CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 1SR/ADMIN

Perform a Manual Shutdown Margin Calculation
(Unit at Power)

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 2R/ADMIN

Monitor Reactor Coolant System Leakage
During Loss of OAC

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Monitor Reactor Coolant System Leakage and determine status of leakage during Loss of OAC

Alternate Path:
N/A

Facility JPM #:
NEW

K/A Rating(s):
2.1.23(3.9/4.0)

Task Standard:

Collect data on Reactor Coolant system Leakage and correctly determines that the acceptance criteria of Enclosures 13.5 and **13.7** are not met and notifies SRO.

Preferred Evaluation Location:

Simulator ___X___ In-Plant ___X___

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:
PT/1/A/4600/009 (Loss of Operator Aid Computer) Revision **67**

Validation Time: 7 minutes **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____
_____ / _____
NAME SIGNATURE
DATE

==========

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

PT/1A/4600/009 (Loss of Operator Aid Computer)
Enclosures with first set of data entered

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 in Mode 3. You are the Balance of Plant Operator responding to a Loss of Operator Aid Computer. The Control Room SRO is assigning tasks to complete in PT/1/A/4600/009 (Loss of Operator Aid Computer). The initial set of data has been entered (0830 hrs) into all required enclosures.

INITIATING CUE:

The Control Room SRO directs you to gather the next set of readings (0930 hrs for:

Enclosure 13.4 (Ventilation Unit Condensate Drain Tank Input Rate Determination)
Enclosure 13.5 (Containment Floor and Equipment Sumps Input Rate Determination)
Enclosure 13.6 (1EMF-38 Delta Count Rate Determination)
Enclosure 13.7 (1EMF-39 Delta Count Rate Determination)

Evaluate data obtained from each enclosure to determine if it is acceptable and notify the Control Room SRO of the results.

Start Time:_____

STEP 1: Record second data set for "Unit 1 VUCDT LEVEL" on Enclosure 13.4, VUCDT INLEAKAGE RATE LOG SHEET STANDARD: Contacts either Radwaste Chemistry or sends NLO to Unit 1 VUCDT Level instrument on panel 1ELCC0013 to obtain data. **EXAMINER CUE: WHEN operator dispatched or Radwaste technician is called, report that VUCDT level is reading 14%.** COMMENTS:	___SAT ___UNSAT
STEP 2: Candidate determines that VUCDT level has increased less than 1% since last data collection STANDARD: Based on previous data and current VUCDT level, candidate determines level increase is 0% per hour and criteria is met. COMMENTS:	___SAT ___UNSAT

STEP 3: Enclosure 13.5, Containment Floor and Equipment Sumps Input Rate Determination actions are performed. **EXAMINER CUE: The Containment Floor and Equipment pumps were turned off 90 minutes ago.** STANDARD: Enters time and sump levels. Calculates leak rate per calculation formula on Enclosure 13.5 Page 4 of 4: " A Sump 12.1 inches is 467.6 gallons, (current reading) 9.5 inches is 399.5 gallons, (previous reading) 467.6 – 399.5 = 68.1 gallons per hour "B" Sump 8.7 inches is 369.7 gallons, (current reading) 7.5 inches is 311.9 gallons, (previous reading) 369.7 – 311.9 = 57.8 gallons per hour Total leakage = 68.1+ 57.8 = 125.9 gallons per hour 125.9 gallons/60 minutes = **2.098 gallons per minute** **(With an allowable range of 2.0 to 2.2 gallons per minute)** **EXAMINER CUE: Containment Floor and Equipment Sump "A" reads 12.1 inches and Sump "B" reads 8.7 inches** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
STEP 4: Enclosure 13.5, Containment Floor and Equipment Sumps Input Rate Determination leakage is checked against the criteria. STANDARD: Candidate determines that the leak rate is greater than 1 gpm for the Containment Floor and Equipment Sump and criteria is NOT met. COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT

STEP 5: Enclosure 13.6, 1EMF-38 Delta Count Rate Determination is performed. **EXAMINER CUE: EMF38 Low Range is reading 200 CPM** STANDARD: Candidate records EMF38 **Low** Range radiation count rate at module. Determines delta reading is less than 750 cpm. COMMENTS:	___SAT ___UNSAT
STEP 6: Enclosure 13.7, 1EMF-39 Delta Count Rate Determination is performed. **EXAMINER CUE: EMF39 Low Range is reading 8979 CPM** STANDARD: Candidate records EMF39 Low Range radiation count rate at module. Determines delta reading is greater than 6700 cpm and criteria is NOT met COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
STEP 7: Reports results to SRO. STANDARD: Candidate reports that Containment Floor and Equipment Sump Input Rate and 1EMF-39 Count Rate Change do NOT meet criteria. **EXAMINER CUE: I understand that the Containment Floor and Equipment Sump Input Rate and 1EMF-39 Count Rate change do not meet acceptable criteria.** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
JPM Complete	

TIME STOP: _____

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

INITIAL CONDITIONS:

Unit 1 is in Mode 3. You are the Balance of Plant Operator responding to a Loss of Operator Aid Computer. The Control Room SRO is assigning tasks to complete in PT/1/A/4600/009 (Loss of Operator Aid Computer). The initial set of data has been entered (0830 hrs) into all required enclosures.

INITIATING CUE:

The Control Room SRO directs you to gather the next set of readings (0930 hrs) for:

Enclosure 13.4 (Ventilation Unit Condensate Drain Tank Input Rate Determination)
Enclosure 13.5 (Containment Floor and Equipment Sumps Input Rate Determination)
Enclosure 13.6 (1EMF-38 Delta Count Rate Determination)
Enclosure 13.7 (1EMF-39 Delta Count Rate Determination)

Evaluate data obtained from each enclosure to determine if it is acceptable and notify the Control Room SRO of the results.

ADMIN JPM 2R RO KEY

Enclosure 13.4

PT/1/A/4600/009
Page 1 of 1

Ventilation Unit Condensate Drain Tank Input Rate Determination

Acceptance Criteria - Rate of increase must be < 1%/hour.

NOTE:

1. Either of the following instruments may be used to perform this surveillance, however, the same instrument should be used for the duration of time the procedure is in effect:
   - "UNIT 1 VUCDT LEVEL" on Auxiliary Waste Processing Control Panel (1ELCC0013) (AB-543, MM, 53-54)
   - 1WLP5771 (AB-543, BB-CC, 50) CA Pump Room (Next to VUCDT)
2. If the rate of increase is ≥ 1%/hour, the VUCDT input rate is > 1 gpm. Refer to TS 3.4.13 and TS 3.4.15 and determine if NC System leakage is > 1 gpm.
3. Coordinate with Radwaste Chemistry as required when the VUCDT needs to be pumped down.

VUCDT INLEAKAGE RATE LOG SHEET

Time	Level - %	Rate of Change %/Hour	Leakage Acceptable Initial/Date
0830	14%	-	-
0930	14%	0	INITIALS AND TODAYS DATE

RO KEY

Containment Floor and Equipment Sumps Input Rate Determination

1. Procedure

NOTE: If any containment floor and equipment sump pump starts during the 10 minute test period the test results will **NOT** be valid. The test should be repeated until valid results are obtained. (i.e., no pump start during test period)

NOTE: The Containment Floor and Equipment Sumps may be pumped down as necessary, however, a new initial sump level reading should be recorded after the pumps are returned to the "Manual" position.

1.2 **IF** at any time during the performance of this test the sump level reaches ≥ 15", perfom the following:

1.2.1 Place the following sump pumps in "AUTO":

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

NOTE: A level less than 4" is below the calibration range of the Containment Floor and Equipment Sump level instrumentation, therefore the Leakage Detection Systems must be declared inoperable at sump level less than 4".{PIP 95-0878}

1.2.2 Verify the affected sump level is lowered to 10" as indicated on 1WLP5740 (Cont Floor and Equipment Sump A Level) or 1WLP5750 (Cont Floor and Equipment Sump B Level).

1.2.3 Return the following sump pumps to "Manual" and stopped:

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

RO KEY

1.3 Record initial sump readings on the "Containment Floor and Equipment Sump Inleakage Rate Log Sheet".

1.4 Once per hour, record sump level readings on the "Containment Floor and Equipment Sump Inleakage Rate Log Sheet".

1.5 Calculate the leakage rate using the "Sump Volume vs. Level Indication Table".

1.6 Verify leakage is < 1 gpm

1.7 **IF** the input to the Containment Floor and Equipment Sumps is > 1 gpm, perform the following:

- Refer to TS 3.4.13 and TS 3.4.15.
- Determine if NC System leakage is > 1 gpm.

____ 1.8 **WHEN** the OAC is returned to service, place the following sump pumps in "AUTO":

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

RO KEY

Enclosure 13.5

Containment Floor and Equipment Sumps Input Rate Determination

Containment Floor and Equipment Sump Inleakage Rate Log Sheet

Date Time/Initials	1WLP5740 CFE Sump **A** Level – Inches	1WLP5750 CFE Sump B Level - Inches	Leakage Rate gpm	Leakage Acceptable Initial/Date
TODAY/0830/RHK	9.5	7.5	—	N/A
TODAY/0930/INITIALS	12.1	8.7	2.0 to 2.2	NOT ACCEPTABLE AND MAY BE LEFT BLANK

RO KEY

Enclosure 13.5

Containment Floor and Equipment Sumps
Input Rate Determination

SUMP VOLUME VS. LEVEL INDICATION TABLE

Level Indication	Water Volume		Level Indication	Water Volume		Level Indication	Water Volume
4.0	126.5		9.0	383.2		14.0	510.3
4.1	131.9		9.1	386.5		14.1	512.5
4.2	137.3		9.2	389.7		14.2	514.8
4.3	142.6		9.3	393.0		14.3	517.0
4.4	148.0		9.4	396.2		14.4	519.3
4.5	153.4	→	9.5	399.5		14.5	521.5
4.6	158.8		9.6	402.7		14.6	523.7
4.7	164.2		9.7	406.0		14.7	526.0
4.8	169.5		9.8	409.2		14.8	528.2
4.9	174.9		9.9	412.5		14.9	530.5
5.0	180.3		10.0	415.1		15.0	532.7
5.1	185.6		10.1	417.8		15.1	534.9
5.2	190.8		10.2	420.6		15.2	537.2
5.3	196.1		10.3	423.3		15.3	539.4
5.4	201.3		10.4	426.0		15.4	541.7
5.5	206.6		10.5	428.7		15.5	543.9
5.6	211.8		10.6	431.4		15.6	546.1
5.7	217.1		10.7	434.2		15.7	548.4
5.8	222.3		10.8	436.9		15.8	550.6
5.9	227.6		10.9	439.6		15.9	552.9
6.0	232.8		11.0	442.3		16.0	555.1
6.1	238.1		11.1	444.6		16.1	557.4
6.2	243.3		11.2	446.9		16.2	559.6
6.3	248.6		11.3	449.2		16.3	561.8
6.4	253.8		11.4	451.5		16.4	564.1
6.5	259.1		11.5	453.8		16.5	566.3
6.6	264.4		11.6	456.1		16.6	568.6
6.7	269.6		11.7	458.4		16.7	570.8
6.8	274.9		11.8	460.7		16.8	573.1
6.9	280.1		11.9	463.0		16.9	575.3
7.0	285.4		12.0	465.3		17.0	577.6
7.1	290.7	→	12.1	467.6		17.1	579.8
7.2	296.0		12.2	469.8		17.2	582.0
7.3	301.3		12.3	472.1		17.3	584.3
7.4	306.6		12.4	474.3		17.4	586.5
7.5	311.9		12.5	476.6		17.5	588.8
7.6	317.1		12.6	478.8		17.6	591.0
7.7	322.4		12.7	481.1		17.7	593.3
7.8	327.7		12.8	483.3		17.8	595.5
7.9	333.0		12.9	485.6		17.9	597.8
8.0	338.3		13.0	487.8		18.0	600.0
8.1	342.8		13.1	490.1			
8.2	347.3		13.2	492.3			
8.3	351.8		13.3	494.6			
8.4	356.3		13.4	496.8			
8.5	360.8		13.5	499.1			
8.6	365.2		13.6	501.3			
8.7	369.7		13.7	503.6			
8.8	374.2		13.8	505.8			
8.9	378.7		13.9	508.1			

To calculate the Rate of volume increase in the Sump, perform the following calculation:
(Sump **A** Gals.(T2) - Sump **A** Gals.(T1)) + (Sump B Gals.(T2) - Sump B Gals.(T1))
(Time at T2 - Time at T1)

SEE JPM STEP 3 FOR CALCULATION

NOTE:
1. T1 is the data from the previous reading.
2. T2 is the data from the current reading.

RO KEY

EMF38 Count Rate Log Sheet

Time	Counts/Min	Change in Counts Rate/Hour	Leakage Acceptable Initial/Date
0830	76	-	N/A
0930	200	124	INITIALS AND DATES

NOTE:
1. If the change in count rate per hour is ≥ 750 cpm, refer to TS 3.4.13 and TS 3.4.15 and determine if NC System leakage is > 1 gpm.
2. **A** digital readout of 1EMF-38 may be obtained from recorder 1MICR6640.

RO KEY

Enclosure 13.7

1EMF-39 Delta Count Rate Determination

EMF39 Count Rate Log Sheet			
Time	Counts/Min	Change in Counts Rate/Hour	Leakage Acceptable Initial/Date
0830	450	-	N/A
0930	8979	8529	NOT ACCEPTABLE AND MAY BE LEFT BLANK

Acceptance Criteria - Change in count rate < 6700 cpm per hour

NOTE: If the change in count rate per hour is ≥ 6700 cpm, refer to TS 3.4.13 and TS 3.4.15 and determine if NC System leakage is > 1 gpm.

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Perform a manual shutdown margin calculation (Unit at Power)

Alternate Path:

N/A

Facilitv JPM #:

OP-CN-RT-RB-I21 (Modified)

K/A Rating(s):

2.1.25 (2.8/3.1)

Task Standard:

Determine that adequate shutdown margin exists per Technical Specifications.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator X In-Plant X Perform **X** Simulate _____

References:

OP/0/A/6100/006 Reactivity Balance Calculation Enclosure **4.3** Revision **64**

ROD Book Section **5**

Validation Time: 20 minutes **Time Critical:** No

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

Performance Ratinq: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ /_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures N

OP/0/A/6100/006 Reactivity Balance Calculation Enclosure 4.3
ROD Book Section 5

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 TIONS:

You are the Unit 1 Balance of Plant operator. You have just been informed by the Control Room SRO that the following rods are determined to be untrippable:

- B-4
- c-7

Current Plant Conditions:

Present Thermal Power Best Estimate	97.75%
Present Cycle Burnup	277 EFPD
Present Control Bank Position	215 steps Bank "D"
Present Shutdown Bank Positions	All Banks at 226 Steps
Present Boron Concentration	779 ppm

INITIATING CUE:

Perform a Manual Shutdown Margin Calculation for these untrippable rods per OP/0/A/6100/006 (Reactivity Balance Calculation) and determine if adequate shutdown margin exists.

Start Time:_____

STEP **1:** Performs Section 2.3 and N/A's Section 2.2. STANDARD: Step 2.2 marked N/A. COMMENTS:	___SAT ___UNSAT
STEP 2: Record data required in step 2.3. STANDARD: Operator determines the following using the initial conditions.; Unit: **1** Date/Time: **Present Date/Time** Present Thermal Power, Best Estimate: **97.75%** Present Cycle Burnup: **277 EFPD** Present Control Bank Position: 215 SWD, Control Bank D Number of untrippable RCCA(s): **B4 and C7** COMMENTS:	___SAT ___UNSAT
STEP 3: Determine total available rod worth. STANDARD: Determine total available rod worth to be **4879 pcm** per section 5.7 of R.O.D. Manual. COMMENTS:	___SAT ___UNSAT
STEP 4: Determine there are multiple untrippable RCCA's. STANDARD: N/A steps 2.4.3 and 2.4.4. COMMENTS:	___SAT ___UNSAT

STEP 5: Determine location of highest reactivity worth RCCA and its reactivity worth penalty.. STANDARD: Determines RCCA **C7** Rod worth is **263 pcm** per section **5.8** of the R.O.D. Manual. COMMENTS:	___SAT ___UNSAT
STEP 6: Determine maximum stuck rod worth during cycle. STANDARD: Determines maximum stuck rod worth during cycle is **970 pcm** per section 5.7 of the R.O.D. Manual. COMMENTS:	___SAT ___UNSAT
STEP 7: Calculate total untrippable RCCA reactivity worth penalty. STANDARD: Calculates a penalty: {[2-1] X 970pcm} + 263pcm = **1233** pcm COMMENTS:	___SAT ___UNSAT
STEP 8: Calculate inserted reactivity worth of rods. STANDARD: Determines: Worth of Control Banks HFP, Eq Xenon IRW: **12 pcm** Worth of Shutdown Banks HFP Eq Xenon IRW: **0 pcm** Inserted Worth of Present Position **12 pcm.** COMMENTS:	___SAT ___UNSAT

STEP 9: Calculate available reactivity worth of trippable rods. STANDARD: Determines: Total available rod worth **4879 pcrn** Untrippable RCCA penalty **1233 pcm** Inserted Rod Worth **12 pcm** Available Worth of Trippable RCCA's: **3634 pcm** COMMENTS:	___SAT ___UNSAT
STEP 10: Calculate total misaligned RCCA reactivity worth. STANDARD: Determines: Quantity of Misaligned Rods: **0 pcm** Maximum Dropped or Misaligned Rod Worth: **200 pcm** Total Misaligned RCCA Worth: **0 pcm** COMMENTS:	
EXAMINER NOTE: JPM Step 11A (procedure step 2.5) finalizes the SDM calculation. If the candidates choose not to interpolate they must use the Highest Total Power Defect for plant conditions on table 5.9. 1882 pcm is the only value allowed for step 2.5 C.	
STEP 11A: Calculate SDM for present conditions. (step 2.5) STANDARD: Determines: A. Available Worth of trippable RCA's: **3634 pcm** **B.** Total Misaligned RCCA Worth: **0 pcrn** C. Total Power Defect **(without Interpolation)** **1882 pcrn** D. Transient Flux Redistribution Allowance: **340 pcrn** Present SDM: **1412 pcrn** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT

EXAMINER NOTE: JPM Step 11B (procedure step 2.5) finalizes the SDM calculation. If the candidates choose to interpolate, the Total Power Defect for plant conditions on table 5.9 is 1829.1 pcm with an allowed range of 1810 to 1850 pcm in step 2.5 C.	
STEP 11B: Calculate SDM for present conditions. (step **2.5**) STANDARD: Determines: A. Available Worth of trippable RCA's: **3634 pcm** B. Total Misaligned RCCA Worth: **0 pcrn** C. Total Power Defect **(with Interpolation)** **1810-1850 pcrn** D. Transient Flux Redistribution Allowance: **340 pcrn** Present SDM: (allowable final value) **1484 - 1444 pcrn** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
STEP **12:** Ensure Present SDM equal to greater than 1300 PCM. STANDARD: Determines present SDM is greater than **1300** pcm. COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT

TIME STOP: _____

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

INITIAL CONDITIONS:

You are the Unit 1 Balance of Plant operator. You have just been informed by the Control Room SRO that the following rods are determined to be untrippable:

- B-4
- C-7

Present Thermal Power Best Estimate	97.75%
Present Cycle Burnup	277 EFPD
Present Control Bank Position	215 steps Bank "D"
Present Shutdown Bank Positions	**All** Banks at 226 Steps
Present Boron Concentration	779 ppm

INITIATING CUE:

Perform a Manual Shutdown Margin Calculation for these untrippable rods per OP/0/A/6100/006 (Reactivity Balance Calculation) and determine if adequate shutdown margin exists.

ADMIN JPM 1SR

Key RO & SRO

Enclosure 4.3

Shutdown Margin - Untrippable RCCA(S) - Modes 1 & 2

1. Initial Conditions

1.1 Limits and Precautions have been reviewed.

2. Procedure

2.1 **IF** performing a MANUAL calculation, N/A Step 2.2.

N/A 2.2 Perform the following steps if using the REACT program to complete the calculation:

2.2.1 Access Reactivity Balance Program per Enclosure 4.7.

2.2.2 Select "View" then "Reactivity Balance Calculations" on toolbar.

2.2.3 Select "SDM – Mode 1 or 2" tab in Reactivity Balance Calculations window.

NOTE:
1. Sign must be provided with Difference from Equilibrium Samarium [i.e., ( ) ___ pcm].
2. "Quantity of Misaligned Rods" refers to rods that are misaligned but remain OPERABLE (trippable). Only the total number of rods is required.
3. Input inoperable (untrippable) control rods by clicking "Select Inoperable Rods" and input any inserted shutdown banks using "Shutdown Banks Inserted" tab.

2.2.4 Enter appropriate values as prompted.

2.2.5 Click Calculate, print program results, label appropriately, and attach to this enclosure.

2.2.6 Ensure Effective Shutdown Margin for Present Position is greater than Required Shutdown Margin.

2.2.7 Ensure that a separate, independent calculation has been performed per steps 2.2.1 through 2.2.6.

2.2.8 Verify that both attachments to this enclosure yield the same results.

2.2.9 N/A the rest of this enclosure (steps 2.3 through 2.7)

Performed By: _____ Date/Time: ____/____

Verified By: _____ Date/Time: ____/____

NOTE: 1. In Modes 1 or 2 with all RCCA's trippable, shutdown margin is satisfied provided control banks are positioned above the Control Rod Insertion limits in Section 2.2 of the R.O.D. manual.

2. Assume all values are positive unless otherwise indicated by parentheses. **IF** parentheses precede the value [i.e. ( )_____ pcm], record the sign provided with data. The calculations account for these sign conventions.

2.3

Step	Description	Reference	Value
2.3.1	Unit	N/A	1
2.3.2	Date/Time	N/A	Present
2.3.3	Present Thermal Power, Best Estimate	P1385	97.75 %
2.3.4	Present cycle burnup	P1457 or Reactor Group Duty Engineer	2.77 EFPD
2.3.5	Present control bank position	N/A	215 SWD on Control Bank D
2.3.6	Present shutdown bank position	N/A	A 226 B 226 C 226 D 226 E 226
2.3.7	Quantity of misaligned rods	N/A	0
2.3.8	Number of untrippable RCCA(s)	N/A	2
2.3.9	Untrippable RCCA(s) core location(s).	N/A	B4, C7

2.4 Determine available reactivity worth of trippable RCCA's for present conditions:

2.4.1 Determine Total Available Rod Worth (Section 5.7 of R.O.D. manual) 4879 pcm

2.4.2 **IF** there are multiple untrippable RCCA's. N/A steps 2.4.3 and 2.4.4

N/A 2.4.3 Determine reactivity worth penalty for untrippable RCCA core location of Step 2.3.9 (Section 5.8 of R.O.D. manual). _____ pcm

N/A 2.4.4 N/A steps 2.4.5 through 2.4.8.

2.4.5 Determine untrippable RCCA of Step 2.3.9 with the highest reactivity worth penalty (Section 5.8 of ROD Manual). Core Location C7

2.4.6 Record reactivity worth of the untrippable RCCA of Step 2.4.5 (Section 5.8 of ROD Manual). 263 pcm

2.4.7 Determine maximum stuck rod worth during cycle (Section 5.7 of the R.O.D. manual). 970 pcm

2.4.8 Calculate total untrippable RCCA reactivity worth penalty below:

Description	Reference	Value
A. Number of Untrippable RCCA's	Step 2.3.8	2 pcm
B. Max Stuck Rod	Step **2.4.7**	970 pcm
C. Highest Worth Penalty	Step 2.4.6	263 pcm
Total untrippable RCCA **Worth**	**{ [(A) - 1] X**	1233 **pcm**

2.4.9 _____

NOTE: Interpolation is not required in step 2.4.10. Reactivity worth may be determined by choosing the highest reactivity worth from Section 5.6 of the R.O.D Manual associated with rod positions that bound the present rod position.

Description	Reference	Value
A. HFP, Eq Xenon IRW for current control bank position	Step 2.3.5	12 pcm
B. HFP, **Eq** Xenon IRW for current shutdown bank positions	Step 2.3.6	A 0 pcm B 0 pcm C 0 pcm D 0 pcm E 0 pcm
Inserted Worth of Present Position	**Sum of above**	12 **pcm**

A. Total Available Rod Worth	Step 2.4.1	4979 pcm
B. Untrippable RCCA's Penalty	Step 2.4.9	1233 pcm
C. Inserted Worth of Present Position	Step 2.4.10	12 pcm
Available Worth of Trippable RCCA's	(A) - (B) - (C)	3634 **pcm**

2.4.12 Calculate total misaligned RCCA reactivity worth below:

Description	Reference	Value
A. Quantity of Misaligned Rods	Step 2.3.7	0
B. Maximum Dropped or Misaligned Rod Worth	ROD Manual Section 5.7	200 pcm
Total misaligned RCCA Worth	**A*B**	0 **pcm**

NOTE: Interpolation of Power Defect is not required for step 2.5. Bounding burnups and power levels may be used to select the highest Power Defect from section 5.9 of the R.O.D. manual.

CAUTION: SDM shall be within the limits specified by the COLR per Tech Spec 3.1.1.

Description	Reference	Value
A. Available worth of Trippable RCCA's	Step 2.4.11	3634 pcm
B. Total misaligned RCCA Worth	Step **2.4.12**	0 pcm
C. Total Power Defect at present thermal power (Step **2.3.3**)and cycle burnup (Step **2.3.4**)	Section 5.9 of R.O.D.manual	1882 pcm
D. Transient **Flux** Redistribution Allowance	Section 5.7 of R.O.D. manual	340
Present SDM	**(A) - (B) - (C) - (D)**	(+) 1412 **pcm**

NO* INTERPOLATION

2.6 Ensure Present SDM is ≥ 1300 pcm. (TS 3.1.1 via COLR)

NOTE: Separate, independent calculation must be performed by the verifier.

