Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	TMI – Unit 1	Task No.:	001C030101
Task Title:	Review and approve an Estimated Critical Boron Concentration calculation.	JPM No.:	2005 NRC A1-1
K/A Reference:	2.1.25 (3.1)		

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 sequential trip of both main feedwater pumps resulted in a reactor trip 48 hours ago.
- The unit had been at 100% power for 150 days prior to the reactor trip.
- Cycle Burnup is 310 EFPD.
- TAVE = 532°F
- Current Boron Concentration = 985 PPM
- The Desired Critical Rod Position is: 80% WD on CRG-6.
- CRG-8 position is 30%.
- The FINAL MIXED BORON DEPLETION CORRECTION FACTOR as specified in the control room log is .95.
- The Plant Process Computer is NOT available.
- No reactor engineering personnel are on site.

Task Standard: Identifies Xe curve reading error, performs correct calculation, and returns original enclosure unapproved.

Required Materials:

- Calculator
- Straight Edge

General References: 1103-15B, ESTIMATED CRITICAL CONDITIONS, Rev. 35

Handouts:

- Completed 1103-15B, Enclosure 1
- Figures 1-6

Initiating Cue:	You are the Control Room Supervisor on duty. A reactor startup is anticipated for this shift. An 1103-15B, Enclosure 1 - ESTIMATED CRITICAL BORON CONCENTRATION, has been prepared by a licensed operator. Perform Step 3.1.2.4.5.2 – Have an independent licensed SRO review and approve the calculation.
Time Critical Task:	No
Validation Time:	17 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check)

Performance Step: 1 Locates/reviews procedure.

Standard:
- Determines Section 3.1 applies.
- Reviews LIMITS AND PRECAUTIONS.

Comment: **The candidate may choose to perform the task by independently completing Enclosure 1.**

Evaluator Cue:
- **Provide a copy of the prepared 1103-15B, Enclosure 1.**
- **Provide a clean copy of 1103-15B Section 1.0 through 3.1 and Enclosure 1.**

Performance Step: 2 Verify present conditions (TAVE, Burnup, Boron Concentration, Desired Critical Rod Positions) are correct.

Standard: Compares Enclosure 1, 2.a -2.d, against initial condition information and determines no errors.

Comment:

Evaluator Cue: **No major boron concentration changes have been made since the last analysis.**

Performance Step: 3 Determine the FUEL EXCESS REACTIVITY per Figure 1.

Standard: Records/verifies 11.8% dk/k IN Step 3.a

Comment:

Performance Step: 4 Determine the DESIRED CRITICAL CRG 5-7 REACTIVITY WORTH of Step 2.d per Figure 6

Standard: Records/verifies -1.02% to -1.16% dk/k in Step 3.b

Comment:

Performance Step: 5 Determine the DESIRED CRITICAL CRG 8 REACTIVITY WORTH of Step 2.d per Figure 2

Standard: Reads/records -.116 to .121% dk/k in Step 3.c.

Comment:

√ **Performance Step: 6** Obtain the Xenon worth - - - .

Standard: Records/verifies >-0.48% to <-0.5% dk/k in Step 3.d. Identifies graph reading error (.25% dk/k).

Comment:

Evaluator Cue: **The Plant Process Computer Program and Nuclear Engineering are unavailable. Figure 4 was used for the completed Enclosure 1.**

If after identifying the graph reading error the candidate stops: Review the entire Enclosure 1 and calculate the ESTIMATED MEASURED CRITICAL BORON CONCENTRATION based on your graph reading numbers.

Performance Step: 7 Determine the reactivity associated with SAMARIUM AND PLUTONIUM BUILDUP after shutdown by using Figure 5.

Standard: Records/verifies -.07 to .08 dk/k in Step 3.e

Comment:

Performance Step: 9 Determine the BORON REACTIVITY WORTH REQUIRED FOR CRITICALITY.

Standard: Calculates BORON REACTIVITY WORTH REQUIRED FOR CRITICALITY and records in Step 4.1.

