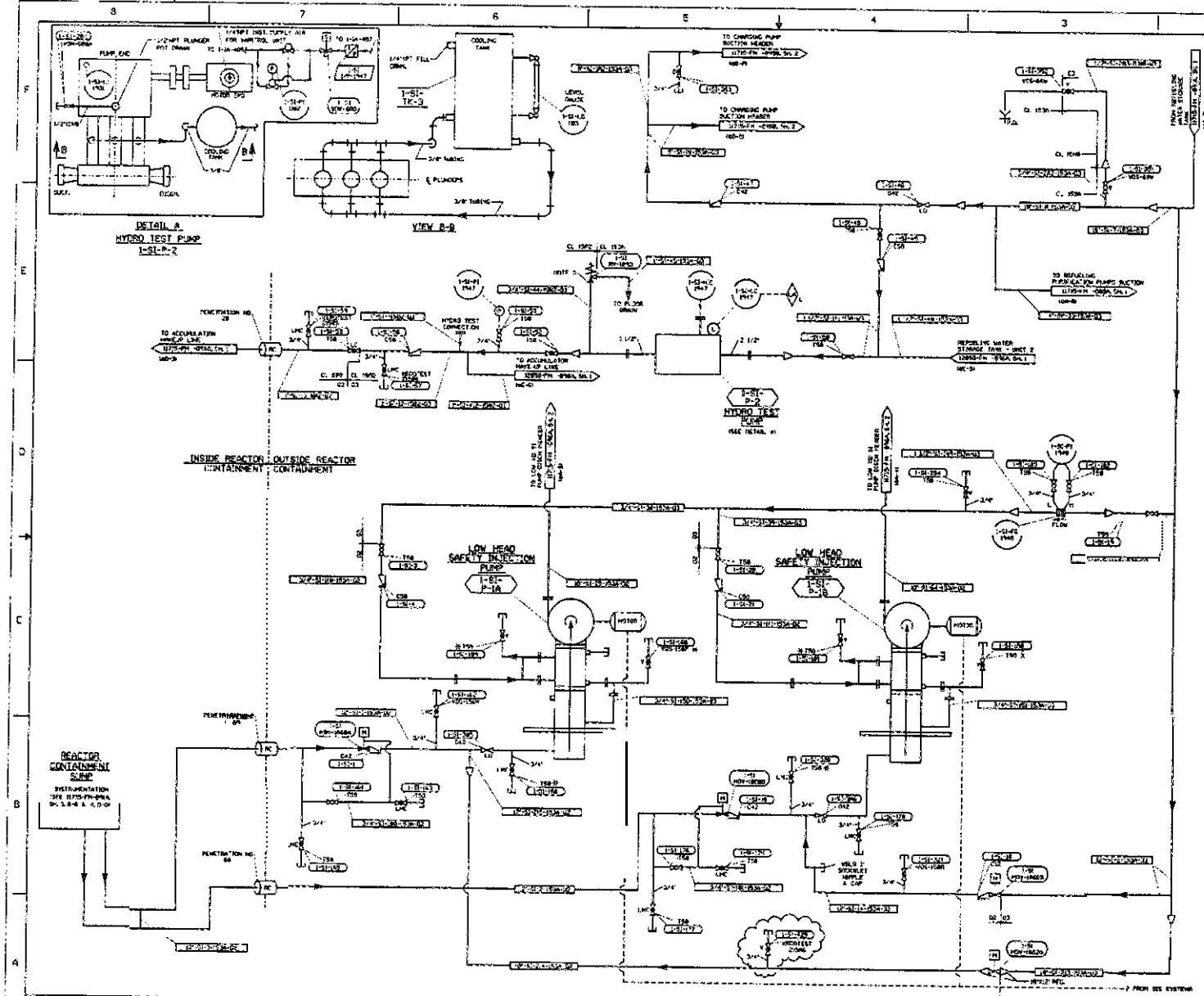
INITIAL CONDITIONS:

A tag-out is hanging on 1-SI-P-1B, "B" Low Head Safety Injection Pump.
A copy of the tag-out is on your desk.

INITIATING CUES:

A mechanic comes to your desk requesting approval of a work order on 1-SI-RV-1845B. The mechanic requests to work this package under the tagout for the 1B Low Head SI Pump. You are to review the work order in accordance with DNAP 2000 to determine the following:

1. Is the tag-out boundary adequate for the work?
2. If an adequate boundary is established whether by this tag-out or creating a separate one, would you approve this request. State your reasons for approving or not approving this work package.



NOTES

1. ADJUST VALVES IN FIELD TO LIMIT PUMP ALREADY THEN LOCK IN POSITION. NEW LOCKING DEVICE INSTALLED PER DCP 93-304
2. LOCATE CONNECTION CLOSE TO BORON INJECTION TANK.
3. PH-1870 TO BE CHECKED DURING HYDRO TESTING.
4. LOCATE CONNECTION CLOSE TO VALVES MOV-1867C & D.
5. DRAINING LINES ARE TRANSDUCER TO BE INSTALLED IN HEATED ENCLOSURE.
6. TAPS MUST BE 2-4" APART.
7. SAMPLE CONNECTION SHALL BE BROUGHT INTO THE ANNULUS PRESSURE BETWEEN A COLUMN 4-COLN 5-RELIEF VALVE FROM ACCUMULATOR.
8. PLUGGED DRAINS BY DOUBLE BLOCK VALVES MOV 1067 P.U.C.D.
9. SYMBOL B DENOTES SUPPLIED BY EQUIPMENT MANUFACTURER.
10. SYMBOL LC DENOTES LOCKED CLOSED VALVE.
11. SYMBOL FC DENOTES FAIL CLOSED VALVE.
12. SYMBOL AC DENOTES ADMINISTRATIVE CONTROL VALVE.
13. SYMBOL Pipe Cap DENOTES HEAT TRACE.
14. S.I. SAFETY INJECTION TRAIN.
15. LOCK LEAKAGE MONITORING CONNECTION.
16. 3/4"-MOV-1867A IS A TORRAY VALVE MODEL * 6867A.
17. 3/4"-MOV-1867B IS A VELAN VALVE MODEL *HCM-2004B-1.3HC.
18. 3/4"-MOV-1867C IS A CONVAL VALVE MODEL * 1068.
19. 3/4"-MOV-1867D IS A CONVAL VALVE MODEL * 202.
20. TO HELP PREVENT A POTENTIAL UNPLANNED EXCESSIVE RELEASE IN THE EVENT OF PIPE RUPTURE TO BRAKEN SECTION OF THE PLANT IS IMPERATIVE.

THIS CAD DRAWING SHEETS 1,2 & 3 OF 3 SUPERSEDES THE MANUAL FLOW AND VALVE OPERATING NUMBERS DRAWINGS 11715-FM-896A REV-2B AND 11715-FM-896A REV-1B RESPECTIVELY.

REFERENCE DRAWINGS

NUMBER	TITLE
02. 11715-FM-896A	FLOOR DRAINAGE AUXILIARY BUILDING
03. 11715-FM-897A	FLOW/VOL DIAGRAM/CHEM. PET CLNG. & REF FUEL SYSTEM
07. 11715-FM-0A60	FLOW/VOL DIAGRAM/BORON RECOVERY SYSTEM
04. 11715-FM-898A	FLOW/VOL DIAGRAM/VENT & DRAIN SYSTEM
05. 11715-FM-899A	FLOW/VOL DIAGRAM/WASTE & DRAIN SYSTEM
06. 11715-FM-893A	FLOW/VOL DIAGRAM/REACTOR COOLANT SYSTEM
07. 11715-FM-893B	FLOW/VOL DIAGRAM/REACTOR COOLANT SYSTEM
08. 11715-FM-894A	FLOW/VOL DIAGRAM/RESIDUAL HEAT REMOVAL SYSTEM
09. 11715-FM-895A	FLOW/VOL DIAGRAM/CHEM & VOLUME CONTROL SYSTEM
10. 11715-FM-895B	FLOW/VOL DIAGRAM/CHEM & VOLUME CONTROL SYSTEM
11. 11715-FM-895C	FLOW/VOL DIAGRAM/CHEM & VOLUME CONTROL SYSTEM
12. 11715-FM-896B	FLOW/VOL DIAGRAM/SAFETY INJECTION SYSTEM
13. 11715-FM-899A	FLOW/VOL DIAGRAM/LIQUID WASTE DISPOSAL SYSTEM
14. 12050-FM-896A	FLOW/VOL DIAGRAM/SAFETY INJECTION SYSTEM
15. 11715-FM-896A	FLOW/VOL DIAGRAM/SAFETY INJECTION SYSTEM
16. 11715-FM-1B0A	FLOW/VOL DIAGRAM/PRIMARY PLANT GAS SUPPLY SYSTEM

SUPPORT DRAWINGS

1. 11715-CSM-896A SH.1 101 PLANT/SYSTEM BOUNDARY DRAWING
2. DELETED
3. 11715-SPM-896A SH.1 101 SYSTEM PRESSURE TESTING DRAWING

SUPPORT NOTES

REVISION DESCRIPTION

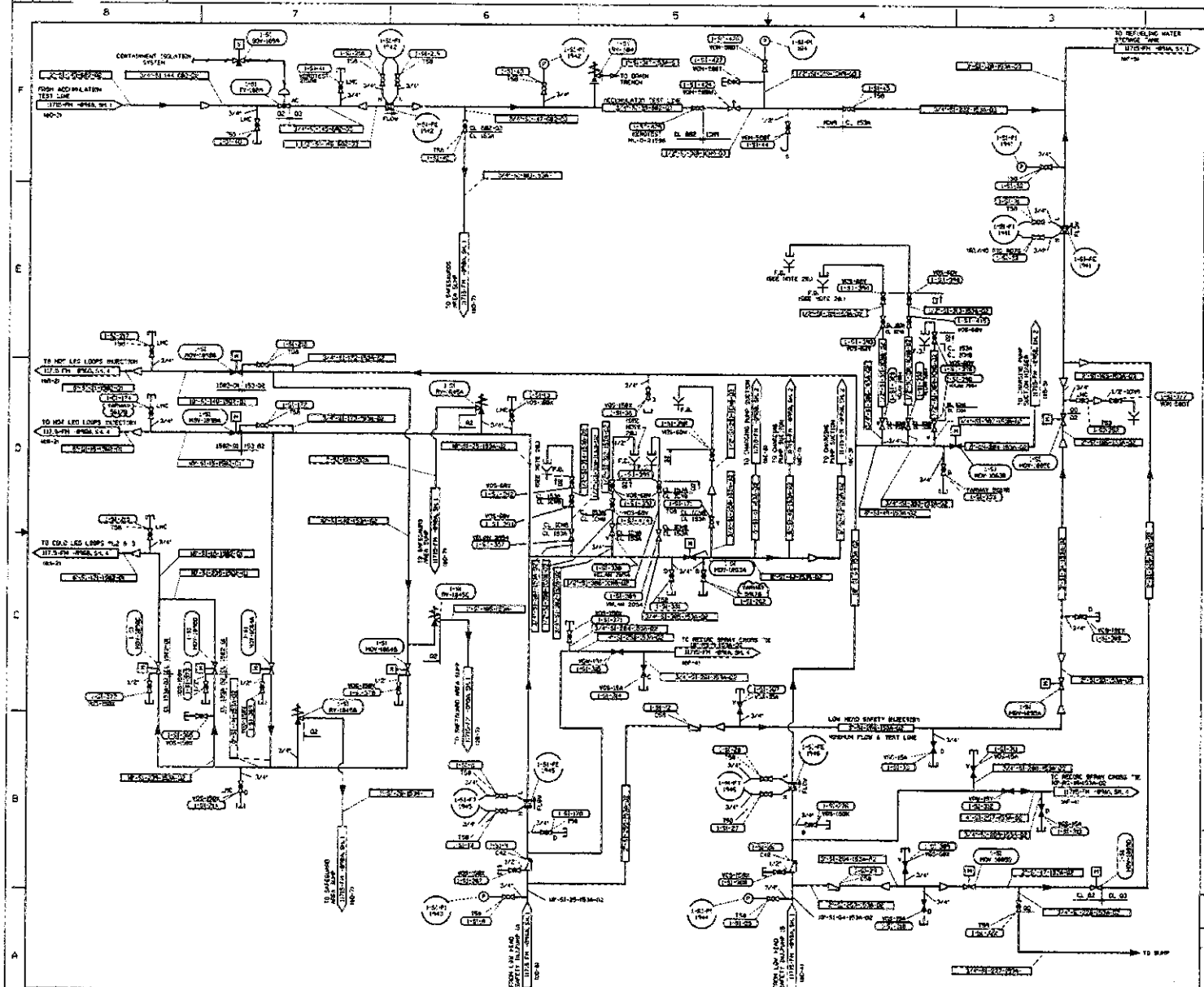
VIRGINIA POWER
NORTH CAROLINA POWER
NUCLEAR ENGINEERING SERVICES
RICHMOND, VIRGINIA

FLOW/VALVE OPERATING NUMBERS DIAGRAM SAFETY INJECTION SYSTEM NORTH ANNA POWER STATION UNIT 1 VIRGINIA POWER

DRAWING NO. 11715-FM -896A REV 3B

SCALE: NONE — UNLESS OTHERWISE NOTED — SH 1 OF 3

REVISED PER DCP 94-120 THIS DWG SUPERSEDES THE REV 3A ORIGINAL



NOTES:

1. FOR NOTES, SEE SHEET 1 OF THIS DRAWING.

THIS CAD DRAWING SHEETS 1,2 & 3 OF 3 SUPERSEDES THE MANUAL FLOW AND VALVE OPERATING NUMBERS DIAGRAM. 11715-FM-096A REV-29 AND 11715-FM-096A REV-30 RESPECTIVELY.

REFERENCE DRAWINGS

NUMBER	TITLE
AL FOR ADDITIONAL REFERENCE DRAWINGS, SEE SHEET 1 OF THIS DRAWING.	
1. 11715-FM-095A	FLOW/VLVE DIAGRAM, VENT & DRAIN SYSTEM
2. 11715-FM-096A	FLOW/VLVE DIAGRAM, VENT & DRAIN SYSTEM
3. 11715-FM-098B	FLOW/VLVE DIAGRAM, FLOW & VALVE CONTROL SYSTEM
4. 11715-FM-099B	FLOW/VLVE DIAGRAM, SAFETY INJECTION SYSTEM

SYPROJECT DRAWINGS

1. 11715-SIM-SPMA, SH.2 — SIC CLASSIFICATION DIAGRAM DRAWING
2. DELETED
3. 11715-SIM-SPMA, SH.2 — SIC SYSTEM PRESSURE RATING DRAWING

SYPROJECT NOTES

DEVIATION DESCRIPTION

VIRGINIA POWER
NORTH CAROLINA POWER
NUCLEAR ENGINEERING SERVICES
RICHMOND, VIRGINIA

FLOW/VALVE OPERATING NUMBERS DIAGRAM
SAFETY INJECTION SYSTEM
NORTH ANNA POWER STATION UNIT 1
VIRGINIA POWER

DSGN	DSGN SUPV	CAD NO. C:\User\dgn\NPM\NPM\NPM.dwg	
DRWN CWC-CDL	DSPL ENGR	DRAWING NO. 11715-FM -096A	REV. 39
CHKD LAR	LEAD ENGR		
DATE 09-09-86	SCALE NONE	UNLESS OTHERWISE NOTED	SH 2 OF 3

REVISED PER CCN 47-126 THIS DRAWING SUPERSEDES REV 38

REVISED PER CCN 45-305 THIS DRAWING SUPERSEDES REV 34

REVISED PER CCN 47-126 THIS DRAWING SUPERSEDES REV 37 ORIGINAL

REVISED PER CCN 47-126 THIS DRAWING SUPERSEDES REV 36 ORIGINAL

REVISED PER CCN 47-126 THIS DRAWING SUPERSEDES REV 35 ORIGINAL

CAD FILE NAME: C:\User\dgn\NPM\NPM\NPM.dwg
DATE: MAY-1994 12:15

MARK NUMBER: 59-01-SI-RV-1845B-VALVE- QUAL CLASS: SR
MN DESC: LOW HEAD SAFETY INJECTION PUMP DISCHARGE RELIEF UTC NUMBER: *
BOM ITEM NO: * MFR: C515 MODEL NO.: JMAK-BS-B SERIAL NO : * ITEM QCL: *
TASK TITLE : SAFETY/RELIEF VALVE TESTING/ISI TYPE: PLANNED MAINTENANCE SR TASK: Y

LOC GRID XIY : * * ELEV: 255 VIMS FR: *
LOCATION CODE: SFGD - SAFEGUARDS
LOCATION DESC: 7FT ABOVE FLOOR 8FT W OF E WALL 2FT S OF ACCESS LAODER

TASK PROBLEM SAFETY/RELIEF VALVE TESTINGIISI TASK PRIORITY: 4
DESCRIPTION: CROSBY JMAK-BS 3/4 X I"

MRULE A(4) - RISK SIGNIFICANT

EQ REL	: N	EQML	: N	HUMAN FACTORS:	*	ENVIRONMENTAL ZONE:	SFGD-1
REG 1.97	: N	APPEND R	: N	APPEND R AREA:	15-1	PRA FLAG:	R
SEISMIC	: Y	NPRDS ITEM	: Y	INSUL COMP :	*	LIC. REN:	Y

TASK INFORMATION

TAGOUT REOD	: Y	WELD/FL REOD	: N	ASME PRGM	: N	DEV RPT IND	: N
PMP REQD	: Y	SCAF REQD	: N	INS REM REQD	: N	DEY RPT #'S	: * * *
RWP REQD	: Y	CONF ENTRY	: N	IND SR	: N	ENG REVIEW	: N
		SECURE REL	: N	COATING REQD	: N	ENG DES DOC	: N/A

RWP NUMBERS : * * *

PLANNER: PURSHON HONCHAR S UCR: 5 LMD: M TASK TYPE: PM
W/R SUBMITTED BY: * * * DEPT: * TROUBLE/BREAKDOWN: N
W/R APPROVED BY : * * * DATE: * WINDOW : _____ FEG: _____

DEL W/O: 00436347

PM INFORMATION

DUE DATE	EARLY START	PAST GRACE	FREQ CODE	OVERLAPPED: N
*	*	*	*	

TASK SIGNATURES

OPERATIONS _____ DATE/TIME: _____/_____
ICO _____

IC NOTIFIED _____ OATEITIME: _____/_____

TAGGING VERIFIED BY: _____ DATEITIME: _____/_____

TAGGING REPORT NBRS: _____ _____ _____

SPECIAL NOTES : THIS IS AN AGING MANAGEMENT WORK ORDER AND COMPONENT AGING INFORMATION IS REQUIRED.
CME 85-0110 FOR ANTI-SEIZE.
SUBMIT DR IF VALVE FAILS PT AND RETURN TO PLANNING FOR NEW TASK. THIS VALVE IS PART OF ISI INSPECTION PROGRAM AND CANNOT BE DEFERRED. THE SET POINT OF THIS VLV. WAS CHANGED AND A NEW SPRING WAS INSTALLED UNDER DCP-92-106. REFER TO THIS DOCUMENT FOR PROPER SETTING OF VLY.

