Draft Submittal

(Pink Paper)

NORTH ANNA 2006-302
RETAKE

RO WRITTEN
SRO ADMIN.

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

DRAFT

ES-301, Rev. 9 | Administrative Topics Outline | Form ES-301-1

Facility: **North Anna Power Station** Date of Examination: _____
Examination Level (circle one): **SRO** Operating Test Number: 1

Administrative Topic (see Note)	Type Code* **KA**	Describe activity to be performed
Conduct of Operations	N, CLR 015-A1.04 (3.5/3.7)	**1-PT-23, QUADRANT POWER TILT RATIO DETERMINATION** **Review for completeness (faulted)**
Conduct of Operations	M, CLR GEN 2.1.25 (2.8/3.1)	**1-FP-I.3, RESPONSE TO VOIDS IN REACTOR VESSEL** **Calculate head vent time**
Equipment Control	M, CLR 005-A1.06 (2.7/3.1)	**1-GOP-13.0 ALTERNATE CORE COOLING METHOD ASSESSMENT / 1-GOP-13.1 ALTERNATE CORE COOLING METHOD ASSESSMENT GUIDELINES** **Calculate time to boiling.**
Radiation Control	N, CLR GEN 2.3.4 (2.5/3.1)	**ASSESS PERSONNEL EXPOSURE** **Determine path with lowest total dose.**
Emergency Plan	D, CLR, P GEN 2.4.29 GEN 2.4.44	**EPIP-1.01 EMERGENCY MANAGER CONTROLLING PROCEDURE** **Determine highest EPIP classification.**

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.

* Type Codes & Criteria:(C)ontrol room
(CLR) Classroom
(D)irect from bank (3 for ROs; 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (1)
(P)revious 2 exams (1; randomly selected) (Similar Topic)
(S)imulator

DRAFT

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Admin-1A

1-PT-23, QUADRANT POWER TILT RATIO DETERMINATION REVIEW

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

1-PT-23, QUADRANT POWER TILT RATIO DETERMINATION REVIEW

Alternate Path:

Yes, determine that a math error was performed

Facility JPM #:

N/A

K/A Rating(s):

Gen 2.1.23 (3.9/4.0)
015-A1.04 (3.5/3.7)

Task Standard:

1-PT-23 is reviewed and determined to have a math error on N-44 upper QPTR.

Preferred Evaluation Location:

Simulator _____ Classroom ___X___

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

1-PT-23, QUADRENT POWER TILT RATIO DETERMINATION

Validation Time: 15 min. **Time Critical:** NO

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Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

N/A

Tools/Equipment/Procedures Needed:

- 1-PT-23, QUADRENT POWER TILT RATIO DETERMINATION
- Calculator

READ TO OPERATOR

DIRECTION TO TRAINEE:

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.

INITIAL CONDITIONS:

- Reactor power is stable at 100%.
- The unit supervisor desired a hand-calculated QPTR be performed on unit 1
- The Unit 1 OATC has just completed 1-PT-23, QUADRENT POWER TILT RATIO DETERMINATION up through step 4 of Attachment 2, QPTR Hand Calculation.

INITIATING CUES:

You are to perform step 5 of Attachment 2, QPTR Hand Calculation.

TIME CRITICAL

N/A

START TIME: _____

STEP 1: Verify Current Reading for upper channels. STANDARD: Verifies entered data matches given data for all 4 upper channels. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Verify Expected Current for upper channels. STANDARD: Verifies entered data matches given data for all 4 upper channels. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Verify math for Normalized Current for upper channels. STANDARD: Verifies math performed properly for all 4 upper channels. COMMENTS:	___ SAT ___ UNSAT
STEP 4: Verify math for QPTR for upper channels. STANDARD: Verifies math performed properly for all 4 upper channels and determines N-44 math error. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Verify Current Reading for lower channels. STANDARD: Verifies entered data matches given data for all 4 lower channels. COMMENTS:	___ SAT ___ UNSAT

STEP 7: Verify Expected Current for lower channels. STANDARD: Verifies entered data matches given data for all 4 lower channels. COMMENTS:	___ SAT ___ UNSAT
STEP 8: Verify math for Normalized Current for lower channels. STANDARD: Verifies math performed properly for all 4 lower channels. COMMENTS:	___ SAT ___ UNSAT
STEP 9: Verify math for QPTR for lower channels. STANDARD: Verifies math performed properly for all 4 lower channels. COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
4	Step is necessary, the operator must identify that math error occurred (inverted numbers).

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

INITIAL CONDITIONS:

- Reactor power is stable at 100%.
- The unit supervisor desired a hand-calculated QPTR be performed on unit 1
- The Unit 1 OATC has just completed 1-PT-23, QUADRENT POWER TILT RATIO DETERMINATION, up through step 4 of Attachment 2, QPTR Hand Calculation.

INITIATING CUES:

You are to perform step 5 of Attachment 2, QPTR Hand Calculation.

TIME CRITICAL

N/A

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Attachment 2
QPTR Hand Calculation

N/A

2. IF one Power Range Channel is in trip OR the Unit 1 SRO desires that the current meters on the Power Range drawers be used, THEN read the current meters on the front of each operable Power Range upper and lower Detector Channel AND record the measured currents on Page 3 of this attachment.

3. IF the Unit 1 PCS is operable AND the Unit 1 SRO desires to use the Unit 1 PCS to obtain Current Readings, THEN do the following:

   3.1 Request a QPTR Report by doing the following on the Unit 1 PCS:

   a. Select the NSSS AND BOP button from the Main Screen.

   b. Select the QPTR button from the NSSS Menu Screen.

   c. Select the F4=Report button from the NI: Quadrant Power Tilt Ratio screen.

   d. IF using PCS, THEN select PRINT to print the QPTR Report.

   3.2 WHEN the QPTR Report is complete, THEN remove the report from the printer.

   3.3 Using the QPTR Report, record the appropriate current readings in the Current Reading spaces provided on Page 3 of this attachment.

4. Complete the calculations on Page 3 of this attachment.

5. Have a qualified individual complete an independent verification of all calculations.

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Attachment 2
QPTR Hand Calculation

NOTE: Current Readings may be obtained from the face meters of the Power Range "B" Drawer OR from the test jacks OR from the Unit 1 PCS, if operable.

Description	N-41 Upper	N-42 Upper	N-43 Upper	N-44 Upper	Avg. of Upper Normalized Currents
Current Reading (record to nearest μa)	160.749	168.904	173.413	209.151	
Expected Current (record as shown in Reactor Data Book or 1-PT-22.4)	161.2	170.3	174.9	211.2	
Normalized Current (Current Reading / Expected Current) (4 decimal places)	.9972	.9918	.9915	.9903	.9927
QPTR (Normalized Current / Avg. of Norm. Currents) (4 decimal places)	1.0045	.9991	.9988	1.0024	

Description	N-41 Lower	N-42 Lower	N-43 Lower	N-44 Lower	Avg. of Lower Normalized Currents
Current Reading (record to nearest μa)	193.086	173.604	216.635	227.198	
Expected Current (record as shown in Reactor Data Book or 1-PT-22.4)	188.8	170.3	212.7	223.4	
Normalized Current (Current Reading / Expected Current) (4 decimal places)	1.0227	1.0194	1.0185	1.0170	1.0194
QPTR (Normalized Current / Avg. of Norm. Currents) (4 decimal places)	1.0032	1.0000	0.9991	0.9976	

Maximum QPTR: 1.0045 (Record Maximum Upper or Lower QPTR Value from above)

Quadrant of Max QPTR: N41 UPPER (N41 Upper, N41 Lower N42 Upper, N42 Lower, etc.)