2.7 Sign the appropriate space below. N/A the unsigned space.

Performed By: _____ Date/Time: _____/_____

Verified By: _____ Date/Time: _____/_____

2.4.12 Calculate total misaligned RCCA reactivity worth below:

Description	Reference	Value
A. Quantity of Misaligned Rods	Step 2.3.7	0
B. Maximum Dropped or Misaligned Rod Worth	ROD Manual Section 5.7	200 pcm
Total misaligned RCCA Worth	**A*B**	0 **pcm**

NOTE: Interpolation of Power Defect is not required for step 2.5. Bounding burnups and power levels may be used to select the highest Power Defect from section 5.9 of the R.O.D. manual.

CAUTION: SDM shall be within the limits specified by the COLR per Tech Spec 3.1.1.

Description	Reference	Value
A. Available worth of Trippable RCCA's	Step **2.4.11**	3634 pcm
B. Total misaligned RCCA Worth	Step **2.4.12**	0 pcm
C. Total Power Defect at present thermal power (Step **2.3.3)** and cycle burnup (Step **2.3.4)**	Section 5.9 of R.O.D. manual	1810 TO 1850 pcm
D. Transient Flux Redistribution Allowance	Section 5.7 of R.O.D. manual	340
Present SDM	(A) - (B) - (C) - (D)	( ) 1484-1444 **pcm**

USING * INTERPOLATION

2.6 Ensure Present SDM is ≥ 1300 pcm. (TS 3.1.1 via COLR)

NOTE: Separate, independent calculation must be performed by the verifier.

2.7 **Sign** the appropriate space below. N/A the unsigned space,

Performed By: _____ Date/Time: ____/____

Verified By: _____ Date/Time: ____/____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 2S/ADMIN

Evaluate Reactor Coolant System Leakage
And Determine Tech Spec actions
During Loss of OAC

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Evaluate reactor coolant system leakage and determine Tech Spec actions during loss of OAC.

Alternate Path:

N/A

Facility JPM #:

NEW

K/A Rating(s):

2.1.33 (3.4/4.0)

Task Standard:

Evaluate data collected on reactor coolant system leakage and correctly determines that leakage exceeds 1 GPM UNIDENTIFIED per T.S. 3.4.13.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator ___X_ In-Plant __X___ Perform __**X**___ Simulate _____

References:
PT/1A/4600/009 (Loss of Operator Aid Computer) Revision 67
CNS Tech Specs 3.4.13 and 3.4.15

Validation Time: 10 minutes **Time Critical:** No

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ /_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

Equipment/. rocedures Needed

PT/1A/4600/009 (Loss of Operator Aid Computer)
CNS Tech Specs 3.4.13 and 3.4.15
Completed Enclosures with the first set of readings.

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 in Mode 3 and a loss of OAC has occurred. You are the Control Room SRO supervising the actions contained in PT/1/A/4600/009 (Loss of Operator Aid Computer).

The BOP has completed the initial data entries (0830 hrs) for:

Enclosure 13.4 (Ventilation Unit Condensate Drain Tank Input Rate Determination)
Enclosure 13.5 (Containment Floor and Equipment Sumps Input Rate Determination)
Enclosure 13.6 (1EMF-38 Delta Count Rate Determination)
Enclosure 13.7 (1EMF-39 Delta Count Rate Determination)

Data from previously performed NC Leakage Calculation:

- Identified leakage = 0.2 gpm
- Unidentified leakage = 0.1 gpm

INITIATING CUE:

You are directed to gather the next set of readings (0930 hrs), evaluate the data collected in Enclosures 13.4 through Enclosure 13.7, and determine the applicable Technical Specification actions (if any).

Start Time:_____

STEP 1: Record second data set for "Unit 1 VUCDT LEVEL on Enclosure 13.4, VUCDT INLEAKAGE RATE LOG SHEET STANDARD: Contacts either Radwaste Chemistry or sends NLO to Unit 1 VUCDT Level instrument on panel 1ELCC0013 to obtain data. **EXAMINER CUE: WHEN operator dispatched or Radwaste technician is called, report that VUCDT level is reading 14%.** COMMENTS:	___SAT ___UNSAT
STEP 2: Candidate determines that VUCDT level has increased less than 1% since last data collection STANDARD: Based on previous data and current VUCDT level, candidate determines level increase is 0% per hour and criteria is met. COMMENTS:	___SAT ___UNSAT

STEP 3: Enclosure 13.5 Containment Floor and Equipment Sumps Input Rate Determination actions are performed. **EXAMINER CUE:** The Containment Floor and Equipment pumps were turned off 90 minutes ago. STANDARD: Enters time and sump levels. Calculates leak rate per calculation formula on Enclosure 13.5 Page 4 of 4: "A Sump 10.9 inches is 439.6 gallons, (current reading) 8.5 inches is 360.8 gallons, (previous reading) 439.6 – 360.8 = 78.8 gallons per hour "B" Sump 7.7 inches is 322.4 gallons, (current reading) 7.2 inches is 296.0 gallons, (previous reading) 322.4 – 296.0 = 26.4 gallons per hour Total leakage = 78.8 + 26.4 = 105.2 gallons per hour 105.2 gallons/60 minutes = **1.753 gallons per minute** **(With an allowable range of 1.7 to 1.8 gallons per minute.)** **EXAMINER CUE: Containment Floor and Equipment Sump "A" reads 10.9 inches and Sump "B" reads 7.7 inches** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT

STEP **4:** Enclosure 13.5, Containment Floor and Equipment Sumps Input Rate Determination leakage is checked against the criteria. STANDARD: Candidate determines that the leak rate is greater than 1 gpm for the Containment Floor and Equipment Sump and criteria is NOT met. **EXAMINER NOTE: Candidate may complete remaining enclosures before determining if Tech Spec 3.4.13 and 3.4.15, Limiting Conditions for Operation, are met.** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
STEP *5:* Candidate reads 1EMF-38 counts from Control Boards and completes appropriate entries on enclosure 13.6. STANDARD: Candidate enters time, countrate, calculates change in the last hour to be 200 cpm, and determines leakage is acceptable. **EXAMINER CUE: IEMF-38 is currently reading 276 cpm.** COMMENTS:	___SAT ___UNSAT
STEP 6: Candidate reads 1EMF-39 counts from Control Boards and completes appropriate entries on enclosure 13.7. STANDARD: Candidate enters time, countrate, calculates change in the last hour to be 1201 cpm, and determines leakage is acceptable. **EXAMINER CUE: 1EMF-39 is currently reading 1677 cpm.** COMMENTS:	___SAT ___UNSAT

STEP 7: Refer to Technical Specifications 3.4.13 and 3.4.15 and determine if NC System Leakage is >1gpm. STANDARD: Based on an allowable range of 1.7 to 1.8 gallons per minute calculated and T.S. 3.4.13 bases, the Containment Sump Level increases are considered Unidentified Leakage and Unit 1 enters Action A, Reduce Leakage in 4 hours. **EXAMINER NOTE: The initial previously known values of Unidentified Leakage would be added to this total but are not needed here to perform this step SAT.** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
JPM Complete	

TIME STOP: _____

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

INITIAL ONDITIONS:

Unit 1 is in Mode 3 and a loss of OAC has occurred. You are the Control Room SRO supervising the actions contained in PT/1/A/4600/009 (Loss of Operator Aid Computer).

The BOP has completed the initial data entries (0830 hrs) for:

Enclosure 13.4 (Ventilation Unit Condensate Drain Tank Input Rate Determination)
Enclosure 13.5 (Containment Floor and Equipment Sumps Input Rate Determination)
Enclosure 13.6 (1EMF-38 Delta Count Rate Determination)
Enclosure 13.7 (1EMF-39 Delta Count Rate Determination)

Data from previously performed NC Leakage Calculation:

- Identified leakage = 0.2 gpm
- Unidentified leakage = 0.1 gpm

INITIATING CUE:

You are directed to gather the next set of readings (0930 hrs), evaluate the data collected in Enclosures 13.4 through Enclosure 13.7, and determine the applicable Technical Specification actions (if any).

ADMIN JPM 2S SRO KEY

Enclosure 13.4

Ventilation Unit Condensate Drain Tank Input Rate Determination

Acceptance Criteria - Rate of increase must be < 1%/hour.

NOTE:
1. Either of the following instruments may be used to perform this surveillance, however, the same instrument should be used for the duration of time the procedure is in effect:
   - "UNIT 1 VUCDT LEVEL" on Auxiliary Waste Processing Control Panel (1ELCCOO13) (AB-543, MM, 53-54) .
   - 1WLP5771 (AB-543, BB-CC, 50) CA Pump Room [Next to VUCDT)
2. If the rate of increase is ≥ 1%/hour, the VUCDT input rate is > 1 gpm. Refer to TS 3.4.13 and TS 3.4.15 and determine if NC System leakage is > 1 gpm.
3. Coordinate with Radwaste Chemistry as required when the VUCDT needs to be pumped down.

VUCDT INLEAKAGE RATE LOG SHEET

Gauge Used: "UNIT 1 VUCDT LEVEL"

Time	Level - %	Rate of Change %/Hour	Leakage Acceptable Initial/Date
0830	4	-	N/A
0930	4	0	INTIAL/TODAYS DATE

SRO KEY

Containment Floor and Equipment Sumps Input Rate Determination

1. Procedure

NOTE: If any containment floor and equipment sump pump starts during the 10 minute test period the test results will **NOT** be valid. The test should be repeated until valid results are obtained. (i.e. no pump start during test period)

1.1 Stop the following sump pumps and place in "Manual":

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

NOTE: The Containment Floor and Equipment Sumps may be pumped down as necessary, however, a new initial sump level reading should be recorded after the pumps are returned to the "Manual" position.

1.2 **IF** at any time during the performance of this test the sump level reaches ≥ 15". perform the following:

1.2.1 Place the following sump pumps in "AUTO":

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

NOTE: A level less than 4" is below the calibration range of the Containment Floor and Equipment Sump level instrumentation, therefore the Leakage Detection Systems must be declared inoperable at sump level less than 4". {PIP 95-0878}

1.2.2 Verify the affected sump level is lowered to 10" as indicated on 1WLP5740 (Cont Floor and Equipment Sump A Level) or 1WLP5750 (Cont Floor and Equipment Sump B Level).

1.2.3 Return the following sump pumps to "Manual" and stopped:

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

SRO KEY

1.3 Record initial sump readings on the "Containment Floor and Equipment Sump Inleakage Rate Log Sheet".

1.4 Once per hour, record sump level readings on the "Containment Floor and Equipment Sump Inleakage Rate Log Sheet".

1.5 Calculate the leakage rate using the "Sump Volume vs. Level Indication Table"

1.6 Verify leakage is < 1 gpm.

1.7 IF the input to the Containment Floor and Equipment Sumps is > 1 gpm. perfom the following:

- Refer to TS 3.4.13 and TS 3.4.15.
- Determine if NC System leakage is > 1 gpm.

_____ 1.8 **WHEN** the **OAC** is returned to service, place the following sump pumps in **"AUTO":**

- "Pump 1A1 Cont Floor & Equip Sump"
- "Pump 1A2 Cont Floor & Equip Sump"
- "Pump 1B1 Cont Floor & Equip Sump"
- "Pump 1B2 Cont Floor & Equip Sump"

SRO KEY

Enclosure 13.5

Containment Floor and Equipment Sumps Input Rate Determination

Containment Floor and Equipment Sump Inleakage Rate Log Sheet				
Date Time/Initials	1WLP5740 CFE Sump A Level – Inches	1WLP5750 CFE Sump B Level - Inches	Leakage Rate gpm	Leakage Acceptable Initial/Date
TODAY/0830/RR	8.5	7.2	–	N/A
TODAY/0930/IN	10.9	7.7	1.7 to 1.8	Not acceptable,
				candidate may leave
				blank.

SRO KEY

Enclosure 13.5

Containment Floor and Equipment Sumps
Input Rate Determination

SUMP VOLUME VS. LEVEL INDICATION TABLE

Level Indication	Water Volume		Level Indication	Water Volume		Level Indication	Water Volume
4.0	126.5		9.0	383.2		14.0	510.3
4.1	131.9		9.1	386.5		14.1	512.5
4.2	137.3		9.2	389.7		14.2	514.8
4.3	142.6		9.3	393.0		14.3	517.0
4.4	148.0		9.4	396.2		14.4	519.3
4.5	153.4		9.5	399.5		14.5	521.5
4.6	158.8		9.6	402.7		14.6	523.7
4.7	164.2		9.7	406.0		14.7	526.0
4.8	169.5		9.8	409.2		14.8	528.2
4.9	174.9		9.9	412.5		14.9	530.5
5.0	180.3		10.0	415.1		15.0	532.7
5.1	185.6		10.1	417.8		15.1	534.9
5.2	190.8		10.2	420.6		15.2	537.2
5.3	196.1		10.3	423.3		15.3	539.4
5.4	201.3		10.4	426.0		15.4	541.7
5.5	206.6		10.5	428.7		15.5	543.9
5.6	211.8		10.6	431.4		15.6	546.1
5.7	217.1		10.7	434.2		15.7	548.4
5.8	222.3		10.8	436.9		15.8	550.6
5.9	227.6	→	10.9	439.6		15.9	552.9
6.0	232.8		11.0	442.3		16.0	555.1
6.1	238.1		11.1	444.6		16.1	557.4
6.2	243.3		11.2	446.9		16.2	559.6
6.3	248.6		11.3	449.2		16.3	561.8
6.4	253.8		11.4	451.5		16.4	564.1
6.5	259.1		11.5	453.8		16.5	566.3
6.6	264.4		11.6	456.1		16.6	568.6
6.7	269.6		11.7	458.4		16.7	570.8
6.8	274.9		11.8	460.7		16.8	573.1
6.9	280.1		11.9	463.0		16.9	575.3
7.0	285.4		12.0	465.3		17.0	577.6
7.1	290.7		12.1	467.6		17.1	579.8
→ 7.2	296.0		12.2	469.8		17.2	582.0
7.3	301.3		12.3	472.1		17.3	584.3
7.4	306.6		12.4	474.3		17.4	586.5
7.5	311.9		12.5	476.6		17.5	588.8
7.6	317.1		12.6	478.8		17.6	591.0
→ 7.7	322.4		12.7	481.1		17.7	593.3
7.8	327.7		12.8	483.3		17.8	595.5
7.9	333.0		12.9	485.6		17.9	597.8
8.0	338.3		13.0	487.8		18.0	600.0
8.1	342.8		13.1	490.1			
8.2	347.3		13.2	492.3			
8.3	351.8		13.3	494.6			
8.4	356.3		13.4	496.8			
→ 8.5	360.8		13.5	499.1			
8.6	365.2		13.6	501.3			
8.7	369.7		13.7	503.6			
8.8	374.2		13.8	505.8			
8.9	378.7		13.9	508.1			

To calculate the Rate of volume increase in the Sump, perform the following calculation:

$$\frac{(\text{Sump A Gals.(T2)} - \text{Sumo A Gals.(T1)}) + (\text{Sumo B Gals.(T2)} - \text{Sump B Gals.(T1)})}{(\text{Time at T2} - \text{Time at T1})}$$

See calculation in JPM step 3

NOTE:
1. TI is the data from the previous reading.
2. T2 is the data from the current reading.

SRO KEY

Enclosure **13.6**

PTI 1/A/4600/009

1EMF-38 Delta Count Rate Determination

Time	Counts/Min	Change in Counts Rate/Hour	Leakage Acceptable Initial/Date
0830	76	-	N/A
0930	276	200	INITIALS AND TODAYS DATE

Acceptance Criteria - Change in count rate < 750 cpm per hour

NOTE: 1. If the change in count rate per hour is ≥ 750 cpm, refer to TS 3.4.13 and TS 3.4.15 and determine if NC System leakage is > 1 gpm.

2. **A** digital readout of 1EMF-38 may be obtained from recorder 1MICR6640.

SRO KEY

Enclosure 13.7

I EMF-39 Delta Count Rate Determination

EMF39 Count Rate Log Sheet			
Time	Counts/Min	Change in Counts Rate/Hour	Leakage Acceptable Initial/Date
0830	476	-	N/A
0930	1677	1201	INITIALS AND TODAYS DATE

Acceptance Criteria - Change in count rate < 6700 cpm per hour

NOTE: If the change in count rate per hour is ≥ 6700 cpm, refer to TS 3.4.13 and TS 3.4.15 and determine if NC System leakage is > 1 gpm.

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 3S/ADMIN

Perform a Review of a R&R Procedure

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Perform a review of a R&R procedure.

Alternate Path:

N/A

Facility JPM #:

N/A)

K/A Rating(s):

GKA2.2.13 (3.613.8)

Task Standard:

The R&R is reviewed for technical correctness and determines the vent path requires one an additional valve to be tagged open: 1KF-9 or 1KF-11, or 1KF-13. The candidate also discovers the "wrong unit" tag for the pump breaker.

Preferred Evaluation Location:

Simulator ____ In-Plant __X__

Preferred Evaluation Method:

Perform __**X**__ Simulate _____

References:

OMP 2-18 (Tagout Removal and Restoration Procedure) Revision 62
CN-1570-1.0 (Flow Diagram of the KF System) Revision 19

Validation Time: 8 min **Time Critical:** No

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

Simulator Setup

N/A.

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 operating at 100% power.
1A KF Pump indicated no flow with the pump running and has been removed from service.
1B KF pump has been placed in service.
The Safety Tagging Computer program is not available.
An NLO has manually generated a tag out of the 1A KF pump for maintenance to investigate.

INITIATING CUE:

You are directed to review the R&R that will be used to tag out the 1A KF pump.

EXAMINER NOTE: Provide student with a copy of flow diagram CN-1570-1.0.	
STEP **1:** Verify all required blanks in the top two sections on page 1 of the Removal Enclosure are completed. (Down to Pre-Execution Sign Off Block). STANDARD: Department, Page Number, Tagout ID, Enclosure Type, Date, Unit, Isolation Tagged, Reason, Prepared By, Date and Time prepared are entered. COMMENTS:	___SAT ___UNSAT
STEP 2: Verify all tag information blocks are completed as follows: STANDARD: Verifies the following information on pages 2 and 3 of the Removal Enclosure. • Sequence Number and Tag ID. • Equipment tag, Equipment Description and Location. • Position and Label. **EXAMINER NOTE: It is not necessary for the candidate to review the Enclosure Summary Report in the Removal Enclosure in order to properly complete the review of the Removal.** COMMENTS:	___SAT ___UNSAT

STEP 3: Component verified to be completely isolated and that all components are tagged in the proper position STANDARD: The pump is verified to be completely isolated. The candidate recognizes that the motor breaker for the 2A KF Pump is to be racked out and tagged and corrects the Removal Enclosure to rackout and tag 1A KF Pump motor breaker. EXAMINER CUE: After the candidate identifies an error on the Removal Enclosure, instruct him to correct the error on the Removal Enclosure and any other errors that may be present. When complete with his review, the Removal Enclosure will be returned to the preparer so that a new Removal Enclosure can be made. COMMENTS:	CRITICAL STEP ___SAT ___UNSAT
STEP **4:** Verify proper sequence. STANDARD: Candidate determines that the isolation sequence is incorrect and should be re-ordered as follows • Discharge Isolation valve closed • Suction Isolation Valve closed EXAMINER NOTE: The items that are out of sequence are for the suction and discharge valves. COMMENTS:	___SAT ___UNSAT

STEP 5: Verifies technical accuracy. STANDARD: Candidate determines from flow diagram CN-1570-10 that the drain path from 1KF-121 does not have a complete vent path from 1KF-IO. For these two valves an additional flow path must be tagged open using any one of the following valves: • 1KF-9 • 1KF-11 • 1KF-13 **EXAMINER NOTE: Any one of these valves will create a vent path for the two valves listed on the tag sheet.** COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
STEP 6: Return the Removal Enclosure to the NLO to make identified corrections. STANDARD: N/A **EXAMINER CUE: NLO will take the Removal Enclosure and make required corrections.** COMMENTS:	___SAT ___UNSAT

TIME STOP: _____

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

INITIAL CONDITIONS:

Unit 1 is operating at 100% power.
I A KF Pump indicated no flow with the pump running and has been removed from service.
1B KF pump has been placed in service.
The Safety Tagging Computer program is not available.
An NLO has manually generated a tag out of the 1A KF pump for maintenance to investigate.

INITIATING CUE:

You are directed to review the **R&R** that will be used to tag out the 1A KF pump.

ADMIN JPM 3S SRO KEY

Attachment 9.1

Removal/Removal Addendudpartial Restoration/Restoration Enclosures

Catawba Nuclear Station	Dept: OPS	Page 1 of 3	Tagout ID: 03-M007
Enclosure Type: REMOVAL		Date: APRIL 14, 2003	
		Unit: 1	BTO:

Isolation Tagged:	KF - SPENT FUEL COOLING SYSTEM
Reason:	INSPECT KF PUMP
Remarks:	

Modification:

Cross Disciplinary Rev By:	at: 4/14/03 0930	Approved By:	at:

Pre-execution Signoffs:

Technical Specifications / SLC	Unit 1	Unit 2
Orarn Sentinel Evaluation By:		
Fire Impairment By:		
SSF Degrade:		
Containment Operability Evaluation By:		
Control Room Logs Updated by:	Unit 1	Unit 2
1.47 Panel Reviewed By:	Unit 1	Unit 2
OAC Points Removed/Restored To/From Service By:	Unit 1	Unit 2

SRO KEY

Attachment 9.1
Removal/Removal Addendum/Partial Restoration/Restoration Enclosures

Catawba Nuclear Station	**Dept:** OPS	Page 2 of 3	**Tagout ID:** 0-03-M007
Enclosure Type REMOVAL	**Date:** APRIL 14, 2003		
	Unit : 1		**BTO:**

Enclosure Execution Start Date/Time: _____

Seq#:	Equip Tag:	Position:	Placed By:
1	1ETA-15	RACKED OUT	
lag ID:	Equipment Description:	As found:	LBL:
1	FUEL POOL COOLING PUMP MOTOR 1A		
	Location: AUX BLDG ELEV 577+00 COLAA-49		IV By:

Seq#:	Equip Tag:	Position.	Placed By:
3 2	1KF-2	CLOSED	
lag ID:	Equipment Description:	As found:	LBL
2	1A KF PUMP SUCTION ISOL		
	Location: AUX418 E581+00 QQ52		IV By
Special info:			

Seq#:	Equip Tag:	Position:	Placed By:
2 3	1KF-4	CLOSED	
Tag ID:	Equipment Description:	As found:	LBL:
3	KF PUMP 1A DISCH ISOL		
	Location: AUX418 E588+00 QQ52		IV By
Special info:			

Seq#:	Equip Tag:	Position	Placed By
4	1KF-12-1	OPEN	
Tag ID	Equipment Description	As found	LBL
4	1A KF PUMP DRAIN		
	Location AUX418 E581+00 QQ51		IV By

Enclosure Execution Completion Date/Time: _____

1

SRO KEY

Attachment 9.1
Removal/Removal Addendudpartial Restoration/Restoration Enclosures

Catawba Nuclear Station | Dept: OPS	Page 3 of 3	Tagout ID: 0-03-MOOT
Enclosure Type: REMOVAL	Date: APRIL 14, 2003	
	Unit: 1	BTO:

Enclosure Execution Start Date/Time: _____

Seq#: 5	Equip Tag: 1KF-10	Position: OPEN	Placed By:
Tag ID: 5	Equipment Description: 1A KF PUMP VENT TO WEFT	As found:	LBL:

Seq#:	Equip Tag:	Position:	Placed By:
Tag ID:	Equipment Description:	As found:	LBL:
	Location:		IV By:

*

Seq#:	Equip Tag:	Position:	Placed By:
Tag ID:	Equipment Description:	As found:	LBL:
	Location:		IV By:

Special info:

Seq#:	Equip Tag:	Position:	Placed By:
Tag ID:	Equipment Description:	As found:	LBL:
	Location:		IV By:

Special info:

Enclosure Execution Completion Date/Time: _____

* CANDIDATE NOTES A REQUIRED ADDITIONAL VALVE, SEE JPM STEP 5

SRO KEY

Attachment 9.1
Removal/Removal Addendudpartial Restoration/Restoration Enclosures

Enclosure Summary Report

Applicable Work Orders:	98147961-01

Affected Procedures:	OP/1/A/6200/005 SPENT FUEL COOLING SYSTEM REV #70

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 3R/ADMIN

Classify Emergency Diesel Generator Start and Make Required Log Entries

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Classify Emergency Diesel Generator Start and Make Required Log Entries

Alternate Path:

NIA

Facility JPM #:

NEW

K/A Rating(s):

2.2.12 (3.0/3.4)

Task Standard:

Correct classification of Emergency Diesel Generator is determined as an INVALID FAILURE and OMP 2-28 Attachment 10.1 is filled out down the point where it is ready to be reviewed by the CRSRO.

Preferred Evaluation Location:

Simulator __X__ In-Plant __X__

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

Operations Management Procedures 2-28, Diesel Generator Logbook Revision 24

Validation Time: 10 minutes **Time Critical:** No

==========

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

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE **DATE**

==========

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

OMP2-28
Completed Attachment 10.2 showing last diesel run and total run hours for 2003.

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 2 is in Mode 1. You are an extra operator on shift and assisting the Operation Test Group in a scheduled surveillance test of the 2B Emergency Diesel Generator. The test will be conducted using procedure PT/2/A/4350/002B, DIG Operability Test.

INITIATING CUE:

The history of what occurred during the 2B diesel operability is as follows:

- The test was performed as a Turbo Prelube and Manual key start.
- Speed, frequency, and voltage reached their required values in 7.3 seconds.
- Diesel Generator ran loaded to 3600 KW from 0830 to 0915 then tripped on "High Jacket Water Temperature"
- IAE Technicians determined that the trip was spurious since the highest recorded water temperature only reached 178 °F.

Classify the test and complete a Diesel Generator Logbook entry for this test and submit to the CRSRO for review.