TASK JOB STEPS

STEP NO	STEP DESCRIPTION	CRAFT	REQUIRED	HOURS	TOT HOURS
01	HOLD PRE-JOB BRIEF/STAGE PARTS	MECH	2	0.5	1.0
02	REMOVE VLV. FROM SYSTEM	HECH	2	1.0	2.0
03	TEST/RECORD AS FOUND CONDITION	MECH	2	1.0	2.0
04	RESET/SET/TEST VALVE	MECH	2	1.0	2.n
05	REINSTALL VLV. IN SYSTEM	MECH	2	1.0	2.0
06	CLEAN UP AREA/REVIEW PAPERWORK	MECH	2	0.5	1.0
				TOTAL EST HOURS:	10.0

TASK REFERENCE DOCUMENTS

DOC TYPE	SUB TYPE	DOCUMENT NUMBER	SHEET	REV	TITLEIDESCRIPTION	USED(Y/N)
PROC59	000	0-MCM-0415-01			REPAIR OF CROBSY RELIEF VALVES, 1-SI-RV-1845A, B, C	
PROC59	000	1-PT-147.1			VALVE INSERVICE INSPECTION (CLASS 2 AND 3 SAFETY AN	

TASK TOOLS

QC TOOL #	OTV PLANNED	TOOL NAME	TOOL RANGE
	1	GAUGE PRESSURE	0-300 PSI
	1	GAUGE PRESSURE	0-600 PS
	1	THERMOMETER OIGITAL	-112 TO 1999 F
		TORQUE WRENCH	5-80 FT LB

OTHER TOOLS

AS FOUND

ACTUAL START DATE: _____ ACTUAL START TIME: _____

THIS IS A PM WORK ORDER: THE CORRESPONDING AS-FOUND CONDITION CODE BELOU (1 - 5) SHALL BE ENTERED IN ACCORDANCE WITH THE EOJIPMENT RELIABILITY PROGRAM. PREVENTIVE MAINTENANCE PROGRAM AND AGING MANAGEMENT PROGRAM. THE AS-SOUND SECTION BELOW MUST DOCUMENT INFORMATION RELATED TO THE AS-FOUND EQUIPMENT CONDITION AND COMPONENT MATERIAL CONDITION (INCLUDING INTERNAL SURFACES OF ACCESSIBLE ADJACENT PIPING). (E.G.: DEGRADATION EXCEEDING NORMAL WEAR. INTERNAL SEDIMENT OR DEBRIS. GENERALIZED. LOCALIZED. PITTING AND/OR CREVICE CORROSION. EROSION CRACKING. ALL TYPES OF SEPARATION OR DELAMINATION OF MATERIAL. (INCLUDING CLADDING. SEALANTS. AND LONG-LIVED GASKETS.)) INCLUDE ANY RECOMMENDATIONS FOR CHANGING THE PM FREQUENCY OR TASK BASED ON THE "AS FOUND" CONDITION.

(1=LIKE NEW. 2-SATISFACTORY. 3-RELIABILITY DEGRADED. 4-REPAIRIREPLACEMENT REQD, 5=UNANTICIPATED FAILURE)

AS FOUND CODE- ____

AS FOUND NOTES:

_____

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CRAFTSMAN COMPLETING "AS FOUND" SECTION ABOVE

CRAFTSMAN: _____ / _____ / _____ / _____

PRINT SIGNATURE DATE BADGE

WORK PERFORMED/AS LEFT

WORK PERFORMED/AS LEFT:

MAJOR FAILURE: _____ MAJOR ACTION: _____
CONTINUED ON ADDITIONAL SWEETS: ____ (Y/N) NUMBER OF SHEETS AODEO: _____ ACTUAL CBMPLETION DATE: _____
ROOT CAUSE COMPONENT (IF APPLICABLE): _____ ACTUAL CBMPLETION TIME: _____

WORK ACCEPTED AS PERFORMED

CRAFTSMAN: _____ DATE: _____ MANHOURS : _____ W/R TAG REMOVED: __ BY: _____

FOREMAN/SR. TECH : _____ OATEITIME: _____ / _____

ENGINEERING REVIEW: _____ DATE/TIME: _____

QRR/TEST ENG _____ DATE/TIME: _____ / _____

OPERATIONS _____ DATE/TIME: _____ / _____

QA REVIEW _____ OATEITIME: _____ / _____

TASK UTC DATA

(FOR CHANGEOUTS!

CHANGEOUT?: __ (Y/N) IF 'Y', PLEASE ENTER THE UTC CHANGEOUT OATA BELOW:

NEW UTC NUMBER: _____ OLD UTC STATUS: _____

TASK MATERIALS

QN PLANNED	QTY ALLOC	UI	ITEM NO.	ITEM DESCRIPTION	PRIMARY LOC	SECONDRY LOC	PO NUMBER	QTY USED
1	0	EA	06050310	GASKET. SPIRAL-WOUND. 1/2" NOMINAL PIPE	SR01CA1J0103	SR02CA1J0103		
1	0	EA	06050320	GASKET. SPIRAL-WOUND. 3/4" NOHINAL PIPE	SR01CA1I0407			
1	0	EA	06050340	GASKET. SPIRAL-WOUND. 1" NOMINAL PIPE	SR01CA1I0407			
1	0	EA	06144510	LUERICAMT. ANTI-SEIZE, 16 OZ. CAN,	SR01M1SH1E02			
1	0	EA	06262360	NUT. HEAVY HEX, 1/2", CS ASM A194 GR.7.	W501SHJJ0603	SR01CA1K0605		
1	0	EA	06479546	GUIDE. WITH RING, FOR JRAK-BS RELIEF				
1	0	EA	06479547	RING, DISC. FOR MODEL NO. JRAK-BS RELIEF	W501CA2A0106	W5021D0302		
1	0	EA	20800600	ASSEMBLY. BELLOWS. W/HOLDER, SS, FOR	SR01CA1E0506			
1	0	EA	20804440	DISC, INSERT. SS A479-316, FOR 3/4" X 1"	SR01CA1G0310			
1	0	EA	20805900	GASKET, SET. STAINLESS STEEL, FOR NOZZLE	SR01CA1G0301			
1	0	EA	20808090	NOZZLE. RELIEF VALVE. VALVE SIZE 3/4",	SR01CA1G0309			
1	0	EA	20809810	PIN. DISC INSERT. RELIEF VALVE, SS 316.	SR01CA1G0404			
0	0	EA	37215210	LUBRICAIIT. ANTI-SEIZE, 1 LB. CAN, NICKEL	SR01M31A0206			
0	0	EA	37574090	STUD, STRUCTURAL, 1/2" DIAMETER, 3 1/2"	SR01CA1B0206			
1	0	EA	41045559	SPRING. W/WASHERS, SPRING SET PRESSURE	W501CAFF1102			
1	0	EA	42000508	GUIDE, VALVE. WITH RING. SS	SR01M1CA1C10			
1	0	Ed	42000510	SPRING. WITH WASHER. CS. FOR CROSBY	SR01CA1F0406			

V A R I A N C E R E A S O N
(O P T I O N A L)

POOR ESTIMATE: ____ MANLOADING: ____
DELAYS : ____ REWORK : ____
SCOPE CHANGE : ____ OTHER : ____
COMMENTS : _____

DELAY REASON : _____ MANHRS: _____

SUPERVISOR'S INPUT ON REWORK
(OPTIONAL)

PERSONNEL -
PLANNED : ____
TECHNIQUE : ____
INADVERTENT: ____
CONTRACTOR : ____

OTHER -
MATERIAL : ____
TOOL/EQUIP: ____
DESIGN : ____
PROCEDURES: ____

COMMENTS : _____

W O R K O R D E R P A C K A G E F E E D B A C K

DID THIS WORK ORDER PACKAGE MEET YOUR EXPECTATIONS ?

CIRCLE ONE OF THE FOLLOWING. COMMENTS REQUIRED EXCEPT FOR "MET EXPECTATIONS".

1 EXCEEDED EXPECTATIONS
2 MET EXPECTATIONS
3 ENHAMCEMENTS REQUIRED

C O M M E N T S:

C R A F T I N F O R M A T I O N

RESPONSIBLE CREW/SHIFT: ____/__ SUPERVISOR NAME: _____ SCHEDULED DATC: _____

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

ADM JPM

Make State And Local Notifications In Accordance With EPIP-2.01.

CANDIDATE _____

EXAMINER _____

NORTH ANNA POWER STATION
INITIAL UCENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

Task:

Make state and local notifications in accordance with EPIP-2.01.

References:

EPIP-2.01, " Notification Of State And Local Governments. "

Candidate: _____
NAME

Performance Rating: §AT _____ UNSAT _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

EPIP-2.01, " Notification Of State And Local Governments. "
A lete copy f Att t 2 " Report of Emergency To State And

READ TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed for this JPM. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS:

Unit 1 has experienced a large break LOCA.
A General Emergency has been declared.
Attachment 2, " Report of Emergency To State and Local Governments" has been completed.

INITIATING CUES:

You are requested to make state and local notifications in accordance with EPIP *2.01,* " Notification of State and Local Governments. "

STEP 1: Record time notification started on Attachment 2. STANDARD: Operator records time on Attachment 2 COMMENTS:	___ SAT ___ UNSAT
STEP 2: Use Instaphone to contact state and local EOC's. Check boxes on Attachment 2 as contact is made with each EOC. EOC's include Louisa County, Spotsylvania County, State EOC, Hanover County, Orange County, and Caroline County. STANDARD: Operator makes contact and checks off each box except Hanover County. They will not answer call. Hanover will get a separate notification later in the JPM. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Read item one: General Emergency and then date and time it was declared. STANDARD: Operator reads them General Emergency and gives them a time and date that is no more than 15 minutes ago. COMMENTS:	___ SAT ___ UNSAT
STEP 4: Read item 2: Release of radioactive material is presently occurring. STANDARD: Operator tells EOC's a release is presently occurring. COMMENTS:	___ SAT ___ UNSAT

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEP 5:	Read item 3: Description of the event, large break loss of coolant accident with a 2" penetration that is unisolable. Release below protective action levels.	___ SAT
STANDARD:	Operator tells **EOCs** there is a large break loss of coolant accident with a 2" unisolable penetration. Release levels below protective action recomendations.	___ UNSAT
COMMENTS:		
STEP 6:	Read items 4-7: state these items are excluded from this message.	___ §AT
STANDARD:	Operator may deliver these items to the EOC's in a step by step fashion similar to the other steps or it is permissible to group these steps together since they are all excluded from this message.	___ UNSAT
COMMENTS:		
STEP 7:	Read item 8: state wind direction is from the NNE at 10 mph.	___ SAT
STANDARD:	Operator tells the EOC's that wind direction is from NNE at 10 mph.	___ UNSAT
COMMENTS:		
STEP 8:	Read item 9: state your name and then take roll call. Hanover County will again not answer. Checks should be put in boxes when EOC's acknowledge. Control Room box than needs to be checked and time and date written on item 9.	___ SAT
STANDARD:	Operator states name and checks all EOC boxes except Hanover County. Control room box is checked and time and date written in.	___ UNSAT
COMMENTS:		

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEQ:	Operator now contacts State using DEM ARB. State they are from North Anna Control Room.	**CRITICAL STEP**
TANDARD:	Operator contacts State uslng DEM ARD. Operator identifies they are calling from North Anna Control Room.	___ SAT
COMMENTS:		___ UNSAT
STEP 10:	Operator reads item 10: Recommended offsite protective actions are standard.	**CRITICAL STEP**
STANDARB:	Operator tells EOC PARS are standard.	___ SAT
COMMENTS:		___ UNSAT
STEP 11:	Operator reads item 11: We will not issue a report on radiologicalconditions.	___ SAT
STANDARD:	Operator tells EOC a report on radiological conditions will not be issued.	
COMMENTS:		___ UNSAT

****Italicized Cues Are To Be Used Only If JPM Performance Is Being Simulated.***

STEP 13:	Operator sets update schedule in item 12 and records name of EOC Duty Officer. Operator signs out and records time and date.	CRITICAL STEP
STANDARD:	Operator tells State and records name of Duty Officer. Operator signs out and records time and date.	___ SAT
COMMENTS:		UNSAT
STEP 13:	Operator verifies all EOC's answered roll call. Recognizes Hanover County did not and contacts them by telephone at (804) 537-6140. Operator begins to read items 1-9.	CRITICAL STEP
STANDARD:	Operator makes contact with Hanover County EOC over the telephone. When operator starts reading item 1 the JPM is complete.	___ SAT
COMMENTS:		___ UNSAT
	END OF TASK	

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Unit 1 has experienced a large break LOCA.
A Genera! Emergency has been declared.
Attachment 2, " **Report** of Emergency To State and Local Governments" has been completed.

INITIATING CUES:

You are requested to make state and local notifications in accordance with EPIP 2.01, " Notification of State and Local Governments. "

NUMBER	PROCEDURE TITLE	REVISION
EPIP-2.01	NOTIFICATFON OF STATE AND LOCAL GOVERNMEHTS (With 3 Attachments)	25 PAGE 1 of 18

IPURPOSE

To initially notify State and local governments of the declaration of an emergency and to provide status updates related to the event.

ENTRY CONDITIONS

Any of the following:

1. An emergency has been declared.
2. Entry directed by Station Emergency Manager.

Approvals on File

Effective Date 8/28/02

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 1	INITIATE PROCEDURE: • By: _____ Date: _____ Time: _____ Location: _____	
_____ 2	CHECK FIRST REPORT OF EMERGENCY FOR EVENT - REQUIRED	IF procedure previously initiated, THEN continue from step in effect identified during relief/turnover.

NOTE:
- The initial notification of any emergency classification must be completed within 15 minutes of declaring the emergency class.
- Items 4 through 8 on Attachment 2 may be excluded from the first report of any emergency classification (including termination).
- Attachment 1. Instructions for Completing Report of Emergency to State and Local Governments. may be referenced as needed.

_____ 3	RECORD INFORMATION ON ATTACHMENT 2 (REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS)	
_____ 4	CHECK EMERGENCY - REMAINS IN EFFECT	IF emergency terminated before message sent, THEN do the following: a) Record reason event terminated in Item 3. b) Record "State EOC-only portion of message not applicable" on bottom of Attachment 2 Page 2.
_____ 5	HAVE SEM/RM APPROVE REPORT (initial at top of Attachment 2)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 6 RECORD TIME NOTIFICATION STARTED

NOTE
- Multiple items excluded from a message may be read as a single statement. e.g., "Items 4 through 8 excluded from this message."
- Outbound calls through the PBX system are made by dialing 8-1-(area code)-###-####. Direct outbound calls may be made using unrestricted telephones by dialing 9-1-(area code)-###-#### (area code not required for direct outbound calls within local calling area). No prefix is required when using a commercial telephone.