Completed by: Joe Plant Date: _____

Verified by: _____

Date/Time Verification Completed: _____ (Use this Time for recording when surveillance is completed)

CURRENT (UAMP): VERIFIED BY: _____

	UPPER		LOWER
N41U =	160.749 GOOD	N41L =	193.086 GOOD
N42U =	168.904 GOOD	N42L =	173.604 GOOD
N43U =	173.413 GOOD	N43L =	216.635 GOOD
N44U =	209.151 GOOD	N44L =	227.198 GOOD

EXPECTED 100% (UAMP): VERIFIED BY: _____

	UPPER		LOWER
N41U =	161.200 GOOD	N41L =	188.800 GOOD
N42U =	170.300 GOOD	N42L =	170.300 GOOD
N43U =	174.900 GOOD	N43L =	212.700 GOOD
N44U =	211.200 GOOD	N44L =	223.400 GOOD

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Admin-1B

CALCULATE THE MAXIMUM ALLOWABLE REACTOR VESSEL HYDROGEN VENTING TIME

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

CALCULATE THE MAXIMUM ALLOWABLE REACTOR VESSEL HYDROGEN VENTING TIME

Alternate Path:

No

Facility JPM #:

R-217

K/A Rating(s):

G2.1.25 (2.8/3.1)

Standards

Allowable vent time calculated IAW FR-I.3, Attachment 1 to be 1.52 minutes or 1 minute 31 seconds (1.47 – 1.57 acceptable).

Preferred Evaluation Location:

Simulator _____ Classroom __X__

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

FR-I.3, Response to Voids in Reactor Vessel, Attachments 1 and 2, Rev. 11.

Validation Time: 15 min. **Time Critical:** NO

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Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

Tools/Equipment/Procedures Needed:

- FR-I.3, Response to Void in Reactor Vessel, attachments 1 and 2.
- Calculator

READ TO OPERATOR

DIRECTION TO TRAINEE:

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.

Initial Conditions

- A SBLOCA has occurred on Unit 1.
- 1-FR-I.3, Response to Voids in Reactor Vessel, has been implemented and completed through subsequent step 21.
- Containment Pressure - 9 psia
- Containment Temperature - 140°F
- H_2 Concentration - 1.8%
- RCS Pressure - 1500 psig

Initiating Cues

- Calculate maximum allowable reactor vessel hydrogen venting time using FR-I.3, Attachments 1 and 2.
- When you finish the actions necessary to accomplish this, please inform an examiner.

Performance Checklist

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1 & 2 (any order) before 3; 3 & 4 (any order) before 5.

START TIME: _____

*** Step 1** DETERMINE CONTAINMENT VOLUME (STP). **Standards** a) Determines containment temperature from Initial Conditions. b) Converts containment temperature in °F to °R. (140°F + 460 = 600°R) c) Determines containment pressure from Initial Conditions. d) Inserts containment pressure and °R into formula. *e) Determines Containment volume (ref: 9.137 x 10^5 Cu Ft). **Evaluator's Note** ***This step is sequence critical.*** **Evaluator's Comments**	**CRITICAL STEP** ___ SAT ___ UNSAT
Step 2** DETERMINE MAXIMUM HYDROGEN VOLUME TO BE VENTED. **Standards** a) Inserts H_2 concentration and containment volume into formula. *b) Determines max H_2 volume to be vented. (Ref: 10964 Cu Ft). **Evaluator's Note** ***This step is sequence critical. **Evaluator's Comments**	**CRITICAL STEP** ___ SAT ___ UNSAT

Step 3** DETERMINE HYDROGEN FLOW RATE BASED ON RCS PRESSURE **Standard** a) Consults Attachment 2 to determine hydrogen flow rate. b) Determines RCS pressure from Initial Conditions. c) *Based on RCS pressure of 1500 psig, determines flow rate (Ref: 7200 +/- 100 scfm). **Evaluator's Note** ***This step is sequence critical **Evaluator's Comments**	**CRITICAL STEP** ___ SAT ___ UNSAT
Step 4** CALCULATE MAXIMUM VENT PERIOD. **Standard** 1. Recalls maximum H_2 volume to be vented and inserts into formula. 2. Recalls H_2 flowrate and inserts into formula. *c) Calculates venting period as 1.52 minutes or 1 minute 31 seconds (1.47 – 1.57 acceptable). **Evaluator's Note** ***This step is sequence critical. **Evaluator's Comments**	**CRITICAL STEP** ___ SAT ___ UNSAT

Step 6 REPORT TO NUCLEAR SHIFT MANAGER (EVALUATOR). **Standard** Verbal status report made of task completion. **STOP TIME:** _____ **Evaluator's Comments**	_____ SAT _____ UNSAT

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
1	Required to calculate containment volume.
2	Required to calculate volume of hydrogen to be vented.
3	Required to determine flow rate.
4	Required to calculate flow period.

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

Initial Conditions

- A SBLOCA has occurred on Unit 1.
- 1-FR-I.3, Response to Voids in Reactor Vessel, has been implemented and completed through subsequent step 21.
- Containment Pressure - 9 psia
- Containment Temperature - 140°F
- H_2 Concentration - 1.8%
- RCS Pressure - 1500 psig

Initiating Cues

- Calculate maximum allowable reactor vessel hydrogen venting time using FR-I.3, Attachments 1 and 2.
- When you finish the actions necessary to accomplish this, please inform an examiner.

Procedure: **1-FR-I.3**

Rev: **011** PAR: **0**

Title: **RESPONSE TO VOIDS IN REACTOR VESSEL**

Effective Date: **03/30/2004**

Station: **North Anna**

CONTINUOUS USE

VIRGINIA POWER
NORTH ANNA POWER STATION
FUNCTION RESTORATION PROCEDURE

NUMBER	PROCEDURE TITLE	REVISION
1-FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL (WITH TWO ATTACHMENTS)	11 PAGE 1 of 14

PURPOSE

To provide instructions to respond to voids in the Reactor Vessel Head.

ENTRY CONDITIONS

This procedure is entered from:

- Yellow terminus of the INVENTORY CSF STATUS TREE.

RECOMMENDED APPROVAL: RECOMMENDED APPROVAL - ON FILE	DATE	EFFECTIVE DATE
APPROVAL: APPROVAL - ON FILE	DATE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: If a controlled natural circulation cooldown is in progress and a void in the Reactor Vessel Upper Head is expected, then this procedure should not be performed.

* *

NOTE: Setpoints in brackets [ ] are for adverse Containment atmosphere (20 psia Containment pressure or Containment Radiation has reached or exceeded 10^5 R/hr or 70% on High Range Recorder).

1. CHECK IF SI IS TERMINATED - SI FLOW ISOLATED

   RETURN TO procedure and step in effect.

