Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Reactor power is 100%

Reactor Coolant System boron concentration is 1250 ppm.

In-service boric acid storage tank concentration is 14,660 ppm.

Core age is 7038 MWD/MTU

Movement of control rods is not desired.

Tavg is higher than Tref.

INITIATING CUE

You are requested to calculate the amount of boric acid required to lower Tavg by 2°F.

Record the answer below.

Gallons of boric acid _____

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

RXXX

TASK

Calculate the amount of boric acid required to reduce Tavg by 2°F.

TASK STANDARDS

The correct amount of boron acid was calculated.

K/A REFERENCE:

G2.1.37 (4.3/4.6)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 15 minutes
Actual Time = _____ minutes

Start Time = _____
Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Date _____

EVALUATOR'S COMMENTS

_____

_____

_____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

RXXX

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

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Instructions for In-Plant JPMs

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In-service boric acid storage tank concentration is 14,660 ppm.

Core age is 7038 MWD/MTU

Movement of control rods is not desired.

Tavg is higher than Tref.

INITIATING CUE

You are requested to calculate the amount of boric acid required to lower Tavg by 2°F.

Record the answer below.

Gallons of boric acid _____

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

Calculator

Station Curve Book (or copies of 1-SC-2.1, 1-SC-2.2, 1-SC-2.4, and 1-SC-3.4)

Station Data Book (or a copy of the ITC curve)

PERFORMANCE STEPS

START TIME _____

1	Determine isothermal temperature coefficient (ITC).	Procedure Step ____
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: From the ITC curve in the Reactor Data Book, determines ITC at 100% power and 1250 ppm boron is -19.0 pcm/°F	
	Notes/Comments	

2	Determine desired reactivity insertion.	Procedure Step ____
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Multiplies the amount RCS temperature is high by ITC. (2°F) x (-19.0 pcm/°F) = -38 pcm.	
	Notes/Comments	

3	Determine boron coefficient.	Procedure Step ____

Critical Step	SAT [ ] UNSAT [ ]

Standards	From 1-SC-3.4, determines boron coefficient at 7038 MWD/MTU is -6.75 pcm/ppm.

Notes/Comments

4	Determine desired change in boron concentration.	Procedure Step ____

Critical Step	SAT [ ] UNSAT [ ]

Standards	Divides the desired reactivity insertion by the boron coefficient. (-38 pcm) ÷ (-6.75 pcm/ppm) = 5.6 ppm

Notes/Comments

5	Determine gallons of boric acid required to raise RCS boron concentration 5.6 ppm.	Procedure Step _____

Critical Step	SAT [ ] UNSAT [ ]

Standards	Using 1-SC-2.2, determines the gallons of boric acid required to be added. Gal. acid = $\frac{(9262\ ft3) \times (44.779\ lbm/ft3)}{8.22\ lbm/gal} \times \ln\left(\frac{14{,}660\ ppm - 1250\ ppm}{14{,}660\ ppm - 1255.6\ ppm}\right)$ = $50{,}455 \times \ln\left(\frac{13{,}410}{13404.4}\right)$ = 21 gallons of acid

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME _____

BLENDED FLOW

The general equations for Blended Flow boron concentration calculations are as follows:

- For a given acid flow, Boric Acid Storage Tanks (BAST) boron concentration, and Primary Grade water (PG) flow, the boron concentration in the blended flow will be as follows:

$$Boron\ Conc\ of\ Blended\ Flow = \frac{(Gallons\ of\ Acid) \times (BAST\ Boron\ Conc)}{(Gallons\ of\ Acid) + (Gallons\ of\ PG)}$$

- For a given acid flow, BAST boron concentration, and desired boron concentration in the Blended Flow, the PG flow will be as follows:

$$Gallons\ of\ PG = \frac{Gallons\ of\ Acid \times [(BAST\ Boron\ Conc) - (Desired\ Blended\ Flow\ Boron\ Conc)]}{Desired\ Blended\ Flow\ Boron\ Conc}$$

- For a given PG flow, BAST boron concentration, and desired boron concentration in the Blended Flow, the acid flow will be as follows:

$$Gallons\ of\ Acid = \frac{(Gallons\ of\ PG) \times (Desired\ Blended\ Flow\ Boron\ Conc)}{(BAST\ Boron\ Conc) - (Desired\ Blended\ Flow\ Boron\ Conc)}$$

The following tables contain the gallons of PG needed per gallon of acid for a given BAST boron concentration and desired Blended Flow boron concentration. These values may be used to determine the total PG and acid required for a given makeup. For example, if a 2600 gallon, 2350 ppm makeup is desired and the BAST is at 14,000 ppm, the table shows that 4.96 gallons of PG will be required for each gallon of acid in the makeup. The multiplier for the PG and acid flows will be {2600 ÷ (1 + 4.96)} = 436.2. Therefore, (436.2 x 1) = 436 gallons of acid and (436.2 x 4.96) = 2164 gallons of PG will be needed for this 2600 gallon makeup.

APPROVED BY: _____ DATE: 8/16/01

BORON ADDITION

The general equation for the gallons of Boric Acid from the Boric Acid Storage Tanks (BAST) to add to the Reactor Coolant System (RCS) to increase the RCS boron concentration is as follows:

$$Gallons\ of\ Acid = \frac{(Volume\ of\ RCS)\times(Density\ of\ RCS\ Water)}{Density\ of\ Charging\ Flow} \times ln\left(\frac{BAST\ ppm - Initial\ RCS\ ppm}{BAST\ ppm - Desired\ RCS\ ppm}\right)$$

Below are typical values to use in the equation:

Density of Charging Flow: 8.22 lbm/gallon

BAST ppm: 14,350 ppm
(This is an average of the 12,950 ppm minimum value and 15,750 ppm maximum value listed in Tech Specs 3.1.2.7 and 3.1.2.8)

Volume of RCS: 9759 ft^3 with the Pressurizer Solid
8757 ft^3 with the Pressurizer level at 28.4%
9262 ft^3 with the Pressurizer level at 64.5%

Density of RCS Water:

RCS Temp	RCS Pressure	RCS Water Density
100°F	14.7 psia	61.999 lbm/ft^3
200°F	350 psia	60.176 lbm/ft^3
300°F	400 psia	57.380 lbm/ft^3
400°F	900 psia	53.877 lbm/ft^3
500°F	2000 psia	49.643 lbm/ft^3
547°F	2250 psia	47.056 lbm/ft^3
580.8°F	2250 psia	44.779 lbm/ft^3

NOTE: RCS Water above 100°F is typically a subcooled liquid and **NOT** a saturated liquid. Density values should be determined for the given RCS temperature and pressure.

APPROVED BY: _____ DATE: 8/16/01

BORON DILUTION

The general equation for the gallons of Primary Grade Water (PG) to add to the Reactor Coolant System (RCS) to dilute the RCS boron concentration is as follows:

$$Gallons\ of\ PG = \frac{(Volume\ of\ RCS)\times(Density\ of\ RCS\ Water)}{Density\ of\ Charging\ Flow} \times ln\left(\frac{Initial\ RCS\ Boron\ Concentration}{Desired\ RCS\ Boron\ Concentration}\right)$$

Below are typical values to use in the equation:

Density of Charging Flow: 8.22 lbm/gallon

Volume of RCS:
9759 ft^3 with the Pressurizer Solid
8757 ft^3 with the Pressurizer level at 28.4%
9262 ft^3 with the Pressurizer level at 64.5%

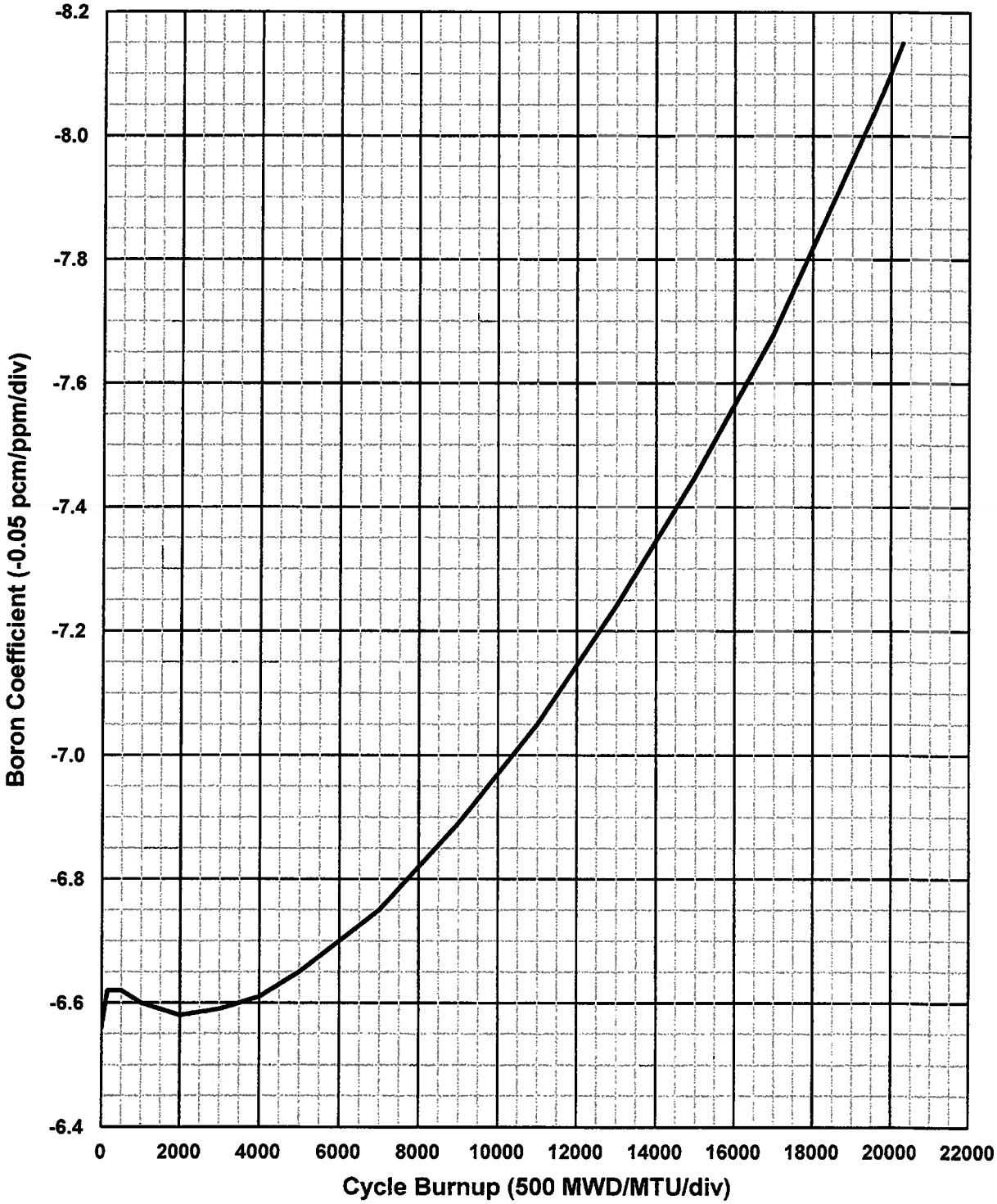
Density of RCS Water:

RCS Temp	RCS Pressure	RCS Water Density
100°F	14.7 psia	61.999 lbm/ft^3
200°F	350 psia	60.176 lbm/ft^3
300°F	400 psia	57.380 lbm/ft^3
400°F	900 psia	53.877 lbm/ft^3
500°F	2000 psia	49.643 lbm/ft^3
547°F	2250 psia	47.056 lbm/ft^3
580.8°F	2250 psia	44.779 lbm/ft^3

NOTE: RCS Water above 100°F is typically a subcooled liquid and **NOT** a saturated liquid. Density values should be determined for the given RCS temperature and pressure.

