Draft Submittal

(Pink Paper)

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

Facility: Shearon Harris Task No.: 333003H101

Task Title: Pull to criticality/Take Corrective Action For Less Than Minimum Tavg During A Reactor Startup JPM No.: 2007 NRC JPM a

K/A Reference: 001 A1.07 (3.7)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The unit is in Mode 2.
- The crew is performing GP-004, REACTOR STARTUP, and has completed Step 33.
- The estimated critical rod height is Control Bank "D" at 90 steps.
- Control Bank "D" withdrawal was halted at the third doubling when the RO became ill.
- Control Bank D is currently at 60 steps.

Task Standard:

- Criticality identified within specified band.
- Maintain stable SUR ≤ 1 DPM and block SRNIS.
- Reactor trip initiated within two minutes after Tave-Tref > 10 °F.

Required Materials: None

General References: GP-004, Reactor Startup, Revision 40
OP-104, Rod Control System, Revision 22

Handouts: OP-104, Section 5.4

GP-004, completed through Step 33

To expedite the examination schedule, the candidate should review the INITIAL CONDITIONS, INITIATING CUE, and the HANDOUT prior to entering the simulator to perform the JPM.

Initiating Cue: You have been directed to assume the RO position. For the purpose of this JPM, assume that the CRS has authorized the watch relief without a face-to-face turnover. Continue the reactor startup in accordance with GP-004, Step 31.

Time Critical Task: N/A

Validation Time: 8 minutes

SIMULATOR SETUP

- IC-7 (Sub-critical, reactor startup in progress).
- ECP = D-90
- Adjust RCS boron concentration so that criticality is at D-82.
- GP-004 with Step 31 in progress and 32/33 completed.
- Withdraw rods and take associated actions until the third doubling.
- imf sgn04a on Trigger 1
- FREEZE and SNAP to an IC-161 as NRC JPM a
- When the candidate has established a stable SUR and after the SRNIS is blocked, activate Trigger 1.

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Position Rod Motion Switch to WITHDRAW.

Standard: Withdraws rods a few steps at a time while monitoring rod position and NIS response.

Evaluator's Cue: **Provide 1/M feedback whenever requested: 1/M predicts criticality between D-80 and D-90 steps.**

Comment:

√ **Performance Step: 2** Record the time and approximate critical rod position.

Standard:

- Logs time and rod position in Step 34.
- Criticality determined at D ≥ 77 ≤ 87 steps.

Evaluator Note: **The evaluator can elect to just have the applicant report the time and rod position.**

Comment:

PERFORMANCE INFORMATION

Performance Step: 3 Announce twice on the Public Address (PA) System:

Attention, the reactor is critical.

Standard: Using the PA, announces twice: Attention, the reactor is critical.

Evaluator's Cue: **Assume that the announcements have been made.**

Comment:

Performance Step: 4 Verify that ALB-010/6-4B, RCS TREF/TAVG HIGH-LOW, is clear or verify that RCS temperature is greater than or equal to 551 ˚F, once per 30 minutes with the RCS TREF/TAVG HIGH-LOW alarm not reset.

Standard: Verifies ALB-010/6-4B is clear and Tavg is >551 ˚F

Comment:

√ **Performance Step: 5** Establish a startup rate not to exceed one decade per minute, and allow power to increase to 10E-08 amps.

Standard:

- Withdraws Control Bank D rods and establishes a SUR ≤ 1 DPM.
- Blocks Source Range NIS by placing Train A and Train B SOURCE RANGE TRIP BLOCK Switches in BLOCK after the P-6 Permissive actuates and before an automatic reactor trip initiates.

Simulator Operator: **Actuate Trigger 1 (IMF SGN04A) when a stable SUR is established and after the SRNIS block.**

Comment:

PERFORMANCE INFORMATION

√	**Performance Step: 6**	Determines that RCS Tavg is dropping in an uncontrolled manner.
	Standard:	Initiates a MANUAL reactor trip no later than two minutes after Tavg lowers to >10 ˚F below Tref. (GP-004, SECTION 4.0, PRECAUTIONS AND LIMITATIONS 19 and/or 20)
	Comment:	**Candidate might initiate a trip because SUR is rising with no controlled reactivity change.**

Terminating Cue: **When the immediate actions of PATH-1 commence: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM a

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The unit is in Mode 2.
- The crew is performing GP-004, REACTOR STARTUP, and has completed Step 33.
- The estimated critical rod height is Control Bank "D" at 90 steps.
- Control Bank "D" withdrawal was halted at the third doubling when the RO became ill.
- Control Bank D is currently at 60 steps.

INITIATING CUE:

You have been directed to assume the RO position. For the purpose of this JPM, assume that the CRS has authorized the watch relief without a face-to-face turnover. Continue the reactor startup in accordance with GP-004, Step 31.

Facility:	Shearon-Harris	Task No.:	301150H601
Task Title:	TRANSFER TO HOT LEG RECIRCULATION	JPM No.:	2007 NRC JPM b
K/A Reference:	EPE011 EA1.11 (4.2)	Bank JPM CR-066 ALTERNATE PATH	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:	The plant has experienced a large break LOCA and is presently aligned for cold leg recirculation per EPP-010, TRANSFER TO COLD LEG RECIRCULATION.
Task Standard:	All critical tasks evaluated as SAT.
Required Materials:	None
General References:	EPP-011, TRANSFER BETWEEN HOT LEG AND COLD LEG RECIRCULATION, Revision 14
Handout:	Use simulator copy of EPP-011 or provide a paper copy. If simulator copy is used, ensure it has been cleaned from the previous user.
Initiating Cue:	6.5 hours have passed since Cold leg Recirculation was established. You have been directed to perform EPP-011, TRANSFER BETWEEN HOT LEG AND COLD LEG RECIRCULATION.
Time Critical Task:	No

Validation Time: 7 minutes

SIMULATOR SETUP

- At power IC
- LBLOCA
- Perform PATH-1 to EPP-010 transition
- Perform EPP-010 when conditions are met
- Insert RFSIS079 – ENGAGED to disable 1SI-86
- FREEZE and SNAP with ECCS in proper CL alignment
- Snapped to IC-162 for 2007 NRC Exam JPM b
- Before applicant enters: go to RUN, silence and acknowledge alarms.

PERFORMANCE INFORMATION

START TIME: _____

	EPP-011, Step 1
Performance Step: 1	Check Charging System status: a. Check charging line - isolated
Standard:	Verifies at least one charging line isolation valve closed.
Comment:	

	EPP-011, Step 2
Performance Step: 2	Check SI systems - aligned for cold leg recirculation
Standard:	Determined from initial conditions.
Evaluator Cue:	**If applicant starts to perform SI system alignment verification: SI Systems are properly aligned for cold leg recirculation.**
Comment:	

PERFORMANCE INFORMATION

√ **Performance Step: 3**

EPP-011, Step 3.a

Align RHR Pumps for hot leg recirculation:

a. Shut Low Head SI to Cold Leg valves:

- 1SI-340
- 1SI-341

Standard:

- Verifies 1SI-340 SHUT (GREEN light)
- Restores control power to 1SI-341
- Closes 1SI-341 (GREEN light)

Evaluator Note:

1SI-340 is already SHUT in CL Recirculation to prevent pump runout if one RHR Pump trips.

Comment:

√ **Performance Step: 4**

EPP-011, Step 3.b

b. Open Low Head SI to Hot Leg valve:

- 1SI-359

Standard:

- Restores control power to 1SI-359
- Opens 1SI-359 (RED light)

Comment:

Performance Step: 5

EPP-011, Step 4.a

Check CSIP injection flow path:

Check Alternate High Head SI to Cold Leg valve - OPEN:

- 1SI-52

Standard:

Verifies 1SI-52 open (RED light)

Comment:

EPP-011, Step 4.b

Performance Step: 6 Check any BIT Outlet valve - OPEN:

- 1SI-3
- 1SI-4

Standard:

- Verifies 1SI-3 open (RED light)
- Verifies 1SI-4 open (RED light)

Comment:

EPP-011, Step 5.a, b, c, d

√ **Performance Step: 7** Align both CSIPs for hot leg recirculation:

a. Stop Train "A" CSIP.

b. Shut Alternate High Head SI to Cold Leg valve:

- 1SI-52

c. Open Alternate High Head SI to Hot Leg valve:

- 1SI-107

d. Restart the Train "A" CSIP.

Standard:

- Places CSIP "A" in stop (GREEN light)
- Shuts 1SI-52 (GREEN light)
- Restores control power to 1SI-107
- Opens 1SI-107 (RED light)
- Places CSIP "A" in start (RED light)

Comment:

PERFORMANCE INFORMATION

EPP-011, Step 5.e, f, g

√ **Performance Step: 8**

e. Stop Train "B" CSIP.

f. Shut BIT Outlet valves: 1SI-3, 1SI-4

g. Open High Head SI to Hot Leg valve: 1SI-86

RNO g.1: Open BIT Outlet valves: 1SI-3, 1SI-4

Standard:

- Places CSIP "B" in stop (GREEN light) **[√]**
- Shuts 1SI-3 (GREEN light)
- Shuts 1SI-4 (GREEN light)
- Restores control power to 1SI-86
- Attempts to open 1SI-86
- Determines 1SI-86 has NOT opened and takes RNO
- Opens at least 1SI-3 (RED light) or 1SI-4 (RED light) **[√]**

Comment:

EPP-011, RNO Step 5.g.2

Performance Step: 9

Consult with plant staff to evaluate use of Attachment 1 to open High Head SI to Hot Leg valve while continuing with this procedure.

Standard:

Makes report to USCO.

Evaluator Cue:

The USCO will initiate the contact. Continue with the procedure.

Comment:

EPP-011, Step 5.h

√ **Performance Step: 10**

h. Restart the Train "B" CSIP.

Standard:

Places CSIP "B" in start (RED light).

Comment:

PERFORMANCE INFORMATION

Performance Step: 11	EPP-011, Step 5.i and Step 7 5.i: Go to Step 7 7: Change from Hot Leg to Cold Leg Recirculation in 6.5 hours using this procedure.
Standard:	Marks the time.
Comment:	
Terminating Cue:	**After Step 7 is read: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM b

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS: The plant has experienced a large break LOCA and is presently aligned for cold leg recirculation per EPP-010, TRANSFER TO COLD LEG RECIRCULATION.

INITIATING CUE: 6.5 hours have passed since Cold leg Recirculation was established. You have been directed to perform EPP-011, TRANSFER BETWEEN HOT LEG AND COLD LEG RECIRCULATION.

Facility: Shearon-Harris

Task No.:

Task Title: Isolate SI Accumulators

JPM No.: 2007 NRC JPM c

K/A Reference: 006 A4.02 (4.0)

- **Alternate Path**
- **2004 NRC Exam JPM not in facility bank.**

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: _____

Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: A small break LOCA has occurred. Actions have been taken in accordance with PATH-1, and EPP-009, LOCA COOLDOWN AND DEPRESSURIZATION. EPP-009 is in progress at Step 28 – Isolate ECCS Accumulators.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References:
- PATH-1
- EPP-009, LOCA COOLDOWN AND DEPRESSURIZATION, Revision 13
- OP-110, SAFETY INJECTION, Revision 24

Handout:
- EPP-09 marked through Step 27
- OP-110, Section 8.3

Initiating Cue: Starting at Step 28, perform EPP-009.

Time Critical Task: No

Validation Time: 11 minutes

SIMULATOR SETUP

- Initialize to IC-19 (100% power)
- Insert a small break LOCA (MALF RCS 18 2)
- Trip all RCPs
- Perform PATH-1
- Transition to EPP-8
- Transition to EPP-009
- Perform EPP-009 through Step 27
- Insert a malfunction to prevent 1SI-247 from closing (DI XAA1068)
- Place the following remote functions on a trigger to close the breakers for the SI Accumulator Isolation valves when requested:
    - SIS006 CLOSED (Trigger 1)
    - SIS007 CLOSED (Trigger 2)
    - SIS008 CLOSED (Trigger 3)
- FREEZE and SNAP to IC-163 for 2007 NRC JPM c
- Go to RUN, acknowledge and silence alarms before applicant assumes the watch.

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1	EPP-009, Step 28.a Isolate SI Accumulators: a. RCS subcooling greater than 10°F [40°F] – C 20°F [50°F] – M
Standard:	Verifies RCS subcooling requirements are met.
Evaluator Note:	**Adverse containment values are in effect.**
Comment:	

Performance Step: 2	EPP-009, Step 28.b PRZ level greater than 10% [30%]
Standard:	• Verifies PRZ level greater than 30%. • Proceeds to Step 28.e
Comment:	

PERFORMANCE INFORMATION

EPP-009, Step 28.e

Performance Step: 3

e. Locally unlock AND close both breakers for each SI accumulator discharge valve:

- ISI-246 (MCC-IA21-SA-5C)
- ISI-247 (MCC-IB21-SB-5C)
- ISI-248 (MCC-IA21-SA-3D)

Standard: Contacts AO and directs closure of the breakers.

Booth Operator Cue:

- **Acknowledge order.**
- **Inform the applicant: For the purpose of expediting performance of this JPM, simulator time compression techniques will be utilized to quickly close all the breakers.**
- **Actuate the trigger(s) to close all the breakers and then make the report.**

Comment:

EPP-009, Step 28.f

√ **Performance Step: 4**

Shut SI accumulator discharge valves:

- 1SI-246 (√)
- 1SI-247
- 1SI-248 (√)

Standard:

- Places switches for 1SI-246, 1SI-247, 1SI-248 in CLOSE.
- Verifies 1SI-246, 1SI-248 go closed (GREEN light)
- Reports 1SI-247 did NOT close.
- Proceeds to EPP-009, Step 28.f RNO

Comment:

PERFORMANCE INFORMATION

EPP-009, Step 28.f RNO

Performance Step: 5 Vent any unisolable accumulator using OP-110, SAFETY INJECTION, Section 8.3.

Standard: Locates procedure.

Evaluator Cue: **Provide OP-110, Section 8.3 Handout.**

Comment:

OP-110, 8.3.1

Performance Step: 6 Verify Initial Conditions.

Standard: Determines Initial Conditions are met.

Evaluator Cue: **If necessary: No personnel are in containment.**

Comment:

PERFORMANCE INFORMATION

OP-110, 8.3.2.1/8.3.2.2.a

PROCEDURE NOTE: To minimize any potential sluicing between Accumulators through leaking valves, accumulator pressures should be approximately equal (within 4 psid between lowest and highest ERFIS indications) at the completion of this Section. (Reference 2.7.4, AR 72818)

Performance Step: 7

- Perform the following Steps on only one Accumulator at a time. (Reference 2.7.4)
- At the MCB perform the following:

PROCEDURE NOTE: Nitrogen is the primary motive force to LTOPS. The impact on LTOPS operability should be determined prior to shutting 1SI-287 per Precaution and Limitation 4.0.0.06.

- If necessary initiate an EIR.

Standard:

- Determines first NOTE does NOT apply since only one accumulator is being depressurized.
- Informs CRS regarding PORV operability.
- Determines EIR is NOT necessary since this is an EOP directed action or refers it to the CRS.

Evaluator Cue: **Acknowledge any reports.**

Comment:

OP-110, 8.3.2.2.b

√ **Performance Step: 8** Shut 1SI-287, ACCUMULATORS & PRZ PORV N2 SUPPLY

Standard: Places 1SI-287 in SHUT and verifies indication change. (GREEN light ON)

Comment:

OP-110, 8.3.2.2.c

Performance Step: 9 Declare the associated Accumulator inoperable per Tech Spec 3.5.1, due to being connected to Non-Safety piping (a one hour action statement in Modes 1 through 3 above 1000 psig).

Standard: Informs CRS.

Evaluator Cue: **Acknowledge report.**

Comment:

OP-110, 8.3.2.2.d

√ **Performance Step: 10** Open the ACCUMULATOR N2 SUPPLY & VENT for the Accumulator to be vented:

Standard: Places 1SI-296, ACCUMULATOR B N_2 SUPPLY & VENT, in OPEN. (RED light)

Comment:

OP-110, 8.3.2.3

Procedure CAUTION: In modes 1, 2, and 3, ensure Accumulators are maintained within Technical Specification limits for pressure and level when venting SI Accumulators.

√ **Performance Step: 11** Slowly adjust HC-936, 1SI-298 ACCUM VENT PRESS CNTL, control potentiometer output signal to open 1SI-298 and vent the Accumulator.

Standard: Adjusts potentiometer slowly while observing pressure in SI Accumulator "B" (PI-925).

Evaluator Note: **Pressure will be dropping very slowly; even when HC-936 is fully open.**

Comment:

Terminating Cue: **When Accumulator "B" only pressure is lowering under control: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM c

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:	A small break LOCA has occurred. Actions have been taken in accordance with PATH-1, and EPP-009, LOCA COOLDOWN AND DEPRESSURIZATION. EPP-009 is in progress at Step 28 – Isolate ECCS Accumulators.
INITIATING CUE:	Starting at Step 28, perform EPP-009.

Facility:	Shearon-Harris	Task No.:	301170H601
Task Title:	Initiate RCS Feed and Bleed	JPM No.:	2007 NRC JPM d
K/A Reference:	E05 EA1.3 (3.8)	**Alternate Path** **Bank JPM CR-068, modified**	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: __X__

Classroom _____ Simulator __X__ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The reactor tripped from 100% power due to a loss of off-site power.
- A SBLOCA occurred following the reactor trip. Adverse containment values are in effect.
- Bus 1A-SA is locked out on an electrical fault.
- Motor Driven AFW Pump "B" is partially disassembled for maintenance.
- The Turbine-Driven AFW Pump failed while starting.
- The crew is performing FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.
- The Foldout criteria for initiation of RCS Feed and Bleed have just been met.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Revision 21

Handout: FRP-H.1, Steps 12-21.

Initiating Cue:	Observe the procedure CAUTION prior to FRP-H.1, Step 12, then initiate RCS feed and bleed.
Time Critical Task:	No
Validation Time:	8 minutes

SIMULATOR SETUP

- At power IC
- Tag MDAFW Pump "B"
- MALF for an electrical fault to lock out Bus 1A-SA
- MALF to trip TDAFW Pump during AUTO start
- Overrides to block MANUAL OPEN on PCV-445A and PCV-444B
- Loss of Off-site power
- Perform PATH-1
- Perform EPP-4
- SBLOCA after entering FRP-H.1 to get to adverse containment values.
- Perform FRP-H.1 without establishing any source of feed flow
- Allow SG levels to reach feed and bleed Foldout criteria
- Place shifting 1A and 1B Air Compressors to LOCAL Mode on a trigger
- FREEZE and SNAP to IC-164 for 2007 NRC JPM d.

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

FRP-H.1, Step 12

Procedure CAUTION: Perform Steps 12 through 21 quickly to establish RCS heat removal by RCS bleed and feed.

Performance Step: 1 Verify All RCPs - STOPPED

Standard: All RCP's stopped on LOOP.

Comment:

FRP-H.1, Step 13

Performance Step: 2 Actuate SI.

Standard: Verifies SI actuated.

Comment:

FRP-H.1, Step 14

Performance Step: 3 Verify RCS Feed Path:

VERIFY BOTH OF THE FOLLOWING:

- VERIFY CSIPs - AT LEAST ONE RUNNING.
- VERIFY SI VALVES - PROPERLY ALIGNED. (REFER TO PATH-1 GUIDE, ATTACHMENT 1)

Standard:

- Verifies both CSIP's running. (RED lights)
- Verifies valve alignment using Guide 1, Attachment 1, and/or verifies flow indication on the SI Flow meters.

Comment:

PERFORMANCE INFORMATION

FRP-H.1, Step 15

√ **Performance Step: 4** Reset SI.

Standard:

- Places both SI Train RESET Switches in RESET and releases. **(√)**
- Verifies RESET on Bypass Permissive Panel.

Comment:

FRP-H.1, Step 16

Performance Step: 5 MANUALLY REALIGN SAFE-GUARDS EQUIPMENT FOLLOWING A LOSS OF OFF-SITE POWER.