Start Time:

EXAMINER CUE: Provide a copy of OMP 2-28 and a completed copy of Attachment 10.2 showing the last logbook entry for 2B Diesel Generator.	
STEP 1: Candidate enters diesel generator on Attachment 10.1 STANDARD: Candidate enters Diesel Generator: 2B COMMENTS:	___SAT ___UNSAT
STEP 2: Candidate enters his/her name as Recorded By on Attachment 10.1 STANDARD: Candidate enters Recorder by: Candidate performing test COMMENTS:	___SAT ___UNSAT
STEP 3: Candidate enters START ATTEMPT NUMBER on Attachment 10.1 STANDARD: Candidate enters next start attempt number based on last entry of Attachment 10.2. Enters 2003-16 COMMENTS:	___SAT ___UNSAT

STEP **4:** Candidate enters DATE onto Attachment 10.1. STANDARD: Candidate enters TODAY'S DATE **on** Attachment 10.1. COMMENTS:	___SAT ___UNSAT
STEP 5: Candidate enters PROCEDURE USED onto Attachment 10.I . STANDARD: Candidate checks PT/1(2)/4350/002A(B) based on initial cue on Attachment 10.1. COMMENTS:	___SAT ___UNSAT
STEP 6: Candidate enters REASON FOR D/G OPERATION onto Attachment 10.1. STANDARD: Candidate checks SCHEDULED SURVIELLANCE per the initial cue on Attachment 10.1. COMMENTS:	___SAT ___UNSAT
STEP 7: Candidate enters TYPE OF START onto Attachment 10.1. STANDARD: Candidate checks TURBO PRELUBE from the initial cue on Attachment 10.1. COMMENTS:	___SAT ___UNSAT

STEP 8: Candidate refers to OMP 2-28 Section 6 and determines the TEST CLASSIFICATION and checked that block on Attachment 10.1. STANDARD: Candidate determines the following and checks the appropriate block for: • It is NOT a Valid SUCCESS due to NOT meeting criteria 6.1 C • It **is** NOT a INVALID TEST due to NOT meeting criteria 6.1 A,B, or C • *It IS an **INVALID FAILURE** due to MEETING CRITERIA 6.1 B (Spurious operation of a trip that is bypassed in the EMERGENCY OPERATING MODE) The Jacket Water Trip is a NON-Emergency trip which is bypassed during the Emergency Operating Mode. • It is NOT a VALID FAILURE due to NOT meeting criteria 6.1 A, B, or C. **EXAMINER NOTE: Critical Step denoted by** * COMMENTS:	**CRITICAL STEP** ___SAT ___UNSAT
STEP 9: Candidate enters OPERATING DATA onto Attachment 10.1. STANDARD: Candidate enters the start and stop times for the diesel generator from the initial cue. Based on Attachment 10.2 run log, adds current and previous hours for new total run hours: Previous Run Time: 13.75 hours Latest Run Time: 0.75 hours Total D/G Engine Yearly Run Time: 14.50 Hrs. COMMENTS:	___SAT ___UNSAT

STEP 10: Candidate enters explanation in detail the reason D/G operation was not a Valid Success onto Attachment 10.1. STANDARD: Candidate records that the diesel tripped spuriously on the High Jacket Water Temperature Trip prior to reaching the one hour at greater than 2875 KW criteria. COMMENTS:	___SAT ___UNSAT
STEP 11: Note If a Valid or Invalid failure, route copy to MCE. STANDARD: Candidate determines that note applies to this situation. **EXAMINER CUE: SSA will route copy to the MCE.** COMMENTS:	___SAT ___UNSAT
STEP 12: Submit Attachment 10.1 to CRSRO for review. STANDARD: Candidate submits attachment to CRSRO. **EXAMINER CUE: CRSRO will review the attachment.** COMMENTS:	___SAT ___UNSAT
JPM is complete	

TIME STOP: _____

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

INITIAL CONDITIONS:

Unit 2 is in Mode 1. You are an extra operator on shift and assisting the Operation Test Group in a scheduled surveillance test of the 2B Emergency Diesel Generator. The test will be conducted using procedure PT/2/A/4350/002B, D/G Operability Test.

INITIATING CUE:

The history of what occurred during the 2B diesel operability is as follows:

- The test was performed as a Turbo Prelube and Manual key start.
- Speed, frequency, and voltage reached their required values in 7.3 seconds.
- Diesel Generator ran loaded to 3600 KW from 0830 to 0915 then tripped on "High Jacket Water Temperature"
- IAE Technicians determined that the trip was spurious since the highest recorded water temperature only reached 178 °F.

Classify the test and complete a Diesel Generator Logbook entry for this test and submit to the CRSRO for review.

ADMIN JPM 3R RO Key

Operations Management Procedure 2-28 Page 1 of 1

Attachment 10.1
Diesel Generator Sheet

DIESEL GENERATOR 2B RECORDED BY CANDIDATE

START ATTEMPT NUMBER 2003-16 DATE TODAYS DATE

PROCEDURE USED:

☑ **PT/1(2)/A/4350/002A(B)** (D/G Operability Test)

☐ **OP/1(2)/A/6350/002** (D/G Operation)

☐ Other, Specify: _____

REASON FOR D/G OPERATION:

☑ Scheduled Surveillance

☐ Opposite Train Inoperable

☐ Functional Verification (Maintenance)

☐ Other, Specify: _____

TYPE OF START:

☑ Turbo Prelube

☐ Non-Prelube

TEST CLASSIFICATION: (See OMP 2-28, Sect. 6.)

☐ VALID SUCCESS

Time required to reach ≥ 441 RPM (98% speed) and Frequency ≥ 60 ± 1.2 Hz _____ sec.

OPERATING DATA:

Time required: Voltage ≥ 4160 ● 420 volts _____ sec.

Time Load ≥ 2875 KW _____ hrs.

☐ INVALID TEST

D/G Engine Start Date/Time TODAY / 0830

☑ INVALID FAILURE

D/G Engine Shutdown Date/Time TODAY / 0915

☐ VALID FAILURE

Run Time (hrs) 0.75 13.75+.75

*Total D/G Engine Yearly Run Time 14.50 Hrs.

Explain in detail the reason D/G operation was not a VALID SUCCESS/failed to meet acceptance criteria.

RO CANDIDATE DESCRIPTION of "WHY"

Diesel tripped spuriously on the "HIGH JACKET WATER TEMPERATURE" trip prior to reaching the one hour at greater than 2875 KW CRITERIA

NOTE: If a VALID or INVALID failure, route copy to MCE.

REVIEW _____ PIP # _____ (CRSRO)

CRSRO

SYS.ENG./Designee _____

Req'd if other than Valid Success

* Notify Environmental Management if Total Run Time exceeds 260 hours per calendar year for any D/G.

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 4SR/ADMIN

Calculate Low Pressure Service Water Discharge Flow for Liquid Radioactive Release

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Calculate Low Pressure Service Water Discharge Flow for Liquid Radioactive Release.

Alternate Path:

N/A

Facility JPM #:

New

KIA Rating(s):

2.3.11 (2.7/3.2)

Task Standard:

Candidate obtains needed data, correctly calculates total discharge flow and determines that the liquid waste release can continue.

Preferred Evaluation Location:

Simulator ___X___ In-Plant __X____

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:

PT/0/A/4250/011 (RL Temperature and Discharge Flow Determinations) Revision 037

Validation Time: 22 min ___. **Time Critical:** No

==========

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

Performance Rating: SAT _____ **UNSAT** _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ /_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

Each candidate will be provided a copy of PT/0/A/4250/011, appropriate data sheets, and a copy of the LWR permit report. A calculator will be needed to complete the enclosures.

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 currently performing a liquid waste release from the Waste Monitor building.
- Low Pressure Service Water (RL) Flow transmitter 0RLP5080 (RL Disch Flow) and OAC points C1P0903 and C2P0903 (RL Line A Disch Flow-Hourly Average) are inoperable and have been removed from service.
- The RN system is aligned to the RL discharge header.
- PT/0/A/4250/011 (RL Temperature and Discharge Flow Determinations) was last completed at 0700.
- Current time is 1030.

INITIATING CUE:

Calculate total discharge flow using Enclosure 13.2 (Total Discharge Flow Calculation Sheet) of PT/0/A/4250/011 and determine if adequate flow exists to continue the release per the LWR currently in progress.

START TIME: _____

EXAMINER CUE: Provide a copy of PT/0/A/4250/011 enclosure 13.2, data sheets, and LWR permit report.	
EXAMINER NOTE: If asked about YT and YF inputs from RL, provide the following cue. CUE: "This is chemistry, inputs to YT and YF were secured at 0645 today."	
STEP 1: To obtain Total RL Supply perform the following: STANDARD: Calculates Total RL supply with the following: RL Disch Pressure = RL HDR PRESS (0RLP5030) + 5.6 psi 67 + 5.6 = 72.6 psi (72.6 psig X 2.311 ft/psig) + (577.25 – 567 ft) = 178.03 ft Total Discharge Head RL Pump A Flow 30000 gpm (obtained from Encl. 13.7 for Pump "A") RL Pump B Flow 32000 gpm (obtained from Encl. 13.7 for Pump "B") RL Pump C Flow OFF gpm Total RL Supply 62000 gpm (A) EXAMINER NOTE: The following ranges on the flow calculations are acceptable: RL pump A: 28500 to 31500 **gpm** RL pump B: 30500 to 33500 gpm Total Flow range 59000 to 65000 gpm COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

STEP 2: To obtain Total RN Flow perform the following: STANDARD: Calculates Total RN Flow with the following: RN Pump 1B is the only pump in service, Train B meter = **16,500** gpm RN Pump Train A Flow = (1RNP7520) + (2RNP7520) = 0 gpm RN Pump Train B Flow = (1RNP7510) + (2RNP7510) = 16500 gprn Total RN Flow = **16500 gpm** (B) COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 3: To obtain Total Cooling Tower Evaporation, perform the following. STANDARD: Calculates Total Cooling Tower evaporation using the following: IF OAC is in service for Unit 1 Cooling Tower evaporation, perform the following calculations: (**3406.879** C1P1355 - **1231** C1A1632 +19) x 6.837 gpm/mw = **15006.38** gpm Total Tower Evaporation IF OAC is in service for Unit 2 Cooling Tower evaporation, perform the following calculation: (**3402.602** C1P1355 - **1231** C1A1632 +19) x 6.837 gpm/mw = **14977.15** gpm Total Tower Evaporation Total Evaporation = 15006.38 + 14977.15 = **29983.53** gpm (C) **EXAMINER NOTE: Due to potential for rounding, a range of 29983.53 +/- 100 gpm is acceptable.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP **4:** To obtain Total RL Disch Flow, perform the following. STANDARD: Calculates Total Cooling Tower evaporation using the following: Total RL Supply 62000 (A) gpm + Total RN Flow 16500 (B) gpm - RL Disch Total Evaporation 29983.53 (C) gpm = Total Flow **48516.47** gpm **EXAMINER NOTE: Based on previous acceptable values, a range of 45416.47 gpm to 51616.47 gpm is acceptable.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 5: Data Recorded by: STANDARD: Candidate initials and enters date and time. COMMENTS:	___ SAT ___ UNSAT
STEP 6: Compare flow value obtained to required flow per LWR. STANDARD: Determines that LWR required flow is 19000 gpm and that the calculated flow exceeds the required flow and the LWR may continue. COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
This JPM is complete.	

TIME STOP: _____

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

Unit 1 and 2 Data Sheet for 1030

Unit 1 Generator Megawatts (PID C1A1632) 1231 MW
Reactor thermal Power, Best (PID C1P1355) 3406.879 MW

Unit 2 Generator Megawatts (PID C2A1632) 1231 MW
Reactor thermal Power, Best (PID C2P1355) 3402.602 MW

Low Pressure Service Water Status:

RL Pump A and B in service
Lake Wylie Level (ORNP7380) 567 feet
RL Header Pressure (ORLP5030) 67 PSIG

Nuclear Service Water Status:

1B RN pump in service
RN Pump Train A Flow (1RNP7520) = 0 gpm
RN Pump Train A Flow (2RNP7520) = 0 gpm
RN Pump Train B Flow (1RNP7510) = 16500 gpm
RN Pump Train B Flow (2RNP7510) = 0 gpm

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

SIMULATOR SETUP

- Unit 1 is currently performing a liquid waste release from the Waste Monitor building.
- Low Pressure Service Water (RL) Flow transmitter 0RLP5080 (RL Disch Flow) and OAC points C1P0903 and C2P0903 (RL Line A Disch Flow-Hourly Average) are inoperable and have been removed from service.
- The RN system is aligned to the RL discharge header.
- PT/0/A/4250/011 (RL Temperature and Discharge Flow Determinations) was last completed at 0700.
- Current time is 1030.

INITIATING CUE:

Calculate total discharge flow using Enclosure 13.2 (Total Discharge Flow Calculation Sheet) of PT/0/A/4250/011 and determine if adequate flow exists to continue the release per the LWR currently in progress.

ADM JPM 4SR

KEY - RO & SRO

Enclosure 13.2

PT/0/A/4250/011

Total Discharge Flow Calculation Sheet

- To obtain Total RL Supply, perform the following:

RL Disch Pressure = RL HDR PRESS (0RLP5030) + 5.6 psi

67

RL Disch Pressure		Lake Elevation		Total Discharge Head
(72.6 psig X 2.311 ft/psig) + (577.25 -	567 ft) =	1803 ft		

RL Pump **A** Flow	RL Pump B Flow	RL Pump C Flow	Total RL Supply
30000 gpm +	32000 gpm +	OFF (0) gpm =	62000 (59000 - 65000) gpm (A)

ALLOWABLE RANGES (28500 - 31500) (30500 - 33500)

- To obtain Total RN Flow, perfom the following:

RN Pump Train **A** Flow [(1RNP7520) + (2RNP7520)]		RN Pump Train B Flow [(1RNP7510) + (2RNP7510)]		Total RN Flow
0 gpm +		16500 gpm =		16500 gpm (B)

- To obtain Total Cooling Tower Evaporation, perfom the following:

IF OAC is in service for Unit 1 Cooling Tower evaporation, perform the following calculations:

(3406.879 -	1231 +19) x 6.837	gpm =	15006.38	
C1P1355	C1A1632	mw	Cooling Tower Evaporation	

IF OAC is in service for Unit 2 Cooling Tower evaporation, perform the following calculation:

(3402.602 -	1231 +19) x 6.837	gpm =	14977.15	{PIP 96-0822}
C2P1355	C2A1632	mw	Cooling Tower Evaporation	

15006.38	+ 14977.15	=	29983.53	(C)
Unit 1 Evaporation	Unit **2** Evaporation		Total Evaporation	

ALLOWABLE RANGE 29983.53 +/- 1000gpm

IE OAC is **NOT** in service for either **OR** both Units, Cooling Tower Evaporation is calculated by the following:

Cooling Tower Evaporation = ((3411 MW) (%Rx Power) + 19 - Gen MW)(6.837 gpm/MW)

Unit 1 Cooling Tower Evaporation =((3411 MW) (_____) + 19 - _____) (6.837 gpm/MW)= _____

% Rx Power (ex. 95%=0.95)	Gen MW	Unit 1 Evaporation (gpm)

Unit 2 Cooling Tower Evaporation =((3411 MW) (_____) + 19 - _____) (6.837 gpm/MW)= _____

% Rx Power (ex. 95%=0.95)	Gen MW	Unit 2 Evaporation (gpm)

Total Cooling Tower Evaporation = _____ + _____ - _____ (C)

Unit 1 Evaporation (gpm)	Unit 2 Evaporation (gpm)	Total Evaporation (gpm)

- To obtain Total RL Disch Flow, perfom the following:

Total RL Supply		Total RN Flow		RL Disch Total Evaporation		Total Flow
62000 gpm (A)	+	16500 gpm (B)	-	29983.53 gpm (C)	=	48516.47 gpm

ALLOWABLE RANGE 45416.47 gpm to 51616.47 gpm

Data Recorded By CANDIDATE INITIALS (Operator/Initials) DATE/TIME (Date/Time)

Data IV By _____ (Operator/Initials) _____ (Date/Time)

LIQUID WASTE RELEASE PERMIT REPORT

LWR Number: 2002130
Release ID: 5 Auxiliary Monitor Tank "A"
Release Mode: 2 Batch
Status: P Pre-Release
Comments:

*** NUCLIDE DATA - INITIAL SAMPLE ***

Nuclide	Undiluted uCi/ml	EC	EC Ratio
CO-57	1.46E-07	6.00E-05	2.43E-03
CO-58	1.66E-05	2.00E-05	8.30E-01
CO-60	2.17E-06	3.00E-06	7.23E-01
Gamma	1.89E-05		
H-3	5.00E-01	1.00E-03	5.00E+02
Beta	5.00E-01		
Total	5.00E-01		5.02E+02

LIQUID WASTE RELEASE PERMIT REPORT

LWR Number: 2002130

--- RL PUMP DATA ---
RL pumps assigned to release..... 1.00

--- RECOMMENDED RELEASE RATE ---
Allowable release rate (gpm)..... 3.86E+02
Recommended release rate (gpm)..... 2.50E+02

--- SETPOINT DATA ---
EMF57L in Service..... Yes
EMF57L Background (cpm)..... 6.03E+03

Cs-137 Equivalence (uCi/ml)..... 2.89E-05
Expected CPM..... 8.34E+03
Trip 1 setpoint (cpm)..... 8.40E+04
Trip 2 setpoint (cpm)..... 1.20E+05

--- SPECIAL INSTRUCTIONS FOR RELEASE ---
RECOMMENDED RL FLOW INTERLOCK: ~~5,000~~ 19,000 GPM

Conservative Interlock / Release Rate needed for dilution for boron

Performed by: _____ Date: 11-6-02

Verified by: _____ Date: 11-6-02

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM 5S/ADMIN

Upgrade to a Higher Emergency Classification

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Upgrade to a higher emergency classification

Alternate Path:

NO

Facilitv JPM #:

New

K/A Rating(s):

2.4.41 (2.3/4.1)

Task Standard:

Candidate classifies the event as an Alert within 15 minutes of starting the JPM, and correctly completes the follow-up notification form within 15 minutes of determining the classification.

Preferred Evaluation Location:

Simulator ___X___ In-Plant ___X___

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:

RP/0/A/5000/001 (Classification of Emergency) revision 15
RP/0/A/5000/003 (Alert) revision 39
RP/0/A/5000/006A (Notification of States and Counties from the Control Room) revision 14

Validation Time: 11 min. **Time Critical:** Yes

==========

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ /_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

Each candidate requires one copy of the following: Complete initial notification sheet, RP/01, RP/03, RP/06A and a blank ENS sheet

READ TO OPERATOR

TO

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 reactor was shutdown three (3) days ago and is now in Mode 5 with loops filled
- Reactor Coolant temperature was 143° F.
- "A" train ND, KC and RN in service.
- 1B ND pump is red tagged for repairs and unavailable.
- An Unusual Event was declared at 0830 per 4.7.U.1 (Natural and Destructive Phenomena Affecting the Protected Area) when Security forces reported a tornado touched down on the northeast side of the Protected Area.
- At 0850, the unit entered AP/1/A/5500/19 (Loss of Residual Heat Removal System) after an electrical transient caused 1A ND pump breaker to fail.
- Reactor coolant temperature has started to increase.

INITIATING CUE:

Reactor Coolant temperature is currently at 181° F and increasing.

Based on the current plant status, determine the emergency classification and prepare an Emergency Notification Form for transmittal.

This JPM is Time Critical.

STARTTIME: _____ (When initiating cue is read to candidate)

STEP 1: Compare actual plant conditions to the Emergency Action Levels listed, then declare the appropriate Emergency Class as indicated. STANDARD: Candidate uses RP-01 and from the initial conditions, determines the unit is in an Alert based on Enclosure 4.4 page 2 of 3: 4.4.A.2 Inability to Maintain Plant In Cold Shutdown Operating Mode *5:* (4.4A.2-1 Total Loss of ND AND Uncontrolled reactor coolant temperature rise to greater than **180°F.)** Candidate must make the declaration within 15 minutes of being read the initiating cue by the examiner. EXAMINER : When candidate determines classification record the time for this critical step. _____ COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
EXAMINER NOTE: The second time critical portion of this JPM is to complete the blank ENS sheet provided by the examiner. When the candidate declares, the next 15 minute clock starts for JPM step 2.	
STEP 2: Complete a blank Emergency Notification Form for the classification level determined. STANDARD: Candidate refers to RP/0/A/5000/06A "Notification of States and Counties from the Control Room and completes the ENS sheet within 15 minutes from when the declaration was made. See JPM step 3 for line by line entries for the ENS sheet. A marked key is also provided. EXAMINER: Record time candidate completes ENS sheet for this critical step _____ COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
EXAMINER NOTE: JPM Step 3 is a line by line listing of what is filled in on the ENS sheet.	

STEP 3: Per RP/0/A/5000/06A, line by line entries are entered on ENS sheet.	*CRITICAL STEP
STANDARD: Candidate completes form per the guidelines in enclosure 4.3	___ SAT
Line 1: Emergency checked, Initial checked, Message #2	
Lines 2, 3 and 4 are not filled in	___ UNSAT
Line 5: Alert checked	
* Line 6: Mark box " A and enters date and time event is declared.	
Line 7: Enters appropriate information from event number 4.4.A.2	
Line 8: Stable or Degrading	
Line 9: Enters time reactor shutdown (3 days ago)	
Line 10: Based on initial conditions, checks NONE or POTENTIAL	
Line 11-14: leaves these blank	
EXAMINER CUE: If asked, state that "surveys are not yet available".	
Line 15: From initial cue, verifies Box " A is entered.	
* Line 16: signs as Operations Shift Manager with date and time.	
*EXAMINER NOTE: The following items are CRITICAL:	
• This form must be completed within 15 minutes of the time that the declaration was made. • Line 6 - enters date and time which is < 15 minutes since start of JPM. • Line 16 - signature with date and time which is < 15 minutes since the declaration of Alert was made.	
COMMENTS:	
This JPM is complete.	

TIME STOP: _____

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:

- The reactor was shutdown three (3) days ago and is now in Mode 5 with loops filled
- Reactor Coolant temperature was 143° F.
- "A" train ND, KC and RN in service.
- "B" ND pump is red tagged for repairs and unavailable.
- An Unusual Event was declared at 0830 per 4.7.U.1 (Natural and Destructive Phenomena Affecting the Protected Area) when Security forces reported a tornado touched down on the northeast side of the Protected Area.
- At 0850, the unit entered AP/1/A/5500/19 (Loss of Residual Heat Removal System) after an electrical transient caused 1A ND pump breaker to fail.
- Reactor coolant temperature has started to increase.

INITIATING CUE:

Reactor Coolant temperature is currently at 181° F and increasing.

Based on the current plant status, determine the emergency classification and prepare an Emergency Notification Form for transmittal.

This JPM is Time Critical.

ADMIN JPM 5S SRO KEY

EMERGENCY NOTIFICATION FORM

1 [A] THIS IS A DRILL [X] ACTUAL EMERGENCY [X] INITIAL [ ] FOLLOW-UP MESSAGE NUMBER 2

2 SITE: CATAWBA NUCLEAR STATION UNIT 1 REPORTED BY _____

3 TRANSMITTAL TIME/DATE _____ (Eastern) ____ mm ____ dd ____ W CONFIRMATION PHONE NUMBER (803) 831-3807 (Simulator)

4 AUTHENTICATION (If Required) _____ (Number) _____ (Codeword)

5 EMERGENCY CLASSIFICATION

[A] NOTIFICATION OF UNUSUAL EVENT [X] ALERT [C] SITE AREA EMERGENCY [D] GENERAL EMERGENCY

(*) NOTE: DECLARED TIME MUST BE LESS THAN OR EQUAL TO 15 MINUTES SINCE START OF JPM

DECLARED TIME (*) ____ (Eastern) ____ mm ____ dd ____ yy

7. EMERGENCY DESCRIPTION/REMARKS:

INABILITY TO MAINTAIN PLANT IN COLD SHUTDOWN - (4.4.A.2)

8 PLANT CONDITION [A] IMPROVING [X] STABLE OR [X] DEGRADING

9 REACTOR STATUS [X] SHUTDOWN TIME/DATE 3 DAYS AGO PER CUE (Eastern) ____ mm ____ dd ____ W [B] ____ % POWER

10 EMERGENCY RELEASE(S):

[X] NONE (Go to item 14.) OR [X] POTENTIAL (Go to item 14) [C] IS OCCURRING [D] HAS OCCURRED

**11 TYPE OF RELEASE [ ] ELEVATED [ ] GROUND LEVEL

[A] AIRBORNE Started ____ Time(Eastern) ____/____/____ Date Stopped ____ Time(Eastern) ____/____/____ Date

[B] LIQUID Started ____ Time(Eastern) ____/____/____ Date Stopped ____ Time(Eastern) ____/____/____ Date

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

[A] NOBLE GASES _____ [B] IODINES _____

[C] PARTICULATES _____ [D] OTHER _____

**13. ESTIMATE OF PROJECTED OFFSITE DOSE: [ ] NEW [ ] UNCHANGED PROJECTION TIME: _____ (Eastern)

	TEDE mrem	Thyroid CDE rnrem
SITE BOUNDARY		
2 MILES		
5 MILES		
10 MILES		

ESTIMATED DURATION: _____ HRS.

**14. METEOROLOGICAL DATA: [A] WIND DIRECTION (from) _____ ° [B] SPEED (mph) _____

[C] STABILITY CLASS _____ [D] PRECIPITATION (type) _____

15. RECOMMENDED PROTECTIVE ACTIONS:

[A] NO RECOMMENDED PROTECTIVE ACTIONS

[B] EVACUATE _____

[C] SHELTER IN-PLACE _____

~ OTHER _____

16 APPROVED BY: CANDIDATE SIGNATURE (Name) EMERGENCY COORDINATOR (Title) TIME/DATE TIME (*) (Eastern) ____ mm ____ dd ____ yy

(*) NOTE: SIGNED TIME MUST BE LESS THAN OR EQUAL TO 15 MINUTE FROM TIME ON LINE 6

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

** Information may not be available on initial notifications

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/SIM-1

Respond to Inadvertent Dilution While Shutdown

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Trip the reactor and establish boration flow from the FWST per AP/1/A/5500/13 (Boron Dilution), Case II (Boron Dilution While Shutdown).

