Facility: Limerick Examination Level: **RO**		Date of Examination: 10/9/12-10/12/12 Operating Test Number: 1
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A-1.1	R, N	Evaluate Overtime Work Request
Conduct of Operations A-1.2	R, N	Review Drywell Floor Drain Sump/Equipment Drain Tank Logs and Determine Compliance with TS 3.4.3.2
Equipment Control A-2	R, N	Determine Blocking Required per OP-MA-109-101 "Clearance and Tagging"
Radiation Control A-3	N/A	N/A
Emergency Procedures/Plan A-4	R, N	Emergency Plan Communications

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

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

Facility: Limerick	Date of Examination: 10/9/12-10/12/12
Examination Level: **SRO**	Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A-1.1	R, N	Evaluation of Overtime Hours to Determine Availability
Conduct of Operations A-1.2	R, N	Review Drywell Floor Drain Sump/Equipment Drain Tank Logs and Determine Compliance with TS 3.4.3.2
Equipment Control A-2	R, N	Review and Verify Blocking Required per OP-MA-109-101 "Clearance and Tagging"
Radiation Control A-3	R, N	Review and Approve Inventory Release from Equipment Drain Sample Tank to Cooling Tower Blowdown Line
Emergency Procedures/Plan A-4	R, N	Classify an SAE with Escalation to a GE and Make Protective Action Recommendations

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

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)

Limerick Generating Station

Job Performance Measure

Evaluate Overtime Work Request

RO JPM Designation: A-1.1

Revision Number: 3

Date: 08/15/12

Developed By:	**Patel**	**04/16/12**
	Author	**Date**
Review By:	**Lally**	**04/19/12**
	Examiner	**Date**
Approved By:	**Caruso**	**04/19/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 1, Revised/clarified initiating cue per licensee's request.

Rev 2/3, Revised initiating cue per pre-validation comments, and changed Wed (10/3) to day off based on RO comment, to reset 9 day clock and eliminate confusion.

JPM Setup Instructions:

1. Provide applicant with the work history table.
2. Provide applicant with a copy of, or access to, LS-AA-119, "Fatigue Management and Work Hour Limits".

TASK STANDARD:

Reviews the work hour history and determines that overtime request will result in exceeding work hour limits and also previously worked schedule violates additional work hour rules.

TASK CONDITIONS:

- Shift supervision has contacted you on Sunday, 10/07 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800.
- You were on vacation from 9/1 to 9/22.
- Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operating duties):

Sunday 9/23	**Monday 9/24**	**Tuesday 9/25**	**Wednesday 9/26**	**Thursday 9/27**	**Friday 9/28**	**Saturday 9/29**
Worked 1200-1800	Worked 0600-1800	Worked 0600-1800	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400
Sunday 9/30	**Monday 10/1**	**Tuesday 10/2**	**Wednesday 10/3**	**Thursday 10/4**	**Friday 10/5**	**Saturday 10/6**
Worked 0600-1500	Worked 0600-2100	OFF	OFF	Worked 0600-1800	Worked 0800-1200	Worked 0600-2100

RO INITIATING CUE:

Using the work history provided:

1. Determine if your prior work schedule met work hour requirements.
2. Determine if you can work the entire requested shift schedule, if not, list any and ALL restrictions that apply.
3. Document your conclusion on the cue sheet below.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Evaluate Overtime Work Request

JPM Number: A1.1

Revision Number: 1

K/A Number and Importance: 2.1.5 RO 2.9 SRO 3.9

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 25 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2 Supp. 1
2. LS-AA-119, Rev. 9

EVALUATION SUMMARY:

1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**

Comments:_____

_____

_____

_____

Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator review the work hour history and determines that overtime request will result in exceeding work hour limits and also previously worked schedule violates additional work hour rules.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: This JPM can be performed in the simulator, classroom or other similar environment **EVALUATOR NOTE:** To begin this JPM provide the applicant the task conditions and the cue sheet. Review the work hours history table and the JPM cue sheet.	Applicant reviews work hours history table and the JPM cue sheet.			
1. Reviews LS-AA-119, "Fatigue Management and Work Hour Limits"	Applicant reviews LS-AA-119, "Fatigue Management and Work Hour Limits"			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
2. ★Applicant determines that the required 10 hour break between work periods will not be met, and that the additional hours will result in exceeding 26 hours in any 48 hours period. 10 hours break not met – (From 2100 to 0600 = 9 hours) 27hrs in 48hr period – (Sat 10/6 [15 hrs] + Sun 10/7 [12 hrs] = 27 hrs	Applicant determines that he/she cannot work the requested shift because the required 10 hour break between work periods will not be met, and the additional hours will result in exceeding 26 hours in any 48 hours period 10 hours break not met – (From 2100 to 0600 = 9 hours) 27hrs in 48hr period – (Sat 10/6 [15 hrs] + Sun 10/7 [12 hrs] = 27 hrs			
3. ★Applicant also determines that the previously worked schedule, there was NOT a 34 hour break in any 9 day period. 9 day period [9/23 -10/01] did not have a 34 hour break	Applicant determines that previously worked schedule violation occurred due to not having a 34 hour break in a 9 day period. Actual Break – Mon 10/01 (2100) to Thus 10/4 (0600) = 33 hours.			
<u>EVALUATOR CUE:</u> No further actions are required for this JPM. **EVALUATOR:** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

JPM Stop Time _____

TASK CONDITIONS:

- Shift supervision has contacted you on Sunday, 10/07 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800.
- You were on vacation from 9/1 to 9/22.
- Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operating duties):

Sunday 9/23	**Monday 9/24**	**Tuesday 9/25**	**Wednesday 9/26**	**Thursday 9/27**	**Friday 9/28**	**Saturday 9/29**
Worked 1200-1800	Worked 0600-1800	Worked 0600-1800	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400
Sunday 9/30	**Monday 10/1**	**Tuesday 10/2**	**Wednesday 10/3**	**Thursday 10/4**	**Friday 10/5**	**Saturday 10/6**
Worked 0600-1500	Worked 0600-2100	OFF	OFF	Worked 0600-1800	Worked 0800-1200	Worked 0600-2100

RO INITIATING CUE:

Using the work history provided:

1. Determine if your prior work schedule met work hour requirements.
2. Determine if you can work the entire requested shift schedule, if not, list any and ALL restrictions that apply.
3. Document your conclusion on the cue sheet below.

ANSWER:

TASK CONDITIONS:

- Shift supervision has contacted you on Sunday, 10/07 (a scheduled day off), to report to the control room to work a 12 hour overtime shift from 0600-1800.
- You were on vacation from 9/1 to 9/22.
- Your work history for the previous 2 weeks is as follows (all hours worked performing licensed operating duties):

Sunday 9/23	**Monday 9/24**	**Tuesday 9/25**	**Wednesday 9/26**	**Thursday 9/27**	**Friday 9/28**	**Saturday 9/29**
Worked 1200-1800	Worked 0600-1800	Worked 0600-1800	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400	Worked 0600-1400
Sunday 9/30	**Monday 10/1**	**Tuesday 10/2**	**Wednesday 10/3**	**Thursday 10/4**	**Friday 10/5**	**Saturday 10/6**
Worked 0600-1500	Worked 0600-2100	OFF	OFF	Worked 0600-1800	Worked 0800-1200	Worked 0600-2100

RO INITIATING CUE:

Using the work history provided:

1. Determine if your prior work schedule met work hour requirements.
2. Determine if you can work the entire requested shift schedule, if not, list any and ALL restrictions that apply.
3. Document your conclusion on the cue sheet below.

