FINAL RO ADMIN JPMS

Facility:	Shearon Harris	Task No.:	301179H601
Task Title:	Response to Voids In Reactor Vessel – Calculate Reactor Vessel Maximum Vent Time	JPM No.:	2009B NRC Exam Admin JPM RO A1-1
K/A Reference:	EPE E10 EK3.2 RO 3.2 SRO 3.7		

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 plant was at 100 percent power when a Small Break LOCA occurred.

- All RCPs have been secured.
- SI has been terminated.
- RVLIS Upper Range reading is 85 percent
- Pressurizer level is 90 percent
- RCS Pressure is 1560 psig
- Containment Temperature is 195°F
- Chemistry reports that Containment Hydrogen Concentration is 2.15 percent

Based on the present conditions a void has formed in the Reactor Vessel. The CRS and STA have reviewed the CSFSTs. It was determined that FRP-I.3, Response To Voids In Reactor Vessel should be implemented.

Initiating Cue: The crew has completed preparing the Containment for Reactor Vessel venting. The CRS has directed you to calculate the maximum time the Reactor Vessel should be vented, using Attachment 1 of FRP-I.3

Your calculation should be determined to the second to allow timing using the MCR timer.

Task Standard:	Determine maximum Reactor Vessel vent time within ±5 seconds of calculation.
Required Materials:	Calculator
General References:	FRP-I.3 Figure 2 and Attachment 1 (Rev. 16)
Handouts:	FRP-I.3 Figure 2 and Attachment 1 (Rev. 16)
Time Critical Task:	No
Validation Time:	10 minutes

Critical Step Justification

Step 2	Without the correct Containment volume you cannot determine the maximum venting time
Step 3	Without the correct hydrogen volume you cannot determine the maximum venting time
Step 4	Without the correct hydrogen flow rate you cannot determine the maximum venting time
Step 5	This is the maximum venting time calculation required by the CRS

START TIME: _____

FRP-I.3

Performance Step: 1 OBTAIN PROCEDURE (provided with handout)

Standard: Obtains FRP-I.3 and refers to Figure 2 and Attachment 1.

Comment:

FRP-I.3 Attachment 1 Step 1

✓ **Performance Step: 2** Calculate the maximum venting time using Attachment 1.

Calculate Containment Volume at STP 'A' in FT^3

Standard: Using the provided Containment temperature of 195°F Containment Volume at STP 'A' = 1702094.66 FT^3

Comment:

FRP-I.3 Attachment 1 Step 2

✓ **Performance Step: 3** Determine Maximum Hydrogen volume that can be vented 'B' in FT^3

Standard: Using provided Containment Hydrogen Concentration of 2.15 percent determine maximum Hydrogen volume that can be vented 'B' = 14467.80 FT^3

Comment:

FRP-I.3 Attachment 1 Step 3

✓ **Performance Step: 4** Determine Hydrogen flow rate as a function of RCS pressure 'C' in FT^3/MIN.

Standard: Determines from Figure 2 that 1560 psig corresponds to 4850 FT^3/MIN (Tolerance 4950 – 4750 FT^3/MIN)

Comment:

FRP-I.3 Attachment 1 Step 4

✓ **Performance Step: 5** Calculate maximum venting time 'D' in minutes.

Standard: **Calculates 2.98 minutes (2 minutes and 59 seconds)**

Tolerance $\pm$ 5 seconds 3 min 4 seconds to 2 min 54 seconds

Comment:

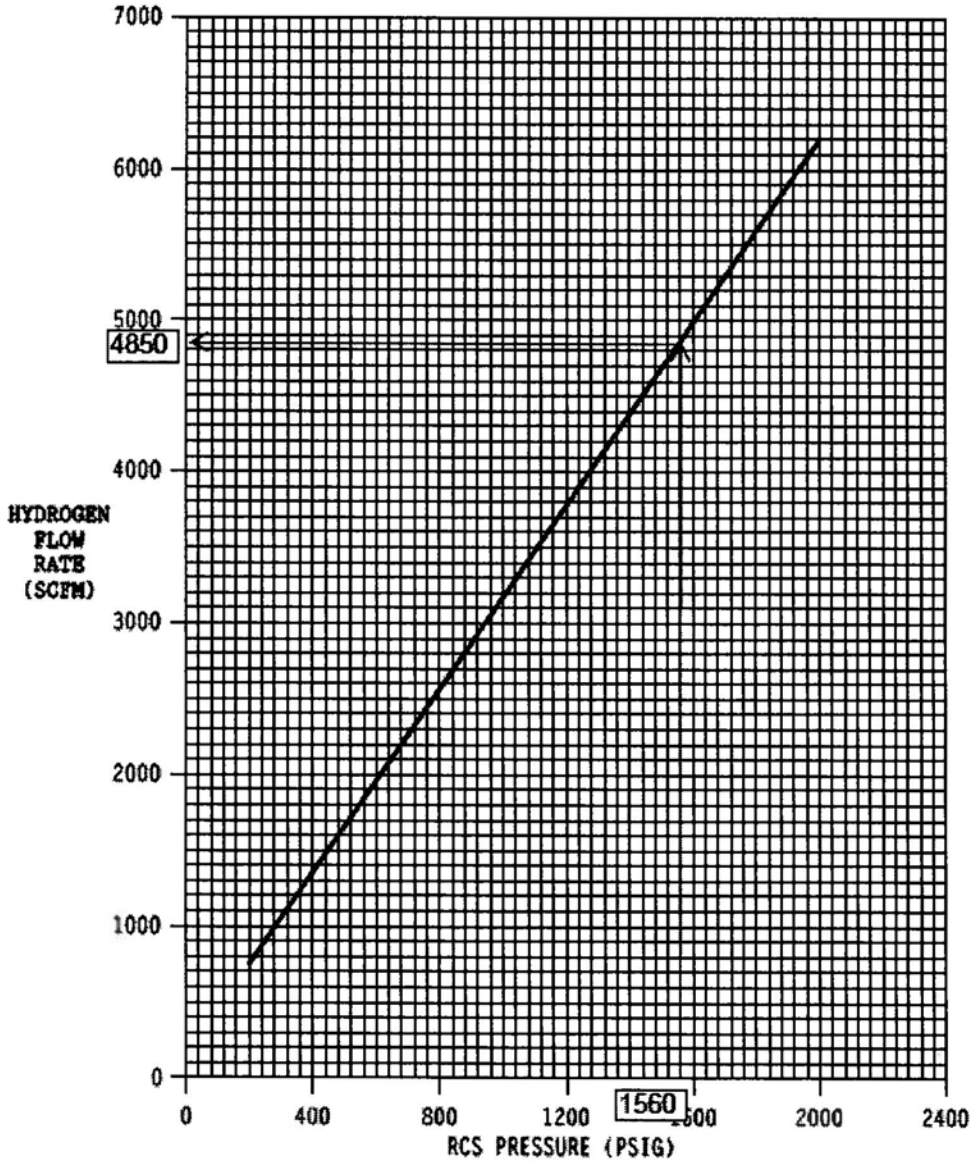
Terminating Cue:	**When calculation is returned** **END OF JPM**

STOP TIME: _____

KEY

RESPONSE TO VOIDS IN REACTOR VESSEL

FIGURE 2: HYDROGEN FLOW RATE VERSUS RCS PRESSURE



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KEY

RESPONSE TO VOIDS IN REACTOR VESSEL

Attachment 1
Sheet 1 of 1
INSTRUCTIONS FOR DETERMINING VENTING TIME

1. Determine CNMT Volume at STP 'A':

$$A = (2.266 \times 10^6\ FT^3) \times \frac{492°R}{(\text{CNMT temperature } °F + 460°R)}$$

195°F

A = 1702094.66 (FT^3)

2. Determine Maximum Hydrogen volume that can be vented 'B':

$$B = \frac{(3.0\% - \text{CNMT Hydrogen Concentration})}{100\%} \times \text{'A'}$$

2.15 1702094.66

B = 14467.80 (FT^3)

3. Determine Hydrogen flow rate as a function of RCS pressure 'C':

a. Check RCS pressure and mark on Figure 2.

b. Using Figure 2. read hydrogen flow rate 'C'.

Tolerance 4750 - 4950

C = 4850 (FT^3/MIN)

4. Calculate maximum venting time 'D':

$$\text{Maximum venting time} = \frac{B}{C} = 2.98$$

D = 2 min and 59 seconds (MINUTES)

Tolerance
2 min 54 seconds
3 min 4 seconds

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VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam Admin JPM RO A1-1 - Response to Voids In Reactor Vessel – Calculate Reactor Vessel Maximum Vent Time

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 was at 100 percent power when a Small Break LOCA occurred. • All RCPs have been secured. • SI has been terminated. • RVLIS Upper Range reading is 85 percent • Pressurizer level is 90 percent • RCS Pressure is 1560 psig • Containment Temperature is 195°F • Chemistry reports that Containment Hydrogen Concentration is 2.15 percent Based on the present conditions a void has formed in the Reactor Vessel. The CRS and STA have reviewed the CSFSTs. It was determined that FRP-I.3, Response To Voids In Reactor Vessel should be implemented.

Initiating Cue:	The crew has completed preparing the Containment for Reactor Vessel venting. The CRS has directed you to calculate the maximum time the Reactor Vessel should be vented, using Attachment 1 of FRP-I.3 Your calculation should be determined to the second to allow timing using the MCR timer.

Facility:	Shearon Harris	Task No.:	001004H101
Task Title:	Perform A Manual Shutdown Margin Calculation	JPM No.:	2009B NRC Exam Admin JPM RO A1-2
K/A Reference:	G 2.1.25 RO 3.9 SRO 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 plant has been operating at 52% power for 6 weeks while maintenance is replacing the motor on the 'A' Main Feedwater Pump

- Core burnup is 140 EFPD
- RCS boron concentration is 1140 ppm
- **NO** rods are believed to be immovable / untrippable
- POWERTRAX is **NOT** available

Initiating Cue: The CRS has directed you to complete OST-1036, Shutdown Margin Calculation Modes 1-5, Section 7.3, "Manual SDM Calculation (Modes 1 and 2)" for current plant conditions.

NOTE: For this JPM assume independent verification has been performed.

Task Standard:	OST-1036, Attachment 3, Manual SDM Calculation (Modes 1 and 2), completed with SDM of 5195 ± 75 pcm **(tolerance based on total of curves used and their division readability)**
Required Materials:	Calculator
General References:	OST-1036, Shutdown Margin Calculation Modes 1-5 (Rev. 40) Curve Book (Cycle 16)
Handouts:	OST-1036, Shutdown Margin Calculation Modes 1-5 (Rev. 40)
Time Critical Task:	No
Validation Time:	20 minutes

Critical Step Justification

Step 3	Must determine correct rod insertion limit based on curve value. The number of rod steps will be an input to the calculation.
Step 6	Must determine correct power defect based on curve value. The power defect will provide one of the inputs to the calculation.
Step 7	Must determine the correct rod worth based on curve value. The rod worth will provide one of the inputs to the calculation.
Step 9	The total shutdown margin was the task that the CRS directed applicant to perform.