APPROVED BY: TA Kendzia DATE: 10/8/01

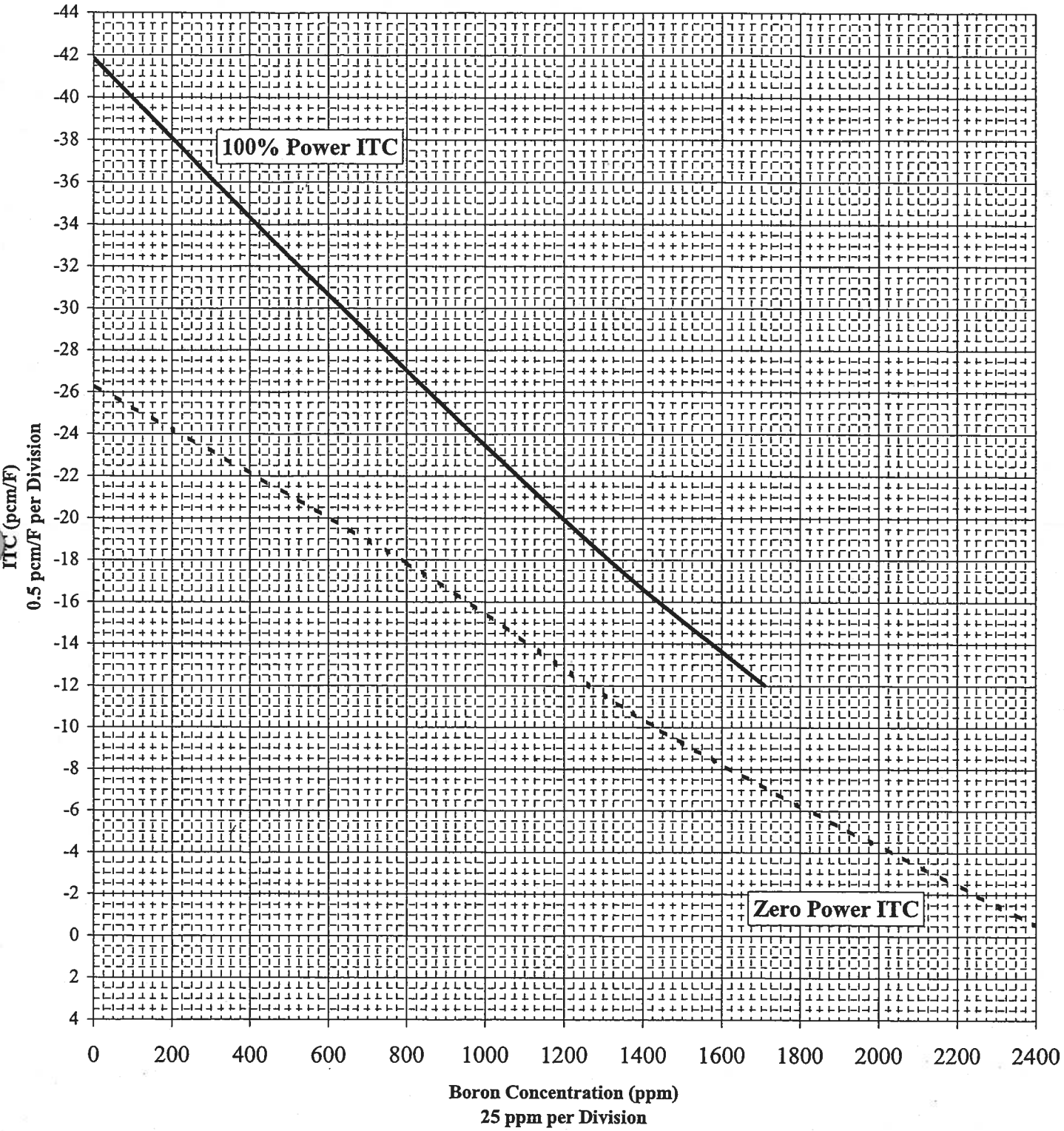
NORTH ANNA UNIT 1 - CYCLE 24
BORON COEFFICIENT VS. BURNUP
FOR ZERO PERCENT POWER



APPROVED BY: RC Arrington

DATE: 9/21/13

North Anna Unit 1 Cycle 21 ITC
Data for 100% Power and Zero Power



Prepared By: _____ Date: 3-27-09

Reviewed By: _____ Date: 3-27-09

N1C21ITC.xls

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Unit 1 entered Mode 3 for a refueling outage at 1230 on April 8.

It is now 0030 on April 15.

The last refueling outage was completed more than six months ago.

PCS computer point T0615A indicates component cooling temperature has exceeded the maximum allowable CC temperature for core off-load.

CC temperature is 88°F.

Fuel movement has been suspended.

110 fuel assemblies remain in the core.

An operator has been sent to the Aux Building basement to increase SW flow to the CC heat exchangers.

INITIATING CUE

You are requested to perform Attachment 13 of 1-OP-4.1 to determine the new maximum allowable CC temperature, and to determine if core off-load may recommence.

Record the answers below.

New Maximum Allowable CC Temperature _____

May core off-load recommence? _____

Once you have determined the new maximum allowable CC temperature, another operator will initiate a 1-LOG-14 to check CC temperature on PCS.

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

TASK

Determine the new maximum allowable CC temperature for core off-load.

Determine if core off-load may recommence.

TASK STANDARDS

Given a copy of 1-OP-4.1, Attachment 13, determine the new maximum allowable CC temperature and determine if core off-load may recommence.

K/A REFERENCE:

G2.1.42 (2.5/3.4)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 10 minutes Start Time = _____

Actual Time = _____ minutes Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Date _____

EVALUATOR'S COMMENTS

_____

_____

_____

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

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It is now 0030 on April 15.

The last refueling outage was completed more than six months ago.

PCS computer point T0615A indicates component cooling temperature has exceeded the maximum allowable CC temperature for core off-load.

CC temperature is 88°F.

Fuel movement has been suspended.

110 fuel assemblies remain in the core.

An operator has been sent to the Aux Building basement to increase SW flow to the CC heat exchangers.

INITIATING CUE

You are requested to perform Attachment 13 of 1-OP-4.1 to determine the new maximum allowable CC temperature, and to determine if core off-load may recommence.

Record the answers below.

New Maximum Allowable CC Temperature _____

May core off-load recommence? _____

Once you have determined the new maximum allowable CC temperature, another operator will initiate a 1-LOG-14 to check CC temperature on PCS.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

Copy of 1-OP-4.1 or just Attachments 11, 12, and 13

Calculator

PERFORMANCE STEPS

START TIME _____

1	Immediately initiate actions to reduce CC temperature to within limit.	Procedure Step 1

SAT [ ] UNSAT [ ]

Standards	Initials step (Initial Condition states that an operator is adjusting SW flow to the CC heat exchangers).

Notes/Comments:

2	Complete calculation to determine "decay time."	Procedure Step 2
	Critical Step	SAT [ ] UNSAT [ ]

Standards	Enters "110" (# of assemblies in reactor). Divides 110 by 7.8 Adds 156 (Tcurrent) Subtracts 20 Determines decay time (Tcalc) is 150 hours.

Notes/Comments

3	Determine the new maximum CC temperature by plotting the "Decay Time" calculated above on the applicable attachment.	Procedure Step 3

Critical Step	SAT [ ] UNSAT [ ]

Standards	Determines Attachment 12 (Non-Back-to-Back) is applicable because it has been greater than 120 days since the previous outage. Using Attachment 12, marks 150 hours on the X-axis, then moves up to intersect the curve, then moves left to find the new maximum allowable CC temperature of 86.5°F on the Y-axis.

Notes/Comments

4	If CC temperature is less than or equal to the new maximum CC temperature, then core off-load may recommence.	Procedure Step 4

Critical Step	SAT [ ] UNSAT [ ]

Standards	Compares actual CC temperature (88°F) to the new maximum allowable CC temperature (86.5°F). Determines core off-load may not recommence.

Notes/Comments

5	Initiate a 1-LOG-14 to check CC temperature.	Procedure Step 5

SAT [ ] UNSAT [ ]

Standards	Initials step (Initiating Cue).

Notes/Comments

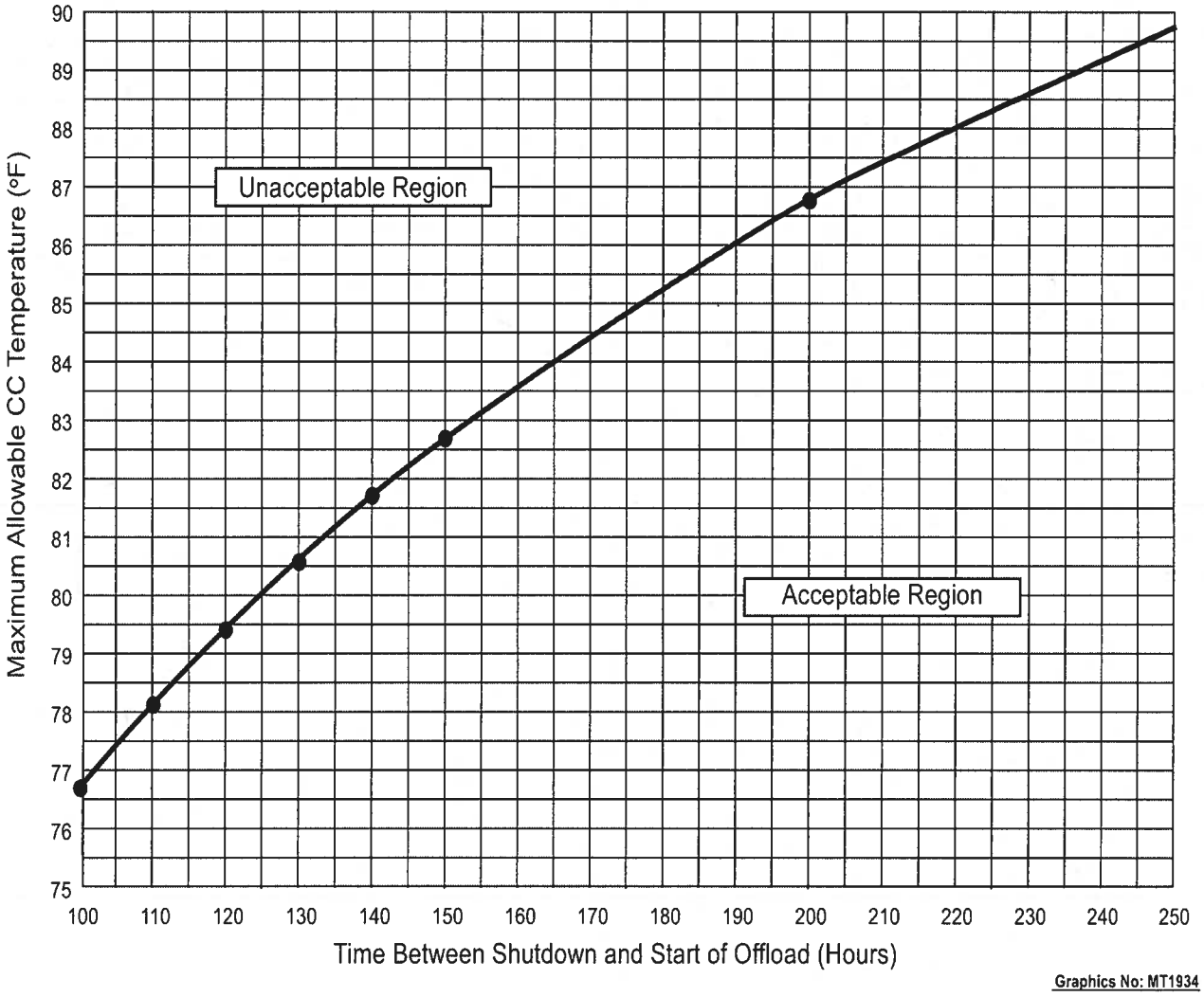
>>>>> END OF EVALUATION <<<<<

STOP TIME _____

(Page 1 of 1)