ANSWER:

Limerick Generating Station

Job Performance Measure

Evaluation of Overtime Hours to Determine Availability

SRO JPM Designation: A-1.1

Revision Number: 1

Date: 08/15/12

Developed By:	**Patel**	**04/16/12**
	Author	**Date**
Review By:	**Lally**	**04/19/12**
	Examiner	**Date**
Approved By:	**Caruso**	**04/19/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 1 – Revised the initiating cue, to provide more clarification on the task, per pre-validation SRO comments.

JPM Setup Instructions:

1. Provide applicant with RO candidates work history table.
2. Provide applicant with a copy of, or access to, LS-AA-119, "Fatigue Management and Work Hour Limits".

TASK STANDARD:

Reviews the work hour history for various RO candidates and determines if any one of the candidates can stand an entire shift. Explains whether or not RO can stand the entire shift.

TASK CONDITIONS:

- Unit 1 is in OPCON 1
- Unit 1 oncoming RO for the 1800-0600 shift has called off sick
- Date is 10/10
- Time is 1700

Reference the attached RO work hour sheet.

SRO INITIATING CUE:

There are 5 RO's available to fill the position. You are told to perform verification of overtime hours to determine which RO, if any, can stand the entire shift. Document your conclusion(s) below (why or why NOT)?

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Evaluation of Overtime Hours to Determine Availability

JPM Number: A1.1

Revision Number: 0

K/A Number and Importance: 2.1.5 RO 2.9 SRO 3.9

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 25 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2 Supp. 1
2. LS-AA-119, Rev. 9

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: For this JPM, SRO needs to review the work hour history for various RO candidates and determines if any one of the candidates can stand an entire shift and explain why or why not?

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: This JPM can be performed in the simulator, classroom or other similar environment **EVALUATOR NOTE:** To begin this JPM provide the applicant the task conditions and the cue sheet. Review RO candidates work hours history table and the JPM cue sheet.	Applicant reviews RO candidates work hours history table and the JPM cue sheet.			
1. Reviews LS-AA-119, "Fatigue Management and Work Hour Limits"	Applicant reviews LS-AA-119, "Fatigue Management and Work Hour Limits"			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
2. ★Applicant determines that the RO candidate #1 CANNOT fill the RO position because RO#1 violates >72 hrs in any 7 days – from 10/4-10/10 (12+13+12+12+12+12=73 hrs)	Applicant determines that the RO candidate #1 CANNOT fill the RO position because RO#1 violates >72 hrs in any 7 days – from 10/4-10/10 (12+13+12+12+12+12=73 hrs)			
3. ★ Applicant determines that the RO candidate #2 CANNOT fill the RO position because RO#2 violates <34 hours break in any 9 days (no 34hr break from 10/2 – 10/10)	Applicant determines that the RO candidate #2 CANNOT fill the RO position because RO#2 violates <34 hours break in any 9 days (no 34hr break from 10/2 – 10/10)			
4. ★ Applicant determines that the RO candidate #3 CAN fill the RO position. NO violation of the work hour limits.	Applicant determines that the RO candidate #3 CAN fill the RO position. NO violation of the work hour limits.			
5. ★Applicant determines that the RO candidate #4 CANNOT fill the RO position because RO#4 violates >26 hrs in any 48 hours – from 10/9-10/10 [15hrs (10/9-10)+12hrs (10/2-3) = 27 hrs]	Applicant determines that the RO candidate #4 CANNOT fill the RO position because RO#4 violates >26 hrs in any 48 hours – from 10/9-10/10 [15hrs (10/9-10)+12hrs (10/2-3) = 27 hrs]			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
6. ★ Applicant determines that the RO candidate #5 CANNOT fill the RO position because RO#5 violates <10 hours break (btwn work period) on 10/10 (0900 to 1800(10/10) = 9hrs break)	Applicant determines that the RO candidate #5 CANNOT fill the RO position because RO#5 violates <10 hours break (btwn work period) on 10/10 (0900 to 1800(10/10) = 9hrs break)			
EVALUATOR CUE: No further actions are required for this JPM. **EVALUATOR:** Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

JPM Stop Time _____

TASK CONDITIONS:

- Unit 1 is in OPCON 1
- Unit 1 oncoming RO for the 1800-0600 shift has called off sick
- Date is 10/10
- Time is 1700

Reference the attached RO work hour sheet

SRO INITIATING CUE:

There are 5 RO's available to fill the position. You are told to perform verification of overtime hours to determine which RO, if any, can stand the entire shift. Document your conclusion(s) below (why or why NOT)?

ANSWER:

RO#1:

RO#2:

RO#3:

RO#4:

RO#5:

TASK CONDITIONS:

- Unit 1 is in OPCON 1
- Unit 1 oncoming RO for the 1800-0600 shift has called off sick
- Date is 10/10
- Time is 1700

Reference the attached RO work hour sheet

SRO INITIATING CUE:

There are 5 RO's available to fill the position. You are told to perform verification of overtime hours to determine which RO, if any, can stand the entire shift. Document your conclusion(s) below (why or why NOT)?

ANSWER:

RO#1:

RO#2:

RO#3:

RO#4:

RO#5:

RO Work Hour Sheet

RO									
	10/1	10/2	10/3	10/4	10/5	10/6	10/7	10/8	10/9
1			1800(10/3)-0200(10/4)	1800(10/4)-0600(10/5)		1800(10/6)-0700(10/7)	1800(10/7)-0600(10/8)	1800(10/8)-0600(10/9)	1800(10/9)-0600(10/10)
2		0600(10/2)-1800(10/2)	0600(10/3)-1800(10/3)	0600(10/4)-1800(10/4)	0600(10/5)-1800(10/5)	0600(10/6)-1200(10/6)	0600(10/7)-1000(10/7)	0600(10/8)-1200(10/8)	0600(10/9)-1000(10/9)
3	0600(10/1)-1800(10/1)		1800(10/3)-0600(10/4)		1800(10/5)-0800(10/6)	1800(10/6)-0600(10/7)	1800(10/7)-0800(10/8)	1800(10/8)-0600(10/9)	
4	0800(10/1)-1600(10/1)	0800(10/2)-1600(10/2)	0800(10/3)-1600(10/3)	0800(10/4)-1600(10/4)			1800(10/7)-0000(10/8)	1800(10/8)-0600(10/9)	1700(10/9)-0800(10/10)
5			0700(10/3)-1500(10/3)	0700(10/4)-1500(10/4)	0700(10/5)-1500(10/5)	0700(10/6)-1500(10/6)		0600(10/8)-1100(10/8)	2300(10/9)-0900(10/10)

RO Work Hour Sheet

RO									
	10/1	10/2	10/3	10/4	10/5	10/6	10/7	10/8	10/9
1			1800(10/3)-0200(10/4)	1800(10/4)-0600(10/5)		1800(10/6)-0700(10/7)	1800(10/7)-0600(10/8)	1800(10/8)-0600(10/9)	1800(10/9)-0600(10/10)
2		0600(10/2)-1800(10/2)	0600(10/3)-1800(10/3)	0600(10/4)-1800(10/4)	0600(10/5)-1800(10/5)	0600(10/6)-1200(10/6)	0600(10/7)-1000(10/7)	0600(10/8)-1200(10/8)	0600(10/9)-1000(10/9)
3	0600(10/1)-1800(10/1)		1800(10/3)-0600(10/4)		1800(10/5)-0800(10/6)	1800(10/6)-0600(10/7)	1800(10/7)-0800(10/8)	1800(10/8)-0600(10/9)	
4	0800(10/1)-1600(10/1)	0800(10/2)-1600(10/2)	0800(10/3)-1600(10/3)	0800(10/4)-1600(10/4)			1800(10/7)-0000(10/8)	1800(10/8)-0600(10/9)	1700(10/9)-0800(10/10)
5			0700(10/3)-1500(10/3)	0700(10/4)-1500(10/4)	0700(10/5)-1500(10/5)	0700(10/6)-1500(10/6)		0600(10/8)-1100(10/8)	2300(10/9)-0900(10/10)