(REFER TO PATH-1 GUIDE, ATTACHMENT 2.)

Standard: Reads/acknowledges.

Comment:

FRP-H.1, Step 17

√ **Performance Step: 6** Reset Phase A AND Phase B Isolation Signals.

Standard:

- Places Phase "A" RESET Switch in RESET and releases.
- Places Phase "B" RESET Switch in RESET and releases.

Comment:

FRP-H.1, Step 18

Performance Step: 7 Energize AC Buses 1A1 AND 1B1.

Standard:

- Energizes Bus 1B1 by closing the cross-tie from the vital bus.
- No power available to 1A1.

Comment:

FRP-H.1, Step 19

√ **Performance Step: 8** Establish Instrument Air AND Nitrogen To CNMT:

a. Open the following valves:

- 1IA-819
- 1SI-287

b. Place air compressor 1A and 1B in the local control mode. (Refer to PATH-1 GUIDE, Attachment 5.)

Standard:

- Opens 1IA-819 **(√)**
- Opens 1SI-287 **(√)**
- Dispatches an AO to place 1A and 1B Air Compressors in the LOCAL Control Mode.

Booth Operator Cue: **Acknowledge assignment then actuate the ET to place 1A and 1B Air compressors in the LOCAL Mode and report back.**

Comment:

FRP-H.1, Step 20

√ **Performance Step: 9** ESTABLISH RCS BLEED PATH:

ESTABLISH TWO RCS BLEED PATHS LISTED IN TABLE 2 BY PERFORMING THE FOLLOWING FOR EACH BLEED PATH:

- VERIFY PRZ PORV BLOCK VALVE - OPEN.
- OPEN PRZ PORV.
- Evaluate EAL network using entry point U.

Standard:

- Verifies RC-115 and RC-117 indicate OPEN (RED light)
- No indication for RC-113
- Opens PCV-445B **(√)**
- Informs Shift Superintendent to evaluate EAL network using entry point U

Evaluator Cue:

- **The last known position for RC-113 was OPEN.**
- **As Shift Superintendent, acknowledge direction to evaluate the EAL network using entry point U.**

Comment:

PERFORMANCE INFORMATION

FRP-H.1, Step 21.a

Performance Step: 10 Verify Adequate RCS Bleed Path:

Check PRZ PORVs AND associated block valves - TWO BLEED PATHS OPEN

RNO a. GO TO Step 21c.

Standard:

- Determines only one PRZ PORV is OPEN.
- Proceeds to RNO.

Comment:

FRP-H.1, Step 21.c

√ **Performance Step: 11** Open all RCS vent valves to commence venting:

- 1RC-900
- 1RC-901
- 1RC-902
- 1RC-903
- 1RC-904
- 1RC-905

Standard: Opens:

- 1RC-901 ___
- 1RC-903 ___
- 1RC-905 ___

Evaluator Note: **There is no power available to 1RC-900, 1RC-902, 1RC-904.**

Comment:

Terminating Cue: **After RCS Vent Valves with power available are OPEN: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM d

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The reactor tripped from 100% power due to a loss of off-site power.
- A SBLOCA occurred following the reactor trip. Adverse containment values are in effect.
- Bus 1A-SA is locked out on an electrical fault.
- Motor Driven AFW Pump "B" is partially disassembled for maintenance.
- The Turbine-Driven AFW Pump failed while starting.
- The crew is performing FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK.

INITIATING CUE: Observe the procedure CAUTION prior to FRP-H.1, Step 12, then initiate RCS feed and bleed.

Facility:	Shearon-Harris	Task No.:	
Task Title:	Control RCS temperature following a reactor trip	JPM No.:	2007 NRC JPM e
K/A Reference:	041 A2.02 (3.8)	New JPM ALTERNATE PATH	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The reactor tripped from 100% power due to a technician error while testing the turbine protection system.
- The immediate actions of PATH-1 are complete.
- Both vital buses are energized from off-site power.
- The operating crew has just entered EPP-4, REACTOR TRIP RESPONSE.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: EPP-4, REACTOR TRIP RESPONSE, Revision 14

Handout: Use simulator copy of EPP-4. Ensure that it is cleaned after/prior to each use.

Initiating Cue: Perform the actions of EPP-4.

Time Critical Task: No

Validation Time: 4 minutes

SIMULATOR SETUP

- 100% power IC.
- MALF for one stuck open steam dump valve (MS-109 @ 70 %).
- MALF for all six SG Blowdown Isolation valves fail to close.
- Manual trip Main Turbine.
- Perform PATH-1 immediate actions.
- Transition to EPP-4.
- FREEZE and SNAP to IC-165 for NRC Exam JPM e.

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1

EPP-4, NOTE
FOLDOUT applies

- SI Initiation
- AFW Suction Switchover

Standard: Verifies no actions required.

Comment:

Performance Step: 2

EPP-4, Step 1
Implement Function Restoration Procedures As Required.

Standard: Verifies no RED or ORANGE CSF.

Comment:

Performance Step: 3

EPP-4, Step 2
Evaluate EAL Network Using Entry Point X.

Standard: Informs SSO.

Evaluator Cue: **Acknowledge "Evaluate EAL Network Using Entry Point X for a reactor trip".**

Comment:

PERFORMANCE INFORMATION

EPP-4, Step 3

Performance Step: 4 Check SG blowdown isolation valves – SHUT

Standard:

- Determines all SG Blowdown Isolation valves are OPEN and answers NO.
- Refers to RNO column.

Comment:

EPP-4, Step 3 RNO

√ **Performance Step: 5** Shut SG blowdown FCVs

Standard: Closes each (3) SG Blowdown Flow Control Valve at the Main Control Board by unlocking each POT and adjusting it to ZERO.

Comment:

EPP-4, Table 1

Performance Step: 6 Stabilize AND maintain temperature between 555 ˚F AND 559 ˚F using TABLE 1: RCS TEMPERATURE CONTROL GUIDELINES FOLLOWING RX TRIP

Standard:

- Refers to Table 1.
- Determines RCS temperature < 557 ˚F and decreasing.

Comment:

PERFORMANCE INFORMATION

EPP-4, Table 1

Performance Step: 7 RCS temperature < 557 ˚F and decreasing.

- Stop dumping steam

Standard:

- May note the open steam dump valve and attempt to close it using Steam Dump controls in MANUAL or taking it to OFF.
- May skip over next two steps and begin closing MSIV's.

Evaluator Note: **If applicant begins closing the MSIV's then skip to that JPM Performance Step.**

Comment:

EPP-4, Table 1

Performance Step: 8 RCS temperature < 557 ˚F and decreasing.

- Control feed flow
- Maintain total feedwater flow greater than 210 KPPH until level greater than 25% in one SG.

Standard: Reduces total AFW flow to no less than 210 KPPH.

Comment:

PERFORMANCE INFORMATION

EPP-4, Table 1

√ **Performance Step: 9** RCS temperature < 557 ˚F and decreasing.

- If cooldown continues then shut MSIV's and Bypass Valves.

Standard: Using each individual control switch, SHUTS:

- MSIV "A" _____ **(√)**
- MSIV "B" _____ **(√)**
- MSIV "C" _____ **(√)**
- Verifies Bypass Valves SHUT

Comment:

Terminating Cue: **When the applicant has moved to the next step (RCP Status): Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM e

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The reactor tripped from 100% power due to a technician error while testing the turbine protection system.
- The immediate actions of PATH-1 are complete.
- Both vital buses are energized from off-site power.
- The operating crew has just entered EPP-4, REACTOR TRIP RESPONSE.

INITIATING CUE: Perform the actions of EPP-4.

Facility: Shearon-Harris Task No.:

Task Title: Reduce Containment Spray flow JPM No.: 2007 NRC JPM f

K/A Reference: 026 A4.01 (4.5)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A large break LOCA has occurred.
- Both RHR Pump breakers have tripped. Maintenance is investigating.
- The crew has transitioned to EPP-12, LOSS OF EMERGENCY COOLANT RECIRCULATION, and has completed Step 9.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: None

General References: EPP-12, LOSS OF EMERGENCY COOLANT RECIRCULATION, Revision 17

Handout: Use simulator copy of EPP-12. Ensure that it is cleaned after/prior to each use.

Initiating Cue: Beginning at Step 10, perform EPP-12.

Time Critical Task: No

Validation Time: 5 minutes

SIMULATOR SETUP

- 100% power
- LBLOCA
- Perform PATH-1
- Trip both RHR Pumps near the EPP-12 transition point
- Transition to EPP-12
- Perform EPP-12 through Step 9
- FREEZE and SNAP to IC-166 for 2007 NRC JPM f

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

EPP-12, Step 10

Performance Step: 1 Verify Containment Fan Coolers – one fan per unit running in SLOW speed.

Standard: Verifies all Containment Fan Coolers are running with one fan in SLOW speed.

Comment:

EPP-12, Step 11

Performance Step: 2 Check RWST level - greater than 3% (Empty alarm)

Standard: Verifies RWST level greater than 3% by level indication and/or alarm ALB-004-2-5 clear.

Comment:

EPP-12, Step 12.a

Performance Step: 3 Determine CNMT requirements.

- Spray Pump suction – aligned to RWST

Standard: Verifies CNMT Spray Pump suction valves aligned to RWST.

Comment:

PERFORMANCE INFORMATION

EPP-12, Step 12.b

Performance Step: 4 Determine the required number of CNMT Spray Pumps from Table 1.

Standard:

- Applies existing RWST level, CNMT Pressure and number of CNMT Fan Coolers running to Table 1.
- Determines no CNMT Spray Pumps are required.

Comment:

EPP-12, Step 12.c

√ **Performance Step: 5** Verify spray pumps – required number running.

Standard: Stops both Containment Spray Pumps.

Comment:

EPP-12, Step 12.d

√ **Performance Step: 6** Reset CNMT Spray signal.

Standard: Resets CNMT Spray signal (both trains).

Comment:

PERFORMANCE INFORMATION

EPP-12, Step 12.e

√ **Performance Step: 7** Align CNMT Spray Pumps stopped in 12.c for standby operation.

- Shut CNMT Spray Discharge valves.

Standard:

- Shuts 1CT-50 ("A" CT Pump)
- Shuts 1CT-88 ("B" CT Pump)

Evaluator Note: **The discharge valves and chemical addition valves can be operated in any order.**

Comment:

EPP-12, Step 12.e

√ **Performance Step: 8** Align CNMT Spray Pumps stopped in 12.c for standby operation.

- Shut Chemical addition valves.

Standard:

- Shuts 1CT-12 ("A" CT Pump)
- Shuts 1CT-11 ("B" CT Pump)

Comment:

Terminating Cue: **When the applicant proceeds to Step 13 (Align CNMT Spray for Recirculation): Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM f

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A large break LOCA has occurred.
- Both RHR Pump breakers have tripped. Maintenance is investigating.
- The crew has transitioned to EPP-12, LOSS OF EMERGENCY COOLANT RECIRCULATION, and has completed Step 9.

INITIATING CUE: Beginning at Step 10, perform EPP-12.

Facility:	Shearon Harris	Task No.:	062008H601
Task Title:	Restore Offsite Power to an Emergency Bus	JPM No.:	2007 NRC JPM g
K/A Reference:	062 A4.01 (3.3)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A loss of off-site power occurred.
- Bus 1B SB is being carried by the EDG.
- EDG 1A-SA failed to start.
- The switchyard has been reenergized.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: Board Operator to acknowledge/silence unrelated alarms.

General References: OP-156.02, AC Electrical Distribution, Revision 59

Handouts: OP-156.02 Section 8.17, Restoration of Off-site Power to Emergency Buses R, with Initial Conditions signed off.

Initiating Cue: The SCO has directed you to restore power to Bus 1A-SA from off-site power per OP-156.02, Section 8.17. The Initial Conditions have been verified. An extra operator has been assigned to deal with alarms that are unrelated to your assigned task.

Time Critical Task: No

Validation Time: 10 minutes

SIMULATOR SETUP

- Initialize the simulator to 100% (IC-18/19/20).
- Insert malfunction for EDG 1A-SA failure to start <**IMF DSG01 1**>.
- Insert a SUT 1A lockout <**IMF EPS07 1**> and a loss of off-site power <**IMF EPS01 1**>.
- After the B Sequencer has run through, delete the SUT 1A lockout <**DMF EPS07 1**> and loss of off-site power <**DMF EPS01 1**>.
- Verify the A EDG output breaker, BKR 106, is open.
- Acknowledge annunciators.
- FREEZE and SNAP to IC-___ for 2007 NRC JPM g.
- When the operator is ready to begin, place the simulator in RUN.

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain Procedure

Standard: Reviews procedure OP-156.02, Section 8.17.

Examiners Cue: **Provide the operator with the handout (OP-156.02, Section 8.17) with the Initial Conditions signed off.**

Examiners Note:

- **Closed breaker indication is RED.**
- **Open breaker indication is GREEN.**

Comment:

Step 8.17.1

Performance Step: 2 Initial Conditions:

Standard: Verifies Initial Conditions initialed.

Examiners Cue: **The Load Dispatcher has given permission to reset the SUT lockout relay and re-energize from off-site power.**

Comment:

PERFORMANCE INFORMATION

8.17.2.1.a

Procedure Note: Step 8.17.2.11 energizes Bus 1A-SA, while Step 8.17.2.12 energizes Bus 1B-SB.

Procedure CAUTION: Tripping of a Start Up Transformer Lockout Relay indicates a major fault on the transformer. Re-energizing the transformer may cause additional damage and should NOT be done without Load Dispatcher permission.

√ **Performance Step: 3** RESTORE off-site Power to 6.9KV Emergency Bus A-SA by performing the following:

a. VERIFY the START UP XFMR 1A LOCKOUT SU 1A relay on SU XFMR PROTECTIVE RELAY PANEL 1A is reset.

Standard: Places the START-UP XFMR 1A LOCKOUT Relay Switch to RESET position.

Comment:

Step 8.17.2.1.b

√ **Performance Step: 4** CLOSE 52-2 and/or 52-3.

Standard: Places 52-2 and/or 52-3 control switches to the CLOSE position.

Comment:

PERFORMANCE INFORMATION

Step 8.17.2.1.c.1/2

Procedure Note: Steps 8.17.2.1.c through 8.17.2.1.p are performed at the MCB.

Procedure Caution: Do not attempt to manually reset the 6.9KV Undervoltage Relay Lockout Devices before energizing the 6.9KV buses, or severe damage may result to the relay devices.

Performance Step: 5 VERIFY the availability to SUT 1A, as indicated by the following voltmeters reading between 6.55 and 7.25KV across EACH phase:

(1) EI-503, X Winding Volts (EACH phase)

(2) EI-504, Y Winding Volts (EACH phase)

Standard: Verifies EI-503 and EI-504 reading within the band on each phase.

Comment:

Step 8.17.2.1d

Procedure Caution: Lack of breaker lights does not mean that the breaker is open, only that control power is off.

Performance Step: 6 VERIFY that all load feeder breakers are open on Auxiliary Bus 1D as required per the Unit SCO.

Standard: Acknowledges.

Examiners Cue: **All load feeder breakers on Auxiliary Bus 1D have been verified OPEN by an AO.**

Comment:

PERFORMANCE INFORMATION

Step 8.17.2.1.e

√ **Performance Step: 7** PLACE the START UP XFMR A TO AUX BUSES A & D SYNCHRONIZER switch in the BKR 101 position.

Standard: Places START-UP TRANSFORMER "A" Synchronizer Switch in the BKR 101 position and verifies it indicating at the 12 o'clock position.

Comment:

Step 8.17.2.1.f

√ **Performance Step: 8** PLACE BKR 101, START UP XFMR A TO AUX BUS D, in the CLOSE position.

Standard: Places Breaker 101 Control Switch in the CLOSE position.

Comment:

Step 8.17.2.1.g

Performance Step: 9 VERIFY voltage on EI-561, AUX BUS 1D VOLT, is between 6.55 to 7.25KV.

Standard: Verifies EI-561 is reading within the specified band.

Comment:

Step 8.17.2.1.h

Performance Step: 10 PLACE the START UP XFMR A TO AUX BUSES A & D SYNCHRONIZER switch in the OFF position.

Standard: Places the START UP XFMR A TO AUX BUSES A & D Synchronizer Switch in the OFF position.

Comment:

PERFORMANCE INFORMATION

Step 8.17.2.1.i

Procedure Caution:

- Do not attempt to manually reset the 6.9KV undervoltage relay lockout devices before energizing the 6.9KV buses, or severe damage may result to the relay devices.
- Lack of breaker lights does not mean that the breaker is open, only that control power is off.

√ **Performance Step: 11** PLACE BREAKER 104, AUX BUS D TO EMERGENCY BUS A-SA, in the CLOSE position.

Standard: Places Breaker 104 Control Switch in the CLOSE position.

Comment:

Step 8.17.2.1.j

Performance Step: 12 IF BREAKER 106 SA, DIESEL GEN A-SA, is closed with EDG energizing bus 1A-SA, THEN SYNCHRONIZE AND TRANSFER off-site power with EDG A-SA per OP-155 AND DISREGARD the following Steps 8.17.2.1.k through 8.17.2.1.p.

Standard: Verifies Breaker 106 SA OPEN and EDG 1A-SA not running and continues in the procedure.

Examiners Cue: **Per the Initial Conditions: EDG 1A-SA did not start.**

Comment:

Step 8.17.2.1.k

Performance Step: 13 IF BREAKER 106 SA, DIESEL GEN A-SA is open, THEN PERFORM Steps 8.17.2.1.l through 8.17.2.1.p below to energize Bus 1A-SA.

Standard: Proceeds to step 8.17.2.1.l

Comment:

PERFORMANCE INFORMATION

Step 8.17.2.1.l

√ **Performance Step: 14** PLACE EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the SYNC position.

Standard: Places EMERGENCY Bus A-SA TO AUX BUS D SYNCHRONIZER Switch to SYNC position and verifies it indicating at the 12 o'clock position.

Comment:

Step 8.17.2.1.m

√ **Performance Step: 15** PLACE BREAKER 105 SA, EMERGENCY BUS A-SA TO AUX BUS D TIE, in the CLOSE position.

Standard: Places the Breaker 105 Control Switch in the CLOSE position.

Comment:

Step 8.17.2.1.n

Performance Step: 16 VERIFY EI-6956A1 SA, EMER BUS A VOLTS, indicates between 6.55 and 7.25KV across EACH phase.

Standard: Verifies EI-6956A1-SA voltage within the specified band across each phase.

Comment:

Step 8.17.2.1.o

Performance Step: 17 PLACE the EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the OFF position.

Standard: PLACES the EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the OFF position.

Comment:

PERFORMANCE INFORMATION

Step 8.17.2.1.p.1

Performance Step: 18 VERIFY the following breakers are closed:
(1) A3 B-SA, EMERGENCY BUS A3 SA SUPPLY BREAKER.

Standard: Verifies Breaker A3 B-SA indicates CLOSED.

Comment:

Step 8.17.2.1.p.2

√ **Performance Step: 19** VERIFY the following breakers are closed:
(2) A3 A-SA, EMERGENCY BUS A SA TO XFMR A3 SA.

Standard: Places Breaker A3 A-SA Control Switch in the CLOSE position.

Comment:

Step 8.17.2.1.p.3

Performance Step: 20 VERIFY the following breakers are closed:
(3) A2 B-SA, EMERGENCY BUS A2 SA SUPPLY BREAKER.

Standard: Verifies Breaker A2 B-SA CLOSED.

Comment:

Step 8.17.2.1.p.4

Performance Step: 21 VERIFY the following breakers are closed:
(4) A2 A-SA, EMERGENCY BUS A SA TO XFMR A2 SA.

Standard: Verifies Breaker A2 A-SA CLOSED.

Comment:

PERFORMANCE INFORMATION

Step 8.17.2.1.p.5

Performance Step: 22 VERIFY the following breakers are closed:
(5) A1 B, EMERGENCY BUS A1 SUPPLY BREAKER.