2. CHECK AT LEAST ONE CHARGING PUMP - RUNNING

   Do the following:

   a) IF CC flow to any RCP Thermal Barrier is NOT indicated, THEN locally isolate seal injection to the affected RCPs:

      - 1-CH-318, A RCP Seal Injection Isolation Valve
      - 1-CH-314, B RCP Seal Injection Isolation Valve
      - 1-CH-310, C RCP Seal Injection Isolation Valve

   b) Open 1-CH-MOV-1373, Charging Pump Recirc Header Isolation Valve.

   c) Establish recirc path for the Charging Pump to be started:

      - 1-CH-MOV-1275A (1-CH-P-1A)
      - 1-CH-MOV-1275B (1-CH-P-1B)
      - 1-CH-MOV-1275C (1-CH-P-1C)

   d) Start one Charging Pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	ESTABLISH INSTRUMENT AIR TO CONTAINMENT: a) Verify at least one Air Compressor is supplying Instrument Air System b) Verify Containment Instrument Air Trip Valves - OPEN: • 1-IA-TV-102A • 1-IA-TV-102B	a) Start at least one Air Compressor. b) Do the Following: 1) Reset both trains of Phase B Isolation if necessary. 2) Manually open valves.
4	CHECK CHARGING FLOW - AT LEAST 25 GPM INDICATED	Establish charging: a) Put controller for 1-CH-FCV-1122 in MANUAL and close. b) Close 1-CH-HCV-1311, Auxiliary Spray Valve. c) Open Normal Charging Line Isolation Valves: • 1-CH-HCV-1310 • 1-CH-MOV-1289A • 1-CH-MOV-1289B d) Open 1-CH-FCV-1122 to establish 25 gpm charging flow IF 25 gpm Charging can NOT be established, THEN RETURN TO procedure and step in effect.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	CHECK CC SYSTEM STATUS:	
	a) Check CDA - NOT ACTUATED	a) WHEN either of the following conditions are met, THEN continue with Steps 5b and 5c: • Service Water flow through Recirc Spray Heat Exchangers is secured OR • TSC or Plant Staff has determined that Service Water System capacity is sufficient to supply CC Heat Exchangers
	b) Verify Service Water Supply Valves to CC System - OPEN: • 1-SW-MOV-108A • 1-SW-MOV-108B	b) Manually open valves. WHEN Service Water is restored to CC Heat Exchangers, THEN continue with Step 5c.
	c) Verify at least one CC Pump - RUNNING	c) Perform the following: 1) IF a CDA has occurred, THEN close the Stub Bus Tie Breaker(s). 2) Start at least one CC Pump using 1-OP-51.1, COMPONENT COOLING SYSTEM. IF at least one CC Pump cannot be started, THEN restore CC System using 1-AP-15, LOSS OF COMPONENT COOLING. WHEN CC is established, THEN perform Step 6. Continue with Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	CHECK LETDOWN IN SERVICE:	Establish letdown: a) Put 1-CH-PCV-1145 in MANUAL and open to 100%. b) Open the following: • 1-CH-TV-1204A • 1-CH-TV-1204B • 1-CH-LCV-1460A • 1-CH-LCV-1460B c) Open one of the following Letdown Orifice Valves: • 1-CH-HCV-1200A OR • 1-CH-HCV-1200B OR • 1-CH-HCV-1200C d) Adjust 1-CH-PCV-1145 to establish 300 psig letdown pressure and put in AUTO. IF Letdown can NOT be established, THEN establish excess letdown using 1-OP-8.5, OPERATION OF EXCESS LETDOWN. GO TO Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	ESTABLISH STABLE RCS CONDITIONS:	
	a) PRZR level - GREATER THAN 69% [72%]	a) Control charging and letdown as required to stabilize PRZR level.
	b) RCS pressure - STABLE	b) Energize PRZR heaters and use normal spray as required to stabilize RCS pressure. IF normal spray is NOT available AND letdown is in service, THEN use Auxiliary Spray.
	c) Hot Leg temperatures - STABLE	c) Dump steam as required to stabilize Hot Leg temperatures.
8.	CHECK RCP SEAL COOLING: • Thermal barrier - FLOW INDICATED • Seal injection - FLOW INDICATED	IF one flow is indicated, THEN re-establish the other flow. IF no flow is indicated, THEN initiate 1-AP-33.2, LOSS OF RCP SEAL COOLING.
9.	MAINTAIN SEAL INJECTION FLOW TO EACH RCP BETWEEN 6 GPM AND 8 GPM	
10.	CHECK RCPs - ALL STOPPED	GO TO Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	CHECK IF RCS PRESSURE SHOULD BE INCREASED:	
	a) RCS pressure - AT LEAST 100 psi LESS THAN TECH SPEC LIMIT 3.4.3, Figure 3.4.3-2	a) GO TO Step 14.
	b) RCS pressure - LESS THAN 1850 PSIG [2000 PSIG]	b) GO TO Step 14.
	c) Energize PRZR Heaters to increase RCS pressure 50 psi <u>AND</u> stabilize RCS pressure	
12	CONTROL CHARGING AND LETDOWN FLOW TO MAINTAIN PRZR LEVEL GREATER THAN 36% [40%]	
13	CHECK RVLIS UPPER RANGE INDICATION:	
	a) Indication - INCREASING	a) GO TO Step 14.
	b) Indication - GREATER THAN 95%	b) RETURN TO Step 11.
	c) Turn off PRZR Heaters as required to stabilize RCS pressure	
	d) RETURN TO procedure and step in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION: Following a loss of all seal cooling, affected RCPs should not be started without prior status evaluation.

* *

NOTE:
- Normal PRZR spray should be isolated from any RCP that is stopped.
- RCPs should be run in the following order of priority to provide PRZR spray: C, A.

14 TRY TO START ONE RCP:

a) Consult TSC or Plant Staff to determine if RCS non-condensible gas concentration - ACCEPTABLE FOR RCP START

a) GO TO Step 16.

b) Establish the following conditions before starting an RCP:

- PRZR level - GREATER THAN 69% [72%]
- RCS subcooling based on Core Exit TCs - GREATER THAN 50°F [100°F]
- Use PRZR heaters as necessary to saturate the pressurizer water

b) IF conditions cannot be established, THEN GO TO Step 16.

c) Start one RCP using 1-OP-5.2, REACTOR COOLANT PUMP STARTUP AND SHUTDOWN

c) GO TO Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

15. RVLIS INDICATION - LESS THAN VALUE IN TABLE:

GO TO Step 26.

NO. RCPs RUNNING	RVLIS INDICATION	
	UPPER RANGE	DYNAMIC RANGE
0	95%	———
1	———	42%

16. VERIFY CONTAINMENT HYDROGEN ANALYZER - IN SERVICE

Put Hydrogen Analyzer in service using 1-OP-63.2, CONTAINMENT HYDROGEN ANALYZER.

17. CHECK IF LOW PRZR PRESSURE SI CAN BE BLOCKED:

a) PRZR pressure - LESS THAN 1950 PSIG

a) Reduce PRZR pressure to less than 1950 psig using normal PRZR spray.

IF normal spray is NOT available AND letdown is in service, THEN use Auxiliary Spray.