SRO Admin JPM A1.1 – ANSWER KEY

RO										
	10/1	10/2	10/3	10/4	10/5	10/6	10/7	10/8	10/9	10/10
1			1800(10/3)-0200(10/4)	1800(10/4)-0600(10/5)		1800(10/6)-0700(10/7)	1800(10/7)-0600(10/8)	1800(10/8)-0600(10/9)	1800(10/9)-0600(10/10)	1800(10/10) - 0600(10/11)
	0	0	8	12	0	13	12	12	12	12
2		0600(10/2)-1800(10/2)	0600(10/3)-1800(10/3)	0600(10/4)-1800(10/4)	0600(10/5)-1800(10/5)	0600(10/6)-1200(10/6)	0600(10/7)-1000(10/7)	0600(10/8)-1200(10/8)	0600(10/9)-1000(10/9)	1800(10/10) - 0600(10/11)
	0	12	12	12	12	6	4	6	4	12
3	0600(10/1)-1800(10/1)		1800(10/3)-0600(10/4)		1800(10/5)-0800(10/6)	1800(10/6)-0600(10/7)	1800(10/7)-0800(10/8)	1800(10/8)-0600(10/9)		1800(10/10) - 0600(10/11)
	12	0	12	0	14	12	14	12	0	12
4	0800(10/1)-1600(10/1)	0800(10/2)-1600(10/2)	0800(10/3)-1600(10/3)	0800(10/4)-1600(10/4)			1800(10/7)-0000(10/8)	1800(10/8)-0600(10/9)	1700(10/9)-0800(10/10)	1800(10/10) - 0600(10/11)
	12	12	12	12	0	0	6	12	15	12
5			0700(10/3)-1500(10/3)	0700(10/4)-1500(10/4)	0700(10/5)-1500(10/5)	0700(10/6)-1500(10/6)		0600(10/8)-1100(10/8)	2300(10/9)-0900(10/10)	1800(10/10) - 0600(10/11)
	0	0	8	8	8	8	0	5	10	12

- >16 hrs in any 24 hours –
- >26 hrs in any 48 hours – RO Candidate # 4 violation (15(10/9-10)+12(10/2-3) = 27 hrs)
- >72 hrs in any 7 days – RO Candidate #1 violation (12+13+12+12+12+12=73 hrs)
- <10 hours break (btwn work period) – RO Candidate # 5 violation (0900 to 1800(10/10) = 9hrs break)
- <34 hours break in any 9 days – RO Candidate # 2 violation (no 34hr break from 10/2 – 10/10)

Limerick Generating Station

Job Performance Measure

Review Drywell Floor Drain Sump/Equipment Drain Tank Logs and Determine Compliance with TS 3.4.3.2

RO JPM Designation: A-1.2

Revision Number: 3

Date: 09/18/12

Developed By:	Lally	09/18/12
	Author	**Date**
Review By:	Patel	09/18/12
	Examiner	**Date**
Approved By:	Caruso	09/18/12
	Chief Examiner	**Date**

* NOTE! CHANGE MADE TO JPM AFTER THE EXAM THAT AFFECTED GRADING ~~STANDARD~~ 9a STANDARD.
10/25/12

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0

Rev 1: Added second critical task for identification of math error

Rev 2: edited ST and editorial changes to cue/task standard

Rev 3: changed "MODE" to "OPCON" in task conditions.

JPM Setup Instructions:

1. Provide completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3"
2. Provide Unit 1 Tech Specs
3. Provide calculator for applicant use

TASK STANDARD:

Review the data for drywell floor drain and equipment drain tanks, determine that >2 gpm increase in leakage over a 24 hour period was exceeded, and identification of a math error on day 2

TASK CONDITIONS:

1. Unit 1 is in OPCON 1
2. Unit 1 has been at 100% power for 179 days

INITIATING CUE:

You are performing a peer check review for a completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3". Perform this review and document discrepancies found, if any.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Review Drywell Floor Drain Sump/Equipment Drain Tank Logs and Determine Compliance with TS 3.4.3.2

JPM Number: A-1.2

Revision Number: 2

K/A Number and Importance: 2.1.25 RO 3.9 SRO 4.2

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 25 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2 Supp. 1
2. ST-6-107-596-1, Rev. 23
3. LGS Unit 1 TS 3.4.3.2

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**

Comments:_____

_____

_____

_____

_____

Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator review surveillance data for drywell floor drain and equipment drain tank logs to determine compliance with TS 3.4.3.2

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: This JPM can be performed in the simulator, classroom or other similar environment. Ensure ST-6-107-596-1, Unit 1 Tech Specs, and calculator are available for candidate use. **EVALUATOR CUE:** Provide the candidate with the task conditions, initiating cue, and the completed ST-6-107-596-1				
Obtain and review ST-6-107-596-1	Obtains and reviews surveillance procedure			
(Step 4.2.1) IF FI-61-115, FLOOR, FL, AND FI-61-135, EQUIP, FL, are OPERABLE, THEN GO TO Step 4.2.3	Applicant notes that step 4.2.2 is N/A, concluding that instrumentation was OPERABLE			
* (Step 4.2.4) Calculate Total Leakrate by adding together each of the recorded values on Attachment 2, Table 1 AND RECORD Total Leakrate on Attachment 2, Table 1	Applicant verifies Total Leakrate calculations are correct for all Total Leakrate entries **★Notes math error Day 2 Total Leakrate 1.3 gpm vice 2.3 gpm**			

* EXAM TEAM RE-EVALUATED IN POST EXAM-SPACE THAT THERE WERE NO CONSEQUENCES RESULTING FROM FAILURE TO IDENTIFY THIS MATH ERROR, BECAUSE THE MATH ERROR DID NOT AFFECT THE OUTCOME OF THE ST, EXAM TEAM CONCLUDED THAT THIS SHOULD BE DESIGNATED AS A NON CRITICAL TASK.

JOHN CARUSO
CHIEF EXAMINER
10/25/12

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★ (Step 4.2.5) Perform the following at 08:15, 16:15, AND 00:15: 1. IF Total Leakrate is less than or equal to 25 gpm, AND FI-61-115, FLOOR, FL, is less than or equal to 5 gpm AND FI-61-115, FLOOR, FL increases is less than or equal to 2 gpm from previous 00:15 reading THEN ENTER SAT on Attachment 2, Table 1. Otherwise ENTER UNSAT on Attachment 2, Table 1, AND NOTIFY SSV **Evaluator Note:** Roleplay as unit supervisor and acknowledge applicant report. *If applicant does not identify any TS violation, ask them if there are any TS concerns.*	**★Applicant identifies on day 5 that the 0815 floor drain reading is now 3.9 gpm. This is an increase of >2 gpm over the last 24 hours. Applicant notes this and that step 4.2.5.1 should not have been marked SAT. Notes that they would notify SSV as Tech Spec actions are required**			
EVALUATOR CUE: No further actions are required for this JPM				
EVALUATOR: Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

JPM Stop Time _____

TASK CONDITIONS

1. 1. Unit 1 is in OPCON 1
2. Unit 1 has been at 100% power for 179 days

INITIATING CUE

You are performing a peer check review for a completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3". Perform this review and document discrepancies found, if any, on this sheet.