Alternate Path:

YES

Facility JPM #:

Modified from NV-119

K/A Rating(s):

004 ***A2.06*** (4.2/4.3)

Task Standard:

The reactor is tripped and boration from the FWST is initiated per AP/1/A/5500/13, Case II.

Preferred Evaluation Location:

Simulator ___X___ In-Plant _____

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:

AP/1/A/5500/13 (Boron Dilution), Case II (Boron Dilution While Shutdown) Revision 15

Validation Time: 11 min. **Time Critical:** No

==========

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

Performance Ratina: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

SIMULATOR SET-UP SHEET

1. Reset to any Cooldown IC Set
2. Run simulator and acknowledge annunciators.
3. Insert VLV-NV044F, (NV238A Failed Position) Severity Level = 0.
4. Close Reactor Trip Breakers and withdraw Shutdown Banks A through E.
5. Ensure 1NV153A in Demin position.
6. Insert MAL NV014A, (Boric Acid Pump 1A Failure).
7. Insert MAL NV014B, (Boric Acid Pump 1B Failure).
8. Insert OVR – NV047A (B/A Xfer Pmp 1B Sel Off Light); Value = OFF.
9. Place red rag sticker on 1B Boric Acid Transfer Pump.
10. Insert OVR NV011D (Boric Acid Transfer Pump On Position; Value = OFF
11. Insert OVR-NV047B (B/A Xfer Pmp 1B Sel On Lt – OFF
12. Ensure Train A and Train B BDMS setpoints are updated so that BDMS will NOT actuate during the performance of this JPM.
13., MAL-NC001 (Variable RCS Boron Concentration), Set Malfunction Value = 1300, Ramp = 60 sec. 0 time delay, Trigger = 1
14. Freeze simulator, write a snap and fill in the temperature of this setup in the Initiating Cues on pages 4 and 16.

SIMULATOR OPERATOR INSTRUCTIONS:

1. Reset to IC 217, place Red Tag sticker on 1B Boric Acid pump.
2. Ensure train A and train B BDMS setpoints are updated so BDMS will NOT actuate during this JPM.
3. When instructed by the examiner, activate Trigger 1 to begin dilution.

Tools/Equipment/Procedures Needed:

Have enough copies of AP/1/A/5500/13 revision 15 available for each candidate.

READ TO OPERATOR

I TO AINEE:

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 in Mode 3 preparing to start up.
- Boric Acid Transfer Pump 1B is tagged out for maintenance.

INITIATING CUE:

You are the Operator at the Controls. It has been determined that source range counts and **BDMS** counts are increasing unexpectedly. The SRO instructs you to address the situation using AP/13 Case II (Boron Dilution While Shutdown).

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates AP1/A/5500/13. **EXAMINER CUE: When the candidate locates AP/1/A/5500/13, hand himlher a clean copy of Case 2 and tell him/her that it is current and complete.** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Verify boron dilution event - IN PROGRESS. (Step 1.) STANDARD: Candidate recalls from the initiating cue that count rate is increasing, or checks count rate increasing on source range meters or Boron Dilution Mitigation System on MC-5 to verify boron dilution event In progress. ***CUE: Count rate is increasing on the source range meters and on the Boron Dilution Mitigation System.*** COMMENTS:	___ SAT ___ UNSAT

STEP 3: Verify reactor trip: (Step 2.) • All rod bottom lights - LIT • All reactor trip and bypass breakers - OPEN • S/R counts - STABLE or DECREASING STANDARD: Candidate determines that the shutdown banks are withdrawn by any the following indications and transitions to Step 2 RNO column. • Rod bottom lights NOT lit on Shutdown Banks A through E. • Red CLOSED light for reactor trip breaker 1A is LIT • Red CLOSED light for reactor trip breaker 1B is LIT ***CUE: Rod bottom lights for shutdown banks A through E are DARK. The Red "CLOSE" light for reactor trip breaker 1A is LIT and the Green "OPEN" light is DARK. The Red "CLOSE" light for reactor trip breaker 1B is LIT and the Green "OPEN" light is DARK.*** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Manually trip the reactor. (Step 2. RNO) STANDARD: Candidate rotates the handles for reactor trip breakers A and B to the "OPEN" position and verifies all rod bottom lights LIT. The candidate transitions to A/ER Step 3. ***CUE: The handle for reactor trip breaker 1A has been rotated to the "OPEN" position. The Green "OPEN" light is LIT and the Red "CLOSED" light is DARK. The handle for reactor trip breaker 1B has been rotated to the "OPEN" position. The Green "OPEN" light is LIT and the Red "CLOSED" light is DARK. The rod bottom lights for shutdown banks A through B are LIT.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: WHEN manpower AND time permits, THEN - REFER TO AP/1/A/5500/05 (Reactor Trip or Inadvertent S/I below P-11). (Step 3.) STANDARD: No action required by the candidate. **EXAMINER CUE: *Another operator* will *refer to* AP/05.** COMMENTS:	___ SAT ___ UNSAT
STEP 6: Verify core alterations - IN PROGRESS. (Step **4.)** STANDARD: Candidate determines from the Initiating Cue that core alterations are not in progress and goes to Step 6. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Evacuate personnel from reactor building using the following: (Step 6.) STANDARD: Candidate actuates the Containment Evacuation Alarm (1MC-1) and makes a plant page. *****CUE; The Red "ON" pushbutton for the Unit 1 Cont Evac Alarm has been depressed. The RED "ON" light is LIT, and the GREEN "0FF" light is DARK. Announcement is heard over the paging system.***** COMMENTS:	___ SAT ___ UNSAT

STEP 8: Stop any dilutions in progress as follows: Place "NC MAKEUP CONTROL" switch to "STOP". (Step 7.a.) STANDARD: Candidate positions the "NC MAKEUP CONTROL" switch to STOP. **CUE: The "NC MAKEUP CONTROL" switch is in the 'STOP" position ** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Place both reactor makeup water pumps to "OFF". (Step 7.b) STANDARD: Candidate places the switch for reactor makeup water pump 1A in the OFF position and verifies the Green OFF light is LIT and the Red "ON" light is DARK. Candidate places the switch for reactor makeup water pump 1B in the OFF position and verifies the Green OFF light is LIT and the Red "ON" light is DARK. **CUE: The switch for reactor makeup water pump 1A is in the "OFF" position. The Green OFF light is LIT and the Red "ON" light is DARK. The switch for reactor makeup water pump 1B is in the OFF position The Green OFF light is LIT and the Red "ON" light is DARK.** COMMENTS:	___ SAT ___ UNSAT

STEP 10: Isolate NV Demineralizers as follows: (Step 7.c.) 1) Place 1NV-153A (Letdn Hx Otlt 2-Way Vlv) in the "VCT position 2) Ensure the following valves – CLOSED: • 1NV-353 & 364 (Mixed Bed Demin 1A Isol) CLOSED • 1NV-368 & 379 (Mixed Bed Demin 1B Isol) CLOSED	___ SAT ___ UNSAT
STANDARD: Candidate performs the following: • Positions 1NV-153A to the "VCT position. • Depresses CLOSE for 1NV-353 & 364 and verifies green CLOSED light lit. • Checks 1NV-368 & 379 green CLOSED light lit. ***CUE: INV 153A is in the "VCT" position. The Green "CLOSED" light for 1NV-368 and 379 is LIT and the Red "OPEN" light is DARK. The "CLOSED" pushbutton for 1NV 353 and 364 has been depressed. The Green "CLOSED" light for is LIT and the Red "OPEN" fight is DARK. The Green "CLOSED' light for 1NV 368 and 379 is LIT and the Red "OPEN" light is DARK.*** COMMENTS:	

STEP 11: Ensure proper BDMS operation as follows: (Step 8.) Verify at least one of the following alarms LIT: (Step 8.a.) • 1AD-2, E/2 "TRAIN A SHUTDOWN MARGIN ALARM" OR • 1AD-2, F/2 "TRAIN B SHUTDOWN MARGIN ALARM" STANDARD: Candidate verifies the following alarms are DARK and transitions to step 8.a. RNO. Candidate determines no action is required and goes to Step 9 A/ER. • 1AD-2, E/2 "TRAIN A SHUTDOWN MARGIN ALARM" • 1AD-2, F/2 "TRAIN B SHUTDOWN MARGIN ALARM" ***CUE: Alarms IAD-2, E/2 "TRAIN A SHUTDOWN MARGIN ALARM" and IAD-2, F/2 "TRAIN B SHUTDOWN MARGIN ALARM" are DARK.*** COMMENTS:	___ SAT ___ UNSAT
STEP 12: Initiate boration of the NC system as follows: (Step 9.) Ensure one NV pump - ON. (Step 9.a.) STANDARD: Candidate verifies the Red "ON" light lit for NV pump 1A is LIT and the Green "OFF" light is DARK and pump amps are indicated. ***CUE: The Red "ON" light lit for NV pump 1A is LIT and the Green "OFF" light is DARK. Pump amps are indicated.*** COMMENTS:	___ SAT ___ UNSAT

STEP 13: Ensure at least one boric acid transfer pump – ON (Step 9.b.) STANDARD: Candidate selects ON for Boric Acid Transfer Pump 1A and observes that the Red "ON" light is DARK and the Green "OFF" light is LIT. Transitions to step 9.b. RNO. ***CUE: The switch for the Boric Acid Transfer Pump 1A is in the "ON" position. The Red "ON" light is DARK and the Green "OFF" light is LIT.*** COMMENTS:	___ SAT ___ UNSAT
STEP 14: Establish boric acid flow from the FWST as follows: (Step 9.b. RNO) (Step 9.b.1) RNO) 2) Open the following valves • 1NV-252A (NV Pumps Suct from FWST) • 1NV-253B (NV Pumps Suct from FWST) STANDARD: Candidate depresses the "OPEN" pushbuttons for 1NV-252A and 1NV-253B. Verifies the Red "OPEN" light is LIT and the Green "CLOSED" light is DARK for 1NV-252A and verifies the Red "OPEN" light is LIT and the Green "CLOSED" light is DARK for 1NV-253B. ***CUE: The "OPEN" pushbuffon for 1NV-252A has been depressed. The Red "OPEN' light is LIT and the Green "CLOSED" light is DARK. The "OPEN" pushbuffon for 1NV-253B has been depressed. The Red "OPEN' light is LIT and the Green "CLOSED" light is DARK.*** **EXAMINER NOTE:** *It is only necessary to open one of the above valves to satisfy the critical step.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 15: Close the following valves: (Step 9.b.2) RNO) • 1NV-188A (VCT Otlt Isol) • 1NV-189B (VCT Otlt Isol) STANDARD: Candidate depresses the "CLOSED" pushbuttons for 1NV-188A and 1NV-189B. Verifies the Green "CLOSED" light is LIT and the Red "OPEN" light is DARK for 1NV-188A and the Green "CLOSED" light is LIT and the Red "OPEN" light is DARK for 1NV-189B. ***CUE: The "CLOSED" pushbutton for 1NV-188A has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK. The "CLOSED" pushbutton for 1NV-189B has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.*** **EXAMINER NOTE:** *It is only necessary to close one of the above valves to satisfy the critical step.* COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
STEP 16: Maintain charging flow greater than or equal to 105 GPM. (Step 9.b.3) RNO) STANDARD: Candidate adjusts 1NV-294 (NV PMPS A&B DISCH FLOW CNTRL) as required and verifies on 1NVP5630 on 1MC-1 that charging flow is equal to or greater than 105 GPM and transitions to Step 10. ***CUE: Charging flow is greater than 105 GPM.*** COMMENTS:	CRITICAL **STEP** ___ SAT ___ UNSAT

STEP 17: Ensure compliance with appropriate Tech Specs: (Step 10.) STANDARD: No action required by the candidate. **EXAMINER CUE: The SRO will ensure compliance with Tech Specs** **TERMINATING CUE: BOP will complete the remainder of the procedure.** COMMENTS:	___ SAT ___ UNSAT
This JPM is complete	

TIME STOP: _____

***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 preparing to start up.
- Boric Acid Transfer Pump 1B is tagged out for maintenance.

INITIATING CUE:

You are the Operator at the Controls. It has been determined that source range counts and BDMS counts are increasing unexpectedly. The SRO instructs you to address the situation using AP/13 Case II (Boron Dilution While Shutdown).

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/SIM-2

Align the NS System to Cold Leg Recirculation

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Align the NS System to Cold Leg Recirculation

Alternate Path:

YES

Facility JPM #:

NS-101 (Modified)

K/A Rating(s):

026 **A2.04**(3.9/4.2)

Task Standard:

NS Pump 1B is in operation with its suction aligned to the containment sump and proper RN flow established to the NS 1B NS heat exchanger.

Preferred Evaluation Location:

Simulator ___X___ In-Plant _____

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:

EP/1/A/5000/ES-1.3 (transfer to Cold Leg Recirculation) Enclosure 2; Revision 11

Validation Time: 6 min. **Time Critical:** No

==========

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

SIMULATOR SET-UP SHEET

1. Reset to any power IC set.

2. Ensure RN Pump 1A is NOT in service.

3. Insert the following:

   - MAL-NC013B (Cold Leg Leak) set malfunction value = 27.0.
   - MAL-RN003A (Nuclear Service Water Pump I A Failure) Value = BOTH.
   - MAL-NS001B (Containment Spray Pump 1B Failure) Value = AUTO
   - VLV-NI038F (NI-185A CNMT Sump Line 1A ISO (Stem) Fail To Position) Value = 0.

4. Run the simulator until the "FWST LO-LO LEVEL" alarm is received while performing all required actions of EP/E-0, EPIE-1 and EP/ES-1.3 up through step 7a by stopping NS pumps.

5. Freeze the simulator and write snap.

6. Selected IC **216**

SIMULATOR OPERATOR INSTRUCTIONS:

1. Reset to IC 216

Tools/Equi Pr ures Needed:

Have enough copies of EP/1/A/5000/ES-1.3 Revision 1 ▮ Enclosure 2 for each candidate.

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.

INITIATING CUE:

EP/1/A/5000/ES-1.3, Transfer to Cold Leg Recirculation has been implemented following a LOCA. With containment pressure previously reaching 6 psig and currently above the shutdown criteria, the containment spray system is still required. "FWST Lo-Lo Level" alarm has been received and the NS pumps have been stopped per ES-1.3 step 7. The SRO instructs you to align NS to Cold Leg Recirculation per Enclosure 2 of EP/ES-1.3.

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates , Enclosure 2 of EP/1/A/5000/ES-1.3 **EXAMINER CUE: When the candidate locates EP/1/A/5000/ES-1.3, hand him/her a clean copy of Enclosure 7 and tell him/her that it is current and complete.** COMMENTS:	___ SAT ___ UNSAT

STEP 2: Align NS as follows. (Enclosure 2, Step 1)	**CRITICAL STEP**
*a. Close 1NS-20A (NS Pump 1A Suct From FWST).	
STANDARD: Candidate depresses the GREEN "CLOSE" pushbutton for 1NS-20A (1MC-11). Verifies GREEN "CLSD" light LIT and RED "OPEN" light DARK.	___ SAT
CUE.The GREEN "CLOSED" pushbutton for 1NS-20A has been depressed. 1NS-20A RED "OPEN" light is DARK and fhe GREEN "CLSD" light LIT.*	___ UNSAT
COMMENTS:	
***b.** Close 1NS-3B (ND Pump 1B Suct From FWST).	
STANDARD: Candidate depresses the GREEN "CLOSE" pushbutton for 1NS-3B (IMC-11). Verifies GREEN "CLSD" light lit and RED "OPEN" light dark.	
CUE.The GREEN "CLOSED" pushbutton for 1NS-3B has been depressed. The RED "OPEN" light is DARK and the GREEN "CLSD" light is LIT.	
COMMENTS:	
c. Verify 1NI-185A (ND Pump 1A Cont Sump Suct) open.	
STANDARD: Candidate verifies RED "OPEN" light DARK and GREEN "CLSD" light LIT for 1NI-I85A (1MC-11). Transitions to Step 1.b. RNO.	
***CUE. The **1NI-185A** RED "OPEN" light is DARK and GREEN "CLSD" light is LIT ***	
COMMENTS:	

EXMAINER NOTE: NS pump 1B will not automatically start in the next step. The candidate may attempt to start the pump at this point or may wait until directed by step JPM Step 5 (Enclosure 2, step 4).	
STEP 2: (Continued) 1) Open 1NS-1B (NS PMP 1B Suct From Cont Sump). (Step 1.b. RNO). STANDARD: Candidate depresses the RED "OPEN" pushbutton for 1NS-1B (1MC-11). Verifies RED "OPEN" light LIT, GREEN "CLSD" light DARK, Continues to Step 2. **CUE: The RED "OPEN" pushbuffon for *1NS-1B* has been depressed. The RED "OPEN" light is LIT and fhe GREEN *"CLSD"* light is DARK.** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
STEP 3: Verify containment pressure has exceeded 3 psig.: (Enclosure 2, STEP 2). STANDARD: Candidate verifies containment pressure is greater than 3 psig on 1NSCR5040/5390 (pen 1) (1MC-9) or 1MICR5340/5350 (pen 3) (1MC-7). EXAMINER CUE: Provide cue IF pressure is less than 3 psig. Containment Pressure has exceeded 3 psig **CUE: Containment pressure is greater than 3 psig.** COMMENTS:	___ SAT ___ UNSAT

STEP 4: Verify containment pressure greater than 1 psig. (Enclosure 2, Step 3) STANDARD: Candidate verifies containment pressure is greater than 1 psig 1NSP5040/5050/5060/5070 (1MC-11) or 1NSCR5040/5390 (pen 1) (1MC-7) or 1MICR5340/5350 (pen 3) (1MC-9). *****CUE; Containment pressure is greater than 1 psig.***** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Ensure NS pump **(s)** aligned to an open containment suction valve-ON. (Enclosure 2, Step 4) STANDARD: Candidate determines NS Pump 1B is not running, NS Pump 1B RED "ON" light DARK and 1N1-I84B RED "OPEN" light LIT and GREEN "CLSD" light DARK. Candidate depresses the RED "ON" pushbutton for NS pump 1B and verifies the RED "ON" light is LIT and the GREEN "OFF" light is DARK. **EXAMINER NOTE: NS *pump* 1B *may have* been *started* in JPM *Step 2* (Enclosure *2, step* 1.b. RNO).** *****CUE: The RED "ON" pushbutton for NS pump 1B has been depressed. The RED "ON" light is LIT and the GREEN "OFF" light is DARK.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

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

STEP 6: Verify all Unit 1 and Unit 2 RN pumps on. (Enclosure 2, Step *5)* STANDARD: Candidate verifies RN Pump 1A RED "ON" light is DARK and the GREEN "OFF" light is LIT. RN Pump 1B RED "ON" light LIT with pump current at midscale on ammeter, RN Pump 2A RED "ON" light LIT and RN Pump 2B RED "ON" light LIT. Candidate transitions to step 5 RNO and goes to Step 7. *****CUE:*** • ***The RED "ON" light for RN pump 1A is DARK, and the GREEN "OFF" light is LIT*** • ***The RED "ON" light for RN pump 1B is LIT, and the GREEN "OFF" light is DARK.*** • ***The RED "ON" light for RN pump 2A is LIT, and the GREEN "OFF" light is DARK.*** • ***The RED "ON" light for RN pump 2B is LIT, and the GREEN "OFF" light is DARK.*** COMMENTS:	___ SAT ___ UNSAT

STEP 7: Align RN to NS HX(s) based on RN and NS pumps status: (Enclosure 2, Step 7)	**CRITICAL STEP**
a. Verify NS Pump 1A on:	
STANDARD: Candidate determines that NS pump 1A is not running and transitions to Step 7.a. RNO	___ SAT
CUE: NS pump I A RED :ON" light is DARK and the GREEN "OFF" light is LIT.*	___ UNSAT
COMMENTS:	
a. Perform the following:	
1) IF only one B Train RN pump is on, THEN close 2RN-47A (RN Supply X-Over)	
STANDARD: Candidate determines that BOTH B Train RN pumps are running. Continues to step 7. RNO a.2)	
CUE. RN pump 1B RED :ON" light is LIT and the GREEN "OFF" light is DARK and RN pump 2B RED :ON" light is LIT and the GREEN "OFF" light is DARK .*	
COMMENTS:	
2) IF only B train RN pumps are on, THEN	
STANDARD: Candidate determines that 2A RN pump is running. Continues to step 7 RN0.a.3)	
CUE:. RN pump 2A RED :ON" light is LIT and fhe GREEN "OFF" light is DARK.*	
COMMENTS:	

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

STEP 7 (Continued)

2) Open 1RN-2256 (NS HX 16 Inlet Isol).

CRITICAL STEP

STANDARD: Candidate depresses the RED "OPEN" pushbutton for 1RN-2256 (1MC-11). Verifies RED "OPEN" light is LIT and the GREEN "CLSD" light is DARK.

___ SAT

___ UNSAT

CUE. The RED "OPEN" pushbutton for 1RN-225B has been depressed. 1RN-225B RED "OPEN" light LIT and GREEN "CLSD" light DARK

COMMENTS:

4) Throttle open 1RN-229B (NS HX Outlet Isol) to obtain one of the following:

- 4600 GPM flow through NS Hx 1B
  OR
- 1RN 2296 full open

STANDARD: Candidate depresses RED "OPEN" pushbutton for 1RN-229B until flow meter for 1B NS HX (1RNP5850 on 1MC-9) indicates 4600 gpm or 1RN-2296 is fully open, with the RED "OPEN" light LIT and the GREEN "CLSD" light DARK.

CUE. The RED "OPEN" pushbutton for 1RN-229B has been depressed. 1RN-229B RED "OPEN" light LIT and GREEN "CLSD" light DARK

COMMENTS:

5) Go to Step 8

STEP 8.: Verify adequate RN heat sink as follows: (Enclosure 2, Step 8) RN system suction aligned to Lake Wylie STANDARD: Verifies RN pump suctions open from Lake Wylie: RED "OPEN" lights lit and GREEN "CLSD" lights dark: • 1RN-IA RED "OPEN" light LIT and GREEN "CLSD" light DARK: • 1RN-2B RED "OPEN" light LIT and GREEN "CLSD light DARK • 1RN-5A RED "OPEN" light LIT and GREEN "CLSD" light DARK • 1RN-6B RED "OPEN" light LIT and GREEN "CLSD" light DARK ***CUE:** • ***1RN-1A RED "OPEN" light LIT and GREEN "CLSD" light DARK*** • ***1RN-2B RED "OPEN" light LIT and GREEN "CLSD" light DARK*** • ***1RN-5A RED "OPEN" light LIT and GREEN "CLSD" light DARK*** • ***1RN-6B RED "OPEN" light LIT and GREEN "CLSD" light DARK*** COMMENTS:	___ SAT ___ UNSAT
STEP 9: RN essential header temperatures at one of the following locations- LESS THAN OR EQUAL TO 82.5°F.: • 1MC-9 OR • RO Logbook STANDARD: Candidate determines from either 1RNP5000 or 1RNP5010 that RN essential header temperature is approximately 69 °F. or determines temperature from RO Logbook. ***CUE: RN essential header temperature is 69°F.*** COMMENTS:	___ SAT ___ UNSAT
This JPM is complete.	

TIME STOP: _____

***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)

INITIATING CUE:

EP/1/A/5000/ES-1.3, Transfer to Cold Leg Recirculation has been implemented following a LOCA. With containment pressure previously reaching ***6*** psig and currently above the shutdown criteria, the containment spray system is still required. "FWST Lo-Lo Level" alarm has been received and the NS pumps have been stopped per ES-1.3 step 7. The SRO instructs you to align NS to Cold Leg Recirculation per Enclosure 2 of EP/ES-1.3.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM /CR-3

Take Power Range Drawer Out of Service

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Remove Power Range Channel N-41 from service per AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation System), Case IV Power Range Malfunction.

Alternate Path:

NO

Facility JPM #:

OP-CN-IC-ENB-002

K/A Rating(s):

015 A4.03 (3.8/3.9)

Task Standard:

Power Range Detector is N-41 removed from service with Control Power fuses removed.

Preferred Evaluation Simulator:

Control Room _X_ In-Plant ___

Preferred Evaluation Perform

Perform _____ Simulate __X____

References:

AP/1/A/5500/016 (Malfunction of Nuclear Instrumentation System), Case IV Power Range Malfunction Rev. 19

Validation Time: 10 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ /
NAME SIGNATURE DATE

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COMMENTS

SIMULATOR SETUP SHEET

1. Place simulator on Run.
2. Insert **MAL-ENB011A** (Power Range Detector N-41A Failure), Severity Value = **100%.**
3. Perform actions of AP/16 through step 5.
4. **FREEZE** simulator.
5. Write to Protected IC.

SNAP No.: 211

SIMULATOR OPERATOR INSTRUCTIONS:

None.

Tools/Equipment/Procedures Needed:

Ensure enough copies of AP/1/A/5500/16 for each candidate.

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 operating at 100% power.

N-41, Power Range, Upper Detector has failed offscale high.

AP/1/A/5500/16, Case IV, Power Range Malfunction, has been implemented.

INITIATING CUES:

The Control Room SRO instructs you to remove N-41 from service per step 6 through 9 of Case IV of AP/1/A/5500/16.