IF Auxiliary Spray is NOT available, THEN use one PRZR PORV.

b) Put both Low PRZR Pressure SI Block switches to BLOCK

c) Check Annunciator Panel "P" G-4 - LIT

18. RECORD RCS PRESSURE: 1500 psig

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	ESTABLISH FOLLOWING RCS CONDITIONS:	
	a) PRZR level - GREATER THAN 69% [72%]	a) Control charging and letdown as required.
	b) RCS pressure - STABLE	b) Energize PRZR Heaters and use normal spray as required. IF normal spray is NOT available AND letdown is in service, THEN use Auxiliary Spray.
	c) RCS subcooling based on Core Exit TCs - GREATER THAN 75°F [125°F]	c) Dump steam as required.
	d) Hot Leg temperatures - STABLE	d) Dump steam as required.

NOTE:
- This procedure should be continued while hydrogen sample is obtained in Step 20.
- There is a delay time of 5 minutes before the Containment Hydrogen Analyzer will provide an accurate reading.

20	CHECK CONTAINMENT HYDROGEN CONCENTRATION:	
	a) Verify Hydrogen Analyzer - IN SERVICE	a) Put Hydrogen Analyzer in service using 1-OP-63.2, CONTAINMENT HYDROGEN ANALYZER.
	b) Hydrogen concentration - LESS THAN 4%	b) Consult TSC or Plant Staff for additional recovery actions. GO TO Step 21.
	c) Hydrogen concentration - LESS THAN 0.5%	c) IF hydrogen concentration is less than 4%, THEN put Hydrogen Recombiner in service using 1-OP-63.1, POST ACCIDENT THERMAL HYDROGEN RECOMBINER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21.	PREPARE CONTAINMENT FOR REACTOR VESSEL VENTING:	
	a) Check Containment Purge and Exhaust Valves - CLOSED	a) Manually close valves.
	b) Start Containment Air Recirculation Equipment: • Containment Air Recirc Fans • Containment Dome Fans	
22.	DETERMINE MAXIMUM ALLOWABLE VENTING TIME:	
	a) Containment hydrogen concentration - LESS THAN 4%	a) Consult TSC or Plant Staff. GO TO Step 22b.
	b) Containment pressure - LESS THAN 20 PSIA	b) Consult TSC or Plant Staff. GO TO Step 23.
	c) Refer to Attachment 1 to determine maximum venting time	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

23.___ REVIEW REACTOR VESSEL VENTING TERMINATION CRITERIA:

- RCS subcooling based on Core Exit TCs - LESS THAN 25°F [75°F]

OR

- PRZR level - LESS THAN 36% [40%]

OR

- RCS pressure - DECREASES BY 200 PSI

OR

- Venting time - GREATER THAN MAXIMUM TIME CALCULATED IN STEP 22

OR

- RVLIS indication - GREATER THAN OR EQUAL TO VALUE IN TABLE:

NO. RCPs RUNNING	RVLIS INDICATION	
	UPPER RANGE	DYNAMIC RANGE
0	95%	———
1	———	42%
2	———	61%
3	———	100%

OR

- RVLIS indication - NO INCREASING TREND

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION:
- Venting should be stopped if any venting termination criterion in Step 23 is met.
- Opening Reactor Vent Valves could cause pressure transients in the vent piping, resulting in spurious Reactor Vent Valve actuation.

* *

24.__ VENT REACTOR VESSEL:

a) Open both Reactor Vent Valves in one vent path:

- 1-RC-SOV-101A-2 and 1-RC-SOV-101A-1

OR

- 1-RC-SOV-101B-2 and 1-RC-SOV-101B-1

a) IF either valve fails to open in one vent path, THEN close both valves and open valves in second path.

b) Any venting termination criterion - MET

b) Continue venting.

WHEN any venting termination criterion is met, THEN do Step 24c.

c) Close all Reactor Vent Valves:

- 1-RC-SOV-101A-1
- 1-RC-SOV-101A-2
- 1-RC-SOV-101B-1
- 1-RC-SOV-101B-2

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

25.__ CHECK RVLIS INDICATION - GREATER THAN OR EQUAL TO VALUE IN TABLE:

Raise RCS pressure to value recorded in Step 18.

RETURN TO Step 16.

NO. RCPs RUNNING	RVLIS INDICATION	
	UPPER RANGE	DYNAMIC RANGE
0	95%	———
1	———	42%
2	———	61%
3	———	100%

26.__ CHECK PRZR LEVEL - STABLE

Control charging and letdown as required.

27.__ RETURN TO PROCEDURE AND STEP IN EFFECT

- END -

1. Determine containment volume at STP = A

$$A = (1.82 \times 10^6 \text{ cubic ft}) \times \frac{P}{14.7 \text{ psia}} \times \frac{492^\circ R}{T}$$

where: P (psia) = Containment pressure (psia)
T (degrees R) = Containment temperature (degrees F) + 460

2. Determine maximum hydrogen volume that can be vented = B

$$B = \frac{(3\% - \text{Containment Hydrogen Concentration}) \times A}{100\%}$$

3. Determine hydrogen flow rate as a function of RCS pressure = C

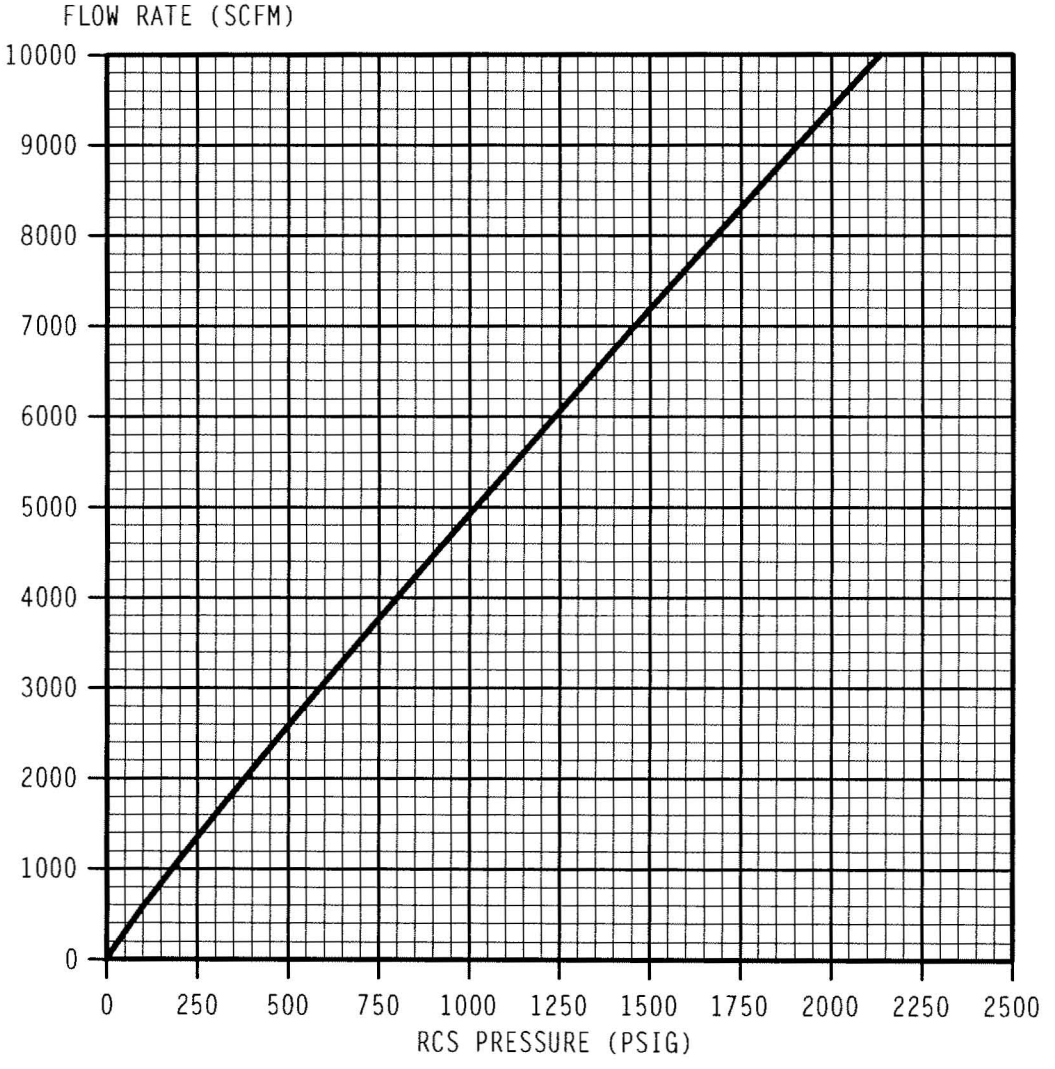
   a. Check RCS pressure.