TASK CONDITIONS

1. Unit 1 is in OPCON 1
2. Unit 1 has been at 100% power for 179 days

INITIATING CUE

You are performing a peer check review for a completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3". Perform this review and document discrepancies found, if any, on this sheet.

Limerick Generating Station

Job Performance Measure

Review Drywell Floor Drain Sump/Equipment Drain Tank Logs and Determine Compliance with TS 3.4.3.2

SRO JPM Designation: A-1.2

Revision Number: 3

Date: 09/18/12

Developed By:	**Lally**	**09/18/12**
	Author	**Date**
Review By:	**Patel**	**09/18/12**
	Examiner	**Date**
Approved By:	**Caruso**	**09/18/12**
	Chief Examiner	**Date**

* NOTE: CHANGE MADE TO JPM AFTER THE EXAM THAT AFFECTED THE GRADING STANDARD.

10/25/12

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0

Rev 1: Added second critical task for identification of math error

Rev 2: edited ST and editorial changes to cue/task standard

Rev 3: Changed "MODE" to "OPCON" and editorial changes to initiating cue.

JPM Setup Instructions:

1. Provide completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3"
2. Provide Unit 1 Tech Specs
3. Provide calculator for applicant use

TASK STANDARD:

Review the data for drywell floor drain and equipment drain tanks, determine that >2 gpm increase in leakage over a 24 hour period was exceeded, and identification of a math error on day 2

TASK CONDITIONS:

1. Unit 1 is in OPCON 1
2. Unit 1 has been at 100% power for 179 days

SRO INITIATING CUE:

You are performing a review of a completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3". Perform this review and document discrepancies found, including operational concerns, if any, on this sheet.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Review Drywell Floor Drain Sump/Equipment Drain Tank Logs and Determine Compliance with TS 3.4.3.2

JPM Number: A-1.2

Revision Number: 2

K/A Number and Importance: 2.1.25 RO 3.9 SRO 4.2

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 25 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2 Supp. 1
2. ST-6-107-596-1, Rev. 23
3. LGS Unit 1 TS 3.4.3.2

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ Date: _____

Description: This JPM has the operator review surveillance data for drywell floor drain and equipment drain tank logs to determine compliance with TS 3.4.3.2

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: This JPM can be performed in the simulator, classroom or other similar environment. Ensure ST-6-107-596-1, Unit 1 Tech Specs, and calculator are available for candidate use. **EVALUATOR CUE:** Provide the candidate with the task conditions, initiating cue, and the completed ST-6-107-596-1				
Obtain and review ST-6-107-596-1	Obtains and reviews surveillance procedure			
(Step 4.2.1) IF FI-61-115, FLOOR, FL, AND FI-61-135, EQUIP, FL, are OPERABLE, THEN GO TO Step 4.2.3	Applicant notes that step 4.2.2 is N/A, concluding that instrumentation was OPERABLE			
* ★(Step 4.2.4) Calculate Total Leakrate by adding together each of the recorded values on Attachment 2, Table 1 AND RECORD Total Leakrate on Attachment 2, Table 1	Applicant verifies Total Leakrate calculations are correct for all Total Leakrate entries **★Notes math error Day 2 Total Leakrate 1.3 gpm vice 2.3 gpm**			

* EXAM DETERMINED AFTER THE EXAM THAT THERE WERE NO CONSEQUENCES RESULTING FROM FAILURE TO IDENTIFY THIS MATH ERROR SINCE THE MATH ERROR DID NOT AFFECT THE OUTCOME OF THE ST. THEREFORE, THE EXAM TEAM CONCLUDED THAT THIS SHOULD BE DESIGNATED AS A NON CRITICAL TASK.

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★ (Step 4.2.5) Perform the following at 08:15, 16:15, AND 00:15: 1. IF Total Leakrate is less than or equal to 25 gpm, AND FI-61-115, FLOOR, FL, is less than or equal to 5 gpm AND FI-61-115, FLOOR, FL increases is less than or equal to 2 gpm from previous 00:15 reading THEN ENTER SAT on Attachment 2, Table 1. Otherwise ENTER UNSAT on Attachment 2, Table 1, AND NOTIFY SSV **Evaluator Note:** Roleplay as unit supervisor and acknowledge applicant report. Ask applicant, "if the reading were real, what actions would be required?" Direct applicant to document their results on the cue sheet.	**Applicant identifies on day 5 that the 0815 floor drain reading is now 3.9 gpm. This is an increase of >2 gpm over the last 24 hours. Applicant notes this and that step 4.2.5.1 should not have been marked SAT. Applicant will note that the 3.9 gpm reading is not corroborated by other readings for that time. Notes that they would notify SSV as Tech Spec actions are required**			
★Refers to and evaluates compliance with Tech Spec 3.4.3.2	**Applicant states/documents that the plant should be in TS 3.4.3.2 Action E, which states:** With any reactor coolant system leakage greater than the limit in f above (2 gpm increase in UNIDENTIFIED LEAKAGE over a 24-hour period), identify the source of leakage within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours			
EVALUATOR CUE: No further actions are required for this JPM				

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR: Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

JPM Stop Time _____

TASK CONDITIONS

1. Unit 1 is in OPCON 1
2. Unit 1 has been at 100% power for 179 days

INITIATING CUE

You are performing a review of a completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3". Perform this review and document discrepancies found, including operational concerns, if any, on this sheet.

TASK CONDITIONS

1. Unit 1 is in OPCON 1
2. Unit 1 has been at 100% power for 179 days

INITIATING CUE

You are performing a review of a completed ST-6-107-596-1, "Drywell Floor Drain Sump/Equipment Drain Tank Surveillance Log/OPCON 1, 2, 3". Perform this review and document discrepancies found, including operational concerns, if any, on this sheet.

Limerick Generating Station

Job Performance Measure

Determine Blocking Required per OP-MA-109-101 "Clearance and Tagging"

RO JPM Designation: A-2

Revision Number: 2

Date: 08/17/12

Developed By:	**DeMarshall**	**08/17/12**
	Author	**Date**
Reviewed By:	**Lally**	**08/20/12**
	Examiner	**Date**
Approved By:	**Caruso**	**08/20/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0 (4/12/12): JPM split into separate RO and SRO actions. RO to provide proposed blocking points, SRO to review and correct proposed blocking points

Rev 1 (6/29/12): Removed Critical Element designation from the INFO tags associated with the two Handswitch blocking points listed in the Exam Key

Rev 2 (8/17/12): Revised what information is required for each blocking point

JPM Setup Instructions:

1. Provide OP-MA-109-101
2. Provide prints E-15, E-57 (sheet 1), and M-52 (sheets 1 and 2)
3. Provide blank Proposed Blocking Sheet

TASK STANDARD:

Provide a list of proposed blocking points for 1C Core Spray Pump in accordance with OP-MA-109-101, that identifies the components specified in the attached Proposed Blocking Key.

TASK CONDITIONS

Unit 1 is at 100% power.