Standard: Verifies Breaker A1 B CLOSED.

Comment:

Step 8.17.2.1.p.6

Performance Step: 23 VERIFY the following breakers are closed:
(6) A1 A-SA, EMERGENCY BUS A SA TO XFMR A1.

Standard: Places Breaker A1 A-SA Control Switch in the CLOSE position.

Comment:

Terminating Cue: **When Section 8.17 is complete: Evaluation on this JPM is complete.**

STOP TIME: _____ **TIME CRITICAL STOP TIME:** _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM g

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A loss of off-site power occurred.
- Bus 1B-SB is being carried by the EDG.
- EDG 1A-SA failed to start.
- The switchyard has been reenergized.

INITIATING CUE:

The SCO has directed you to restore power to Bus 1A-SA from off-site power per OP-156.02, Section 8.17. The Initial Conditions have been verified. An extra operator has been assigned to deal with alarms that are unrelated to your assigned task.

Facility:	Shearon Harris	Task No.:	301058H401
Task Title:	Take corrective action for Loss of Both CCW Pumps	JPM No.:	2007 NRC JPM h
K/A Reference:	APE026 AA1.02 (3.2/3.3)	Alternate Path	

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The plant is at 100 percent power.
- All controls are aligned for full power.

Task Standard: Reactor tripped and all RCP's stopped.

Required Materials: None

General References: AOP-014, LOSS OF COMPONENT COOLING WATER, Rev. 29

Initiating Cue: You are the RO. Maintain current plant conditions.

Time Critical Task: NO

Validation Time: 6 minutes

SIMULATOR SETUP

- Initialize to a 100 percent steady-state condition (IC-18/19/20).
- IMF CCW01B to prevent AUTO/MANUAL start.
- Place IMF CCW01A on a trigger.
- Place clearance tags on the following to mask upcoming fault:
  - CCW Pump "B"
  - HD Pump "A"
  - RMUW Pump "B"
- FREEZE and SNAP to IC-168 for 2007 NRC JPM h.
- RUN
- When the operator has assumed the watch, actuate the trigger to "TRIP" the running CCW pump (IMF CCW01A).

(Denote Critical Steps with a check mark)

START TIME: _____

Simulator Operator:	**Actuate trigger for IMF CCW01A 10-15 seconds after the candidate assumes the watch.**
Performance Step: 1	Responds to CCW alarms.
Standard:	Enters AOP-014, reads purpose and enters at Section 3.0.
Comment:	**May attempt to start CCW "B" IAW OMM-001 guidance for failure of an automatic action to occur.**

Step 3.1

Performance Step: 2	Refer to PEP-110, Emergency Classification and Protective Action Recommendations, and enter the EAL Network at Entry Point X.
Standard:	Informs SS-O.
Evaluator Cue:	**Acknowledge.**
Comment:	

Step 3.2

Performance Step: 3	Evaluate Plant Conditions and go to appropriate section.
Standard:	Identifies condition as Loss of CCW Pump and goes to Section 3.3.
Comment:	

PERFORMANCE INFORMATION

Step 3.3.1

Performance Step: 4 Check the Standby CCW Pump has STARTED.

Standard: Determines no CCW Pump running and may attempt MANUAL start on standby pump.

Comment:

PERFORMANCE INFORMATION

		Step 3.3.2
	Performance Step: 5	Check CCW Header Pressure GREATER THAN 52 psig.
	Standard:	Determines CCW header pressure is less than 52 PSIG and proceeds to RNO column.
		Step 3.3.2.a RNO Column
	Performance Step: 5a	If CCW is lost, then perform the following: Verify the following valves shut:
	Evaluator Note:	**Valve operation/verification may be performed in any order.**
√	**Performance Step: 5b**	• 1CS-7, 45 gpm Letdown Orifice A.
	Standard:	Shuts 1CS-7.
√	**Performance Step: 5c**	• 1CS-8, 60 gpm Letdown Orifice B.
	Standard:	Shuts 1CS-8.
	Performance Step: 5d	• 1CS-9, 60 gpm Letdown Orifice C.
	Standard:	Verifies 1CS-9.
	Performance Step: 5e	• 1CS-460, EXCESS LETDOWN
	Standard:	Verifies 1CS-460.
	Performance Step: 5f	• 1CS-461, EXCESS LETDOWN
	Standard:	Verifies 1CS-461.
√	**Performance Step: 5g**	• 1SP-948, RCS LOOPS B&C HOT LEG CNMT ISOL
	Standard:	Shuts 1SP-948.
√	**Performance Step: 5h**	• 1SP-949, RCS LOOP B&C HOT LEG CNMT ISOL
	Standard:	Shuts 1SP-949.
	Performance Step: 5i	• 1SP-40, SB PRESSURIZER LIQUID SAMPLE ISOL
	Standard:	Verifies 1SP-40 SB.

Performance Step: 5j • 1SP-41 SA, PRESSURIZER LIQUID SAMPLE CNMT ISOL

Standard: Verifies 1SP-41 SA.

Performance Step: 5k • 1SP-59 SB, PRESSURIZER STM SPACE SAMPLE ISOL

Standard: Verifies 1SP-59 SB.

Performance Step: 5l • 1SP-60 SA, PRESSURIZER STM SPACE SAMPLE ISOL

Standard: Verifies 1SP-60 SA.

Comment:

Step 3.3.2.b RNO Column

√ **Performance Step: 6** ISOLATE CHARGING FLOW AS FOLLOWS:

- Place controller FK-122.1 in MANUAL and shut.
- SHUT 1CS-235 SB, Charging Flow Line Isolation.
- SHUT 1CS-238 SA, Charging Flow Line Isolation.

Standard:

- Places FK-122.1 in MANUAL and adjusts to ZERO demand and/or SHUT light lit.
- Places 1CS-235 in SHUT.
- Places 1CS-238 in SHUT.

Comment:

Step 3.3.2.c RNO Column

Performance Step: 7 If the RCS is solid, then stop the running CSIP.

Standard: Determines RCS NOT solid.

Comment:

Step 3.3.2.d RNO Column

Performance Step: 8 If RHR is in service, then shut 1CS-28, RHR LETDOWN (HC-142.1)

Standard: Determines RHR NOT in service.

Comment:

Step 3.3.2.e.1 RNO Column

Performance Step: 9 If CCW is expected to be lost for greater than or equal to 10 minutes, then perform the following:

- Check the reactor is tripped.

Standard: Reports/identifies reactor not tripped.

Evaluator Cue: **After the step "If CCW is expected to be lost for greater than or equal to 10 minutes, then perform the following" is read: No CCW Pump will be available for at least 15 minutes.**

Comment:

Step 3.3.2.e.2 RNO Column

√ **Performance Step: 10** If CCW is expected to be lost for greater than or equal to 10 minutes, then perform the following:

- If the reactor is not tripped, then trip the reactor and go to EOP PATH-1 (continue with this procedure as time permits).

Standard: Initiates a MANUAL reactor trip.

Evaluator Cue: **After the reactor trip is initiated, the Evaluator can elect to have the applicant complete the immediate actions of PATH-1 and then direct him/her to return to AOP-014 or provide the following cue: Another operator will perform EOP PATH-1 immediate actions. Continue performing AOP-014.**

Comment:

PERFORMANCE INFORMATION

Step 3.3.2.e.3 RNO Column

√ **Performance Step: 11** If CCW is expected to be lost for greater than or equal to 10 minutes, then perform the following:

- Stop all running RCP's.

Standard: Stops each RCP (3).

Comment:

Terminating Cue: **When the candidate reads AOP-014 "Go to Step 4": Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM h

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- The plant is at 100 percent power.
- All controls are aligned for full power.

INITIATING CUE: You are the RO. Maintain current plant conditions.

Facility: Shearon Harris | Task No.: 301116H401

Task Title: Inhibit Both Trains of SSPS | JPM No.: 2007 NRC JPM i

K/A Reference: 012 G2.1.30 3.9

Examinee: | NRC Examiner:

Facility Evaluator: | Date:

Method of testing:

Simulated Performance: X | Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A major fire has occurred on RAB 286' elevation in Cable Spread Room A (FIRE AREA 1-A-CSRA).
- The reactor is tripped and both RTBs are verified open.
- The operating crew is implementing AOP-036, SAFE SHUTDOWN FOLLOWING A FIRE.

Task Standard: Removal of listed fuses simulated.

Required Materials:

- SSPS cabinet key
- Standard safety equipment

General References: AOP-036, SAFE SHUTDOWN FOLLOWING A FIRE, Rev. 39
AOP-036.05, Fire Areas 1A-CSRA, 1A-CSRB

Handout: AOP-036.05, Fire Areas 1A-CSRA, 1A-CSRB, Section 3.1

Initiating Cue: The SCO has directed you to defeat both trains of SSPS per AOP-036.05, Section 3.1, Step 1. Report when the task is complete.

Time Critical Task: No

Validation Time: 9 minutes

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain procedure.

Standard: The operator obtains a copy of the procedure.

Reviews applicable step.

Evaluator Cue: **Provide a copy of AOP-036.05, Fire Areas 1A-CSRA, 1A-CSRB.**

Comment:

Step 3.1.1.a

Procedure Caution:

• The following step will inhibit all automatic and manual safeguards functions since a fire in this area could cause spurious actuations as well as disable controls for resetting SI.

• Removal of Output Relay Power Fuses from both trains of SSPS will generate a Reactor Trip signal. The Reactor should be shut down prior to performing the following step.

Performance Step: 3 Defeat both trains of SSPS as follows:

- Verify Reactor Trip Breakers are OPEN.

Standard: Information provided in Initial Conditions.

Evaluator Cue: **If necessary: Both Reactor Trip Breakers are OPEN.**

Comment:

PERFORMANCE INFORMATION

Step 3.1.1.b

Performance Step: 4 Obtain SSPS Key 40, 41, 94, 95, 96, or 97 (MCR or ACP Key Locker).

Standard: Describes the method/location for obtaining the key.

Evaluator Cue: **Provide SSPS Cabinet key.**

Comment:

Step 3.1.1.c

√ **Performance Step: 5** Remove the following fuses: (In the front of the SSPS Output cabinets).

- Train A, Output Cabinet No. 1, Output Relay Power Fuses.

Standard: Locates and simulates removal of the Train A Output Cabinet No. 1 Output Relay Power fuses.

Evaluator Cue: **Train A Output Cabinet No. 1 Output Relay Power fuses are removed.**

Comment: **Each cabinet should be closed and locked after the simulated action(s).**

Step 3.1.1.c

√ **Performance Step: 6** Remove the following fuses: (In the front of the SSPS Output cabinets).

- Train A, Output Cabinet No. 2, Fuses 61 and 62.

Standard: Locates and simulates removal of Train A Output Cabinet No. 2 fuses 61 and 62.

Evaluator Cue: **Train A Output Cabinet No. 2 fuses 61 and 62 are removed.**

Comment:

PERFORMANCE INFORMATION

Step 3.1.1.c

√ **Performance Step: 7** Remove the following fuses: (In the front of the SSPS Output cabinets).

- Train B, Output Cabinet No. 1 Output Relay Power Fuses.

Standard: Locates and simulates removal of Train B Output Cabinet No. 1 Output Relay Power fuses.

Evaluator Cue: **Train B Output Cabinet No. 1 Output Relay Power fuses are removed.**

Comment:

Step 3.1.1.c

√ **Performance Step: 8** Remove the following fuses: (In front of the SSPS Output cabinets).

- Train B, Output Cabinet No. 2, Fuses 61 and 62.

Standard: Locates and simulates removal of Train B Output Cabinet No. 2 fuses 61 and 62.

Evaluator Cue: **Train B Output Cabinet No. 2 fuses 61 and 62 are removed.**

Comment:

Terminating Cue: **Control Room/SCO notified of step completion: This JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM i

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A major fire has occurred on RAB 286' elevation in Cable Spread Room A (FIRE AREA 1-A-CSRA).
- The reactor is tripped and both RTBs are verified open.
- The operating crew is implementing AOP-036, SAFE SHUTDOWN FOLLOWING A FIRE.

INITIATING CUE:

The SCO has directed you to defeat both trains of SSPS per AOP-036.05, Section 3.1, Step 1. Report when the task is complete.

Facility: Shearon Harris | Task No.: 039102H104

Task Title: Shut MSIVs by Isolating Air | JPM No.: 2007 NRC JPM j

K/A Reference: 039 G2.1.30 3.9

Examinee: | NRC Examiner:

Facility Evaluator: | Date:

Method of testing:

Simulated Performance: X | Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: A steamline break caused a safety injection. The MSIVs will not shut from the control room. The operating crew transitioned from PATH-1 to EPP-014, FAULTED STEAM GENERATOR ISOLATION.

Task Standard: RAB 261' instrument air header has been isolated and depressurized.

Required Materials: EOP-EPP-014, Faulted Steam Generator Isolation

General References: EOP-EPP-014, Faulted Steam Generator Isolation, Rev. 15

Handouts: EOP-EPP-014, Faulted Steam Generator Isolation

Initiating Cue: The SCO has directed you to perform Step 2 RNO of EPP-014. The MSIV Bypasses are shut.

Time Critical Task: N/A

Validation Time: 7 minutes

SIMULATOR SETUP

N/A

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain Procedure

Standard: Operator obtains procedure EPP-014, Step 2.

Examiners Cue: **Provide the operator with a copy of EPP-014, Step 2.**

Comment:

Step 2.a

Performance Step: 2 Check MSIVs AND Bypass Valves:
a. Verify all MSIVs - SHUT

Standard: Initial Conditions indicate all MSIVs are OPEN.

Evaluator Note: **The applicant may go directly to the RNO column.**

Comment:

PERFORMANCE INFORMATION

Step 2.a.1 RNO Column

√ **Performance Step: 3** Check MSIVs AND Bypass Valves:

a. Perform the following:

1) Locally shut instrument air supply to RAB 261: 1IA-814 (north of AH-19 1A-SA)

Standard: Locates and simulates shutting 1IA-814 by rotating the handwheel in the clockwise direction.

Examiners Cue: **If performed properly inform the operator that 1IA-814 is shut.**

Comment:

Step 2.a.2 RNO Column

√ **Performance Step: 4** 2. Check MSIVs AND Bypass Valves:

a. Perform the following:

2) Locally remove cap AND open drain valve: 1IA-1876 (located in corridor outside VCT valve gallery)

Standard: The operator locates 1IA-1876, removes cap, and simulates opening valve by rotating the handwheel in the counter-clockwise direction.

Examiners Cue: **If performed properly inform the operator that 1IA-1876 is OPEN and the air header is blowing down and depressurizing.**

Comment:

PERFORMANCE INFORMATION

Performance Step: 5 Notify the Control Room instrument air is isolated to the MSIVs.

Standard: The operator notifies the Control Room that instrument air to the MSIV's is isolated and depressurized.

Examiners Cue: **Respond as the Control Room Operator that all MSIVs have shut.**

Comment:

Terminating Cue: **All MSIVs are shut.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM j

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:	A steamline break caused a safety injection. The MSIVs will not shut from the control room. The operating crew transitioned from PATH-1 to EPP-014, FAULTED STEAM GENERATOR ISOLATION.
INITIATING CUE:	The SCO has directed you to perform Step 2 RNO of EPP-014. The MSIV Bypasses are shut.

Facility:	Shearon Harris	Task No.:	071104H112
Task Title:	Respond to High Rad Alarm During a Waste Gas Decay Tank Release	JPM No.:	2007 NRC JPM k
K/A Reference:	071 G2.1.30 3.9		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: _____

Classroom _____ Simulator _____ Plant X

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- "A" Waste Gas Decay Tank is being released.
- Monitors REM-3546 and RM-3546-1 are OPERABLE.

Task Standard: Waste Gas Decay Tank release is terminated per OP-120.07, Waste Gas Processing, Section 8.37.

Required Materials: None

General References: OP-120.07, Waste Gas Processing, Rev. 46

Handouts:
- A copy of OP-120.07, Waste Gas Processing, Attachment 3 completed through Item 23.
- A copy of OP-120.07, Waste Gas Processing, Section 8.37.

Initiating Cue: You relieved the operator who commenced the release. The control room has just directed you to implement OP-120.07, Section 8.37, Actions for a REM Monitor Alarm During a Waste Gas Decay Tank Release, because an ALERT alarm has been received on REM-3546.

Time Critical Task: N/A

Validation Time: 20 minutes

SIMULATOR SETUP

N/A

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain Procedure

Standard: Reviews OP-120.07, Section 8.37.

Examiners Cue: **Provide the handout (OP-120.07, Attachment 3 signed off through Item 23 and OP-120.07, Section 8.37).**

Comment:

Step 8.37.1

Performance Step: 2 Verifies the Initial Conditions:

1. A Waste Gas Decay Tank is being released.
2. Monitors REM-3546 or RM-3546-1 are OPERABLE.
3. A REM Monitor Alert or High Alarm has been received.

Standard: Confirms the initial conditions apply.

Comment:

PERFORMANCE INFORMATION

Step 8.37.2.1

Procedure Note:

- If an Alert alarm is received, the WGDT release may continue provided the reading does not approach the High Alarm setpoint.
- This section contains steps which require independent verification.

Performance Step: 4 If the Monitor goes into an Alert Alarm, observe the reading to see if it continues to increase. Record the reading in the Radwaste Control Room AO logs.

Standard: Observes the REM-3546 monitor reading.

Examiners Cue: **REM-3546 is rising and approaching the HIGH alarm setpoint.**

Comment:

Step 8.37.2.2

Performance Step: 5 If the Monitor reading continues to approach or goes into a High Alarm condition, the Waste Gas Decay Tank release must be secured. Continue to next step to secure the Gas Decay Tank Release.

Standard: Determines the release must be secured and continues to the next step.

Comment:

PERFORMANCE INFORMATION

Step 8.37.2.3

√ **Performance Step: 6** Adjust HK-7392, PLANT VENT Controller until indicator reads 0 and record the Actual Stop Date/Time (Log Item 24).

Standard:

- Adjusts HK-7392 until indicator reads 0.
- Records the actual Stop Date/Time on Attachment 3.

Examiners Cue: **Controller HK-7392 reads 0.**

Comment:

Step 8.37.2.4

√ **Performance Step: 7** Using key, place the WG DECAY TANKS E & F TO PLANT VENT VALVE switch 3WG-229 to KEYLOCKED SHUT and log on Attachment 3. (Log Item 25)

Standard:

- Selects WG DECAY TANKS E & F TO PLANT VENT VALVE 3WG-229 switch to KEYLOCKED SHUT.
- Records log entry on Attachment 3.

Examiners Cue: **3WG-229 is in the KEYLOCKED SHUT position.**

Comment:

PERFORMANCE INFORMATION

Step 8.37.2.5

Procedure Note: Independent verification of 3WG-229 position in the next step can be performed out of sequence.

Performance Step: 9 Perform independent verification that 3WG-229 is locked shut and log on Attachment 3. (Log item 26)

Standard: Logs independent verification entry on Attachment 3 or delays action based on the Procedure Note.

Examiners Cue: **Independent verification was the valve position feedback you received on Step 8.37.2.4.**

Comment:

Step 8.37.2.6

Performance Step: 10 Notify the Superintendent - Shift Operations that Monitor REM-3546 has alarmed and the release has been stopped.

Standard: Notifies the Superintendent Shift Operations that monitor REM-3546 alarmed and the release has been stopped.

Examiners Cue: **Superintendent Shift Operations acknowledges the report.**

Comment:

Step 8.37.2.7.a

Performance Step: 11 The release package must be closed out by performing the following steps:

- Record the Vent Stack 5 Flow Rate (Log Item 27).

Standard:

- Reads and records Vent Stack 5 Process Flow Rate on Attachment 3.

Comment:

PERFORMANCE INFORMATION

Step 8.37.2.7.b

Performance Step: 12 The release package must be closed out by performing the following steps:

- Record the Final Gas Decay Tank Pressure (Log Item 28).