Comment:

Performance Step: 10 Determine the HZP INVERSE BORON WORTH associated with cycle burnup per Figure 3.

Standard: Records/verifies 141.5 to <142 ppmB/%dk/k in Step 4.2.

Comment:

	Performance Step: 11	Determine the CORRECTED CRITICAL BORON CONCENTRATION by multiplying the required boron worth (Step 4.1) by the HZP Inverse Boron Worth (Step 4.2)
	Standard:	Calculates CORRECTED CRITICAL BORON CONCENTRATION and records in Step 4.3.1.
	Comment:	
	Performance Step: 12	Determine the FINAL MIXED BORON DEPLETION CORRECTION FACTOR based on current correction factor and accounting for predicted boron additions.
	Standard:	Verifies/records .95 in Step 4.3.2
	Comment:	
	Evaluator Cue:	**If necessary: The FINAL MIXED BORON DEPLETION CORRECTION FACTOR in the control room log is .95.**
√	**Performance Step: 13**	Determine the ESTIMATED MEASURED CRITICAL BORON CONCENTRATION by dividing the CORRECTED CBC (Step 4.3.1) by the DEPLETION CORRECTION FACTOR (4.3.2)
	Standard:	• Calculates ESTIMATED MEASURED CRITICAL BORON CONCENTRATION as 1463 to 1523 PPM and records in 4.3.3. • Returns original completed Enclosure 1 unapproved.
	Comment:	1464 to 1524 PPM Band is +/- 2% error around 1494 PPM.
	Terminating Cue:	**When the candidate returns Enclosure 1 to the examiner: This JPM is complete.**

Job Performance Measure No.: 2005 NRC 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:

- A sequential trip of both main feedwater pumps resulted in a reactor trip 48 hours ago.
- The unit had been at 100% power for 150 days prior to the reactor trip.
- Cycle Burnup is 310 EFPD.
- TAVE = 532°F
- Current Boron Concentration = 985 PPM
- The Desired Critical Rod Position is: 80% WD on CRG-6.
- CRG-8 position is 30%.
- The FINAL MIXED BORON DEPLETION CORRECTION FACTOR as specified in the control room log is .95.
- The Plant Process Computer is NOT available.
- No reactor engineering personnel are on site.

INITIATING CUE:

You are the Control Room Supervisor on duty. A reactor startup is anticipated for this shift. An 1103-15B, Enclosure 1 - ESTIMATED CRITICAL BORON CONCENTRATION, has been prepared by a licensed operator. Perform Step 3.1.2.4.5.2 – Have an independent licensed SRO review and approve the calculation.

NRC JAMAI 1 KEY

ENCLOSURE 1
Estimated Critical Boron Concentration (3.1)

NOTE

Individual data entries may be completed in any sequence. Sign-off of the Enclosure signifies the completion of the Enclosure calculation.

2.a CALCULATION IS FOR AN ECB AT 532 ± 2°F ON TAVE 532 DATE/TIME TODAY/NOW

2.b CYCLE BURNUP 310 EFPD

2.c PRESENT MEASURED BORON CONCENTRATION 965 ppmB

2.d DESIRED CRITICAL ROD POSITION

- CRG 1-4 100 % WD
- CRG 5 100 % WD
- CRG 6 50 % WD
- CRG 7 5 % WD
- CRG 8 30 % WD

3.a FUEL EXCESS REACTIVITY (FIG 1) 11.8 % Δk/k

3.b DESIRED CRITICAL CRG 5-7 REACTIVITY WORTH (FIG 6) -1.1 % Δk/k

3.c DESIRED CRITICAL CRG 8 REACTIVITY WORTH (FIG 2) -0.119 % Δk/k

3.d XENON REACTIVITY WORTH (PPC, NUCLEAR ENGR., FIG 4) -0.495 % Δk/k

3.e SAMARIUM AND PLUTONIUM BUILDUP (FIG 5)