1C Core Spray Pump has been scheduled for packing replacement, but due to an oversight, no clearance package was developed

Database problems within PIMS have prevented development of a clearance order by electronic means

INITIATING CUE

Using the appropriate drawings, provide a list of components and print designations to be aligned to provide adequate personnel protection for the pump packing replacement. Additionally, determine whether they should be "blocked open", "blocked closed", "de-energized", and/or "racked out". Document the Component/Print Designation and Blocked Position on the Proposed Blocking Sheet. The Clearance Order Office will generate the associated Clearance Order when PIMS is returned to service.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Determine Blocking Required per OP-MA-109-101 "Clearance and Tagging"

JPM Number: A-2

Revision Number: 2

K/A Number and Importance: 2.2.41 RO 3.5 SRO 3.9

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: **20 min.** **Actual Time Used:** _____minutes

References:
1. NUREG 1123 Rev. 2, Supp. 1
2. OP-MA-109-101 Rev. 13
3. E-15, Sh. 1, Rev 029
4. E-57, Sh. 1, Rev 041
5. M-52, Sh. 1, Rev 001, and Sh. 2, Rev 002

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator determine blocking points for the 1C Core Spray Pump to support packing replacement. The normal means of clearance development, PIMS, is unavailable. The applicant will provide proposed blocking points in accordance with OP-MA-109-101.

NOTE: Critical Element(s) indicated by ★ in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: • Ensure the following material is available to support performance of this JPM: ♦ Prints: M-52 sheets 1 and 2, E-15, E-57 sh. 1 ♦ OP-MA-109-101 ♦ Attached Proposed Blocking Sheet (blank) **EVALUATOR NOTE:** To begin this JPM, provide the applicant with the Task Conditions, Initiating Cue Sheet and Proposed Blocking Sheet. Reviews the scope of work planned for 1C Core Spray Pump. OP-MA-109-101 is an Information Use only procedure. Applicant should reference clearance Section 5, "Clearance Tag Standards," and Section 7, "Clearance Development Standards," for general equipment blocking rules to develop proposed blocking list. Applicant may also reference Attachment 6, "Clearance Writer and Approver Checklist."	Determines that pump and motor need to be blocked AND should isolate all pump flowpaths to allow for packing replacement work. Locates and uses referenced drawings to determine blocking points; Uses M-52 Sheets 1 and 2, E-15, and E-57 Sheet 1 to develop proposed blocking list.			
★Develops list of proposed blocking points based upon print review and OP-MA-109-101 guidance **EVALUATOR NOTE:** Applicant may at any time reference OP-MA-109-101 to ensure compliance and follow appropriate check sheets.	Proposed blocking list generated matches attached Proposed Blocking Key; AND all critical steps met.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Provides completed list of proposed blocking points to the Unit Supervisor to be forwarded to WCC. **EVALUATOR CUE:** Roleplay the Unit Supervisor and acknowledge receipt of the proposed blocking points. Inform applicant that the list will be forwarded to the WCC.	Unit Supervisor is given the list of proposed blocking points.			
EVALUATOR CUE: Once applicant turns in list of proposed blocking points, the JPM is complete. **DUE TO THE NATURE OF THIS JPM OTHER BLOCKING POINTS MAY BE ACCEPTABLE. CONSULT WITH ADDITIONAL SMEs AS NECESSARY TO DETERMINE ACCEPTABILITY OF ALTERNATE BLOCKING POINTS.**				

JPM Stop Time _____

NOTE

Do **NOT** give the next page (Key) to the Applicant!

Applicant is given Cue sheet and Blank Proposed Blocking sheet

PROPOSED BLOCKING KEY
DO NOT GIVE TO CANDIDATE

NOTE: Critical Element(s) indicated by ★ in Performance Checklist.

Component and Designation	Position
1. ★1C Core Spray Pump 1CP206 4kV Breaker 152-11706	**★Racked Out**
2. ★1C Core Spray Pump Suction Valve HV-052-1F001C	**★Blocked Closed**
3. ★1C Core Spray Pump Suction Valve HV-052-1F001C 480V Breaker 152-21709	**★Blocked Open/De-energized**
4. ★1C Core Spray Pump Discharge Isolation Valve 052-1F020C	**★Blocked Closed**
6. ★1C Core Spray Pump Suction From CST Valve 1F002C	**★Blocked Closed**
6. ★1C Core Spray Pump Min Flow Valve Isolation Valve 52-1F010C	**★Blocked Closed**
7. ★1C Core Spray Pump Safeguard Piping Fill Isolation Valve 52-1047A	**★Blocked Closed**
8. 1C Core Spray Pump Discharge Drain Valve 52-1029C	**Blocked Open**
9. 1C Core Spray Pump Discharge Drain Valve 52-1030C	**Blocked Open**
10. 1C Core Spray Pump Discharge Drain Valve 52-1001C	**Blocked Open**
11. 1C Core Spray Pump Discharge Drain Valve 52-1002C	**Blocked Open**
12. 1C Core Spray Pump Discharge Vent Valve 52-1005C	**Blocked Open**
13. 1C Core Spray Pump Discharge Vent Valve 52-1006C	**Blocked Open**
14. 1C Core Spray Pump Suction Drain Valve 52-1028C	**Blocked Open**
15. 1C Core Spray Pump Suction Vent Valve 52-1F034C	**Blocked Open**
16. 1C Core Spray Pump Seal Vent Valve 52-1F016C	**Blocked Open**
17. 1C Core Spray Pump Seal Vent Valve 52-1071C	**Blocked Open**
★ Applicant must identify at least 1 vent and 1 drain valve (components 8-17) as BLOCKED OPEN	

TASK CONDITIONS

Unit 1 is at 100% power.

1C Core Spray Pump has been scheduled for pump packing replacement, but due to an oversight, no clearance package was developed.

Database problems within PIMS have prevented development of a clearance order by electronic means.

INITIATING CUE

Using the appropriate drawings, provide a list of components and print designations to be aligned to provide adequate personnel protection for the pump packing replacement. Additionally, determine whether they should be "blocked open", "blocked closed", "de-energized", and/or "racked out". Document the Component/Print Designation and Blocked Position on the Proposed Blocking Sheet. The Clearance Order Office will generate the associated Clearance Order when PIMS is returned to service.

PROPOSED BLOCKING

NOTE: Focus is on determining that the proposed blocking points are adequate for personnel protection

TASK CONDITIONS

Unit 1 is at 100% power.

1C Core Spray Pump has been scheduled for pump packing replacement, but due to an oversight, no clearance package was developed.

Database problems within PIMS have prevented development of a clearance order by electronic means.

INITIATING CUE

Using the appropriate drawings, provide a list of components and print designations to be aligned to provide adequate personnel protection for the pump packing replacement. Additionally, determine whether they should be "blocked open", "blocked closed", "de-energized", and/or "racked out". Document the Component/Print Designation and Blocked Position on the Proposed Blocking Sheet. The Clearance Order Office will generate the associated Clearance Order when PIMS is returned to service.

PROPOSED BLOCKING

NOTE: Focus is on determining that the proposed blocking points are adequate for personnel protection

Limerick Generating Station

Job Performance Measure

Review and Verify Blocking Required per OP-MA-109-101 "Clearance and Tagging"

SRO JPM Designation: A-2

Revision Number: 2

Date: 08/17/12

Developed By:	**DeMarshall**	**08/17/12**
	Author	**Date**
Reviewed By:	**Lally**	**08/20/12**
	Examiner	**Date**
Approved By:	**Caruso**	**08/20/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0 (4/12/12): JPM split into separate RO and SRO actions. RO to provide proposed blocking points, SRO to review and correct proposed blocking points

Rev 1 (6/29/12): Removed Critical Element designation from the INFO tags associated with the two Handswitch blocking points listed in the Exam Key and the Cue Sheet

Rev 2 (8/17/12): Adjusted parameters required and descriptions of isolation points, removed references to tag types

JPM Setup Instructions:

1. Provide OP-MA-109-101
2. Provide prints E-15, E-57 (sheet 1), and M-52 (sheets 1 and 2)
3. Provide pre-filled Proposed Blocking Sheet

TASK STANDARD:

Review the list of proposed blocking points for 1C Core Spray Pump; identify and note discrepancies in accordance with attached key; determine applicable Tech Spec.