Standard:

- Locates "A" Gas Decay Tank pressure indication and records on Attachment 3.

Examiners Cue: **Final Gas Decay Tank pressure is 23 psig.**

Comment:

Step 8.37.2.7.c

Performance Step: 13 The release package must be closed out by performing the following steps:

- Calculate the Actual Gas Decay Tank ΔP and record. (Log Item 29).

Standard:

- Actual Gas Decay Tank ΔP calculated and recorded on Attachment 3.

Comment:

Step 8.37.2.7.d

√ **Performance Step: 14** The release package must be closed out by performing the following steps:

- Shut 3WG-230, Gas Decay Tanks to Plant Vent Manual Isolation Valve and log on Attachment 3. (Log Item 30)

Standard:

- Locates 3WG-230 and shuts valve by rotating the handwheel in the clockwise direction.
- Records 3WG-230 position on Attachment 3.

Examiners Cue: **3WG-230 is shut.**

Comment:

PERFORMANCE INFORMATION

Step 8.37.2.7.e

Procedure Note: Independent verification of 3WG-230 position in the next step can be performed out of sequence.

Performance Step: 16 The release package must be closed out by performing the following steps:

- Perform independent verification that 3WG-230 is shut and log on Attachment 3. (Log Item 31)

Standard: Logs entry on Attachment 3.

Evaluator Cue: **Independent verification was the valve position feedback you received on Step 8.37.2.7.d.**

Comment:

Terminating Cue: **When Independent Verification of 3WG-230 is logged on Attachment 3: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM k

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- "A" Waste Gas Decay Tank is being released.
- Monitors REM-3546 and RM-3546-1 are OPERABLE.

INITIATING CUE:

You relieved the operator who commenced the release. The control room has just directed you to implement OP-120.07, Section 8.37, Actions for a REM Monitor Alarm During a Waste Gas Decay Tank Release, because an ALERT alarm has been received on REM-3546.

Facility:	SHEARON-HARRIS	Date of Examination:	8/6/2007
Examination Level (circle one):	**RO** / SRO	Operating Test Number:	**NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (A1-1)	M	Perform OP-111, ATT. 3, LOW HEAD SAFETY INJECTION LINEUP CHECKLIST (Control Room, only). 2.1.29 Knowledge of how to conduct and verify valve lineups. (3.4)
Conduct of Operations (A1-2)	N	Given a set of conditions, complete OP-107, CHEMICAL AND VOLUME CONTROL SYSTEM, ATTACHMENT 17 – Blender Manual Operation Calculation Sheet. 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (3.9)
Equipment Control (A2)	P, M	Perform OST-1026, REACTOR COOLANT SYSTEM LEAKAGE EVALUATION, as directed by AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE. 2.2.12 Knowledge of surveillance procedures. (3.0)
Radiation Control (A3)	M	Given a set of conditions, a survey map, and an RWP, determine the applicable facility dose limit and calculate the stay time. 2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements. (2.6)
Emergency Plan		**Category not selected for RO candidates**

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

*Type Codes & Criteria:

(C)ontrol room
(D)irect from bank (≤ 3 for ROs; ≤ for SROs & RO retakes)
(N)ew or (M)odified from bank (> 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

SHEARON-HARRIS 2007 NRC ADMINISTRATIVE JPM SUMMARY

A1-1: Perform OP-111, RESIDUAL HEAT REMOVAL, ATTACHMENT 3 - LOW HEAD SAFETY INJECTION LINEUP CHECKLIST (Control Room, only). The applicant will be directed to verify the control board valve lineup for the RHR System in the LOW HEAD SAFETY INJECTION LINEUP. Modify a JPM from a previous AUDIT Examination that is not in the facility bank by changing the improperly aligned equipment. RO only.

A1-2: Given a set of conditions, complete OP-107, CHEMICAL AND VOLUME CONTROL SYSTEM, ATTACHMENT 17 – BLENDER MANUAL OPERATION CALCULATION SHEET. The applicant will apply the attachment formulas to determine the flow controller setpoints for makeup water and boric acid when a blender manual operation is required to raise Refueling Water Storage Tank Level. New JPM. RO-SRO common.

A2: Perform OST-1026, REACTOR COOLANT SYSTEM LEAKAGE EVALUATION, as directed by AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE. The applicant will calculate RCS leak rate using the computer program in manual. This task is a randomly selected repeat from the 2006 NRC examination. The JPM conditions will be modified to change the leak rate and the classification of the leakage. The calculation is RO-SRO common.

A3: Given a set of conditions, a survey map, and an RWP, determine the applicable facility dose limit and calculate the stay time. The applicant will evaluate a survey map to determine dose rate for a specific task and apply the facility limit to determine stay time for the task. While there are no similar JPM's in the facility bank, this is a common approach at other facilities for addressing ES-301 requirements of "Radiation Control" and is therefore designated as an "M". RO-SRO common.

Facility:	Shearon-Harris	Task No.:	005016H101
Task Title:	Perform OP-111, Attachment 3 – Low Head SI Standby Lineup Checklist	JPM No.:	2007 NRC RO ADM JPM A1-1
K/A Reference:	2.1.29 (3.4)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing: **This JPM should be set up and performed on a running or frozen simulator.**

Simulated Performance: _____ Actual Performance: X

Classroom _____ Simulator X Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- A heatup is in progress.
- OP-111 RESIDUAL HEAT REMOVAL SYSTEM, Section 7.2 – Restoring the RHR System to ECCS Mode, has just been completed.

Task Standard: All errors identified.

Required Materials: None

General References: OP-111, RHR SYSTEM, Rev. 36

Handouts: OP-111, Attachment 3, with CHECK column initialed except for the local valves.

Initiating Cue: You have been assigned to perform the independent verification on OP-111, Attachment 3 – Low Head SI Standby Lineup Checklist, for the control room operated valves. An AO is checking the local equipment.

Time Critical Task: No

Validation Time: 8 minutes

SIMULATOR SETUP

IC-16 (Mode 4 with RHR aligned for ECCS).

- OPEN 1CC-147
- Adjust 1RH-20 OUTPUT to ZERO and SETPOINT to 50%
- Leave 1SI-341 SA OPEN but take out of PTL.

(Denote Critical Steps with a √)

Start Time: _____.

Performance Step: 1 Obtain procedure.

Standard: Fills out applicable sections of Sheet 1 of 4 and reviews Attachment.

Evaluator Cue: **Provide OP-111, Attachment 3.**

Evaluator Note: **The Attachment can be performed in any order. The valves/controls listed in the JPM are out of position. All others are correctly positioned.**

The applicant can complete the REMARKS section as misaligned equipment is identified or at the conclusion of all verification steps.

Comment:

√ **Performance Step: 2** Locates and compares actual position to required position IAW Attachment 3.

- 1RH-20, RHR HEAT XCHG "A" BYP FLOW CONTROL - (MANUAL & SHUT)

Standard: Determines 1RH-20 is in MANUAL but the OUTPUT at ZERO and SETPOINT at 50% are reversed. Notes out-of-position condition in REMARKS section.

Evaluator Cue: **As USCO: Throughout the JPM, acknowledge any verbal communications. Instruct them to document each mis-positioned control/valve but to continue performing the Attachment without re-aligning any equipment.**

Comment:

√ **Performance Step: 3** Locates and compares actual position to required position IAW Attachment 3.

- 1CC-147, CCW FROM RHR HEAT EXCHANGER A-SA - SHUT

Standard: Determines 1CC-147 is OPEN. Notes out-of-position condition in REMARKS section.

Comment:

√ **Performance Step: 4** Locates and compares actual position to required position IAW Attachment 3.

- 1SI-341 SA LOW HEAD SI TRAIN A TO COLD LEG (OPEN and PTL)

Standard: Determines 1SI-341 SA is OPEN but not in PTL. Notes out-of-position condition in REMARKS section.

Comment:

Performance Step: 5 Provide Attachment to USCO.

Standard: Completes Att. 3, Sheet 1 of 4 and provides Attachment to USCO.

Evaluator Cue: **Acknowledge any verbal report.**

Comment:

Terminating Cue: **When Attachment 3 has been returned to the USCO: Evaluation on this JPM is complete.**

Stop Time: _____.

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC RO ADM JPM A1-1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A heatup is in progress.
- OP-111 RESIDUAL HEAT REMOVAL SYSTEM, Section 7.2 – Restoring the RHR System to ECCS Mode, has just been completed.

INITIATING CUE:

You have been assigned to perform the independent verification on OP-111, Attachment 3 – Low Head SI Standby Lineup Checklist, for the control room operated valves. An AO is checking the local equipment.

Low Head Safety Injection Standby Lineup Checklist

Person(s) Performing Checklist

Initials	Name (Print)	Initials	Name (Print)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Remarks - Indicate any component not in the prescribed position.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Checklist Started Time _____ Date _____

Checklist Completed Time _____ Date _____

Approved by _____ Date _____
Unit SCO

After receiving the final review signature, this OP Attachment becomes a QA RECORD and should be submitted to Document Services.

Low Head Safety Injection
Standby Lineup Checklist

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
1RH-1	RCS LOOP A TO RHR PUMP A-SA	Shut	_____	_____
1RH-2	RCS LOOP A TO RHR PUMP A-SA	Shut	_____	_____
1RH-39	RCS LOOP C TO RHR PUMP B-SB	Shut	_____	_____
1RH-40	RCS LOOP C TO RHR PUMP B-SB	Shut	_____	_____
1RH-30	RHR HEAT XCHG A OUT FLOW CONT	Open	_____	_____
1RH-66	RHR HEAT XCHG B OUT FLOW CONT (HC-603B1)	Open	_____	_____
1RH-20	RHR HEAT XCHG A BYP FLOW CONT	Manual & Shut	_____	_____
1RH-58	RHR HEAT XCHG B BYP FLOW CONT	Manual & Shut	_____	_____
1RH-26 *	RHR Header A to CVCS Letdown Isol Vlv	Locked Shut	_____	_____
1RH-64 *	RHR Header B to CVCS Letdown Isol Vlv	Locked Shut	_____	_____
1RH-31	RHR PUMP A-SA MINI FLOW	Open	_____	_____
1RH-69	RHR PUMP B-SB MINI FLOW	Open	_____	_____
1CS-28	RHR LETDOWN (HC-142.1)	Shut	_____	_____
1CC-146 **	RHR HX A Outlet Throttle Valve	Locked Throttled	_____	_____
1CC-147	CCW FROM RHR HEAT EXCHANGER A-SA	Shut	_____	_____

* This is a local valve operated in the body of the procedure.

** Throttled position should be as recorded in the last OST-1216. This ensures the required flow for ECCS function.

Low Head Safety Injection
Standby Lineup Checklist

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
1CC-166 **	RHR HX B Outlet Throttle Valve	Locked Throttled	_____	_____
1CC-167	CCW FROM RHR HEAT EXCHANGER B-SB	Shut	_____	_____
1SI-340 SA	LOW HEAD SI TRAIN A TO COLD LEG	Open & Pull to Lock	_____	_____
1SI-340 SA	LOW HEAD SI TRAIN A TO COLD LEG CONT PWR & VLV POS	Off	_____	_____
1SI-341 SB	LOW HEAD SI TRAIN B TO COLD LEG	Open & Pull to Lock	_____	_____
1SI-341 SB	LOW HEAD SI TRAIN B TO COLD LEG CONT PWR & VLV POS	Off	_____	_____
1SI-326 SA	LOW HEAD SI TRAIN A TO HOT LEG CROSSOVER	Open	_____	_____
1SI-327 SB	LOW HEAD SI TRAIN B TO HOT LEG CROSSOVER	Open	_____	_____
1SI-322 SA	RWST TO RHR PUMP A-SA	Open	_____	_____
1SI-323 SB	RWST TO RHR PUMP B-SB	Open	_____	_____

** Throttled position should be as recorded in the last OST-1216. This ensures the required flow for ECCS function.

Low Head Safety Injection
Standby Lineup Checklist

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
	480V MCC-1A21-SA			
1A21-SA-7B	RCS Loop A to RHR Pump 1A-SA (1RH-2) (Both Bkrs)	Locked Off	_____	_____
		Locked Off	_____	_____
1A21-SA-8A	RCS Loop C to RHR Pump 1B-SB (1RH-40) (Both Bkrs)	Locked Off	_____	_____
		Locked Off	_____	_____
	480V MCC-1B21-SB			
1B21-SB-5B	RCS Loop A to RHR Pump 1A-SA (1RH-1) (Both Bkrs)	Locked Off	_____	_____
		Locked Off	_____	_____
1B21-SB-11A	RCS Loop C to RHR Pump 1B-SB (1RH-39) (Both Bkrs)	Locked Off	_____	_____
		Locked Off	_____	_____

Facility:	Shearon-Harris	Task No.:	002001H201
Task Title:	Perform the RCS Water Inventory Balance surveillance	JPM No.:	2007 NRC RO JPM A2
K/A Reference:	G2.2.12 (3.0)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing: **Any setting with the RCS Continuous Leak Rate Program on a computer.**

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The plant is at 100 percent power.
- The operating crew has entered AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE, suspecting an increase in RCS leakage.
- Radiation levels are normal but the frequency of makeup has increased.

Task Standard: RCS leakage calculated within required range

Required Materials:
- PC with RCS Continuous Leak Rate Program
- This JPM should be performed in the Simulator at the STA computer.

General References: OST-1026, RCS LEAKAGE EVALUATION, Rev. 34

Handouts:
- OST-1026 with Prerequisites and Steps 7.0.1 – 7.0.8 signed
- Start Data Sheet (JPM pg. 3) information entered on Attachment 1.
- End Data Sheet (JPM pg. 4) information entered on Attachment 1.

Initiating Cue: The Unit SCO directs you perform a 30 minute leak rate in accordance with OST-1026, RCS LEAKAGE EVALUATION. Assume that Steam Generator Tube Leakage, Miscellaneous Identified Leakage and RCPB leakage is ZERO. All prerequisites are met. The procedure has been completed through Step 7.0.8 and Attachment 1 data has been entered. Begin at Step 7.0.9.

For the purpose of the examination, there will be no independent verification of your data entry.

Time Critical Task: No

Validation Time: 10 minutes

Setup Instructions

Log onto the STA computer using the generic login and bring up the STA icons then minimize the icons.

Connect the printer to the computer START – Programs – Accessories – Local PRT then follow along with the dialog wizard that appears. The current default network printer should be /NT000231/LP000442 make sure the "Enable LPT1 Redirection" has the dot on it then select OK.

At the conclusion of each JPM re-open the OST-1026 program and enter erroneous data or ensure previous data entry is deleted. This will prevent the next student from inadvertently pulling up previous material.

START DATA

TODAY
TIME: ZERO

POINT ID	PARAMETER	CURRENT VALUE	QUALITY CODE	ENGR UNITS
LRC0460	PRZ LVL-2	59.45	GOOD	PCNT
PRC0455	PRESSURIZER PRESS CH1	2233.4	GOOD	PSIG
TRC0408Z	RCS MEDIAN T-AVG (CONTROL)	588.8	GOOD	DEGF
LRC0470	PRT LEVEL	40.0	GOOD	PCNT
LI-1003	RCDT Level	50.4		
LCS0115	VCT LEVEL	52.0	GOOD	PCNT

END DATA

TODAY
TIME: 30 minutes later

POINT ID	DESCRIPTION	CURRENT VALUE	QUALITY CODE	ENGR UNITS
LRC0460	PRZ LVL-2	59.46	GOOD	PCNT
PRC0455	PRESSURIZER PRESS CH1	2233.4	GOOD	PSIG
TRC0408Z	RCS MEDIAN T-AVG (CONTROL)	588.8	GOOD	DEGF
LRC0470	PRT LEVEL	40.0	GOOD	PCNT
LI-1003	RCDT Level	51.1		
LCS0115	VCT LEVEL	46.9	GOOD	PCNT

PERFORMANCE INFORMATION

(Denote Critical Steps with a √)

Start Time _____.

Performance Step: 1 Obtain procedure.

Standard: Reviews procedure.

Evaluator Cue: **Provide handout for RO JPM A2.**

Comment:

OST-1026, 7.0.9

Performance Step: 2 IF RCS TAVG at the end of the test interval differs by more than 0.2°F from TAVG at the start of the test, OR, IF an automatic VCT makeup has occurred during the data collection, THEN perform the following:

Standard: Verifies START and END Tavg within .2 °F and marks N/A.

Evaluator Cue: **No makeup occurred during the data collection.**

Comment:

7.0.10.a and b

Procedure Note: The "Step" numbers cited in the instructions below refer to labels displayed in the "Manual RCS Leakrate" spreadsheet.

√ **Performance Step: 3** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **START** the RCS Real-Time Continuous Leakrate Program.
- **CLICK** on the "Manual RCS Leakrate" tab.

Standard: **STARTs** the RCS Real-Time Continuous Leakrate Program and then clicks on the "Manual RCS Leakrate" tab.

Comment:

7.0.10.c

Procedure Caution: Computer points TRC0408M and TRC0408ZM represent time averaged values of RCS Tavg. Use of these points when RCS temperature is unstable can result in large calculated unidentified leakages due to incorrect temperature compensation. These points should **NOT** be used to calculate RCS leak rate when RCS temperature is **NOT** stable.

√ **Performance Step: 4** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **ENTER** the starting data in the designated table (Step 1).

Standard: Enters data from handout as prompted by the computer program.

Comment:

7.0.10.d

√ **Performance Step: 5** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **ENTER** the ending data in the designated table (Step 1).

Standard: Enters data from handout as prompted by the computer program.

Comment:

7.0.10.e

Procedure Note: The basis for any pre-calculated Steam Generator Tube Leakage must be documented on Attachment 5.

Performance Step: 6 **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

ENTER the Miscellaneous Data in the designated table (Step 3).

- SG Tube Leakage
- Miscellaneous Identified Leakage
- Known Non-RCPB Leakage

Standard: Enters ZERO per Initiating Cue.

Comment:

7.0.10.f and g

Procedure Note: The "Perform Data Validation" verifies all required "Start" and "End" data is entered. It does **NOT** check for correct format **OR** for an expected range of values

√ **Performance Step: 7** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Perform Data Validation box (Step 4).
- **VERIFY** the text "Data Validation – Completed" is displayed.

Standard: **CLICKs** on the "Perform Data Validation" box and verifies "Data Validation – Completed" displays.

Comment:

7.0.10.h and i

Procedure Note: When the "Manual Data Upload" box is clicked, the user will receive a prompt that this action upload all manually calculated data to the "RCS Leakrate Report" and defeat the automatic calculation functions. The automatic functions will be restored through subsequent operations directed on the spreadsheet.

√ **Performance Step: 8** PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Manual Data Upload box (Step 5)
- **WHEN** prompted to complete the manual data upload, **THEN CLICK** "YES".

Standard: **CLICKs** on the "Manual Data Upload" box and "YES" when prompted.

Comment:

7.0.10.j

√ **Performance Step: 9**

PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Print RCS Leakrate Report" box (Step 6) to automatically print the report

Standard:

- **CLICKs** on the "Print RCS Leakrate Report" box and retrieves the report.
- Unidentified Leakage ≥ 2 GPM ≤ 2.5 GPM. **(√)** [Actual is 2.27 GPM]
- Identified leakage ≤ .15 GPM [Actual is .09]

Evaluator Note:

If this JPM is not done in the Simulator or the Control Room then it will be necessary to provide the candidate with a printer number/designation for printing.

Comment:

7.0.10.k and l

Performance Step: 10

PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Restore Automatic Calculations" box (Step 7).
- **VERIFY** the text "Automatic Calculations – Restored" is displayed.

Standard:

CLICKs on the "Restore Automatic Calculations" box and verifies "Automatic Calculations – Restored" displays.

Comment:

7.0.10.m and n

Performance Step: 11 PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **INDEPENDENTLY VERIFY** the input data on the printout is correct.
- **ATTACH** the computer printout to this procedure.