Attachment 11

Back-To-Back Refueling CC Supply Temperature vs Decay Time



Graphics No: MT1934

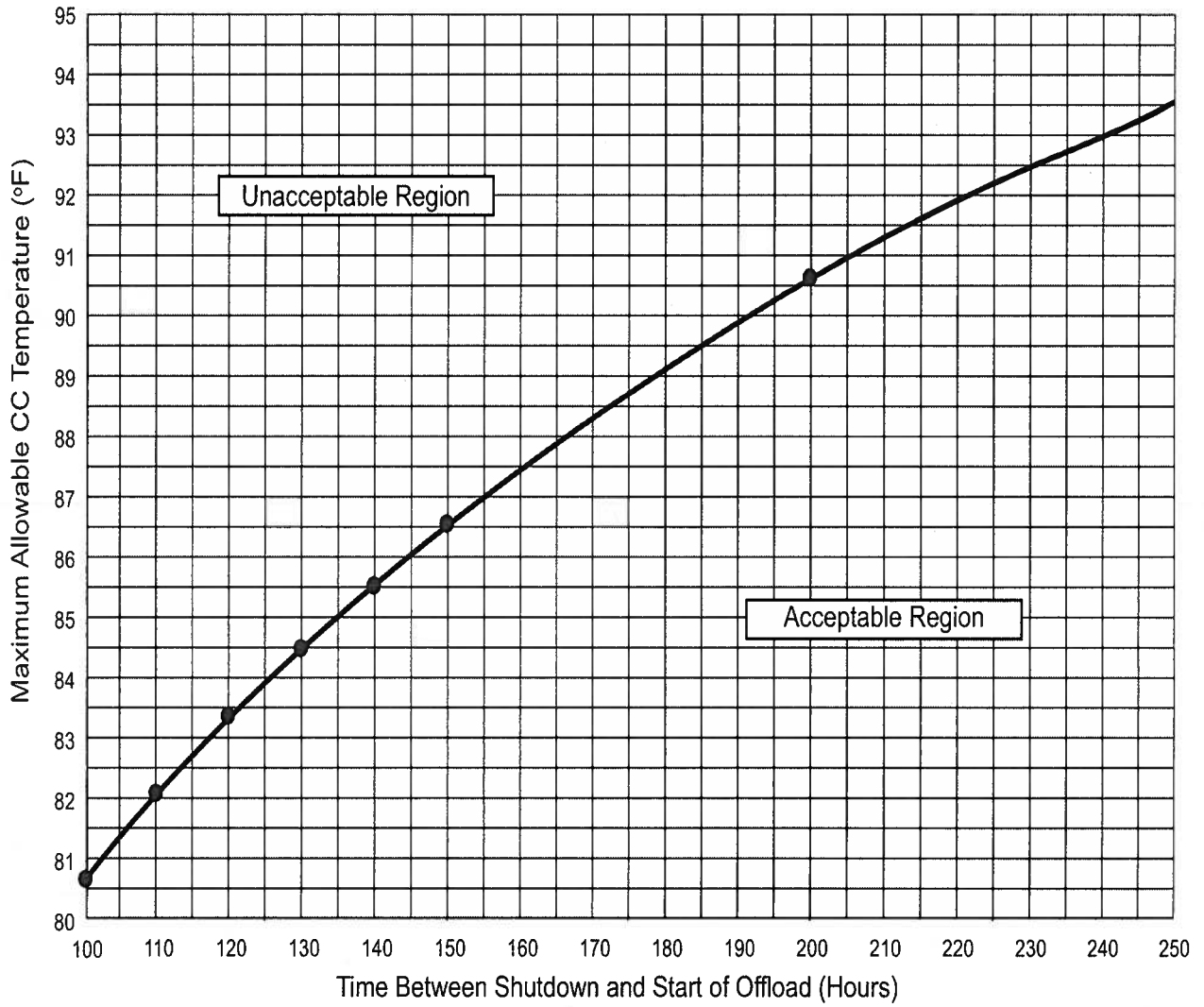
MAXIMUM CC SUPPLY TEMPERATURE VS. DECAY TIME BACK-TO-BACK OFFLOAD (1 PUMP, 2 COOLER)

NOTE: Back-to-Back outage is defined as an outage that has occurred at less than or equal to 120 days since the previous outage unit became subcritical.

(Page 1 of 1)

Attachment 12

Non Back-To-Back Refueling CC Supply Temperature vs Decay Time



Graphics No: MT1933

MAXIMUM CC SUPPLY TEMPERATURE VS. DECAY TIME NON-BACK-TO-BACK OFFLOAD (1 PUMP, 2 COOLER)

NOTE: Non Back-to-Back outage is defined as an outage that has occurred at greater than 120 days since the previous outage unit became subcritical.

(Page 1 of 2)

Attachment 13
Determine New Maximum CC Temperature vs Decay Time

_____ 1. Immediately initiate actions to reduce CC temperature to within limit.

_____ 2. Immediately complete the following calculation to determine the "Decay Time" to be used to find the new maximum CC temperature for the current time since entry into Mode 3:

$$T_{calc} = \left[\frac{\text{\# of assemblies in reactor}}{\text{7.8 assemblies per hour}} + T_{current} \right] - 20$$

T_{calc} = Time to be used on the appropriate attachment (Attachment 11 or Attachment 12) to determine the new maximum CC temperature

$T_{current}$ = Time since entry into Mode 3.

Tcurrent = _____ (time since entry into Mode 3) (Line 1)

Assemblies = _____ (number of assemblies in reactor vessel) (Line 2)

Line 2 divided by 7.8 = _____ (Line 3)

Line 3 + Line 1 = _____ (Line 4)

Line 4 - 20 = _____ (Line 5)

Line 5 is the "Decay Time" to read on the appropriate attachment (Attachment 11 or Attachment 12)

_____ 3. Determine the new maximum CC temperature by plotting the "Decay Time" calculated above on the applicable attachment listed below:

- Attachment 11, Back-To-Back Refueling CC Supply Temperature vs Decay Time
- Attachment 12, Non Back-To-Back Refueling CC Supply Temperature vs Decay Time

(Page 2 of 2)

Attachment 13

Determine New Maximum CC Temperature vs Decay Time

_____ 4. IF the CC supply temperature, as indicated by Unit 1 PCS Computer Point T0615A, is less than or equal to the new maximum CC temperature, THEN core offload may recommence.

_____ 5. Initiate a 1-LOG-14 to check CC temperature, as monitored by Unit 1 PCS Computer Point T0615A, is less than or equal to the new maximum CC temperature in accordance with TRM TSR 3.9.7.1. Step 4.57 provides actions to be taken in the event CC temperature increases above the new maximum CC temperature.

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

1-PT-14.1, Charging Pump 1-CH-P-1A Periodic Test, is in progress.

Local charging pump data has been entered on Attachment 1, 1-CH-P-1A Data Sheet.

INITIATING CUE

You are requested to complete the calculations in Attachment 1 of 1-PT-14.1 and to plot pump flowrate and differential pressure on the pump curve in Attachment 4.

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

TASK

Complete calculations and plot pump flowrate vs. differential pressure.

TASK STANDARDS

Attachment 1 calculations completed accurately. Pump flowrate vs. differential pressure plotted accurately on Attachment 4 to determine operation is in the acceptable range.

K/A REFERENCE:

G2.2.1 (4.5/4.4)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 10 minutes Start Time = _____

Actual Time = _____ minutes Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Date _____

EVALUATOR'S COMMENTS

_____

_____

_____

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

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INITIAL CONDITIONS

1-PT-14.1, Charging Pump 1-CH-P-1A Periodic Test, is in progress.

Local charging pump data has been entered on Attachment 1, 1-CH-P-1A Data Sheet.

INITIATING CUE

You are requested to complete the calculations in Attachment 1 of 1-PT-14.1 and to plot pump flowrate and differential pressure on the pump curve in Attachment 4.

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

1-PT-14.1 Attachment 1 with values recorded for each parameter except the "Actual GPM", "Discharge Flow" and "Differential Pressure" calculations.

1-PT-14.1 Attachment 4

PERFORMANCE STEPS

START TIME _____

1	Calculate "Actual GPM" (e).	Procedure Step

Critical Step	SAT [ ] UNSAT [ ]

Standards	Performs the following calculation: Square root of [recirc flow DP (19.8) divided by 144.47] X 180 = 66.6 gpm

Notes/Comments:

2	Calculate "Discharge Flow."	Procedure Step

Critical Step	SAT [ ] UNSAT [ ]

Standards	Performs the following calculation: a+b+c+d+e-f-g-h = discharge flow 70 + 7.8 + 7.9 + 7.9 + 66.6 – 2.36 – 1.97 – 1.78 = 154.09 gpm

Notes/Comments

3	Calculate "Differential Pressure."	Procedure Step

Critical Step	SAT [ ] UNSAT [ ]

Standards	Performs the following calculation: Differential Pressure = x – y Differential Pressure = 2575 – 50 = 2525 psid

Notes/Comments

4	Plot pump flowrate vs. differential pressure on Attachment 4.	Procedure Step

Critical Step	SAT [ ] UNSAT [ ]

Standards	Plots 154 gpm (x-axis) and 2525 psid (y-axis).