TASK CONDITIONS:

Unit 1 is at 100% power.

1C Core Spray Pump has been scheduled for pump packing replacement, but due to an oversight, no clearance package was developed

Database problems within PIMS have prevented development of a clearance order by electronic means

SRO INITIATING CUE:

Using the appropriate drawings referenced on the proposed clearance, review the requested blocking points to ensure they provide adequate personnel protection for the pump packing replacement. The Clearance Order Office will generate the associated Clearance Order when PIMS is returned to service. Document discrepancies found, if any, on this sheet and determine required Tech Spec ACTION(s), if any.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Determine Blocking Required per OP-MA-109-101, "Clearance and Tagging"

JPM Number: A-2

Revision Number: 2

K/A Number and Importance: 2.2.41 RO 3.5 SRO 3.9

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: **20 min.** **Actual Time Used:** _____minutes

References:
1. NUREG 1123 Rev. 2, Supp. 1
2. OP-MA-109-101 Rev.13
3. E-15, Rev. 29
4. E-57, sheet 1, Rev. 41
5. M-52, sheet 1, Rev. 50
6. M-52, sheet 2, Rev. 46

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator determine blocking points for the 1C Core Spray Pump to support impeller replacement. The normal means of clearance development, PIMS, is unavailable. The applicant will review proposed blocking points in accordance with OP-MA-109-101.

NOTE: Critical Element(s) indicated by ★ in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: • Ensure the following material is available to support performance of this JPM: ♦ Prints: M-52 sheets 1 and 2, E-15, E-57 sh. 1 ♦ OP-MA-109-101 ♦ Attached Proposed Blocking Sheet (filled out) **EVALUATOR NOTE:** To begin this JPM, provide the applicant with the Task Conditions, Initiating Cue Sheet and Proposed Blocking Sheet.				
Reviews the scope of work planned for 1C Core Spray Pump. OP-MA-109-101 is an Information Use only procedure. Applicant should reference clearance Section 5, "Clearance Tag Standards," Section 7, "Clearance Development Standards," and Attachment 10, "Clearance Challenge," for general equipment blocking rules and verification of correct blocking points. Applicant may also reference Attachment 6, "Clearance Writer and Approver Checklist."	Determines that pump and motor need to be blocked AND should isolate all pump flowpaths to allow for pump packing replacement work			
Reviews list of proposed blocking points against referenced drawings per OP-MA-109-101 guidance **EVALUATOR NOTE:** Applicant may at anytime reference OP-MA-109-101 to ensure compliance and follow appropriate check sheets.	Uses M-52 (Sheets 1 and 2), E-15, and E-57 Sheet 1, to review proposed blocking points			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★Using E-15, applicant recognizes that the requested 4kV breaker listed (152-11705) for 1C Core Spray Pump 1CP206, is incorrect	Applicant identifies 152-11706 as the correct 4kV breaker for 1C Core Spray Pump AND revises the tagging clearance			
★Using M-52, Sheet 2, applicant recognizes that 1C Core Spray Pump Safeguard Piping Fill Isolation Valve 52-1047A has been omitted from the tagging clearance	Applicant identifies that 1C Core Spray Pump Safeguard Piping Fill Isolation Valve 52-1047A is a required blocking point AND revises the tagging clearance to include the valve			
Provides completed list of corrected blocking points to the Unit Supervisor to be forwarded to WCC. **EVALUATOR CUE:** Roleplay the Unit Supervisor and acknowledge receipt of the corrected blocking sheet. Inform applicant that the list will be forwarded to the WCC.	Unit Supervisor is given the corrected blocking sheet.			
Determines that Tech Spec 3.5.1, "ECCS - Operating," is applicable	Determines that ACTION 3.5.1.a.1 is required: "With one CSS subsystem inoperable, provided that at least two LPCI subsystems are OPERABLE, restore the inoperable CSS subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours."			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
<u>EVALUATOR CUE:</u> Once applicant turns in list of corrected blocking points or documented discrepancies on the cue sheet, and determines TS applicability, the JPM is complete. **DUE TO THE NATURE OF THIS JPM OTHER BLOCKING POINTS MAY BE ACCEPTABLE. CONSULT WITH ADDITIONAL SMEs AS NECESSARY TO DETERMINE ACCEPTABILITY OF ALTERNATE BLOCKING POINTS.**				

JPM Stop Time _____

NOTE

Do **NOT** give the next page (Key) to the Applicant!

Applicant is given Cue sheet and Proposed Blocking sheet

PROPOSED BLOCKING KEY
DO NOT GIVE TO CANDIDATE

NOTE: Critical Element(s) indicated by ★ in Performance Checklist.

Component and Designation	Position
1. ★1C Core Spray Pump 1CP206 4kV Breaker **152-11706**	Racked Out
2. 1C Core Spray Pump Suction Valve HV-052-1F001C	Blocked Closed
3. 1C Core Spray Pump Suction Valve HV-052-1F001C 480V Breaker 152-21709	Blocked Open/De-energized
4. 1C Core Spray Pump Suction From CST Valve 1F002C	Blocked Closed
5. **★1C Core Spray Pump Safeguard Piping Fill Isolation Valve 52-1047A**	Blocked Closed
6. 1C Core Spray Pump Discharge Isolation Valve 052-1F020C	Blocked Closed
7. 1C Core Spray Pump Min Flow Valve Isolation Valve 52-1F010C	Blocked Closed
8. 1C Core Spray Pump Discharge Drain Valve 52-1029C	Blocked Open
9. 1C Core Spray Pump Discharge Drain Valve 52-1030C	Blocked Open
10. 1C Core Spray Pump Discharge Drain Valve 52-1001C	Blocked Open
11. 1C Core Spray Pump Discharge Drain Valve 52-1002C	Blocked Open
12. 1C Core Spray Pump Discharge Vent Valve 52-1005C	Blocked Open
13. 1C Core Spray Pump Discharge Vent Valve 52-1006C	Blocked Open
14. 1C Core Spray Pump Suction Drain Valve 52-1028C	Blocked Open
15. 1C Core Spray Pump Suction Vent Valve 52-1F034C	Blocked Open
16. 1C Core Spray Pump Seal Vent Valve 52-1F016C	Blocked Open
17. 1C Core Spray Pump Seal Vent Valve 52-1071C	Blocked Open

★Correct 1C Core Spray Pump Breaker Designation is 152-11706; 152-11705 is given to applicant

★1C Core Spray Pump Safeguard Piping Fill Isolation Valve 52-1047A is missing from proposed clearance, applicant must identify

TASK CONDITIONS

Unit 1 is at 100% power.

1C Core Spray Pump has been scheduled for pump packing replacement, but due to an oversight, no clearance package was developed.

Database problems within PIMS have prevented development of a clearance order by electronic means.

INITIATING CUE

Using the appropriate drawings referenced on the proposed clearance, review the requested blocking points to ensure they provide adequate personnel protection for the pump packing replacement. The Clearance Order Office will generate the associated Clearance Order when PIMS is returned to service. Document discrepancies found, if any, on this sheet and determine required Tech Spec ACTION(s), if any.