Standard:

- May take this opportunity to check work/data.
- Clips or staples printout to procedure.

Evaluator Cue: **If necessary, no independent verification will be provided.**

Comment:

7.0.11

√ **Performance Step: 12** **VERIFY** calculated leak rates are within the Acceptance Criteria listed in Section 6.0.

Standard:

- References Section 6.0 for limits, as necessary.
- Informs USCO that Acceptance Criteria 6.2 is exceeded.

Comment:

Terminating Cue: **After RO has evaluated the calculation against the acceptance criteria: Evaluation on this JPM is complete.**

End Time: _____.

JPM CUE SHEET

Job Performance Measure No.: 2007 NRC RO JPM A2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

The plant is at 100 percent power.

The operating crew has entered AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE, suspecting an increase in RCS leakage.
Radiation levels are normal but the frequency of makeup has increased.

INITIATING CUE:

The Unit SCO directs you perform a 30 minute leak rate in accordance with OST-1026, RCS LEAKAGE EVALUATION. Assume that Steam Generator Tube Leakage, Miscellaneous Identified Leakage and RCPB leakage is ZERO. All prerequisites are met. The procedure has been completed through Step 7.0.8 and Attachment 1 data has been entered. Begin at Step 7.0.9.

For the purpose of the examination, there will be no independent verification of your data entry.

HARRIS NUCLEAR PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

PROCEDURE TYPE: OPERATIONS SURVEILLANCE TEST

NUMBER: **OST-1026**

TITLE: **REACTOR COOLANT SYSTEM LEAKAGE EVALUATION, COMPUTER CALCULATION, DAILY INTERVAL, MODES 1-2-3-4**

NOTE: This procedure has been screened per PLP-100 Criteria and determined to be CASE III. No additional management involvement is required.

1.0 PURPOSE

The purpose of this OST is to determine the IDENTIFIED and UNIDENTIFIED LEAKAGE portions of the allowed REACTOR COOLANT SYSTEM OPERATIONAL LEAKAGE. This is accomplished by the performance of a Reactor Coolant System water inventory balance as required by Technical Specification 4.4.6.2.1.d. This surveillance is required every 72 hours and should not interfere with plant evolutions (heatup, cooldown, power changes).

This OST is the preferred method for performing the RCS leakrate calculation. In the event RCS Real-Time Continuous Leakrate (including the manual entry spreadsheet) is not available, this surveillance can be performed using OST-1226, Reactor Coolant System Leakage Evaluation, Manual Calculation, Daily Interval, Modes 1-2-3-4.

2.0 REFERENCES

2.1. Plant Operating Manual Procedures

1. OP-100
2. OP-107
3. OP-120.08
4. OP-163
5. OST-1226

2.2. Technical Specifications

1. 3.4.6.2
2. 4.4.6.2.1.d.

2.3. Final Safety Analysis Report

1. Section 5.2.5, Detection of Leakage through Reactor Coolant Pressure Boundary

2.4. Drawings

1. 5-S-1301
2. 5-S-1305
3. 5-S-1313

2.5. Corrective Action Program (CAP) Items

1. 90H0916
2. 94H0559

2.6. Other

1. ASME Steam Tables.
2. OEF Feedback Item 94H0559.
3. CNTR 214906, RCS Real-Time Continuous Leakrate 3.0
4. License Amendment #85.
5. WNEP-9517, Thermal and Hydraulic Design Data Report For Shearon Harris Nuclear Station.
6. SD-100.1
7. SD-100.3
8. SD-107
9. SD-120.8
10. EC 52490
11. WCAP-16423-NP, Pressurized Water Reactor Owners Group Standard Process and Methods for Calculating RCS Leak Rate for Pressurized Water Reactors
12. 10 CFR 50.2, Definitions

3.0 PREREQUISITES

NOTE: Performance of this OST does not require entry into any LCO action statements.

1. The performance of this OST has been **COORDINATED** with other plant evolutions such that the minimum operability requirements of Technical Specifications will continue to be satisfied during the performance of this OST or appropriate action statements have been met. _____
2. Instrumentation needed for the performance of this test is free of deficiency tags that affect instrument indication. _____
3. **OBTAIN** Unit SCO permission to perform this OST.

Signature	Date

4.0 PRECAUTIONS AND LIMITATIONS

1. **IF** an RCDT pump down or a VCT makeup is required during this OST, **THEN** take the "End" data prior to the pump down/makeup.

2. **IF** test data is manually recorded,
THEN an effort should be made to maximize the test accuracy by taking start and end test data accurately and with a minimal time delay between individual data points.

3. Do not allow RCS sampling or other evolutions that would result in a reduction of RCS water inventory during the performance of this OST.

4. With proper notice given to the Unit SCO, this test may be canceled and systems returned to normal at any time.

5. The preferred leakrate duration is 60 minutes, though shorter leakrate durations may be used if the available time is limited. The recommended RCS temperature difference between start and end data are provided below as a function of leakrate test duration.

CHANGE IN RCS T_{AVG} (EF)	MINIMUM TIME (MINUTES)
Less than 0.1	15
0.1 - 0.2	30

6. When manually obtaining data to enter into the leakrate program, minimize the effect of normal steady state oscillations in indicated RCS T_{AVG} by attempting to record the end data with RCS T_{AVG} equal to T_{AVG} at the beginning of the test interval.

7. The RCS Real-Time Continuous Leakrate Program is an Excel spreadsheet that uses real-time data from OSI-PI to perform the RCS Leakrate calculation. This data is updated at a frequency specified by the Recalculation Function found under the Tools menu. Typically a 30 second update rate is sufficient. The filename is HNP_SWQL_C_OPS-RCS_RT_Cont_Leakrate.xls and is located in the P:\Corp\NGG PI Displays\qualified folder. Using the "Start" menu, the program can be accessed from the "Progress Energy PI Displays" shortcut by clicking on "Harris Qualified" and then the "OPS" tab. Upon opening the program, the user must select "Enable Macros" for the program to function. Worksheet names, within the program, are shown at the bottom of the Excel program screen.

8. The RCS Real-Time Continuous Leakrate Program contains a manual entry spreadsheet for use if the automatic portion of the program is not functioning. Use of the manual method overrides the output of the automatic method. Prior to exiting the program, the automatic output must be re-enabled by "clicking" the designated "box" on the manual spreadsheet.

9. Component leakage (valve packing, pump seal, fitting leakage, etc.) from accessible sources may only be treated as Miscellaneous Identified leakage or Known Non-RCPB leakage if the source has been identified **AND** the actual value of the leakage is obtained by a measurement taken at the start or during the data taking interval for the surveillance test. In other words, the leakage must be measured each time the OST is performed if it is to be credited towards Miscellaneous Identified leakage or Known Non-RCPB leakage. Each component leak must have an active Work Order. (Ref. AR 151486)

10. **IF** the component leakage source is located but is inaccessible such that it cannot be measured each time the surveillance is performed,
THEN it must be measured and determined to be constant,
AND Engineering must provide justification to treat the leakage as Miscellaneous Identified leakage or Known Non-RCPB Leakage. (Ref. AR 151486)

11. Negative leakrate values may occur due to the inherent variation in the data that input to the leakrate calculations. Negative leakrate values should be considered statistically valid and entered into the RCS Leakrate control charts to ensure accurate tracking of historical leakrate trends.

12. Leakrate values outside the upper and lower control bands of the RCS Leakrate control charts should be designated as "outliers" if subsequent leakrate values are within the control bands.

5.0 TOOLS AND EQUIPMENT

None Applicable

6.0 ACCEPTANCE CRITERIA

NOTE: There is a large uncertainty associated with the calculated leak rates due to random instrument variability of the input parameters. This uncertainty can be minimized by use of time averaged ERFIS values.

This OST will be completed satisfactorily when the following conditions are verified:

1. The IDENTIFIED LEAKAGE portion of the allowed RCS Operational Leakage is less than or equal to 10 gpm.

2. The UNIDENTIFIED LEAKAGE portion of the allowed RCS Operational Leakage is less than or equal to 1.0 gpm.

3. STEAM GENERATOR TUBE LEAKAGE, if suspected, is less than or equal to 1 gpm total through all steam generators and 150 gallons per day through any one steam generator (obtained from plant daily chemistry report).

7.0 PROCEDURE

1. **INFORM** Chemistry that this OST is to be performed and verify they have suspended RCS chemistry operations that affect RCS inventory until the test is complete.

> **NOTE:** Measurement of leakage for Step 7.0.2 may be performed immediately prior to or during the duration of this test.

2. **IF** there are any components that have known leakage where the source is identified and can be treated as Miscellaneous Identified leakage or Known Non-RCPB Leakage per P&L 4.0.9,
THEN list the component(s), totaled measured leakage, and Work Order number(s) on Attachment 3.

N/A

Verified

3. **VERIFY** the Radwaste Control Room Operator is prepared to provide support and has suspended any operations that affect RCDT inventory.

> **NOTE:** WO's written against 1ED-121 or 1ED-125 need to be evaluated for operability of the components.

4. **DIRECT** the Radwaste Control Room Operator to:

   a. **CHECK SHUT** 1ED-138, RCDT PUMPS A/B to PRESSURIZER RELIEF TANK.

   b. **IF** there is a WO against 1ED-121, RCDT LCV/IRC ISOLATION or 1ED-125, RCDT PMP DISCH for suspected leakby,
   THEN STOP the running RCDT Pump. (Circle pump secured A/B)

   N/A

   c. **POSITION** controller LK-1-1003 to manual and **SHUT** 1ED-121, RCDT LCV/IRC ISOLATION.

5. At AEP-1, **SHUT** 1ED-125, RCDT PUMP DISCH.

6. **CHECK SHUT** 1RC-135, PRT DRAIN.

7. **PLACE** the control switch for LCV-115A LETDOWN TO VCT/HOLD UP TANK in the **VCT** position.

NOTE: The ERFIS points listed in Attachment 1 are time averaged RCS parameters. If the reactor is critical and RCS pressure is greater than 1700 psig, use of these values is preferred. Data may be obtained from an ERFIS Group Display, or OSI-PI.

NOTE: The RCS Real-Time Continuous Leakrate Program uses time averaged RCS parameters and performs the necessary calculations. This is the preferred method for obtaining Leak rate data in the following step.

8. **OBTAIN** Leak Rate data by performing **ONE** of the following substeps. (Mark the substeps not performed N/A)

   a. **COLLECT** data on Attachment 1 using ERFIS Group Display, or OSI-PI Group Trend.

      (1) **RECORD** "START" data on Attachment 1. ___

      (2) **RECORD** "END" data on Attachment 1. ___

      (3) **MARK** all of Attachment 2 N/A ___

NOTE: Any instrument listed on Attachment 2 may be used for data collection. If any of the instruments listed on Attachment 2 are out of service, an equivalent instrument may be used, provided a note is made on Attachment 5.

   b. **COLLECT** data on Attachment 2 using ERFIS Group Display, OSI-PI, or alternate instruments listed.

      (1) **RECORD** "START" data on Attachment 2. N/A

      (2) **RECORD** "END" data on Attachment 2. ___

      (3) **MARK** all of Attachment 1 N/A. ___

c. **PERFORM** the following to collect data from ERFIS GD or OSI-PI OST-1026.

(1) **COLLECT** and **PRINT** "START" data. N/A

(2) **RECORD** RCDT level at the beginning of the test interval on the "START" printout.

(3) **COLLECT** and **PRINT** "END" data.

(4) **RECORD** RCDT level at the end of the test interval on the "END" printout.

(5) **ATTACH** printouts to this procedure.

(6) **MARK** all of Attachment 1 and 2 N/A.

CAUTION

Computer points TRC0408M and TRC0408ZM represent time averaged values of RCS Tavg. Use of these points when RCS temperature is unstable can result in large calculated unidentified leakages due to incorrect temperature compensation. These points should **NOT** be used to calculate RCS leak rate when RCS temperature is **NOT** stable.

d. **PERFORM** the following to collect data from the RCS Real-Time Continuous Leakrate Program:

(1) **START** the RCS Real-Time Continuous Leakrate Program. N/A

(2) **WAIT** until the "Benchmark Test progress" indicates SAT in Cell L20.

(3) **VERIFY** Excel is recalculating values by **SELECTING** the "Tools" menu item. A recommended setting is 15 seconds and **UPDATE** the entire workbook.

(4) **SELECT** the "RCS Leakrate Results" worksheet tab at the bottom of the screen.

(5) **UPDATE** the RCS Leakrate user data:

> **NOTE:** The preferred leakrate duration (program default) is 60 minutes.

- "Leakrate Time Duration"
- Any known "Misc Leakage Identified"
- Any known "Non-RCPB Leakage"
- Any known "Steam Generator Tube Leakage"

(6) **CLICK** on the "Start RCS Leakrate" button.

(7) **VERIFY** a dialogue box is generated which asks if automatic printout of the leakrate results is desired.

N/A

> **NOTE:** Choosing the "automatic" printout mode will automatically upload all leakrate data and print the "RCS Leakrate Report" when the duration of the test is complete (100 data sets with Data Quality Checks at 100%). Choosing the "manual" method allows the operator to choose the "end" time for the test at any time after duration time has been satisfied. The "automatic" mode is preferred to enhance statistical reliability of the historical leakrate data.

(8) **CHOOSE** whether an "automatic" **OR** "manual" leak rate printout is desired by performing one of the following: (N/A the step NOT used.)

(a) **IF** an automatic generation and printout of the leakrate results at the conclusion of the calculations is desired,
THEN CLICK "YES".

OR

(b) **IF** a manual generation and printout of the leakrate results is desired,
THEN CLICK, "NO".

N/A

NOTE: A minimum of 50 data sets are required to be collected to perform a satisfactory leakrate.

NOTE: Data collection will be prevented until a time delay equal to the user setting for Leakrate Time Duration. Following this time delay, data collection will commence automatically and be displayed on the RCS Leakrate Results.

(9) **VERIFY** the "Number of Data Sets" in Cell I28 is greater than or equal to 50 before continuing. N/A

(10) **VERIFY** the "Tave Change" that is listed on the printout is acceptable for the "Leakrate Time Duration".
REFERENCE P&Ls #5 and 6.

NOTE: If the Data Quality Check is less than 100.00, the program may be allowed to run until the Data Quality Check is 100.00. If a Data Quality Check of 100.00 cannot be obtained, then the OST should be closed out as UNSAT and another method used to perform the OST.

(11) **VERIFY** the "Data Quality Check" in Cell I26 indicates 100.00.

(12) **IF** the "manual" print method was chosen,
THEN CLICK the "Print RCS Leakrate Report" button to generate the printout. (Otherwise **N/A** this step.)

(13) **ATTACH** RCS Leakrate results printout to this procedure.

(14) **MARK** all of Attachment 1 and 2 N/A.

(15) **MARK** Step 7.0.10 N/A.

9. **IF** RCS T_{AVG} at the end of the test interval differs by more than 0.2°F from T_{AVG} at the start of the test,
OR,
IF an automatic VCT makeup has occurred during the data collection,
THEN perform the following:

   a. **MARK** this test void in the comments section. _____

   b. **COMPLETE** steps 14 through 15.b below, and step 21 below to close out this test. _____

   c. **MARK** all remaining steps N/A. _____

NOTE: The "Step" numbers cited in the instructions below refer to labels displayed in the "Manual RCS Leakrate" spreadsheet.

10. **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet..

   a. **START** the RCS Real-Time Continuous Leakrate Program. _____

   b. **CLICK** on the "Manual RCS Leakrate" tab. _____

CAUTION

Computer points TRC0408M and TRC0408ZM represent time averaged values of RCS Tavg. Use of these points when RCS temperature is unstable can result in large calculated unidentified leakages due to incorrect temperature compensation. These points should **NOT** be used to calculate RCS leak rate when RCS temperature is **NOT** stable.

   c. **ENTER** the starting data in the designated table (Step 1). _____

   d. **ENTER** the ending data in the designated table (Step 2). _____

NOTE : The basis for any pre-calculated Steam Generator Tube Leakage must be documented on Attachment 5.

e. **ENTER** the Miscellaneous Data in the designated table (Step 3).

- SG Tube Leakage _____
- Miscellaneous Identified Leakage _____
- Known Non-RCPB Leakage _____

NOTE: The "Perform Data Validation" verifies all required "Start" and "End" data is entered. It does **NOT** check for correct format **OR** for an expected range of values

f. **CLICK** on the "Perform Data Validation box (Step 4). _____

g. **VERIFY** the text "Data Validation – Completed" is displayed. _____

NOTE: When the "Manual Data Upload" box is clicked, the user will receive a prompt that this action upload all manually calculated data to the "RCS Leakrate Report" and defeat the automatic calculation functions. The automatic functions will be restored through subsequent operations directed on the spreadsheet.

h. **CLICK** on the "Manual Data Upload box (Step 5) _____

i. **WHEN** prompted to complete the manual data upload, **THEN CLICK** "YES". _____

j. **CLICK** on the "Print RCS Leakrate Report" box (Step 6) to automatically print the report _____

k. **CLICK** on the "Restore Automatic Calculations" box (Step 7). _____

l. **VERIFY** the text "Automatic Calculations – Restored" is displayed. _____

m. **INDEPENDENTLY VERIFY** the input data on the printout is correct. _____

n. **ATTACH** the computer printout to this procedure. _____

11. **VERIFY** calculated leak rates are within the Acceptance Criteria listed in Section 6.0. _____

NOTE: OP-163 provides guidance on sump pump backleakage.

CAUTION

The ERFIS "Baseline" function should not be updated on an unsatisfactory completion of this OST OR when sump pump check valve leakage is suspected.

12. Upon satisfactory completion of this OST, **PERFORM** one of the following (Entire Step is N/A for UNSAT completions of this OST or when sump pump back leakage is suspected) (Substep not used is N/A).

    a. **PROMPTLY UPDATE** the CNMT sump leakrate setpoint in the ERFIS computer by entering the turn-on-code "BASELINE". _____

    OR

    b. **UPDATE** the SUMP LEAK RATE LIMIT on the MANUAL CNMT SUMP INLEAKAGE LOG. _____

13. **RECORD** both ERFIS sump leakrates (URE9001 and URE9002) in the CO's log. These values are used for manual CNMT sump logging in AOP-005 Attachments 10 and 11, and in AOP-016 Attachments 18 and 19. (Step is N/A if ERFIS is inoperable) _____

14. **ALIGN** the control switch for LCV-115A, LETDOWN TO VCT/HOLD UP TANK as desired. (Circle one)

    (VCT, AUTO, RHT). _____

    _____ Verified

15. **PERFORM** the following to realign RCDT valves:

    a. **OPEN** 1ED-125 RCDT PUMP DISCH. _____

    _____ Verified

    b. **IF** an RCDT pump was secured in Step 7.0.4.b, **THEN DIRECT** the Radwaste Control Room Operator to **START** the RCDT pump that was secured. (Initial when action has been confirmed completed by the Radwaste CR Operator) _____

    c. **DIRECT** the Radwaste Control Room Operator to place LK-1-1003 to automatic. If RCDT Level is high, flow should be established slowly. (Initial when action has been confirmed completed by the Radwaste CR Operator) _____

16. **INFORM** chemistry that normal RCS chemistry operations may resume. _____

17. **UPDATE** the Status Board. _____

NOTE: Leakrate values obtained using the "Manual RCS Leakrate" spreadsheet should be designated as "outliers" when updating the RCS leakage control charts.

18. **UPDATE** the Control Chart on the STA's computer. _____

NOTE: It is the expectation of Operations Management that, upon calculation of UNIDENTIFIED LEAKAGE greater than anticipated values based on previously recorded leakrates, action will be initiated to investigate the cause of the elevated leakage and corrective actions taken as appropriate. This expectation acknowledges that additional personnel exposure may be necessary due to walkdowns in elevated dose areas. The Unit SCO may use discretion as to the extent of this investigation when RCS parameters are known to be unstable and elevated leakrates are calculated and expected.