START TIME: _____

OST-1036

Performance Step: 1 OBTAIN PROCEDURE (OST-1036 will be provided to allow candidates to write on, Curve Book will be included as a reference)

Standard: OST-1036, Section 7.3, Attachment 3, and Curve Book

Comment:

OST-1036 Attachment 3 Step 1

Performance Step: 2 Enters Reactor Power Level

Standard: Refers to given conditions and enters 52%

Comment:

OST-1036 Attachment 3 Step 2

✓ **Performance Step: 3** Determine Rod Insertion Limit for power level

Standard: Refers to Curve F-16-1 and determines TS limit for RIL to be 96 ± 2 steps (tolerance based on curve division readability)

Comment:

OST-1036 Attachment 3 Step 3

Performance Step: 4 Enters core Burn Up

Standard: Refers to given conditions and enters 140 EFPD

Comment:

OST-1036 Attachment 3 Step 4

Performance Step: 5 Enters RCS Boron Concentration

Standard: Refers to initial conditions and enters 1140 ppm

Comment:

Evaluator Note:	**ATT 3, STEP 5 NOT PERFORMED SINCE VALUE IS INCLUDED AS PART OF ATTACHMENT.**

OST-1036 Attachment 3 Step 6

✓ **Performance Step: 6** Determines Power Defect for current power level

Standard: Refers to Curve C-16-1 and determines power defect to be 1060 ± 50 pcm

(tolerance based on curve division readability)

Comment:

OST-1036 Attachment 3 Step 7

✓ **Performance Step: 7** Determines Rod Worth for RIL position determined above

Standard: Refers to Curve A-16-9 and determines rod worth to be 725 + 25 pcm

(tolerance based on curve division readability)

Comment:

OST-1036 Attachment 3 Step 8

Performance Step: 8 Enters worth of any additional immovable or untrippable rods

Standard: Refers to given conditions and enters 0

Comment:

OST-1036 Attachment 3 Step 9

✓ **Performance Step: 9** Determines Total Shutdown Margin

Standard: Determines Total Shutdown Margin to be 5195 ± 75 pcm (tolerance based on total of all curves used and their division readability)

Comment:

OST-1036 Section 7.3

Performance Step: 10 Signs off Section 7.3 steps

Standard: Signs off steps as complete

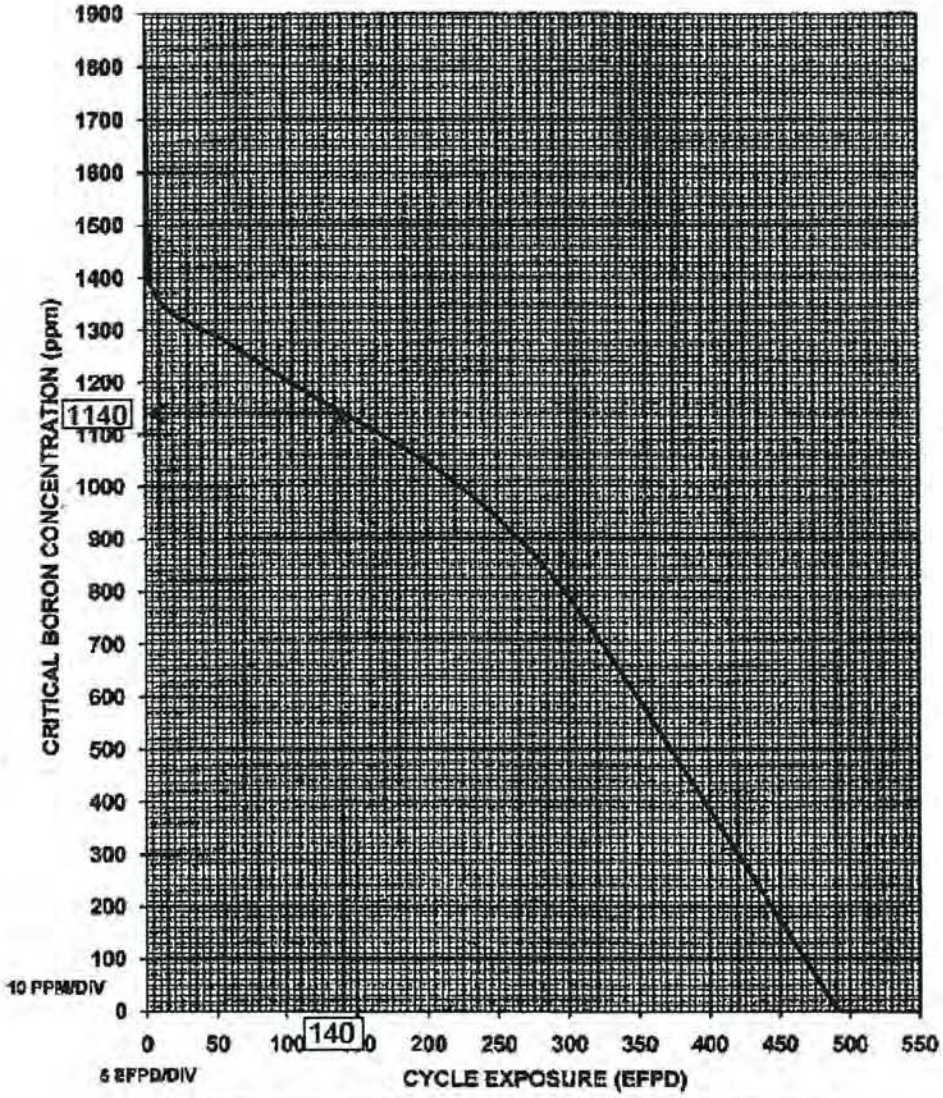
Comment:

Terminating Cue:	**When OST-1036, Attachment 3, Manual SDM Calculation is completed.** **END OF JPM**