- TIME SINCE SHUTDOWN 48 HRS
- REACTIVITY DUE TO BUILDUP -0.078 % Δk/k

4.1 BORON REACTIVITY WORTH REQUIRED FOR CRITICALITY

$$\left[\underset{3.a}{(\text{FUEL})} + \underset{3.b}{(\text{CRG 5-7})} + \underset{3.c}{(\text{CRG 8})} + \underset{3.d}{(\text{Xenon})} + \underset{3.e}{(\text{SM})}\right] \times (-1) =$$

11.8 + (-1.1) + (-.119) + (-.495) + (-.78) = 10.005 % Δk/k

4.2 INVERSE BORON WORTH (FIG 3) 141.8 ppmB/% Δk/k

4.3 CRITICAL BORON CONCENTRATION

4.3.1 CORRECTED CRITICAL BORON CONCENTRATION

$$\left[\underset{4.2}{(\text{Inverse Boron})} \times (-1) \times \underset{4.1}{(\text{Boron React})}\right] =$$

1419.1 ppmB

4.3.2 FINAL MIXED BORON DEPLETION CORRECTION FACTOR (PPC, Control Room Log, Nuclear Engineering) .95

4.3.3 ESTIMATED MEASURED CRITICAL BORON CONCENTRATION (4.3.1) / (4.3.2) = 1494 ppmB

CALCULATED BY: _____ DATE/TIME _____

APPROVED BY (SRO): _____ DATE/TIME _____

Send copy of this Enclosure to Nuclear Engineering
Send original to Operations for filing

NRC JPM A1-1 HANDOUT

ENCLOSURE 1
Estimated Critical Boron Concentration (3.1)

NOTE

Individual data entries may be completed in any sequence. Sign-off of the Enclosure signifies the completion of the Enclosure calculation.

2.a CALCULATION IS FOR AN ECB AT 532 ± 2°F ON TAVE 532 DATE/TIME TODAY/NOW

2.b CYCLE BURNUP 310 EFPD

2.c PRESENT MEASURED BORON CONCENTRATION 965 ppmB

2.d DESIRED CRITICAL ROD POSITION

- CRG 1-4 100 % WD
- CRG 5 100 % WD
- CRG 6 80 % WD
- CRG 7 5 % WD
- CRG 8 30 % WD

3.a FUEL EXCESS REACTIVITY (FIG 1) 11.8 % Δk/k

3.b DESIRED CRITICAL CRG 5-7 REACTIVITY WORTH (FIG 6) -1.1 % Δk/k

3.c DESIRED CRITICAL CRG 8 REACTIVITY WORTH (FIG 2) -.119 % Δk/k

3.d XENON REACTIVITY WORTH (PPC, NUCLEAR ENGR., FIG 4) -.25 % Δk/k

3.e SAMARIUM AND PLUTONIUM BUILDUP (FIG 5)

- TIME SINCE SHUTDOWN 48 HRS
- REACTIVITY DUE TO BUILDUP -.078 % Δk/k

4.1 BORON REACTIVITY WORTH REQUIRED FOR CRITICALITY

11.8 + (-1.1) + (-.119) + (-.25) + (-.078) x (-1)

$$\left[\underset{3.a}{(\text{FUEL})} + \underset{3.b}{(\text{CRG } 5-7)} + \underset{3.c}{(\text{CRG } 8)} + \underset{3.d}{(\text{Xenon})} + \underset{3.e}{(\text{SM})}\right] \times (-1) = -10.253 \text{ \% } \Delta k/k$$

4.2 INVERSE BORON WORTH (FIG 3) 141.8 ppmB/% Δk/k

4.3 CRITICAL BORON CONCENTRATION

4.3.1 CORRECTED CRITICAL BORON CONCENTRATION

$$\left[\underset{4.2}{(\text{Inverse Boron})} \times (-1) \times \underset{4.1}{(\text{Boron React})}\right] = 1453.9 \text{ ppmB}$$

141.8 x (-1) x (-10.253)