19. **REVIEW** the Control Chart historical data for the established mean value (CEN) and the standard deviation for unidentified leakage. _____

20. **IF** any of the following trigger points are reached,
THEN perform the indicated actions:
(Mark any trigger points **NOT** reached as N/A)

    a. **TRIGGER POINT ONE** – Nine consecutive measurements above the mean value (CEN):

        (1) **TAKE ACTIONS** to find the leak:

        - System Walkdowns _____
        - Inspections _____
        - System realignments _____

        (2) **DOCUMENT** actions taken in Autolog _____

        (3) **PERFORM** additional surveillances to confirm leakage rate _____

b. **TRIGGER POINT TWO** – Two of three consecutive measurements exceed two standard deviations above the mean:

(1) **TAKE ACTIONS** in previous trigger point if not already done. _____

(2) **CHECK** additional parameters such as:

- Containment temperature, humidity _____
- Sump inleakage _____
- Radiation monitor trends _____
- Air samples _____

c. **TRIGGER POINT THREE** – One measurement exceeds 3 standard deviations (UCL) above the mean (CEN):

(1) **TAKE ACTIONS** in previous trigger points if not already done _____

(2) **IMPLEMENT** a formal troubleshooting plan if not already done _____

(3) **INITIATE** an NCR if not already done _____

(4) **PERFORM** a Containment entry and conduct visual inspections of accessible equipment for evidence of unidentified or pressure boundary leakage. _____

21. **COMPLETE** Attachment 5, Certifications and Reviews. _____

22. **PERFORM** OPT-9002T, Temporary Test for Pressurizer Dissimilar Weld Enhanced Leakage Monitoring, Daily Interval Modes 1, 2, and 3. (Only required until RFO-14, otherwise N/A) _____

23. **INFORM** the Unit SCO when this test is completed or found to be unsatisfactory. _____

8.0 DIAGRAMS AND ATTACHMENTS

Attachment 1 – Time Averaged Leak rate Data Collection Form

Attachment 2 – Leak rate Data Collection Form

Attachment 3 - Components with Known Measured Leakage

Attachment 4 – RCS Leakrate Standard Definitions

Attachment 5 - Certifications and Reviews

Attachment 1 - Time Averaged Leak Rate Input Data Table

Sheet 1 of 1

CAUTION

This attachment should **NOT** be used when RCS temperature is **NOT** stable. Computer point TRC0408M represents a time averaged value of RCS Tavg. Use of this point when RCS temperature is unstable can result in large calculated unidentified leakages due to incorrect temperature compensation.

NOTE: This attachment should only be used when the reactor is critical and RCS pressure is greater than 1700 psig.

PARAMETER	START	END	DURATION
TIME			min
PRZ Level (LRC0460M)	%	%	
PRZ Pressure (PRC0455M)	psig	psig	
RCS T_{avg} (TRC0408M)	°F	°F	
PRT Level (LRC0470M)	%	%	
RCDT Level (LI-1003, LA020)	%	%	
VCT LEVEL (LCS0115M)	%	%	

Attachment 2 - Leak Rate Data Collection Form

Sheet 1 of 1

CAUTION

Computer point TRC408ZM for time averaged RCS Tavg should **NOT** be used when RCS temperature is **NOT** stable. Use of this point when RCS temperature is unstable can result in large calculated unidentified leakages due to incorrect temperature compensation.

NOTE: If any instruments listed below are out of service, the use of an equivalent instrument is allowed, provided a note is made on Attachment 5.

NOTE: If the reactor is critical, only use Tavg for RCS Temperature.

NOTE: If the reactor is shutdown, Tc or Th may be used for RCS Temperature.

NOTE: If RCS Pressure is greater than 1700 psig use PRZ Pressure Indication.

(Circle indicator used)

PARAMETER	START	END	DURATION
TIME			min
PRZ Level (LI-460, LRC0460)	%	%	
PRZ Pressure (PI-455, PRC0455) **OR** WR RCS Pressure (PI-440, PRC0440)	psig	psig	
RCS T_{avg} (TR-408, TRC0408Z, TRC408ZM), **OR** WR T_{cold} (TRC0410), or WR T_{hot} (TRC0423)	°F	°F	
PRT Level (LI-470.1, LRC0470)	%	%	
RCDT Level (LI-1003, LA020)	%	%	
VCT LEVEL (LI-115.1, LCS0115)	%	%	

Attachment 3 - Components with Known Measured Leakage

Sheet 1 of 1

NOTE: Any Component leakage that will be treated as Miscellaneous Identified leakage or Known Non-RCPB Leakage must be measured at the start or during the interval of this surveillance test and must be measured each time the OST is run. Each component leak must have an active Work Order.
(Ref. AR 151486)

NOTE: To convert milliliters per minute to gallons per minute, multiply milliliters per minute by 2.64×10^{-4} (0.000264).

Component	Measured Leakage (gpm)	Active Work Order Number
Total measured Leakage	**gpm**	

NOTE: The definitions in the attachment are based on the standards adopted in WCAP-16423-NP, plant Technical Specifications and 10 CFR 50.2.

Term	Definition
LEAKAGE Type: Gross	Gross LEAKAGE is the sum of all leakage from the RCS control volume during the leak rate test time interval, ΔTime.
LEAKAGE Type: IDENTIFIED	1. LEAKAGE inside containment (except reactor coolant pump (RCP) seal water injection or leakoff) into closed systems, such as pump seals or valve packing leaks that are captured and conducted to collection systems; sump or collecting tank, 2. LEAKAGE into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of Technical Specification Leakage Detection Systems or not to be pressure boundary LEAKAGE, or 3 LEAKAGE through a steam generator (SG) to the Secondary.
LEAKAGE Type: PRESSURE BOUNDARY	LEAKAGE (except SG LEAKAGE) through a non-isolable fault in an RCS component body, pipe wall, or vessel wall.
LEAKAGE Type: Steam Generator	LEAKAGE from the RCS into the secondary side of the steam generators. Steam generator LEAKAGE includes LEAKAGE through all steam generators.
LEAKAGE Type: UNIDENTIFIED	All LEAKAGE inside containment (except RCP seal water injection or leakoff) that is not identified LEAKAGE.
LEAKAGE Type: Other Known RCPB Leakage	Other Known RCPB LEAKAGE is the sum of leakage that is both known and documented, and not accounted for in RCDT LEAKAGE, PRT LEAKAGE, or Steam Generator LEAKAGE. Other Known LEAKAGE may include: • documented fitting or gasket leaks from the RCPB that are collected and measured

Term	Definition
LEAKAGE Type: Non-RCPB (Non-Reactor Coolant Pressure Boundary Leakage)	Non-RCPB LEAKAGE is the sum of leakage that impacts the reactor coolant system gross leakage calculation but occurs outside the RCPB and therefore should not be included in IDENTIFIED LEAKAGE or UNIDENTIFIED LEAKAGE. In order to account for Non-RCPB LEAKAGE it must be known to exist at the time of the leak rate calculation and documented. An example of Non-RCPB LEAKAGE may include: • charging pump packing leakage (known and documented) • charging pump relief valve leakage (known and documented)
Reactor Coolant Pressure Boundary (RCPB)	The Reactor Coolant Pressure Boundary (RCPB) consists of all those pressure-containing components which are part of the reactor coolant system or which are connected to the reactor coolant system, up to and including: (i) the outermost containment isolation valve in system piping which penetrates primary reactor containment. (ii) the second of two valves normally closed during normal reactor operation in system piping which does not penetrate primary reactor containment, (iii) the reactor coolant system safety and relief valves.
Reactor Coolant System (RCS) Control Volume	The RCS Control Volume includes: • Reactor Coolant Water Volume, • Pressurizer, and • Volume Control Tank. Gross leakage is calculated by measuring the change in level, temperature, and pressure conditions in each segment of the RCS Control Volume.

Attachment 4 – RCS Leakrate Standard Definitions

Sheet 3 of 3

Term	Definition
Reactor Coolant Water Volume (RCWV)	The Reactor Coolant Water Volume (RCWV) is that portion of the Reactor Coolant System where the effective bulk temperature is represented by Tave. This includes the reactor coolant liquid mass contained within: • hot leg piping, • cold leg piping, • reactor vessel, and • steam generators.
Historical Baseline	The leak rate historical baseline is the mean and standard deviation value based on one operating quarter (such as JUL-SEP). The historical baseline should be recalculated at the end of each quarter for use in the next quarter. Outage: Use the historical baseline calculated for the quarter prior to the outage for the first quarter after outage.

Attachment 5 - Certifications and Reviews

Sheet 1 of 1

This OST was performed as a:

Periodic Surveillance Requirement: _____
Postmaintenance Operability Test: _____
Redundant Subsystem Test: _____

Plant Conditions: _____ MODE: _____
OST Completed By: _____ Date: _____
Time: _____

OST Performed By:

Initials	Name (Print)	Initials	Name (Print)

General Comments/Recommendations/Corrective Actions/Exceptions:

_____
_____
_____
_____
_____
_____
_____

Pages used: _____

OST Completed with NO EXCEPTIONS/EXCEPTIONS

Reviewed By: _____ _____
Unit SCO Date

After receiving the final review signature, this OST becomes a QA RECORD and should be submitted to Document Services.

Revision Summary
(PRR 230461)

General

Editorial Correction to Step 7.0.2 to clarify that a total of measured leakage should be entered and verified. Also, modified NOTE on Attachment 3 to clarify the conversion from milliliters per minute to gallons per minute and removed the referenced website that could have been used to aid in the conversion.

Page	Section/ Step	Description of Changes
All		Update revision level.
7	7.0.2	Modified Step to account for multiple leakage points.
21	Att. 3	In the NOTE, Simplified conversion from ml/min to gpm/min. Removed referenced web site that could be used to aid in conversion.

Facility: Shearon-Harris | Task No.:

Task Title: Complete OP-107, Attachment 17 – Blender Manual Calculation Sheet | JPM No.: 2007 NRC JPM RO-SRO A1-2

K/A Reference: G2.1.23 (3.9)

Examinee: | NRC Examiner:

Facility Evaluator: | Date:

Method of testing:

Simulated Performance: _____ | Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A refueling outage has concluded.
- One of the activities planned for this shift is to raise RWST level from 93% to 95%.
- RWST Boron concentration is 2500 PPM.
- Boric Acid Tank concentration is 7300 PPM.

Task Standard: All critical tasks evaluated as SAT.

Required Materials:

- Straight edge
- Calculator

General References:

- OP-107, CHEMICAL AND VOLUME CONTROL SYSTEM, Revision 70
- RWST Level Curve

Handout:

- OP-107, Section 8.7, Blender Manual Operation, with the Initial Conditions signed off.
- RWST Level Curve
- OP-107, Attachment 17 – Blender Manual Calculation Sheet
- OP-107, Attachment 19 – Makeup Concentration Limits

Initiating Cue: You have been directed to perform OP-107, Chemical and Volume Control System, Section 8.7 - Blender Manual Operation, to set up the blender for filling the RWST. The procedure Initial Conditions are met and signed off. Computer program OP-107 is NOT available. There will be no independent verification of your work.

Time Critical Task: No

Validation Time:

SIMULATOR SETUP

N/A

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Obtain procedure.

Standard: Reviews Section 8.7/verifies Initial Conditions signed.

Evaluator Cue: **Provide handout, calculator and straight edge.**

Comment:

OP-107, 8.7.2.1.1

Performance Step: 2 If filling the VCT, then proceed to Section 8.7.2.4.

Standard: Marks N/A (filling the RWST)

Comment:

OP-107, 8.7.2.1.2

Performance Step: 3 Verify the boron concentration in the tank to be filled has been determined.

Standard: Yes – 2500 PPM provided in Initial Conditions.

Comment:

PERFORMANCE INFORMATION

OP-107, 8.7.2.1.3

Procedure Caution: Observe the VCT level to verify the level remains above the automatic makeup setpoint when filling the RWST or RHT. Computer program OP-107 calculates the time the manual operation will take based on the information input to it. Some manual operations could continue for long periods of time in which the VCT level could decrease to the automatic switchover to RWST for CSIP suction.

Performance Step: 4 If computer program OP-107 is to be used - - - - .

Standard: Marks N/A per Initial Conditions.

Comment:

OP-107, 8.7.2.1.4

Performance Step: 5 If the computer program is not being used to perform the fill calculations then complete the Blender Manual Calculations Sheet, Attachment 17.

Standard: Reviews Attachment 17 from the handout.

Comment:

PERFORMANCE INFORMATION

OP-107, Attachment 17, Step 1

Performance Step: 6 Obtain the following data:

- Initial Tank Boron Concentration
- Initial Tank Volume
- Boric Acid Tank Boron Concentration
- Final Tank Volume
- Final Tank Boron Concentration

Standard:

- Initial Tank Boron Concentration (C1): 2500 PPM
- Initial Tank Volume (V1): >438,000 ≤440,000 (from RWST Curve)
- Boric Acid Tank Boron Concentration (Cbat): 7300 PPM
- Final Tank Volume (V3): >448,00 ≤450,000 (from RWST Curve)
- Final Tank Boron Concentration (C3): 2500 PPM

Comment:

OP-107, Attachment 17, Step 2

√ **Performance Step: 7** Calculate volume of the blended fluid to be added.

V2 = V3 – V1

Standard: ≥ 8000 but ≤ 12000

Evaluator Note: **It is difficult to be precise reading the RWST Curve. It has small divisions representing a large volume and has been copied repeatedly. Applicants should calculate approximately 10000 gallons. The computer program calculates a volume change of 8240 gallons.**

Comment:

PERFORMANCE INFORMATION

OP-107, Attachment 17, Step 3

Performance Step: 8 Calculate the required blended flow concentration by inserting the values from above:

- C3V3 – C1V1 ÷ V2 = C2

Standard: The calculation will come out to 2500 PPM since the concentration is not being changed.

Comment:

OP-107, Attachment 17, Step 4

Procedure Note: Blended flows at high boron concentrations require lower total makeup flow as indicated in Attachment 19.

Performance Step: 9 Using the required blended flow concentration (C2) and the Boric Acid Tank boron concentration (Cbat), select an appropriate total makeup flow rate (Q) from Attachment 19.

Standard: Selects 80 GPM per Attachment 19.

Comment:

OP-107, Attachment 17, Step 5

√ **Performance Step: 10** Calculate the required Boric Acid Flow Rate.

- (Q)(C2) ÷ Cbat
- If the calculated boric acid flow rate is greater than 30 GPM then recalculate using a lower total makeup flow rate (Q).

Standard: (80)(2500) ÷ 7300 = ≥ 27 < 27.5 GPM (Actual is 27.4 GPM)

Comment:

PERFORMANCE INFORMATION

OP-107, Attachment 17, Step 6

√ **Performance Step: 11** Calculate the total volume of boric acid: (X is equal to boric acid flow rate)

- (X)(V2) ÷ Q

Standard: (≥ 27 < 27.5)(> 8000 < 12000) ÷ 80 = > 2700 GALS < 4125 GALS

Evaluator Note: **The wide acceptable range carries forward from the difficulty in precisely reading the RWST Curve. The computer program indicates 2822 GALS of boric acid will be used.**

Comment:

OP-107, Attachment 17, Step 7

Procedure Note: The Boric Acid Flow Controller has a 10 turn potentiometer and controls linearly from 0 to 50 GPM.

√ **Performance Step: 12** Calculate the required controller setpoint per the following equation:

- (X) ÷ 5 GPM/TURN

Standard: (≥ 27 < 27.5) ÷ 5 = ≥ 5.4 ≤ 5.5 TURNS

Comment:

OP-107, Attachment 17, Step 8

Procedure Note: The RWMU Flow Controller has a 10 turn potentiometer and controls linearly from 0 to 160 GPM.

√ **Performance Step: 13** Calculate the required controller setpoint per the following equation:

- Q ÷ 16 GPM/TURN

Standard: 80 ÷ 16 GPM/TURN = 5 TURNS

Comment:

PERFORMANCE INFORMATION

OP-107, Attachment 17

Performance Step: 14 Completes Page 1 of Attachment 17

Standard:

- Initials, Name, Time/Date Started, Time/Date Completed
- Submits to Unit SCO.

Comment:

Terminating Cue: **After Attachment 17 has been submitted, collect the remainder of the handout: Evaluation on this JPM is complete.**

STOP TIME: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A refueling outage has concluded.
- One of the activities planned for this shift is to raise RWST level from 93% to 95%.
- RWST Boron concentration is 2500 PPM.
- Boric Acid Tank concentration is 7300 PPM.

INITIATING CUE:

You have been directed to perform OP-107, Chemical and Volume Control System, Section 8.7 - Blender Manual Operation, to set up the blender for filling the RWST. The procedure Initial Conditions are met and signed off. Computer program OP-107 is NOT available. There will be no independent verification of your work.

Attachment 17 - Blender Manual Operation Calculation Sheet

Sheet 1 of 3

Person(s) Performing Checklist

Initials	Name (Print)	Initials	Name (Print)

Remarks – Indicate any component not in the prescribed position.

Checklist Started Time _____ Date _____

Checklist Completed Time _____ Date _____

Approved by _____ Date _____

Unit SCO

After receiving the final review signature, this OP Attachment becomes a QA RECORD.

1. **OBTAIN** the following data:

Initial Tank Boron Concentration	C_1 = _____ PPM
Initial Tank Volume	V_1 = _____ GAL
Boric Acid Tank Boron Concentration	C_{BAT} = _____ PPM
Final Tank Volume	V_3 = _____ GAL
Final Tank Boron Concentration	C_3 = _____ PPM

2. **CALCULATE** volume of the blended fluid to be added:

$V_2 = V_3 - V_1$ = _____ GAL _____

_____
Verify

3. **CALCULATE** the required blended flow concentration by inserting the appropriate values from above:

$$C_2 = \frac{(C_3\ V_3) - (C_1\ V_1)}{V_2} = \_\_\_\_\_ \text{ PPM}$$

_____

_____
Verify

NOTE:	Blended flows at high boron concentrations require lower total makeup flow as indicated in Attachment 19

4. Using the required blended flow concentration (C_2) and the Boric Acid Tank boron concentration (C_{BAT}), **SELECT** an appropriate total makeup flow rate (Q) from Attachment 19.

Q = _____ GPM _____

_____
Verify

5. **CALCULATE** the required boric acid flowrate:

$$X = \text{Boric Acid Flowrate} = \frac{Q\,(C_2)}{(C_{BAT})} = \_\_\_\_\_ \text{ GPM}$$

_____

_____
Verify

a. **IF** the calculated Boric Acid flow rate (X) is greater than 30 gpm, **THEN RECALCULATE** using a lower total makeup flow rate (Q). _____

6. **CALCULATE** total volume of boric acid: (X is equal to boric acid flowrate)

$$\text{Volume of Boric Acid} = \frac{(X)(V_2)}{Q} = \_\_\_\_\_ \text{ GAL}$$ _____

_____
Verify

NOTE:	The Boric Acid Flow Controller has a 10 turn potentiometer and controls linearly from 0 to 50 gpm.

7. **CALCULATE** the required controller setpoint per the following equation:

(X)
_____ gpm ÷ 5 gpm/turn = _____ turns

_____

_____
Verify

NOTE:	The RWMU Flow controller has a 10 turn potentiometer and controls linearly from 0 to 160 gpm.

8. **CALCULATE** the required controller setpoint per the following equation:

(Q)
_____ gpm ÷ 16 gpm/turn = _____ turns _____

_____
Verify

Facility: Shearon-Harris Task No.:

Task Title: Given a set of conditions, determine and apply the facility dose limits. JPM No.: 2007 NRC ADM JPM RO-SRO A3

K/A Reference: 2.3.1 (2.6/3.0)

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- A fire has occurred in 1-A-SWGRA
- The reactor is tripped.
- The operating crew is performing AOP-036.08, FIRE AREAS: 1-A-SWGRA, 1-A-SWGRB
- Charging flow cannot be controlled from the control room.