STOP TIME: _____

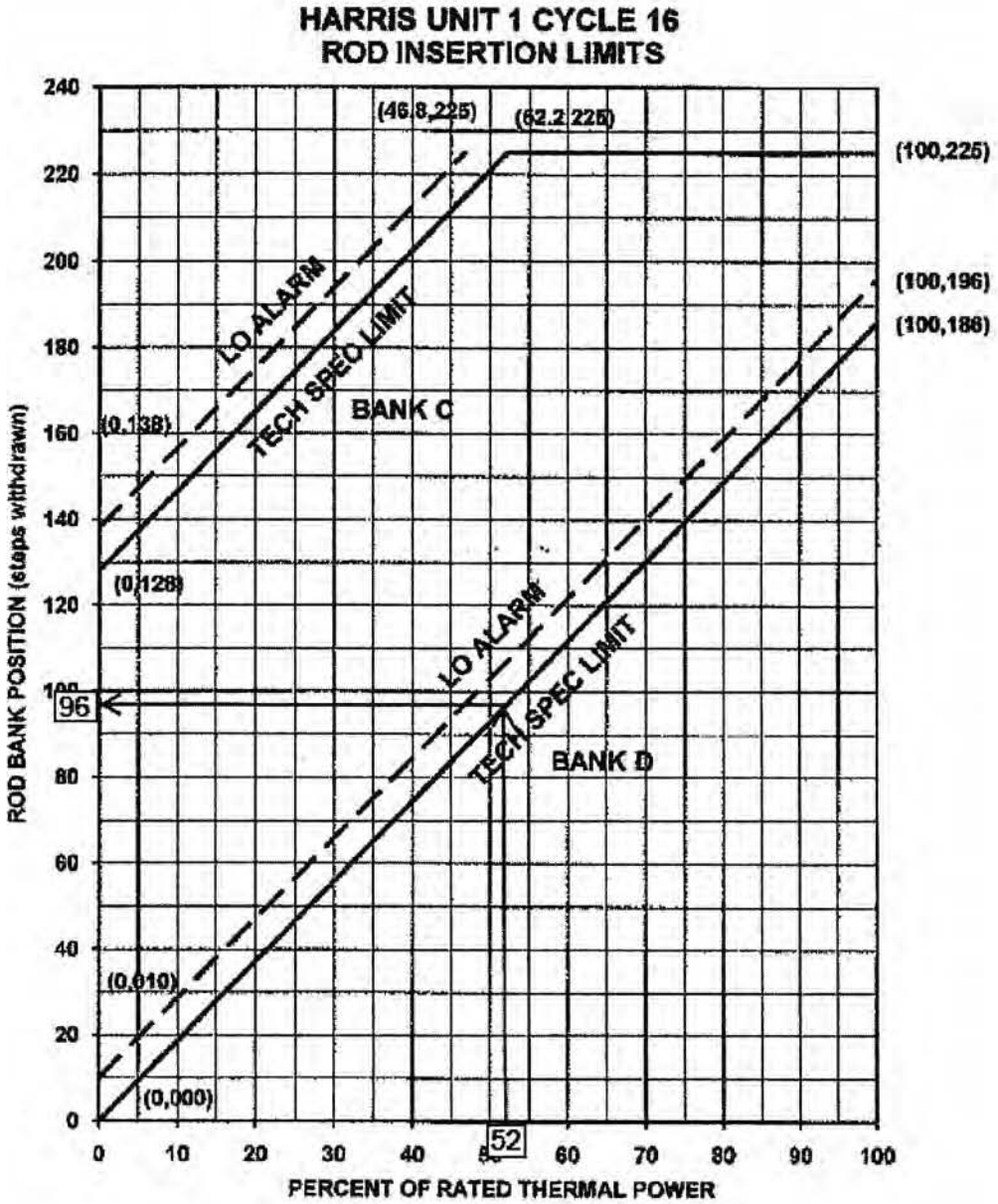
KEY

HARRIS UNIT 1 CYCLE 16
CRITICAL BORON CONCENTRATION vs. CYCLE EXPOSURE
AT HFP, ARO, EQUILIBRIUM XENON CONDITIONS



Determination of Boron concentration for 140 EFPD

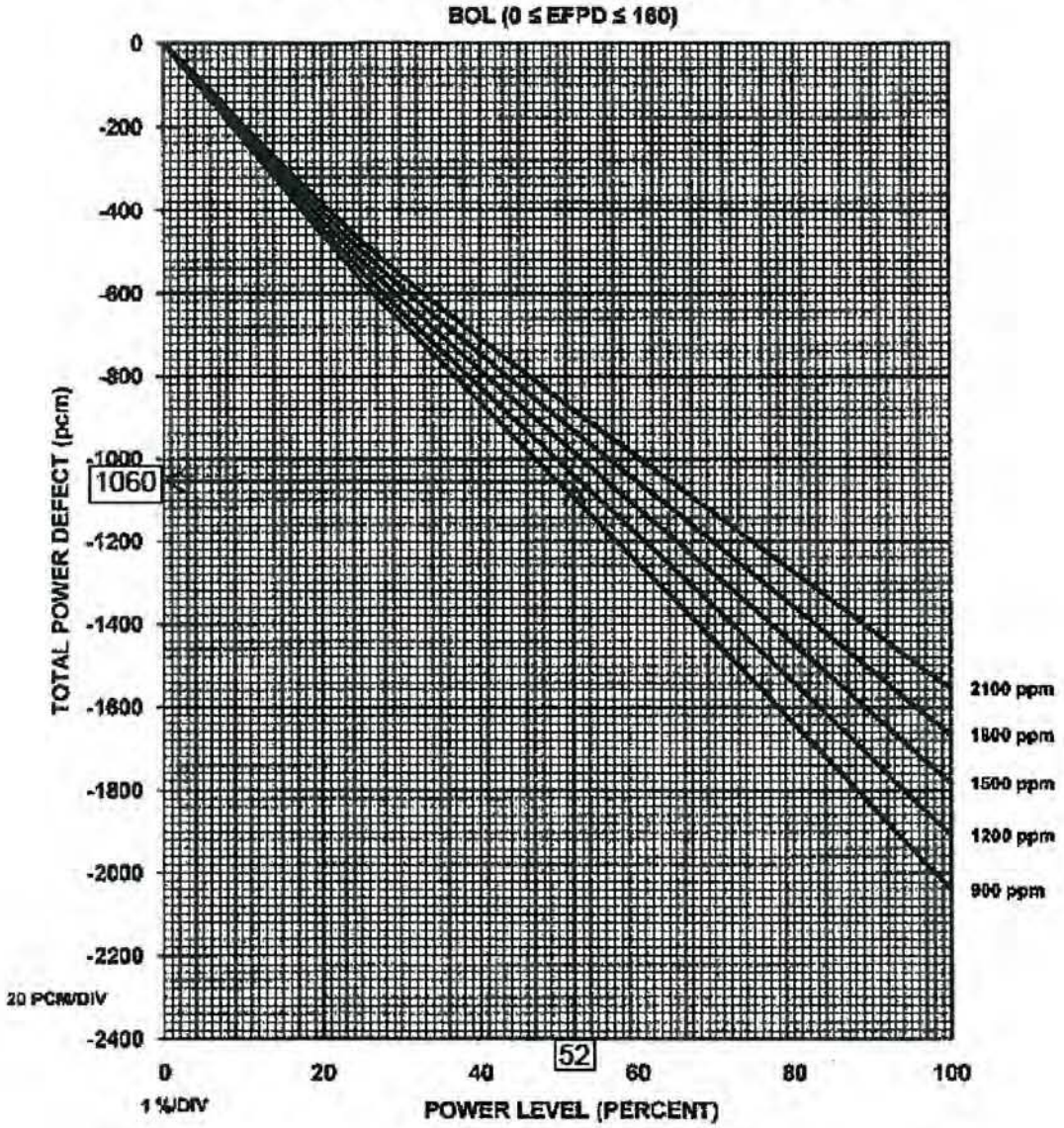
CURVE NO.	A-16-23	REV NO.	0
ORIGINATOR	Emily G Miller	DATE	4/27/09
SUPERVISOR	[illegible]	DATE	4/27/09
SUPERINTENDENT - SHIFT OPERATIONS	[illegible]	DATE	4/28/09



CURVE NO.	F-16-1	REV NO.	0
ORIGINATOR		DATE	4/27/09
SUPERVISOR		DATE	4/27/09
SUPERINTENDENT - SHIFT OPERATIONS		DATE	4-28-09

KEY

HARRIS UNIT 1 CYCLE 16
POWER DEFECT vs. POWER LEVEL
for VARIOUS BORON CONCENTRATIONS



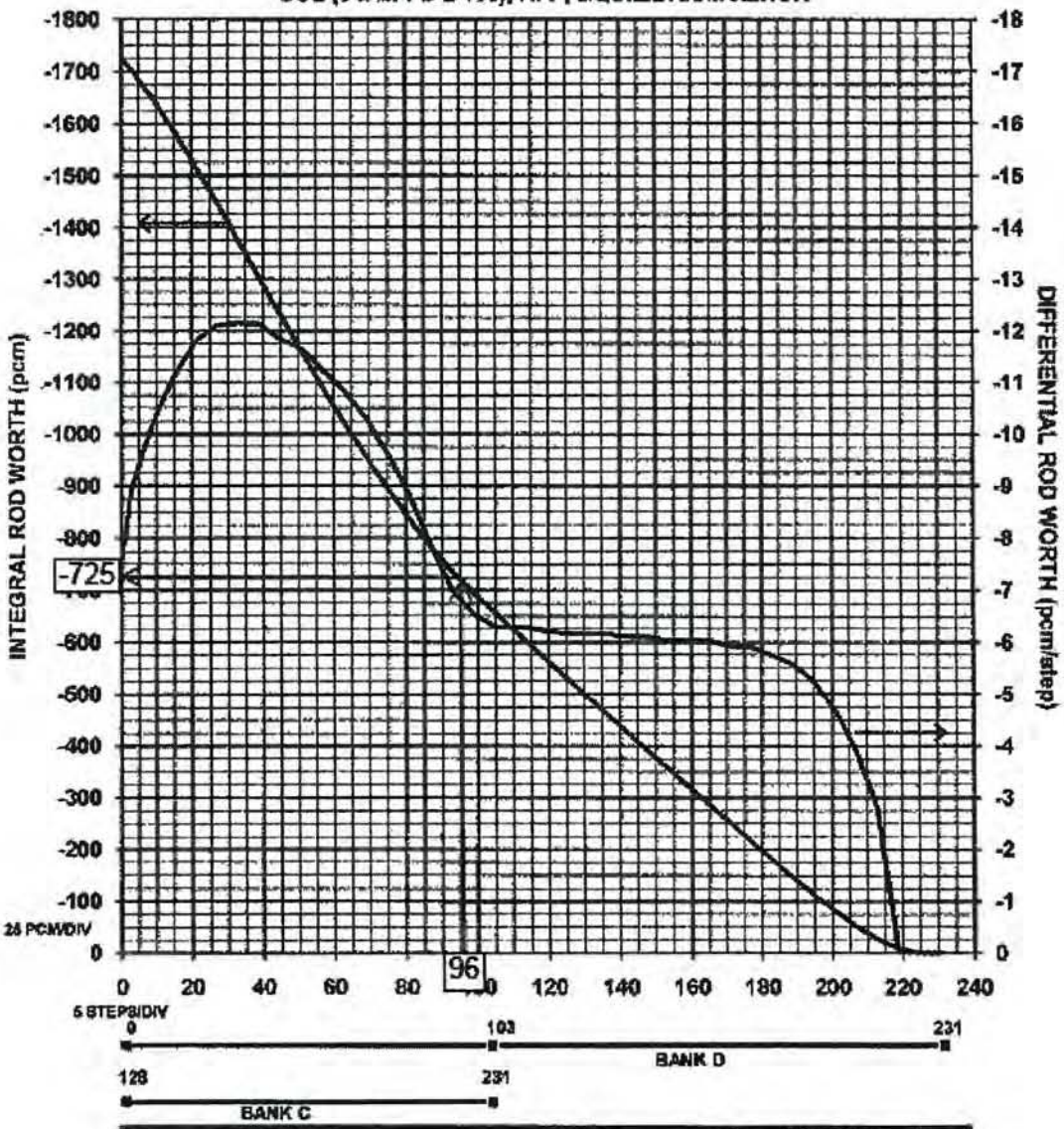
CURVE NO.	C-16-1	REV NO.	0
ORIGINATOR	[illegible]	DATE	4/27/09
SUPERVISOR	[illegible]	DATE	4/27/09
SUPERINTENDENT - SHIFT OPERATIONS	[illegible]	DATE	4/28/09

KEY

HARRIS UNIT 1 CYCLE 16
DIFFERENTIAL AND INTEGRAL
ROD WORTH CONTROL BANKS D and C

MOVING WITH 103 STEP OVERLAP

BOL (0 ≤ EFPD ≤ 160), HFP, EQUILIBRIUM XENON



CURVE NO.	A-16-9	REV NO.	0
ORIGINATOR	Emily G Miller	DATE	4/27/09
SUPERVISOR	[illegible]	DATE	4/27/09
SUPERINTENDENT - SHIFT OPERATIONS	[illegible]	DATE	4/28/09

EXAMINER CALCULATION KEY

(SHADED AREA BELOW INDICATES DATA ALREADY PROVIDED)

Manual SDM Calculation (Modes 1 and 2)

1. Reactor power level. **52** %

2. Rod insertion limit for the above power level

   96 ± 2 steps on bank **D**

3. Burn up (POWERTRAX/MCR Status Board). **140** EFPD

4. Present RCS Boron Concentration **1140** ppm

NOTE: Use absolute values of numbers obtained from curves.

5. Total worth of all control and shutdown banks, minus the worth of the most reactive rod for Fuel Cycle 16.

   6980 pcm
   (a)

6. Cycle 16 Power defect for the power level recorded in Step 1. (Refer to Curves C-X-1 to C-X-3).

   Curve used **C-16-1** **1060 ± 50** pcm
   (b)

NOTE: HFP curves are used for power levels of 10% or greater.

7. Inserted control rod worth at the rod insertion limit recorded in Step 2. (Refer to Curves A-X-6 to A-X-11)

   Curve used **A-16-9** **725 ± 25** pcm
   (c)

8. Worth of any additional immovable or untrippable rods (for each stuck rod, use the most reactive single rod worth (1129 pcm) or obtain individual withdrawn rod worth from the reactor engineer).

   0 pcm
   (d)

9. Determine the Total Shutdown Margin using the following formula:

   Total SDM C_B = **6980** (a) - **1060 ± 50** (b) - **725 ± 25** (c) - **0** (d)

   5195 ± 75 pcm
   (e)

✓ - Denotes Critical Steps

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC EXAM Admin JPM RO A1-2 - Perform A Manual Shutdown Margin Calculation

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 been operating at 52% power for 6 weeks while maintenance is replacing the motor on the 'A' Main Feedwater Pump • Core burnup is 140 EFPD • RCS boron concentration is 1140 ppm • **NO** rods are believed to be immovable / untrippable • POWERTRAX is **NOT** available

Initiating Cue:	The CRS has directed you to complete OST-1036, Shutdown Margin Calculation Modes 1-5, Section 7.3, "Manual SDM Calculation (Modes 1 and 2)" for current plant conditions. **NOTE: For this JPM assume independent verification has been performed.**

PERFORMANCE INFORMATION

Facility: Shearon Harris Task No.:

Task Title: Determine Clearance Requirements for a CSIP JPM No.: 2009B NRC Exam Admin JPM RO A2

K/A Reference: G 2.2.13 RO 4.1 SRO 4.3

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 plant is defueled. CSIP 1B-SB is required to be placed under a clearance for seal replacement. Cooling water and lube oil systems are NOT required to be placed under clearance. There is no known isolation boundary leakage.