START TIME: _____

STEP 1: Perform the following actions at the Miscellaneous Control and Indication Panel: (Step 6) • Place the appropriate "ROD STOP BYPASS" switch to the affected channel position. • Verify NUC OVER PWR ROD STOP CH BYP status light (1SI-19) for affected channel – LIT. • Place "POWER MISMATCH BYPASS" switch to the affected channel position. STANDARD: Locates Miscellaneous Control and Indication Panel and performs the following: • Places ROD STOP BYPASS switch to BYPASS PRN41. *****CUE: The ROD STOP BYPASS switch is rotated to the BYPASS PRN41 position.*** • *Locates 1SI-19 and verifies NUC OVER PWR ROD STOP CH BYP status light for N-41 – LIT. *****CUE: The NUC OVER PWR ROD STOP CH BYP status light for N41 is LIT.*** • Places POWER MISMATCH BYPASS switch to BYPASS PRN41. *****CUE: The POWER MISMATCH BYPASS switch is rotated to the BYPASS PRN41 position.*** **EXAMINER NOTE: * This *step not* critical.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 2: Perform the following actions at the Detector Current Comparator panel: (Step 7) • Place "UPPER SECTION" channel defeat switch to the affected channel. o Verify 'CHANNEL DEFEAT" light for upper section-LIT. • Place "LOWER SECTION" channel defeat switch to the affected channel. o Verify 'CHANNEL DEFEAT" light for lower section-LIT.	*CRITICAL* **STEP** ___ SAT ___ UNSAT
STANDARD: Locates Detector Current Comparator Panel and performs the following: • Places "UPPER SECTION" channel defeat switch to PR N41. ***CUE: The UPPER SECTION channel defeat switch is rotated to the PR N41 position.* • *Verify "CHANNEL DEFEAT" light for upper section lit. ***CUE: The CHANNEL DEFEAT light for the upper section is LIT.* • Places "LOWER SECTION" channel defeat switch to PR N41. ***CUE: The LOWER SECTION channel defeat switch is rotated to the PR N41 position.* • *Verify "CHANNEL DEFEAT light lit for lower section. ***CUE: The CHANNEL DEFEAT light for the lower section is LIT.* **EXAMINER NOTE:** ** These steps are not critical.*	
COMMENTS:	

STEP 3: At the Comparator and Rate panel, place the 'COMPARATOR CHANNEL DEFEAT switch to the affected channel position. (Step 8) STANDARD: Locates Comparator and Rate panel and places "COMPARATOR CHANNEL DEFEAT" switch to N41. ****CUE: The COMPARATOR CHANNEL DEFEAT switch is rotated to the N41 position.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP **4:** De-energize affected channel. (Step 9.a) • Remove "CONTROL POWER" fuses at Power Range A drawer. STANDARD: Locates N41 Power Range Drawers: • Remove fuses far enough to de-energize 'CONTROL POWER". ****CUE: The CONTROL POWER fuse holders are rotated counter-clockwise and pulled out.** **EXAMINER NOTE: The candidate should warn the RO of the alarm he is about to initiate (1AD-2, B/5), however this is NOT required to meet the critical step.** COMMENTS:	**CRITICAL STEP** ___ **SAT** ___ UNSAT
NOTE: Replacement of the affected P/R control power fuses shall not occur without authorization of the Superintendent of Operations or his designee.	

STEP 5: Request the OSM to maintain the 'CONTROL POWER" fuses under his control. (Step 9.b) STANDARD: Operator hands both "Control Power" fuses to the OSM to maintain under his/her control. **EXAMINER CUE: OSM replies that he will keep the control power fuses in his possession.** COMMENTS:	___ SAT ___ UNSAT
STEP 6: Verify the affected Power Range cabinet shows no physical signs of damage. (Step 9.c) STANDARD: Operator checks outside of the Power Range cabinet for signs of damage. ***CUE: The Power Range cabinef shows no sign of damage.*** COMMENTS:	___ SAT ___ UNSAT
This JPM is complete.	

TIME STOP: _____

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

INITIAL CONDITIONS:

Unit 1 is operating at 100% power.

N-41, Power Range, Upper Detector has failed offscale high.

AP/1/A/5500/16, Case IV, Power Range Malfunction, has been implemented.

INITIATING CUES:

The Control Room SRO instructs you to remove N-41 from service per steps 6 through 9 of Case IV of AP/1/A/5500/16.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/CR-4

Start Reactor Coolant Pump 1B

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start Reactor Coolant Pump 1B.

Alternate Path:

NO

Facility JPM #:

NCP-081

K/A Rating(s):

003 A4.01 *(3.313.2)*

Task Standard:

Seal injection flow to 1B NCP is restored to 7-10 gpm and 1B reactor coolant pump is successfully started.

Preferred Evaluation Location:

Control Room X In-Plant

Preferred Evaluation Method:

Perform Simulate X

References:

OP/1/A/6150/002A (Reactor Coolant Pump) Enclosure 4.1 Revision 050.

Validation Time: 20 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

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COMMENTS

SIMULATOR SET-UP SHEET

1. Reset to any "at power" SNAP.
2. Manually trip the reactor at 1MC-1.
3. Place Steam dumps in Pressure Mode.
4. Trip all (4) four NCP breakers at 1MC-10.
5. Reset CA and control flow to maintain S/G levels at 38% N/R level.
6. Place 1NV-309 in manual and reduce total seal water flow to ~ 12 gpm.
7. Freeze the simulator and write to SNAP.

IC SELECTED 213

Needed:

Have enough copies of OP/1/A/6150/002A Enclosure 4.1 available for each candidate.

READ ERAT

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.

INITIATING CUE:

EP/1/A/5000/ES-0.2, Natural Circulation Cooldown has been implemented following a Reactor Trip. Control problems with 1NV-309 require the valve be operated in manual. The SRO instructs you to attempt to start NC Pump 1B by completing OP/1/A/6150/002A, NC Pump Operation Enclosure. 4.1. The Initial Conditions of Enclosure. **4.1** have been satisfied.

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates OP/1/A/6150/002A, Enclosure 4.1. **EXAMINER CUE: When the candidate locates OP/1/A/6150/002A, hand him/her a clean copy of Enclosure 4.1 and tell him/her that it is current and complete.** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Caution prior to Step 2.1: An NC Pump should not be started if associated 6.9 KV switchgear is supplying essential switchgear 1ETA or 1ETB and switchyard voltage is less than or equal to 223 KV or only one off-site source of power is available. STANDARD: Candidate determines that both offsite power sources are available by verifying that the Red "CLOSED" lights for PCB's 14, 15, 17 and 18 are LIT and the Green "OPEN" lights for PCB's 14, 15, 17 and 18 are DARK and that switchyard voltage is greater than 223 KV on the OAC graphic or on the SWYD VOLTS meter on 1MC-11. ****CUE: The Red "CLOSED" lights for PCB's 14, 15, 17 and 18 are LIT and the Green "OPEN" lights for PCB's 14, 15, 17 and 18 are DARK. Switchyard voltage is 230 KV.*** COMMENTS:	___ SAT ___ UNSAT

STEP 3: Note prior to Step 2.1: 1. In order to start an NC Pump, the underfrequency condition should be cleared by having at least three of four 6900 V breakers (ITA, B, C, D-3) racked in and energized. 2. NC Pump operational configuration restrictions, as follows, will ensure adequate PZR spray for press control, maintain spray line water solid, and prevent thermal stratification of spray line: • Pump combination should include NC Pump A or NC Pump B, • If NC Pump **A** is in service, at least two other pumps should be in service, • If single pump operation is required, ensure NC Pump B is in service, Otherwise, Auxiliary PZR spray flow should be established. STANDARD: Candidate verifies the Red "CLSD" light is LIT and the Green "OPEN" light is DARK for all four 6900 V breakers. Candidate recognizes from the Initiating Cue that NC Pump 1B is to be started. *****CUE: The Red "CLSD" light is LIT and fhe Green "OPEN" light is DARK for all four 6900 V breakers.***** COMMENTS:	___ SAT ___ UNSAT
STEP 4: IF Unit 1 is in Mode 5, refer to Tech Spec 3.4.12-1 for temperature limitations on NC Pump starts. (Step 2.1) STANDARD: Candidate determines from NC System temperature that Unit 1 is in Mode 3. *****CUE: NC temperature is 557° F.**.*** COMMENTS:	___ SAT ___ UNSAT

STEP 5: If the pump to be started will be the fourth NC pump in service on Unit 1, verify NC temperature is greater than or equal to 130°F. (Step 2.2) STANDARD: Per the initiating cue this is the first pump to be started. Candidate should go on to step 2.3. COMMENTS:	___ SAT ___ UNSAT
STEP 6: Note prior to Step 2.3: If #1 Seal AP gauge overranged, AP can be determined using 1NV-125B (Excess Letdn Hx Otlt Ctrl) "VCT" or "NCDT' switch position as follows: • "VCT position: NC Press minus Excess Letdn Hx Otlt Press = #1 Seal AP • "NCDT" position: NC Press minus VCT Press = #1 Seal AP STANDARD: No action required by candidate. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Verify No. 1 Seal D/P is greater than 200 psig for the pump to be started per the following gauges: (Control Board 1MC-5) • 1B NCP: 1NVP 5220 (Step 2.3) STANDARD: Candidate verifies D/P indication (1MC5: 1NVP5220) for 1B NC Pump is overranged. Determines by method described in Note that #1 Seal AP is approximately 2200 psid. ***CUE: NC pressure is 2235 psig and VCT pressure is 30 psig..*** COMMENTS:	___ SAT ___ UNSAT

STEP 8: Verify that the standpipe level for the pump to be started *is* normal by its associated annunciator DARK. • "NCP B #2 SEAL S-PIP HI/LO LVL" 1AD-7 A/2 (Step 2.4) STANDARD: Candidate verifies 1AD-7 A/2 "NCP B #2 SEAL S-PIPE HI/LO LVL" alarm is dark. *****CUE:. IAD-7 A/2 "NCP B #2 SEAL S-PIPE HI/LO LVL" alarm is dark.***** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Verify VCT pressure is equal to or greater than 15 psig. (Step 2.5) STANDARD: Candidate verifies VCT pressure (1MC5: NVP5500 or NV GRAPHIC) is greater than 15 psig. *****CUE: VCT pressure is 30 psig***** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Verify 7-10 gpm seal injection flow on the pump to be started by the following gauges: (Control Board MC-5) • 1B NCP: 1NCP5320 (Step 2.6) STANDARD: Candidate observes seal injection flow (1NVP5320 on 1MC-5) is approximately 4-5 gpm *****CUE: Seal injection flow to NC Pump 1B is 4 gpm.***** COMMENTS:	___ SAT ___ UNSAT

STEP 11: Increase seal injection flow to NC Pumps. STANDARD: Candidate manually adjusts 1NV-309 to restore seal injection flow to 8 gpm per pump. **EXAMINER CUE: If candidate states he/she would notify the CRSRO, respond as the CRSRO and instruct the candidate to restore seal injection to its normal value.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: Note prior to Step 2.7: 1. If #1 Seal Leakoff Flow is less than 1 gpm, the #1 Seal Low Flow indication shall be used. 2. If adequate #1 Seal Leakoff Flow is NOT indicated in the following step, refer to Enclosure **4.4.** 3. If #1 Seal AP gauge overranged, AP can be determined using 1NV-125B (Excess Letdn Hx Otlt Ctrl) "VCT" or "NCDT" switch position as follows: • "VCT" position: NC Press minus Excess Letdn Hx Otlt Press = #1 Seal AP • "NCDT position: NC Press minus VCT Press = #1 Seal AP STANDARD: No action required by the candidate. COMMENTS:	___ SAT ___ UNSAT

STEP 13: Verify adequate No. 1 Seal Leakoff flow on the pump to be started as follows: (Step 2.7) Determine required #1 Seal Leakoff Flow from Revised Data Book Figure 26. (Step 2.7.1) STANDARD: Candidate determines required #1 Seal Leakoff Flow from Revised Data Book Figure 26 to be between 1 gpm and **5** gpm. COMMENTS:	___ SAT ___ UNSAT
STEP 14: Add 0.26 gpm to the minimum required #1 Seal Leakoff Flow of Figure 26 to correct for an expected drop in leakoff flow on pump start (0.20 gpm) and instrument inaccuracy (0.06 gpm). (Step 2.7.2) STANDARD: Candidate adds 0.26 gpm to the minimum required #1 Seal Leakoff flow of Figure 26 for a minimum acceptable value of 1.26 gpm. COMMENTS:	___ SAT ___ UNSAT

STEP 15: Verify the indicated #1 Seal Leakoff flow is within the range of Data Book Figure 26 as adjusted per step 2.7.2 per one of the following: (Step 2.73) • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) or • 1NVCR-5140 (NC Pump Lo Leakoff Flow) (1MC-5) or • 1NVCR-5121, (NC Pump Hi Leakoff Flow) (1MC-5) or • Computer OAC computer point C1A1376, or C1A0442 STANDARD: Candidate determines indicated #1 Seal Leakoff Flow is between 1.26 gpm and **5.0** gpm. ***CUE: Indicated #1 Seal Leakoff Flow is 3.0 gpm.*** COMMENTS:	___ SAT ___ UNSAT
STEP 16: Verify upper and lower oil pot levels normal, for the pump to be started, via one of the following. (Step 2.8) • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • Visual inspection (local) OR • 1AD-6 F/2 "NCP B UPPER/LOWER OIL RESERVOIR **LO** LEVEL" DARK. STANDARD: Candidate determines that the upper and lower oil pot levels are normal by any of the following: • OAC Graphic indicates normal oil levels • 1AD6 F/2 annunciator is DARK. ***CUE: Upper and lower oil pot levels are normal.*** COMMENTS:	___ SAT ___ UNSAT

STEP 17: Verify KC flow to Thermal Barrier Heat Exchanger normal, for the pump to be started, via one of the following: (Step 2.9) • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • 1AD-6 E/2, "NCP B THERMAL BARRIER KC OUTLET HI/LO FLOW", DARK	___ SAT ___ UNSAT
STANDARD: Candidate determines that KC flow exists to the thermal barrier heat exchanger by any of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • 1AD-6 E/2, "NCP B THERMAL BARRIER KC OUTLET HI/LO FLOW", DARK	
CUE: NC Pump 1B has adequate KC flow to the Thermal Barrier Heat Exchanger.	
COMMENTS:	

STEP 18: Verify KC flow to Upper Motor Bearing. Oil Cooler normal, for the pump to be started, via one of the following: (Step 2.10) • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • 1AD-6 C/2, "NCP B MTR UPPER BRG KC OUTLET HI/LO FLOW, DARK STANDARD: Candidate determines that KC flow exists to the Upper Motor Bearing. Oil Cooler by any of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • 1AD-6 C/2 "NCP B MTR UPPER BRG KC OUTLET HI/LO FLOW, DARK ***CUE: NC Pump 1B has adequate KC flow to the upper motor bearing oil cooler.** COMMENTS:	___ SAT ___ UNSAT

STEP 19: Verify KC flow to Lower Motor Bearing. Oil Cooler normal, for the pump to be started, via one of the following: (Step 2.11) • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • 1AD-6 D/2 "NCP B MTR LOWER BRG KC OUTLET HI/LO FLOW, DARK STANDARD: Candidate determines that KC flow exists to the Lower Motor Bearing. Oil Cooler by any of the following: • Unit 1 Reactor Coolant Pumps graphic (NCPMPALL) OR • 1AD-6 D/2 "NCP B MTR LOWER BRG KC OUTLET HI/LO FLOW", DARK ***CUE: NC Pump 15 has adequate KC flow to the lower motor bearing oil cooler.** COMMENTS:	___ SAT ___ UNSAT
STEP 20: Verify annunciator 1AD-11, "230KV SWITCHYARD VOLTAGE LO" is dark. (Step 2.12) STANDARD: Candidate verifies alarm 1AD-11, K/6 is DARK ***CUE: "230KV SWITCHYARD VOLTAGE LO" Annunciator on 1AD-11, K/6 is DARK.** COMMENTS:	___ SAT ___ UNSAT

STEP 21: Two minutes prior to starting NC pump, start one oil lift pump for NCP to be started by pressing the on pushbutton for: (Step 2.13) "NC PMP OIL LIFT PMP B1" (or B2) STANDARD: Candidate depresses the Red "ON" pushbutton for NC PMP OIL LIFT PMP B1 or B2 and verifies that the Red "ON" light is LIT and the Green "OFF" light is DARK for the lift pump started. Candidate then waits two minutes before starting NC Pump 1B. ***CUE: The "ON" pushbutton for the oil lift pump has been depressed. The Red "ON" light is LIT and the Green "OFF' light is DARK. Two minutes have passed.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 22: Note prior to Step 2.14: 1. If NC pump is NOT started, the oil lift pump should be secured to minimize stress on oil nozzles. 2. The Degraded Bus Voltage Relays (27N) may actuate on the essential bus being supplied by the 6.9KV Switchgear associated with the NC Pump to be started in the following step. The alarm condition should clear within 36 seconds. STANDARD: No action required by the candidate. COMMENTS:	___ SAT ___ UNSAT

STEP 23: Start desired NC pump by pressing the "ON" pushbutton for: "NC PMP 1B" (Step 2.14) STANDARD: Candidate depresses the Red "ON" pushbutton for NC PMP 1B and verifies Red "ON" light is LIT and the Green "OFF" light is DARK and pump amps have stabilized near midscale on ammeter. ***CUE: The Red "ON" pushbutton for NC PMP 1B has been depressed. The Red "ON" light is LIT and the Green "OFF" light is DARK and pump amps have stabilized near midscale on ammeter.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 24: Observe all pump and motor parameters *to* verify proper operation. (Step 2.15) STANDARD: Candidate monitors the following parameters and verifies all are normal: • #1 Seal D/P greater than or equal to 200 psid. • Inlet Seal Water Flow 7-10 gpm (may be greater than 10 due to pump start) • #1 Seal Leakoff Flow appropriate for current Delta P per Revised Data Book Figure 26. • Pump Radial Bearing Temp less than 225°F (1MC5: 1NVP5360 or NCP GRAPHIC). • #1 Seal Outlet Temp between 60°F & 235°F (1MC5: 1NVP5400 or NCP GRAPHIC). • Pump Shaft Vibration less than 15 mils. (NCP GRAPHIC or PANEL on rear of 1MC-6). • Motor Bearings less than 190°F (NCP GRAPHIC). • Motor Winding Temp less than 302°F (NCP GRAPHIC). • Motor Frame Vibration less than 3 mils. (NCP GRAPHIC or PANEL on rear of 1MC-6). ***CUE: All operating parameters are normal.*** COMMENTS:	___ SAT ___ UNSAT

STEP 25: Three minutes after flow in the affected NC loop exceeds 90%, stop the oil lift pump started in step 2.13. (Step 2.16)	___ SAT
STANDARD: Candidate waits three minutes and then depress the Green "OFF" pushbutton and verifies the Green "OFF" light is LIT and the Red "ON:" light is DARK.	___ UNSAT
CUE: Three minutes have passed. The Green "OFF" pushbutton has been depressed. The Green "OFF" lighf is LIT and the Red "ON" light is DARK.	
COMMENTS:	
This JPM is complete.	

TIME STOP: _____

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

INITIATING CUE:

EP/1/A/5000/ES-0.2, Natural Circulation Cooldown has been implemented following a Reactor Trip. Control problems with 1NV-309 require the valve be operated in manual. The SRO instructs you to attempt to start NC Pump 1B by completing OP/1/A/6150/002A, NC Pump Operation Enclosure. 4.1. The Initial Conditions of Enclosure 4.1 have been satisfied.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/CR-5

Establish Feedwater to a Hot Dry Steam Generator

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Establish auxiliary feedwater flow to a hot, dry steam generator using Enclosure 8 of EP/1/A/5000/FR.H-1 (Response to Loss of Secondary Heat Sink).

Alternate Path:

NO

Facility JPM #:

CSF-005

K/A Rating(s):

061 **A2.04**(3.4/3.8)

Task Standard:

Candidate establishes CA flow to 1B steam generator based on the trend *of* Core Exit Thermocouples stable or decreasing.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Control Room **X** In-Plant _____ Perform _____ Simulate **X**

References:

EP/1/A/5000/FR.H-1 (Response to Loss of Secondary Heat Sink) Revision 22

Validation Time: 16 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ /_____
NAME SIGNATURE DATE

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COMMENTS

_____

_____

_____

SIMULATOR SET- UP SHEET

1. Init to 100% power.
2. Rackout both motor driven CA pumps (LOA-CA017 & CA-018) and close the CAPT T&T valve.
3. Trip both CFPT's and perform actions of E-0 and ES-0.1 until entry conditions to FR-H.l are satisfied.
4. Allow the steam generators to decrease level until all are less than 12% W/R. Establish Bleed and Feed and ensure all steps up to Step 33 are complete. The intent is to have all actions fail to restore CA or CM/CF until step 33. Ensure CA is reset.
5. Rack-in CA pump 1A (CA-017) and ensure it is capable of being manually started per Enclosure 7.
6. Freeze simulator and write to a snap.

IC SELECTED 218

SIMULATOR OPERATOR INSTRUCTIONS:

1. Reset to IC selected in the setup.

Tools/Equipment/Procedures Needed:

Have enough copies of EP/1A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink) Revision 22 available for each candidate.

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.

INITIATING CUE:

The unit is currently in a Bleed and Feed alignment per EP/1/A/5000/FR-H.1 (Response to Loss *of* Secondary Heat Sink). With the bleed in progress, the PRT has ruptured causing containment pressure to reach 3 psig; the unit is in ACC conditions. A source of feedwater has been aligned to CA pump 1A and the SRO has directed you to establish CA flow to 1B steam generator per Enclosure 8 (Hot Dry Feed flow Restoration Limits).

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates EP/1/A/5000/FR-H.1, Enclosure 8. **EXAMINER CUE: When the candidate locates EP/1/A/5000/FR-H.1, hand him/her a clean copy of Enclosure 8 and tell him/her that it is current and complete.** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Establish feedwater flow to only one S/G (Enclosure 8, Step 1) STANDARD: From initiating cue, the candidate will feed only 1B S/G COMMENTS:	___ SAT ___ UNSAT

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

STEP 3: Close the following valves for the three S/Gs to be isolated: (Enclosure 8, Step 2) STANDARD: Candidate closes the following valves • S/G 1A: a. Close ICA-62A (CA Pmp A Disch To S/G 1A Isol ***CUE: The "Close" pushbutton for 1CA-62A has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* **b.** Close 1CA-66B (CA Pmp 1 Disch To S/G 1A Isol) ***CUE: The "Close" pushbutton for ICA-66B has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* • S/G IC: a. Close 1CA-46B (CA Pmp B Disch To S/G 1C Isol ***CUE: The "Close" pushbutton for 1CA-46B has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* b. Close 1CA-50A (CA Pmp 1 Disch To S/G 1C Isol) ***CUE: The "Close" pushbutton for ICA-50A has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* • *S/G* ID: a. Close 1CA-42B (CA Pmp B Disch To S/G I D Isol ***CUE: The "Close" pushbuffon for 1CA-42B has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* b. Close 1CA-38A (CA Pmp 1 Disch To S/G I D Isol) ***CUE: The "Close" pushbutton for ICA-38A has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

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

STEP 4: Ensure CA System valve control – RESET (Enclosure 8, Step 3) STANDARD: Candidate ensures CA system reset by verifying the yellow "CA SYS VLV CTRL TRAIN A (B)" "RESET" lights are lit. ***CUE: The Yellow "CA SYS VLV CTRL TRAIN A" "RESET" light is LIT and the Yellow "CA SYS VLV CTRL TRAIN B "RESET" light is LIT**.*** COMMENTS:	___ SAT ___ UNSAT

STEP 5: Close the following CA flow control valves: (Enclosure 8, Step 4)

CRITICAL STEP

STANDARD: Candidate turns the potentiometer for the following valves in the counter-clockwise direction until 0.0 is displayed:

___ SAT

- 1CA-64 (CA Pump #1 Flow To S/G 1A)

CUE: The potentiometer for 1CA-64 is turned in the counter-clockwise direction. The controller display indicates 0.0

___ UNSAT

- 1CA-60 (CA Pump 1A Flow To S/G 1A)

CUE: The potentiometer for 1CA-60 is turned in the counter-clockwise direction. The controller display indicates 0.0

- 1CA-52 (CA Pump #1 Flow To S/G 1B)

EXAMINER NOTE: It is critical that the flow controller to steam generator 1B from CA pump 1A (1CA-52) be closed to prevent feeding the steam generator in an uncontrolled manner. Closing the other controllers is not critical since no source of feedwater is available via that flow path.