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME _____

(Page 1 of 2)

Attachment 1
Charging Pump 1-CH-P-1A Pump Data Sheet

Parameter	Reference Values*	Measured Value	Acceptable	Required Action	
				Low	High
Static Inlet Pressure (1-CH-PI-103, 1-CH-PI-104, or 1-CH-PI-105)	44.95 psig	50 psig	≥ 33.4	< 33.4	None
Charging Flow (1-CH-FI-1122A)	72.0 gpm	(a) 70 gpm	None	None	None
Seal Water Flow (1-CH-FI-1130A)	7.6 gpm	(b) 7.8 gpm	None	None	None
Seal Water Flow (1-CH-FI-1127A)	7.6 gpm	(c) 7.9 gpm	None	None	None
Seal Water Flow (1-CH-FI-1124A)	7.6 gpm	(d) 7.9 gpm	None	None	None
Recirc Flow Indication from Δ/P Cell	20.86 in. H_2O	19.8 in. H_2O	None	None	None
(X = Recirc flow ΔP) $\sqrt{\frac{X}{144.47}} \times 180 =$ Actual GPM Combined CHG Recirc Flow 1-CH-FE-1161	68.4 gpm	(e) gpm	None	None	None
Seal Return 1-CH-FR-1154A RCP 1A (Red Pen)	2.85 gpm	(f) 2.36 gpm	None	None	None
Seal Return 1-CH-FR-1154A RCP 1B (Green Pen)	2.55 gpm	(g) 1.97 gpm	None	None	None
Seal Return 1-CH-FR-1154A RCP 1C (Blue Pen)	2.16 gpm	(h) 1.78 gpm	None	None	None
Discharge Flow (a + b + c + d + e - f - g - h)	155.64 gpm	gpm	> 120	≤ 120	None
Discharge Pressure (1-CH-PI-1151)	2550 psig	(x) 2575 psig	None	None	None
Dynamic Inlet Pressure (1-CH-PI-103)	40.34 psig	(y) 50 psig	≥ 33.4	< 33.4	None

*Reference values and Acceptance criteria in accordance with IST Calc Basis **(Reference 2.3.15)**

(Page 2 of 2)

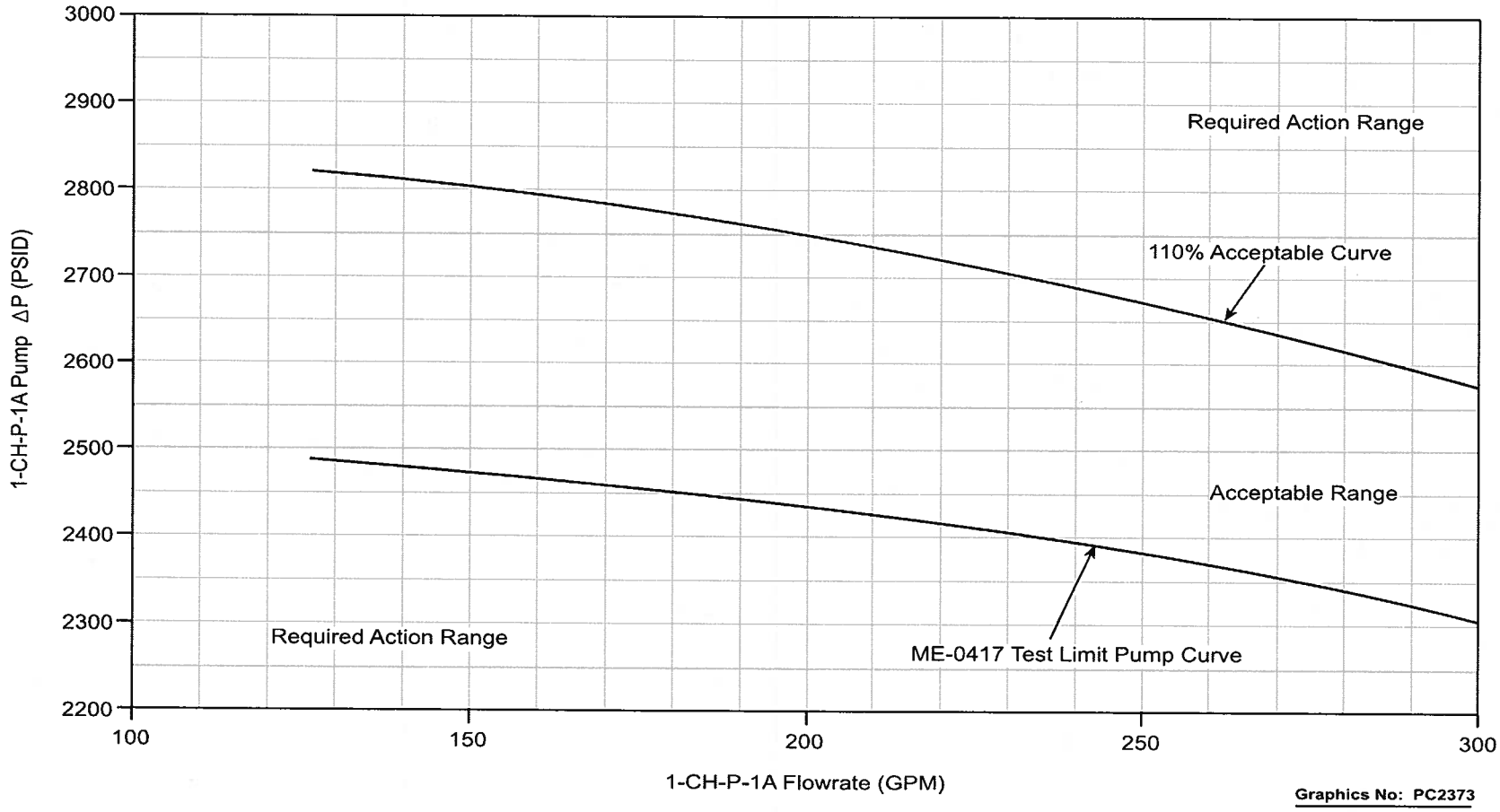
Attachment 1
Charging Pump 1-CH-P-1A Pump Data Sheet

Parameter	Reference Values*	Measured Value	Acceptable	Required Action	
				Low	High
Differential Pressure = x -y	2509.66 psid	psid	Attachment 4	Attachment 4	Attachment 4
Lube Oil Pressure (1-CH-PI-101A)	11.6 psig	10.6 psig	9.5 -12.0	None	None
Motor Current	63.0 amps	62 amps	None	None	None

*Reference values and Acceptance criteria in accordance with IST Calc Basis **(Reference 2.3.15)**

(Page 1 of 1)

Attachment 4
1-CH-P-1A Quarterly Test Pump Curves



1-CH-P-1A QUARTERLY TEST PUMP CURVES

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Unit 1 is in mode 1.

1-CH-217, PG Supply to Boric Acid Blender Isolation Valve, diaphragm must be replaced.

INITIATING CUE

You are requested to review the 1-CH-217 tagging record package for accuracy and completeness using the Tag Out Preparation and Review Check List.

A component configuration is NOT required by the tagout.

Circle the results of your review. If not approved, record the reason below.

Approved Not Approved

Dominion
North Anna Power Station
JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

RXXX

TASK

Review a tagging record for accuracy and completeness.

TASK STANDARDS

Tagging record review identifies inadequate boundary because 1-GN-109 is not included as a boundary isolation valve.

K/A REFERENCE:

G2.2.13 (4.1 / 4.3)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 30 minutes
Actual Time = _____ minutes

Start Time = _____
Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Date _____

EVALUATOR'S COMMENTS

_____

_____

_____

Dominion
North Anna Power Station

JOB PERFORMANCE MEASURE
(Evaluation)

OPERATOR PROGRAM

RXXX

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Unit 1 is in mode 1.

1-CH-217, PG Supply to Boric Acid Blender Isolation Valve, diaphragm must be replaced.

INITIATING CUE

You are requested to review the 1-CH-217 tagging record package for accuracy and completeness using the Tag Out Preparation and Review Check List.

A component configuration is NOT required by the tagout.

Circle the results of your review. If not approved, record the reason below.

Approved Not Approved

EVALUATION METHOD

Perform if conducted in the simulator or in a laboratory (use Performance Cue(s))

Simulate if conducted in the station or on a dead simulator (use Simulation Cue(s))

TOOLS AND EQUIPMENT

Tagging record package for 1-CH-217 which includes:

- Tagout Preparation and Review Checklist
- Tagout coversheet
- OP-AP-300, Attachment 7, Reactivity Management Screening
- Tagout Request
- Valve Lineup sheets
- 11715-FM-095B, sheet 1
- 11715-FK-095B, sheet 1
- 11715-FM-086D, sheet 1

PERFORMANCE STEPS

START TIME _____

1	Work scope defined and understood ...	Procedure Step ____
		SAT [ ] UNSAT [ ]
	Standards: Checks JPM initial conditions to define work scope (replace diaphragm).	
	Notes/Comments	

2	Boundaries established for tasks and hazards ... **NO**	Procedure Step ____
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Reviews tagging record and reference material. Determines 1-PG-118 was excluded as a boundary isolation valve (11715-FM-086D, sheet 1)	
	Notes/Comments	

3	Review for heat trace, IA, seal water, seal cooling fuses ...	Procedure Step _____
		SAT [ ] UNSAT [ ]
	Standards	Reviews tagging record and reference material to determine no heat trace, IA, seal water, seal cooling, fuses ...
	Notes/Comments	

4	If a component configuration is required by the tagout ...	Procedure Step _____
		SAT [ ] UNSAT [ ]
	Standards	Notes initiating cue that component configuration is not required and previously NA'd step on the check list.
	Notes/Comments	

5	Applicable procedures and controlled documents are used to create tagout. If using non-priority drawings ...	Procedure Step _____

	SAT [ ] UNSAT [ ]

Standards	Determines applicable procedures and controlled documents were used. Determines non-priority drawings were not used.

Notes/Comments

6	Tagout is sequenced as directed by controlling procedure, or per OP-AA-200.	Procedure Step _____

Critical Step	SAT [ ] UNSAT [ ]

Standards	Reviews tagout and determines sequence is correct.

Notes/Comments

7	"Return To" positions reflect OP-1A, controlling procedure ...	Procedure Step _____

Critical Step	SAT [ ] UNSAT [ ]

Standards	Reviews tagout and valve lineup sheets and determines "return to" positions are correct.

Notes/Comments

8	Consider effects on alarms, indications, instrumentation, and controls.	Procedure Step _____

	SAT [ ] UNSAT [ ]

Standards	Reviews tagout and determines no effects on alarms, indications, instrumentation, or controls.

Notes/Comments

9	Compliance with TS & TRM (maintain redundant equipment operable).	Procedure Step _____
		SAT [ ] UNSAT [ ]
	Standards	Determines tagout is in compliance with TS and TRM.
	Notes/Comments	

10	Reference documents and special notes ... are on cover sheet.	Procedure Step _____
		SAT [ ] UNSAT [ ]
	Standards	Reviews tagout to confirm reference documents and special notes are on cover sheet.
	Notes/Comments	

11	Tagout Request reviewed as applicable.	Procedure Step ____
		SAT [ ] UNSAT [ ]
Standards	Reviews tagout request.	
Notes/Comments		

12	Consider the effects on reactivity management.	Procedure Step ____
		SAT [ ] UNSAT [ ]
Standards	Reviews Reactivity Screening attachment. Reviews notes 1, 2 and 4 on the tagout coversheet.	
Notes/Comments		

13	Pre-maintenance and post-maintenance requirements are understood.	Procedure Step _____
		SAT [ ] UNSAT [ ]
	Standards: Reviews tagging record package for pre-maintenance and post-maintenance requirements.	
	Notes/Comments	

14	Comments or problems found.	Procedure Step _____
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Notes failure to include 1-PG-118 as a boundary isolation. Circles "not-approved" on the JPM cover sheet.	
	Notes/Comments	

>>>>> END OF EVALUATION <<<<<

STOP TIME _____

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North Anna Operations Tag-Out Preparation and Review Check List

Tagging is a Safety Process, Tagging is NOT a production process.