Initiating Cue: You have been directed to determine the clearance requirements for CSIP 1B-SB using the SFDs, and System Operating Procedures, as necessary. Provide the clearance installation sequence. The complete electrical and mechanical protection and the necessary vent and drain paths. The MSO has approved using single valve isolation.

NOTE: LISTING OF CIT'S IS NOT REQUIRED FOR THIS JPM.

IT IS NOT INTENDED THAT YOU ACTUALLY GENERATE A CLEARANCE. ONLY PROVIDE THE EVALUATOR WITH A LISTING OF THE REQUIRED COMPONENTS, POSITIONS AND THE INSTALLATION SEQUENCE.

Task Standard:	Provide complete electrical and mechanical isolation of CSIP 1B-SB
Required Materials:	OPS-NGGC-1301, Equipment Clearance, pgs. 38 and 41, Rev. 20 OP-107, Chemical and Volume Control System, Rev. 78 OP-107.03, Rev. 5 SFD 2165 S-1304 and S-1305 Additional copies of page 12 of this JPM available
General References:	OPS-NGGC-1301, Equipment Clearance, Rev. 20 OP-107, Chemical and Volume Control System, Rev. 78 OP-107.03, Rev. 5 SFD 2165 S-1304 and S-1305
Handouts:	JPM Cue Sheets SFD 2165 S-1304 and S-1305 OP-107, Chemical and Volume Control System Rev. 78 OPS-NGGC-1301, Equipment Clearance Rev. 20
Time Critical Task:	No
Validation Time:	25 minutes

Critical Step Justification

Step 2	Critical to remove power from the pump for personnel protection.
Step 3	Critical to isolate suction source to allow pump to be depressurized.
Step 4	Critical to isolate discharge path to allow pump to be depressurized.
Step 5	Critical to isolate miniflow path to allow pump to be depressurized.
Step 6	Critical to isolate miniflow path to allow pump to be depressurized.
Step 7	Critical to open vent path to allow pump to depressurize.
Step 8	Critical to open drain path to allow pump to depressurize.

START TIME: _____

Examiner provides applicant the required references.

Performance Step: 1 Obtain a copy of the appropriate drawings and procedures **(OPS-NGGC-1301, OP-107, SFD 2165 S-1304 and 1305)**

Standard: Operator obtains a copy of OP-107 to determine electrical requirements. SFD 2165 S-1304 and S-1305 to determine mechanical requirements. OPS-NGGC-1301 to determine proper installation sequence for clearance.

Comment:

NOTE: SEE JPM ATTACHMENT FOR A COMPLETE LISTING OF EACH COMPONENT AND REQUIRED POSITION. JPM STEPS ARE NOT REQUIRED TO BE PERFORMED IN THE LISTED SEQUENCE.

✓ **Performance Step: 2** **Determine the electrical supply breaker for CSIP 1B-SB**

Standard: Refers to OP-107 (or any other valid source) and determines the electrical supply breaker for CSIP 1B-SB to be 6.9 KV Emergency Bus 1B-SB, Cubicle 4

(BREAKER RACKED OUT)

Also determines pump has MCB and ACP switch and includes a CIT on CSIP 'B' switch for each location

Comment:

Examiners Note:	**CRITICAL TO REMOVE POWER FROM PUMP.** *NOTE: CIT's ARE NOT REQUIRED TO BE INCLUDED FOR CRITICAL PORTION OF THIS STEP*

✓ **Performance Step: 3** Determine the suction valve for CSIP 1B-SB.

Standard: Refers to S-1305 and determines the suction valve for CSIP 1B-SB to be 1CS-187, B CSIP Suction Isol Vlv **(CLOSE)**

Comment:

✓ **Performance Step: 4** Determine the discharge isolation for CSIP 1B-SB

Standard: Refers to S-1305 and determines the valve to isolate CSIP 1B-SB discharge is 1CS-197, B CSIP Discharge Isol Vlv **(CLOSE)**

Comment:

✓ **Performance Step: 5** Determine the normal miniflow isolation for CSIP 1B-SB.

Standard: Refers to S-1305 and OP-107 and determines the valve to isolate normal miniflow path for CSIP 1B-SB is 1CS-196 SB, CHARGING/SI PUMP B-SB MINIFLOW ISOL, and power supply for valve is 1B35-SB (Breaker 4E)

(VALVE TO BE CLOSED WITH POWER REMOVED – LOCAL HANDWHEEL TO BE IN CLOSED)

Also determines valve has MCB switch and includes a CIT on 1CS-196 switch

Comment:

Evaluator Note:	*CIT IS NOT REQUIRED TO BE INCLUDED FOR SATISFACTORY COMPLETION OF THIS STEP.*

✓ **Performance Step: 6** Determine the alternate miniflow isolation for CSIP 1B-SB

Standard: Refers to S-1304 and determines the valve to isolate alternate miniflow path for CSIP 1B-SB is 1CS-751, B CSIP Alt Mini Flow Man Isol

(CLOSE)

Comment:

✓ **Performance Step: 7** Determine the vent path for CSIP 1B-SB

Standard: Refers to S-1305 and determines the valve to vent CSIP 1B-SB is 1CS-188, B CSIP Suction Px Isol Vlv

(OPEN WITH CAP REMOVED)

Comment:

Evaluator Note:	*EITHER STEP 7 OR STEP 8 IS CRITICAL. ONE OR THE OTHER MUST BE PERFORMED, BUT NOT BOTH. HOWEVER, IF BOTH ARE PERFORMED, THIS IS ALSO ACCEPTABLE.*

✓ **Performance Step: 8** Determine the drain path for CSIP 1B-SB

Standard: Refers to S-1305 and determines the valves to drain CSIP 1B-SB discharge piping to be 1CS-189, B CSIP Casing Leak Off Drain Vlv, and 1CS-190, B CSIP Casing Leak Off Drain Isol Vlv

(BOTH OPEN)

Comment:

Evaluator Note:	*EITHER STEP 7 OR STEP 8 IS CRITICAL. ONE OR THE OTHER MUST BE PERFORMED, BUT NOT BOTH. HOWEVER, IF BOTH ARE PERFORMED, THIS IS ALSO ACCEPTABLE.*

Evaluator Cue:	**When applicant completes and returns clearance list.** **END OF JPM**

Stop Time: _____

KEY

JPM ATTACHMENT

COMPONENT LISTING AND REQUIRED POSITIONS

COMPONENT	POSITION
1) CSIP 1B-SB P.S. - 6.9 KV Emergency Bus 1B-SB, Cubicle 4.	Racked Out
2) 1CS-196 SB, CHARGING/SI PUMP B-SB MINIFLOW ISOL	Closed
3) 1CS-196 SB P.S. - 1B35-SB, Breaker 4E	Off
4) 1CS-197, B CSIP Discharge Isol Vlv.	Shut
5) 1CS-187, B CSIP Suction Isol Vlv.	Shut
6) 1CS-751, B CSIP Alt Mini Flow Man Isol.	Shut

7) Accept - EITHER **one vent path** OR **the drain path** or **BOTH a vent path and drain path.**

NOTE: Any of the following vent valves will support a vent path for the pump. One or more of these vent paths are required to be identified

VENT PATHS

1CS-188, B CSIP Suction Px Isol Vlv	Uncapped/Open
- OR –	
1CS-802, ECCS Outter Vent Vlv CSIP B Disch Upstream of 1CS-192	Uncapped/Open
- AND -	
1CS-801, ECCS Inner Vent Vlv CSIP B Disch Upstream of 1CS-192	Open
- OR –	
1CS-800, ECCS Outter Vent Vlv CSIP B Suct Downstream of 1CS-187	Uncapped/Open
- AND -	
1CS-799, ECCS Inner Vent Vlv CSIP B Suct Downstream of 1CS-187	Open

DRAIN PATH

1CS-189, B CSIP Casing Leak Off Drain Vlv	Open
- AND -	
1CS-190, B CSIP Casing Leak Off Drain Isol Vlv	Open

NOTE – CITs are NOT required for satisfactory completion of JPM.

VERIFICATION OF COMPLETION

Job Performance Measure No.: Determine Clearance Requirements for a CSIP

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 defueled. CSIP 1B-SB is required to be placed under a clearance for seal replacement. Cooling water and lube oil systems are NOT required to be placed under clearance. There is no known isolation boundary leakage.

Initiating Cue:	You have been directed to determine the clearance requirements for CSIP 1B-SB using the SFDs, and System Operating Procedures, as necessary. Provide the clearance installation sequence. The complete electrical and mechanical protection and the necessary vent and drain paths. The MSO has approved using single valve isolation. **NOTE: LISTING OF CIT'S IS NOT REQUIRED FOR THIS JPM.** **IT IS NOT INTENDED THAT YOU ACTUALLY GENERATE A CLEARANCE. ONLY PROVIDE THE EVALUATOR WITH A LISTING OF THE REQUIRED COMPONENTS, POSITIONS AND THE INSTALLATION SEQUENCE.**

NOTE: Provide a list of components in the proper installation sequence to the examiner using the following page(s).

Additional pages are available upon request.

CSIP 1B-SB CLEARANCE COMPONENT LISTING AND REQUIRED POSITIONS

SEQUENCE	COMPONENT	POSITION

Facility: Shearon Harris | Task No.:

Task Title: Using survey maps determine stay times | JPM No.: 2009B NRC Exam Admin JPM RO A-3

K/A Reference: G.2.3.4 RO 3.2 SRO 3.7

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: Two individuals are tasked to hang a clearance on the 'A' ED Tank Transfer Pump. The clearance includes the following valves:

- 1ED-12
- 1ED-13
- 1ED-14
- 1ED-15
- 1ED-17
- 1ED-18

Initiating Cue: Two Operators are being assigned to hang a clearance and perform work in a radiological area. Operator 1 has an accumulated annual Whole Body dose of 1760 mrem (Progress Energy). Operator 2 has an accumulated annual Whole Body dose of 700 mrem (Progress Energy) and worked at Saint Lucie earlier this year where he has accumulated 2700 mrem.

The clearance and work activity is for the 'A' ED Tank Transfer Pump.

Using the supplied survey map, determine the maximum allowable individual stay times for each Operator that would prevent exceeding the Progress Energy Annual Administrative dose limit while performing these activities.

Do not consider dose received during transit. The calculated dose should be ONLY what they would receive while working at the valves for the clearance.

Complete the information below and return to the evaluator when complete.

Task Standard:	Calculation of stay times based on survey maps, two hours for Operator 1, five hours for Operator 2.
Required Materials:	Survey map A4 RAB 190' North Valve MAP 2 SFD-5-S-0684
General References:	DOS-NGGC-0004 (Rev. 10) DOS-NGGC-0004 "Progress Energy Annual Administrative Dose Limits" Section 9.3.1 LIMIT = 2 rem Progress Energy dose not to exceed 4 rem total dose if non- Progress Energy dose for the current year has been determined.
Time Critical Task:	No
Validation Time:	12 minutes

Critical Task Justification

Step 1	Must determine dose rates in order to calculate stay time
Step 2	Must determine available dose to determine stay time.
Step 3	Calculation of stay time.