_____ 7 SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS:

a) Check Instaphone - CLEAR OF CONFLICTING MESSAGE TRAFFIC	a) IF Instaphone NOT available. THEN do the following: 1) Call State EOC on OEM ARO (Alternate: (804) 674-2400). 2) Notify State EOC Duty Officer of need to transmit message. 3) WHEN Instaphone available for message transmittal, THEN GO TO Step 7.b.
b) use nstaphone to contact State and ocal Emergency Operations Centers (EOCs)	b) IF Instaphone NOT operable. THEN GO TO Step 11.
c) Perform initial roll-call (check boxes as EOC(s) answer or circle if no response)	
d) Read Items 1 through 9	
e) Perform acknowledgement roll-call (check boxes as EOC(s) answer or circle if no response)	

(STEP 7 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS: (Continued1	
	f) Repeat any items upon request	
	g) Record date and time transmittal of Items I through 9 completed	
	h) Check message reports emergency - REMAINS IN EFFECT	h) IF State EOC acknowledged message. THEN GO TO Step 9. IF State EOC did NOT acknowledge message. THEN do the following: 1) Use DEM ARD phone to contact State EOC (Alternate: (804) 674-2400 (ask for Duty Officer)). IF all means of communications with State EOC are inoperable. THEN do the following: a) Notify SEMIRM. b) GO TO Step 9. 2) Read Items 1 through 9. 3) GO TO Step 9.

(STEP 7 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	SEND REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS: (Continued)	
	i) Use DEM ARD phone to contact State EOC (Alternate: (804) 674-2400 (ask for Duty Officer))	i) IF all means of communications with State EOC are inoperable, THEN do the following: 1) Use Instaphone to transmit Item 10 to local EOCs. 2) Record the following on second page of Attachment 2: • "Transmitted Item 10 to local EOCs." • Date and time transmitted to each local EOC. 3) GO TO Step 9.
	j) Check State EOC acknowledged message	j) Read Items 1 through 9.
	k) Read Items 10 and 11	
	l) Consult with State EOC Duty Officer to determine desired update message schedule	
	m) Record the following at Item 12: • Update message schedule • State EOC Duty Officer's name	
_____ 8	RECORD DATE AND TIME TRANSMITTAL OF ITEMS TO STATE EOC COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 9	VERIFY ALL LOCAL EOCs ANSWERED ACKNOWLEDGEMENT ROLL CALL	IF any EOC(s) did NOT answer acknowledgement roll-call. THEN do the following: a) Use telephone to call EOC(s) that did not answer. b) Refer to the table below for order of priority and list of local EOC phone numbers: Louisa: (540) 967-1234 (local) Spotsylvania: (540) 582-7115 Caroline: (804) 633-5555 Orange: (540) 672-1234 Hanover: (804) 537-6146 c) IF State EOC notified. THEN read Items 1 through 9. IF NO communications with State EOC, THEN read Items 1 through 10. d) Record the following on Attachment 2: • Method of contact. • Reason Instaphone failed (if known). • Date and time of contact.
_____ 10	GO TO STEP 12	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Other personnel may assist by making notifications simultaneously using other telephones.

_____ 11 **SEND** ATTACHMENT 2 USING ALTERNATIVE MEANS:

a) Call State EOC:

1) Use DEM ARD (Alternate: (804) 674-2400. ask for EOC Duty Officer)

2) Read entire Attachment 2

3) Record date/time transmittal to State EOC complete

b) Call each local EOC and read Items 1 through 9:

Louisa:	(540) 967-1234 (local)
Spotsylvania:	(540) 582-7115
Caroline:	(804) 633-5555
(Orange:	(540) 672-1234
(Hanover:	(804) 537-6140

c) Record date/time transmittal of Items 1 through 9 complete

_____ 12 NOTIFY SEMIRM TRANSMITTAL WAS SENT

_____ 13 KEEP ATTACHMENT 2 WITH THIS PROCEDURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 14	CHECK IF ITEM 11 ON REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS INDICATES REPORT OF RADIOLOGICAL CONDITIONS - REQUIRED	GO TO Step 17.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- The initial Report of Radiological Conditions must be transmitted to the State EOC (or State representatives in the LEOF/CEOF) as soon as possible following the release of radioactive material.
- Follow-up reports should be issued approximately every 60 minutes or when there are changes in radiological conditions. Time should be measured from time of delivery. time facsimile sent. or time verba? transmittal completed.
- The numbering sequence for Reports of Radiological Conditions (Attachment 3) starts at #1 for the first report issued and is separate from the numbering sequence for Reports of Emergency to State and Local Governments (Attachment 2).

_____ 15	GET REPORT OF RADIOLOGICAL CONDITIONS FOR THE STATE:	
	a) Check if either of the following Radiological Status reports available: • MIDAS Radiological Status repart OR • €PIP-4.03, DOSE ASSESSMENT TEAM CONTROLLING PROCEDURE. Attachment 1, Radiological Status	a) Do the following: 1) Determine from radiological assessment organization when report will be available. 2) Notify SEM/RM about delay. 3) WHEN Radiological Status report becomes available. THEN continue in this procedure.
	b) Get Radiological Status report from radiological assessment organination	
	c) Check report - COMPLETE	c) IF blank items remain on Radiological Status report. THEN return report to radiologica1 assessment organization for completion

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 16	SEND REPORT OF RADIOLOGICAL CONDITIONS TO THE STATE TO EOC:	
	a) Attach Radiological Status report to Attachment 3	
	b) Follow Attachment 3 Part I. Instructions for North Anna Emergency Communicator	
	c) Check Report of Radiological Conditions to the State - SENT VIA FACSIMILE MACHINE	c) IF Radiological Status report communicated verbally or delivered. THEN GO TO Step 16.g.
	d) Allow 5 minutes for State EOC Duty Officer to verify receipt of message	
	e) Check receipt of message - VERIFIED BY STATE EOC DUTY OFFICER	e) IF receipt of message NOT verified. THEN do the following: 1) Call State EOC on DEM ARD (Alternate: (804) 674-2400). 2) Ask State EOC Duty Officer if message received. 3) IF receipt of message verified. THEN GO TO Step 16.f. IF message NOT received, THEN do the following: a) Follow Attachment 3 Part I Item 6 instructions. b) GO TO Step 16.g.
	f) Record Date/Time verified on Attachment 3 Part III Item 1	
	g) Notify SEM/RM transmittal - SENT	
	h) Keep Attachment 3 with this procedure	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Follow-up reports of emergency conditions must be provided to State and local governments approximately every 60 minutes (from previous message notification start time) or when there are changes in emergency conditions. unless otherwise agreed upon with the State.

_____ 17	CHECK ANY OF THE FOLLOWING MESSAGE UPDATE CONDITIONS - EXISTS:
	• Status of any of the following Report of Emergency items - CHANGED:
	  • Emergency class (including event termination)
	  • Offsite Assistance Requised
	  • Site Evacuation
	  • Prognosis Worsening
	  • Radioactive Release
	  • Protective Action Recommendation
	OR
	• Updated Radiological Status report provided by radiological assessment organization
	OR
	• Follow-up report due IAW schedule established with State EOC Duty Officer
		WHEN Report of Emergency message update conditions satisfied, THEN RETURN TO Step 3.
		WHEN Report of Radiological Conditions message update conditions satisfied. THEN RETURN TO Step 15.
		LE termination message has been sent. THEN GO TO Step 27.

_____ 18	RETURN TO APPLICABLE STEP AS INDICATED BELOW:	

Report of Emergency to State and Local Governments	RETURN TO Step 3
Report of Radiological Conditions to the State	RETURN TO Step 15

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Data may be obtained from meteorological panel charts (via TSC staff communicating with Control Room when PCS not available) or PCS (by selecting WEATHER from Group Display Menu).
- Both the PCS WEATHER Group Display and the PCS ERDS RAD / MET Group Display contain meteorological information averaged over the previous 15 minutes.

_____ 19	CHECK OM-SITE METEOROLOGICAL INFORMATION - AVAILABLE	IF on-site data NOT available. THEN do the following: a) Get regional information from one of the following: • Company Weather Center: (804) 273-3025. • National Weather Service (NWS): (800) 737-8624. • Have HP initiate EPIP-4.10, DETERMINATION OF X/Q. b) Give meteorological information to requestor. c) RETURN TO procedure step in effect.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ 20 GET ON-SITE METEOROLOGICAL INFORMATION AS REQUESTED:

a) Refer to specified step(s) to acquire requested information:

Temperature	Step 21
Wind Speed	Step 22
Wind Direction	Step 23
Affected Sectors	Steps 23 and 24
Stability Class	Step 25

b) Give meteorological information to requestor

c) RETURN TO procedure step in effect

_____ 21 GET TEMPERATURE FROM MAIN TOWER TEMPERATURE INDICATOR

NOTE: Primary source of wind speed is the Main Tower Lower Level indicator. Alternates sources are (1) Backup Tower. and (2) Main Tower Upper Level.

_____ 22 GET WIND SPEED

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE-
- An approximate average wind direction for previous 15 minutes should be determined.
- Primary source of wind direction *is* the Main Tower Lower indicator. Alternates sources are (1) Backup Tower. and (2) Main Tower Upper Level.
- Wind direction is always given as the compass point the wind blows from. Example: Wind direction is from East North East (ENE).

_____ 23 GET WINR DIRECTION IN TERMS OF COMPASS POINT WINO BLOWING FROM:

QEGREES	COMPASS POINT	OEGREES	COMPASS POINT	DEGREES	COMPASS POINT
0-11	N	192-214	SSW	350-371	N
12-34	NNE	215-236	SW	372-394	NNE
35-56	NE	237-259	WSW	395-416	NE
57-79	ENE	260-281	W	417-439	ENE
80-101	E	282-304	WNW	440-461	E
102-124	ESE	305-326	NW	461-484	ESE
125-146	SE	327-349	NNW	485-506	SE
147-169	SSE			507-529	SSE
170-191	S			530-540	S

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Downwind sectors are recorded using alphabetic designations.

_____ 24 DETERMINE OOWNWINO SECTORS:

COMPASS POINT	DOWNWIND SECTORS	COMPASS POINT	DOWNWIND SECTORS
N	H - J - K	S	R - A - B
NNE	J - K - L	SSW	A - B - C
NE	K - L - M	SW	5 - C - D
€NE	L - M - N	WSW	C - D - E
E	M - N - P	W	D - E - F
ESE	N - P - Q	WNW	E - F - G
SE	P - Q - R	NW	F - G - H
SSE	Q - R - A	NNW	G - H - J

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- Main Tower Delta T is the preferred source of stability class. Sigma Theta (Backup Tower) is the secondary source.
- The value closer to "G" should be used if unable to distinguish Delta T or Sigma Theta value.
- Numerical ranges presented below for Delta T and Sigma Theta are less than the range of the chart recorder and indicator in the Control Room. Indications are not expected to read outside the ranges found on these tables.

_____ 25 DETERMINE STABILITY CLASS:

MAIN TOWER DELTA T			BACKUP TOWER SIGMA THETA		
DELTA T (°F)	STABILITY CLASS		SIGMA THETA (°)	STABILITY CLASS	
≤ -1.31	=	A	≥ 22.5	=	A
-1.30 to -1.18	=	B	22.4 to 17.5	=	B
-1.17 to -1.04	=	C	17.4 to 12.5	=	C
-1.03 to -0.35	=	D	12.4 to 7.5	=	D
-0.34 to +1.04	=	E	7.4 to 3.8	=	E
+1.05 to +2.77	=	F	3.7 to 2.1	=	F
> +2.77	=	G	< 2.1	=	G

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE: Responsibilities may be transferred to relief within a facility or to another facility. e.g., Control Room to TSC. Control Room to LEOF or CEOF. or TSC to LEOF or CEOF.	
_____ 26	TRANSFER RESPONSIBILITY FOR STATE/LOCAL NOTIFICATIONS:	
	a) Notify SEM (or RM if in LEOF/CEOF)	
	b) Tell relief Emergency Communicator about current event status	
	c) Review most recently completed Attachments 2 and 3 with relief	
	d) Tell relief Emergency Communicator when next notification is due	
	e) Provide this procedure and all attachments or send copies of attachments to relief	
	f) Have relief/turnover recorded in event Tog	
	g) Check - INTERFACILITY TURNOVER HAS BEEN COMPLETED	g) RETURN TO step in effect prior to relief.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 27	TERMINATE PROCEDURE: • Give EPIP-2.01. forms and other applicable records to the Control Room STA (TSC Emergency Procedures Coordinator or EOF Services Coordinator) • Completed by: _____ Date: _____ Time: _____ -END-	

Form Field	Instructions for Preparing Form:
Approval (SEM or RM)	Leave blank. (The Station Emergency Manager (SEMI or Recovery Manager (RM) signs/initials this space after message is drafted.)
Message #	Record sequential message number on pages 1 and 2.
	A single numbering sequence is used for Reports of Emergency to State and Local Governments (Attachment 2) from the initial classification until the Emergency Plan is exited, The numbering sequence for Reports of Radiological Conditions to the State (Attachment 3) is separate.
Notification Start Time	Leave blank. (Enter notification start time when beginning transmittal of the approved message.)
Location	Check off facility from which notification will be made.
Roll Call	Leave blank. (Check off recipients of the emergency message when they answer the roll call.)

NOTE:
- Information to complete Items 1-2 and 4-7 obtained from SEM/RM.
- Items 4. 5. 6, 7 and/or 8 are optional for a message reporting initial entry into the Emergency Plan or an emergency class change. including emergency termination and may be checked 'Excluded from this message.'
- Inclusion of optional items. e.g., Item 6, Evacuation of onslte personnel. should be considered when it can result in avoiding an immediate follow-up message.

Item 1 — Emergency Class.

IF message initial or follow-up report. THEN do the following:

a. Check block for highest applicable emergency class.

b, Enter time (0001-2400) and date of declaration.

IF initial message is also a termination report. THEN record time of termination Item 3.

IF message emergency termination report. THEN do the following:

a. Check Emergency Terminated block.

b. Complete Items 2. 3 and 9.

Form Field	Instructions for Preparing Form:
Item 2	Release of radioactive material. The SEM/RM determines whether a release of radioactive material is occurring. has occurred. has occurred and has been terminated.. or is projected to occur based on plant indications and/or consultation with the RAD/RAC. For the purposes of emergency messages. release refers to a radiological release attributable to the emergency event.
Item 3	Remarks / Description of event. Write Remarks / Description of event in plain language. Avoid technical jargon. abbreviations and acronyms. Explain any change in the prognosis of situation (Item 7) reported in the previous message. IF Item 2 indicated a radiological release is occurring or has occurred. THEN remarks should be entered placing the release in context. e.g., release is estimated to be confined to the site. release estimated to be within normal plant limits, site boundary dose rates are below offsite protective action levels. Avoid repeating Remarks / Description of event from the previous message. The description should describe current conditions at the time the report approved by the SEM/RM.
Item 4	Assistance requested. [1 Excluded from this message may be checked for the initial report of any emergency class only (including termination). This item documents requests that have been made for on-site assistance from off-site organizations such as from fire departments. rescue squads or law enforcement agencies. including local law enforcement. Virginia State Police. Federal Bureau of Investigation. etc.). This item is NOT for requesting assistance. A check block for other off-site organizations and space to record a description of the off-site organization is provided, e.g., U.S. Department of Energy. Continue to record requests for assistance until the request has been canceled or off-site assistance has been released. For an ambulance. continue to record request for assistance until the ambulance has been released from the hospital.

Form Field	Instructions fer Preparing Form:
Item 5	Emergency Response Actions Underway. [3 Excluded from this message may be checked for the initial report of any emergency class only (including termination). Check blocks are provided for the following: [1 Station monitoring teams dispatched offsite (teams may be dispatched for any emergency classification. but dispatch is generally required at the Site Area Emergency and General Emergency classifications) [ ] Station emergency personnel called in (unless special circumstances are involved, station emergency personnel are called-in at an Alert OF higher emergency class, but may be called-in for a Notification of Unusual Event) [3 Other (examples of other emergency response actions include dispatch of damage control teams, relocation of personnel from selected areas. etc.)
Item 6	Evacuation of onsite personnel. [1 Excluded from this message may be checked for the initial report of any emergency class only (including termination). The Remote Assembly Area is selected in accordance with EPIP-5.05. SITE EVACUATION. An 'Other' check block is provided in case personnel are evacuated to different location. e.g., local evacuation assembly center. Early release of personnel. i.e., oon-essential personnel are sent home early. is reported in Item 3. Remarks / Rescription of event. Continue to record evacuation of onsite personnel until evacuated personnel released from the applicable Remote Assembly Area.

Form Field	Instructions for Preparing Form:
	NOTE: Changes in the prognosis of situation should be explained in Item 3, Remarks / Description of event.
Item 7	Prognosis of situation. [ ] Excluded from this message may be checked for the initial report of any emergency class only (including termination). The "Other" check block can be used to provide an indication of anticipated event termination, e.g., emergency will be terminated when unit reaches cold shutdown at or about 1700 hours.
Item a	Meteorological data. [1 Excluded from this message may be checked for the initial report of any emergency class only (including termination). [I Not available may be checked when waiting for meteorological information will delay transmission of a message. Efforts to obtain meteorological data from alternative sources should not delay sending emergency messages. Check [ ] Eased on onsite measurements when meteorological information is acquired from onsite instruments. Onsite measurements may be acquired from any of the following: • PCS WEATHER Group Display (15-minute average) • PCS ERCS RAD / MET Group Display (15-minute average) • Control Room meteorological panel charts (approximate average for previous 15 minutes) (communicate with Control Room staff when PCS not available in other facilities)

[Instructions for Item 8. Meteorological data. continued on following page.]