Task Standard: All critical tasks evaluated as SAT.

Required Materials: Calculator

General References:

- AOP-036.08, FIRE AREAS: 1-A-SWGRA, 1-A-SWGRB, Revision 3

Handout:

- Routine Operations Activities RWP (00001771)
- Survey Map (A47) for area including FCV-122, 1CS-228, 1CS-227

Initiating Cue:	You have been assigned to locally control charging in accordance with AOP-036.08, Step 7. This is not considered to be an emergency evolution. Your accumulated TEDE dose for this year is 1800 mr. You will be performing the task under the "Routine Operations Activities" RWP. Determine the maximum permissible stay time before the first facility limit requires you to exit the area. Assume that no dose is received in transit.
Time Critical Task:	No
Validation Time:	10 minutes

SIMULATOR SETUP

N/A

PERFORMANCE INFORMATION

(Denote Critical Steps with a check mark)

START TIME: _____

Performance Step: 1 Determine the general valve location on the survey map.

Standard: Locates general area on the Survey Map.

Evaluator Cue:

- **Provide the handout.**
- **Assume that all handout materials are the most recent, approved documents.**

Comment:

Performance Step: 2 Determine the radiation level in the area of the valve.

Standard: Using Survey Map A47, determines general radiation level in the area of the Charging Line to be 23 mr/hr.

Evaluator Cue: **If necessary, use the highest value in the area of the Normal Charging Line.**

Comment:

√ **Performance Step: 3** Review the RWP to determine the limit.

Standard: Determines exit required when Alarming Dosimeter actuates:

32 mr accumulated dose or 200 mr/hr dose rate.

Comment:

PERFORMANCE INFORMATION

√ **Performance Step: 4** Calculate maximum stay time.

Standard: (32 mr)(1 hr/23 mr)(60 mins/1hr) = ≥ 1 hour 18 minutes ≤ 1 hour 24 minutes.

Comment:

Terminating Cue: **After stay time is reported: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC ADM JPM RO-SRO A3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

JPM CUE SHEET

INITIAL CONDITIONS:

- A fire has occurred in 1-A-SWGRA
- The reactor is tripped.
- The operating crew is performing AOP-036.08, FIRE AREAS: 1-A-SWGRA, 1-A-SWGRB
- Charging flow cannot be controlled from the control room.

INITIATING CUE:

You have been assigned to locally control charging in accordance with AOP-036.08, Step 7. This is not considered to be an emergency evolution. Your accumulated TEDE dose for this year is 1800 mr. You will be performing the task under the "Routine Operations Activities" RWP. Determine the maximum permissible stay time before the first facility limit requires you to exit the area. Assume that no dose is received in transit.

Map #:

RADIOLOGICAL SURVEY RECORD

Unit: 1	Bldg/Elev: RAB 236	Area: Mechanical Penetration Mezz	Date: 6/3/07	Time: 1553	RWP#: 1769	Survey#: 0603-009

Component: N/A

Work Description: Monthly survey. Lower elevation, mech pen, is posted as RA.

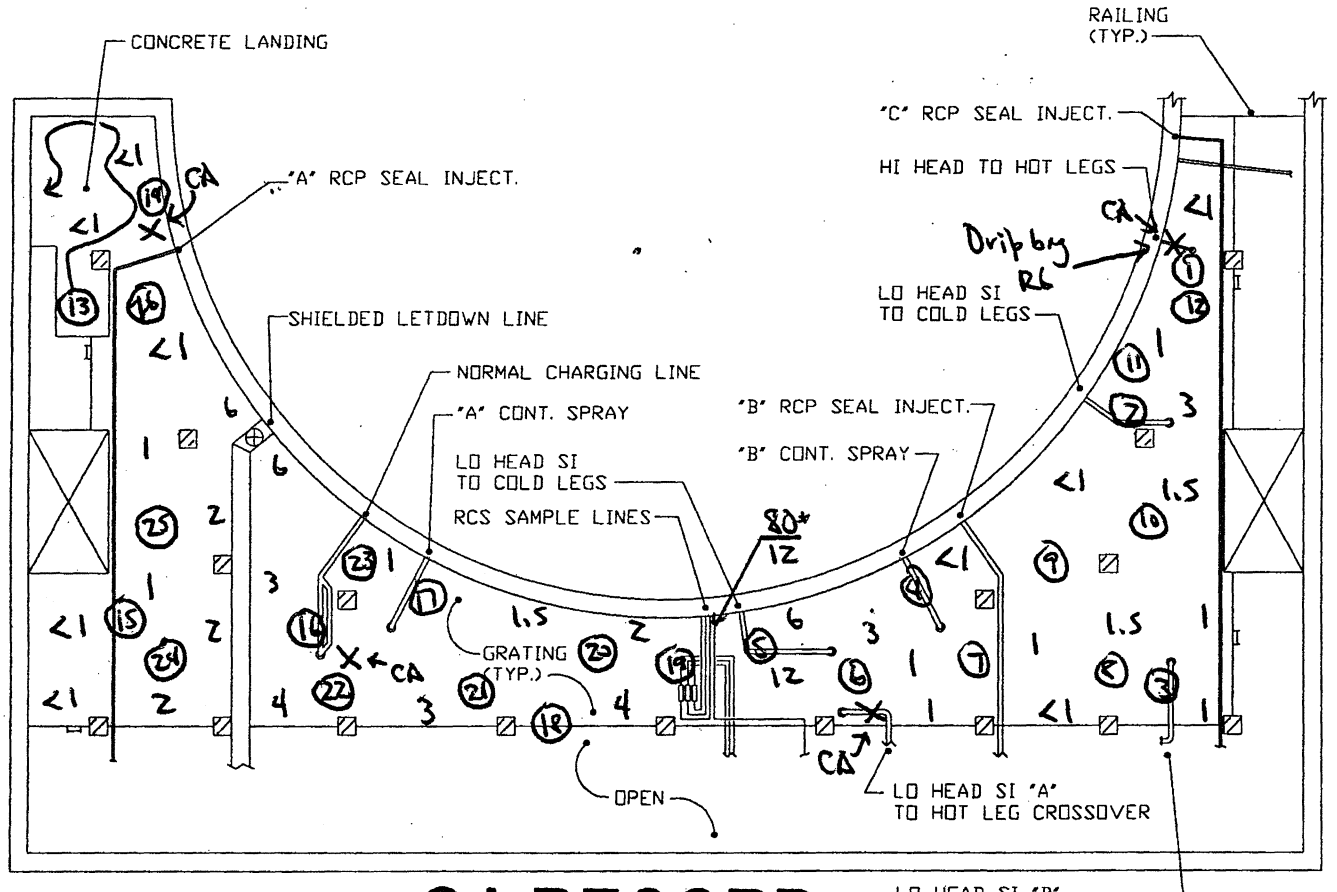
Surveyor: Michael P. Honer

Signature: Michael P. Honer

Reviewed By: C. [illegible] 6-3-07

Comments: All dose rates <1 unless otherwise indicated.

dose received 0.6 mrem



#	dpm/100cm²	Location
1-5	<1K	Pipes/Valves
6-12	↓	Grating
13	<1K/M	Landing
14-17	<1K	Pipes/valves
18	↓	Handrail
19	↓	Sample lines
20-26	↓	Grating

N

A

QA RECORD

Instrument	Serial #
RO-2	4993
L-177	41295
N	
A	

RA	Radiation Area	β	Beta Dose Rate
HRA	High Radiation Area	n	Neutron Dose Rate
LHRA	Locked High Radiation Area	R	Rem/Hour
VHRA	Very High Radiation Area	~~XXXX~~	Boundary
ARA	Airborne Radioactivity Area	o	Smear Location
CA	Contaminated Area	Δ	Air Sample Location
RMA	Radioactive Materials Area	Dose rates in mrem/hr unless otherwise noted	

K=1,000

M=Masslin

Air Activity

No. ___ DAC ___ % Activity ___ μCi/cc

N

No. ___ DAC ___ % Activity ___ μCi/cc

No. ___ DAC ___ % Activity ___ μCi/cc

A

WRJO/Action Request# ___

Map # 6

RADIOLOGICAL SURVEY RECORD

Unit: 1	Bldg/Elev: RAB 236	Area: Mechanical Penetration Area	Date: 5-2-07	Time: 1330	RWP#: 1769	Survey#: 0502-008

Component: N/A

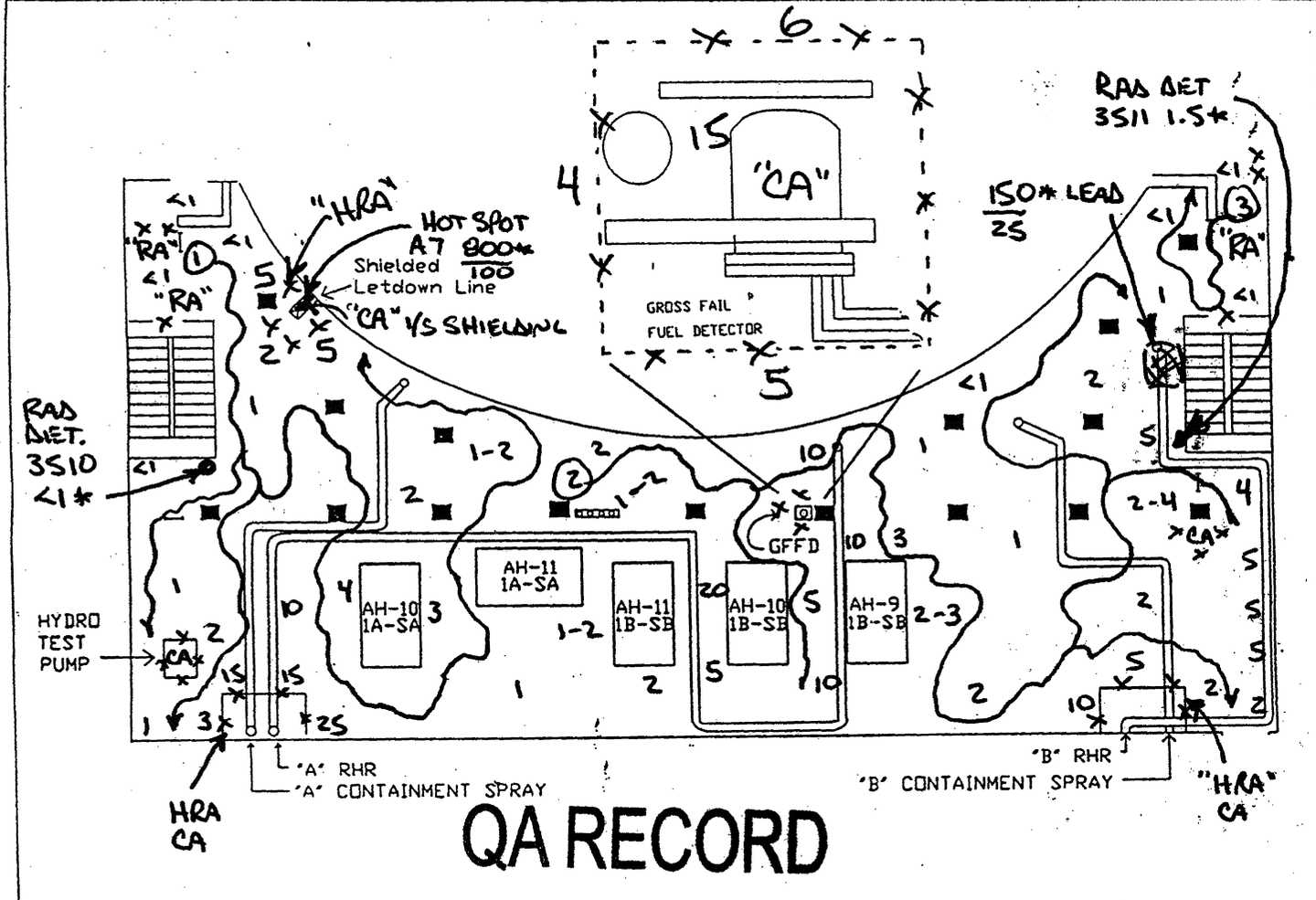
Work Description: MONTHLY SURVEY

Surveyor: B. CLAY

Signature: [signature]

Reviewed By: [signature] 5-2-07

Comments: GENERAL AREA DOSE RATES + SMEARS ONLY dose received N/A mrem



QA RECORD

#	dpm/100cm²	Location
1	<1000	FLOOR
2	↓	↓
3	↓	↓

Instrument	Serial #
RO-2	3599
L-177	41295
N/A	

RA	Radiation Area	β	Beta Dose Rate
HRA	High Radiation Area	n	Neutron Dose Rate
LHRA	Locked High Radiation Area	R	Rem/Hour
VHRA	Very High Radiation Area	✱✱✱✱	Boundary
ARA	Airborne Radioactivity Area	o	Smear Location
CA	Contaminated Area	Δ	Air Sample Location
RMA	Radioactive Materials Area	Dose rates in mrem/hr unless otherwise noted	

→ MASSLIN SMEAR

Air Activity

No. ___ DAC ___ % Activity _____ µCi/cc

No. ___ DAC N/A % Activity _____ µCi/cc

No. ___ DAC ___ % Activity _____ µCi/cc

WRJO/Action Request# _____

PASSPORT - TOTAL EXPOSURE SYSTEM

RADIATION WORK PERMIT

				ALARA Task		
Report ID : TIPH900	RWP Number:	00001771	02	WO 00490854	01	01
Page : 1	Facility :	HNP				

RWP Title : ROUTINE OPERATIONS ACTIVITIES
Type : LR Status: ACTIVE Date : 06/20/2005 14:31
Area : GENERAL FACILITY Location:

Work Begin Date: 12/15/2003 00:00 Work End Date: 12/31/2010 23:59
Extension Date : By:
Initiated Date : 06/20/2005 14:31 By: KIVETP CHRISTENSEN CHRIS P
Approved Date : 06/20/2005 14:31 By: KIVETP CHRISTENSEN CHRIS P

ALARA Task

ALARA Task : WO 00490854 01 01 Status: READY
ALARA Desc : OPS ACTIVITIES

Radiological Conditions

ED Time Alarm: 900
(in Minutes)

Administrative Dose Limit: 40 (mrem)

ED Dose Alarm: 32 (mrem) ED Dose Rate Alarm: 200 (mrem/hr)

Radiological Hazard

Radiological Hazard	!--Distance--!	!-------Reading-------!	
SEE HOLD POINT INST	N/A	N/A	N/A

Radiation Protection Requirements

Dosimetry Type : S STANDARD (DRD/TLD) Multi-Pack Type:

Type	Code	Description	Type	Code	Description
SPCL	SPCL	SEE SPECIAL INSTRUCTION			

Hold Points and Special Instructions

Nbr	Hold Point Description
10	ENTRY ALLOWED TO ALL AREAS EXCEPT AREAS POSTED:
10	VERY HIGH RADIATION AREAS (VHRA)
20	AIRBORNE RADIATION AREAS (ARA),
30	HOT PARTICLE AREAS (HPA),
30	CONTAINMENT WHEN REACTOR CRITICAL
30	NO ENTRY INTO DOSE FIELDS > 1000 MREM/HR

Nbr	Special Instructions
10	********** WORK DESCRIPTION**********
10	ROUNTINE OPERATIONS ACTIVITIES
10	----------
10	.
10	1.REVIEW AREA SURVEY MAPS AND/OR CONTACT RADIATION
10	CONTROL FOR SPECIFIC WORK AREA RADIOLOGICAL
10	CONDITIONS PRIOR TO START OF WORK.
10	2.IF RADIOLOGICAL CONDITIONS ARE SIGNIFICANTLY HIGHER
10	THAN CURRENT SURVEYS OR HISTORICAL SURVEY DATA
10	THEN WORK IS NOT ALLOWED TO CONTINUE ON THIS RWP
10	WITHOUT APPROVAL FROM RC SUPERVISION.
10	3.NOTIFY RADIATION CONTROL PRIOR TO CLIMBING IN
10	THE OVERHEAD.
10	4.FOR HIGH NOISE AREAS EVALUATE THE USE OF THE
10	FOLLOWING:
10	- LED LIGHT
10	- VIBRATING DOSIMETRY
10	- TELEMETRY
10	- STAY TIMES
10	5.IF ACCUMULATED DOSE ALARM OR UNANTICIPATED DOSE
10	RATE ALARM SOUNDS, LEAVE THE AREA AND CONTACT
10	RADIATION CONTROL.
10	.
20	********LOCKED HIGH RADIATION AREA ENTRIES*****
20	----------
20	1.PRE-JOB BRIEFING REQUIRED.
20	2.RC SUPERVISOR APPROVAL REQUIRED PRIOR TO ENTRY.
20	3.CONTINUOUS RADIATION CONTROL COVERAGE REQUIRED
20	4.WHEN PROVIDING CONTINUOUS COVERAGE, RP PERSONNEL
20	SHALL NOT ENGAGE IN ANY ACTIVITIES WHICH COULD
20	DISTRACT THEM FROM MONITORING THE WORKERS AND THE
20	WORK ENVIRONMENT.
20	.
40	**** CONTAMINATED SYSTEM BREACH (LINES > 1 INCH) ***
40	----------
40	1.CONTINUOUS RC COVERAGE REQUIRED FOR INITIAL

RADIATION WORK PERMIT

				ALARA Task		
Report ID :	TIPH900	RWP Number:	00001771 02	WO 00490854	01	01
Page :	3	Facility :	HNP			

Nbr	Special Instructions
40	SYSTEM BREACH.
40	2.FULL PROTECTIVE CLOTHING (TYPE W) W/HOOD
40	REQUIRED FOR WET WORK, AND ADDITIONAL DRESS
40	CONTROLS MAY BE REQUIRED BASED ON RC INSTRUCTIONS.
40	3.GLOVES AND A CONTAINMENT DEVICE ARE REQUIRED AS A
40	MINIMUM IN CLEAN AREAS.
40	4.ENGINEERING CONTROLS AS PER RADIATION CONTROL.
40	5.PROVIDE PATH OR CONTAINMENT FOR SYSTEM DRAINAGE,
40	IF NEEDED TO CONTAIN LIQUIDS.
40	.
60	**********CONTAMINATED AREA ENTRIES**********
60	----------
60	1.GLOVES AND SHOECOVERS REQUIRED AS A MINIMUM
60	FOR INSPECTIONS ACTIVITIES.
60	2.FULL PROTECTIVE CLOTHING AND HOOD (TYPE D) REQUIRED
60	FOR CLIMBING IN OVERHEAD ABOVE 8 FEET AND/OR
60	CRAWLING.
60	3.FULL PROTECTIVE CLOTHING (TYPE D) REQUIRED FOR HANDS
60	ON WORK.
60	4.DOUBLE SURGEONS GLOVES MAY BE SUBSTITUTED FOR
60	RUBBER GLOVES WITH RADIATION CONTROL APPROVAL.
60	5.FULL PROTECTIVE CLOTHING (TYPE W) REQUIRED FOR WET
60	WORK AND ADDITIONAL DRESS CONTROLS MAY BE REQUIRED
60	BASED ON RC INSTRUCTIONS.
60	6.INTERMITTENT RC COVERAGE, UNLESS OTHERWISE
60	INSTRUCTED.
60	.