START TIME: _____

Evaluator Note:	**The order of performance does not matter** **IF THE APPLICANT ASKS FOR IT: Provide a copy of DOS-NGGC-0004, Rev. 10**

✓ **Performance Step: 1** Using Radiological Survey Record Map A4 and RAB 190' North map, determines dose rates in the area where the clearance will be applied

Standard: Identifies that General Area Dose Rates are 120 mrem/hr

Comment:

✓ **Performance Step: 2** Determine the remaining dose for the year for each individual

Standard: Operator 1: **240 mrem**

(2000 mrem - 1760 mrem = 240 mrem

Operator 2: **600 mrem**

4000 mrem - 700 mrem (PE) - 2700 mrem (SL) = 600 mrem

Comment:

✓ **Performance Step: 3** Determine stay time for each operator (based on 1st Operator reaching 2 Rem and the 2nd Operator reaching 4 Rem - for the year)

Standard: Operator 1: **2 hours**

240 mrem ÷ 120mrem/hr = 2 hrs

Operator 2: **5 hours**

600 mrem ÷ 120 mrem/hr = 5 hours

Comment:

Terminating Cue:	**After the stay time has been calculated, this JPM is complete** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam Admin JPM RO A-3 - Using survey maps determine stay times. (DOS-NGGC-0004 Rev. 10)

DOS-NGGC-0004 "Progress Energy Annual Administrative Dose Limits" Section 9.3.1

LIMIT = 2 rem Progress Energy dose not to exceed 4 rem total dose if non- Progress Energy dose for the current year has been determined.

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: Two individuals are tasked to hang a clearance on the 'A' ED Tank Transfer Pump. The clearance includes the following valves:

- 1ED-12
- 1ED-13
- 1ED-14
- 1ED-15
- 1ED-17
- 1ED-18

INITIATING CUE: Two Operators are being assigned to hang a clearance and perform work in a radiological area. Operator 1 has an accumulated annual Whole Body dose of 1760 mrem (Progress Energy). Operator 2 has an accumulated annual Whole Body dose of 700 mrem (Progress Energy) and worked at Saint Lucie earlier this year where he has accumulated 2700 mrem.

The clearance and work activity is for the 'A' ED Tank Transfer Pump.

Using the supplied survey map, determine the maximum allowable individual stay times for each Operator that would prevent exceeding the Progress Energy Annual Administrative dose limit while performing these activities.

Do not consider dose received during transit. The calculated dose should be ONLY what they would receive while working at the valves for the clearance.

Complete the information below and return to the evaluator when complete.

Name _____

Record the maximum allowable stay time calculations below to the nearest hour and minute.

Operator 1: _____ Operator 2: _____

FINAL SRO JPADMIN JPM5

Facility: Shearon Harris Task No.:

Task Title: During a Loss of Shutdown Cooling, determine the time that the RCS will reach Core Boiling and Boil-Off JPM No.: 2009B NRC Exam Admin JPM SRO A1-1

K/A Reference: G2.1.20 RO 4.6 SRO 4.6

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: On 9/05/09 at 0000 the plant was shutdown for a refueling outage.

- While the Reactor cavity was being filled the 'B' RHR pump tripped. Motor repairs are not expected to be completed until 9/25/09.
- The Reactor cavity fill was completed to the normal refueling levels with the 'A' RHR pump.
- No fuel has been moved due to problems with the Manipulator Crane and the Source Range audible count rate.

The current date is 9/22/09

- The current time is 1400 and the 'A' RHR pump just tripped.
- The crew is implementing AOP-020, Loss of RCS Inventory or RHR While Shutdown.
- Core exit thermocouples are rising; they are currently reading 135°F.

Initiating Cue: IAW AOP-020 you are directed to determine the time to reach core boiling and core boil-off time. Mark up your curves to indicate where you are determining these times. Return the curves to the examiner with this page. Write your estimates of "time to boil" and "time to boil-off" on the lines at the bottom of this page (below).

Task Standard:	Candidate obtains curves and correctly identifies the time to reach core boiling and core boil-off time
Required Materials:	Curve Book Straight Edge
General References:	AOP-020 (Rev. 31) Curve Book curves H-X-8, 9, 10 and 11 (All Rev. 2)
Time Critical Task:	No
Validation Time:	10 minutes

Critical Step Justification

Step 3	Step required in order to accurately determine "time to boil" using the appropriate curve.
Step 4	Step required in order to accurately determine "time to boil-off" using the appropriate curve.

START TIME: _____

Performance Step: 1 OBTAIN CURVES NEEDED FOR CALCULATION
(Curve Book will be provided to the candidate)

Standard: Refers to curves H-X-8 through H-X-11

Comment:

Performance Step: 2 Refers to provided data and determines that curve H-X-9 is required to calculate "time to boil" and curve H-X-11 is required to calculate "boil-off" time

Standard: Reviews curves and determines which ones are appropriate to determine the "time to boil" and "boil-off time"

Comment:

✓ **Performance Step: 3** Based on time since shutdown (9/5/09 – 9/22/09) 17 days 14 hours since shutdown and current RCS temperature of 135°F using curve H-X-9 determine "time to boil"

Standard: Reviews curve H-X-9
Determines that "time to boil" is **22 minutes** (± 2 minutes)

Comment:

✓ **Performance Step: 4** Based on time since shutdown (9/5/09 – 9/22/09) 17 days 14 hours since shutdown and current RCS temperature of 135°F using curve H-X-11 determine "time to boil-off"

Standard: Reviews curve H-X-11

Determines that "time to boil-off" is **4 hrs and 45 minutes** (± 15 minutes) or (4.5 to 5.0 hours)

Comment:

Terminating Cue: **After completing the "time to boil" and "time to boil-off" calculation, the evaluation on this JPM is complete.**

END OF JPM

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam Admin JPM SRO A1-1 - During a Loss of Shutdown Cooling, determine the time that the RCS will reach Core Boiling and Boil-Off

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:	On 9/05/09 at 0000 the plant was shutdown for a refueling outage. • While the Reactor cavity was being filled the 'B' RHR pump tripped. Motor repairs are not expected to be completed until 9/25/09. • The Reactor cavity fill was completed to the normal refueling levels with the 'A' RHR pump. • No fuel has been moved due to problems with the Manipulator Crane and the Source Range audible count rate. The current date is 9/22/09 • The current time is 1400 and the 'A' RHR pump just tripped. • The crew is implementing AOP-020, Loss of RCS Inventory or RHR While Shutdown. • Core exit thermocouples are rising; they are currently reading 135°F.

INITIATING CUE:	IAW AOP-020 you are directed to determine the time to reach core boiling and core boil-off time. Mark up your curves to indicate where you are determining these times. Return the curves to the examiner with this page. Write your estimates of "time to boil" and "time to boil-off" on the lines at the bottom of this page (below).

Name _____

Record your calculations here and return your curves to the examiner:

TIME TO BOIL _____

TIME TO BOIL-OFF _____

Facility:	Shearon Harris	Task No.:	301013H401
Task Title:	Determine Boric Acid Addition Following CR Evacuation	JPM No.:	2009B NRC Exam Admin JPM SRO A1-2
K/A Reference:	G2.1.25 RO 3.9 SRO 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 Control Room has been evacuated and the MCB transfer to the ACP has been completed. Plant management has directed a plant cooldown to mode 5 utilizing AOP-004. BAT level is 83% with a concentration of 7205 ppm. The RCS is currently 915 ppm.

Initiating Cue: You are the CRS. Perform a calculation of the minimum required boric acid addition to achieve cold shutdown and BAT level change per AOP-004, Section 3.2 Step 25 to obtain an OST-1036 cold shutdown boron requirement of 1740 ppm.

Task Standard:	Utilizes Curve E-X-2 to determine required boric acid addition to achieve cold shutdown and Curve D-2 to obtain a change of 27 to 29 percent in BAT level (or a final level of 54 to 56 percent). Actual is 28% change (or 55% final).
Required Materials:	Curve Book Calculator
General References:	AOP-004 (Rev. 46) Curve Book nomograph E-X-2 (Rev. 4) and Curve D-2 (Rev. 0)
Time Critical Task:	No
Validation Time:	15 minutes

Critical Step Justification

Step 3	Step is critical in order to correctly identify the amount of boric acid required boric acid concentration.
Step 4	Step is critical in order to determine the change in tank level.

START TIME: _____

Performance Step: 1 OBTAIN PROCEDURE

Standard: Obtains AOP-004 and refers to Section 3.2 Step 25
(Copy of step will be provided to the candidate)

Comment:

Performance Step: 2 Obtain cold shutdown boron concentration using copy of latest OST-1036 in back of book.

Standard:

Evaluator Cue:	**(If candidate asks: This information is provided in the initiating cue.)** **Required shutdown boron concentration is 1740 ppm**

Comment:

✓ **Performance Step: 3** Determine required gallons of boric acid to achieve required RCS boron concentration using the formula on the boron addition nomograph E-2

Standard: Utilizes formula on Nomograph E-2 and calculates between 9130 to 9030 gallons of boric acid to be added. Actual is 9080 gallons

Boron Addition (RCS @ 350°F)

$$V_B = \frac{-M}{8.33} \ln\left(\frac{7000 - C_f}{7000 - C_i}\right)$$

$$M = 538{,}000$$

Examiners NOTE: **The Nomograph formula found on Curve E-X-2 assumes that the BAT boron concentration is 7000 ppm. In this JPM the given information is BAT concentration is 7205 ppm. The candidate MUST use the given concentration of 7205 ppm to come to the correct boron addition.**

CORRECT CALCULATION

$$V_B = \frac{-538000}{8.33} \ln\left(\frac{7205-1740}{7205-915}\right) = 9080$$

If candidate uses 7000 ppm for BAT BA concentration (from the nomograph) instead of changing to 7205 ppm the result will be 9409 gallons

INCORRECT CALCULATION
(using wrong BAT concentration)

$$V_B = \frac{-538000}{8.33} \ln\left(\frac{7000-1740}{7000-915}\right) = 9409$$

If candidate uses correct BAT BA concentration but uses the wrong Curve (E-X-1 verses E-X-2) the result will be 7443 gallons