Form Field	Instructions for Preparing Form:
Item 8 [continued]	Meteorological data.

Multiple indications of wind direction and wind speed are available. The priority for using these indications is:

I Main Tower Lower Level

2 Backup Tower

3 Main Tower Upper Level

Check [1 Eased on offsite regional data when onsite measurements are NOT available. Regional wind speed and wind direction data may he obtained from the following in the order indicated:

1 Company Weather Center. (804) 273-3025

2 National Weather Service (NWS). (800) 737-8624

Use the following table to convert indicated degree reading to compass point wind blowing from.

DEGREES	COMPASS POINT
0-11 or 350-371	N (NORTH)
12-34 or 372-394	NNE (NORTH NORTHEAST)
35-56 or 395-416	NE (NORTHEAST)
57-79 or 417-439	ENE (EAST NORTHEAST)
80-101 or 440-461	E (EAST)
102-124 or 462-484	ESE (EAST SOUTHEAST)
125-146 or 485-506	SE (SOUTHEAST)
147-169 or 507-529	SSE (SOUTH SOUTHEAST)
170-191 or 530-540	S (SOUTH)
192-214	SSW (SOUTH SOUTHWEST1
215-236	SW (SOUTHWEST)
237-259	WSW (WEST SOUTHWEST)
260-281	W (WEST)
282-304	WNW (WEST NORTHWEST)
305-326	NW (NORTHWEST)
327-349	NNW (NORTH NORTHWEST)

Record wind direction in compass point wind is blowing from.

Record wind speed.

Form Field	Instructions for Preparing Form:
Item 9	Emergency Communicator identification. Enter name of Emergency Communicator.
Roll Call	Leave blank. (Check off recipients of the emergency message when they answer the roll call.)
Message Close-Out	Leave blank. (Check off facility from which notification was made and enter date/time after transmitting Items 1-9.)
Item 10	Recommended offsite protective actions. IF Item 1 indicates the emergency class is a Notification of Unusual Event, Alert OF Site Area Emergency. THEN check E 1 None. IF Item 1 indicates the emergency class is a General Emergency. THEN copy recommended offsite protective action from EPIP-1.06, PROTECTIVE ACTION RECOMMENDATION. Attachment 3. in Item 10.
Item 11	Report of Radiological Conditions. IF Item 2 indicates a release of radioactive material has NOT occurred and is NOT projected. THEN check [ ] We will not issue a Report of Radiological Conditions. IF a Report of Radiological Conditions is required AND all the following conditions are met: ■ LEOF (or CEOF) - RESPONSIBLE FOR STATE NOTIFICATIONS • Department of Emergency Management - PRESENT ■ Department of Health (Radiological Health Programs) representative - PRESENT THEN check [1 We will provide the Report of Radiological Conditions to the State representatives in the LEOF (CEOF). IF a Report of Radiological Conditions is required AND has to be transmitted to the State EOC. THEN check [3 We will transmit a Report of Radiological Conditions to the State EOC.

Form Field	Instructions for Preparing Form:.
Item 12	Update schedule and name of State EOC Duty Officer. Leave blank. (Update schedule and identification of State EOC Duty Officer is determined in consultation with the State EOC Duty Officer after message is transmitted.)
Message Close-Out	Leave blank. (Check off facility from which notification was made and enter date/time after transmitting Items 10-12.)

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-2.01	REPORT OF EMERGENCY TO STATE AND LOCAL GOVERNMENTS	25
ATTACHMENT 2		PAGE 1 of 2

APPROVAL: (SEM or RM): Mark Schrey **: MESSAGE #** 1 **: TIME NOTIFICATION STARTED:** _____

This is North Anna Power Station [✓] Control Room [] TSC [] LEOF [] CEOF. Standby for a roll-call followed by an emergency message. Use a Report of Emergency form to copy this message. **(Conduct a roll-call** and check boxes as **each** party answers)

[] Louisa County 11 State EOC [] Orange County
[] Spotsylvania County [] Hanover County [] Caroline County

The emergency message is as follows: **(READ SLOWLY)**

Item 1: Emergency Class:

[] Notification of Unusual Event [] Site Area Emergency
[] Alert [✓] General Emergency

Declared at 5min ago (24-hr time) (date) Date

11 Emergency Terminated

Item 2: Release of radioactive material:
[] Has NOT occurred and is NOT projected [✓] Is presently occurring
[] Has occurred and is nor terminated 11 Is projected to occur

Item 3: Remarks / Description of event: Large Break Loss of Coolant Accident with a 2" penetration unisolable. Release below protective action levels.

NOTE: Items 4 - 8 may be excluded fro. initial message reporting any emergency elm (including termination).

Item 4: Assistance requested: [✓] Excluded from this message
[] None
____ (#) Fire Units from _____
____ (#) Police Units from _____
____ (#) Rescue Units from _____
[I Other _____

Item 5: Emergency response actions underway: [✓] Excluded from this message
[] None
[] Station monitoring teams dispatched offsite
[] Station emergency personnel called in
[] Other _____

Item 6: Evacuation of onsite personnel: [✓] Excluded from this message
[] No
[] Yes. evacuated to: [] Primary Remote Assembly Area
[] Secondary Remote Assembly krea
[] Other _____

(ATTACHMENT 2 CONTINUED ON NEXT PAGE)

MESSAGE # 1

Item 7: Prognosis of situation: [✓] Excluded from this message
[] Improving [] Stable
[] Worsening [] Other _____

Item 8: Meteorological data is: [] Excluded from this message
[✓] Based on onslte measurements; [] Based on offsite regional data:
[] Wind direction Is from the NNE; [] Wind speed is 10 mph
[] Not available

Item 9: This is (name) Your Name /Emergency Communicator.
Please acknowledge receipt of this message. (Conduct roll-call and check boxes)

[] Louisa County [] State EOC [] Orange County
[] Spotsylvania County [] Hanover County [] Caroline County

This is North Anna Power station [] Control Room [] TSC [] LEOF [] CEOF out at _____ (24-hr time) on _____ (date)

NOTE: The remainder of this report is not transmitted when the message reports emergency termination. When transmitted, the following information is for state use only. Transmit to State EOC using the DEM ARD.

This is North Anna Power Station [✓] Control Room [] TSC [] LEOF [] CEOF Continuing the emergency message.

Item 10: Recommended offsite protective actions are:

[] None

[✓] Standard: Evacuate 360° from 0 miles to 5 miles.

[] Expanded:
11 Evacuate 360" from 0 miles to 5 miles.
[] Evacuate 360' from 5 riles to ____ miles.
[] Evacuate sectors ____ ____ ____ from ____ miles to ____ miles.
[] Shelter 360° from ____ miles to ____ miles.
[] Shelter sectors ____ ____ ____ from ____ miles to ____ miles.
[] Shelter unaffected sectors from ____ miles to ____ miles.

Item 11: [] Ye rill transmit a Report of Radiological Conditions to the State EOC.
[✓] Ye will provide the Report of Radiological Conditions to the State representatives in the LEOF (CEOF).
[✓] We will not issue a Report of Radiological Conditions.

Item 12: Update Schedule: [] 60 minute: 11 Other _____.

Name of State ROC Duty Officer:. _____

This is North Anna Power Station [] Ccotrol Room 11 TSC [] LEOF [] CEOF Out at _____ (24-hr tine) On _____ (date).

NUMBER	ATTACHMENT TITLE	REVISION
EPIP-2.01	REPORT OF RADIOLOGICAL CONDITIONS TO THE STATE	25
ATTACHMENT 3		PAGE 1 of 1

PART I. Instructions for Worth Anna Emergency Communicator:

1. Check name of facility: [ ] Control Room [I TSC [I local EOF [ ] Central EOF

2. Record Message #: ___ Communicator's name: _____ Call-back #: ( ) _____

3. Check which report is attached and record the report number and run tine (as appropriate):

   _____ MIDAS Radiological Status computer printout (2 pages) Report # _____ Run Time _____
   _____ Radiological Status attachment from EPIP-4.03 (1 page) Report # _____

4. Have Station Emergency Manager (SEM) ▮ Recovery Manager (RM) approve transmittal:

   APPROVED FOR TRANSMITTAL: _____ (SEM / RM initials) DATE: ___▮___/___ TIME: ___:___

5. IF report can be delivered to both VDEM AND VOH staff in EOF. THEN GO TO BART I. ITEM 6.
   IF report will be sent by facsimile. THEN notify State EQC Report of Radiological Conditions will be sent by facsimile (Use DEM ARO or (804) 674-2400) and request receipt confirmation.

6. Deliver report to both VOEH AND VDH staff in EOF:
   a. Date/Time Message Delivered to VDEM Representative in Local/Central EOF: ___/___/___ ___:___
   b. OatelTime Message Delivered to VDH Representative in Local/Central EOF: ___▮___▮___ ___:___
   c. Record N/A by Part II and Part III below.

   IF report will be sent by facsimile. THEN ask facsimile machine operator to transmit this message.

   IF transmittal of repart by facsimile NOT achieveable. THEN do the following:
   a. Notify State EOC using DEM ARD or call (804) 674-2400
   b. Identify yourself and your location
   c. Ask EOC Duty Officer to use a Report of Radiological Conditions form to copy message
   d. Read the attached report
   e. Record when message transmittal completed: DatelTime Message Completed: ___/___/___ ___:___
   f. Record N/A by Part II and Part III below.

PART II. Instructions for *Facsimile* Machine Operator:

1. Record Facsimile Operator's name : _____ DatelTime Sent: ___/___/___ ___:___

2. Transmit this message to State EOC facsimile machine (804) 674-2419.
   If facsimile transmission NOT successful, THEN RETURN message to Emergency Communicator.

3. Return original report to State and local Emergency Communicator.

PART III. Instructlons fer State EOC Duty Officer:

1. Notify North Anna Emergency Communicator report received. Date/Time Verified: ___▮___▮___ ___:___
   (Use DEM ARO OF see PART I, Item 2 above for call-back number). Receipt Verification

2. Forward message to EOC Operations Officer for distribution io State Radiological Health Programs and Information & Planning represmtatives.

NORTH ANNA POWER STATION
INITIAL LICENSE EXAMINATION
ADMINISTRATIVE
JOB PERFORMANCE MEASURE

ADMIN JPM

Classify Per EPIP I.01
"Emergency Manager Controlling Procedure"

CANDIDATE _____

EXAMINER _____

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Personnel in the Main Control Room have just heard a loud thud and the control room shudders. At the same time the reactor trips.

One minute later the Security Shift Supervisor notifies the Control Room that the unit 1 turbine has come apart.

Follow up reports indicate the following:

- The fire brigade and first aid personnel are arriving an the scene
- A fire caused by hot oil on the lagging burns out of control
- Turbine blading has penetrated all 3 Main Feed Pumps rendering them inoperable
- Na plant personnel have been injured
- Fire spreads to the 1H Emergency Bus Room
- 1H bus is de-energized by the crew

INITIATING CUE

You are requested tu classify an emergency event in accordance with EPIP-1.01. Continue until you have determined if an emergency action level has been exceeded.

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

s94.5

TASK

Classify the Event

TASK STANDARDS

Event has been classified as a site area emergency per TAB 11

WA REFERENCE:

GEN-2.4.41 (2.3/4.1)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 10 minutes Start Time = _____
Actual Time = _____ minutes Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Bate _____

EVALUATOR'S COMMENTS

_____

_____

_____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

s94.5

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator **JPMs**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state *the* task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

PREREQUISITE

INITIAL CONDITIONS

Personnel in the Main Control Room have just heard a loud thud and the control room shudders. At the same time the reactor trips.

One minute later the Security Shift Supervisor notifies the Control Room that the unit 1 turbine has come apart.

Follow up reports indicate the following:

- The fire brigade and first aid personnel are arriving on the scene

- A fire caused by hot oil on the lagging burns out of control
- Turbine blading has penetrated all 3 Main Feed Pumps rendering them inoperable
- No plant personnel have been injured
- Fire spreads to the 1H Emergency Bus Room
- 1H bus is de-energized by the crew

INITIATING CUE

You are requested to classify an emergency event in accordance with EPIP-1.01. Continue until you have determined if an emergency action level has been exceeded.

EVALUATION METHOD

Demonstration if conducted in the simulator or in a laboratory (use DEMONSTRATION cues)

Verbal-visual if conducted in the station or on a dead simulator (use VERBAL-VISUAL cues)

TOOLS AND EQUIPMENT

None

PERFORMANCE STEPS

START TIME _____

1	Determine the event category using the emergency action level table index.	Procedure Step _____

Critical Step	SAT [ ] UNSAT [ ]

Standards	Event is identified as a lire

Notes/Comments

2	Review the emergency action level tab associated with the event category.	Procedure Step _____

SAT [ ] UNSAT [ ]

Standards	Event tab T reviewed

Verbal-Visual Cues	

Notes/Comments

3	Use available resources to obtain indications of emergency conditions.	Procedure Step _____

[SAT[ ] UMSAT [ ]

4	Verify that an emergency action level has been exceeded.	Procedure Step ____
	[Critical Step	SAT [ ] UNSAT [ ]
	Standards	Event is classified as a site area emergency IAW TAB H
	Notes/Comments	

>>>>> END OF EVALUATION <<<<<

STOP TIME _____

SIMULATOR, **LABORATORY,** IN--PLANT **SETUP**
(If Required)

VIRGINIA WWER
NORTH ANNA POWER STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
EPIP-1.01	EMERGENCY MANAGER CONTROLLING PROCEDURE (With 3 Attachments)	39
		PAGE 1 of 7

IPURPOSE

To assess potential emergency conditions and initiate corrective actions

ENTRY CONDITIONS

Any of the following:

1. Another station procedure directs initiation of this procedure.
2. A potential emergency condition is reported to the Shift Manager.

Approvals on File

Effective Date 1/15/2004

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Declaration of the highest emergency class for which an Emergency Action Level is exceeded shall be made.

* *

NOTE: The PCS is potentially unreliable in the event of an earthquake. Therefore. PCS parameters should be evaluated for accuracy should this situation occur.

_____ 1 EVALUATE EMERGENCY ACTION LEVELS:

a) Determine event category using Attachment 1. EMERGENCY ACTION LEVEL TABLE INDEX

b) Review EAL Tab associated with event category

c) Use Control Room monitors, PCS. and outside reports to get indications of emergency conditions listed in the EAL Table

d) Verify EAL - CURRENTLY EXCEEDED

RESPONSE NOT OBTAINED:

d) IF basis for EAL no longer exists when discovered AND no other reasons exist for an emergency declaration. THEN do the following:

- RETURN TO procedure in effect.
- GO TO VPAP-2802. NOTIFICATIONS AND REPORTS. to make one-hour. non-emergency reports for classification without declaration.

IF EAL was NOT exceeded, THEN RETURN TO procedure in effect.

(STEP 1 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

1 EVALUATE EMERGENCY ACTION LEVELS: (Continued)

e) Record procedure initiation:

- By: _____
  Date: _____
  Time: _____

f) Initiate a chronological log of events

g) Declare position of Station Emergency Manager

NOTE: Assembly. accountability and/or initiation of facility staffing may nut be desired during certain situations (e.g., security event. severe weather. anticipated grid disturbance) or may have already been completed. These activities should be implemented as quickly as achievable given the specific situation.

_____ 2 CHECK - CONDITIONS ALLOW FOR NORMAL IMPLEMENTATION OF EMERGENCY RESPONSE ACTIONS

IF deviation from normal emergency response actions warranted. THEN do the following:

a) Refer to Attachment 3. Considerations for Operations Response Under Abnormal Conditions.

b) Consider applicability of 50.54(x).

c) IF classification/assembly announcement deferred. THEN GO TO Step 4.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____ 3	NOTIFY PLANT STAFF OF ALERT OR HIGHER CLASSIFICATION:	
	a) Check classification - ALERT OR HIGHER	a) GO TO Step 4.
	b) Check if emergency assembly and accountability - PREVIOUSLY CONDUCTED	b) Do the following: 1) Have Control Room sound EMERGENCY alarm and make announcement on station Gai-Tronics system as follows: "(Emergency classification) has been declared as the result of _____ (event) " All Emergency Response personnel report to your assigned stations' "All contractor personnel not responding to the emergency and all visitors report to the Security Building" "All other personnel report to your Emergency Assembly Areas" 2) Repeat RNO Step 3.b.1. 3) GO TO Step 4.
	c) Have Control Room sound EMERGENCY alarm and make announcement on station Gai-Tronics system as follors: "(Emergency classification) has been declared as the result of _____ (event)	
	d) Repeat Step 3.c	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Continue through this and all further instructions unless otherwise directed to hold.

* *

_____ 4 INITIATE SUPPORTING PROCEDURES:

a) Direct Emergency Communicators to initiate the following procedures:

1) EPIP-2.01. NOTIFICATION OF STATE AND LOCAL GOVERNMENTS

2) €PIP-2.02. NOTIFICATION OF NRC

b) Direct HP to initiate EPIP-4.01. RADIOLOGICAL ASSESSMENT QIRECTOR CONTROLLING PROCEDURE

c) Establish communications with Security Team Leader:

1) Provide Security with current emergency classification

2) Notify Security which Operations Shift is designated for coverage

3) Direct Security to initiate EPIP-5.09. SECURITY TEAM LEADER CONTROLLING PROCEDURE

****

CAUTION:
- Declaration of the highest emergency class for which an EAL is exceeded shall be made.
- Emergency Action bevels shall be conservatively classified based on actual or anticipated plant conditions.