4.3.2 FINAL MIXED BORON DEPLETION CORRECTION FACTOR (PPC, Control Room Log, Nuclear Engineering) .95

4.3.3 ESTIMATED MEASURED CRITICAL BORON CONCENTRATION (4.3.1) / (4.3.2) = 1530.4 ppmB

CALCULATED BY: _____ DATE/TIME _____

APPROVED BY (SRO): _____ DATE/TIME _____

Send copy of this Enclosure to Nuclear Engineering
Send original to Operations for filing

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	TMI – Unit 1	Task No.:	3410020303
Task Title:	Verify the Equipment Status Tag Log supports unit startup.	JPM No.:	2005 NRC A1-2
K/A Reference:	2.1.23 (4.0)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: _____ Actual Performance: X

Classroom X 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:
- The unit is shutdown with TAVE at 190 °F
- The operating crew is performing OP-AA-108-108, UNIT RESTART REVIEW, in preparation for beginning a plant heatup in accordance with procedure 1102-1, PLANT HEATUP TO 525 °F.

Task Standard: Identify any item(s) that would preclude plant heatup and notify the Shift Manager.

Required Materials: Location with plant references and LAN access or in the control room.

General References:
- OP-AA-108-108, UNIT RESTART REVIEW, Rev. 2
- 1102-1, PLANT HEATUP TO 525 °F, Rev. 163

Handouts:
- Equipment Status Tag Log with RC-V-1-EX2 in MANUAL (waiting for a replacement card for the AUTO circuit) and 4-5 other items that will not affect startup.
- OP-AA-108-108, ATTACHMENT 5
- 1102-1, PLANT HEATUP TO 525 °F
- OP-TM-220-000, REACTOR COOLANT SYSTEM

Initiating Cue: The Shift Manager has assigned you to complete OP-AA-108-108, ATTACHMENT 5, Step 8, in preparation for initiating a plant heatup IAW 1102-1, PLANT HEATUP TO 525 °F.

Time Critical Task: No

Validation Time: 12 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with an asterisk)

	Performance Step: 1	Reviews OP-AA-108-108, ATTACHMENT 5, Step 8.
	Standard:	Reviews OP-AA-108-108, ATTACHMENT 5
	Comment:	
	Evaluator Cue:	• **Provide OP-AA-108-108, ATTACHMENT 5** • **Provide 1102-1, PLANT HEATUP TO 525 °F**
	Performance Step: 2	Locate the Equipment Status Tag Log
	Standard:	Accesses Equipment Status Tag Log from a computer on the LAN or in the control room.
	Comment:	
	Evaluator Cue:	**When the log is accessed or located, provide a copy of the attached Equipment Status Tag Log.**
	Performance Step: 3	Evaluate items listed on the Equipment Status Tag Log.
	Standard:	Compare each item listed on the Equipment Status Tag Log to the requirements of procedure 1102-1.
	Comment:	
	Evaluator Cue:	**Provide a copy of OP-TM-220-000 when requested.**
√	**Performance Step: 4**	Identify each item that will preclude plant heatup.
	Standard:	Identifies RC-V-1-EX2 must be in AUTO per OP-TM-220-000, System Mode Lineups.
	Comment:	
√	**Performance Step: 5**	Notify Shift Manager.
	Standard:	Informs Shift Manager that ATTACHMENT 5, Step 8 cannot be signed until RC-V-1-EX2 can be placed in AUTO.
	Comment:	
	Evaluator Cue:	**Respond as Shift Manager.**
	Terminating Cue:	**After the candidate notifies the Shift Manager: This JPM is complete.**

VERIFICATION OF COMPLETION

Job Performance Measure No.: TMI 2005 NRC JPM A1-2

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 shutdown with TAVE at 190 °F.
- The operating crew is performing OP-AA-108-108, UNIT RESTART REVIEW, in preparation for beginning a plant heatup in accordance with procedure 1102-1, PLANT HEATUP TO 525 °F.