   b. Using Attachment 2, read hydrogen flow rate.

4. Calculate maximum venting time (minutes):

   $$\text{Maximum venting time} = \frac{B}{C}$$

NUMBER	ATTACHMENT TITLE	REVISION
1-FR-I.3	REACTOR HEAD VENT HYDROGEN FLOW RATE FOR VARIOUS RCS PRESSURES	11
ATTACHMENT 2		PAGE 1 of 1



REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Admin-2

0-PT-80 AC SOURCES OPERABILITY VERIFICATION

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

0-PT-80 AC SOURCES OPERABILITY VERIFICATION

Alternate Path:

Yes, determine surveillance is unsat.

Facility JPM #:

Admin-100

K/A Rating(s):

GEN 2.2.12 (3.0/3.4)

Task Standard:

Determine that 1H 4160v bus voltage is out of specifications low.

Preferred Evaluation Location:

Simulator ___X___ In-Plant _____

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:

0-PT-80 "AC SOURCES OPERABILITY VERIFICATION"
TS-???

Validation Time: 15 min.

Time Critical: NO

==========

Candidate: _____
NAME

Time Start: _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____

Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

1. Recall IC # 2

2. Override meter for 1H Emergency Bus voltage to 0.81, meter should read approx. 4000.

Tools/Equipment/Procedures Needed:

0-PT-80 "AC SOURCES OPERABILITY VERIFICATION"

READ TO OPERATOR

DIRECTION TO TRAINEE:

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.

INITIAL CONDITIONS:

- Unit 1 is stable at 100% power.
- 0-PT-80 "AC SOURCES OPERABILITY VERIFICATION" is scheduled to be completed during your shift for its normal weekly surveillance.
- Attachment 2, Unit 2 Emergency busses has already been completed.

INITIATING CUES:

You are to complete 0-PT-80 "AC SOURCES OPERABILITY VERIFICATION".

TIME CRITICAL

N/A

START TIME: _____

STEP 1: Review "Initial Conditions". STANDARD: Reviews section 3.0. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Review "Precautions and Limitations". STANDARD: Reviews section 4.0. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Perform Attachment 1, Unit 1 Emergency Buses. STANDARD: During performance of completing attachment determines that 1H Emergency Bus voltage is out of specifications low. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Perform Attachment 2, Unit 2 Emergency Buses. STANDARD: Already performed per initial conditions. COMMENTS:	___ SAT ___ UNSAT
STEP 5: Perform Attachment 3, Switchyard. STANDARD: Completes attachment. COMMENTS:	___ SAT ___ UNSAT

STEP 6: Perform section 7.1, "Acceptance Criteria". STANDARD: Determines that step 7.1.1 cannot be signed off. COMMENTS:	___ SAT ___ UNSAT
STEP 6: Perform section 7.2, "Follow-On Tasks". STANDARD: Determines that step 7.2.1 cannot be signed off. Completes step 7.2.2. NOTE: Inform candidate that another operator will enter the applicable Tech Spec Action along with any associated paperwork. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Perform section 7.3, "Completion Notification". STANDARD: Informs SRO that the test is complete. COMMENTS: **END OF TASK**	___ SAT ___ UNSAT

TIME STOP: _____

CRITICAL STEP EXPLANATIONS:

STEP #	Explanation
3	Required to determine that 1H bus voltage is below acceptable value.
6	Required to determine that test is unsat and that the 1H emergency bus is inoperable.

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

INITIAL CONDITIONS:

- Unit 1 is stable at 100% power.
- 0-PT-80 "AC SOURCES OPERABILITY VERIFICATION" is scheduled to be completed during your shift for its normal weekly surveillance.
- Attachment 2, Unit 2 Emergency busses has already been completed.

INITIATING CUES:

You are to complete 0-PT-80 "AC SOURCES OPERABILITY VERIFICATION".

TIME CRITICAL

N/A

Procedure: **0-PT-80**

Rev: **007** PAR: **0**

Title: **AC SOURCES OPERABILITY VERIFICATION**

Effective Date: **03/31/2006**

Station: **North Anna**

CONTINUOUS USE

Dominion

NORTH ANNA POWER STATION

PROCEDURE NO: **0-PT-80**

REVISION NO: **7**

PROCEDURE TYPE: **OPERATIONS PERIODIC TEST**

UNIT NO: **1 & 2**

PROCEDURE TITLE:

AC SOURCES OPERABILITY VERIFICATION

TEST FREQUENCY:	UNIT CONDITIONS REQUIRING TEST:
Weekly surveillance in Modes 1 through 6, during movement of recently irradiated fuel assemblies, OR within 1 hour after entering Action of Tech Spec 3.8.1, and every 8 hours thereafter	All modes or if EDG or normal offsite supply to emergency bus is inoperable

SPECIAL CONDITIONS: None

SURV REQ						

REVISION SUMMARY:

- FrameMaker Template 030.
- Incorporated DCP 05-143 by deleting G1TH5 and G102 being closed as an option when H502 is open on page 2 of Attachment 3. Added DCP 05-143 to References.
- Incorporated E-PAR {P1} which replaced graphic on Attachment 1 with a new graphic showing alternate path for 1H Bus operability through backfeed from B RSST and Bus 4 as long as the 1J Bus is being fed from "A" RSST and Bus 5. Deleted P&L 4.3 that WHEN 1H Emergency Bus is on Alternate Feed, THEN the 1B Bus must be on Normal Feed to prevent both 1H and 1J Bus from being supplied from 34.5 KV Bus 4. This PT does not establish plant electrical configurations, it verifies lineups.
- Changed "Shift Supervisor" to "SRO" in Step 4.1 to comply with Operations Management title changes.