****

	EVENT CATEGORY:	TAB
1.	Safety, Shutdown. or Assessment System Event	A
2.	Reactor Coolant System Event	B
3.	Fuel Failure or Fuel Handling Accident	C
4.	Containment Event	D
5.	Radioactivity Event	
6.	DELETED	
7.	Loss of Secondary Coolant	G
8.	Electrical Failure	
9.	Fire	I
10.	Security Event.	
11.	Hazard to Station Operation	K
12.	Natural Events	L
13.	Miscellaneous Abnormal Events..	M

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
CAUTION: EAL C.2 is duplicated below for cross-reference/comparison to EAL A.1:		
C.2. Probable large radioactivity release initiated by loss of heat sink leading to core degradation MODES 1. 2. 3 & 4	Loss of Main Feedwater System, Condensate System and Auxiliary Feedwater System	GENERAL EMERGENCY
1. Loss of function needed for unit HSD condition MODES 1, 2, 3 & 4	• Total loss of the Charging/SI System OR Total loss of the Main Feedwater and Auxiliary Feedwater systems	SITE AREA EMERGENCY
2. Failure of the Reactor Protection System to initiate and complete a required trip while at power MODES 1 & 2	• Reactor trip setpoint and coincidences - EXCEEDED AND • Automatic trip from RPS - FAILED AND • Manual trip from Control Room - FAILED	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
3. Inability to monitor a significant transient in progress MODES 1, 2, 3 & 4	• Most (>75%) or all annunciator alarms on panels "A' to "K" - NOT AVAILABLE AND • All computer monitoring capability (e.g., PCS) - NOT AVAILABLE AND • Significant transient - IN PROGRESS (e.g., reactor trig. SI actuation. turbine run ack >25% thermal reactor power, thermal power oscillations >10%) AND • Inability to directly monitor any one of the following using Control Room indications: • Subcriticality • Core Cooling • Heat Sink • Vessel Integrity • Containment Integrity	SITE AREA EMERGENCY
4. Evacuation of Main Control Room with control not established within 15 minutes ALL MODES	Evacuation of the Control Room with local shutdown control not established within 15 minutes	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
5. Total loss of function needed for unit CSD condition MODES 5 & 6	• Secondary system cooling capability - UNAVAILABLE AND • Loss of any of the following systems: • Service Water • Component Cooling • RHR AND • RCS temperature GREATER THAN 140 °F	ALERT
6. Failure of the Reactor Protection System to complete a trip which takes the Reactor Subcritical MODES 1 & 2	• Reactor trip setpoint and coincidences - EXCEEDED AND • Automatic trip from RPS FAILED AND • Manual trip - REQUIRED AND • Manual trip from Control Room - SUCCESSFUL	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
7. Unplanned loss of safety system annunciators with compensatory indicators unavailable or a transient in progress MODES 1. 2, 3 & 4	• Unplanned loss of most (>75%) or all annunciator alarms on anels "A" to "K" for GREATE THAN 15 minutes AND • All computer monitoring capability (e.g., PCS) - NOT AVAILABLE OR .Significant transient - INITIATED OR EN PROGRESS (e.g., reactor trip, SI. turbine runback > 25% thermal reactor power, thermal power oscillations > 10%)	ALERT
8. Evacuation of Main Control Room required ALL MODES	Evacuation of the Control Room with shutdown control established within 15 minutes	ALERT
9. Inability to reach required mode within technical specification limits MODES 1, 2. 3 & 4	• Intentional reduction in power. load or temperature CAW T.S. Action Statement - HAS COMMENCED AND • T.S. Action Statement time limit for mode change - CANNOT BE MET	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
10. Failure of a safety or relief valve to close after pressure reduction. which may affect the health and safety of the public MODES 1, 2, 3. 4 & 5	• RCS • RCS pressure - LESS THAN 2000 psig OR NDT Protection System - IN SERVICE AND • Any indication after lift or actuation that Pressurizer Safety or PORV - REMAINS OPEN AND • Flow - UNISOLABLE • Main Steam • Excessive Steam Generator Safety. PORV or Decay Meat Release flow as indicated by rapid RCS cooldown rate AND • Main Steam pressure greater than 100 psi below setpoint of affected valwe	NOTIFICATION OF UNUSUAL EVENT
11. Unplanned loss of most or all safety system annunciators for greater than 15 minutes MODES 1, 2. 3 & 4	• Unplanned loss of most (>75%) or all annunciators on panels "A' to "K" for GREATER THAN 15 minutes	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
12. Loss of communications capability ALL MODES	• Station PBX phone system - FAILED AND • Station Gai-tronics system - FAILED AND • Station UHF radio system - FAILED	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	JNOICATION	CLASSIFICATION
1. Loss of 2 of 3 fission product barriers with Potential loss of 3rd barrier ALL MODES	Any two of a). b) or c) exist and the third is imminent: a) Fuel clad integrity failure as indicated by any of the following: • RCS specific activity greater than or equal to 300.0 µCi/gram dose equivalent I-131 OR 5 or more core exit thermocouples greater than 1200 °F OR Containment High Range Radiation Monitor RM-RMS-165, -166 or RM-RMS-265, -266 GREATER THAN 1.88×10^2 R/hr b) Loss of RCS integrity as indicated by any of the following: • RCS pressure greater than 2735 psig OR Loss of Reactor Coolant in progress c) Loss of containment integrity as indicated by any of the following: • Containment pressure greater than 60 psia and not decreasing OR Release path to environment -EXISTS	GENERAL EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
2. Fuel failure with steam generator tube ruature ALL MODES	Any two of a), b) or c) exist and the third is imminent: a) Fuel clad integrity failure as indicated by any of the following: • RCS specific activity greater than 300 µCi/gram dose equivalent I-131 OR 5 or more core exit thermocouples GREATER THAN 1200 °F OR High Range Letdown radiation monitor 1-CH-RI-128 or 2-CH-RI-228 GREATER THAN 5.9 x 104 mR/hr b) Steam Generator tube rupture as indicated by both of the following: • SI coincidence - SATISFIED AND • Steam Generator tube rupture - IN PROGRESS c) Loss of secondary integrity agsociated with ruptured-steam generator pathway as indicated by any of the following: Steam Generator PORV - OPEN OR Main Steam Code Safety Valve - OPEN OR Loss of secondary coolant outside containment - IN PROGRESS	GENERAL EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
3. RCS leak rate exceeds makeup capacity MODES 1. 2, 3. & 4	• Primary system leak (LOCA) - IN PROGRESS AND • Safety Injection - REQUIRED AND • RCS subcooling based on Core Exit Thermocouples - LESS THAN 30" F OR RCS inventory cannot be maintained based on pressurizer level or RVLIS indication	SITE AREA EMERGENCY
4. Gross primary to secondary leakage with loss of offsite power MODES 1. 2. 3. & 4	■ Steam Generator Tube Rupture - IN PROGRESS AND • Safety Injection - REQUIRED AND • Vent Vent A MGPI Monitor RM-VG-179 GREATER THAN 1.25 x 10^8 µCi/sec OR Steam Generator Blowdown monitor on affected pathway RM-SS-122. -222 RM-SS-123. -223 RM-SS-124, -224 GREATER THAN $1x10^6$ cpm AND ■ A subsequent loss of offsite power indicated by zero volts on voltmeters for 4160V buses D, E. & F	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
5. RCS leak rate limit - EXCEEDED MODES 1. 2. 3. & 4	• Pressurizer level cannot be maintained greater than 20% with one (1) Charging/SI pump in operation AND • RCS inventory balance indicates leakage - greater than 50 gpm	ALERT
6. Gross primary to secondary leakage MODES 1. 2. 3, & 4	Steam Generator Tube Rupture - IN PROGRESS AND Safety Injection - REQUIRED	ALERT
7. Excessive primary to secondary leakage with loss of offsite power MODES 1, 2. 3. & 4	• Intentional reduction in power. load or temperature CAW T.S. 3.4.13 primary-to-secondary leakage LCO Action Statement AND • Vent Vent A MGPI Monitor RM-VG-179 GREATER THAN 1.73 x 10^6 µCi/sec OR Steam Generator Blowdown monitor on affected pathway RM-SS-122. -222 RM-SS-123, -223 RM-SS-124, -224 GREATER THAN 1x10^5 cpm AND ■ A subseauent loss of offsite'power indicated by zero volts on voltmeters for 4160V buses D, E. & F	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
8. RCS operational leakage requiring plant shutdown IAW T.S. 3.4.13 MODES 1, 2, 3, & 4	Intentional reduction in power load or temperature IAW T.S. 3.4.13 leakage limit action statement - HAS COMMENCED	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Probable large radioactivity release initiated by LOCA with ECCS failure leading to core degradation ALL MODES	• Loss of reactor coolant in progress AND • RCS specific activity - greater than 300 µCi/gram dose equivalent I-131 OR Containment High Range Radiation Monitor RM-RMS-165, -166 or RM-RMS-265. -266 GREATER THAN 1.88×10^2 R/hr AND • High or low head ECCS flow not being delivered to the core (if expected by plant conditions)	GENERAL EMERGENCY

CAUTION: EAL A.1 is duplicated below' for cross-reference/comparison to EAL C.2:

A.1.	boss of function needed for unit HSD condition MODES 1. 2. 3 & 4	• Total loss of the Charging/SI System OR Total loss of the Main Feedwater and Auxiliary Feedwater systems	SITE AREA EMERGENCY

2.	Probable large radioactivity release initiated by loss of heat sink leading to core degradation MODES 1. 2, 3 & 4	Loss of Main Feedwater System. Condensate System and Auxiliary Feedwater System	GENERAL EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
3. Probable large radioactivity release initiated by failure of rotection system to ring Rx subcritical and causing core degradation ALL MODES	• Rx nuclear Dower after a trip - greater than 5% AND • RCS pressure greater than or equal to 2485 psig OR Containment pressure and temperature rapidly increasing	GENERAL EMERGENCY
4. Probable large radioactivity release initiated by loss of AC power and all feedwater ALL MODES	• Loss of all onsite and offsite AC power AND • Turbine Driven Auxiliary Feedwater Pump not operable AND • Restoration of either of the above not likely within 2 hours	GENERAL EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
5. Probable large radioactivity release initiated by LOCA with loss of ECCS and containment cooling ALL MODES	• Loss of reactor coolant in progress AND • High or low head ECCS flow not being delivered to the core (if expected by plant conditions) AND • Containment RS sump temperature greater than 190°F and NOT decreasing OR All Quench Spray and Recirculation Spray systems - NOT OPERABLE	GENERAL EMERGENCY

CONDITION/APPLICABILITY	INRICATION	CLASSIFICATION
6. Core damage with possible loss of coolable geometry MODES 1, 2. 3. & 4	a) Fuel clad failure as indicated by any of the following: • RCS Specific activity greater than 60 µCi/gram dose equivalent I-131 OR High Range Letdown radiation monitor 1-CH-RI-128 or 2-CH-RI-228 GREATER THAN 1.2×10^4 mR/hr AND b) Loss of cooling as indicated by any of the fol1owing: • 5 confirmed core exit thermocouples greater than 1200 °F OR Core delta T - zero OR Core delta T - rapidly diverging	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
7. Major fuel damage accident with radioactivity release to containment or fuel buildings ALL MODES	• Water level in Rx vessel during refueling below the top of core OR Water level in spent fuel pool below top of spent fuel AND • Verified damage to irradiated fuel resulting in readings on Vent Vent "B" MGPI monitor RM-VG-180 GREATER THAN 2.69 x 10^8 µCi/sec	SITE AREA EMERGENCY
8. Severe Fuel Clad Damage MODES 1, 2, 3, & 4	• High Range Letdown radiation monitor 1-CH-RI-128 or 2-CH-RI-228 Increases to GREATER THAN Hi Hi Alarm setpeint (representing 1% fuel failure) within 30 minutes and remains for at least 15 minutes OR • RCS soecific activity - greater than 300 µCi/gram dose equivalent I-131	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
9. Fuel damage accident with release of radioactivity to containment or fuel buildings ALL MODES	• Verified accident involving damage to irradiated fuel **AND** • Health Physics confirms fission product release from fuel **OR** Vent Vent "B" MGPI monitor RM-VG-180 GREATER THAN 1.99×10^6 µCi/sec	ALERT
10. Potential for fuel damage to occur during refueling MOOE 6	Continuing uncontrolled decrease of water level in Reactor Refueling Cavity or Spent Fuel Pool	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
11. Fuel clad damage indication MODES 1. 2. 3. & 4	• Intentional reduction in power. load or temperature IAW reactor coolant activity T.S. Action Statement - HAS COMMENCED OR High Range Letdown radiation monitor 1-CH-RI-128 or 2-CH-RI-228 Increases to GREATER THAN Hi Alarm setpoint (representing 0.1% fuel failure) within 30 minutes and remains for for at least 15 minutes	NOTIFICATION OF UNUSUAL EVENT
12. Independent Spent Fuel Storage Installation (ISFSI) event ALL MODES	• Verified Sealed Surface Storage Cask (SSSC) seal leakage OR Sealed Surface Storage Cask (SSSC) dropped or mishandled	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Extremely high containment radiation. pressure and temperature MODES 1. 2. 3. & 4	• Containment High Range radiation monitor RM-RMS-165. -166 or RM-RMS-265. -266 GREATER THAN 3.76 x 10^2 R/hr AND • Containment pressure greater than 45 psia and not decreasing OR Containment temperature greater than 280°F	GENERAL EMERGENCY
2. High-high containment radiation. pressure. and temperature MODES 1. 2. 3, & 4	• Containment High Range radiation monitor RM-RMS-165, -166 or RM-RMS-265. -266 GREATER THAN 1.88 x 10^2 R/hr AND ■ Containment pressure - greater than 27.75 psia and not decreasing OR Containment temperature - greater than 200 °F	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
3. High Containment radiation, pressure and temperature MODES 1, 2, 3, & 4	• Containment High Range radiation monitor RM-RMS-165, -166 or RM-RMS-265, -266 GREATER THAN 81.5 R/hr AND • Containment pressure - greater than 17 psia OR Containment temperature - greater than 150°F	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Release imminent or in progress and site boundary doses projected to exceed 1.0 Rem TEDE or 5.0 Rem Thyroid COE ALL MODES	• HP assessment indicates actual or projected doses at or beyond site boundary greater than 1.0 Rem TEDE or 5.0 Rem Thyroid CDE	GENERAL EMERGENCY
2. Release imminent or in progress and site boundary doses projected to exceed 0.1 Rem TEDE or 0.5 Rem Thyroid CDE ALL MODES	• HP assessment indicates actual or projected dose at or beyond Site Boundary exceeds 0.1 Rem TEDE or 0.5 Rem Thyroid CDE	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
3. Effluent release greater than 10 times ODCM allowable limit ALL MODES	a) Any of the following monitors indicate valid readings above the specified values for greater than 15 minutes • Clarifier Effluent RM-LW-111 GREATER THAN 4.8×10^5 cpm • Discharge Canal RM-SW-130 or -230 GREATER THAN 5×10^4 cpm • Vent Vent A MGPI RM-VG-179 GREATER THAN 1.73×10^6 µCi/sec • Vent Vent B MGPI RM-VG-180 GREATER THAN 1.99×10^6 µCi/sec • Process Vent MGPI RM-GW-178 GREATER THAN 1.35×10^7 µCi/sec OR b) HP assessment (sample results or dose projections) indicate greater than 10 times ODCM allowable limit	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
4. High radiation or airborne contamination levels indicate a severe degradation in control of radioactive material ALL MODES	Valid readings on any of the following monitors have increased by a factor of 1000 and remain for at least 15 minutes: • Ventilation Vent Multi-sample gaseous or particulate monitor RM-VG-106 or -105 • Control Room Area RMS-157 • AUX. Bldg. Control Area RMS-154 • Decon. Bldg. Area RMS-151 • Fuel Pool Bridge Area RMS-153 • New fuel storage Area RMS-152 • Laboratory Area RMS-158 • Sample Room Area RMS-156	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
5. Effluent release greater than ODCM allowable limit ALL MODES	a) Any of the following monitors indicate valid readings above the specified value for more than 1 hour: • Clarifier Effluent RM-LW-114 GREATER THAN 4.8×10^4 cpm • Discharge Canal RM-SW-130 or -230 GREATER THAN 5×10^3 cpm • Vent Vent A MGPI RM-VG-179 GREATER THAN 1.73×10^5 µCi/sec Vent Vent B MGPI RM-VG-180 GREATER THAN 1.99×10^5 µCi/sec • Process Vent MGPI RM-GW-178 GREATER THAN 1.35×10^6 µCi/sec OR b) HP assessment (sample results or dose projections) indicates greater than ODCM allowable limit	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Major secondary line break with significant primary to secondary leakage and fuel damage indicated MODES 1. 2. 3' & 4	Conditions a) and b) exist with c): a) Uncontrolled loss of secondary coolant - IN PROGRESS AND b) RCS specific activity exceeds limits of T.S. Figure 3.4.16-1 OR High Range Letdown radiation monitor 1-CH-RI-128 or 2-CH-RI-228 GREATER THAN Hi Alarm setpoint AND c) Vent Vent A MGPI Monitor RM-VG-179 GREATER THAN 6.21 x 10^7 µCi/sec OR Affected pathway Steam Generator Blowdown monitor RM-SS-122, -123, -124, -222, -223, -224 GREATER THAN 1 x 10^6 cpm OR Affected pathway Main Steam bine High Range monitor RM-MS-170. -171. -172, -270. -271. -272 GREATER THAN 12.2 mR/hr	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
2. Major secondary line break with significant primary to secondary leakage MODES 1, 2. 3. & 4	• Uncontrolled loss of secondary coolant - IN PROGRESS AND • Vent Vent A MGPI Monitor RM-VG-179 GREATER THAN 1.76 x 10^6 µCi/sec OR Steam Generator Blowdown monitor on affected pathway RM-SS-122. -123. -124 RM-SS-222, -223. -224 GREATER THAN $1x10^5$ cpm OR Main Steam Line High Range monitor on affected pathway RM-MS-170. -171, -172 RM-MS-270, -271. -272 GREATER THAN 0.14 mR/hr	ALERT
3. Major secondary line break MODES 1, 2. 3, & 4	Uncontrolled loss of secondary coolant - IN PROGRESS	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Loss of offsite and onsite AC power for more than 15 minutes ALL MODES	The following conditions exist for greater than 15 minutes: • Ammeters for 4160V Reserve Station Service Buses D, E. E F all indicate - zero (0) amps AND • Ammeters for 4160V Station Service Buses A. B, E C all indicate - zero (0) amps AND • Ammeters for 4160V Emergency Buses H E J both indicate - zero (0) amps	SITE AREA EMERGENCY
2. Loss of all onsite DC power for greater than 15 minutes ALL MODES	The following conditions exist for greater than 15 minutes: • All station battery voltmeters indicate zero (0) volts AND • No light indication available to Reserve Station Service breakers 15D1, 15E1 and 15F1	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
CAUTION: EAL A.1 is duplicated below for cross-reference/comparison to EAL H.3:		
A.1. Loss of function needed for unit HSO condition MODES 1. 2. 3 & 4	• Total loss of the Charging/SI System OR Total loss of the Main Feedwater and Auxiliary Feedwater Systems	SITE AREA EMERGENCY
3. Loss of all offsite and onsite AC power ALL MODES	• Ammeters for 4160V Reserve Station Service Buses D. E & F all indicate - zero (0) amps AND • Ammeters for 4160V Station Service Buses A, 5. & C all indicate - zero (0) amps AND • Ammeters for 4160V Emergency Buses H and J both indicate - zero (0) amps	ALERT
4. Loss of all onsite OC power ALL MODES	• All station battery voltmeters indicate - zero (0) volts AND • No light indication available to Reserve Station Service Breakers 1501. 15E1 and 15F1	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
5. Loss of offsite power or onsite AC power capability ALL MODES	• Unit main generator and both emergency diesel generators out of service OR Loss of all 34.5 KV reserve station service buses	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Fire resulting in degradation of safety systems MODES 1, 2, 3, & 4	• Fire which causes major degradation of a safety system function required for protection of the public AND • Affected systems are caused to be NOT operable as defined by Tech. Specs.	SITE AREA EMERGENCY
2. Fire potentially affecting station safety systems MODES 1, 2, 3, & 4	Fire which has potential for causing a safety system not to be operable as defined by Tech. Specs.	ALERT
3. Fire lasting greater than 10 minutes in Protected Area or Service Water Pump/Valve House ALL MODES	Fire within the Protected Area or Service Water Pump/Valve House which is not under control within 10 minutes after Fire Brigade - DISPATCHED	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Loss of physical Station control ALL MODES	• Shift Manager/Station Emergency Manager has been informed that the security force has been neutralized by attack. resultinq in loss of physical control of station OR Shift Manager/Station Emergency Manager has been informed of intrusion into one or more Vital Areas which are occupied or controlled by an aggressor	GENERAL EMERGENCY
2. Imminent loss of physical Station control ALL MODES	Security Shift Supervisor has notified the Operations Shift Manager/Station Emergency Manager of imminent intrusion into a Vital Area	SITE AREA EMERGENCY
3. Ongoing Security compromise ALL MODES	Security Shift Supervisor has notified the Operations Shift Manager/Station Emergency Manager of a confirmed unneutralized intrusion into the Protected Area or ISFSI	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATPON
4. Security threat. unauthorized attempted entry. or attempted sabotage ALL MODES	Any of the following when determined to have potential for degrading the level of safety of the plant or ISFSI • Receipt of a credible site-specific threat from Security. NRC or FBI • Confirmed hostage situation • Civil disturbance • Discovery of a bomb device (other-than on or near a safety-related system which represents an on-going security compromise) • Confirmed attempted intrusion (Protected Area or ISFSI) • Attempted sabotage	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Aircraft damage to vital plant systems MODES 1, 2, 3. & 4	Aircraft crash which affects vital structures by impact or fire	SITE AREA EMERGENCY
2. Severe explosive damage MODES 1, 2, 3. & 4	Explosion which results in severe degradation of any of the following systems required for safe shutdown: • CVCS System OR ECCS System OR Main/Auxiliary Feedwater System	SITE AREA EMERGENCY
3. Entry of toxic or flammable gases into plant vital areas other than the Control Room MODES 1. 2, 3. & 4	• Uncontrolled release of toxic or flammable agents greater than life threatenina or exolosive limits in vital Areas AND • Evacuation of Vital Area other than Control Room - REQUIRED OR Significant degradation of plant safety systems 'resulting in loss of a safety system function required for protection of the public	SITE AREA EMERGENCY