INITIATING CUE:

You are an extra SRO assigned to assist the Shift Manager in the completion of OP-AA-108-108, UNIT RESTART REVIEW. The Shift Manager has assigned you to complete OP-AA-108-108, ATTACHMENT 5, Step 8 – Verify the Equipment Status Tag Log supports startup.

Equipment Status Tag

Number	Date Issued	Component Designation	System Number	Reason for Applying Tags	Approved By	ACPS #	Resolution for Removal	Removed Date	Removal By
20050045	5/10/2005 04.50 PM	RB-V-37	545 Industrial Cooler System	RB-V-35 is not working correctly and RB-V-37 is being used to maintain system level/pressure	James A Stubbs		RB-V-35 repair		
20050044	5/10/2005 08.37 AM	Control Bldg Hallway Fan	826 Control Building & Machine Shop H&V Systems	AH-E-93A/B - 94A/B turned off for testing	James A Stubbs	2005-015	Testing complete		
20050043	5/09/2005 05.28 PM	FS-P-0004	811 Fire Protection Service Water System	FS-P-4 running in Hand	Jerome M Gingher	2005-014	Pressure switch FS-PS-586 is repaired		
20050042	5/08/2005 01.33 PM	RC-V-1-EX2	220 Reactor Coolant System	RC-V-1-EX2 placed in Manual waiting for replacement card for the Auto circuit	David Wilson		RC-V-1-EX2 Auto circuit repaired		
20050041	5/08/2005 09.26AM	IA-V-0598, WDG-V-77	852 Instrument Air	IA-V-598 & WDG-V-77 CLOSED PER OP 1104-27 SECT. 3.14.2	Joseph A Csordas		Repair check valve		
20050040	5/07/2005 10.47 AM	WDL-LI-207	232 Liquid Radwaste Disposal System	WDL-LI-207 leaks. Sightglass isolated	Kevin Coughlin				

Facility:	TMI Unit 1	Task No.:	1198030101
Task Title:	Evaluate a completed surveillance procedure and perform appropriate actions IAW AP 1041, IST Program Requirements, Section 4.4.3.	JPM No.:	2005 NRC JPM A2
K/A Reference:	2.2.12 (3.4)		

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 shutdown.
- RCS temperature is 260 °F.
- Both DH Trains are in the ES Standby Mode.
- OP-TM-212-203, IST OF DH-P-1A IN ES STANDBY MODE, was just completed.

Task Standard: Alert range vibration reading identified and follow-up action initiated.

Required Materials: AP 1041, IST PROGRAM REQUIREMENTS

General References:
- OP-TM-212-203, IST OF DH-P-1A IN ES STANDBY MODE, Rev. 4
- AP 1041, IST PROGRAM REQUIREMENTS, Rev. 41

Handouts: A completed OP-TM-212-203 with one or more vibration readings in the alert range.

Initiating Cue: You are the Control Room Supervisor. Review the completed OP-TM-212-203. Assume that the current revision of the procedure was utilized to perform the test.

Time Critical Task: N/A

Validation Time: 16 minutes.

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check)

	Evaluator Cue:	Provide completed OP-TM-212-203 and range value table.
	Performance Step: 1	Review procedure.
	Standard:	Verify all required steps completed/initialed.
	Comment:	
	Performance Step: 2	Review collected data.
	Standard:	Compare collected data to the provided range value table.
	Comment:	
√	**Performance Step: 3**	Identify any data outside of NORMAL range.
	Standard:	Identifies Inboard and Outboard Vib Vertical readings in the ALERT (Double Frequency) region.
	Comment:	
	Evaluator Cue:	**Assume that the instruments utilized were properly calibrated and there is no system alignment problem that contributed to the readings.**
√	**Performance Step: 4**	Review Attachment 7.2, Data Sheet.
	Standard:	Checks/Marks block "Pump test data in ALERT range".
	Comment:	
	Evaluator Cue:	**If asked relative to the AR/CR and burned out light bulb blocks on ATT. 7.2:** • **No degraded conditions discovered.** • **There are no burned out light bulbs.**

√ **Performance Step: 5** Refers to AP 1041.