Tagout Number 1-14-CH-0001 (1-CH-217)

Prep	Review	SRO1	SRO2	Personnel, Equipment and Administrative Review Items
☑	[ ]	[ ]	[ ]	Work scope defined and understood using the following, as applicable: work order, P3E, Craft, Planner and Work Week Coordinator.
☑	[ ]	[ ]	[ ]	Boundaries established for task and hazards, all energy sources removed or noted on the tagout. Initiate WM-AA-301, Operational Risk Assessment, for all tagouts containing non-standard isolation boundaries or no available vent/drain path.
☑	[ ]	[ ]	[ ]	Review for heat trace, IA, seal water, seal cooling, fuses, patch cords, motor/MOV heaters, "hidden power" supplies.
N/A	[ ]	[ ]	[ ]	IF a component configuration is required by the tagout, it's NOT controlled by an MOP, and it is a component/condition controlled by Operations THEN use a Plant Requirement tag to ensure the required status.
☑	[ ]	[ ]	[ ]	Applicable procedures and controlled documents are used to create tagout. If using Non-Priority Drawings then verify either no pending changes or the changes are reviewed and noted. If not, refer to OP-AA-200.
☑	[ ]	[ ]	[ ]	Tagout is sequenced as directed by controlling procedure, or per OP-AA-200.
☑	[ ]	[ ]	[ ]	"Return To" positions reflect OP-1A, Controlling Procedure, or Equipment Status positions. At a minimum, "Return To" position conflicts are to be noted on tagout.
☑	[ ]	[ ]	[ ]	Consider effects on alarms, indications, instrumentation, and controls.
☑	[ ]	[ ]	[ ]	Compliance with TS & TRM (Maintain Redundant Equipment Operable).
☑	[ ]	[ ]	[ ]	References documents and special notes, as required by OP-AA-200, are on cover sheet.
☑	[ ]	[ ]	[ ]	Tagout Request reviewed as applicable.
☑	[ ]	[ ]	[ ]	Consider the effects on Reactivity Management. If affected, then note on the tagout. OP-AP-300 Attachment 7 can be referenced to aid in determination.
		[ ]	[ ]	Pre-maintenance and Post-maintenance requirements are understood.
				Walkdown to evaluate the following: tagout covers the work scope, labeling, components in overhead, work area hazards, work requests on components to be manipulated, "return to" positions match as found position, potential for trapped water in boundary, alternate lockout device required, potential Status Control bump hazards and inform lead craft of

Preparer: CRO (initials) Walkdown: _____ (Initials) Review : _____ (initials) SRO: _____ (initials) SRO: _____ (initials)

Comments or Problems Found:

_____

_____

_____

_____

*If modifications are required, evaluate affects to all associated tagouts.

The check list is to be used as a post tagout development "self-check" tool and is not an official document of record. The checklist may be discarded after completion of the review process.

Component to be Worked:

1-CH - -217

PG Supply To Boric Acid Blender Isolation Valve

AB 274` BLENDER AREA

NOTES

****** FOR TRAINING USE ONLY ******

Effects Reactivity. Refer to OP-AP-300 Att. 7

1) This tagout removes the ability to supply PG to Unit 1. Ensure no makeups or dilutions are required before hanging this tagout.

2) 1-CH-220 IS "LOCKED/CLOSED" to comply with T.S. 3.1.8 in the event of a Unit Trip. If Unit 1 trips while this tagout is hanging, 1-CH-241, 1-CH-FCV-1114B, and 1-CH-FCV-1113B will also need to be secured in the Closed position with in 15 minutes, unless a boration is in progress,IAW T.S. 3.1.8 basis. Ensure Unit 1 OATC and Aux Bldg watchstander are briefed on this requirement before hanging tagout.

3) Ensure craft is ready to work prior to tagging.

4) Return to position for 1-CH-217 is with Unit 1 in Modes 1 or 2. If Unit 1 enters modes 3, 4, 5, or 6, then change the return to position of 1-CH-217 to "LOCKED CLOSED".

REASON

Replace diaphragm for 1-CH-217 due to leak.

INSTRUCTIONS / HAZARDS

CAUTION CRAFT: EXPECT WATER (PG).

ADDITIONAL INFORMATION

REF: 11715-FM-095B(1), FM-086D(1), FK-095B(1), 0-OP-9A, 1-OP-8.1A

Tagout Attributes:

Attribute Description	Attribute Value
Section Holder	SHIFT MANAGER
POD Work Week	N/A
POD Schedule	Emergent
Tag On Request	No

Work Order List:

Number / Equipment ID	Description
59102158672 **- - - - - - - - - - - -** **42** **- - - - - - - - - - - -** **1-CH - -217**	Replace diaphragm due to leakage

Tagout Verification:

Status	Description	Name	Verification Date
Prepared	Prepared	ESOMS CRO TEST USER	04/24/2014 11:29:42
Walkdown	Walkdown		
1 SRO Review	1 SRO Review		

Status	Description	Name	Verification Date
2 SRO Review	2 SRO Review		
Approved to Hang	Approved to Hang		
Tags Verified Hung	Tags Verified Hung		
Restoration SRO review	Restoration Changed		
Approved to Remove	Approved to Remove		
Tags Verified Removed	Tags Verified Removed		

Tag Type ------ Serial No.	Equipment ---------- * Equipment Description * Equipment Location	Ver Req	Pla Seq	Placement Configuration ---------- * Notes	Place. 1st Verif Date/Time	Place. 2nd Verif Date/Time	Ver Req	Rest Seq	Rest. Config. *As Left (If Diff.) ---------- * Notes	Rest. 1st Verif Date/Time	Rest. 2nd Verif Date/Time
Mech. Danger ------	1-CH - -220 ---------- * PG Supply To Chem Mixing Tk And Manual Dilute Isol * BLENDER AREA	IV	1	LOCKED CLOSED ----------			IV	5	CLOSED ----------		
Mech. Danger ------	1-CH - -218 ---------- * PG Supply To Boric Acid Blender Isolation Valve * AUX BLDG 274` BLENDER AREA	IV	1	CLOSED ----------			IV	4	OPEN ----------		
Mech. Danger ------	1-CH - -216 ---------- * PG To Boric Acid Blender 1-CH-PC-1114 Isol Valve * BLENDER AREA	IV	2	OPEN ----------			IV	3	OPEN ----------		
Mech. Danger ------	1-CH -ICV -3212 ---------- * 1-CH-PC-1114 INLET LINE VENT VALVE * AB 274' AT UNIT 1 BLENDER	IV	3	OPEN ----------			IV	1	CLOSED ----------		
Maintenar item ------	1-CH - -217 ---------- * PG Supply To Boric Acid Blender Isolation Valve * AB 274` BLENDER AREA	IV		----------			IV	2	OPEN ----------		

ATTACHMENT 7
(Page 1 of 1)
Reactivity Management Screening

Does the activity:

1.	Affect nuclear fuel?	Yes	No
2.	Affect CRD mechanisms or position indication?	Yes	No
3.	Change input instrumentation or software providing heat balance calculations, core thermal calculations, or core power distribution calculations?	Yes	No
4.	Affect reactivity calculations such as shutdown margin or ECP?	Yes	No
5.	Affect incore or excore nuclear instrumentation?	Yes	No
6.	Place Rods in Manual?	Yes	No
7.	Trip Reactor Protection components? (SSPS, RPS, EIF, AMSAC)	Yes	No
8.	Affect boration/dilution system?	(Yes)	No
9.	Affect main steam or feedwater flow or indication?	Yes	No
10.	Change T hot or T cold indications?	Yes	No
11.	Affect TAVG control circuits?	Yes	No
12.	Affect EH controls?	Yes	No
13.	Affect blowdown flows or indications?	Yes	No
14.	Affect Steam Dump operation?	Yes	No
15.	Place RCS pressure or controls to Manual?	Yes	No
16.	Affect feedwater pre-heating systems (SD, ES)?	Yes	No

If any answer is Yes, then notify the Shift Manager and STA. A formal pre-job brief shall be conducted with the control room team and all individuals involved in the activity. Consideration should be given to establishing additional controls, oversight and monitoring to preclude a reactivity event.

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Tag-Out Request

OP-AA-200 - Attachment 5 Page 1 of 1

Issued To (Name)	Extension	Department

Tag-Out Requested On Unit: ☑ 1 ☐ 2 ☐ 3 ☐ Common

Reason For Tag-Out
- ☑ Corrective Maintenance
- ☐ Preventive Maintenance
- ☐ Trouble Shooting
- ☐ Testing
- ☐ Engineering Work Package
- ☐ Other _____

Initiating Document
Work Order Number 591021586 72
Design Change Package Number _____
Other _____

Equipment Affected 1-CH-217

Work To Be Done Replace diaphragm due to leakage

Assist in Defining Work Scope and establishing safe work boundaries, review the following and check all that apply:

- ☐ "NO ROTATION" Tags (Equipment de-energized and prevented from turning; Non-intrusive maintenance.)
- ☐ "NO FLOW" Tags (System isolated to allow equipment to be manipulated without affecting the plant. Non-intrusive maintenance.)
- ☑ "FULL TAGOUT" Tags (Equipment isolated from all energy sources and depressurized. Intrusive maintenance.)
- ☐ "ELECTRICAL ONLY" (Equipment electrically isolated, the craft will use LOCKOUT, if required, for all other energy sources.)
- ☐ Controlling Procedure, which defines energy sources (OP, MOP, PT, ICP, MCM, etc. List in remarks.)
- ☐ Personnel entering a piping system or plant equipment (List in remarks.) (Operations will assist in determining applicable OPS procedures.)
- ☐ Auxiliary Components associated with equipment:
  - ☐ Seal Water
  - ☐ Oil sub-system
  - ☐ Cooling Water (i.e., BC, SW, CD, CC)
- ☐ Heat Trace (consider if removing insulation)
- ☐ Purge Path Required (Describe Below)
- ☐ System in-service for Freon removal
- ☐ Steam removed from air handler
- ☐ Hazardous Chemicals involved
- ☐ Control Power fuses removal required
- ☐ Grounds required
- ☐ Motor Heater fuses
- ☐ MOV motor/grease heater fuse
- ☐ MOV internal power supplies on LS/Rotor Contacts
- ☐ PMT requires Danger Tags (MOV testing, Flow Scan)

Tag-Out Request Submitted By (Name)	Date	Time
Planner	4/24/14	11:00
Tag-Out Request Verified By (Name)	**Date**	**Time**
Mechanic	4/24/14	11:30

Recommended Isolations or Remarks (If possible, include tag type and position.)