REASON FOR TEST (CHECK APPROPRIATE BOX):

[X] 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:

CONTINUOUS USE

TABLE OF CONTENTS

1.0 PURPOSE

To provide instructions for verifying two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Distribution System as required by Surveillance Requirements 3.8.1.1 and 3.8.2.1.

2.0 REFERENCES

2.1 Source Documents

None

2.2 Technical Specifications

2.2.1 Tech Spec 3.8.1

2.2.2 Tech Spec 3.8.2

2.2.3 SR 3.8.1.1

2.2.4 SR 3.8.2.1

2.3 Technical References

2.3.1 11715-FE-1BB, One Line Diagram Electrical Distribution System

2.3.2 DCP-88-05, GDC-17 Third Station Reserve Transformer

2.3.3 Memo from K. S. Berger to J. A. Stall, dated 5-5-1989, North Anna Power Station Operation of 230-36.5KV Transformer

2.3.4 ET CEE 02-0005, Rev. 2, Voltage Specification For The Emergency AC Buses, North Anna Power Station, Unit 1 and 2

2.3.5 DCP 03-001, Installation Of 500/230 KV Transformer 6 and 230 KV Bus Rearrangement Project

2.3.6 DCP 05-143, Relocation of Switchyard Breaker H502, and Replacement of Switchyard Breakers G1TH5 and G102 / NAPS / Unit 1

2.4 **Commitment Documents**

None

Init Verif

3.0 INITIAL CONDITIONS

Notify the SRO of this test.

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 this test is being performed as a Partial PT or Post-Maintenance Test, THEN mark inappropriate steps N/A.
- IF any other step is marked N/A, THEN have the SRO approve the N/A and submit a Procedure Action Request (PAR).

4.2 The following Tech Specs apply:

- Tech Spec 3.8.1, AC Sources — Operating
- Tech Spec 3.8.2, AC Sources — Shutdown

5.0 SPECIAL TOOLS AND EQUIPMENT

None

6.0 INSTRUCTIONS

NOTE: Attachment 1, Unit 1 Emergency Buses, Attachment 2, Unit 2 Emergency Buses, and Attachment 3, Switchyard, may be performed in any order and in conjunction with other attachments since Section 6.0 only gathers information, therefore order is not important.

NOTE: Verifying that a breaker is racked to test will satisfy the requirement for an open breaker.

NOTE: Verifying that a breakers' disconnects are open will satisfy the requirement for an open breaker.

Complete the following attachments by marking the appropriate box as the required condition is verified. IF the condition cannot be verified, THEN do not mark the box. WHEN an entire branch can be marked, THEN that condition is SAT.

_____ • Attachment 1, Unit 1 Emergency Buses

JP • Attachment 2, Unit 2 Emergency Buses

_____ • Attachment 3, Switchyard

7.0 FOLLOW-ON

7.1 Acceptance Criteria

NOTE: Utilize Attachment 1, Unit 1 Emergency Buses, Attachment 2, Unit 2 Emergency Buses, and Attachment 3, Switchyard to determine the following conditions.

_____ 7.1.1 IF Unit 1 is in Mode 1 - 4, THEN the 1H Emergency Bus AND 1J Emergency Bus are operable.

_____ 7.1.2 IF Unit 1 is in Mode 5, 6, Defueled, or during movement of recently irradiated fuel assemblies, THEN at least 1H Emergency Bus OR 1J Emergency Bus is operable.

_____ 7.1.3 IF Unit 2 is in Mode 1 - 4, THEN the 2H Emergency Bus AND 2J Emergency Bus are operable.

_____ 7.1.4 IF Unit 2 is in Mode 5, 6, Defueled, or during movement of recently irradiated fuel assemblies, THEN at least 2H Emergency Bus OR 2J Emergency Bus is operable.

_____ 7.1.5 T342 conditions are SAT.

_____ 7.1.6 500 KV line conditions are SAT.

_____ 7.1.7 230 KV to 34.5 KV Bus 5 line conditions are SAT.

7.2 **Follow-On Tasks**

_____ 7.2.1 IF the requirements of Steps 7.1.1 through 7.1.7 are satisfied, THEN mark the cover sheet SAT.

7.2.2 IF the requirements of Step 7.1.1, 7.1.2, 7.1.3, 7.1.4, OR 7.1.5 are NOT satisfied, THEN do the following:

_____ a. Declare the affected Bus inoperable. IF Step 7.1.5 is NOT satisfied, THEN both Busses are inoperable.

_____ b. Enter the applicable Action of Tech Spec 3.8.1 or Tech Spec 3.8.2.

_____ c. Record the inoperable Bus on the cover sheet.

_____ d. Mark the procedure cover sheet UNSAT.

7.2.3 IF the requirement of Steps 7.1.6 or 7.1.7 are NOT satisfied, THEN do the following:

_____ a. Notify the SRO to determine, with Engineering Department assistance, if the necessary off-site power supply criteria is met.

_____ b. IF the SRO determines off-site power supply criteria is met, THEN mark the cover sheet SAT.

_____ c. IF the SRO determines off-site power supply criteria is NOT met, THEN mark the cover sheet UNSAT.

_____ 7.2.4 IF this procedure is NOT being performed for a weekly surveillance, THEN note the reason for procedure performance on Cover Page.