Standard: Determines 4.4.3.c.7 applies.

- Submit a CR and document equipment operability status IAW LS-AA-105.
- Notify the Engineering Duty Manager (EDM).
- Notify the PdM vibration expert.

Comment:

Evaluator Cue:

- **Provide a copy of AP 1041.**
- **If the candidate begins a discussion on re-test of the pump: Re-test of the pump will not be performed at this time.**
- **A CR has been submitted and equipment operability status has been logged IAW LS-AA-105.**
- **Respond as the EDM and the PdM vibration expert.**

Terminating Cue: When AP 1041, 4.4.2.c.7 has been completed: This JPM is complete.

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2005 NRC 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 unit is shutdown.
- RCS temperature is 260 °F.
- Both DH Trains are in the ES Standby Mode.
- OP-TM-212-203, IST OF DH-P-1A IN ES STANDBY MODE, was just completed.

INITIATING CUE: You are the Control Room Supervisor. Review the completed OP-TM-212-203. Assume that the current revision of the procedure was utilized to perform the test.

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	TMI Unit 1	Task No.:	5001045013
Task Title:	Authorize emergency personnel radiation exposure in excess of 5 REM TEDE IAW EP-AA-113, Personnel Protective Actions, Section 4.3.3.	JPM No.:	2005 NRC JPM A3
K/A Reference:	2.3.4 (3.1)		

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 large break LOCA occurred; including significant fuel damage.
- The TSC is manning but has not been activated.
- A missing operator has been located. He is seriously injured, conscious, but unable to move and lying in an uncontaminated area where the general radiation level is 200 R/hr.
- It is estimated that four people using a stretcher can move him out of the area in a maximum of 5 minutes.
- Four people have volunteered to perform the task. Pertinent information is provided below.
- No radiation management personnel have arrived on site.

Task Standard: Emergency exposure approved IAW EP-AA-113-F-02

Required Materials: Calculator

General References: EP-AA-113, PERSONNEL PROTECTIVE ACTIONS, Rev. 5

Handouts: EP-AA-113 (after clean copy is located by the candidate).

Initiating Cue: You are the Emergency Director. Perform the required actions prior to dispatching the team of volunteers to rescue the injured man.

Time Critical Task: N/A

Validation Time: 15 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with an a check mark)

	Performance Step: 1	Calculate exposure.
	Standard:	Determines exposure > 5 Rem TEDE will be received.
	Comment:	**This step may be performed later in the process.**
	Evaluator Note:	**It may be necessary to direct the candidate to deal with the situation presented and not the overall emergency response effort.**
	Evaluator Cue:	**If EPA-400 is requested: Limit your actions to EXELON procedure requirements.**
	Performance Step: 2	Determine EP-AA-113 applies.
	Standard:	Locates EP-AA-113 and refers to Section 4.3, Emergency Exposure Limits.
	Comment:	
	Evaluator Cue:	**Provide clean copy of EP-AA-113**
	Performance Step: 3	Apply EP-AA-113, Section 4.3
	Standard:	Determines emergency exposure is for a bonafide emergency.
	Comment:	
√	**Performance Step: 4**	Apply EP-AA-113, Section 4.3. • Plan emergency operations prior to entry. (√) • Wear respiratory protection and protective clothing to reduce contamination where possible. (N/A per initial conditions)
	Standard:	Discusses requirement.
	Comment:	
	Evaluator Cue:	**Assume that the plan was approved when it was determined that the individual could be moved by four people in 5 minutes, or less.**

√ **Performance Step: 5** Determine if emergency exposure limits in excess of 5 Rem TEDE are required for EXELON emergency workers.

Standard: Determines that maximum stay time would result in >5 Rem TEDE.

Comment:

√ **Performance Step: 6** Complete an Authorization for Emergency Exposure Form (EP-AA-113-F-02).