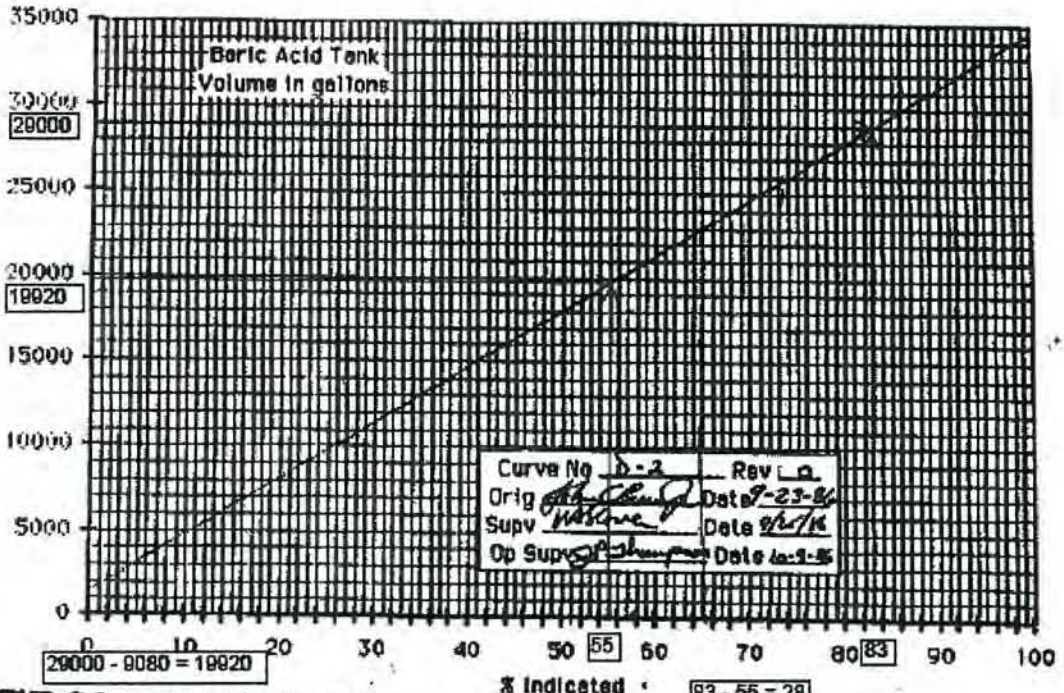
INCORRECT CALCULATION
(using wrong RCS Mass – wrong curve)

$$V_B = \frac{-441000}{8.33} \ln\left(\frac{7205-1740}{7205-915}\right) = 7443$$

Comment:

✓ **Performance Step: 4** Determine the change in boric acid tank level equivalent to the required gallons of boric acid using the boric acid tank curve D-2

Standard: Utilizes Curve D-2 and obtains a change of 27 to 29 percent (or a final level of 54 to 56 percent).
Actual is 28% change (or 55% final).



CONTROL ROOM COPY
DO NOT [illegible]

Comment:

STOP TIME: _____

Terminating Cue:	**When candidate completes the calculations the JPM is completed.** **END OF JPM**

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam Admin JPM SRO A1-2 - Determine boric acid addition following control room evacuation

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

✓- Denotes Critical Steps

Initial Conditions:	The Control Room has been evacuated and the MCB transfer to the ACP has been completed. Plant management has directed a plant cooldown to mode 5 utilizing AOP-004. BAT level is 83% with a concentration of 7205 ppm. The RCS is currently 915 ppm.

Initiating Cue:	You are the CRS. Perform a calculation of the minimum required boric acid addition to achieve cold shutdown and BAT level change per AOP-004, Section 3.2 Step 25 to obtain an OST-1036 cold shutdown boron requirement of 1740 ppm.

Facility: Shearon Harris | Task No.: 002001H201

Task Title: Perform Review of Partial OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4 | JPM No.: 2009B NRC Exam Admin JPM SRO A2

K/A Reference: G2.2.37 RO 3.6 SRO 4.6

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 Plant is operating at 100% Power
- A partial OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4, has just been completed on the 'A' BA pump (section 7.2).

Initiating Cue: You are the CRS. You are to review the completed OST-1007 then discuss any identified problems with the evaluator.

Evaluator Note: Explain to candidate that once he has identified all discrepancies and described them to the evaluator, the cue for the end of the JPM will be his handing the procedure back to the evaluator.

If asked, PMID 22958-03 is NOT due.

Task Standard:	Identify following errors: Pump differential pressure does not meet acceptance criteria. Pump Outboard Vertical vibration is outside of the Acceptable range. Data correction on Attachment 3 not documented correctly. Declare 'A' Boric Acid Transfer Pump inoperable.
Required Materials:	Copy of completed OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4.
General References:	OST-1007 (Rev. 38)
Time Critical Task:	No
Validation Time:	20 minutes

Critical Step Justification

Step 2	Identifies pump performance data is outside Acceptance Criteria.
Step 3	Identifies 'A' Boric Acid Transfer pump is inoperable.
Step 4	Identifies vibration data is outside Acceptance Criteria.

START TIME: _____

OST-1007

Performance Step: 1 Obtain procedure.

Standard: Receives copy of completed OST-1007 ready for review.

Evaluator Cue:	**Provide OST-1007 for review**

Comment:

OST-1007, Attachment 2 – Performance Data

✓ **Performance Step: 2** Identifies pump differential pressure recorded on Attachment 2 – Performance Data is outside Quarterly test acceptance criteria.

Standard: Identifies pump differential pressure does not meet Quarterly test acceptance criteria as listed on Attachment 2 – Performance Data.

Evaluator Note:	**Copy of Attachment 2 included in back of JPM.**

Comment:

✓ **Performance Step: 3** Identifies 'A' Boric Acid Transfer pump is inoperable.

Identifies Technical Specification 3.1.2.2 applicable but no action required as long as RWST is operable (tracking EIR).

Identifies need for NCR per Instruction 1.b of Attachment 2 (sheet 2 of 3).

Standard: (✓) Declares 'A' Boric Acid Transfer pump inoperable.

Discusses need to generate EIR (Equipment Inoperability Record) and NCR (Nuclear Condition Report).

Evaluator Cue:	**May need to prompt candidate to discuss operability and related Technical Specifications.** **If asked, another Operator will generate the EIR and NCR**

Comment:

OST-1007, Attachment 3 – Vibration Data

✓ **Performance Step: 4** Identifies the Outboard Vertical (Out Vert) vibration reading is outside of the Acceptable range but within the Alert Range on Attachment 3 - Vibration Data.

Standard: Identifies the Outboard Vertical vibration reading is outside of the Acceptable range but within the Alert Range on Attachment 3, Vibration Data.

Evaluator Note:	**Copy of Attachment 3 included in back of JPM.**

Comment:

OST-1007, Attachment 3 – Vibration Data

Performance Step: 5 Acknowledges that Instruction 1 applies to Outboard Vertical (Out Vert) vibration value and that an STR and NCR should have been written and documented on Attachment 8, Certifications and Reviews.

Standard: Acknowledges that Instruction 1 applies requiring that an STR (Surveillance Testing Request) and NCR should have been written and documented on Attachment 8, Certifications and Reviews.

Evaluator Cue:	**If asked, another Operator will generate the STR and NCR**

Comment:

OST-1007, Attachment 3 – Vibration Data

Performance Step: 6 Identifies data correction to Inboard Horizontal (In Horiz) vibration data on Attachment 3 not documented correctly.

Standard: Identifies operator must correctly document vibration data change on Attachment 3 (single lineout, initial and date) (ref RDC-NGGC-0001 section 9.2.10).

Comment:

OST-1007

Performance Step: 7 Completes review of procedure.

Standard: Completes review of procedure.

Evaluator Cue:	**Acknowledges that review has been completed, discrepancies identified and that follow up actions need to be taken before surveillance can be completed and submitted.**

Evaluator Note:	**Candidate will likely explain the he would not sign off CRS review signature until he followed up on discrepancies first.**

Comment:

Terminating Cue:	**CRS hands copy of OST-1007 to evaluator indicating that he has completed his review.** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: Perform Review of Partial OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: _____ Date: _____

KEY

Attachment 2 - Performance Data
Sheet 3 of 3

1A-SA Boric Acid Transfer Pump (continued)

NOTE 4: Quarterly test acceptance criteria.

NOTE 5: IF PMID 22958-03 is due, USE 2-Year CPT acceptance criteria. This test satisfies the quarterly test.

NOTE 6: In the event the quarterly pump pressure differential reading exceeds 2-Year CPT acceptance criteria but remains within quarterly acceptance criteria, the pump remains operable. Engineering/IST will evaluate as part of its trending program.

NOTE 7
1. IF pump hydraulic data is outside the Acceptable Range but within the Alert Range:
   a. INITIATE an STR to direct the Surveillance Testing Scheduling Coordinator to double the testing frequency of the pump.
   b. INITIATE an NCR.
   c. RECORD the STR and NCR numbers in the Comments section.
2. IF pump hydraulic data meets the Required Action Criteria:
   a. DECLARE the pump INOPERABLE.
   b. INITIATE an NCR.

* CIRCLE the source of the Reading.

Step	Parameter	Instrument	Reading	Acceptance Criteria
7.2.14	Idle Suction Pressure	Test Instrument @ 1CS-534	15.8	≥ 5 psig
7.2.16	Boric Acid Pump 1B-SB Idle Disch Press	PI-01CS-0110SW	18.0	N/A (Trending Purposes Only)
7.2.25	FK-113 Demand Output	FK-113	30%	N/A (Trending Purposes Only)
7.2.28	FK-113 Demand Output	FK-113	49%	N/A (Trending Purposes Only)
7.2.32	Flow Rate	FCS0113A/ FR-113 *	35	34 to 36 gpm
7.2.34	Operating Discharge Pressure	Test Instrument @ 1CS-535-V1	137	N/A
7.2.35	Operating Suction Pressure	Test Instrument @ 1CS-534	15.7	≥ 5 psig
7.2.36	Boric Acid Pump 1B-SB Idle Disch Press	PI-01CS-0110SW	18.0	N/A (Trending Purposes Only)
7.2.37	Differential Pressure	Calculation	121.3	NOTE 4 and NOTE 6 99.18 to 121.22 psid PMI 22958-03 2-Year CPT NOTE 5 and NOTE 7 102.49 to 113.5 psid Acceptable Range 99.18 to <102.49 psid Alert Range <99.18 or > 113.5 psid Required Action Range

KEY

Attachment 3 - Vibration Data
Sheet 3 of 3

INSTRUCTIONS:

1. **IF pump vibration data is outside the Acceptable Range, but within the Alert Range, THEN:**
   a. **INITIATE an STR to direct the Surveillance Testing Scheduling Coordinator to double the testing frequency of the pump.**
   b. **INITIATE an NCR.**
   c. **RECORD the STR and NCR numbers in the Comments Section.**
2. **IF pump vibration data meets the Required Action Criteria, THEN:**
   a. **DECLARE the pump INOPERABLE.**
   b. **INITIATE an NCR.**

1A-SA Boric Acid Transfer Pump

Vibration Location	IN/SEC	ACCEPTANCE CRITERIA		
		Acceptable Range IN/SEC	Alert Range IN/SEC	Required Action IN/SEC
Axial	0.027	≤ 0.0575	> 0.0575 to ≤ 0.138	> 0.138
Out Horiz	0.025	≤ 0.0525	> 0.0525 to ≤ 0.126	> 0.126
Out Vert	0.123	≤ 0.055	> 0.055 to ≤ 0.132	> 0.132
In Horiz	~~0.280~~ 0.028	≤ 0.0725	> 0.0725 to ≤ 0.174	> 0.174
In Vert	0.040	≤ 0.05	> 0.05 to ≤ 0.12	> 0.12

JPM CUE SHEET

Initial Conditions:	• The unit is in Mode 1 at 100% Power. • A partial OST-1007, CVCS/SI System Operability Train A Quarterly Interval Modes 1-4, has just been completed on the "A" BA pump (section 7.2).