CUE: The potentiometer for 1CA-52 is turned in the counter-clockwise direction. The controller display indicates 0.0

- 1CA-56 (CA Pump 1A Flow To S/G 1B)

CUE: The potentiometer for 1CA-56 is turned in the counter-clockwise direction. The controller display indicates 0.0

- 1CA-48 (CA Pump #1 Flow To S/G IC)

CUE: The potentiometer for ICA-48 is turned in the counter-clockwise direction. The controller display indicates 0.0

- 1CA-44 (CA Pump 1B Flow To S/G IC)

CUE: The potentiometer for 1CA-44 is turned in the counter-clockwise direction. The controller display indicates 0.0

- 1CA-36 (CA Pump #1 Flow To S/G 1D)

CUE: The potentiometer for 1CA-36 is turned in the counter-clockwise direction. The controller display indicates 0.0

- 1CA-40 (CA Pump 1B Flow To S/G 1D)

CUE: The potentiometer for 1CA-40 is turned in the counter-clockwise direcfion. The confroller display indicates 0.0

COMMENTS:

STEP 6: **Do** not continue in this enclosure until a source of feedwater is available to the S/G(s). (Enclosure 8, Step 5) STANDARD: Candidate determines from the initiating cue that 1A CA pump is available) EXAMINER CUE: The SRO directs you to start the 1A CA pump. COMMENTS:	___ SAT ___ UNSAT
STEP 7: Verify core exit T/Cs – Stable or Decreasing (Enclosure 8, Step 6) STANDARD: Candidate determines from the RVLIS display on 1MC-1 or from the OAC the core exit thermocouple trend. EXAMINER NOTE: This JPM has **two** different operator actions depending on the temperature trend of the T/Cs. • If the T/Cs are stable **or** decreasing, the candidate will perform JPM step 8. • If the T/Cs are increasing the candidate will transition to the step 6 RNO and perform JPM step 9. ***CUE:** The core exit thermocouples are increasing** COMMENTS:	___ SAT ___ UNSAT

STEP 8: Maintain feed flow rate less than or equal to 100 GPM until W/R S/G level is greater than 21% (ACC) (Enclosure 8, Step 7) STANDARD: Candidate starts the 1A CA pump by depressing the "ON" pushbutton and verifying that the Red "ON" light is LIT and the Green "OFF" light is DARK. Candidate then turns the potentiometer for 1CA-56 in the clockwise direction to obtain a flow rate to 1B steam generator of less than or equal to 100 gpm. ***CUE: The "ON" pushbutton for the 1A CA pump has been depressed. The RED "ON" light for CA Pump 1A is LIT and the GREEN "OFF" light is DARK. The potentiometer for 1CA-56 has been turned in the clockwise direction. Flow rate to 1B steam generator is 95 gpm.*** COMMENTS:	CRITICAL **STEP** ___ SAT ___ UNSAT
STEP 9: If core exit T/Cs are increasing THEN feed S/G at a rate required to decrease core exit T/Cs temperature. (Enclosure 8, Step 6. RNO.) STANDARD: Candidate starts the 1A CA pump by depressing the "ON" pushbutton and verifying that the Red "ON" light is LIT and the Green "OFF" light is DARK. Candidate then turns the potentiometer for 1CA-56 in the clockwise direction to obtain a flow rate to 1B steam generator that results in a decrease in core exit thermocouple readings. ***CUE: The "ON" pushbutton for the 1A CA pump has been depressed. The RED "ON" light for CA Pump 1A is LIT and the GREEN "OFF" light is DARK. The potentiometer for 1CA-56 has been turned in the clockwise direction. Flow rate to 1B steam generator has increased. Core exit thermocouple temperatures are decreasing.*** COMMENTS:	CRITICAL **STEP** ___ SAT ___ UNSAT

STEP 10: When W/R S/G level is greater than 21% (ACC), then feed flow can be increased to desired rate. (Enclosure 8, Step 8) STANDARD: Candidate determines that wide range steam generator level is less than 21% and continues to monitor level increase. Candidate continues to step 9. **CUE: 1B steam generator wide range level is less than 21%**. COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: If this jpm is performed on the simulator, loop "B" Thot will be greater than 550°F in the next step	
STEP 11: Verify NC T-HOT associated with the S/G being fed – LESS THAN 550°F. (Enclosure 8, Step 9) STANDARD: Candidate verifies temperatures for "B" Hot leg using OAC NC graphic, RVLIS monitors, recorder 1NCCR5850 for Loop 1B Thot on 1MC-05 is approximately 562°F **CUE: "B" loop hot leg temperature is indicating 530°F**. COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: If this JPM is being performed in the control room, continue with JPM Step 12 after providing the cue in JPM Step 12. If this JPM is being performed on the simulator, terminate the JPM by telling the candidate that another operator will complete Enclosure 8.	

Step 12 Verify S/G being fed – Intact. (Enclosure 8, step 10) STANDARD: Candidate verifies the following: • S/G 1B pressure not decreasing in uncontrolled manner using 1MC-2, Steam pressure Channels 1,2,3. • All 1B S/G related EMFs: 27, 72, 73, 33 trip 1 lights DARK. • ***S/G*** 1B level increase is under control of the candidate *****CUE:*** o ***Steam generator 1B is pressurized and pressure is not decreasing in an uncontrolled manner.*** • ***EMF-27, 72, 73 and 33 trip 1 lights are DARK*** o ***Steam generator 1B level is under operator control*** COMMENTS:	___ SAT ___ UNSAT
This JPM is complete.	

TIME STOP: _____

*****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)

INITIATING CUE:

The unit is currently in a Bleed and Feed alignment per EP/1/A/5000/FR-H.1 (Response to Loss of Secondary Heat Sink). With the bleed in progress, the PRT has ruptured causing containment pressure to reach 3 psig; the unit is in ACC conditions. A source of feedwater has been aligned to CA pump 1A and the SRO has directed you to establish CA flow to 1B steam generator per Enclosure 8 (Hot Dry Feed flow Restoration Limits).

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM SIM-6

Transfer Emergency Core Cooling System to Hot Leg Recirculation

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Transfer the emergency core cooling systems to hot leg recirculation with flow indicated from both trains of the ND System

Alternate Path:

YES

Facility JPM #:

NI-098

K/A Rating(s):

011 EA1.11 (4.2/4.2)

Task Standard:

Candidate establishes hot leg recirculation with flow indicated from both trains of the ND System

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator X In-Plant _____ Perform X Simulate _____

References:

EP/1/A/5000/ES-1.4 Transfer to Hot Leg Recirculation Revision 005.

Validation Time: 14 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

SIMULATOR SET-UP SHEET

1. Reset to any at power IC set.
2. **Insert** MAL-NI001B **SI Pump B Failure Set** = BOTH
3. **Insert** MAL-NI001A **SI Pump A Failure Set** = MANUAL
4. **Insert** MAL-NC013A **(Cold Leg Break), Severity Value** = 27.5 **inch.**
5. Complete all procedure actions (EP/E-0, E-1, ES-1.3) up to point of placing ECCS systems in Hot Leg Recirc alignment.
6. Freeze simulator and write snap.
7. IC selected 214

SIMULATOR OPERATOR INSTRUCTIONS:

1. **Reset to snap 214.**

Tools/Equipment/ dure :

Have enough copies of EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation) Revision 5 available for each candidate.

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.

INITIATING CUE:

A LOCA on the NC System has been in progress for 6 hours. The Emergency Core Cooling System (ECCS) is in the Cold Leg Recirculation lineup. 1B NI Pump failed to start on the Safety Injection and could not be started manually. The SRO instructs you to transfer the **ECCS** System to **Hot** Leg Recirculation per **EP/1/A/5000/ES-1.4.**

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates EP/1/A/5000/ES-1.4 *EXAMINER'S CUE: When the candidate locates* **EP/1/A/5000/ES-1.4**, *hand* him/her *a copy and tell* him/her *that it is current and complete.* COMMENTS:	___ SAT ___ UNSAT
STEP 2: Align NI Pumps for Hot Leg Recirculation: (Step 1.) Stop NI Pump 1A. (Step 1.a) STANDARD: Candidate depresses NI Pump A "OFF" pushbutton (1MC-11). Verifies the Green "OFF light is LIT, and the Red "ON" light is DARK. ***CUE: The NI pump A OFF pushbutton has been depressed. The Green "OFF" light is LIT and the Red "ON" light is DARK.*** COMMENTS:	___ SAT ___ UNSAT
STEP 3: Close 1NI-I18A (NI Pump 1A C-Leg Inj Isol). (Step 1.b.) STANDARD: Candidate depresses 1NI-I18A 'CLOSE" pushbutton (1MC-11). Verifies the Green "CLSD" light is LIT and Red "OPEN" light is DARK ***CUE: The close pushbutton for INI-118A has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.* COMMENTS:	___ SAT ___ UNSAT

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

STEP 4: Place the "PWR DISCON For 1NI-121A" switch to the "ENABLE" position. (Step 1.c.) STANDARD: Candidate places the "PWR DISCON For 1NI-121A" switch to the "ENABLE" position ***CUE: The "POWER DISCONNECT for 1NI-121A" switch is in the "ENABLE" position.*** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Open INI-121A (NI Pump 1A To H-Legs B&C) (Step 1.d.) STANDARD: Candidate depresses 1NI-121A (NI Pump A *to* H-Legs B & C) "OPEN" pushbutton (1MC-11). Verifies the Red "OPEN" light is LIT and the Green "CLSD" light is DARK. ***CUE: The "OPEN" pushbutton for 1NI-121A as been depressed. The RED "OPEN" light is LIT, and the GREEN "CLOSED" light is DARK.* COMMENTS:	___ SAT ___ UNSAT
STEP 6: WHEN 1NI-121A is open, THEN start NI Pump 1A. (Step 1.e.) STANDARD: Candidate depresses NI Pump 1A "ON" pushbutton (1MC-11). Observes that the Green "OFF" light is LIT and the Red "ON" light is DARK, no amps indicated on meter. ***CUE: The Green "OFF" light is LIT and the Red "ON" light is DARK for NI Pump 7A. No amps are indicated on the meter*** COMMENTS:	___ SAT ___ UNSAT

STEP 7: Stop NI Pump 1B. (Step 1.f.) STANDARD: Candidate determines that NI Pump B is currently off. Determines the Green "OFF" light is LIT, and the Red "ON" light is DARK. ***CUE: NI pump B is off. The Green "0FF" light is LIT and the Red "ON" light is DARK.*** COMMENTS:	___ SAT ___ UNSAT
STEP 8: Close 1NI-150B (NI Pump 1B C-Leg Inj Isol). (Step 1g.) STANDARD: Candidate depresses 1NI-I50B "CLOSE" pushbutton (1MC-1I). Verifies the Green "CLSD" light is LIT and Red "OPEN" light *is* DARK ***CUE: The close pushbuffon for 1NI-150B has been depressed. The Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.*** COMMENTS:	___ SAT ___ UNSAT
STEP 9: Place the "PWR DISCON For 1NI-I62A switch in "ENABLE. (Step 1.h.) STANDARD: Candidate places the "PWR DISCON For 1NI-162A" switch in "ENABLE". ***CUE: The "POWER DISCONNECT for 1NI-162A" switch is in the "ENABLE" position.** COMMENTS:	___ SAT ___ UNSAT

STEP IO: Close 1NI-162A (NI To C-Legs Inj Hdr Isol) (Step 1.i.) STANDARD: Candidate depresses 1NI-162A "CLOSED" pushbutton (1MC-11). Verifies the Red "OPEN" light is LIT and the Green "CLSD" light is DARK. ***CUE: The "CLOSED" pushbutton for INI-162A as been depressed. The RED "OPEN" light is DARK, and fhe GREEN "CLOSED" light is LIT.*** COMMENTS:	___ SAT ___ UNSAT
STEP 11: Place the "PWR DISCON For 1NI-I52B" switch in "ENABLE". (Step 1.j.) STANDARD: Candidate places the "PWR DISCON For 1NI-152B" switch in "ENABLE". ***CUE: The "POWER DISCONNECT for 1NI-152B" switch is in the "ENABLE" position.*** COMMENTS:	___ SAT ___ UNSAT
STEP 12: Open 1NI-152B (NI Pump 1B To H-Legs A&D) (Step 1.k.) STANDARD: Candidate depresses 1NI-152B "OPEN" pushbutton (1MC-11). Verifies the Red "OPEN" light is LIT and the Green "CLSD" light is DARK. ***CUE: The "OPEN" pushbutton for 1NI-152B as been depressed. The RED "OPEN" light is LIT, and the GREEN 'CLOSED" light is DARK.* COMMENTS:	___ SAT ___ UNSAT

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

STEP 13: WHEN 1NI-152B is open, THEN start NI Pump 1B. (Step 1.l.) STANDARD: Candidate depresses NI Pump 1B "ON" pushbutton (1MC-11). Observes that the Green "OFF" light is LIT and the Red "ON" light is DARK, no amps indicated on meter. ***CUE: The Green "OFF" light is LIT and the Red "ON" light is DARK for NI Pump 1B. No amps are indicated on the meter**** COMMENTS:	___ SAT ___ UNSAT
STEP 14: Verify flow from at least one train of NI. (Step 2.) STANDARD: Candidate determines "0" flow on NI flow meters. Transitions to Step 2 RNO and proceeds to Step 5. ***CUE: No flow is indicated from either NI train.** COMMENTS:	___ SAT ___ UNSAT
STEP 15: a. Notify station management that NI flow not indicated (Step 2. RNO) b. GO TO Step **4** STANDARD: Notifies management of no NI flow indicated. Goes to step **4** ***Examiner Cue: When management* is *called, say* "I *understand that* NO NI flow *indicated."*** COMMENTS:	___ SAT ___ UNSAT

STEP 16: Align ND Pumps for Hot Leg Recirc as follows: (Step 4.a.)

a. Verify following valves – CLOSED

- 1ND-1B (ND Pump 1A Suct From Loop B)
- 1ND-2A (ND Pump 1A Suct From Loop B
- 1ND-36B (ND Pump 1B Suct From Loop C)
- 1ND-37A (ND Pump 1B Suct From Loop C)
- 1ND-32A (ND Train 1A Hot Leg Inj Isol)
- 1ND-65B (ND Train 1B Hot Leg Inj Isol)

CRITICAL STEP

___ SAT

___ UNSAT

STANDARD: Candidate verifies the following:

- 1ND-IB (ND Pump 1A Suct From Loop B) Red "OPEN" light dark and Green "CLOSED" light lit.
- 1ND-2A (ND Pump 1A Suct From Loop B) Red "OPEN" light dark and Green "CLOSED" light lit.
- 1ND-36B (ND Pump 1B Suct From Loop C) Red "OPEN" light dark and Green "CLOSED" light lit.
- 1ND-37A (ND Pump I B Suct From Loop C) Red "OPEN" light dark and Green 'CLOSED" light lit.
- 1ND-32A (ND Train 1A Hot Leg Inj Isol) Red "OPEN" light dark and Green "CLOSED" light lit.
- 1ND-65B (ND Train 1B Hot Leg Inj Isol) Red "OPEN" light dark and Green "CLOSED" light lit.

*****CUE:***

- ***IND-IB Red "OPEN" light DARK and Green "CLOSED" light LIT.***
- ***1ND-2A Red "OPEN" light DARK and Green "CLOSED" light LIT.***
- ***IND-36B Red "OPEN" light DARK and Green "CLOSED" light LIT.***
- ***IND-37A is closed.***
- ***IND-32A Red "OPEN" light DARK and Green "CLOSED" light LIT.***
- ***1ND-65B Red "OPEN' light DARK and Green "CLOSED" light LIT.***

COMMENTS:

STEP 17: Place "PWR DISCON FOR 1NI-183B to "ENABLE" (Step **4.b.)** STANDARD: Candidate places the "PWR DISCON For 1NI-183B" switch to the "ENABLE" position *****CUE: The "POWER DISCONNECT for 1NI-183B" switch is in the "ENABLE" position.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 18: Open 1NI-183B (ND Hdr A&B Hot Leg Inj Isol) (Step 4.c.) STANDARD: Candidate depresses 1NI-183B "OPEN" pushbutton (1MC-11). Verifies the Red "OPEN" light is LIT and the Green "CLSD" light is DARK. *****CUE: The "OPEN" pushbutton for 1NI-183B as been depressed. The RED "OPEN" light is LIT and the GREEN "CLOSED" light is DARK**,*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 19: For A ND Train: (Step 4.d.) 1) Verify INS-43A (ND Pmp 1A to Cont Spray Hdr) - CLOSED STANDARD: Candidate observes 1NS-43A Red "OPEN" light is DARK and the Green "CLSD" light is LIT. *****CUE: The INS-43A Red "OPEN" light is DARK and the GREEN "CLOSED" light is LIT**.*** COMMENTS:	___ SAT ___ UNSAT

STEP 20: Place "PWR DISCON FOR 1NI-173A in "ENABLE". (Step 4.d.2)) STANDARD: Candidate places the "PWR DISCON For 1NI-173A" switch in the "ENABLE". ***CUE: The "POWER DISCONNECT for 1NI-173A" switch is in the "ENABLE" position.**** COMMENTS:	___ SAT ___ UNSAT
STEP 21: Close 1NI-173A (ND Hdr 1A to Cold Legs C&D). (Step 4.d.3)) STANDARD: Candidate depresses 1NI-I73A "CLOSED" pushbutton (1MC-1I). Verifies the Red "OPEN" light is DARK and the Green "CLSD" light is LIT. ***CUE: The "CLOSED" pushbutton for 1NI-173A has been depressed. The RED "OPEN" light is DARK, and the GREEN "CLOSED" light is LIT.** COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: It is critical for the candidate to open EITHER 1ND-32A (ND Train I A Hot Leg Inj. Isol) OR 1ND 65B (ND Train 1B Hot Leg Inj. Isol).	

STEP 22: Open 1ND-32A (ND Train 1A Hot Leg Inj. Isol). (Step 4.d.4)) STANDARD: Candidate depresses 1ND-32A "OPEN" pushbutton (1MC-11). Verifies the Red "OPEN" light is LIT and the Green "CLSD" light is DARK. ***CUE: The "OPEN" pushbuffon for IND-32A has been depressed. The RED "OPEN" light is LIT and the GREEN "CLOSED" light is DARK**.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 23: For B ND Train: (Step 4.e. 1)) 2) Verify INS-38B (ND Pmp 1B to Cont Spray Hdr) – CLOSED STANDARD: Candidate observes 1NS-38B Red "OPEN" light is DARK and the Green "CLSD" light is LIT. ***CUE: The INS-38B Red "OPEN" lighf is DARK and the GREEN "CLOSED" light is LIT**.*** COMMENTS:	___ SAT ___ UNSAT
STEP **24:** Place "PWR DISCON FOR 1NI-178B to "ENABLE" (Step 4.e.2)) STANDARD: Candidate places the "PWR DISCON For 1NI-178B" switch to the "ENABLE" position ***CUE: The "POWER DISCONNECT for 1NI-178B" switch is in the "ENABLE" position.** COMMENTS:	___ SAT ___ UNSAT

STEP 25: Close 1NI-I78B (ND Hdr B to Cold Legs C&D) (Step 4.e.3)) STANDARD: Candidate depresses 1NI-I78B "CLOSED" pushbutton (IMC-I1). Verifies the Red "OPEN" light is DARK and the Green "CLSD" light is LIT. ***CUE: The "CLOSED" pushbuffon for 1NI-178B as been depressed. The RED "OPEN" light is DARK, and the GREEN "CLOSED" lighf is LIT.*** COMMENTS:	___ SAT ___ UNSAT
STEP 26: Open 1ND-65B (ND Train 1B Hot Leg Inj. Isol). (Step 4.e.4)) STANDARD: Candidate depresses 1ND-65B "OPEN" pushbutton (IMC-11). Verifies the Red "OPEN" light is LIT and the Green "CLSD" light is DARK. ***CUE: The "OPEN" pushbuffon for 1ND-65B as been depressed. The RED "OPEN" lighf is LIT and fhe GREEN "CLOSED" light is DARK**.* COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 27: Ensure Monitor Light Panel Group 6 HLR lights – LIT. (Step 5.) STANDARD: Candidate verifies Monitor Light Panel Group 6 HLR lights are LIT. ***CUE: The Monitor Light Panel Group 6 HLR lighfs are lit.*** COMMENTS:	___ SAT ___ UNSAT

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

STEP 28: Verify flow to NC Hot Legs from at least one train of ND. (Step 6.) STANDARD: Verify flow to NC Hot Legs as indicated on ND to Hot Legs B&C flow meter (1NIP5010) on 1 MC-11. *****CUE: Flow to the NC Hot Legs is reading 4500 gpm on 1NIP5010.***** COMMENTS:	___ SAT ___ UNSAT
STEP 29: RETURN TO procedure and step in effect.	

TIME STOP: _____

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

INITIATING CUE:

A LOCA on the NC System has been in progress for 6 hours. The Emergency Core Cooling System (ECCS) is in the Cold Leg Recirculation lineup. 1B NI Pump failed to start on the Safety Injection and could not be started manually. The SRO instructs you to transfer the ECCS System to Hot Leg Recirculation per **EP/1/A/5000/ES-1.4.**

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/SIM-7

Respond to a Leak in the KC System

CANDIDATE _____

EXAMINER _____

CATAWBA

INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Perform Enclosure 1 actions of AP/1/A/5500/021 (Loss of Component Cooling) during a leak in the KC system

Alternate Path:

YES

Facility JPM #:

NEW

K/A Rating(s):

008 ***A2.02*** (3.2/3.5)

Task Standard:

Reactor coolant pumps are tripped. The reactor is tripped and the Immediate Actions of EP/1/A/5000/E-0 (Reactor Trip or Safety Injection) have been performed from memory.

Preferred Evaluation Location:

Simulator ___X___ In-Plant _____

Preferred Evaluation Method:

Perform ___X___ Simulate _____

References:

AP/1/A/5500/021, "Loss of Component Cooling" Rev. 30

Validation Time: 9 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

SIMULATOR SETUP SHEET:

1. Recall IC #
2. Insert LOA – KC010 (KC 106 KC Surge Tank 1A Drn Block), severity = 1.0, insert.
3. Insert LOA – KC-014 (KC 123 KC Surge Tank 1B Drn Block), severity = 1.0, insert.
4. Insert MAL – KC002A (KC System Relief Valve KC-61 Failure); value = OPEN
5. Insert MAL – KC002B (KC System Relief Valve KC-330 Failure); value = OPEN
6. Insert MAL – KC002C (KC System Relief Valve KC-386 Failure); value = OPEN
7. Insert MAL – KC002D (KC System Relief Valve KC-86Failure); value = OPEN
8. Insert MAL – KC002E (KC System Relief Valve KC-313 Failure); value = OPEN
9. Insert MAL – EHC002 (Turbine Trip Failure); value = 0 (AUTO)
10. Go to run until the KC SURGE TANK A and B LoLo LVL annunciators alarm.
11. Ensure both KF pumps are OFF
12. Clear the following when surge tank low level alarms are received:
    1. LOA – KC-014 (KC 123 KC Surge Tank 1B Drn Block)
    - MAL – KC002A (KC System Relief Valve KC-61 Failure)
    - MAL – KC002B (KC System Relief Valve KC-330 Failure)
    - MAL – KC002C (KC System Relief Valve KC-386 Failure)
    - MAL – KC002D (KC System Relief Valve KC-86Failure)
    - MAL – KC002E (KC System Relief Valve KC-313 Failure)
12. Run the simulator until NC pump motor bearing temperatures are approximately 185°F.
13. Acknowledge alarms, Freeze the simulator, and write to a SNAP.

    SNAP No.: 212

Place simulator in run when directed by the examiner.

SIMULATOR OPERATOR INSTRUCTIONS:

None

Tools/Equipment/Procedures Needed:

Ensure a clean copy of AP-21 Enclosure 1 is available for each candidate.

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:

You are the Unit 1 OATC

Unit 1 is at 100% power

Annunciators 1AD-10, N1 and N2, "KC Surge Tank A and B Lo-Lo Level" have alarmed, along with various OAC level and sump alarms.

AP/1/A/5500/021 (Loss of Component Cooling) has been implemented.

INITIATING CUE:

The Control Room SRO instructs you to monitor Enclosure 1 and perform any required actions.