Standard:

- Completes EP-AA-113-F-02 for each volunteer.
- Checks Block 2 (>10<25 Rem).
- Have volunteer sign after reviewing Attachment 1, EMERGENCY WORKER EXPOSURE LIMITS AND ASSOCIATED RISKS.
- Signs as Station Emergency Director.

Comment:

Evaluator Cue:

- **Provide a copy of EP-AA-113-F-02.**
- **Sign EP-AA-113-F-02 as a volunteer.**

Terminating Cue: **After one satisfactory EP-AA-113-F-02 is completed: Assume that all EP-AA-113-F-02 forms have been completed. This JPM is complete.**

Job Performance Measure No.: TMI 2005 NRC JPM 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: _____

INITIAL CONDITIONS:

- A large break LOCA occurred; including significant fuel damage.
- The TSC is manning but has not been activated.
- A missing operator has been located. He is seriously injured, conscious, but unable to move and lying in an uncontaminated area where the general radiation level is 200 R/hr.
- It is estimated that four people using a stretcher can move him out of the area in a maximum of 5 minutes.
- Four people have volunteered to perform the task. Pertinent information is provided below.
- No radiation management personnel have arrived on site.

INITIATING CUE: You are the Emergency Director. Perform the required actions prior to dispatching the team of volunteers to rescue the injured man.

VOLUNTEER DATA

NAME	SSN	CURRENT ANNUAL EXPOSURE
Volunteer #1	123-45-6789	300 mRem
Volunteer #2	234-56-7890	250 mRem
Volunteer #3	345-67-8901	400 mRem
Volunteer #4	456-78-9012	150 mRem

Appendix C	Job Performance Measure Worksheet	Form ES-C-1

Facility:	TMI Unit 1	Task No.:	5001045008
Task Title:	Given a set of conditions, upgrade an EAL and make a Protective Action Recommendation (PAR) IAW the facility Emergency Plan.	JPM No.:	2005 NRC JPM A4
K/A Reference:	2.4.44 (4.0)		

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 large break LOCA caused an ESAS actuation and reactor trip.
- A containment purge was in progress at the time of the trip. The containment purge valves failed to close and all attempts to close them have failed.
- The initial declaration was a Site Area Emergency (FS1 – SAE) 20 minutes ago.
- EP-AA-112-100-F-01, SHIFT EMERGENCY DIRECTOR CHECKLIST, has been implemented.
- The Technical Support Center (TSC) is manning but not activated.
- RM-G-22 reads 2.0 E+03 R/hr.
- RM-G-23 reads 2.2 E+03 R/hr.
- The RO reports that the RM-G-24 (RB Purge) reading has increased from 4.1E+05 mR/hr to 5E+05 mR/hr in the past minute.
- Outside temperature is 59 °F.
- The wind is from 220° at 12 MPH.

Task Standard: Critical facility requirements for upgrading to a GE and making a PAR completed within the required time limit.

Required Materials:

- EAL Table
- Shift Emergency Director Book

General References:	• EP-AA-111, EMERGENCY CLASSIFICATION AND PROTECTIVE ACTION RECOMMENDATIONS, Rev. 9 • EP-AA-111-F-09, TMI PLANT BASED PAR FLOWCHART, Rev. B • EP-AA-112-100-F-01, SHIFT EMERGENCY DIRECTOR CHECKLIST, Rev. C • EP-AA-112-F-09, Rev. A, EMERGENCY PUBLIC ADDRESS ANNOUNCEMENTS • EP-MA-114-F-01, STATE/LOCAL EVENT NOTIFICATION FORM, Rev. B • EP-MA-114-100, MID-ATLANTIC STATE/LOCAL NOTIFICATIONS • EP-AA-114-F-01, Rev. A, COMMAND AND CONTROL TURNOVER BRIEFING FORM • EAL Table
Handouts:	• EP-AA-112-100-F-01, SHIFT EMERGENCY DIRECTOR CHECKLIST, Rev. C, completed for an SAE • EAL Table completed for FS1 SAE Declaration • EP-AA-114-F-01, Rev. A, COMMAND AND CONTROL TURNOVER BRIEFING FORM
Initiating Cue:	You are the Shift Manager. Respond in accordance with the EP-AA-112-100-F-01, SHIFT EMERGENCY DIRECTOR CHECKLIST.
Time Critical Task:	YES (≤15 minutes)
Validation Time:	12 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with a check)