Form No. 721716(Aug 2011)

Step: 5.21 LETDOWN - BLENDER AREA (RT TO LFT) ==> BLENDER AREA (RIGHT TO LEFT)

Equipment:	Description/Instruction:	Location:	Required Config:	Actual Config:	Verif:	Initials
1-CH - -223	Chemical Mixing Tank PG Supply Header Isol Valve	BLENDER AREA	OPEN		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -221	Charging Pumps Manual Dilute Isolation Valve	AB 274` BLENDER AREA	CLOSED		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -220	PG Supply To Chem Mixing Tk And Manual Dilute Isol	BLENDER AREA	CLOSED		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -218	PG Supply To Boric Acid Blender Isolation Valve	AUX BLDG 274` BLENDER AREA	OPEN		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -236	Blender Discharge To Dilute Header (Reach Rod)	VCT CUBE/REACH ROD IN BLENDER AREA	OPEN		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -186	Reactor Coolant Filter To Vct Inlet Hdr Isol Valve (Chain Operated Reach Rod)	AUX BLDG 274` U-1 BLENDER AREA	OPEN		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -191	Vct To Stripper Vent Cond Isolation Valve (Reach Rod)	AB 274` BLENDER AREA (REACHROD)	OPEN		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						
1-CH - -230	Boric Acid Blender To Rwst And Fuel Pit Isol Vv	AB Unit 1 Blender Area	CLOSED		IV	Group: 0 Required:
Instruction:						
Notes:						
Prints:						

Step: 5.10 PG HEADER SOUTH OF CATALYTIC RECOM ==> PG HEADER SOUTH OF CATALYTIC RECOMBINER CUBICLE

Equipment:	Description/Instruction:	Location:	Required Config:	Actual Config:	Verif:	Initials	
1-PG - -104	Gas Waste Recombiner Flushwater Sply Isol Vv (10 feet overhead outside Recombiner Cube)	Aux Bldg elev.256	CLOSED		IV		
					Group: 0	Required:	
Instruction:							
Notes:							
Prints:							
1-PG - -106	PG Supply to Recombiner Constant Temperature Bath (10 feet overhead outside Recombiner Cube)	259' East Outside Recombiner Cube	CLOSED		IV		
					Group: 0	Required:	
Instruction:							
Notes:							
Prints:							
1-PG - -118	Boric Acid Blender Flushwater Supply Isol Valve (10 feet overhead outside Recombiner Cube)	AB 259`;12`NORTH 1-HC-H2A-101 OVHD	OPEN		IV		
					Group: 0	Required:	
Instruction:							
Notes:							
Prints:							
1-PG - -210	Boric Acid Blender Flush Water Supply Isol Valve (above 1-IA-C-1)	AB 259` IN OVHD ABOVE U-1 AIR COMP.	OPEN		IV		
Instruction:					Group: 0	Required:	
Notes:							
Prints:							
1-PG - -300	Primary Grade Water Hose Conn Isol Valve	Aux Bldg 259' at 2-IA-C-1	CLOSED		IV		
Instruction:					Group: 0	Required:	
Notes:							
Prints:							
1-PG - -143	Primary Grade Water Branch Header Isol Valve (West of 2-IA-C-1)	IN AUX. BLDG.	OPEN		IV		
					Group: 0	Required:	
Instruction:							
Notes:							
Prints:							
1-PG - -323	Primary Grade Water Supply Header Isol Valve (West wall of 2-IA-C-1)	West wall of 2-IA-C-1	OPEN		IV		
					Group: 0	Required:	
Instruction:							
Notes:							
Prints:							

Step: 5.21 LETDOWN - BLENDER AREA (RT TO LFT) ==> BLENDER AREA (RIGHT TO LEFT)

Equipment:	Description/Instruction:	Location:	Required Config:	Actual Config:	Verif:	Initials	
1-CH - -225 Instruction: Notes: Prints:	Chemical Mixing Tank Vent Valve	BLENDER AREA	CLOSED		IV	Group: 0	Required:
1-CH - -226 Instruction: Notes: Prints:	Chemical Mixing Tank Funnel Isolation Valve	U-1 BLENDER AREA	CLOSED		IV	Group: 0	Required:
1-CH - -227 Instruction: Notes: Prints:	Chemical Mixing Tank Drain Valve	BLENDER AREA	CLOSED		IV	Group: 0	Required:
1-CH - -216 Instruction: Notes: Prints:	PG To Boric Acid Blender 1-CH-PC-1114 Isol Valve	BLENDER AREA	OPEN		IV	Group: 0	Required:
1-CH - -217 Instruction: Modes 1 and 2 Notes: 4 Prints:	PG Supply To Boric Acid Blender Isolation Valve	AB 274` BLENDER AREA	OPEN		IV	Group: 0	Required:
1-CH - -217 Instruction: Modes 3, 4, 5, and 6 Notes: 4 Prints:	PG Supply To Boric Acid Blender Isolation Valve	AB 274` BLENDER AREA	LOCKED CLOSED		IV	Group: 0	Required:
1-CH - -228 Instruction: Notes: Prints:	Chemical Mixing Tank Outlet Isolation Valve	AB 274` BLENDER AREA	CLOSED		IV	Group: 0	Required:
1-CH - -224 Instruction: Notes: Prints:	Chemical Mixing Tank PG Supply Header Isol Valve	BLENDER AREA	CLOSED		IV	Group: 0	Required:

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

An HP technician has reported possible damage on 1-CH-TCV-100 (letdown header bypass to VCT temperature control valve) in the Unit 1 non-regen heat exchanger cube.

INITIATING CUE

You are directed to perform the following as the operator who will inspect 1-CH-TCV-100. Record your answers below.

- Select the appropriate RWP task number.
- Determine the required protective clothing for the job.
- Determine the required dosimetry for the job.
- Determine the dose alarm setpoint **AND** the dose rate alarm setpoint.
- Determine the maximum stay time IN MINUTES based on reaching the dose alarm setpoint, assuming you avoid the areas surveyed for "contact and 30 cm" readings.

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

TASK

Determine correct RWP task number, protective clothing, dosimetry, dose alarm setpoint, dose rate alarm setpoint, and maximum stay-time.

TASK STANDARDS

Correct RWP task, protective clothing, dosimetry, dose alarm and dose rate setpoints are identified from the RWP/Task.

Correct maximum stay time is calculated based on the alarm setpoint.

K/A REFERENCE:

G2.3.7 (3.5/3.6)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 15 minutes
Actual Time = _____ minutes

Start Time = _____
Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Date _____

EVALUATOR'S COMMENTS

_____

_____

Dominion
North Anna Power Station

ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

An HP technician has reported possible damage on 1-CH-TCV-100 (letdown header bypass to VCT temperature control valve) in the Unit 1 non-regen heat exchanger cube.

INITIATING CUE

You are directed to perform the following as the operator who will inspect 1-CH-TCV-100. Record your answers below.

- Select the appropriate RWP task number.
- Determine the required protective clothing for the job.
- Determine the required dosimetry for the job.
- Determine the dose alarm setpoint **AND** the dose rate alarm setpoint.
- Determine the maximum stay time IN MINUTES based on reaching the dose alarm setpoint, assuming you avoid the areas surveyed for "contact and 30 cm" readings.

EVALUATION METHOD

Demonstration if conducted in the simulator or in a laboratory (use DEMONSTRATION cues)
Verbal-visual if conducted in the station or on a dead simulator (use VERBAL-VISUAL cues)

TOOLS AND EQUIPMENT

RWP, Survey Map, Calculator

PERFORMANCE STEPS

START TIME _____

1	From the RWP provided, determine which task number is applicable for the job.	Procedure Step

Critical Step	SAT [ ] UNSAT [ ]

Standards	Operator determines task1 is the correct task.

Notes/Comments:

2	From the RWP provided, determine the protective clothing requirements.	Procedure Step:
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Operator determines that the area is not contaminated; therefore, no protective clothing is required. **Protective Clothing Requirements:** None	
	Notes/Comments:	

3	From the RWP provided, determine the dosimetry required.	Procedure Step:
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Operator identifies that ED/SRD & TLD are required.	
	Notes/Comments:	

4	From the RWP provided, determine the dose alarm setpoint and dose rate alarm setpoint.	Procedure Step:
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Operator determines the dose alarm is 5 mRem and the dose rate alarm is 90 mRem/hr.	
	Notes/Comments:	

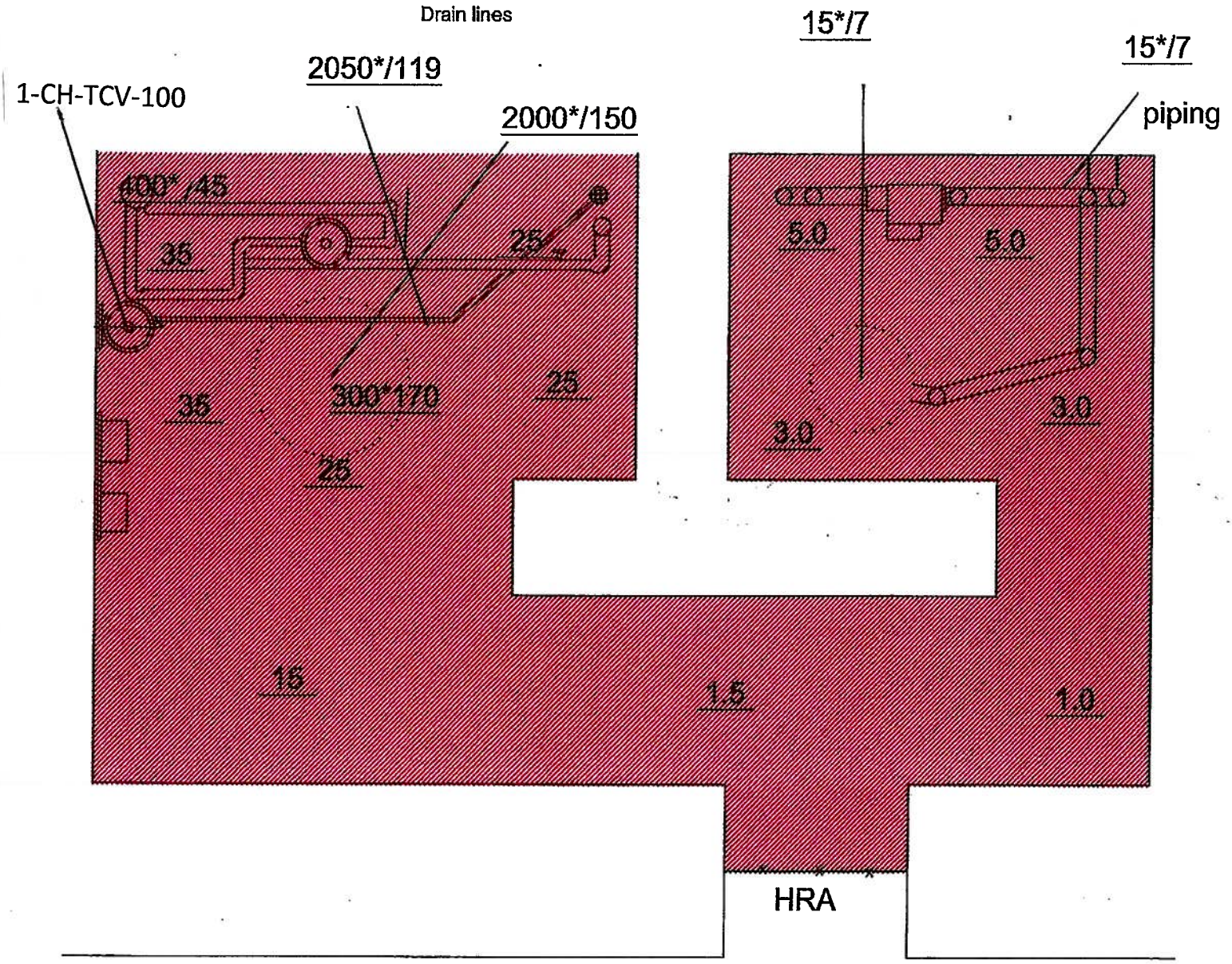
5	Determine the maximum stay time in minutes based on reaching the RWP dose alarm setpoint.	Procedure Step:
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Operator uses RWP to determine dose alarm is set at 5 mRem. Operator uses survey map to determine highest general area dose rate is 35 mrem/hr. Operator performs the following calculation to determine stay stime in minutes: 5 mR divided by 35 mR/hr x 60 min/hr = 8.57 minutes	
	Notes/Comments:	