START TIME: _____

EXAMINER NOTE: *When* **AP/1/A/5500/021** *is located, give the candidate a copy of the procedure.*	
STEP1: SSF Manning Criteria: (Enclosure 1, Step 1) CAUTION Failure to restore NC pump seal cooling via thermal barrier cooling or NV seal injection within ten minutes will cause damage to the NC pump seals resulting in NC System inventory loss. IF KC AND NV seal cooling for any NC pump is lost, THEN ... STANDARD: Candidate observes that 1B NV pump is in service and that seal cooling is available to all four reactor coolant pumps. Determines that step does not apply. ***CUE: The Red "ON" light for NV pump 1B is LIT and the Green 'OFF" light is DARK. Seal injection flow is indicated fo all four reactor coolant pumps.*** COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: JPM *step* **2** *will not be met initially. Candidate will continue to monitor trip criteria for the reactor coolant pumps.*	
STEP 2: NC pump trip criteria: (Enclosure 1, Step 2) IF any of the following NC pump trip criteria is met: • #1 Seal outlet temperature - GREATER THAN 235°F **OR** • Lower bearing temperature - GREATER THAN **225°F OR** • Motor bearing temperature - GREATER THAN 195°F. THEN: STANDARD: Once any of the reactor coolant pump trip criteria are met, the candidate will perform the required actions. ***CUE: Motor bearing temperafure on all four reactor coolant pumps is 197°F.*** COMMENTS:	___ SAT ___ UNSAT

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

EXAMINER NOTE: While monitoring trip criteria, candidate will proceed to JPM step 14 for remainder of Enclosure 1 Actions. When trip criteria is met. candidate performs JPM steps 3-13.	
STEP 3: Place the steam dumps in pressure mode. (Enclosure 1, Step 2.a.) STANDARD: Candidate places the "STEAM DUMP SELECT" switch in the "PESS" position. ***CUE:** The ***"STEAM DUMP SELECT"*** switch is in the ***"PRESS"*** position. ** COMMENTS:	___ SAT ___ UNSAT
STEP 4: Ensure the Reactor – TRIPPED. (Enclosure 1, Step 2.b.) STANDARD: Candidate rotates both reactor trip handles counter clockwise to the trip position ***CUE:** Both reactor trip switches have been rotated counter clockwise to the trip position** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
EXAMINER NOTE: Candidate may go on to perform the Immediate Actions of emergency procedure E-0 (JPM steps 9-13) then perform Enclosure 1 actions. (JPM steps **5,6,7,8,** 14-16)	

STEP 5: Trip all NC pumps. (Enclosure 1, Step 2.c) STANDARD: Candidate depresses the "OFF" buttons for the "NC PMP 1A, 1B, 1C and 1D" switches and verifies Red "ON" lights are DARK and the Green "OFF lights are LIT for all four reactor coolant pumps. **CUE: *The Red "ON" light is DARK and the Green "OFF" light is LIT for reactor coolant pump 1A. The Red "ON" light is DARK and the Green "OFF" light is LIT for reactor coolant pump 1B. The Red "ON" light is DARK and the Green "OFF" light is LIT for reactor coolant pump 1C. The Red "ON" light is DARK and the Green "OFF" light is LIT for reactor coolant pump ID.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Ensure spray valves for the affected NC pumps - IN MANUAL AND CLOSED. (Enclosure 1, Step 2.d.) STANDARD: Candidate places the manual/auto stations for 1NC-27 and 1NC-29 in manual and ensures the demand is at "0". **CUE: *The manual/auto stations for 1NC-27 and 1NC-29 are in manual and the demand is at "0".*** COMMENTS:	___ SAT ___ UNSAT

STEP 7: Secure any dilutions in progress. (Enclosure 1, Step 2.e.) STANDARD: Candidate determines that no dilutions are in progress by determining that the NV make up controls are set for automatic makeup. ***CUE: No dilutions are in progress.*** COMMENTS:	___ SAT ___ UNSAT
STEP 8: IF the reactor trip breakers were closed, THEN perform one of the following while continuing with this procedure as time and conditions allow: • IF above P-11, GO TO EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection). OR • IF below P-11, GO TO AP/1/A/5500/05 (Reactor Trip Or Inadvertent S/I Below P-11). (Enclosure 1, Step 2.f.) STANDARD: Candidate determines that the reactor trip breakers were closed and goes to EP/1/A/5000/E-0 and performs the immediate actions from memory. ***CUE: The reactor trip breakers were previously closed".*** COMMENTS:	___SAT ___UNSAT

STEP 9: Verify Reactor Trip: (E-0, Step 2) • All rod bottom lights – LIT • All reactor trip and bypass breakers – OPEN • I/R amps – DECREASING STANDARD: Candidate determines that all rod bottom lights are lit, all reactor trip and bypass breakers are open and I/R amps are decreasing. ***CUE: All rod bottom lights are lit, all reactor trip and bypass breakers are open and I/R amps are decreasing.**** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Verify Turbine Trip: (E-0, Step 3.) • All turbine stop valves – CLOSED STANDARD: Candidate determines that the turbine is not tripped and performs Step 2 RNO. ***CUE: Turbine stop valves are not closed.**** COMMENTS:	___SAT ___UNSAT

STEP 11: Manually trip the turbine. (E-0, Step 3. RNO) STANDARD: Candidate depresses the manual trip pushbutton on the turbine control panel and determines that the turbine trips by observing that the turbine stop valve status lights are lit. *****CUE: The manual trip pushbutton on the turbine control panel has been depressed. The turbine sfop valve status lights are lif .***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: Verify 1ETA and 1ETB - ENERGIZED. (E-0, Step **4.)** STANDARD: Candidate verifies that 1ETA and 1ET6 are energized by checking power availability to loads supplied from the essential busses. *****CUE: IETA and IETB are energized.***** COMMENTS:	___ SAT ___ UNSAT

STEP 13: Verify S/I is actuated: (E-0, Step 5.) a. "SAFETY INJECTION ACTUATED status light (1SI-13) - LIT. **b.** E/S load sequencer actuated status lights (1SI-14) - LIT. STANDARD: Candidate observes status lights and determines that "SAFETY INJECTION ACTUATED" status light (1SI-13) and E/S load sequencer actuated status lights (1SI-14) are LIT. ***CUE:** SAFETY INJECTION ACTUATED status light (1SI-13) - LIT. **U S** load sequencer actuated status lights (1SI-14) - LIT.** COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: These last 3 JPM steps require no action and are to be monitored by the candidate. This may have already been addressed before the reactor coolant pumps were tripped.	
STEP 14: IF AT ANY TIME the following conditions are met: (Enclosure 1, Step 3.) • Train B KC non-essential header isolation valves - CLOSED AND • 1KC-81B (KC To ND Hx 1B Sup Isol) - CLOSED. THEN: Ensure less than 2 train B KC pumps - IN SERVICE. STANDARD: Candidate determines that only 1B1 KC pump is in service. **CUE: 1B1 KC Pump is in service.** COMMENTS:	___ SAT ___ UNSAT

STEP 15: IF AT ANY TIME both trains of KC are lost, Then return to Section C (Operator Actions), Step 2. (Enclosure 1, Step **4.)** STANDARD: Candidate determines that 1B1 KC pump is operating. ****CUE: 1B1 KC Pump is in service.***** COMMENTS:	___ SAT ___ UNSAT
STEP 16: IF operators are dispatched to align alternate cooling to NV pump 1A, Then perform the following: a. When alternate cooling is aligned, Then perform Enclosure 7 (Maximize NV Pump Run Time) Step 7. (Enclosure 1, Step 5.) STANDARD: No action required by candidate. 1B1 KC pump is in service. ****CUE:** Operators have not been dispatched to align alternate cooling to NV pump 1A.*** COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: If reactor coolant pumps have not been tripped, candidate returns to Enclosure 1 Step 1 (JPM step 2)	
EXAMINER NOTE: After the E-0 actions are complete and Enclosure 1 actions addressed, you may apply the terminating cue TERMINATING CUE: Another operator will perform the remainder of the procedure. JPM is complete.	

TIME STOP: _____

****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:

You are the Unit 1 OATC

Unit 1 is at 100% power

Annunciators 1AD-10, A/1 and *N2,* "KC Surge Tank A and B Lo-Lo Level" have alarmed, along with various OAC level and sump alarms.

AP/1/A/5500/021 (Loss of Component Cooling) has been implemented.

INITIATING CUE:

The, Control Room **SRO** instructs you to monitor Enclosure 1 and perform any required actions.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/CR-8

Vent the Reactor Vessel Head Following a Small Break LOCA

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Vent the reactor vessel head following a small break LOCA.

Alternate Path:

NO

Facility JPM #:

CSF-001 (modified)

K/A Rating(s):

002 A2.01 (4.3/4.4)

Task Standard:

Head venting termination criteria satisfied with flow isolated via 1NC-250A and/or 1NC-251B.

Preferred Evaluation Location:

Control Room ___X___ In-Plant ___X___

Preferred Evaluation Method:

Perform ____ Simulate ___X___

References:

EP/1/A/5500/FR-I.3 (Response to Voids in Reactor Vessel) Revision 10

Validation Time: 6 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

==========

COMMENTS

_____

_____

_____

SIMULATOR SET-UP SHEET

None

SIMULATOR OPERATOR INSTRUCTIONS:

Tools/Equipment/Procedures Needed:

Have enough copies of EP/1/A/5500/FR-I.3 (Response to Voids in Reactor Vessel) Revision 10 for each candidate.

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.

INITIATING CUE:

A LOCA has occurred on Unit 1. EP/1/A/5500/FR-I.3 (Response to Voids in Reactor Vessel) is in progress. Reactor Coolant Pump 1A was started per Step 13.

The following conditions currently exist:

- Pressurizer level: 93%
- NC pressure (recorded in step 18): 1865 psig and stable
- NC Subcooling based on core exit T/C's: 75°F
- All NC T-Hots: 530°F and stable
- PRT pressure: 5 psig
- Reactor Vessel UR Level Train A: 95%
- Reactor Vessel UR Level Train B: 92%
- Allowable Venting Time 1 minute 42 seconds

The Control Room SRO has directed you to review the reactor vessel venting termination criteria listed in step 22 of EP/1/A/5500/FR-I.3 (Response to Voids in Reactor Vessel) and then vent the reactor vessel head per step 23.

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates EP/1/A/5000/FR-I.3. **EXAMINER CUE: When the candidate locates EP/1/A/5000/FR-I.3, hand him/her a clean copy and tell him/her that it is current and complete.** COMMENTS:	___ SAT ___ UNSAT
STEP 2: Review the following reactor vessel venting termination criteria: (Step 22.) STANDARD: Candidate reviews the reactor vessel venting termination criteria. COMMENTS:	___ SAT ___ UNSAT

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

STEP 3: Vent reactor vessel head as follows: (Step 23.) Ensure operator monitors Enclosure 6 (Reactor Vessel Venting Limits) (Step 23.a. STANDARD: Candidate locates Enclosure 6 and monitors the enclosure while continuing with Step 23. b. EXAMINER NOTE: When candidate monitors Enclosure 6 criteria, all parameters are easily read except for "REACTOR VESSEL UR LEVEL". Since 1A NCP is running, vessel level is only obtained from the "diagnostic page" of the Train B RVLIS monitor. IF CANDIDATE uses the normal display of upper range vessel level, provide the following cue to state what the monitor would be displaying: **CUE: TRAIN B REACTOR VESSEL *UR* LEVEL reads "INVALID" COMMENTS:	___ SAT ___ UNSAT
STEP 4: Align vent path by opening the following valves: (Step 23. b.) • 1NC-250A (Rx Head Vent Block) STANDARD: Candidate depresses the Red "OPEN" pushbutton for 1NC-250A and verifies that the Red "OPEN" light is LIT and the Green "CLOSED" light is DARK. **CUE: *The Red "OPEN" pushbutton for 1NC-250A has been depressed.* The Red "OPEN" light is LIT and the Green "CLOSED" light is DARK. ** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

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

STEP 5: Align vent path by opening the following valves: (Step 23. b. continued) • 1NC-251B (Rx Head Vent) STANDARD: Candidate depresses the Red "OPEN" pushbutton for 1NC-251B and verifies that the Red "OPEN" light is LIT and the Green "CLOSED" light is DARK. ***CUE: The Red "OPEN" pushbuffon for 1NC-251B has been depressed. The Red "OPEN" light is LIT and the Green "CLOSED" light is DARK. *** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 6: Verify any venting termination criterion – EXCEEDED. (Step 23. c.) STANDARD: Candidate reviews the reactor vessel venting termination criteria on Enclosure 6 and determines that the criterion for Reactor Vessel UR Level is exceeded. ***CUE:* • *NC Subcooling based on core exit T/C's: 404* • *Pressurizer level: 76%* • *NC pressure: 1750 psig* • *All NC T-Hots: 530°F and stable* • *PRT pressure: 20 psig* • *Venting time: 30 seconds have elapsed* *EXAMINER NOTE: If candidate does not select the diagnostic page, Reactor Vessel UR Level Train B would read "INVALID"* • *Reactor Vessel UR Level Train B (from diagnostic page): 103%* COMMENTS:	___ SAT ___ UNSAT

STEP 7: Ensure all of the following valves – CLOSED: (Step 23. d.) • 1NC-250A (Rx Head Vent Block) STANDARD: Candidate depresses the Green "CLOSED" pushbutton for 1NC-250A and verifies that the Green "CLOSED" light is LIT and the Red "OPEN" light is DARK. ***CUE: The Green 'CLOSED" pushbutton for 1NC-250A has been depressed. The Green 'CLOSED" light is LIT and the Red "OPEN" light is DARK.** ** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP a: Ensure all of the following valves – CLOSED: (Step 23. d. continued) • 1NC-251B (Rx Head Vent) STANDARD: Candidate depresses the Green 'CLOSED" pushbutton for 1NC-251B and verifies that the Green "CLOSED" light is LIT and the Red "OPEN" light is DARK. ***CUE: The Green "CLOSED" pushbuffon for 1NC-251B has been depressed. The Green "CLOSED" light is LIT and fhe Red "OPEN" light is DARK.** ** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
EXAMINER NOTE: As long ***as Step 7*** **or** ***Step 8 above*** **is** ***completed and*** **flow is** ***isolated, the*** **CRITICAL STEP is** ***satisfied.***	

EXAMINER NOTE: In JPM steps 9 and 10, the candidate is directed to ensure 1NC-252B and 1NC-253A are closed. These valves are normally closed with power removed. When the candidate is directed to ensure these valves are closed, it is permissible to state that the valves were not repositioned and that the last known position was closed.	
STEP 9: Ensure all of the following valves – CLOSED: (Step 23. d. continued) • 1NC-252B (Rx Head Vent Block) STANDARD: Candidate determines that 1NC-252B was not opened previously and that the last known position was "CLOSED". ***CUE: 1NC-252B is "CLOSED."*** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Ensure all of the following valves – CLOSED: (Step 23. d. continued) • 1NC-253A (Rx Head Vent Block) STANDARD: Candidate determines that 1NC-253A was not opened previously and that the last known position was "CLOSED". ***CUE: 1NC-253A is "CLOSED."*** COMMENTS:	___ SAT ___ UNSAT
EXAMINER CUE: Another operator will complete the rest of the procedure.	
This JPM is complete.	

TIME STOP: _____

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)

INITIATING CUE:

A LOCA has occurred on Unit 1. EP/1/A/5500/FR-I.3 (Response to Voids in Reactor Vessel) is in progress. Reactor Coolant Pump 1A was started per Step 13.

The following conditions currently exist:

- Pressurizer level: 93%
- NC pressure (recorded in step 18): 1865 psig and stable
- NC Subcooling based on core exit T/C's: 75°F
- All NC T-Hots: 530°F and stable
- PRT pressure: 5 psig
- Reactor Vessel UR Level Train A: 95%
- Reactor Vessel UR Level Train B: 92%
- Allowable Venting Time 1 minute 42 seconds

The Control Room SRO has directed you to review the reactor vessel venting termination criteria listed in step 22 of EP/1/A/5500/FR-I.3 (Response to Voids in Reactor Vessel) and then vent the reactor vessel head per step 23.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/PLANT-9A

Transfer HVAC Control to "LOCAL" Following Control Room Evacuation

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Transfer HVAC Control to "LOCAL" following Control Room Evacuation per AP/1/A/5500/017 (Loss of Control Room), Enclosure **5.**

Alternate Path:

NO

Facility JPM #:

OP-CN-CP-RSS-003

K/A Rating(s):

APE 068 AA1.21 (3.9/4.1)

Task Standard:

Both trains of VC/YC shifted to "LOCAL" and 'B' train VCNC placed in operation, and 'A and 'B' train VA have been verified in operation using AP/1/A/5500/017 (Loss of Control Room), Enclosure 5.

Preferred Evaluation Location:

Simulator ___ In-Plant ___X___

Preferred Evaluation Method:

Perform _____ Simulate ___X___

References:

AP/1/A/5500/017, (Loss of Control Room), Enclosure 5 Rev. 43

Validation Time: 27 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

_____

_____

_____

SIMULATOR SET-UP SHEET

1. N/A

SIMULATOR OPERATOR INSTRUCTIONS:

NONE

Tools/Equipment/Procedures Needed:

Have enough copies of Enclosure 5 of AP/1/A/5500/017 available for each candidate.

REAI TO OPERATOR

DIRECTION TO TRAINEE:

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated 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" train VCNC is out of service fo condenser tube cleaning.

A fire has occurred that causes a Control Room evacuation.

INITIATING CUES:

You are the Auxiliary Building operator and are directed by the ASP 1A operator to perform Enclosure 5 of AP/1/A/5500/017 (Loss of Control Room).

You are to ensure "B" train VCNC equipment and "A" and "B" train VA equipment are operating.

START TIME: _____

STEP 1: Provide a copy of Enclosure 5 HVAC Actions to the candidate. STANDARD: None COMMENTS:	___ SAT ___ UNSAT
STEP 2: Verify Train A VCNC desired to be started in "LOCAL". (Step 1) STANDARD: Examinee should determine from initiating cue that "B" train is to be placed in service (per step 1 RNO) and proceeds to Step 5 of Encl. 5. COMMENTS:	___ SAT ___ UNSAT
NOTE: The following step will cause Unit 1 and Unit 2 B train VA equipment to start.	
STEP 3: Place "VCNC AHU TRAIN B" switch to "LOCAL". (STEP 5.a) STANDARD: VCNC AHU TRN B switch on 2ELCP0058 (AB-594, HH-58, Rm 560) turned to the "LOCAL" position. *****CUE: VCNC AHU TRN B switch turned to the "LOCAL" position.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 4: Place "VCNC AHU TRAIN B" switch to "ON". (STEP 5.b) STANDARD: VCNC AHU TRN B on/off switch positioned to the "ON" position. RED "ON" light is LIT above local control switch on 2ELCP0058. *****CUE: VCNC AHU TRN B on/off switch is in the "ON" position. The RED "ON" light is LIT.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 5: Verify Train B VCNC HVAC equipment in operation: (STEP 5.c) • VCNC AHU Train B - "ON" • 2CRA-AHU-1 - "ON" • 2CR-AHU-1 -"ON" • 1SWGR-AHU-2 - "ON" • 2SWGR-AHU-2 - "ON" • 1SWGR-AHU-4 - "ON" • 2SWGR-AHU-4 - "ON" STANDARD: Indications on 2ELCP0058. • RED "ON" status light LIT • RED "ON" status light LIT, left panel, third row • RED "ON" status light LIT, left panel, third row • RED "ON" status light LIT, left panel, first row • RED "ON" status light LIT, left panel, first row • RED "ON" status light LIT, left panel, first row • RED "ON" status light LIT, left panel, first row After substep read, give the following cue: ***CUE: RED "ON" status light is LIT for each AHU.*** COMMENTS:	___ SAT ___ UNSAT
STEP 6: After 2 minutes, verify 2CRA-P-1 - ON. STANDARD: Verify RED "ON" status light LIT, right panel, fourth row. ***CUE: 2 minutes have passed; RED "ON" light is LIT.*** COMMENTS:	___ SAT ___ UNSAT

STEP 7: Place "VCNC AHU Train A switch to "LOCAL". (STEP 6.a) STANDARD: VCNC AHU TRN A switch on 1ELCP0058 (AB 594, HH-56, RM 570) turned to the "LOCAL" Position. ***CUE: VC/YC AHU TRN A switch is in the "LOCAL" position.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP a: Ensure "VCNC AHU TRAIN A" switch – "OFF". (STEP 6.b) STANDARD: Rotate VCNC AHU TRAIN A switch to the "OFF" position on 1ELCP0058. ***CUE: The switch is pointing to the "OFF" position.*** COMMENTS:	___ SAT ___ UNSAT

STEP 9: Verify VA equipment in operation: (STEPS 7a,b, and c)

At 1ELCPOI ▮▮ (AB-594, HH-55, Rm 500)

- "AUXILIARY BLDG. SUPPLY UNIT 1A" (ABSU-1A) – ON
- "AUXILIARY BLDG. SUPPLY UNIT 1B" (ABSU-1B) – ON
- "AUX. BLDG. UNFILTERED EXHAUST FAN 1A" (ABUXF-1A) - ON
- "AUX. BLDG. UNFILTERED EXHAUST FAN 1B" (ABUXF-1B) - ON

AT 1ELCPOI12 (AB-594, HH-55, Rm 500)

- "AUX. BLDG. FILTD EXH FAN 1A" (ABFXF-1A) – ON

At IELCP0013 (AB-594, LL-52, Rm 500)

- "AUX. BLDG. FILTD EXH FAN 1B" (ABFXF-1B) – ON

STANDARD: Indication on each panel:

- ABSU-1A Red "ON" light lit on left panel on IELCPOI11
- ABSU-1B Red "ON" light lit on left panel on IELCPOI11
- ABUXF-1A Red "ON" light lit on right panel on IELCPOI11
- ABUXF-1B Red "ON" light lit on right panel on 1ELCPOI11
- ABFXF-1A Red "ON" light lit on right panel on 1ELCPOI12
- ABFXF-1B Red "ON" light lit on 1ELCPOI13

CUE: RED "ON" light LIT for each fan.

COMMENTS:

___ SAT

___ UNSAT

STEP 10: Verify VA equipment in operation: (STEPS 7d, e, and f) At 2ELCP0011 (AB-594, LL-58, Rm 500) • "AUXILIARY BLDG. SUPPLY UNIT 2 A (ABSU-2A) - ON • "AUXILIARY BLDG. SUPPLY UNIT 2B" (ABSU-2B) - ON • "AUX. BLDG. UNFILTERED EXHAUST FAN 2 A (ABUXF-2A) - ON • "AUX. BLDG. UNFILTERED EXHAUST FAN 2B" (ABUXF-2B) - ON AT 2ELCP0112 (AB-594, HH-58, Rm 500) • "AUX. BLDG. FILTD EXH FAN 2 A (ABFXF-2A) - ON AT 2ELCP0113 (AB-594, LL-62, Rm 500) • "AUX. BLDG. FILTD EXH FAN 2B" (ABFXF-2B) - ON STANDARD: Indication on each panel: o ABSU-2A Red "ON" light lit on left panel on 2ELCP011 ▮ o ABSU-2B Red "ON" light lit on left panel on 2ELCP0111 • ABUXF-2A Red "ON" light lit on right panel on 2ELCP0111 • ABUXF-2B Red "ON" light lit on right panel on 2ELCP0111 o ABFXF-2A Red "ON" light lit on right panel on 2ELCP0112 o ABFXF-2B Red "ON" light lit on 2ELCP0113 ***CUE RED "ON" light LIT for each fan.*** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Notify ASP operator (x5549, x5548) status of VCNC and VA equipment. (Step 8) STANDARD: Call ASP operator (5549 or 5548) and reports that B Train VCNC is in service, and that A and B Train VA equipment is in operation. ***CUE: This is the ASP Operator. I understand that B Train VC/YC and A and B Train VA are operating.*** COMMENTS:	___ SAT ___ UNSAT
This JPM is complete.	

TIME STOP: _____

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

INITIAL CONDITIONS:

" A train *VCNC* is out of service fo condenser tube cleaning.

A fire has occurred that causes a Control Room evacuation.

INITIATING CUES:

You are the Auxiliary Building operator and are directed by the ASP 1A operator to perform Enclosure 5 of AP/1/A/5500/017 (Loss of Control Room).

You are to ensure "B" train VCNC equipment and "A" and "B" train VA equipment are operating.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM Plant-9B

Restore the VA System to Normal Alignment Following an Inadvertent Safety Injection Actuation

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Restore the Auxiliary Building ventilation system to normal alignment following an inadvertent Safety Injection actuation.

Alternate Path:

NO

Facility JPM #:

VA-001

KIA Rating(s):

013 A3.02 (4.1/4.2)

Task Standard:

All Train **A** and B VA Filter Isolation dampers and Auxiliary Shutdown Panel Supply Units are reset per OP/0A/6450/003 (Auxiliary Building Ventilation System) Enclosure 4.7.

Preferred Evaluation Location:

Simulator _____ In-Plant ___X___

Preferred Evaluation Method:

Perform _____ Simulate ___X___

References:

OP/0/A/6450/003 (Auxiliary Building Ventilation System) Enclosure 4.7 Revision 38

Validation Time: 12 min. **Time Critical:** No

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

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COMMENTS

_____

_____

_____

Tools/Equipment/Procedures Needed:

Have enough copies of OP/0/A/6450/003, Enclosure 4.7 available for each candidate.

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.

INITIATING CUE:

While conducting ESF testing, an inadvertent Safety Injection on low Pressurizer Pressure occurred. EP/1/A/5000/ES-1.1 (Safety Injection Termination) has been entered. ECCS and the Diesel Generator Load Sequencers have been reset and the control room crew is restoring various plant systems. The Control Room SRO instructs you to reset the Auxiliary Building Ventilation to restore the system to normal operations per OP/0/A/6450/003 (Auxiliary Building System) Enclosure 4.7. Initial conditions 1.1, 1.2, 1.3 and 1.4 have been completed.

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates OP/0/A/6450/003, Enclosure 4.7. EXAMINER CUE: When the candidate locates OP/0/A/6450/003, hand them a clean copy of Enclosure 4.7 and tell him/her that it is current and complete. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Obtain Key #209 from the Work Control Center. (Enclosure 4.7 Initial Condition 1.5) STANDARD: Candidate goes to the Work Control Center and obtains Key #209 EXAMINER CUE: When the candidate goes to the work control center inform them that key #209 has been obtained. COMMENTS:	___ SAT ___ UNSAT
STEP 3: Verify 1ELCPOI89 A Train Post LOCA HVAC Control Panel selector switch is in the "OFF" position (AB-597, CC-52, Rm 576). (Enclosure 4.7 Initial Condition 1.6) STANDARD: Candidate determines that the A Train Post LOCA HVAC Control Panel selector switch is in the "OFF" position. ***CUE:** The **A** Train **Post LOCA** HVAC Control Panel selector switch is in the "OFF" position. ** COMMENTS:	___ SAT ___ UNSAT

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

STEP 4: Verify 1ELCPOI90 B Train Post LOCA HVAC Control Panel selector switch is in the "OFF" position (AB-597, CC-53, Rm 576). (Enclosure **4.7** Initial Condition 1.6) STANDARD: Candidate determines that the B Train Post LOCA HVAC Control Panel selector switch is in the "OFF" position. *****CUE: The B Train Post LOCA HVAC Control Panel selector switch is in the "OFF" position.***** COMMENTS:	___ SAT ___ UNSAT
STEP 5: To reset Train **A** dampers, perform the following: (Step 2.1) Insert key and turn the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" switch fully (AB-597, HH-56, Rm 500) (Panel 1AB-ECP-2 1ELCPOI12). (Step 2.1.1) STANDARD: Candidate inserts the key and turns the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" switch fully. *****CUE: The key has been inserted and the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" switch has been turned fully.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 6: Depress key switch firmly. STANDARD: Candidate depresses the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" key switch firmly. (Step 2.1.2) ***CUE: The key switch has been depressed firmly.*** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
STEP 7: After switch has come back out, return it to its original position and remove key. (Step 2.1.3) STANDARD: Candidate releases pressure on the key switch allowing the switch to come back out and returns the switch to its original position. ***CUE: The key switch has come back out and is in its original position.*** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
STEP 8: Depress the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-1A ASPSU-1A (1AHUN0060) SEQUENCED **ON**" switch (AB-597, HH-56, Rm 500) (Panel 1AB-ECP-2 1ELCPOI12). (Step 2.1.4) STANDARD: Candidate depresses the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-IA ASPSU-IA SEQUENCED ON" switch. ***CUE: The "RESET" pushbutton on "AUX SHUTDOWN PANEL SUPPLY UNIT-1AASPSU-IA SEQUENCED ON" switch has been depressed.*** ***(Though not checked in procedure, but IF ADDRESSED, state that the reset light is dark.)*** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT

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

STEP 9: Depress the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-2A ASPSU-2A (2AHUN0060) SEQUENCED ON" switch (AB-597, HH-58, Rm 500) (Panel 2AB-ECP-2 2ELCP0112). (Step 2.1.5) STANDARD: Candidate depresses the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-2A ASPSU-2A SEQUENCED ON" switch. ***CUE: The "RESET" pushbutton on "AUX SHUTDOWN PANEL SUPPLY UNIT-2A ASPSU-2A SEQUENCED ON" switch has been depressed.*** ***(Though not checked in procedure, but IF ADDRESSED, state that the reset light is dark.)*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 10: To reset Train B dampers, perform the following: (Step 2.2) Insert key and turn the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" switch fully (AB-597, LL-52, Rm 500) (Panel 1AB-ECP-3 1ELCPOI 13). (Step 2.2.1) STANDARD: Candidate inserts the key and turns the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" switch fully. ***CUE: The key has been inserted and the "AUX BLDG FILTER TRAIN ISO. DAMPERS RESET" switch has been turned **fully**.***	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 11: Depress key switch firmly STANDARD: Candidate depresses the "**AUX** BLDG FILTER TRAIN ISO. DAMPERS RESET" key switch firmly. (Step 2.2.2) *****CUE: The key switch has been depressed firmly.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNS, **T**
STEP 12: After switch has come back out, return it to its original position and remove key. (Step 2.2.3) STANDARD: Candidate releases pressure on the key switch allowing the switch to come back out and returns the switch to its original position. *****CUE: The key switch has come back out and is in its original position.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 13: Depress the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-1B ASPSU-1B (1AHUN0061) SEQUENCED ON" switch (AB-597, LL-52, Rm 500) (Panel 1AB-ECP-3 IELCPOI13). (Step 2.2.4) STANDARD: Candidate depresses the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-1B ASPSU-1B SEQUENCED ON" switch. ***CUE: The "RESET" pushbutton on "AUX SHUTDOWN PANEL SUPPLY UNIT-1B ASPSU-1B SEQUENCED ON" switch has been depressed.*** ***(Though not checked in procedure, but IF ADDRESSED, state that the reset light is dark.)*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 14: Depress the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-2B ASPSU-2B (2AHUN0061) SEQUENCED ON" switch (AB-597, LL-62 Rm 500) (Panel 2AB-ECP-3 2ELCP0113). (Step 2.2.5) STANDARD: Candidate depresses the "RESET" pushbutton on "AUX S/D PNL SUP UNIT-2A ASPSU-2A SEQUENCED ON" switch. ***CUE: The "RESET" pushbuffon on "AUX SHUTDOWN PANEL SUPPLY UNIT-2A ASPSU-2A SEQUENCED ON" switch has been depressed.*** ***(Though not checked in procedure, but IF ADDRESSED, state that the reset light is dark.)*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 15: Return the VA System to normal operation per Enclosure **4.1** (Startup and Operation) of this procedure. (Step 2.3) STANDARD: No action required by the candidate. *****CUE: The SRO has directed another operator to perform Enclosure 4.1.***** COMMENTS:	___ SAT ___ UNSAT
This JPM is complete.	