	Evaluator Cue:	**Provide handout listed on the cover page.**
	Performance Step: 1	Compare current conditions to the EAL Table.
	Standard:	Determine conditions are met for upgrading EAL to a GENERAL EMERGENCY (GE).
	Comment:	
	Performance Step: 2	Implement EP-AA-112-100-F-01 for GE
	Standard:	Refers to Section 1.4
	Comment:	
√	**Performance Step: 3**	Implement EP-AA-112-100-F-01, Section 1.4.A: • Announce Event Classification to the facility staff.
	Standard:	Discusses announcement of upgrade to GE.
	Comment:	
	Evaluator NOTE:	**Mark the time of the announcement:** _____
	Performance Step: 4	Implement EP-AA-112-100-F-01, Section 1.4.B: • Use the Emergency Public Address Announcements form to select and direct the appropriate public address announcement for a GE.
	Standard:	Simulates announcement IAW with Tab 1, EMERGENCY PUBLIC ADDRESS ANNOUNCEMENTS.
	Comment:	
	Performance Step: 5	Implement EP-AA-112-100-F-01, Section 1.4.C: • If the ERO has not been activated - - - .
	Standard:	N/A – activated on SAE.
	Comment:	

Performance Step: 6 Implement EP-AA-112-100-F-01, Section 1.4.D:

- Determine the correct plant-based PAR per the Emergency Classification and Protective Action Recommendations procedure and the appropriate site specific PAR flowchart.

Standard:

- Refers to Tab 6 - EMERGENCY CLASSIFICATION AND PROTECTIVE ACTION RECOMMENDATIONS
- Refers to Tab 7 – TMI PLANT BASED PAR FLOWCHART

Comment:

√ **Performance Step: 7** Implement EP-AA-112-100-F-01, Section 1.4.E:

- Initiate required State/Local notifications within 15 minutes of the event classification as required per notifications procedure.

Standard: Signs and hands STATE/LOCAL EVENT EMERGENCY NOTIFICATION FORM to Communicator within 15 minutes. Requirements on ENF to meet critical task:

3.a EMERGENCY CLASSIFICATION – GE **or** 4.a EMERGENCY ACTION LEVEL NO. – RG1 or FG1

5.b Checked – AIRBORNE non-routine radiological release in-progress

7.b checked – PAR in the TMI Block:

EVACUATE 360 DEGREES FROM 0 TO **10** MILES AND - - - - .

Comment:

Evaluator NOTE: **Mark the time that the notification form is provided to the communicator: _____**

Terminating Cue: When the candidate hands the completed Notification Form to the Communicator – This JPM is complete.

Job Performance Measure No.: 2005 NRC JPM 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:

- A large break LOCA caused an ESAS actuation and reactor trip.
- A containment purge was in progress at the time of the trip. The containment purge valves failed to close and all attempts to close them have failed.
- The initial declaration was a Site Area Emergency (FS1 – SAE) 20 minutes ago.
- EP-AA-112-100-F-01, SHIFT EMERGENCY DIRECTOR CHECKLIST, has been implemented.
- The Technical Support Center (TSC) is manning but not activated.
- RM-G-22 reads 2.0 E+03 R/hr.
- RM-G-23 reads 2.2 E+03 R/hr.
- The RO reports that the RM-G-24 (RB Purge) reading has increased from 4.1E+05 mR/hr to 5E+05 mR/hr in the past minute.
- Outside temperature is 59 °F.
- The wind is from 220° at 12 MPH.

INITIATING CUE:

You are the Shift Manager. Respond in accordance with the EP-AA-112-100-F-01, SHIFT EMERGENCY DIRECTOR CHECKLIST.