END OF EVALUATION

STOP TIME _____

Verified Current By	Date
mc	4/5/14

Auxiliary Building, 244' Elevation
Unit 1 Non Regen Cube



CALLED NORTH

VHRA = Very High Radiation Area	HPA = Hot Particle Area	CAM = Continuous Air Monitor
LHRA = Locked High Radiation Area	CA = Contaminated Area	SOP = Step Off Pad
HRA = High Radiation Area	ARA = Airborne Radioactivity Area	LDWA = Low Dose Waiting Area
RA = Radiation Area	RMA = Radioactive Material Area	NEA = Neutron Exposure Area
RCA = Radiological Control Area	~~xxx~~ Radiological Boundary	# N = Neutron Dose Rate
_#*_ / _#_ Contact and 30 cm Gamma Dose Rate Readings		# β = Corrected Beta Dose Rate

RADIATION WORK PERMIT SUMMARY 14-1207

RP-AA-274 ATT. 2

PLANT CODE	YEAR	RWP NUMBER	REV.	RWP START	TYPE	CATEGORY	RWP EXPIRATION
0	14	14-1207	0	01-JAN-2014 00:00	S	RM	31-DEC-2014 23:59

RWP DESCRIPTION

Routine Duties, walkdown, and valve line-ups by Operations personnel.

TASK SUMMARY

		DOSE ALARM	DOSE RATE ALARM	TIME INTERVAL
1	Routine Duties, walkdown, and valve line-ups by Operations personnel. Access to Reactor Containments allowed for containment closure team only.	5	90	
2	Perform change out of 1-DC-FL-2 (Radwaste Dewatering Filter).	10	90	
3	BARS Operation, Sampling & 1-RP-FL-2 Change Out	5	90	

ALARA INFORMATION

ALARA Review No.	Hours-Estimated	Person-mrem
14-001	2099997	1580

SPECIAL INSTRUCTIONS:

Requirements for High Radiation Area or Locked High Radiation Area Entry:
-Notify RP PRIOR to entry (Discuss work to be performed)
-Signed in on an RWP that ALLOWS entry into the High Radiation Area or Locked High Radiation Area
-Understand the ED Alarm set-points and your response to a dose or dose rate alarm
-Understand the radological conditions (dose rates) in your work area
-Monitor Electronic Dosimetry frequently (Approximately every 15 minutes)
-Notify RP upon exit

Prepared By	Mark Stokes	DATE:	05-OCT-2013 00:0(	Approved By	DATE:
Revised By		DATE:		Approved By	DATE:
Terminated By		DATE:		Approved By	DATE:

VALID FROM	01-JAN-2014 00:00	TO	31-DEC-2014 23:59	RWP	14-1207-1	REV. NO	0

DOSE RATE ALARM:	90	mrem/Hr	BUDGETED DOSE:	1533	mrem
DOSE LIMIT ALARM:	5	mrem	ALARA EVALUATION NO:	14-001	

JOB LOCATIONS:
ALL RCAs EXCEPT UNIT 1 AND UNIT 2 REACTOR CONTAINMENTS

JOB DESCRIPTION: Routine Duties, walkdown, and valve line-ups by Operations personnel. Access to Reactor Containments allowed for containment closure team only.

THE MAXIMUM POSTED AREA THAT CAN BE ENTERED:
Locked High Radiation Area

RADIOLOGICAL CONDITIONS: *Indicates estimated value for RWP Preparation. See survey forms for details

GENERAL AREA RADIATION LEVELS (mrem/hr):
See Current RCA Surveys.

CONTACT/HOT SPOT RADIATION LEVELS (mrem/hr):
See Current RCA Surveys.

CONTAMINATION LEVELS (dpm/100cm2):
See Current RCA Surveys.

AIRBORNE RADIOACTIVITY (DAC):
0.3*

REQUIRED JOB COVERAGE:
ROUTINE

DOSIMETRY REQUIREMENTS:
ED/SRD TLD

DOSIMETRY COMMENTS:
1.0) Caution: If PAM(ED) is utilized, ensure PAM(ED) is secured so that individual can feel the vibration if PAM(ED) alarms.
2.0) Notify HP prior to entry into a "Neutron Exposure Area" for additional dosimetry requirements.

PROTECTIVE CLOTHING REQUIREMENTS:
LAB COAT, SHOE COVERS & GLOVES MAY BE USED FOR ANY NON-PHYSICAL ACTIVITIES (I.E. OBSERVATIONS OR EQUIPMENT CHECKS) AND CONTAMINATION LEVELS ARE < 10,000 DPM/100CM2.

1.0) Required Protective Clothing:
Surgeons Hood
One Pair Coveralls
Rubber Boots
High Top Shoe Covers
Cotton Inserts
One Pair Rubber Gloves
2.0) Protective Clothing requirements as stated are for entry into "Contaminated Areas" only.
3.0) Double set of PC's are required for work in areas with contamination levels greater than 100,000 dpm/100cm2
4.0) Protective Clothing requirements for a "Hot Particle Area" (HPA) [in addition to those stated above] are:
4.1) Hood, gloves, coveralls, high top shoe covers and rubber boots.
4.2) Workers interfacing with individuals/equipment in a HPA - Gloves and face shield.

A RWP PRE-JOB BRIEFING IS REQUIRED:

HRA BRIEF BY AN HP TECHNICIAN AND SIGN ATTENDANCE SHEET.

WORKER INSTRUCTIONS:

1.0) ED Alarms:
   1.1) If ED dose rate alarm occurs, THEN leave area immediately and notify HP (unless authorized by HP Supervisor and have been briefed on proper responses).
   1.2) If ED dose alarm occurs, THEN leave area immediately and report to the Health Physics office.
2.0) Unless Continuous Health Physics Coverage is provided, workers shall read their SRD/ED approximately every 15 minutes.
3.0) When 80% of dose alarm setpoint is reached, leave work area in a safe condition and exit the RCA.
4.0) Do not enter High Radiation Areas without HP coverage or a ED with knowledge of work area dose rates.
5.0) Workers are responsible for notifying the HP Supervisor or Lead Technician prior to venting\draining systems, that may affect Radiological Conditions in an area, to ensure proper Health Physics Monitoring.
6.0) HPA exit instructions:
   6.1) Use extreme care in removing PCs and frisking.
   6.2) Workers are to be monitored by HP upon exiting the HPA.
   6.3) Workers are to be monitored by HP after interfacing with workers/equipment in a HPA.
7.0) Do not remove any items from a posted "Hot Particle Area" until authorized by HP-Ops.
8.0) Prior to returning Electronic Dosimetry (ED), all individuals shall process through the PDA for whole body monitoring. This is not required if returning ED solely for the purpose of changing RWPs.
9.0) Notify HP prior to entry in overhead areas greater than 8 feet.

HEALTH PHYSICS INSTRUCTIONS:

1.0) Stop work and leave area if whole body dose rates exceed 2000 mRem/hr.
2.0) When the ED dose rate alarm is set >1000 mRem/hr then:
   2.1) Stay times and continuous HP coverage is required.
   2.2) If worker ED alarms, then have worker immediately exit area and report to HP.
3.0) "Hot Particle Area" (HPA) monitoring requirements:
   3.1) Workers exposed skin shall be monitored by HP-Ops every four hours while the workers are in the HPA.

VALID FROM 01-JAN-2014 00:00 **TO** 31-DEC-2014 23:59 **RWP** 14-1207-2 **REV. NO** 0

DOSE RATE ALARM:	90	mrem/Hr	**BUDGETED DOSE:**	30	mrem
DOSE LIMIT ALARM:	10	mrem	**ALARA EVALUATION NO:**	14-001	

JOB LOCATIONS:
DECON BUILDING AND WASTE SOLIDS

JOB DESCRIPTION: Perform change out of 1-DC-FL-2 (Radwaste Dewatering Filter).

THE MAXIMUM POSTED AREA THAT CAN BE ENTERED:
Locked High Radiation Area

RADIOLOGICAL CONDITIONS: *Indicates estimated value for RWP Preparation. See survey forms for details

GENERAL AREA RADIATION LEVELS (mrem/hr):
2 to 10, up to 500 at 1 foot from exposed filters*

CONTACT/HOT SPOT RADIATION LEVELS (mrem/hr):
Up to 2500 on exposed filters*

CONTAMINATION LEVELS (dpm/100cm2):
<1,000, up to 200,000 on exposed filters*

AIRBORNE RADIOACTIVITY (DAC):
<0.30*

REQUIRED JOB COVERAGE:
ROUTINE

DOSIMETRY REQUIREMENTS:
ED/SRD TLD

DOSIMETRY COMMENTS:
1.0)Caution: If PAM(ED) is utilized, ensure PAM(ED) is secured so that individual can feel the vibration if PAM(ED) alarms.

PROTECTIVE CLOTHING REQUIREMENTS:
LAB COAT, SHOE COVERS & GLOVES MAY BE USED FOR ANY NON-PHYSICAL ACTIVITIES (I.E. OBSERVATIONS OR EQUIPMENT CHECKS) AND CONTAMINATION LEVELS ARE < 10,000 DPM/100CM2.

1.0)Required Protective Clothing:
Surgeons Hood
One Pair Coveralls
Rubber Boots
High Top Shoe Covers
Cotton Inserts
One Pair Rubber Gloves
2.0)Double PC's are required for work in areas with contamination levels greater than 100,000 dpm/100cm2

A RWP PRE-JOB BRIEFING IS REQUIRED:
HRA BRIEF BY AN HP TECHNICIAN AND SIGN ATTENDANCE SHEET.

WORKER INSTRUCTIONS:

1.0) ED Alarms:
   1.1) If ED dose rate alarm occurs, THEN leave area immediately and notify HP (unless authorized by HP Supervisor and have been briefed on proper responses).
   1.2) If ED dose alarm occurs, THEN leave area immediately and report to the Health Physics office.
2.0) Unless Continuous Health Physics Coverage is provided, workers shall read their SRD/ED approximately every 15 minutes.
3.0) When 80% of dose alarm setpoint is reached, leave work area in a safe condition and exit the RCA.
4.0) Do not enter High Radiation Areas without HP coverage or a ED with knowledge of work area dose rates.
5.0) Spent filters are to be stored according to the direction of the Supervisor RMC
6.0) Prior to returning Electronic Dosimetry (ED), all individuals shall process through the PDA for whole body monitoring. This is not required if returning ED solely for the purpose of changing RWPs.
7.0) Notify HP prior to entry in overhead areas greater than 8 feet.