PROPOSED BLOCKING FOR SRO REVIEW

NOTE: Focus is on determining that the proposed blocking points are adequate for personnel protection

Print References: E-15, E-57 (Sheet 1), M-52 (Sheets 1 & 2)

Component and Designation	Position
1. 1C Core Spray Pump 1CP206 4kV Breaker 152-11705	Racked Out
2. 1C Core Spray Pump Suction Valve HV-052-1F001C	Blocked Closed
3. 1C Core Spray Pump Suction Valve HV-052-1F001C 480V Breaker 152-21709	Blocked Open/De-energized
4. 1C Core Spray Pump Suction From CST Valve 1F002C	Blocked Closed
5. 1C Core Spray Pump Discharge Isolation Valve 52-1F020C	Blocked Closed
6. 1C Core Spray Pump Min Flow Valve Isolation Valve 52-1F010C	Blocked Closed
7. 1C Core Spray Pump Discharge Drain Valve 52-1029C	Blocked Open
8. 1C Core Spray Pump Discharge Drain Valve 52-1030C	Blocked Open
9. 1C Core Spray Pump Discharge Drain Valve 52-1001C	Blocked Open
10. 1C Core Spray Pump Discharge Drain Valve 52-1002C	Blocked Open
11. 1C Core Spray Pump Discharge Vent Valve 52-1005C	Blocked Open
12. 1C Core Spray Pump Discharge Vent Valve 52-1006C	Blocked Open
13. 1C Core Spray Pump Suction Drain Valve 52-1028C	Blocked Open
14. 1C Core Spray Pump Suction Vent Valve 52-1F034C	Blocked Open
15. 1C Core Spray Pump Seal Vent Valve 52-1F016C	Blocked Open
16. 1C Core Spray Pump Seal Vent Valve 52-1071C	Blocked Open

TASK CONDITIONS

Unit 1 is at 100% power.

1C Core Spray Pump has been scheduled for pump packing replacement, but due to an oversight, no clearance package was developed.

Database problems within PIMS have prevented development of a clearance order by electronic means.

INITIATING CUE

Using the appropriate drawings referenced on the proposed clearance, review the requested blocking points to ensure they provide adequate personnel protection for the pump packing replacement. The Clearance Order Office will generate the associated Clearance Order when PIMS is returned to service. Document discrepancies found, if any, on this sheet and determine required Tech Spec ACTION(s), if any.

PROPOSED BLOCKING FOR SRO REVIEW

NOTE: Focus is on determining that the proposed blocking points are adequate for personnel protection

Print References: E-15, E-57 (Sheet 1), M-52 (Sheets 1 & 2)

Component and Designation	Position
1. 1C Core Spray Pump 1CP206 4kV Breaker 152-11705	Racked Out
2. 1C Core Spray Pump Suction Valve HV-052-1F001C	Blocked Closed
3. 1C Core Spray Pump Suction Valve HV-052-1F001C 480V Breaker 152-21709	Blocked Open/De-energized
4. 1C Core Spray Pump Suction From CST Valve 1F002C	Blocked Closed
5. 1C Core Spray Pump Discharge Isolation Valve 52-1F020C	Blocked Closed
6. 1C Core Spray Pump Min Flow Valve Isolation Valve 52-1F010C	Blocked Closed
7. 1C Core Spray Pump Discharge Drain Valve 52-1029C	Blocked Open
8. 1C Core Spray Pump Discharge Drain Valve 52-1030C	Blocked Open
9. 1C Core Spray Pump Discharge Drain Valve 52-1001C	Blocked Open
10. 1C Core Spray Pump Discharge Drain Valve 52-1002C	Blocked Open
11. 1C Core Spray Pump Discharge Vent Valve 52-1005C	Blocked Open
12. 1C Core Spray Pump Discharge Vent Valve 52-1006C	Blocked Open
13. 1C Core Spray Pump Suction Drain Valve 52-1028C	Blocked Open
14. 1C Core Spray Pump Suction Vent Valve 52-1F034C	Blocked Open
15. 1C Core Spray Pump Seal Vent Valve 52-1F016C	Blocked Open
16. 1C Core Spray Pump Seal Vent Valve 52-1071C	Blocked Open

Limerick Generating Station

Job Performance Measure

Review and Approve Inventory Release from Equipment Drain Sample Tank to Cooling Tower Blowdown Line

SRO JPM Designation: A-3

Revision Number: 2

Date: 09/18/12

Developed By:	**Patel**	**09/18/12**
	Author	**Date**
Review By:	**Lally**	**09/18/12**
	Examiner	**Date**
Approved By:	**Caruso**	**09/18/12**
	Chief Examiner	**Date**

NOTE: CHANGE MADE TO JPM AFTER THE EXAM THAT AFFECTED GRADING STANDARD.

10/25/12

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 1 – Based on pre-validation comments, signed off sections 4.2.10 (S62.1.E) and 4.4 (ST-5-061-570-0) as completed.

Rev 2 – Based on validation comments, added task conditions 7 and 8.

JPM Setup Instructions:

1. Provide marked up copy of ST-5-061-570-0, "Radwaste Discharge Permit"
2. Provide marked up copy of S62.1.E, "Inventory Release From 0A(B)T303 Equipment"
3. Provide marked up copy of ST-5-061-575-0, "Liquid Radwaste Effluent INOP Monitor"

TASK STANDARD:

Review data for the equipment drain sample tank 0AT303 release in-progress and determine that tank released needs to be stopped due to:

- ST-5-061-575-0 not being marked as SAT with appropriate Chemistry Supervision Signature, as required.
- Minimum recirculation tank times were not satisfied for the EDST A
- Cooling Tower Blowdown Flow rate as indicated on FI-63-055.

TASK CONDITIONS:

1. Radiation Monitor (00S368) –Radwaste Effluent Radiation Monitor is INOPERABLE.
2. Chemistry has completed ST-5-061-575-0, "Liquid Radwaste Effluent INOP Monitor" due to the Radwaste Radiation Monitor being INOPERABLE.
3. FI-063-055, Cooling Tower Blowdown Flow, is in service, reading 4,800 gpm.
4. The RWEO has completed ST-5-061-570-0, Radwaste Discharge Permit up to start of the release activity step 4.6.3.
5. The operator has completed S62.1.E, "Inventory Release from 0A(B)T303 Equipment Drain Sample Tanks to Cooling Tower Blowdown Line" up to the step 4.3.8.
6. No Hold Pond release is in progress.
7. ST-5-061-575-0, Step 4.2.5, assume gamma isotopic scan is attached and has been reviewed SAT.
8. ST-5-061-570-0, Step 4.3.1, assume gamma spectrum analysis and liquid permit pre-release data reports are attached and reviewed SAT.

INITIATING CUE:

1. You have just taken the shift as the CRS.
2. The prior crew has been relieved and is undergoing post-event FFD testing based on a human performance issue.
3. Equipment Drain Sample Tank "A" discharge to cooling tower blowdown line is in progress
4. The shift manager has directed you to review the documentation for the on-going release to ensure all requirements have been satisfied.