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
4. Severe missile damage to safety systems MODES 1, 2, 3. & 4	Missile impact causing severe degradation of safety systems required for unit shutdown	SITE AREA EMERGENCY
5. Aircraft crash on the facility ALL MODES	Aircraft crash within the Protected Area or Switchyard	ALERT
6. Explosion damage to facility ALL MOQES	Unplanned explosion resulting in damage to plant structure or equipment that affects plant operations	ALERT
7. Entry of toxic or flammable gases or liquids into plant facility ALL MODES	Notification of uncontrolled release of toxic or flammable agent which causes: • Evacuation of personnel from plant areas AND • Safety related equipment is rendered inoperable	ALERT
8. Turbine failure or missile impact MODES 1 & 2	Failure of turbine/generator rotating equipment resulting in casing penetration	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
9. Missile damage to safety related equipment or structures MODES 1. 2. 3. & 4	Notification of missile impact causing damage to safety related equipment or structures	ALERT
10. Aircraft crash or unusual aircraft activity ALL MODES	• Confirmed notification of aircraft crash within the site boundary OR Unusual aircraft activity in the vicinitv of the site as determined by the Operations Shift Manager/ Station Emergency Manager or the Security Shift Supervisor	NOTIFICATION OF UNUSUAL EVENT
11. Train derailment within Protected Area ALL MODES	Confirmed report of train derailment within Protected Area	NOTIFICATION OF UNUSUAL EVENT
12. Explosion within Protected Area ALL MOOES	Confirmed report of unplanned explosion within Protected Area	MOTIFICATION OF UNUSUAL EVENT
13. Onsite or nearsite release of toxic or flammable liquids or gases ALL MODES	Notification of unplanned release of toxic or flammable agents which may affect safety of station personnel or equipment	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
14. Turbine rotating component failure with no casing penetration MODES 1 & 2	Failure of turbine/generator rotating equipment resulting in immediate unit shutdown	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Earthquake greater than or equal to DBE levels MODES 1. 2. 3. & 4	• Confirmed earthquake which activates the Event Indicator on the Strong Motion Accelerograph AND • Alarms on the Peak Shock Annunciator indicate a horizontal motion of greater than or equal to 0.12 g or a vertical motion of greater than or equal to 0.08g	SITE AREA EMERGENCY
2. Sustained winds in excess of design levels experienced or projected MORES 1, 2. 3, & 4	Sustained winds 150 mph OR GREATER experienced or projected	SITE AREA EMERGENCY
3. NOT USED		

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
4. Earthquake greater than or equal to OBE levels ALL MODES	• Confirmed earthquake which activates Event Indicator on the Strong Motion Accelerograph • Alarms on the Peak Shock Annunciator indicate a horizontal motion of greater than or equal to 0.06 g or a vertical motion of greater than or equal to 0.04g	ALERT
5. Tornado striking facility ALL MODES	Tornado visually detected striking structures within the Protected Area or Switchyard	ALERT
6. Hurricane winds near design basis level experienced or projected ALL MODES	Hurricane winds 120 mph OR GREATER experienced or projected	ALERT
7. Flood near design levels ALL MODES	Flood in the Lake Anna Reservoir with indicated level - greater than 263 feet MSL	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
8. Earthquake detected ALL MODES	Confirmed earthquake which activates the Event Indicator on the Strong Motion Accelerograph	NOTIFICATION OF UNUSUAL EVENT
9. Tornado within Protected Area or Switchyard ALL MODES	Tornado visually detected within Protected Area or Switchyard	NOTIFICATION OF UNUSUAL EVENT
10. Hurricane force winds projected onsite within 12 hours ALL MODES	• Confirmation by Weather Center that hurricane force winds (greater than 73 mph) projected onsite within 12 hours	NOTIFICATION OF UNUSUAL EVENT
11. 50 year flood ALL MODES	Flood in the Lake Anna Reservoir with indicated level - greater than 254 feet MSL	NOTIFICATION OF UNUSUAL EVENT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
1. Any major internal or external events which singly or in combination cause massive damage to station facilities or may warrant evacuation of the public ALL MODES	Shift Manager/Station Emergency Manager judgement	GENERAL EMERGENCY
2. Station conditions which may warrant notification of the public near the site ALL MODES	Shift Manager/Station Emergency Manager judgement	SITE AREA EMERGENCY
3. Station conditions which have the potential to degrade or are actually degrading the level of safety of the station ALL MODES	Shift Manager/Station Emergency Manager judgement	ALERT

CONDITION/APPLICABILITY	INDICATION	CLASSIFICATION
4. Station conditions which warrant increased awareness of state and/or local authorities ALL MODES	Shift Manager/Station Emergency Manager judgement that any of the following exist: • Unit shutdown is other than a controlled shutdown OR Unit is in an uncontrolled condition during operation OR A condition exists which has the potential for escalation and therefore warrants notification	NOTIFICATION OF UNUSUAL EVENT

Conduct a turnover between the onshift and relief SEM in accordance with the following checklist. Use placekeeping aid at left of item. "_____", to track completion.

____ 1. Determine the status of primary responder notification.

____ 2. Determine the status of "Report of Emergency to State and Local Governments," EPIP-2.01. Attachment 2. Get completed copies if avai1able.

____ 3. Determine status of the "Report of Radiological Conditions to the State," EPIP-2.01, Attachment 3. Get completed copy if available.

____ 4. Determine status of Emergency Notification System (ENS) communications and completion status of NRC Event Notification Worksheet (EPIP-2.02 Attachment 1).

____ 5. Review classification and initial PAR status.

____ 6. Review present plant conditions and status. Get copy of Critical Safety Functions form.

____ 7. Review status of station firewatches and re-establish if conditions allow.

____ 8. Determine readiness of TSC for activation.

____ 9. After all information is obtained. transfer location to TSC. (Consider direct transfer of State & local notifications to LEOF/CEOF.)

____ 10. Call the Control Room and assess any changes that may have occurred during transition to the TSC.

____ 11. When sufficient personnel are available. the relief SEM is to assume the following responsibilities from the onshift Station Emergency Manager:
   a. Reclassification.
   b. Protective Action Recommendations until LEOF activated.
   c. Notifications (i.e., state, local. & NRC). Upon LEOF activation. transfer notification responsibilities except for the NRC ENS.
   d. Site evacuation authorization.
   e. Emergency exposure authorization.
   f. Command/control of onsite response.

____ 12. Formally relieve the Interim SEM and assume control in the TSC. Announce name and facility activation status to facility.

This attachment provides procedural guidance for controlling selected emergency response actions when their implementation would have adverse results.

Station Emergency Manager (SEM) approval is required before any required action is postponed. suspended or modified. The guidance below is not all-inclusive.

UNANTICIPATED HAZARD EXISTS (e.g., security event, tornado or toxic release):

IF implementation of emergency response actions could compromise Security Plan response strategies, THEN consider postponing or suspending emergency response actions until threat has been resolved. e.g., on-site announcement directing assembly and emergency response facility activation. pager activation and call-out per EPIP-3.05. AUGMENTATION OF EMERGENCY RESPONSE ORGANIZATION, dispatch of Security Team members to the LEOF per EPIP-3.04. ACTIVATION OF LOCAL EMERGENCY OPERATIONS FACILITY. and staging of road blocks per EPIP-5.04, ACCESS CONTROL.

IF assembling on-site personnel for accountability or activation of emergency response facilities could endanger plant personnel. THEN consider postponing emergency assembly until hazardous conditions are resolved. (Consider having Corporate Security notify corporate emergency response organization only using CPIP-3.4. INNSBROOK SECURITY SUPPORT. and notifying personnel in unaffected areas on-site selectively.)

IF notifying augmentation could create a safety hazard for personnel coming to the station, THEN consider postponing augmentation notification. (Consider having Corporate Security notify corporate emergency response organization only using CPIP-3.4, INNSBROOK SECURITY SUPPORT. or defering notifications until hazardous conditions are resolved.)

ANTICIPATED SITUATION (e.g., forecasted severe weather or grid disturbance):

IF all or part of the ERO has been staged in anticipation of a predicted event. THEN notify Security to omit performance of augmentatdon notification (as described in EPIP-3.05. AUGMENTATION OF EMERGENCY RESPONSE ORGANIZATION).

IF adequate controls have been established to continually account for personnel staged in anticipation of a predicted event. THEN notify Security to omit performance of initial accountability (as described in EPIP-5.03. PERSONNEL ACCOUNTABILITY).

IF a decision has been made to staff the Central EOF in lieu of the LEOF. THEN notify Security that performance of EPIP-3.04. ACTIVATION OF LOCAL EMERGENCY OPERATIONS FACILITY. is not required.

IF environmental conditions are hazardous. THEN consult with Security Team Leader about suspending procedural requirements for staging road blocks (IAW EPIP-5.04, ACCESS CONTROL).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
66															
67															
68															
69															
70															
71															
72															
73															
74															
75															
SRO ONLY															
1	H	3	X											E	01182.10, Modified; The stem needs to be changed. You indicate that the current conditions (Unit 1) for two different power levels. The unit can not be at 100 % and 7% at the same time. There appears to he a lot of unnecessary information in the stem. I do not know if the information is there because you were attempting to make the question appear as if it matches the entire K/A or what.
2	F	3													G2.4.45, New; Need to make sure there are not two answers
3	H	3	X												009EA2.23, Modified; This is not a new questions. It appears to be a slightly modified question from a bank

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
4	F	3	X											E	024AG2.1.32, Bank; The stem needs to be changed. As written, the questions cues the applicant as to where he/she should go.
5	H	3				X									025AG2.2.25, Modified; Distractors not well written. Grammatical errors
6	F	2				X								E	029GG2.1.28, Bank; This question is not SRO only. The K/A does not have a 43 reference. The question is merely asking for the signals that will trip purge supply and exhaust valves. This is basic system knowledge. The way the question is worded you could argue that answer A and C are correct since 35 F is less than 65 F. Answer C can be eliminated because if it was correct then A would also be correct and there can't be two correct answers.
7	H	3	X			X								E	038EA2.09, Bank; Minor changes needed to stem. Look at distractors (three NOTs)
8	H	3	X											S	058AG2.4.4, New; Change Cog Level to C/A since the applicant must analyze that 1H Emergency Bus is de-energized. Modify stem.
9	H	3	X											S	061A2.02, New; Good question. Suggest revising the stem to delete unnecessary information
10	H	3												S	062AG2.1.14, New
11	F													S	062GG2.4.31, New
12	F	2				X								E	064GG2.4.49, New: Possible two correct answers. Is there enough ion in the stem to suggest that which EDG failed to auto start or th there is a possible equipment problem? Two correct answers?

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
13	H	3												S	**065AG2.4.4,** New
14	H	3	X											E	**103A2.05,** New; What type of channel is being isolated? ...the Unit Supervisor was reviewing the paperwork associated with the evolution. Based on the above information, the Unit Supervisor should realize that ..... was not performed _____
15	F	1	X			X								U	G2.1.32, New; This does not appear to be an SRO level question
16	F	2				X								S	G2.1.7, New; Change distractor "A" to read Lo condenser vacuum
17	F	2				X								S	G2.2.19, Bank; There appear to be several correct answers to this question. In your distractor analysis you make too many assumptions.
18	F	2				X								E	G2.2.9; New; There appear to be three correct answers (A, & D). Why would an RO request the lifting of a lead while a technician is performing work? Distractor not well written
19	F	1						X						U	G2.3.6, New;
20	F	2													**G2.4.27**, Bank
21	H	3	X												Revise Stem so that it tests the Unit differences and placing the unit in a Mode where LTOQ may or may not be required. Unit 2 is in Mode **4** with RCS cold leg temperatures at **265°F** and 2-CH-PCV-**2145,** Letdown Pressure Control Valve, has failed closed.
22	H	2	X			X								E	**WE08EA2.2,** Bank; Stem should be redone with logical order of events. Distractors not credible. There could be to correct answers based on assumptions made by the candidate (A & D).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		
23	H	2				X								?	WE10G2.4.4, New; Could a case be made for distractor "D"? It would appear that a cooldown and depressurization will be achieved no matter how it is performed.
24	H	2				X									WE11EA2.2, Modified, Distractor "D" is not plausible
25												X		~~U~~ S	Explain the reason for this question and its association with the K/A.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
SRO ONLY															
1															
2															
3															
4															
5															
6															
7															
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17															
18															
19															
20															
21															

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	**Explanation**
22															
23															
24															
25															

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

Review Worksheet

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

Instructions

[Refer to Section D of ES-401 and Appendix B for additional infunnation regarding each of the following concepts.]