HEALTH PHYSICS INSTRUCTIONS:

1.0) Stop work and leave area if whole body dose rates exceed 7500 mrem/hr.
2.0) CAUTION: Filter dose rates are typically four times the filter housing dose rates. Set the ED Dose Rate Alarm accordingly.
3.0) When the ED dose rate alarm is set >1000 mRem/hr then:
   3.1) Stay times and continuous HP coverage is required.
   3.2) If worker ED alarms, then have worker immediately exit area and report to HP.
3.0) Radiation survey requirements:
   3.1) Prejob filter housing survey.
   3.2) Of filters.
4.0) Contamination Survey requirements:
   4.1) Post Job Survey
5.0) HP-Ops to emphasize precautions associated with opening contaminated systems.
6.0) If there is no DP across filters(See Operations), Strainer cleaning may be necessary. Additional contamination controls should be implemented.
7.0) Filter change-out criteria:
   7.1) Filters are to be drained free of standing water.
   7.2) Filters are to be bagged, with an amount of absorbent material (preferably mopheads) placed in the bag equal to the filter volume.
   7.3) In NO case, should there be standing water in the bottom of the bag when placed for disposal, whether in the liner or the sea-land.
   7.4) Filters can be placed on the DAW sea-land if contact dose rates are < 150 mrem/hr ; otherwise place in the High Radiation Trash DAW liner in Waste Solids.

VALID FROM	01-JAN-2014 00:00	TO	31-DEC-2014 23:59	RWP	14-1207-3	REV. NO	0

DOSE RATE ALARM:	90	mrem/Hr	**BUDGETED DOSE:**	17	mrem
DOSE LIMIT ALARM:	5	mrem	**ALARA EVALUATION NO:**	14-001	

JOB LOCATIONS:
Aux Building 259' BARS Skid

JOB DESCRIPTION: BARS Operation, Sampling & 1-RP-FL-2 Change Out

THE MAXIMUM POSTED AREA THAT CAN BE ENTERED:
Locked High Radiation Area

RADIOLOGICAL CONDITIONS: *Indicates estimated value for RWP Preparation. See survey forms for details

GENERAL AREA RADIATION LEVELS (mrem/hr):
See Current RCA Surveys

CONTACT/HOT SPOT RADIATION LEVELS (mrem/hr):
See Current RCA Surveys

CONTAMINATION LEVELS (dpm/100cm2):
See Current RCA Surveys

AIRBORNE RADIOACTIVITY (DAC):
0.3*

REQUIRED JOB COVERAGE:
ROUTINE

DOSIMETRY REQUIREMENTS:
ED/SRD TLD

PROTECTIVE CLOTHING REQUIREMENTS:

LAB COAT, SHOE COVERS & GLOVES MAY BE USED FOR ANY NON-PHYSICAL ACTIVITIES (I.E. OBSERVATIONS OR EQUIPMENT CHECKS) AND CONTAMINATION LEVELS ARE < 10,000 DPM/100CM2.

1.0) Required Protective Clothing:
- Surgeons Hood
- One Pair Coveralls
- Rubber Boots
- High Top Shoe Covers
- Cotton Inserts
- One Pair Rubber Gloves

2.0) Protective Clothing requirements as stated are for entry into "Contaminated Areas" only.

3.0) Double set of PC's are required for work in areas with contamination levels greater than 100,000 dpm/100cm2

4.0) Protective Clothing requirements for a "Hot Particle Area" (HPA) [in addition to those stated above] are:
- 4.1) Hood, gloves, coveralls, high top shoe covers and rubber boots.
- 4.2) Workers interfacing with individuals/equipment in a HPA - Gloves and face shield.

A RWP PRE-JOB BRIEFING IS REQUIRED:
HRA BRIEF BY AN HP TECHNICIAN AND SIGN ATTENDANCE SHEET.

WORKER INSTRUCTIONS:

1.0) ED Alarms:
   1.1) If ED dose rate alarm occurs, THEN leave area immediately and notify HP (unless authorized by HP Supervisor and have been briefed on proper responses).
   1.2) If ED dose alarm occurs, THEN leave area immediately and report to the Health Physics office.
2.0) Unless Continuous Health Physics Coverage is provided, workers shall read their SRD/ED approximately every 15 minutes.
3.0) When 80% of dose alarm setpoint is reached, leave work area in a safe condition and exit the RCA.
4.0) Do not enter High Radiation Areas without HP coverage or a ED with knowledge of work area dose rates.
5.0) Workers are responsible for notifying the HP Supervisor or Lead Technician prior to venting\draining systems, that may affect Radiological Conditions in an area, to ensure proper Health Physics Monitoring.
6.0) HPA exit instructions:
   6.1) Use extreme care in removing PCs and frisking.
   6.2) Workers are to be monitored by HP upon exiting the HPA.
   6.3) Workers are to be monitored by HP after interfacing with workers/equipment in a HPA.
7.0) Do not remove any items from a posted "Hot Particle Area" until authorized by HP-Ops.
8.0) Prior to returning Electronic Dosimetry (ED), all individuals shall process through the PDA for whole body monitoring. This is not required if returning ED solely for the purpose of changing RWPs.
9.0) Notify HP prior to entry in overhead areas greater than 8 feet.

HEALTH PHYSICS INSTRUCTIONS:

1.0) Stop work and leave area if whole body dose rates exceed 1500 mrem/hr.
2.0) When the ED dose rate alarm is set >1000 mRem/hr then:
   2.1) Stay times and continuous HP coverage is required.
   2.2) If worker ED alarms, then have worker immediately exit area and report to HP.
3.0) Radiation survey requirements:
   3.1) Prejob filter housing survey.
   3.2) Of filter.
4.0) Contamination Survey requirements:
   4.1) Post Job Survey
5.0) HP-Ops to emphasize precautions associated with opening contaminated systems.
6.0) Filter change-out criteria:
   6.1) Filters are to be drained free of standing water.
   6.2) Filters are to be bagged, with an amount of absorbent material (preferably mopheads) placed in the bag equal to the filter volume.
   6.3) In NO case, should there be standing water in the bottom of the bag when placed for disposal, whether in the liner or the sea-land.
   6.4) Filters can be placed on the DAW sea-land if contact dose rates are < 150 mrem/hr ; otherwise place in the High Radiation Trash DAW liner in Waste Solids.

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

INITIAL CONDITIONS

Both units were at 100% power.

High winds from a severe thunderstorm caused a loss of all off-site power.

All emergency diesel generators started and loaded as designed.

A tube rupture occurred on the unit 1 "A" steam generator.

The unit 1 control room crew manually initiated safety injection.

An operator has been directed to locally close the unit 1 "A" SG PORV which is open and will not shut from the control room.

INITIATING CUE

You are requested to classify the emergency event in accordance with EPIP-1.01.

Do NOT use SEM Judgment to classify the event.

This is a time critical JPM (15 minutes).

Record your results in the spaces provided.

Emergency Classification _____

EAL Identifier _____

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

TASK

Classify an emergency event.

TASK STANDARDS

Event is classified as a Site Area Emergency (FS1.1) in accordance with EPIP-1.01 and the applicable Emergency Level Action Matrix (Hot Conditions > 200°F). Classification is made within 15 minutes of starting the evaluation.

K/A REFERENCE:

G2.4.41 (4.6)

ALTERNATE PATH:

N/A

TASK COMPLETION TIMES

Validation Time = 12 minutes
Actual Time = _____ minutes

Start Time = _____
Stop Time = _____

PERFORMANCE EVALUATION

Rating [ ] SATISFACTORY [ ] UNSATISFACTORY

Candidate (Print) _____

Evaluator (Print) _____

Evaluator's Signature / Date _____

EVALUATOR'S COMMENTS

_____

_____

_____

Dominion
North Anna Power Station
ADMINISTRATIVE JOB PERFORMANCE MEASURE EVALUATION

OPERATOR PROGRAM

READ THE APPLICABLE INSTRUCTIONS TO THE CANDIDATE

Instructions for Simulator JPMs

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

Instructions for In-Plant JPMs

I will explain the initial conditions, and state the task to be performed. All steps, including any required communications, shall be simulated for this JPM. Under no circumstances are you to operate any plant equipment. I will provide initiating cues and reports on other actions when directed by you. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

INITIAL CONDITIONS

Both units were at 100% power.

High winds from a severe thunderstorm caused a loss of all off-site power.

All emergency diesel generators started and loaded as designed.

A tube rupture occurred on the unit 1 "A" steam generator.

The unit 1 control room crew manually initiated safety injection.

An operator has been directed to locally close the unit 1 "A" SG PORV which is open and will not shut from the control room.

INITIATING CUE

You are requested to classify the emergency event in accordance with EPIP-1.01.

Do NOT use SEM Judgment to classify the event.

This is a time critical JPM (15 minutes).

Record your results in the spaces provided.

Emergency Classification _____

EAL Identifier _____

EVALUATION METHOD

Demonstration if conducted in the simulator or in a laboratory (use DEMONSTRATION cues)

Verbal-visual if conducted in the station or on a dead simulator (use VERBAL-VISUAL cues)

TOOLS AND EQUIPMENT

EPIP-1.01

EAL Matrix

EAL Basis Document

PERFORMANCE STEPS

START TIME _____

START TIME IS CRITICAL: Start time begins the 15 minute clock for event classification (clock stops when classification is made – element 4 of JPM).

1	Operator determines the Event Category on the applicable Emergency Action Level Matrix.	Procedure Step ____
	Critical Step	SAT [ ] UNSAT [ ]
	Standards: Event is identified as Fission Product Barriers, Category F, of the Hot Conditions > 200°F Matrix.	
	Notes/Comments	

2	Operator reviews the Emergency Action Level Matrix associated with the Event Category.	Procedure Step _____

SAT [ ] UNSAT [ ]

Standards	Category F reviewed to determine highest level of classification.

Notes/Comments

3	Operator uses available resources to obtain indications of emergency conditions.	Procedure Step _____

SAT [ ] UNSAT [ ]

Standards	Category F emergency condition descriptions are compared to the Initial Conditions. • Table F-1 is reviewed to determine that RCS Barrier D.3 and Containment Barrier D.3 apply (loss of two barriers). • Category F is reviewed to determine that FS1.1 applies (loss or potential loss of any two barriers).

Notes/Comments	SU1.1 may be noted as a lower level classification.

4	Operator classifies event based on emergency action level being exceeded.	Procedure Step _____
	Critical Step	SAT [ ] UNSAT [ ]

Standards	Event is classified as a Site Area Emergency IAW EAL Identifier FS1.1 within 15 minutes of the start of the evaluation.

Notes/Comments

>>>>> END OF EVALUATION <<<<<

STOP TIME _____

SIMULATOR, LABORATORY, IN--PLANT SETUP
(If Required)