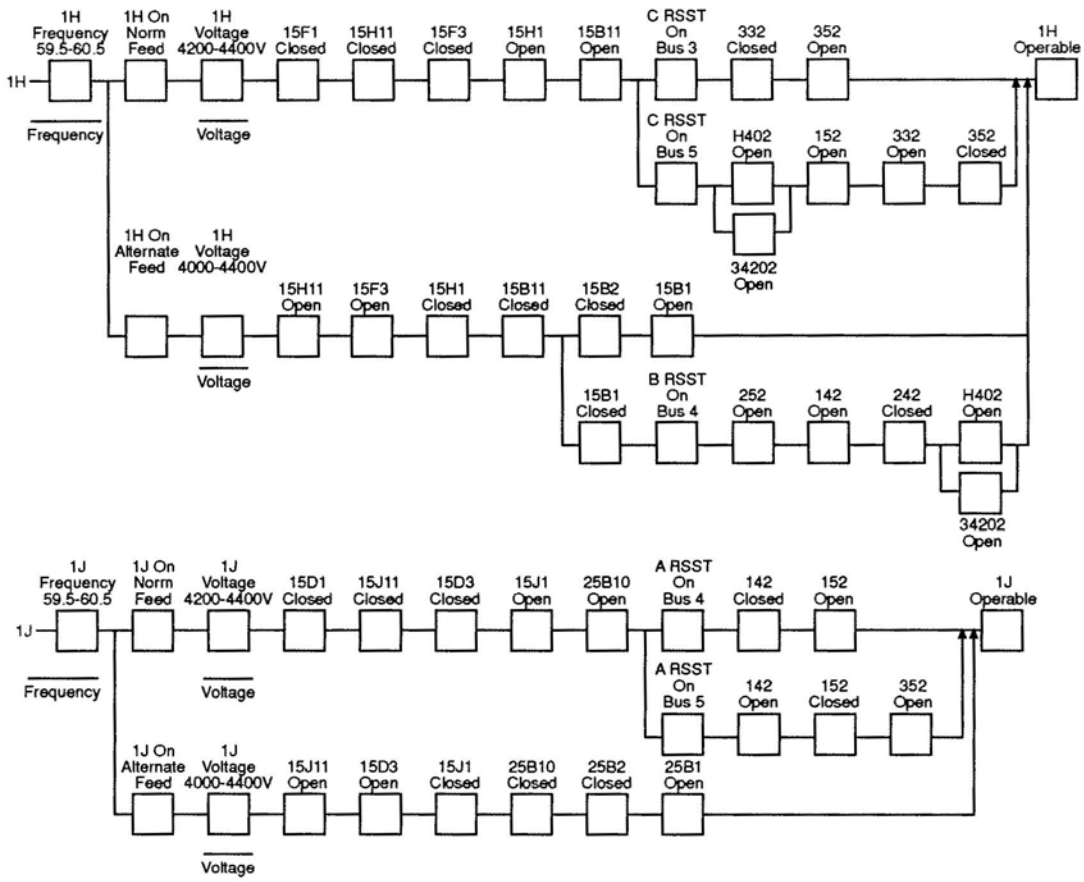
7.3 **Completion Notification**

_____ Notify the SRO that this test is complete.

Completed by: _____ Date: _____

(Page 1 of 1)

Attachment 1
Unit 1 Emergency Buses



UNIT 1 EMERGENCY BUSES

Graphics No. CS26378

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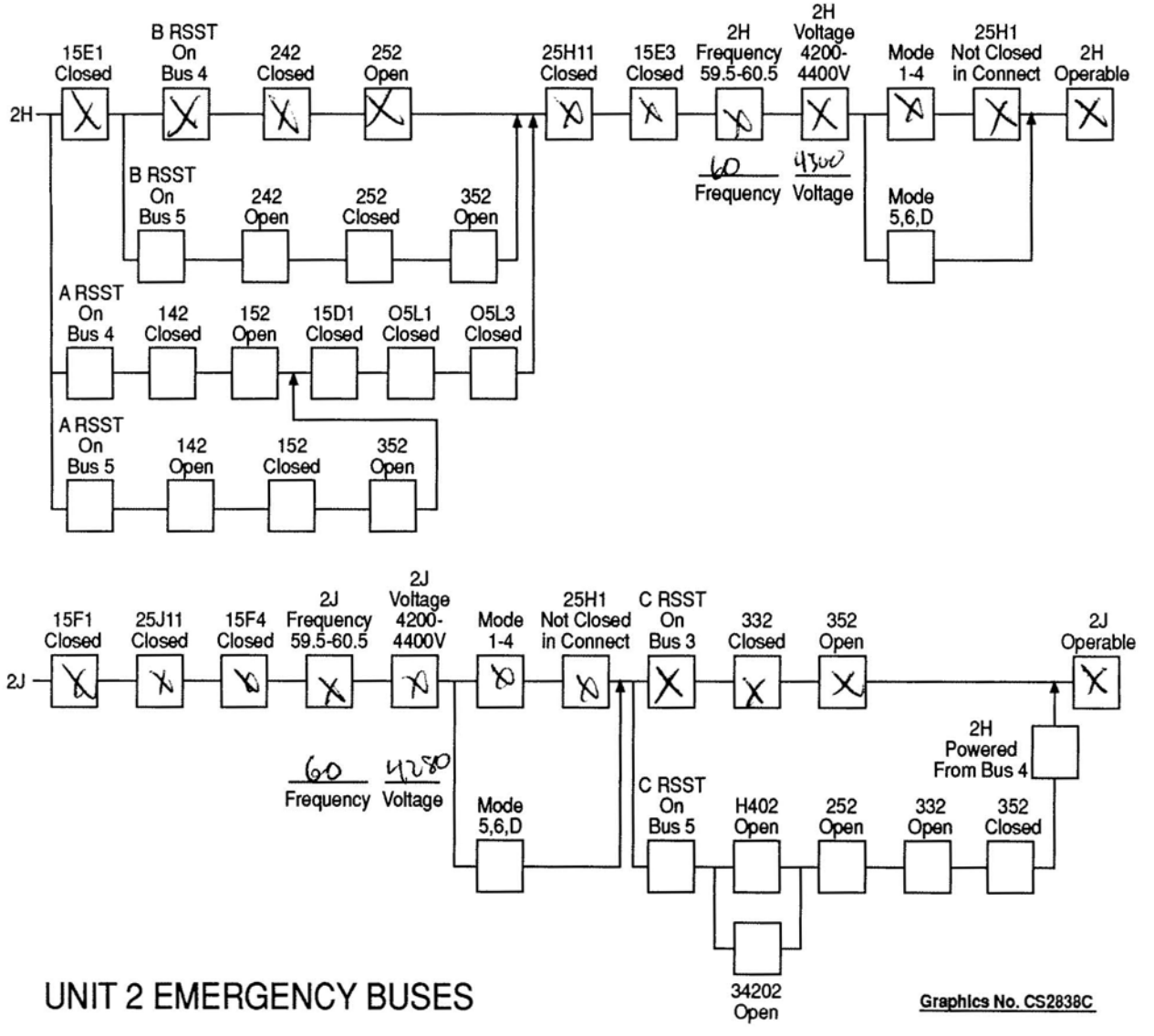
Attachment 2
Unit 2 Emergency Buses