TIME STOP: _____

*****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)

INITIATING CUE:

While conducting ESF testing, an inadvertent Safety Injection on low Pressurizer Pressure occurred. **EP/1/A/5000/ES-1.1** (Safety Injection Termination) has been entered. ECCS and the Diesel Generator Load Sequencers have been reset and the control room crew is restoring various plant systems. The Control Room SRO instructs you to reset the Auxiliary Building Ventilation to restore the system to normal operations per **OP/0/A/6450/003** (Auxiliary Building System) Enclosure 4.7. Initial conditions **1.1**, 1.2, **1.3** and 1.4 have been completed.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/PLANT-10

Startup Backup Temporary VI Compressor

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start the Backup Temporary. VI Compressor and place it in service on the VI header

Alternate Path:

NO

Facility JPM #.

VI-002

K/A Rating(s):

078 K4.02 *(3.213.5)*

Task Standard:

Temporary VI Compressor started and aligned to the Instrument Air Header through 1VI-417.

Preferred Evaluation Location: **Preferred Evaluation Method:**

Simulator _____ In-Plant ___**X**___ Perform _____ Simulate ___X___

References:

OP/0/A/6450/005 (Instrument Air System, Enclosure 4.10) Revision 108

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

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____ / _____
NAME SIGNATURE DATE

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COMMENTS

Tools/Equipment/Procedures Needed:

Have enough copies of OP/0/A/6450/005 Enclosure 4.10 available for each candidate.

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.

INITIATING CUE:

Unit 1 and 2 are at 100% power. VI Lo Pressure Annunciator is lit and VI pressure is 75 psig and slowly decreasing. AP/0/A/5500/22, Loss of Instrument Air, is implemented and the CR SRO directs you to startup and align the Backup Temporary VI Compressor to the Instrument Air Header per OP/0/A/6450/005, Instrument Air System, Enclosure 4.10.

START TIME: _____

STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates OP/0/A/6450/005 Enclosure 4.10. EXAMINER CUE: When the candidate locates OP/0/A/6450/005 Enclosure 4.10, hand him/her a clean copy of Enclosure 4.10 and tell him/her that it is current and complete. COMMENTS:	___ SAT ___ UNSAT
STEP 2: Review the Limits and Precautions. (Step 1.1) STANDARD: Candidate reads Limits and Precautions and determines that 2.11 and 2.12 are applicable COMMENTS:	___ SAT ___ UNSAT
NOTE: The following step may be performed out of sequence at Unit/WCC SRO discretion to prevent garage personnel being called in unnecessarily.	
STEP 3: Notify Catawba Garage at ext. 3590 (or Shift Work Manager on backshift) that the Backup Temporary VI Compressor will be operated and servicing may be required during or after the run. (Step 1.2) STANDARD: Candidate locates a telephone and simulates calling the Catawba Garage. **CUE: This is George at the Catawba Garage. I understand that you are going to operate the Backup Temporary VI Compressor.** COMMENTS:	___ SAT ___ UNSAT

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

STEP **4:** Verify engine oil level is full (dipstick on side of engine). (Step 1.3) STANDARD: Candidate opens panel door on Turbine Building side of compressor and locates dipstick next to the oil filter. Candidates states he/she would remove dipstick to check oil level. *****CUE: Oil level* is *near the "F" mark. ***** COMMENTS:	___ SAT ___ UNSAT
STEP 5: Verify the compressor oil is visible in sight glass (sight glass should be full with compressor shutdown) beside the control panel. (Step 1.4) STANDARD: Candidate locates the sight glass on oil tank inside the large door on the front side of compressor next to the control panel door. Candidate indicates the sight glass should be full. *****CUE: The sight glass* is *FULL. ***** COMMENTS:	___ SAT ___ UNSAT
STEP 6: Start the Backup Temporary VI Compressor as follows: (Step 2.1) Unplug the battery charger. (Battery charger is located inside engine compartment opposite side from battery.) (Step 2.1.1) STANDARD: Candidate simulates unplugging battery charger by disconnecting cable from turbine building side of compressor housing. *****CUE: The battery charger is unplugged. ***** COMMENTS:	___ SAT ___ UNSAT

STEP 7: Ensure OVIT-20 (Compressor Service Valve) is open. (Step 2.1.2) STANDARD: Candidate ensures OVIT-20 (Compressor Service Valve) is open by positioning the handle such that it is in parallel with the hose. **CUE: The handle for *0VIT-20* is parallel to the hose.** COMMENTS:	___ SAT ___ UNSAT
NOTE: The following steps are performed from the compressor control panel located on the front of the compressor.	
STEP **8:** Place the "POWER toggle switch in the "ON" position. (Step 2.1.3) STANDARD: Candidate raises the "POWER toggle switch to the "ON" position on the control panel. **CUE: The "POWER" toggle switch is in the *"ON" position.*** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
STEP 9: Ensure fuel level **is** adequate. (Step 2.1.4) STANDARD: Candidate locates fuel level gauge inside control panel (front of compressor). **CUE: Fuel oil level is at *3/4* full mark.** COMMENTS:	___ SAT ___ UNSAT
EXAMINER NOTE: **JPM** step **10** will only be performed if freezing weather conditions exists. If freezing weather conditions DO NOT exist, proceed to **JPM** step 11.	

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

STEP 10: In freezing weather perform the following: (Step 2.1.5) 1. Place the "HEATERS" toggle switch in the "ON" position to energize cylinder head glow plugs. (Step 2.1.5.1) 2. Proceed after 60 seconds (time permitting) (Step 2.1.5.2) STANDARD: Candidate simulates placing "HEATERS" toggle switch to "ON" and states he/she will wait 60 seconds. ***CUE: The "HEATERS" toggle switch is in the "ON" position. 60 seconds have passed.**** COMMENTS:	___ SAT ___ UNSAT
STEP 11: Press and hold the "BYPASS" switch for 10 - 15 seconds. (Step 2.1.6) STANDARD: Candidate simulates depressing the "BYPASS" switch and indicates he/she would hold it for 10 to 15 seconds. ***CUE: The "BYPASS" switch is depressed. 15 seconds have passed.**** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: While holding the "BYPASS" switch press the "START button. (Step 2.1.7) STANDARD: Candidate presses the START button while still holding the "BYPASS" switch.. ***CUE: The "START" button has been pressed and the "BYPASS" switch is being held.**** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

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

STEP 13: When the engine starts, release the "START button. (Step 2.1.8) STANDARD: Candidate releases the "START button when the engine starts and continues to hold the "BYPASS" switch. ***CUE: Engine starting sounds are heard.*** COMMENTS:	___ SAT ___ UNSAT
STEP 14: When the engine speed is > 1000 rpm, release the "BYPASS" button. (Step 2.1.9) STANDARD: Candidate locates the engine speed indication and states that the "BYPASS" button will be released when engine speed is greater than or equal to 1000 rpm. ***CUE: Engine speed is 1200 rpm. The "BYPASS" button has been released.*** COMMENTS:	___ SAT ___ UNSAT
STEP 15: After the engine has run for 5 minutes (time permitting), press the "SERVICE AIR" button to load the compressor. (Step 2.1.10) STANDARD: Candidate locates and presses the "SERVICE AIR button on the compressor control panel. ***CUE: 5 minutes have passed. The "SERVICE AIR" bufton has been pressed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

italicized Cues Are To Be Used Only If JPM Performance 1s Being Simulated.

STEP 16: Verify "COMPRESSOR DISCHARGE PRESSURE" increases to approximately 110 psig. (Step 2.1.11) STANDARD: Candidate locates the "COMPRESSOR DISCHARGE PRESSURE" gauge on the compressor control panel and states that he/she would expect pressure to read approximately 115 psig. ***CUE: 'COMPRESSOR DISCHARGE PRESSURE" is 115 psig.*** COMMENTS:	___ SAT ___ UNSAT
STEP 17: Ensure the "Heater" toggle switch is in the "OFF" position. (Step 2.1.12) STANDARD: Candidate places the "HEATER" toggle switch in the "OFF" position. ***CUE: The "HEATER" toggle switch is in the "OFF" position.*** COMMENTS:	___ SAT ___ UNSAT
STEP 18: Align the temporary aftercooler and air dryer for service as follows: (Step 2.2) Press the "START button on the "TEMPORARY AFTERCOOLER VI SYSTEM" control panel (TB-598, 2C-2D, 34) (Step 2.2.1) STANDARD: Candidate presses the Green "START button on the "TEMPORARY AFTERCOOLER VI SYSTEM" control panel. ***CUE: The "START button on the "TEMPORARY AFTERCOOLER VI SYSTEM" control panel has been pressed.*** COMMENTS:	___ SAT ___ UNSAT

STEP 19: Cycle 1VI-540 (Port Aux Air Comp Dryer Inlet Drain) to drain any water out of the dryer inlet piping. (Step 2.2.2) STANDARD: Candidate turns the handwheel for 1VI-540 (TB-598, 2C-34) in the counter clockwise direction until motion stops. Once water is drained, candidate turns the handwheel in the clockwise direction until motion stops. ***CUE: 1VI-540 is moving in the counter Clockwise direction. Motion has stopped. Water is observed draining from the line. Water drainage stops. IVI-540 is moving in the clockwise direction. Motion has stopped.*** COMMENTS:	___ SAT ___ UNSAT
STEP 20: Slowly open the following valves: (Step 2.2.3) 1VI-512 (Port Aux Air Comp Dryer Inlet) (TB-598, 2C-34) (Step 2.2.3.1) STANDARD: Candidate rotates the handwheel for 1VI-512 in the counter clockwise direction until motion stops and the stem is exposed. ***CUE: The handwheel for 1VI-512 is moving in the counter clockwise direction. Motion has stopped and the stem is exposed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 21: Slowly open the following valves: (Step 2.2.3) 1VI-513 (Port Aux Air Comp Dryer Inlet) (TB-598, 2C-34) (Step 2.2.3.2) STANDARD: Candidate rotates the handwheel for 1VI-513 in the counter clockwise direction until motion stops and the stem is exposed. ***CUE: The handwheel for IVI-513 is moving in the counter clockwise direction. Motion has stopped and the stem is exposed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 22: Place the "AIR DRYER CONTROL POWER switch to "ON". (TB-598, 2B-34). (Step 2.2.4) STANDARD: Candidate moves the Black switch to the right to the "ON" position. The Green light is LIT. ***CUE: The Black switch has been moved to the "ON" position. The Green light is LIT.*** COMMENTS:	___ SAT ___ UNSAT
STEP 23: Align to the VI System as follows: (Step 2.3) Open 1VI-417(Port ILRT Comp Disch) (TB-598, 2C-34). (Step 2.3.1) STANDARD: Candidate rotates the handwheel for 1VI-417 in the counter clockwise direction until motion stops and the stem is exposed. ***CUE: The handwheel for IVI-417 is moving in the counter clockwise direction. Motion has stopped and the stem is exposed.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 24: Verify compressor is maintaining approximately 110 psig as read on the compressor control panel. (Step 2.3.2) STANDARD: Candidate verifies that "COMPRESSOR DISCHARGE PRESSURE" is reading approximately 1l 0 psig on the control panel. ****CUE: "COMPRESSOR DISCHARGE PRESSURE" is reading approximately *110 psig***.** COMMENTS:	___ SAT ___ UNSAT
STEP 25: Verify pressure drop across the temporary filters is less than 15 psid by subtracting the outlet pressure from the inlet pressure. "FILTER A "FILTER B" (Step 2.3.3) STANDARD: Candidate locates "FILTER A and "FILTER B" inlet and outlet pressure gauges. Determines from values given in following cue that pressure drop across each filter is less than 15 psid. "A FILTER 95 psig minus 92 psig = 3 psid "B FILTER" 90 psig minus 88 psig = 2 psid ****CUE:* Provide the candidate with the following values as each pressure gauge is located:** • 0VIPGT-01 " A Inlet Pressure is **95 psig** • OVIPGT-02 " A Outlet Pressure is **92 psig** • OVIPGT-03 "B" Inlet Pressure is **90 psig** • OVIPGT-04 "B" Outlet Pressure is **88 psig.** COMMENTS:	___ SAT ___ UNSAT
NOTE: The Backup Temporary VI Compressor DIG fuel oil tank holds approximately 180 gallons and lasts less than 12 hours when compressor is running fully loaded.	

STEP 26: If the Backup Temporary VI Compressor is to be left in service for greater than 4 hours, notify the Unit 2 Turbine Rounds NLO to inspect the Compressor D/G fuel oil tank level on a regular frequency and initiate refill at less than ¼ tank.	___ SAT
STANDARD: Candidate states that he will notify an SRO to complete step 2.4.	___ UNSAT
CUE: An SRO will perform step 2.4.	
COMMENTS:	
This JPM is complete.	

TIME STOP: _____

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

INITIATING CUE:

Unit 1 and 2 are at 100% power. VI Lo Pressure Annunciator is lit and VI pressure is 75 psig and slowly decreasing. AP/0/A/5500/22, Loss of Instrument Air, is implemented and the CR SRO directs you to startup and align the Backup Temporary VI Compressor to the Instrument Air Header per OP/0/A/6450/005, Instrument Air System, Enclosure 4.10.

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

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM/PLANT-11

Place SSF Diesel in Operation

CANDIDATE _____

EXAMINER _____

CATAWBA
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Start the **SSF** Diesel, energize ISLXG and start the Standby Makeup Pump with the proper alignment to establish NCP Seal Injection within 10 minutes

Alternate Path:

NO

Facility JPM #:

AD-003

K/A Rating(s):

064 A4.01 (4.0/4.3)

Task Standard:

Within 10 minutes the SSF Diesel is started, ISLXG energized, and the Standby Makeup Pump is started with the proper alignment to establish NCP Seal Injection.

Preferred Evaluation Location:

Simulator ____ In-Plant __X____

Preferred Evaluation Method:

Perform _____ Simulate ___X___

References:

EP/1/A/5000/ECA-0.0 **(Loss** of All AC Power) Enclosure 2 Revision 24

Validation Time: 10 min. **Time Critical:** YES

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

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

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COMMENTS

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_____

_____

Tools/Equipment/Procedures Needed:

Have enough copies of EP/1A/5000/ECA-0.0 Enclosure 2 available for each candidate.

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.

INITIATING CUE:

Unit 1 has just suffered a loss of all AC power while operating in Mode 1. A Security Officer has been directed to establish Seal Injection from the **SSF** per Enclosure 2 of EP/1/A/5000/ECA-0.0. Another operator has been dispatched to swap power to 1EMXS. The **CR** SRO directs you to establish seal injection from the SSF per Enclosure 2 of EP/1/A/5000/ECA-0.0. This JPM is time critical once you get to the SSF.

START TIME: _____

EXAMINER NOTE: The time limit for this JPM is based on the time to perform the actual task considering each step must be explained to the examiner with verbal feedback as appropriate. The JPM evaluates the operator's ability to perform the task under simulated conditions, not real time. Safety considerations are made to preclude operators from running through the plant to satisfy JPM time requirements. Record the time the candidate enters the **SSF.** _____	
STEP 1: Obtain a copy of the appropriate procedure. STANDARD: Operator locates EP/1A/5000/ECA-0.0 Enclosure 2 in the SSF. EXAMINER CUE: When the candidate locates **EP/1A/5000/ECA-0.0** Enclosure 2, hand him/her a clean copy of Enclosure 7 and tell him/her that it is current and complete. COMMENTS:	___ SAT ___ UNSAT
NOTE Indications of ISLXG being de-energized are as follows: • Normal lighting in SSF off with emergency lights on • "LINE VOLTS" on OCNSLOOOI indicating zero volts • OAD-11, B/6 "LOAD CENTER ISLXG TROUBLE"- LIT • "LOAD CENTER ISLXG BUS VOLTAGE" on ISLXG indicating zero volts.	___ SAT ___ UNSAT
STEP 2: IF ISLXG has been de-energized, THEN place the SSF diesel in operation as follows: (Step 1) STANDARD: Candidate locates "LINE VOLTS" indication on OCNSLOOOI ***CUE:** When fhe candidate locates ***OCNSLOOOI,*** indicate thaf voltage is reading zero. If asked, inform fhe candidate that the normal SSF lighting is OFF and fhe emergency lighting is ***ON, 0AD-11 B/6*** is LIT and ***"LOAD CENTER ISLXG BUS VOLTAGE"*** on ***ISLXG*** indicates zero volts. ** COMMENTS:	___ SAT ___ UNSAT

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

STEP 3: Ensure "SSF D/G Mode" switch in "EMERG" position on SSF console. (Step 1.a) STANDARD: Candidate places SSF D/G MODE switch in "EMERG" position. ***CUE: SSF D/G MODE switch in "EMERG" position**** COMMENTS:	CRITICAL **STEP** ___ SAT ___ UNSAT
STEP **4:** Start the D/G by placing the "SSF D/G" switch in the "ON" position. (Step 1.b.) STANDARD: Candidate places the "SSF D/G" switch in the "ON" position. ***CUE: SSF D/G switch in "ON" position. D/G fires and engine rpm increases to a constant speed.**** COMMENTS:	CRITICAL **STEP** ___ SAT ___ UNSAT
STEP 5: If the engine does not start within 30 seconds, THEN: (Step 1.c.) STANDARD: Candidate notes from previous cue that engine started and step does not apply. Goes to Step 1.d. COMMENTS:	___ SAT ___ UNSAT

STEP 6: Adjust "SSF D/G GOV CTRL" to bring frequency to 60 ± 1.2 **Hz.** (Step 1.d.) STANDARD: Candidate locates SSF D/G GOV CTRL and frequency meter to adjust SSF diesel speed to 60 Hz. *****CUE: Frequency is 60 Hz.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 7: Adjust the "SSF D/G VOLT ADJUST" until "VOLTS" is 600 to 660 volts. (Step 1.e.) STANDARD: Candidate locates SSF D/G VOLT ADJUST and volt meter and states he/she would adjust **SSF** diesel voltage to 600 to 660 volts *****CUE: Voltage is reading 610 volts.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 8: Press the "TRIP" pushbutton on "ISLXG NORM FDR FRM I T A on the SSF console. (Step 1.f.) STANDARD: .Candidate depresses the "TRIP" pushbutton on the SSF Control Panel for ISLXG NORM FDR FRM ITA. Verifies Green "OPEN" light is LIT and the Red "CLOSED" light is DARK. *****CUE: The "TRIP" pushbuffon on the SSF Control Panel for 1SLXG NORM FDR FRM 1TA has been depressed. The Green "OPEN" light is LIT and the Red "CLOSED" light is DARK.***** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

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STEP 9: Open the following breakers: (Step 1.g.) • 1SLXG-4C (MCC SMXG Feeder) • 1SLXG-4D (SSF Batt. Charger SDSCI) • 1SLXG-5C (SSF Batt. Charger SDSC2) • 1SLXG-5D (SSF Batt. Charger SDSCS) STANDARD: Candidate locates each breaker on ISLXG. As each breaker is located, candidate states that he/she would rotate the operating handle in the counterclockwise direction **or** would depress the "OPEN" pushbutton on the breaker face. The Green "OPEN" light is LIT and the Red "CLOSED light is DARK. ***CUE: The operating handle has been turned in the counterclockwise direction. The Green "OPEN" light is LIT and the Red "CLOSED" light is DARK for each breaker.** COMMENTS:	___ SAT ___ UNSAT
STEP 10: Press the "CLOSE" pushbutton for the "SSF D/G BKR" on the SSF console. (Step1.h.) STANDARD: Candidate depresses the "CLOSE" pushbutton for the "SSF'D/G BKR on the SSF control panel. Verifies the Red "CLOSED" light is LIT and the Green "OPEN" light is DARK. ***CUE: The "CLOSE" pushbutton for the "SSF'D/G BKR" has been depressed. The Green "OPEN" light is LIT and the Red 'CLOSED" light is DARK.** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

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STEP 11: When SSF D/G has been running for 10 seconds, then close breaker 1SLXG-4C (Motor Control Center SMXG Supply). (Step 1i.) STANDARD: Breaker 1SLXG-4C closed by turning the operating handle clockwise to "CLOSE" position after allowing D/G to run for 10 seconds Verifies the Red "CLOSED" light is LIT and the Green "OPEN" light is DARK and breaker noise is heard when closed. ***CUE: THE operating handle for 1SLXG-4C has been turned in the clockwise direction. The Red "CLOSED" light is LIT and the Green "OPEN" light is DARK. Breaker noise is heard.**** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT
STEP 12: Close the following breakers on 1SLXG at 10 second intervals: (Step 1.j.) • 1SLXG-4D (SSF Batt. Charger SDSCI Feeder) • 1SLXG-5C (SSF Batt. Charger SDSC2 Feeder) • 1SLXG-5D (SSF Batt. Charger SDSCS Feeder) STANDARD: Candidate locates each breaker on ISLXG. As each breaker is located, candidate states that he/she would rotate the operating handle in the clockwise direction or would depress the "CLOSE" pushbutton on the breaker face. The Red "CLOSED" light is LIT and the Green "OPEN" light is DARK. ***CUE: The operating handle has been turned in the clockwise direction. The Red "CLOSED" light is LIT and the Green "OPEN" light is DARK for each breaker.**** COMMENTS:	___ SAT ___ UNSAT

STEP 13: WHEN 1EMXS has been energized, THEN: (Step 2.a.) ***CUE 1EMXS is energized.** a. Ensure 1NV-876 (Stdby M/U To Cont Equip Smp 1A) - CLOSED. STANDARD: Candidate ensures the Green" CLOSED" light is LIT and the Red "OPEN" light is DARK (SSF Control Console) ***CUE: 1NV-876 Green "CLOSED" light is LIT and the Red "OPEN" light is DARK.*** COMMENTS:	___ SAT ___ UNSAT
STEP 14: Ensure the following valves - OPEN: (Step 2.b.) 1NV-865A (Stdby M/U Pmp Suct Frm Xfer Tube 1NV-872A (Stdby M/U Pmp Filt Otlt) 1NV-877 (Stdby M/U Pmp To NC Pmp Seal Inj) STANDARD: Candidate ensures the Red "OPEN" light is LIT and the Green 'CLOSED" light is DARK for each valve. ***CUE: The Red "OPEN" light is LIT and the Green "CLOSED" light is DARK for each valve.*** COMMENTS:	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 15: Start "STBY M/U PUMP #1" by depressing "ON" pushbutton on SSF Console. (Step 2. c.) EXAMINER NOTE: Record the time the Standby Makeup Pump is started._____ STANDARD: Candidate depresses the STDBY M/U PUMP #1 Red "ON" pushbutton and verifies the Red "ON" light is LIT and the Green "OFF" light is DARK. (SSF Control Console). ***CUE:** The Standby Makeup Pump Red "ON light is LIT and the Green "OFF" light is DARK.** COMMENTS:	CRITICAL STEP ___ SAT ___ UNSAT
STEP 16: Notify the Control Room SRO of status. (Step 2.d.) EXAMINER NOTE: Do Not allow the candidate to pick up the telephone receiver as this could hinder communications during an actual emergency. STANDARD: Candidate locates telephone and simulates calling the Control Room. ***CUE:** This is the Control Room SRO. I understand that seal injection has been established to the Unit 1 NC pumps from the SSF**. COMMENTS:	___ SAT ___ UNSAT
STEP 17: Monitor SSF D/G operation EXAMINER CUE: Another operator will monitor SSF DIG operation.	___ SAT ___ UNSAT
This JPM is complete	

TIME STOP: _____

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

INITIATING CUE:

Unit 1 has just suffered a loss of all AC power while operating in Mode 1. A Security Officer has been directed to establish Seal Injection from the SSF per Enclosure 2 of EP/1/A/5000/ECA-0.0. Another operator has been dispatched to swap power to 1EMXS. The CR SRO directs you to establish seal injection from the SSF per Enclosure 2 of EP/1/A/5000/ECA-0.0. This JPM is time critical once you get to the SSF.

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