1. Enter the levei of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question using a 1 - **5** (easy - difficult) rating scale (questions in the 2 - 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
   The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed. or too much needless information),
   The Stein or distractors contain cues (i.e., clues. Specific determiners, phrasing. length, etc).
   The answer choices are a collection of unrelated true/false statements.
   One or more distractors is not credible.
   One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
   · The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
   · The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e.. it is not required to be known from memory).
   The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   The question requires reverse iogic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved KIA and those that are designated SRO-only (K/A and license level mismatches are unacceptable).
6. Based on the reviewer's judgment. is the question as written (U)nacceptable (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
7. At a minimum. explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

RO/SRO Combined Question

1	H														001K5.09, New
2	H														002A1.09, Modified
3	F														003AK3.09, Bank
4	F-H														003GG2.2.22, Modified **5/11/04 TCK** Make distractor "B" for the "B" RCP and distractor "C" for "A & C" RCPs since it is more plausible because "B" RCP is the only one below 235 F. This should be Higher level since the applicant must know the lower 235 F limit and the 50 F limit.
5	F														004K2.04, New

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
6	H														005A4.02, New
7	F														005K1.09, Bank
8	F														006K2.04, New
9	F														007A4.01, New
10	H														007EK2.02, Bank
11	H														008AK1.02, Bank **5/11/04 TCK** Importance rating should be 3.1/3.7.
12	H														008K4.01, Bank
13	F														009EA1.17, Modified
14	H														010GG2.4.31, New
15	H														010K5.02, New
16	F														011EG2.4.49, Bank
17	F														011K6.04, Bank
18	F														012K2.01, Bank
19	H														012K6.01, Bank
20	F														013K4.10, Bank
21	H														014K4.06, Bank
22	F														015AA2.08, Modified
23	F														015G2.1.28, Bank
24	H														016A4.01, New **5/11/04 TCK** Importance rating should be 2.9/2.8.
25	F														022K3.01, Modified

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

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   - The question contains data with an unrealistic ievei of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved KIA and those that are designated SRO-only (KIA and license level mismatches are unacceptable).
6. Based on the reviewer's judgment, is the question as written (U)nacceptable (requiring repair or replacement), in need of (E)ditorial enhancement. or (S)atisfactory?
7. At a minimum. explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

RO/SRO Combined Question

1														U	This question is a JPM??? replace .
2	H	3												S	002A1.09, Modified
3	F	2	X											E	003AK3.09, Bank; Add power level to stem
4												X		U	003GG2.2.22, Modified; The K/A is Knowledge of LCO's and Safety Limits. This question is asking the bases for tripping the Rx if an RCP is lost at power.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
5	F	2	X			X								E	004K2.04, New; Revise stem. Information could provide information to answer SRO Question #8. Distractor "C" should be replaced since the heaters do not have a control switch which makes it implausible. Suggested revision for stem:
6	H	3												S	005A4.02, New;
7	F	2	X											E	005K1.09, Bank; Change format of stem
8	F	2												S	006K2.04, New
9	F	2												S	007A4.01, New
10	F	2												S	007EK2.02, Bank
11	H	2												S	008AK1.02, Bank
12	F	3												S	008K4.01, Bank
13	F/C	2				X								E	009EA1.17, Modified; Distractors "B" and "D" not plausible for the conditions given. (due to step)
14	F	2				X						✓		U	01GG2.4.31, New; Are we testing the labeling of the switch in this question? Tests controller operation
15	F	2												S	010K5.02, New
16		1				X								U	011EG2.4.49, Bank; Distractors not plausible
17	F	2												S	011K6.04, Bank
18		2												~~U~~S	012K2.01, Bank

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
19	H	2	X					X						E	012K6.01, Bank; Reword stem -While Unit 1 was ooerating at 100 oercent power "A" loop hot leg RTD failed. Following the failure of the RTD the instrument technician placed 1-RC-TTS-1412B (BS-1) on card C1-421 to Test per ..... None of the expected annunciators were received..... ask if SRO
20	F	2												S	013K4.10, Bank
21	F	2												S	014K4.06, Bank
22	F	3												S	013K4.10, Bank
23	F	3				X								S	015G2.1.28, Bank, Could distractor "C" also be correct? Have them look at.
24	H	3													016A4.01, New; Did the controller fail to a given position which caused the SG level to drop to 33 percent? Would we not have expected the reactor to trip? OK
25	F	2				X									022K3.01, Modified; Distractor "B" is not plausible given that containment is designed to withstand much higher temperatures true
26	F	1												U	024AK1.04, Modified; Distractors not plausible
27	F	2				X									026A3.02, New; Could distractor "B" be some indication that a system valve is not in the proper position? Is it also correct.
28	H	3												S	026K4.09, New
29	F	2				X								S	~~027AK3.01, New; Could distractor "D" be correct?~~
30						X								U	029A2.01, New;

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
31	F	2	X	X										S	032AA2.09, New; The stem needs to be reworded. Stating that the "voltage setting is set too high" provides a cue to the applicant
~~32~~ 30	F	2	X			X								E	029A2.01, New; Information provided in the stem would indicate to the applicant that 1-RMS-RM-126 would cause an isolation to occur. Is it really plausible to expect an isolation to reset without operation action.
33															
34															
35															
36															
37															
38															
39															
40															
41															
42															
43															
44															
45															
46															

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
26	F														024K1.04, Modified 5/11/04 **TCK** Importance rating should be 2.8/3.6
27	F														026A3.02, New
28	H														026K4.09, New
29	H														027AK3.01, New
30	H														029A2.01, New
31	F														032AA2.09, New
32	H	3										Y	N	S	033AA2.05, New 5/12/04 **TCK** No comment.
33	H	3										Y	N	E	033K3.03, New 5/22/04 **TCK** Distractor analysis does not match the answers.
34	H-F	2										Y	N	S	038EK1.02, Bank 5/12/04 **TCK** This question is Fundamental since only asking the reason to depressurize the RCS.
35	F	2										Y	N	S	039K1.07, Bank 5/12/04 **TCK** No comment
36	F	3						X				Y	Y	~~S~~ E	040AK3.04, Bank **5/12/04 TCK UFSAR** information is usually SRO job. Also, the answer should be revised to say "to prevent a challenge to containment integrity." **as discussed in** support material. Their call.
37	H	2										Y	N	S	051AA1.04, New 5/12/04 **TCK No** comment
38	F	2										Y	N	S	054AA1.03, New 5/12/04 **TCK** No comment.
39	H-F	2	X									Y	N	J	055EG2.4.6, Bank **5/12/04 TCK** Stem says LOCA with core voiding. The strategy [illegible] discuss [illegible] reword stem.
40	F	2		X		X						Y	N	U/E	055K3.01. Modified 5/12/04 **TCK** Distractor C **is** not plausible. The discharge of the air ejector swaps on hi rad. Revise answer A since it **cues** the answer. Say due to non-condensible gases building up.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	UIEIS	Explanation
41	H	2	X									N	N	~~U~~	05fiA2.04, Bank **5/12/04 TCK** Change stem to say "Which ONE of the following is correct per 1-AP-31, boss of Main Feedwater?" This ties question lo KIA. Dishactor analysis for D is incorrect.
42	H-F	3										N	N	U	056AK1.01. Bank **5/12/04 TCK** KIA is for cooling **by** natural convection. Nut **a** cumwrehension level.
43	H	3										Y	N	S	056K1.03, Bank **5/12/04 TCK** No comment.
44	F	3										Y	N	E	057AK3.01, New **5/12/04 TCK Add** the word "to" after OATC in stem.
45	F	2										Y	N	S	058AA2.03, Bank **5/12/04 TCK** No comment.
46	H	2										Y	N	S	059K1.02, Bank **5/11/04 TCK** Importance factor should **be** 3.4/3.4
47	H	3										Y	N	E	061AK2.01, New **5/12/04 TCK Is** there a procedure for this action? If not then may want to change stem to "...backboards operator **could** take?"
48	H-F	2				X						Y	N	~~U~~ E	OfilK5.05. Modified **5/12/04 TCK** Distractor"D" is not credible since nathing in the stem suggests that the pump was run. Not at comprehension level since only asking for reason hot discharge piping is **a** concern.
49	H	3										Y	N	S	062A2.03, Modified **5/12/04 TCK** No comment.
50	F-H	3										Y	N	E	063A1.01, Bank **5/12/04 TCK** This is comprehensive level question. Need a period 3t the end of the stem.
51	F-H	4										Y	N	S	064K3.03. New **5/12/04 TCK** This is comprehensivelevel question.
52	H-F	2				X						Y	N	U	065AA2.03, Bank **5/12/04 TCK** Distractors B and Care not plausible. You would never stop air compressors on **a loss** of ai and the containment isolation valves **are** normally open. Not at comprehensive level.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
53	H	3										Y	N	S	067AG2.2.22, New **5/11/04 TCK** K/A number should be changed fro 067AG2.22 to 067AG2.2.22.
54	F	3										N	N	U	073K3.01, Bank **5/12/04 TCK** K/A is for loss or malfunction of instrument, not the actions that occur on a valid signal. Revise stem to failure of instrument
55	H	2				X						Y	N	U 2	075K4.01, Bank **5/12/04 TCK** No correct answer since the pump doesn't wait for the discharge valve to close prior to de-energizing the pump.
56	F	3										Y	N	S	076A4.01, New **5/12/04 TCK** No comment.
57	H	2										N	N	U	078A3.01, Bank **5/12/04 TCK** Does not meet IK/A. Question should be about automatic operation of the instrument air system and not about manual actions on loss of air.
58	F-H	3										Y	N	E	078GG2.1.30, New **5/11/04 TCK** Importance factor needs to be 3.9/3.4. This question is comprehensive level. Change stem to say "may be started" since the compressor starts based on load demand.
59	F	3		X								Y	N	U/E	086A2.04, Bank **5/12/04 TCK** The cue in the stem is "operator assigned to perform main steam valve houses operations". Suggest to just say "RCS temperature is controlled by locally _____."
60	F	3										Y	N	?	103K4.06, Bank **5/12/04 TCK** Wording doesn't seem right. The support material talks about the 60 seconds as having no fuel failure and everything staying in containment. Not about a release to the environment. Look at.
61	F	2										Y	N	S	G2.1.1, Bank **5/12/04 TCK** No comment.
62	F	2										Y	N	S	G2.1.20, New **5/12/04 TCK** No comment.
63	F	3					X					Y	N	U/E	G2.1.22, Modified **5/12/04 TCK** Not enough information given. Need to indicate Keff and may want to say power is <5%Thermal.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
64	F	3										Y	N	U	G2.2.2, New **5/12/04 TCK** Two correct answers as written (A and 5). Suggest changing 35% to 50% based on Note for 50%Rx power.
65	H	3				X						Y	N	U/E	G2.2.22, New **5/12/04 TCK** 15 minute action time for C and D is not credible. Suggest changing to 8 hours since this is part of the completion time also. Should also state in stem that no other LCOs are in effect at this time. The 1 hour surveillance is usually done prior tomaking the DG inop so that you don't intentionally enter an action statement.
66	F	3										Y	N	S	G2.2.27, Bank **5/12/04 TCK** No comment.
67	H-F	2										Y	N	S	G2.3.2, New **5/12/04TCK** Not at comprehension level.
68	H	3										Y	N	U	G2.3.9, Bank **5/12/04TCK** No correct answer. The recirc fan is on to ensure the rad monitors are operable, not the purge isolation valves.
69	H	3										Y	N	S	**E2.4.15Bank** **5/12/04TCK** No comment.
70	F	2										Y	N	S	**G2.4.29, Bank** **5/12/04TCK** Nu comment.
71	H	3										Y	N	S	WE02EK2.2, Bank **5/12/04TCK** No comment.
72	H	3		X		X						Y	N	U/E	**WE04EA2.1**, Bank **5/12/04 TCK** Distractor C is not plausible. You would nut use a procedure called "**LOCA** outside containment" to combat **a LOCA** inside containment.
73	H	3										Y	N	S	WE05EK2.2, Bank **5/12/04 TCK** No comment.
74	H	3				X						Y	N	U/[illegible]	[illegible] **5/12/04 TCK** Distractor C is not plausible. How can keeping an RCP running cause core w c ng to degrade [illegible]
75	H	3		X								Y	N	U/E	WE11EK2.2, Bank **5/12/04TCK** Stem question gives answer [illegible] Suggest changing to "why S G's are depressur zeo slow y?"

>#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
'5	H	3		X								Y		U/E	WE11EK2.2, Bank Stem question gives answer away. Suggest changing to "why S/G's are depressurized slowly?"
SRO ONLY															
1	H											Y		E	011A2.10, Modified; The stem needs to be changed. You indicate that the current conditions (Unit 1) for two different power levels. The unit can not be at 100 % and 7% at the same time. There appears to be a lot of unnecessary information in the stem. I do not know if the information is there because you were attempting to make the question appear as if it matches the entire K/A or what.
2	F											Y		?	G2.4.45, New; Need to make sure there are not two answers
3	H											Y		E	009EA2.23, Modified; This is not *a* new questions. It appe*ars* to be a slightly modified question from a bank
4	F											Y		E	024AG2.1.32, Bank; The stem needs to be changed. As written, the questions cues the applicant as to where he/she should go.
5	H											Y		**E**	**025AG2.2.2**5, Modified; Distractors not well written. Grammatical errors

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
6	F	2				X		X				Y		E	029GG2.1.28, Bank; This question is not SRO only. The K/A does not have a 43 reference. The question is merely asking for the signals that will trip purge supply and exhaust valves. This is basic system knowledge. The way the question is worded you could argue that answer A and C are correct since 35 F is less than 65 F. Answer C can be eliminated because if it was correct then A would also be correct and there can't be two correct answers.
7	H	3	X			X						Y		E	038EA2.09, Bank; Minor changes needed to stem. Look at distractors (three NOTs)
8	H	3	X									Y		E	058AG2.4.4, New; Change Cog Level to C/A since the applicant must analyze that 1H Emergency Bus is de-energized. Modify stem.
9	H	3	X									Y		S	061A2.02, New; Suggest revising the stem to delete unnecessary information
10	H	3										Y		S	062AG2.1.14, New
11	F											Y		S	062GG2.4.31, New
12	F	2				X						Y		E	064GG2.4.49, New; Possible two correct answers. Is there enough information in the stem to suggest which EDG failed to auto start or that there is a possible equipment problem? Step one of the EOP procedures allows starting the EDG.
13	H	3										Y		S	065AG2.4.4, New

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		
23	H	2				X						Y		?	WE10G2.4.4, New; Could a case be made for distractor "D"? It would appear that a cooldown and depressurization will be achieved no matter how it is performed.
24	H	2				X						Y		E	WE11EA2.2, Modified, Distractor "D" is not plausible
25												Y		S	WE13EG2.2,25, **New; Question** is **very wordy**

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. U/E/S	7. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only		

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
14	H	3	X									Y		E	103A2.05, New; What type of channel is being isolated? ...the Unit Supervisor was reviewing the paperwork associated with the evolution. Based on the above information, the Unit Supervisor should realize that ..... was not performed _____
15	F	1	X			X						Y		U	G2.1.32, New; This does not appear to be an SRO level question
16	F	2										Y		S	G2.1.7, New
17	F	2										Y		S	G2.2.19, Bank
18	F	2				X						Y		E	G2.2.9; New; There appear to be three correct answers (A & D). Why would an RO request the lifting of a lead while a technician is performing work? Distractor not well written
19	F	1						X				Y		U	G2.3.6, New
20	F	2										Y		S	G2.4.27, Bank
21	H	3	X									Y		E	WE02EG2.2.25, New; Revise Stem so that it tests the Unit differences and placing the unit in a Mode where LTOP may or may not be required. Unit 2 is in Mode 4 with RCS cold leg temperatures at 265°F and 2-CH-PCV-2145, Letdown Pressure Control Valve, has failed closed.
22	H	2	X			X						Y		E	WE08EA2.2, Bank; Stem should be redone with logical order of events. Distractors not credible. There could be two correct answers based on assumptions made by the candidate (A & D).

Assuming that containment pressure **is** at 9.65 **psia,** the indicated pressure at which the PRT rupture **discs** would blow would be _____ PSID.