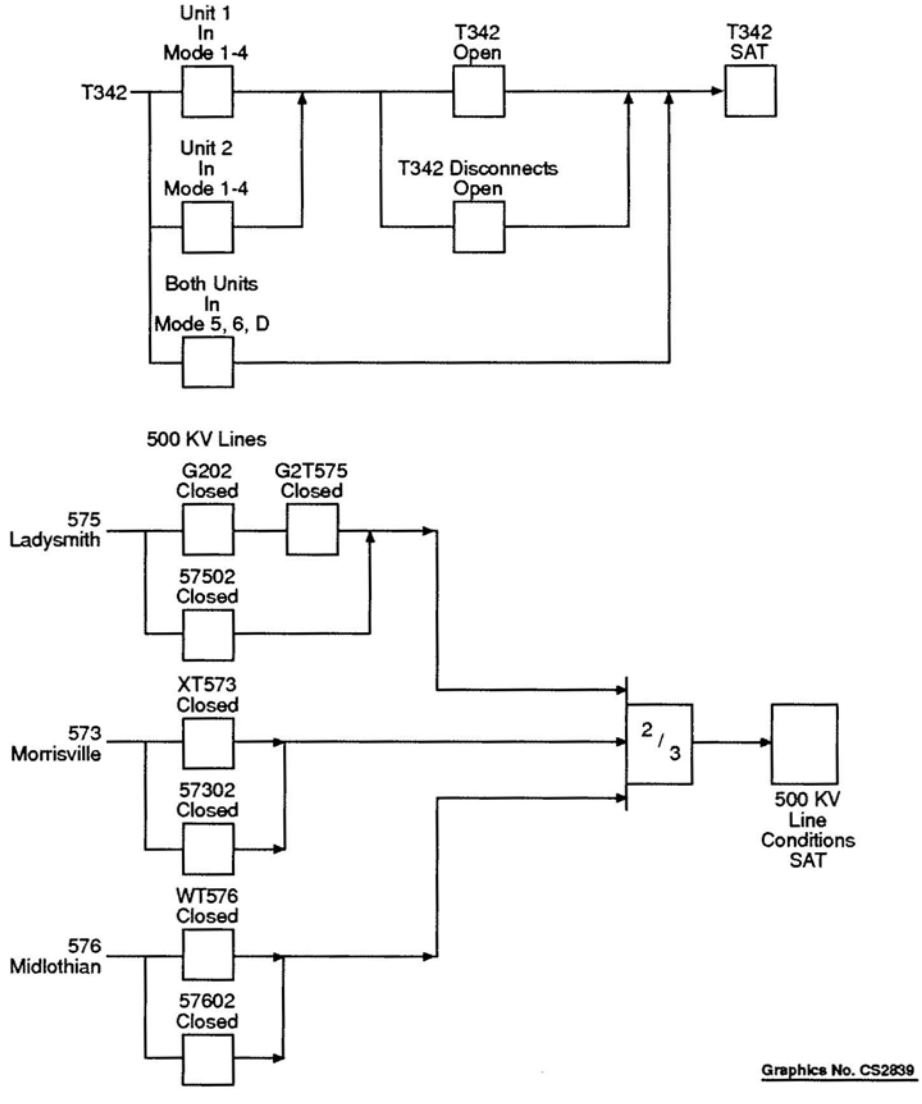


UNIT 2 EMERGENCY BUSES

Graphics No. CS2838C

(Page 1 of 2)

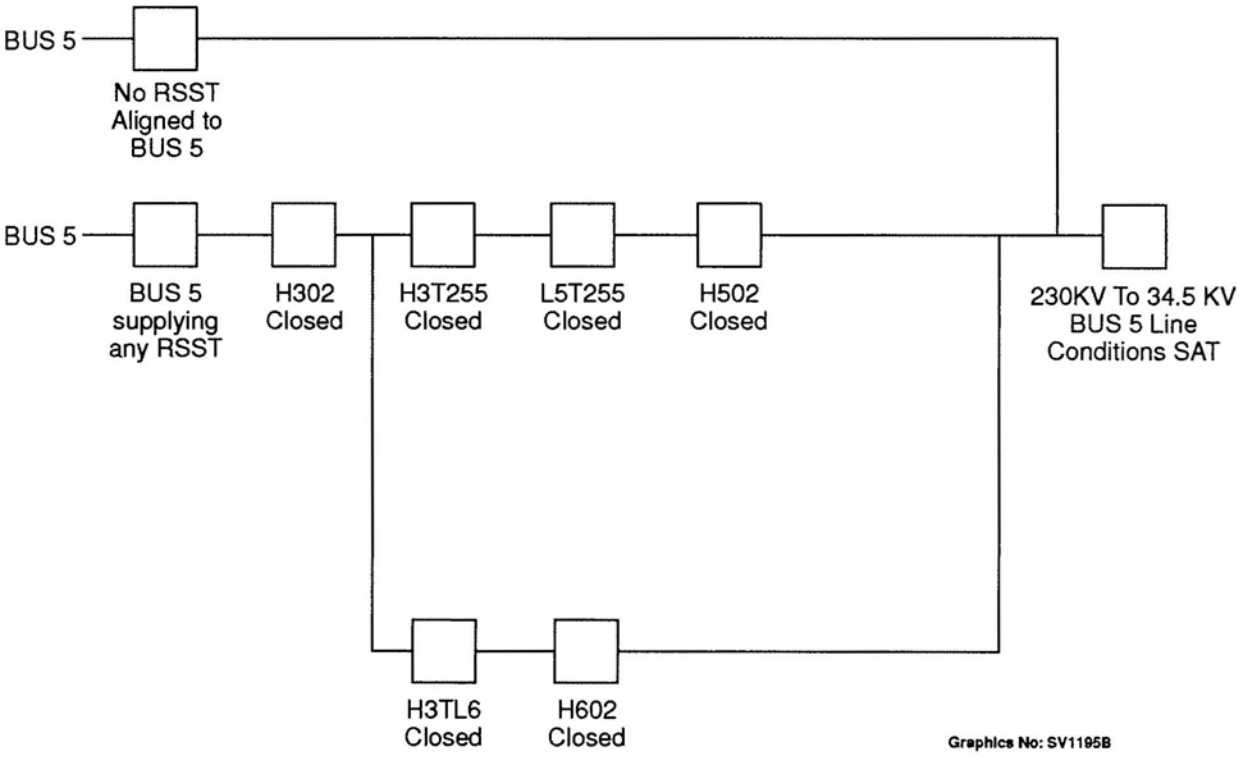
Attachment 3
Switchyard



SWITCHYARD

(Page 2 of 2)

Attachment 3
Switchyard



SWITCHYARD

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Admin-3

ASSESS PERSONNEL EXPOSURE

CANDIDATE _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Assess Personnel Exposure - Determine path with lowest total dose.

Alternate Path:

N/A

Facility JPM #:

N/A

K/A Rating(s):

Gen 2.3.4 (2.5/3.1)

Task Standard:

Determines that Route 2 results in the lowest dose.

Preferred Evaluation Location:

Simulator _____ Classroom ___X___

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

Advanced Radiation Worker Training Manual Level 2

Validation Time: 10 min.

Time Critical: NO

==========

Candidate: _____ Time Start: _____
NAME Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

Calculator

READ TO OPERATOR

DIRECTIONS TO STUDENT:

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.

INITIAL CONDITIONS:

- The crew is attempting to place a system in service, but they are unable to remotely open a valve.
- You have been tasked with entering containment and locally opening the valve.
- Health Physics personnel are currently unavailable to provide assistance.
- Two routes are available to the valve:
    - Route 1 consists of two segments.
        - Segment 1 has you walk through a 200mR/hr general field for 2 minutes.
        - Segment 2 has you walk in a 300 mR/hr general field to the valve for 8 minutes
    - Route 2 consists of two segments.
        - Segment 1 has you walk through a 50 mR/hr general field for 4 minutes.
        - Segment 2 has you walk in a 150 mR/hr general field to the valve for 12 minutes
    - The two routes as detailed are to be considered separately and are listed as the round-trip time to and from the manual valve.

INITIATING CUE:

You are to determine which route allows the lowest exposure.

Note: Candidate may perform these steps in a different order however the calculated stay time should be correct.

START TIME: _____

STEP 1: Calculate exposure from using Route 1. STANDARD: Determine dose received from using Route 1. Segment 1 200 mR/hr * 1hr/60 min * 2 min = 6 2/3 mr Segment 2 300 mR/hr * 1hr/60 min * 8 min = 40 mr Total Dose 6 2/3 + 40 = 46 2/3 mr COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 2: Calculate exposure from using Route 2. STANDARD: Determine dose received from using Route 2. Segment 2 50 mR/hr * 1hr/60min * 4 = 3 1/3 mr Segment 2 150 mR/hr * 1hr/60min * 12 min = 30 mr Total Dose 33 1/3 = 33 1/3 mr COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: Determine the lowest exposure path STANDARD: Compared results of calculations and determined that Route 2 to be the lowest exposure. COMMENTS: **END OF TASK**	**CRITICAL STEP** ___ SAT ___ UNSAT

TIME STOP: _____