- End of Report -

Facility:	SHEARON-HARRIS	Date of Examination:	8/6/2007
Examination Level (circle one):	RO / **SRO**	Operating Test Number:	**NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (A1-1)	M	Given a set of conditions, complete GP-007 – NORMAL PLANT COOLDOWN, Attachment 3 – Mode 5 Minimum Equipment List. 2.1.12 Ability to apply technical specifications for a system. (4.0)
Conduct of Operations (A1-2)	N	Given a set of conditions, complete OP-107, CHEMICAL AND VOLUME CONTROL SYSTEM, ATTACHMENT 17 – Blender Manual Operation Calculation Sheet. 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (3.9/4.0)
Equipment Control (A2)	P, M	Perform OST-1026, REACTOR COOLANT SYSTEM LEAKAGE EVALUATION, as directed by AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE. 2.2.12 Knowledge of surveillance procedures. (3.4)
Radiation Control (A3)	M	Given a set of conditions, a survey map, and an RWP, determine the applicable facility dose limit and calculate the stay time. 2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements. (2.6/3.0)
Emergency Plan (A4)	M	Given a set of conditions, determine the Emergency Action Level (EAL) and make a Protective Action Recommendation (PAR) in accordance with the facility Emergency Plan. 2.4.44 Knowledge of emergency plan protective action requirements. (4.0)

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

*Type Codes & Criteria:

(C)ontrol room
(D)irect from bank (≤ 3 for ROs; ≤ for SROs & RO retakes)
(N)ew or (M)odified from bank (> 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

SHEARON-HARRIS 2007 NRC SRO ADMINISTRATIVE JPM SUMMARY

A1-1: Given a set of conditions, complete GP-007 – NORMAL PLANT COOLDOWN, ATTACHMENT 3 – MODE 5 MINIMUM EQUIPMENT LIST. The applicant will be provided with an equipment status list and be directed to complete GP-007, Attachment 3; an assessment of technical specification compliance for entering Mode 5. There will be two or more non-complying systems/components. Modify a previous AUDIT Examination JPM that is not in the facility bank by revising the equipment status. SRO only.

A1-2: Given a set of conditions, complete OP-107, CHEMICAL AND VOLUME CONTROL SYSTEM, ATTACHMENT 17 – BLENDER MANUAL OPERATION CALCULATION SHEET. The applicant will apply the attachment formulas to determine the flow controller setpoints for makeup water and boric acid when a blender manual operation is required to raise Refueling Water Storage Tank Level. New JPM. RO-SRO common.

A2: Perform OST-1026, REACTOR COOLANT SYSTEM LEAKAGE EVALUATION, as directed by AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE. The applicant will calculate RCS leak rate using the computer program in manual. This task is a randomly selected repeat from the 2006 NRC examination. The JPM conditions will be modified to change the leak rate and the classification of the leakage. The calculation is RO-SRO common. SRO applicants will be required to enter the proper technical specification and to specify the AOP-016 Attachment to be implemented.

A3: Given a set of conditions, a survey map, and an RWP, determine the applicable facility dose limit and calculate the stay time. The applicant will evaluate a survey map to determine dose rate for a specific task and apply the facility limit to determine stay time for the task. While there are no similar JPM's in the facility bank, this is a common approach at other facilities for addressing ES-301 requirements of "Radiation Control" and is therefore designated as an "M". RO-SRO common.

A4: Given a set of conditions, determine the Emergency Action Level (EAL) and make a Protective Action Recommendation (PAR) in accordance with the facility Emergency Plan within the committed time limit. There are Bank JPM's for determining an EAL and Bank JPM's for making a PAR but none that do both. No bank JPM's were used to develop this JPM. SRO only.

Facility:	Shearon-Harris	Task No.:	344047H402
Task Title:	Complete GP-007, Attachment 3 – Mode 5 Minimum Equipment List (MEL)	JPM No.:	2007 NRC SRO A1-1
K/A Reference:	2.1.20 (4.2)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The unit is in Mode 4, heading for Mode 5 in accordance with GP-007, NORMAL PLANT COOLDOWN MODE 3 TO MODE 5.
- See Plant Conditions Sheet for specific conditions.

Task Standard: All conditions not meeting requirement identified.

Required Materials: Technical Specifications

General References: GP-007 - NORMAL PLANT COOLDOWN MODE 3 TO MODE 5, Rev. 40.

Handouts:
- GP-007, Attachment 3
- Attached Plant Conditions sheet

Initiating Cue: The USCO has assigned you to perform GP-007, Step 5.2.38.e – Complete Attachment 3 (Mode 5 Minimum Equipment List).

Time Critical Task: No

Validation Time: 10 minutes

(Denote Critical Steps with a √)

Start Time: _____.

Performance Step: 1 Obtain procedure and determine existing plant conditions.

Standard: Reviews Attachment 3 and Plant Conditions.

Evaluator Cue: **Provide handout (attached Plant Conditions Sheet and GP-007, Attachment 3) for NRC JPM SRO A1-1.**

Comment: **All conditions except the following three meet the minimum requirements.**

√ **Performance Step: 2** Compare Plant Conditions to Attachment 3 requirements.

Standard: Indicates one RHR loop is running but only one is operable.
Condition * not met due to SG levels less than minimum.

Comment:

√ **Performance Step: 3** Compare Plant Conditions to Attachment 3 requirements.

Standard: Indicates no CSIP's operating for more than one hour.
Condition *** not met (no CSIP running for more than one hour).

Comment:

√ **Performance Step: 4** Compare Plant Conditions to Attachment 3 requirements.

Standard: Indicates no train of Safety Related Electrical Buses available with S1 powered from the alternate source and SIV de-energized.

Comment:

Performance Step: 5 Provide Attachment 3 to the USCO.

Standard: Provides Attachment 3 to the USCO and may make a verbal report.

Evaluator Cue: **Acknowledge any verbal communication.**

Comment:

Terminating Cue: **After Attachment 3 and/or the optional report has been provided to the USCO: Evaluation on this JPM is complete.**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC SRO A1-1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS:

- The unit is in Mode 4, heading for Mode 5 in accordance with GP-007, NORMAL PLANT COOLDOWN MODE 3 TO MODE 5.
- See Plant Conditions Sheet for specific conditions.

INITIATING CUE:

The USCO has assigned you to perform GP-007, Step 5.2.38.e – Complete Attachment 3 (Mode 5 Minimum Equipment List).

2007 NRC JPM SRO A1-1 PLANT CONDITIONS

- The Reactor Trip Breakers are CLOSED for system continuity testing.
- DRPI indicates all rods inserted.
- RCS Temperature is 235 °F with a bubble in the PRZ.
- LTOP is in service.
- All PRZ Code Safety Valves are operable.
- Chemistry has reported RCS Specific Activity, O, Cl, and Fl are within TS limits.
- RHR Train "A" is providing cooling.
- RHR Pump "B" is isolated and tagged due to mechanical seal leakage.
- All RCP's are stopped.
- CSIP "A" was stopped due to an oil leak 75 minutes ago.
- Operators are in the process of removing tags and energizing CSIP "B" in preparation for starting.
- Operable indicators indicate the following levels:
  - BAT – 20%
  - RWST – 93%
- Both BATs are at 93 °F and 7450 ppm Boron.
- Both BAT Pumps are operable.
- The RWST is at 73 °F and 2525 ppm.
- Both Emergency Diesel Generators are operable.
- Instrument Bus SI has been shifted to 1DP-S1, Alternate Supply from PP-1A211-SA, while a breaker is replaced in the inverter.
- Instrument Bus SIV is de-energized while a power cable is replaced.
- All other AC buses are energized from off-site power.
- All DC buses are energized.
- Operable indicators indicate SG NR Levels as:
  - SG "A" – 28%
  - SG "B" – 33%
  - SG "C" – 28%
- All MSIVs and SG PORV's are closed.
- CREVS and Train "A" and "B" are operable.
- FHB Emergency Exhaust Train "A" and Train "B" are operable.
- Engineering reported that all snubbers required for Mode 4 and 5 are operable.

Facility:	Shearon-Harris	Task No.:	002001H201
Task Title:	Perform the RCS Water Inventory Balance surveillance	JPM No.:	2007 NRC SRO JPM A2
K/A Reference:	G2.2.12 (3.0)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing: **Any setting with the RCS Continuous Leak Rate Program on a computer.**

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:
- The plant is at 100 percent power.
- The operating crew has entered AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE, suspecting an increase in RCS leakage.
- Radiation levels are normal but the frequency of makeup has increased.

Task Standard: RCS leakage calculated within required range

Required Materials:
- PC with RCS Continuous Leak Rate Program
- This JPM should be performed in the Simulator at the STA computer or as setup elsewhere.

General References: OST-1026, RCS LEAKAGE EVALUATION, Rev. 34

Handouts:
- OST-1026 with Prerequisites and Steps 7.0.1 – 7.0.8 signed
- Start Data Sheet (JPM pg. 3) information entered on Attachment 1.
- End Data Sheet (JPM pg. 4) information entered on Attachment 1.

Initiating Cue:	The Unit SCO directs you perform a 30 minute leak rate in accordance with OST-1026, RCS LEAKAGE EVALUATION. Assume that Steam Generator Tube Leakage, Miscellaneous Identified Leakage and RCPB leakage is ZERO. All prerequisites are met. The procedure has been completed through Step 7.0.8 and Attachment 1 data has been entered. Begin at Step 7.0.9. For the purpose of the examination, there will be no independent verification of your data entry.
Time Critical Task:	No
Validation Time:	12 minutes

Setup Instructions

Log onto the STA computer using the generic login and bring up the STA icons then minimize the icons.

Connect the printer to the computer START – Programs – Accessories – Local PRT then follow along with the dialog wizard that appears. The current default network printer should be /NT000231/LP000442 make sure the "Enable LPT1 Redirection" has the dot on it then select OK.

At the conclusion of each JPM re-open the OST-1026 program and enter erroneous data or ensure previous entered data is deleted. This will prevent the next student from inadvertently pulling up previous material.

START DATA

TODAY
TIME: ZERO

POINT ID	PARAMETER	CURRENT VALUE	QUALITY CODE	ENGR UNITS
LRC0460	PRZ LVL-2	59.45	GOOD	PCNT
PRC0455	PRESSURIZER PRESS CH1	2233.4	GOOD	PSIG
TRC0408Z	RCS MEDIAN T-AVG (CONTROL)	588.8	GOOD	DEGF
LRC0470	PRT LEVEL	40.0	GOOD	PCNT
LI-1003	RCDT Level	50.4		
LCS0115	VCT LEVEL	52.0	GOOD	PCNT

END DATA

TODAY
TIME: 30 minutes later

POINT ID	DESCRIPTION	CURRENT VALUE	QUALITY CODE	ENGR UNITS
LRC0460	PRZ LVL-2	59.46	GOOD	PCNT
PRC0455	PRESSURIZER PRESS CH1	2233.4	GOOD	PSIG
TRC0408Z	RCS MEDIAN T-AVG (CONTROL)	588.8	GOOD	DEGF
LRC0470	PRT LEVEL	40.0	GOOD	PCNT
LI-1003	RCDT Level	51.1		
LCS0115	VCT LEVEL	46.9	GOOD	PCNT

(Denote Critical Steps with a √)

Start Time _____.

Performance Step: 1 Obtain procedure.

Standard: Reviews procedure.

Evaluator Cue: **Provide handout for RO JPM A2.**

Comment:

OST-1026, 7.0.9

Performance Step: 2 IF RCS TAVG at the end of the test interval differs by more than 0.2°F from TAVG at the start of the test, OR, IF an automatic VCT makeup has occurred during the data collection, THEN perform the following:

Standard: Verifies START and END Tavg within .2 ˚F and marks N/A.

Evaluator Cue: **No makeup occurred during the data collection.**

Comment:

7.0.10.a and b

Procedure Note: The "Step" numbers cited in the instructions below refer to labels displayed in the "Manual RCS Leakrate" spreadsheet.

√ **Performance Step: 3** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **START** the RCS Real-Time Continuous Leakrate Program.
- **CLICK** on the "Manual RCS Leakrate" tab.

Standard: **STARTs** the RCS Real-Time Continuous Leakrate Program and then clicks on the "Manual RCS Leakrate" tab.

Comment:

7.0.10.c

Procedure Caution: Computer points TRC0408M and TRC0408ZM represent time averaged values of RCS Tavg. Use of these points when RCS temperature is unstable can result in large calculated unidentified leakages due to incorrect temperature compensation. These points should **NOT** be used to calculate RCS leak rate when RCS temperature is **NOT** stable.

√ **Performance Step: 4** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **ENTER** the starting data in the designated table (Step 1).

Standard: Enters data from handout as prompted by the computer program.

Comment:

7.0.10.d

√ **Performance Step: 5** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **ENTER** the ending data in the designated table (Step 1).

Standard: Enters data from handout as prompted by the computer program.

Comment:

7.0.10.e

Procedure Note: The basis for any pre-calculated Steam Generator Tube Leakage must be documented on Attachment 5.

Performance Step: 6 **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

ENTER the Miscellaneous Data in the designated table (Step 3).

- SG Tube Leakage
- Miscellaneous Identified Leakage
- Known Non-RCPB Leakage

Standard: Enters ZERO per Initiating Cue.

Comment:

7.0.10.f and g

Procedure Note: The "Perform Data Validation" verifies all required "Start" and "End" data is entered. It does **NOT** check for correct format **OR** for an expected range of values

√ **Performance Step: 7** **PERFORM** the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Perform Data Validation box (Step 4).
- **VERIFY** the text "Data Validation – Completed" is displayed.

Standard: **CLICKs** on the "Perform Data Validation" box and verifies "Data Validation – Completed" displays.

Comment:

7.0.10.h and i

Procedure Note: When the "Manual Data Upload" box is clicked, the user will receive a prompt that this action upload all manually calculated data to the "RCS Leakrate Report" and defeat the automatic calculation functions. The automatic functions will be restored through subsequent operations directed on the spreadsheet.

√ **Performance Step: 8** PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Manual Data Upload box (Step 5)
- **WHEN** prompted to complete the manual data upload, **THEN CLICK** "YES".

Standard: **CLICKs** on the "Manual Data Upload" box and "YES" when prompted.

Comment:

7.0.10.j

√ **Performance Step: 9**

PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Print RCS Leakrate Report" box (Step 6) to automatically print the report

Standard:

- **CLICKs** on the "Print RCS Leakrate Report" box and retrieves the report.
- Unidentified Leakage ≥ 2 GPM ≤ 2.5 GPM. **(√)** [Actual is 2.27 GPM]
- Identified leakage ≤ .15 GPM [Actual is .09]

Evaluator Note:

If this JPM is not done in the Simulator or the Control Room then it will be necessary to provide the candidate with a printer number/designation for printing.

Comment:

7.0.10.k and l

Performance Step: 10

PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **CLICK** on the "Restore Automatic Calculations" box (Step 7).
- **VERIFY** the text "Automatic Calculations – Restored" is displayed.

Standard:

CLICKs on the "Restore Automatic Calculations" box and verifies "Automatic Calculations – Restored" displays.

Comment:

7.0.10.m and n

Performance Step: 11 PERFORM the following to calculate RCS leakage using the RCS Real-Time Continuous Leakrate Program, Manual RCS Leakrate spreadsheet.

- **INDEPENDENTLY VERIFY** the input data on the printout is correct.
- **ATTACH** the computer printout to this procedure.

Standard:

- May take this opportunity to check work/data.
- Clips or staples printout to procedure.

Evaluator Cue: **If necessary, no independent verification will be provided.**

Comment:

7.0.11

√ **Performance Step: 12** **VERIFY** calculated leak rates are within the Acceptance Criteria listed in Section 6.0.

Standard:

- References Section 6.0 for limits, as necessary.
- Informs USCO that Acceptance Criteria 6.2 is exceeded.

Evaluator Cue: **After the SRO candidate has calculated the leakage: Assume that you are the Unit SCO – apply your calculation against facility requirements.**

Comment:

AOP-016, Step 18

√ **Performance Step: 13** Evaluate RCS leakage.

Standard:

- Refers to Technical Specification 3.4.6.2 and determines 3.4.6.2.b is exceeded.
- Enters Action Statement 3.4.6.2.b - With any Reactor Coolant System leakage greater than any one of the above limits excluding Pressure Boundary Leakage and leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Comment:

Terminating Cue: **After SRO has determined the TS application: Evaluation on this JPM is complete.**

End Time: _____.

JPM CUE SHEET

Job Performance Measure No.: 2007 NRC SRO JPM A2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: The plant is at 100 percent power.

The operating crew has entered AOP-016, EXCESSIVE PRIMARY PLANT LEAKAGE, suspecting an increase in RCS leakage.
Radiation levels are normal but the frequency of makeup has increased.

INITIATING CUE: The Unit SCO directs you perform a 30 minute leak rate in accordance with OST-1026, RCS LEAKAGE EVALUATION. Assume that Steam Generator Tube Leakage, Miscellaneous Identified Leakage and RCPB leakage is ZERO. All prerequisites are met. The procedure has been completed through Step 7.0.8 and Attachment 1 data has been entered. Begin at Step 7.0.9.

For the purpose of the examination, there will be no independent verification of your data entry.

Facility:	Shearon-Harris	Task No.:	345001H602
Task Title:	Upgrade an EAL and make a PAR	JPM No.:	2007 NRC JPM SRO A4
K/A Reference:	2.4.44 (4.0)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing: **This JPM can be performed in any setting with the required references available.**

Simulated Performance: _____ Actual Performance: X

Classroom X Simulator _____ Plant _____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: See Plant Conditions handout.

Task Standard: Upgrade EAL to GE and correct PAR

Required Materials: None

General References:
- PEP-110, EMERGENCY CLASSIFICATION AND PROTECTIVE ACTION RECOMMENDATIONS, Rev. 16
- PEP-230, CONTROL ROOM OPERATIONS, Rev.14
- PEP-310, NOTIFICATIONS AND COMMUNICATIONS, Rev. 21

Handouts:
- Attached Initial Conditions
- EAL Flowcharts
- PEP-110

Initiating Cue: You are the Site Emergency Coordinator. Review the plant conditions handout sheet and determine the current Emergency Action Level (EAL). This is a time critical JPM based on the facility commitment in the Emergency Plan.

Time Critical Task: YES – 15 minutes.

Validation Time: 10 minutes

(Denote Critical Steps with a √)

Start Time: _____.

Performance Step: 1 Evaluate changing conditions.

Standard: Compares conditions against EAL Flowchart criteria.

Evaluator Cue:

- **Provide Initial Conditions sheet (last page of JPM).**
- **Provide PEP-110 and the EAL Flowcharts if not available in the JPM performance location.**

Comment:

√ **Performance Step: 2** Determine EAL.

Standard: Upgrade to GE (2-1-4) required:

- RCS breached – SGTR
- Fuel Jeopardized – Core Cooling RED
- CNMT Breached – SG Safety Valves lifting

Evaluator Cue: **When the applicant indicates a Protective Action Recommendation is required: The wind is blowing from 223˚.**

Comment:

√ **Performance Step: 3** Determine PAR.

Standard: Refers to PEP-110, Attachment 3:

PROTECTIVE ACTION RECOMMENDATION:

- EVACUATE: 2 mile radius
- EVACUATE: 5 miles downwind (Sectors A, B, C)
- SHELTER: Sectors D, E, F, G, H, I, J, K, L, M, N

Comment:

Terminating Cue: **After the PAR is specified: Evaluation on this JPM is complete.**

Stop Time: _____.

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2007 NRC JPM SRO A4

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

INITIAL CONDITIONS: See Plant Conditions handout.

INITIATING CUE: You are the Site Emergency Coordinator. Review the plant conditions handout sheet and determine the current Emergency Action Level (EAL). This is a time critical JPM based on the facility commitment in the Emergency Plan.

2007 NRC JPM SRO A4 Plant Conditions

- Increasing RCS leakage required a MANUAL Reactor Trip and Safety Injection.
- Vital Bus 1A-SA locked out on a relay actuation.
- The TDAFW Pump is cleared and tagged.
- The EAL Network was entered at Point X.
- The crew diagnosed a Steam Generator Tube Rupture on SG "A". The EAL Network was re-entered at Point U.
- An ALERT has been declared (EAL 2-1-2).
- After the ALERT declaration, off-site power was lost and EDG 1B failed while starting.
- Containment Pressure is normal.
- Containment Area Radiation Monitors are rising slowly but none are in an alarm status.
- Safety valves are lifting on all steam generators.
- The following Critical Safety Functions have been confirmed:
    - Heat Sink – RED
    - Core Cooling – RED