Initiating Cue:	You are the CRS. You are to review the completed OST-1007 then discuss any identified problems with the evaluator.

Facility: Shearon Harris Task No.:

Task Title: Using survey maps determine stay times JPM No.: 2009B NRC Exam Admin JPM SRO A-3

K/A Reference: G.2.3.4 RO 3.2 SRO 3.7

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: Two individuals are tasked to hang a clearance on the 'A' ED Tank Transfer Pump. The clearance includes the following valves:

- 1ED-12
- 1ED-13
- 1ED-14
- 1ED-15
- 1ED-17
- 1ED-18

Initiating Cue: Two Operators are being assigned to hang a clearance and perform work in a radiological area. Operator 1 has an accumulated annual Whole Body dose of 1760 mrem (Progress Energy). Operator 2 has an accumulated annual Whole Body dose of 700 mrem (Progress Energy) and worked at Saint Lucie earlier this year where he has accumulated 2700 mrem.

The clearance and work activity is for the 'A' ED Tank Transfer Pump.

Using the supplied survey map, determine the maximum allowable individual stay times for each Operator that would prevent exceeding the Progress Energy Annual Administrative dose limit while performing these activities.

Do not consider dose received during transit. The calculated dose should be ONLY what they would receive while working at the valves for the clearance.

Complete the information below and return to the evaluator when complete.

Task Standard:	Calculation of stay times based on survey maps, two hours for Operator 1, five hours for Operator 2.
Required Materials:	Survey map A4 RAB 190' North Valve MAP 2 SFD-5-S-0684
General References:	DOS-NGGC-0004 (Rev. 10) DOS-NGGC-0004 "Progress Energy Annual Administrative Dose Limits" Section 9.3.1 LIMIT = 2 rem Progress Energy dose not to exceed 4 rem total dose if non- Progress Energy dose for the current year has been determined.
Time Critical Task:	No
Validation Time:	12 minutes

Critical Task Justification

Step 1	Must determine dose rates in order to calculate stay time
Step 2	Must determine available dose to determine stay time.
Step 3	Calculation of stay time.

START TIME: _____

Evaluator Note:	**The order of performance does not matter** **IF THE APPLICANT ASKS FOR IT: Provide a copy of DOS-NGGC-0004, Rev. 10**

✓ **Performance Step: 1** Using Radiological Survey Record Map A4 and RAB 190' North map, determines dose rates in the area where the clearance will be applied

Standard: Identifies that General Area Dose Rates are 120 mrem/hr

Comment:

✓ **Performance Step: 2** Determine the remaining dose for the year for each individual

Standard: Operator 1: **240 mrem**

(2000 mrem - 1760 mrem = 240 mrem

Operator 2: **600 mrem**

4000 mrem - 700 mrem (PE) - 2700 mrem (SL) = 600 mrem

Comment:

✓ **Performance Step: 3** Determine stay time for each operator (based on 1st Operator reaching 2 Rem and the 2nd Operator reaching 4 Rem - for the year)

Standard: Operator 1: **2 hours**

240 mrem ÷ 120mrem/hr = 2 hrs

Operator 2: **5 hours**

600 mrem ÷ 120 mrem/hr = 5 hours

Comment:

Terminating Cue:	**After the stay time has been calculated, this JPM is complete.** **END OF JPM**

STOP TIME: _____

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam Admin JPM SRO A-3 - Using survey maps determine stay times. (DOS-NGGC-0004 Rev. 10)

DOS-NGGC-0004 "Progress Energy Annual Administrative Dose Limits" Section 9.3.1

LIMIT = 2 rem Progress Energy dose not to exceed 4 rem total dose if non- Progress Energy dose for the current year has been determined.

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: Two individuals are tasked to hang a clearance on the 'A' ED Tank Transfer Pump. The clearance includes the following valves:

- 1ED-12
- 1ED-13
- 1ED-14
- 1ED-15
- 1ED-17
- 1ED-18

Initiating Cue: Two Operators are being assigned to hang a clearance and perform work in a radiological area. Operator 1 has an accumulated annual Whole Body dose of 1760 mrem (Progress Energy). Operator 2 has an accumulated annual Whole Body dose of 700 mrem (Progress Energy) and worked at Saint Lucie earlier this year where he has accumulated 2700 mrem.

The clearance and work activity is for the 'A' ED Tank Transfer Pump.

Using the supplied survey map, determine the maximum allowable individual stay times for each Operator that would prevent exceeding the Progress Energy Annual Administrative dose limit while performing these activities.

Do not consider dose received during transit. The calculated dose should be ONLY what they would receive while working at the valves for the clearance.

Complete the information below and return to the evaluator when complete.

Name _____

Record the maximum allowable stay time calculations below to the nearest hour and minute.

Operator 1: _____ Operator 2: _____

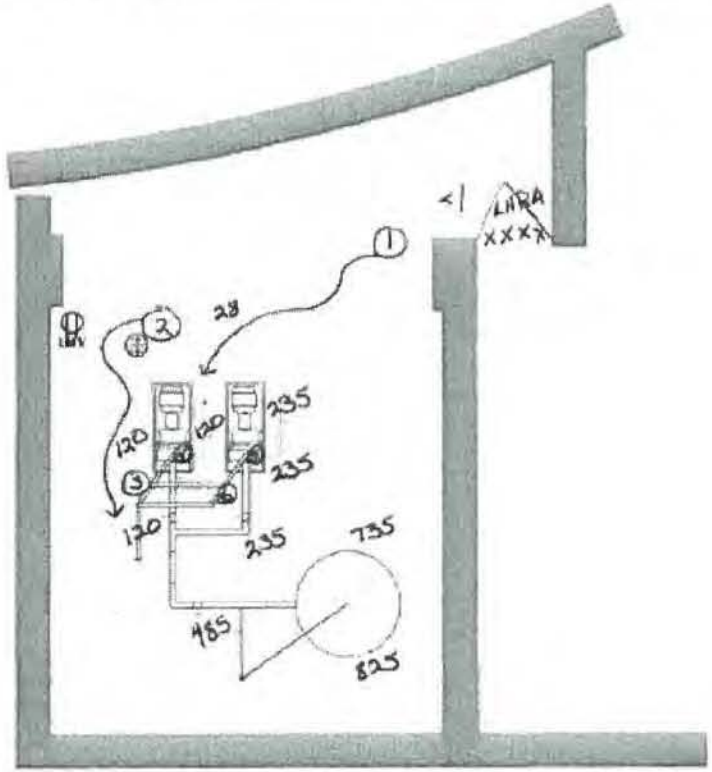
Map A4

RADIOLOGICAL SURVEY RECORD

Page 1 of 1

Unit 1	Bldg/Elev: RAB 190' N	Area: Equipment Drain Transfer Tank/Pumps	Date: 11/30/09	Time: 0001	RWP # 4238	Survey # 0531-066
Component: N/A		Work Description: Equipment Drain Xfer Tank Pump Clearance				
Surveyor: J. Brava		Signature: J. Brava			Reviewed by: F. Zulu	

Comments: Tank level at 23%



% Power

#	dpm/100cm²	Location
1	<1000/M	Floor
2	<1000/M	Floor
3	<1000	Pump
4	<1000	Valve
5	<1000	Pump
6	<1000	Valve

Instrument	Serial No./UTC
TELE	776440
L-177	776213

RA	Radiation Area	β	Beta Dose Rate
HRA	High Radiation Area	η	Neutron Dose Rate
LHRA	Locked HighRadiation Area	R	Rem/hour
VHRA	Very High Radiation Area	XXXX	Boundary
ARA	Airborne Radiation Area	○	Smear Location
CA	Contamination Area	△	Air Sample Location
RMA	Radioactive Materials Area	K	1000

Dose Rates in mrem/hr unless otherwise noted

Air Activity

No.____ DAC____ % Activity_____ uCi/cc

No.____ DAC____ % Activity_____ uCi/cc

No.____ DAC____ % Activity_____ uCi/cc

N/A

QA Record

Facility: Shearon Harris | Task No.: 345001H602

Task Title: Classify an event | JPM No.: 2009B NRC Exam Admin JPM SRO A4

K/A Reference: G2.4.41 RO 2.9 SRO 4.6

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 just been completed and a plant heat up is being performed IAW GP-002, Normal Plant Heatup From Cold Solid to Hot Subcritical Mode 5 to Mode 3.

Initiating Cue: Using the attached information sheet and the EAL Flow Path, classify the event. Mark the EAL Flow Path appropriately. Determine PAR if required.

THIS IS A TIME CRITICAL JPM.

Task Standard:	Event classified as an Site Area Emergency (2-4-3)
Required Materials:	None
General References:	PEP-110 EAL Flowpath EP-EAL (allowed reference)
Handouts:	JPM Cue Sheets Pages 4 and 5 PEP-110 EAL Flowpath EP-EAL (allowed reference)
Time Critical Task:	**Yes**
Validation Time:	15 minutes

Critical Step Justification

Step 2	Classification of the event.

Evaluator Note: **Start Time for this JPM begins when the individual has been briefed**

START TIME: _____

Performance Step: 1 OBTAIN EAL FLOW PATH.

Standard: Obtains EAL Flow Path. (EP-EAL is an allowed reference)

Comment:

✓ **Performance Step: 2** CLASSIFY EVENT

Standard: Identifies a Site Area Emergency (2-4-3),

DAMAGE TO SPENT FUEL with ANY SPENT FUEL POOL AREA RAD MON > 700 mR/HR

Basis:

Damage to spent fuel in the Fuel Handling Building is assessed to determine if a single or multiple assemblies are affected. Trigger points for the FHB area radiation monitors were calculated to provide a symptomatic indication of damage the affected assembly(s). The 700 mR/HR criteria is the dose rate expected at the monitor nearest the damaged assembly(s) based on the expected dose rate from damaging more than 1 spent fuel assembly that had recently been removed from the reactor.

CLASSIFICATION GUIDANCE:

Fuel handling accidents are analyzed as part of the HNP Licensing Basis. These accidents (as demonstrated through evaluation) are not expected to exceed Part 100 limits. Emergency filtration units are available to mitigate the consequences of these accidents.

Comment:

STOP TIME: _____

Terminating Cue:	**Event classification stated to evaluator.** **END OF JPM**

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2009B NRC Exam Admin JPM SRO A4 - Classify an event

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:	A refueling outage has just been completed and a plant heat up is being performed IAW GP-002, Normal Plant Heatup From Cold Solid to Hot Subcritical Mode 5 to Mode 3.