A. 100

B. **24.65**

C. 20

D. 109.65

Answer: **A**

0 psig =

14.7 psia

110.5 psia

14.7

95.8 psig

009EA1 17 001

Unit 1 is operating at 100% power when a pressurizer safety valve lifts. The crew performs the immediate actions of 1-E-0 and initiates safety injection due to low-low pressurizer pressure. A short time later the STA announces that containment sump level is increasing. The OATC announces that the PRT rupture disk has blown.

What ONE indication did the QATC use to come to this conclusion?

A. PRT pressure suddenly decreased
B. Pressurizer level took a step decrease
C. PRT level suddenly decreased
D. Pressurizer pressure took a step decrease

A. Correct. PRT pressure will decrease when the rupture disk blows.

B. Incorrect. Pressurizer level will not take a step decrease when the rupture disk blows.

C. Incorrect. PRT level will remain stable.

D. Incorrect. Pressurizer pressure may be decreasing, but it will not take a step decrease when the PRT rupture disk blows.

Ability to operate and/or monitor the following as they apply to Small Break LOCA: PRT

(CFR: 41.7 / 45.5 / 45.6)

Modified bank question 5447

References:
Objective 15847 from self-study guide on Reactor Coolant System

Level (ROISRO):	RO	Tier:	1
Group:	1	Importance Rating:	3.4/3.4
Type (Bank/Mod/New):	MODIFIED	Cog (Knowledge/Comp):	KNOWLEDGE
Reference (Y/N):	N	Last Exam(Y/N):	N

The reactor is at 80% power with control **rods** in automatic at 205 steps. The Reactor Operator initiates a blended makeup. Due to **a** malfunction of the boric acid controller, the boric acid to blender flow control valve, 1-CH-FCV-1113A, opens 25% greater than that required. Because of this malfunction, the control rods will move _____ to-compensate for the _____ reactivity added **by** the faulty controller.

A. outward; negative

B. inward; negative

C. outward; positive

D. inward; positive

Answer: A

possible replacement for Question #1

RO - Tier 1 Grou 1

Name/Safety Function	KA	Question Type	K/A Topic(s)	RO	SRO
'Reactor Trip - Stabilization - Recovery/ 1	007EK2.02	nowledge of the interrelationsbetween eactor Trip - Stabilization and the following: (CFR: 41.7 145.7 / 45.8)	Breakers, relays and disconnects	2.6	2.8
Pressurizer Vapor Space Accident 13	008AK1.02	Knowledge of the operational implications of the following concepts as they apply to the Pressurizer Vapor Space Accident: CFR: 41.8 to 41.10 / 45.3)	Change in leak rate with change in pressure	3.1	3.7
Small Break LOCA / 3	009EA1.17	bility to operate and/or monitor the following s they apply to Small Break LOCA: (CFR: 41.7 / 45.5 / 45.6)	PRT	3.4	3.4
Large Break LOCA / 3	011EG2.4.49	This is a Generic, no stem statement is associated.	bility to perform without reference to rocedures those actions that require immediate operation of system compon nd controls.	4	4
RCP Malfunctions/ 4	15AA2.08	Ability to determine and interpret the following as they apply to RCP Malfunction: (CFR: 41.10 / 43.5 / 45.13)	When to secure RCPs on high bearing– emperature	3.4	3.5
Pressurizer Pressure control System Malfunction / 3	027AK3.01 CHANGED FROM	Knowledge of the reasons for the following responses as they apply to Pressurizer Pressure Control system malfunction: (CFR: 41.5 / 41.10 / 45.6 / 45.13)	Isolation of PZR spray following loss of PZR heaters	3.5	3.8
Steam Gen. Tube Rupture / 3	038EK1.02	Knowledge of the operational implications of the following concepts as they apply to the SGTR: (CFR: 41.8 to 41.10 / 45.3)	Leak rate vs. pressure drop	3.2	3.5
Steam Line Rupture - Excessive Heat Transfer / 4	D40AK3.04 Replaced 040AK3.06	Knowledge of the reasons for the following responses as they apply to Steam bine Rupture – Excessive Heat Transfer: (CFR: 41.5 / 41.10 / 45.6 / 45.13)	Actions contained in EOPs for steam li rupture	4.5	4.7
Loss of Main Feedwater / 4	054AA1.03	Ability to operate and / or monitorthe following as they apply to Loss of Main Feedwater: (CFR: 41.7 / 45.5 / 45.6)	AFW auxiliaries, including oil cooling w supply	3.5	3.7
Station Blackout / 6	055EG2.4.6	This is a Generic, no stem statement is associated.	Knowledge symptom based EOP mitigaticn strategies.	3.1	4

RO - Tier 1 Grou, 1

Loss of DC Power / 6	058AA2.03	Ability to determine and interpret the following as they apply Loss of DC power: (CFR: 41.10 / 43.5 / 45.13)	DC loads lost; impact on ability to operate and monitor plant systems	**3.5**	3.9
Loss of Instrument Air / 8	065AA2.03	Ability to determine and interpret the following as they apply to Loss of Instrument Air: (CFR: 41.10 / 43.5 / 45.13)	Location and isolation of leaks	2.6	**2.9**
LOCA Outside Containment / 3	WE04EA2.1	Ability to determine and interpret the following as they apply to LOCA outside containment: (CFR: 41.10 / 43.5 / 45.13)	Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.4	4.3
Loss of Emergency Coolant Recirc. / 4	WE11EK2.2	Knowledge of the interrelations between Loss of Emergency Coolant Recirc and the following:(CFR: 41.7 / 45.7 / 45.8)	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal **systems** and relations between the proper operation of these *systems to* the operation **of *the*** facility.	3.9	4.3
Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	WE05EK2.2	Knowledge of the interrelations between Inadequate Heat Transfer – Loss of Secondary Heat Sink and the following: (CFR: 41.7 / 45.7 / 45.8)	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems and relations between the proper operation of these systems to the operation of the facility.	**9**	4.a
RCP Malfunctions / 4	015G2.1.28 Replaced 015AG2.1.33	This is a Generic, no stern statement is associated.	Knowledge of the purpose and function of major system components and controls.	2	3.3
Loss of Off-site Power	056AK1.01 Was added due to not enough KAs	Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power	Principle of cooling by natural convection	*9*	**2**
Loss of Vital AC Electrical Instrument Bus	057AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Vital AS Instrument Bus	Actions contained in EOP for loss of vital AC electrical instrument bus	1	4

RO - Tier 1 Grou... 2

Name / Safety Function	KA	Question Type	K/A Topic(s)	RO	SRO
Dropped Control Rod /	003AK3.09 Replaced 003AK3.03	Knowledge of the reasons for the following responses as they apply Dropped Control Rod: (CFR: 41.5 / 41.10 / 45.6 / 45.13)	Recording of group bank position for dropped rod (reference point used to withdraw dropped rod to equal height with other rods in the bank)	3.0	3.5
Emergency Boration / 1	024AK1.04	Knowledge of the operational implications of the following concepts as they apply to the Emergency Boration system: (CFR: 41.8 to 41.10 145.3)	Low temperature limits for boron concentration	2.8	**3.6**
Loss of Source Range	032AA2.09	Ability to determine and interpret the following as they apply to Loss of **Source** Range: (CFR: 41.10 / 43.5 / 45.13)	Effect of improper HV setting	**2.5**	2.9
Loss of Intermediate Range	033AA2.05 Replaced 033AA1.03	Ability to determine and interpret the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation	Nature of abnormality, from rapid survey of control room data	**3.0**	3.1
Loss of Condenser Vac	051AA1.04	Ability to operate and / or monitor the following as they apply Loss of Condenser Vacuum: (CFR: 41.7 145.5/ 45.6)	Rod position	**2.5**	**2.5**
ARM System Alarms / 7	061AK2.01	Knowledge of the interrelations between Area Radiation Monitoring system and the following: (CFR: 41.7 / 45.7 / 45.8)	Detectors at each **ARM** system location	**2.5**	**2.6**
Plant Fire On-site / 9 8	067AG2.2.22	This is a Generic, no stem statement is associated.	Knowledge of limiting conditions for operations and safety limits.	**3.4**	4.1
SI Termination / 3	WE02EK2.2	Knowledge of the interrelations between **SI** Termination and the following: (CFR: 41.7 145.7 / 45.8)	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems and relations between the proper operation of these systems to the operation of the facility.	3.5	3.9
Degraded Core Cooling	WE06EA2.2	Ability to determine and interpret the following as they apply to Degraded Core Cooling: (CFR: 41.10 / 43.5 /45.13)	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	**3.5**	4.i

RO - Tier 2 Group 1

Name / Safety Functio	KA	Question Type	K/A Topic(s)	RO	SRO
Reactor Coolant Pump	003GG2.2.22	This is a Generic, no stem statement is associated.	Knowledge of limiting conditions for operations and safety limits.	3.4	4.1
Chemical and Volume Control	004K2.04	Knowledge of electrical power supplies to the following: (CFR: 41.7)	BWST tank heaters	2.6	2.7(
Residual Heat Removal	005K1.09	Knowledge of the physical connections and/or cause-effect relationships between RHR system and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)	RCSO	3.6	3.9
Emergency Core Cooling	006K2.04	Knowledge of electrical power supplies to the following: (CFR: 41.7)	ESFAS-operated valves	3.6	3.8
Relief/Quench Tank	007A4.01	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)	PRT spray supply valve	2.7	2.7
Component Cooling ater	008K4.01 Replaced 008K4.07	Knowledge of CCWS design feature(s) and/or interlock(s) which provide for the following:	Automatic start of standby pump	3.1	3.3
Pressurizer Pressure Control	010GG2.4.31	This is a Generic, no stem statement is associated.	Knowledge of annunciators alarms and indications and use of the response instructions.	3.3	3.4
Reactor Protection	012K2.01	Knowledge of electrical power supplies to the following: (CFR: 41.7)	RPS channels, components and interconnections	3.3	3.7
Engineered Safety Features Actuation	013K4.10	Knowledge of ESF design feature(s) and or interlock(s) which provide for the following: (CFR: 41.71	Safeguards equipment control reset	3.3	3.7
Containment Cooling	022K3.01	Knowledge f th ffe that a loss malfunction of the nta Cooling system will have on the following:(CFR: 41.7 / 45.6)	Containment equipment subject to damage by high or low em h and pressure	2.9	3.2
Containment Spray	026A3.02	Ability to monitor automatic operations of the Containment spray system including: (CFR: 41.7 / 45.5)	Verification that cooling water is supplied to the containment spray heat exchanger	3.9	4.2

RO - Tier 2 Group 1

Main and Reheat Steam	039K1.07	Knowledge of the physical connections and/or cause-effect relationships between Main and reheat steam and the following: (CFR: 41.2 to 41.9 / 45.7 to 45.8)	AFW	3.4	3.4
Condensate	056K1.03	Knowledge of the physical connections and/or cause-effect relationships between Condensate system and the following: (CFR: **41.2** to **41.9 / 45.7** to **45.8)**	MFW	2.6	2.6
Main Feedwater	059K1.02	Knowledge of the physical connections and/or cause-effect relationships between Main Feedwater system and the following: (CFR: **41.2** to **41.9 / 45.7** to **45.8)**	AFW system	3.4	3.4
Auxiliary/Emergency Feedwater	061K5.04 Should be K5.05	Knowledge of the operational implications of the following concepts as they apply to the AFW system (CFR: **41.5 / 45.7)**	Feed line voiding and water hammer	2.7	3.2
AC Electrical Distribution	062A2.03	Ability to (a) predict the impacts of the following on the AC electrical distribution system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: [illegible] / **43.5** / [illegible] 45.13)	Consequences of improper sequencing when transferring to or from an inverter	2.9	3[illegible]
DC Electrical Distribution	063A1.01	Ability lo predict and/or monitor changes in parameters associated with operating the DC Electrical system controls including: (CFR: **41.5 / 45.5)**	Battery capacity as it is affected by discharge rate	2.5	3[illegible]

RO - Tier 2 Group 1

Emergency Diesel Generator	54K3.03	Knowledge of the effect that a loss or malfunction of the EDGs will have on the following: (CFR: 41.7 / 45.6)	ED/G (manual loads)	3.6	3.9
Process Radiation Monitoring	73K3.01	Knowledge of the effect that a loss or malfunction of the Process radiation monitoring will have on the following: (CFR: 41.7 / 45.6)	Radioactive effluent releases	3.6	4.2
Service ervice Water	76A4.01	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)	SWS pumps	2.9	2.9
Instrum Instrument Air	78GG2.1.30	This is a Generic, no stem statement is associated.	Ability to locate and operate components, including local controls.	3.9	3.4
Containment	03K4.04 eplaced 03K4.01	Knowledge of containment system design feature(s) and /or interlocks which provide for the following:	Containment isolation system	3.1	3.7
Pressurizer Pressure Control	10K5.02	Knowledge of the operational implications of the following concepts as they apply to the Pressurizer Pressure control system (CFR: 41.5 / 45.7)	Constant enthalpy expansion through a valve	2.6	3.0
Containment Spray	eplaced 26K3.01	Knowledge of CSS design features and/or interlocks which provide for the following:	Prevention of path for escape of radioactivity from containment to the outside (interlock on RWST isolation after swapover)	3.7	4.1
Residual Heat Removal	05A4.02	Ability to manually operate and/or monitor in the control room: (CFR: 41.7 / 45.5 to 45.8)	Heat exchanger bypass flow control	3.4	[illegible]

January 15, 2004

RO - Tier 2 Group 1

Condensate	056A2.04	Ability to (a) predict the impacts of the following on the Condensate system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 43.5 / 45.3 / 45.13)	ɔss of condensate pumps	2.6	2.8
Instrument Air	078A3.01	Ability to monitor automatic operations of the Instrument air system including: CFR: 41.7 / 45.5)	ir pressure	3.1	3.2
Reactor Protection System	012K6.01	Knowledge of the effect of a loss or maifunction of the following will have on the RPS	istables and bistable test equipment	2.8	3.3
~~Condensate~~	~~056K6~~	~~Knowledge of the effect that a loss or malfunction of the following will have on the Condensate system:~~ ~~(CFR: 41.7 / 45.7)~~	~~FW~~	~~2.6~~	~~2.6~~

RO - Tier 2 Group 2

Name / Safety Function	KA	Question Type	K/A Topic(s)	RO	SRO
Containment Purge	029A2.01	Ability to (a) predict the impacts of the following on the Containment purge and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 43.5 / 45.3 / 45.13)	Maintenance or other activity taking place inside containment	2.9	3.6
Spent Fuel Pool Cooling	033K3.03 Replaced 033K3.01	Knowledge of the effect that a loss of malfunction of the Spent Fuel Pit Cooling system will have on the following:	Spent fuel temperature	3.0	3.3
Condenser Air Removal	055K3.01	Knowledge of the effect that a loss or malfunction of the Condenser Air Removal system will have on the following: (CFR: 41.7 / 45.6)	Main condenser	2.5	2.7
Circulating Water	075K4.01	Knowledge of Circulating water system design feature(s) and or interlock(s) which p ovide for the following: (CFR: 41.7)	Heat sink	2.5	2.8
Fire Protection	086A2.04	Ability to (a) predict the impacts of the following on the Fire Protection system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operation: (CFR: 41.5 / 43.5 /	Failure to actuate the FPS when required, resulting in fire damage	3.3	3.9
Control Rod Drive	001K5.09	Knowledge of the operational implications of the following concepts as they apply to the Control Rod drive system (CFR: 41.5 / 45.7)	Relationships between reactivity due to boron and reactivity due to control rod	3.5	3.7
Reactor Coolant	002A1.09	Ability to predict and/or monitor changes in parameters associated with operating the RCS controls including: (CFR: 41.5 / 45.5)	RCS T-ave	3.7	[illegible]

RO - Tier 2 Grou

Name / Safety Function	KA	Question Type	K/A Topic(s)	RO	SRO
Pressurizer Level Control	11K6.04 Replaced 011K6.01 Replaced 011A2.09	Knowledge of the effect of a loss or malfunction of the following will have on the PZR LCS:	Operation of pressurizer level controllers.	3.1	3.1
Rod Position Indication	014K4.06	Knowledge of Rod Position Indication design feature(s) and or interlock(s) which provide for the following: (CFR: 41.7)	Individual and group misalignment	3.4	3.7
Non-Nuclear Instrumentation	016A4.01	Ability to manually operate and/ or monitor in the control room: (CFR: 41.7 / 45.5 to ***45.8)***	NNI channel select controls	2.8	2.9

RO - Tier

Group	KA	Topic	RO	SRO
Conduct of Operations	G2.1.22 Replaced G2.2.4	Ability to determine Mode of Operation	2.8	3.3
Conduct of Operations	G2.1.20	Abiiity to execute procedure steps.		
Conduct of Operations	G2.1.1	Knowledge of conduct of operations requirements.		
Equipment Control	G2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.4	
Equipment Control	G2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown	4	3.5
Equipment Control	G2.2.27	knowledge of the refueling process.	2.6	3.5
Radiation Control	G2.3.9	knowledge of the process for performing a containment purge.	2.5	3.4
Radiation Control	G2.3.2	Knowledge of facility ALARA program.		2.9
Emergency Procedures/Plan	G2.4.29	Knowledge of the emergency plan.	2.6	
Emergency Procedures/Plan	2.4.15	knowledge of communications procedures associated with EOP implementation.	3	3.5