Initiating Cue:	Using the attached information sheet and the EAL Flow Path, classify the event. Mark the EAL Flow Path appropriately. Determine PAR if required. **THIS IS A TIME CRITICAL JPM**

CLASSIFICATION INFORMATION SHEET

A refueling outage has just been completed and a plant heat up is being performed IAW GP-002, Normal Plant Heatup From Cold Solid to Hot Subcritical Mode 5 to Mode 3.

Current plant conditions are:

- RCS Temp 180°F
- RCS Pressure 345 psig
- 'A' RHR pump is in operation

Fuel handlers are performing a fuel shuffle and moving assemblies from the 'A' Fuel Pool to 'B' Fuel Pool.

An emergency landing was being attempted by an aircraft returning to RDU. The pilot has lost control and the aircraft has impacted on the west side of the Fuel Handling Building. The side of the building has suffered external damage and a fire is burning at the impact site.

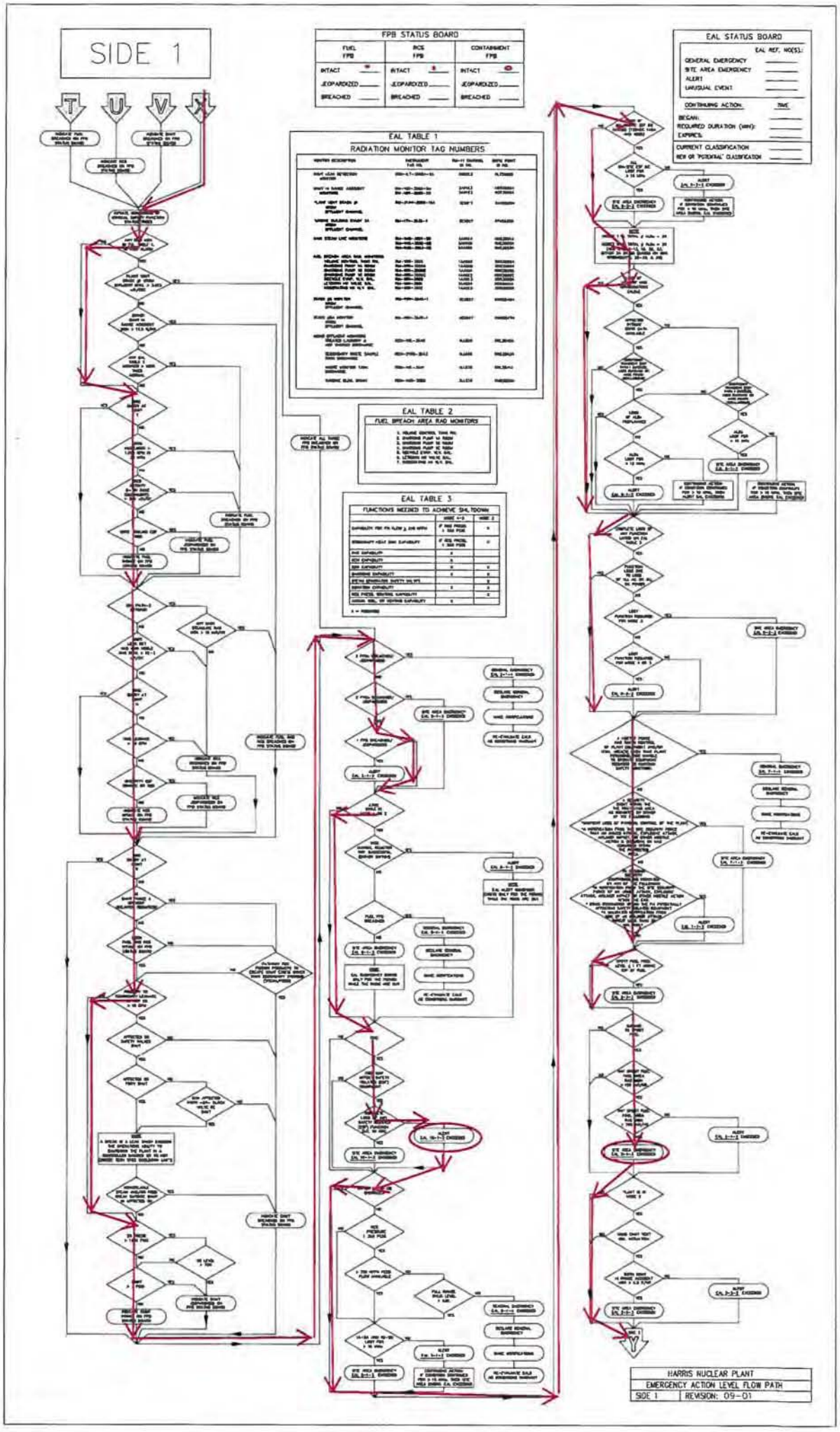
The impact was so severe that a fuel assembly being moved has dropped from the Fuel Bridge Crane and ruptured. The highest Fuel Building Radiation monitor is reading 825 mr/hr.

Classify the event

Name _____

Record your classification here and return to the examiner.

EAL Classification: _____


SIDE 1
FPB STATUS BOARD
FUEL FPB
RCS FPB
CONTAINMENT FPB
INTACT
JEOPARDIZED
BREACHED
EAL STATUS BOARD
EAL REF. NO(S):
GENERAL EMERGENCY
SITE AREA EMERGENCY
ALERT
UNUSUAL EVENT
CONTINUING ACTION
TIME
BEGAN:
REQUIRED DURATION (MIN):
EXPIRES:
CURRENT CLASSIFICATION
NEW OR "POTENTIAL" CLASSIFICATION
EAL TABLE 1
RADIATION MONITOR TAG NUMBERS
EAL TABLE 2
FUEL BREACH AREA RAD MONITORS
EAL TABLE 3
FUNCTIONS NEEDED TO ACHIEVE SHUTDOWN
HARRIS NUCLEAR PLANT
EMERGENCY ACTION LEVEL FLOW PATH
SIDE 1
REVISION: 09-01

SIDE 2

SAE 2-4-3

EAL TABLE 4
DOSE PROJECTION MONITORS

EAL TABLE 5
EFFLUENT MONITORS

EAL TABLE 6
SEISMIC EVENT SYMPTOMS

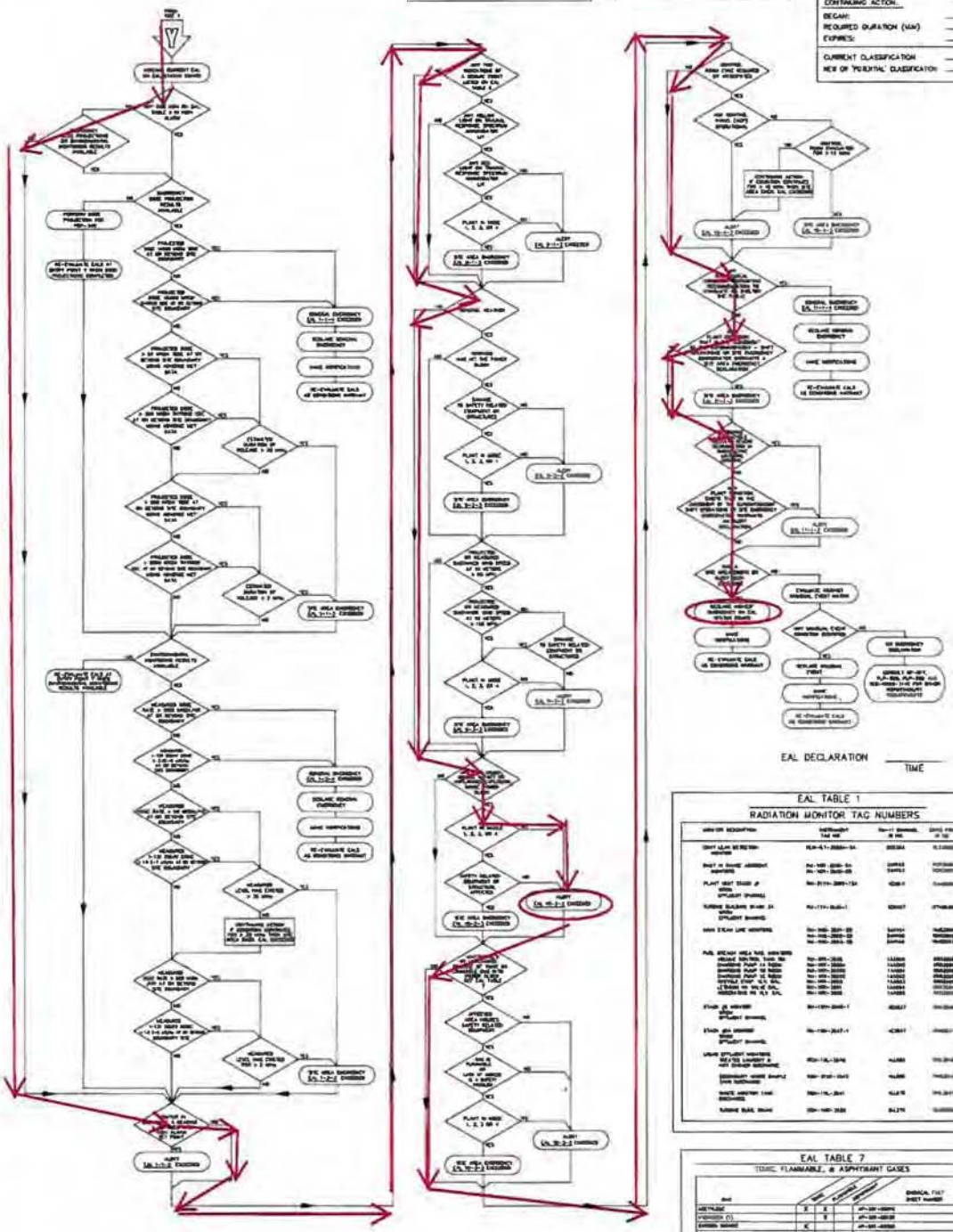
EAL STATUS BOARD

EAL REF. NO(S):

GENERAL EMERGENCY
SITE AREA EMERGENCY
ALERT
UNUSUAL EVENT

CONTINUING ACTION: TIME
BEGAN:
REQUIRED DURATION (MIN)
EXPIRES:

CURRENT CLASSIFICATION
NEW OR 'POTENTIAL' CLASSIFICATION



EAL DECLARATION _____ TIME

EAL TABLE 1
RADIATION MONITOR TAG NUMBERS

EAL TABLE 7
TOXIC, FLAMMABLE, & ASPHYXIANT GASES

UNUSUAL EVENT MATRIX

HARRIS NUCLEAR PLANT
EMERGENCY ACTION LEVEL FLOW PATH
SIDE 2 | REVISION: 09-1