When complete, document discrepancies, if any, on the JPM cue sheet below.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Review and Approve Inventory Release from Equipment Drain Sample Tank to Cooling Tower Blowdown Line

JPM Number: A-3

Revision Number: 0

K/A Number and Importance: 2.3.11 RO 3.8 SRO 4.3

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 25 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2 Supp. 1
2. ST-5-061-570-0, Rev. 46
3. ST-5-061-575-0, Rev. 15
4. S62.1.E, Rev. 26

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator review data for the equipment drain sample tank 0AT303 release in-progress and determine that tank released needs to be stopped due to:

- ST-5-061-575-0 not being marked as SAT with appropriate Chemistry Supervision Signature, as required.
- Minimum recirculation tank times were not satisfied for the EDST A
- Cooling Tower Blowdown Flow rate as indicated on FI-63-055

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
EVALUATOR NOTE: This JPM can be performed in the simulator, classroom or other similar environment • Ensure the following material is available to support performance of this JPM: ♦ Marked up copy of ST-5-061-570-0, "Radwaste Discharge Permit" ♦ Marked up copy of S62.1.E, "Inventory Release From 0A(B)T303 Equipment ♦ Marked up copy of ST-5-061-575-0, "Liquid Radwaste Effluent INOP Monitor"	Applicant reviews S62.1.E and the JPM cue sheet			
EVALUATOR NOTE: To begin this JPM provide the applicant the task conditions, initiating cue, S62.1.E, ST-5-061-570-0, and ST-5-061-575-0				

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. * ★Applicant determines that due to Radwaste Radiation Monitor [00S368] being INOPERABLE, ST-5-061-575-0 needs to be completed SAT per Radwaste Discharge Permit and S62.1.E. However, ST-5-061-575-0 is not marked appropriately as SAT and the required Chemistry Supervision Signature is missing. Therefore, applicant determines that ST-5-061-575-0 is not completed SAT.	Identifies that ST-5-061-575-0 is not marked SAT with required Chemistry Supervision Signature.			
2. ★Applicant also determines that in the ST-5-061-570-0, "Radwaste Discharge Permit" minimum recirculation tank time was not satisfied for the EDST A. The EDST Tank should have been recirculated for 80 min. The actual recirculation time was (10:30 to 11:30, 60 min).	Applicant determines that in the ST-5-061-570-0, "Radwaste Discharge Permit" minimum recirculation tank time was not satisfied for the EDST A. (Tank not recirculated for 80 mins, 10:30 to 11:30 = 60 min)			
3. ★Applicant also determines that in the ST-5-061-570-0, "Radwaste Discharge Permit" cooling tower blowdown flow as indicated on FI-63-055 is not within the limits of S62.1E of between 5000 gpm to 9,000 gpm. The actual blowdown flow rate is 4,800 gpm.	Applicant also determines that in the ST-5-061-570-0, "Radwaste Discharge Permit" cooling tower blowdown flow as indicated on FI-63-055 is not within the limits of S62.1E of between 5000 gpm to 9,000 gpm. (Actual blowdown flow rate is 4,800 gpm).			

* There were no consequences resulting from failure to identify that ST-5-061-575-0 test results were not marked as SAT and the Chemistry Supervisors signature was missing. Because ST-5-061-575-0 was actually completed SAT, the Exam Team determined this task should be designated as non-crit.

John J Caruso 10/25/12
JOHN CARUSO
CHIEF EXAMINER

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
4. ★Applicant determines that release needs to be STOPPED.	Applicant determines that release needs to be STOPPED.			
EVALUATOR CUE: No further actions are required for this JPM				
EVALUATOR: Do you have ALL your JPM exam materials? Task Cue Sheets? Procedures?				

JPM Stop Time _____

TASK CONDITIONS:

1. Radiation Monitor (00S368) –Radwaste Effluent Radiation Monitor is INOPERABLE.
2. Chemistry has completed ST-5-061-575-0, "Liquid Radwaste Effluent INOP Monitor" due to the Radwaste Radiation Monitor being INOPERABLE.
3. FI-063-055, Cooling Tower Blowdown Flow, is in service, reading 4,800 gpm.
4. The RWEO has completed ST-5-061-570-0, Radwaste Discharge Permit up to start of the release activity step 4.6.3.
5. The operator has completed S62.1.E, "Inventory Release from 0A(B)T303 Equipment Drain Sample Tanks to Cooling Tower Blowdown Line" up to the step 4.3.8.
6. No Hold Pond release is in progress.
7. ST-5-061-575-0, Step 4.2.5, assume gamma isotopic scan is attached and has been reviewed SAT.
8. ST-5-061-570-0, Step 4.3.1, assume gamma spectrum analysis and liquid permit pre-release data reports are attached and reviewed SAT.

INITIATING CUE:

1. You have just taken the shift as the CRS.
2. The prior crew has been relieved and is undergoing post-event FFD testing based on a human performance issue.
3. Equipment Drain Sample Tank "A" discharge to cooling tower blowdown line is in progress
4. The shift manager has directed you to review the documentation for the on-going release to ensure all requirements have been satisfied.

When complete, document discrepancies, if any, on the JPM cue sheet below.

ANSWER:

TASK CONDITIONS:

1. Radiation Monitor (00S368) –Radwaste Effluent Radiation Monitor is INOPERABLE.
2. Chemistry has completed ST-5-061-575-0, "Liquid Radwaste Effluent INOP Monitor" due to the Radwaste Radiation Monitor being INOPERABLE.
3. FI-063-055, Cooling Tower Blowdown Flow, is in service, reading 4,800 gpm.
4. The RWEO has completed ST-5-061-570-0, Radwaste Discharge Permit up to start of the release activity step 4.6.3.
5. The operator has completed S62.1.E, "Inventory Release from 0A(B)T303 Equipment Drain Sample Tanks to Cooling Tower Blowdown Line" up to the step 4.3.8.
6. No Hold Pond release is in progress.
7. ST-5-061-575-0, Step 4.2.5, assume gamma isotopic scan is attached and has been reviewed SAT.
8. ST-5-061-570-0, Step 4.3.1, assume gamma spectrum analysis and liquid permit pre-release data reports are attached and reviewed SAT.

INITIATING CUE:

1. You have just taken the shift as the CRS.
2. The prior crew has been relieved and is undergoing post-event FFD testing based on a human performance issue.
3. Equipment Drain Sample Tank "A" discharge to cooling tower blowdown line is in progress
4. The shift manager has directed you to review the documentation for the on-going release to ensure all requirements have been satisfied.

When complete, document discrepancies, if any, on the JPM cue sheet below.

ANSWER:

Limerick Generating Station

Job Performance Measure

Emergency Plan Communications

(TIME CRITICAL)

RO JPM Designation: A-4

Revision Number: 3

Date: 09/14/12

Developed By:	**DeMarshall**	**09/14/12**
	Author	**Date**
Reviewed By:	**Lally**	**09/14/12**
	Examiner	**Date**
Approved By:	**Caruso**	**09/14/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0 (4/25/12)

Rev 1 (6/29/12) Revised the "faulted" element of the JPM, requiring the applicant to (1) recognize that the "Brief Non-Technical Description" label in Block 4.b (Page 1) of the ENF is incorrect (should be **CG6** instead of **CS6**), (2) notify the Shift Emergency Director, and (3) ensure the proper label is affixed. Rev 0 provided the applicant with a partially completed ENF (Block 4.b not filled out), requiring the applicant to provide the missing "Brief Non-Technical Description" label.

Rev 2 (8/17/12) Revised the "Task Condition" and "Initiating Cue" information in the Cue Sheet to ensure that the "faulted" ENF is not given to the applicant until after the Cue Sheet has been reviewed and the applicant indicates ready to start the JPM. Added an Evaluator Cue to Element 6 to address a potential request by the applicant for assistance with making the offsite agency notifications. Added information to several "Evaluator Notes" which support performance of the JPM either inside or outside of the Simulator.

Rev 3 (9/14/12) Revised the "faulted" element of the JPM, requiring the applicant to recognize that the "Brief Non-Technical Description" label in Block 4.b (Page 1) of the ENF is missing. Also rescripted the JPM after Element 2 to require the applicant to recognize and take the appropriate action for failure of Berks County to respond to the initial roll call.

JPM Setup Instructions:

Ensure the following are available for applicant use:

- EP-AA-112-F-08, "ERO Position Log"
- EP-AA-112-100-F-05, "Shift Communicator (CR) Checklist"
- EP-MA-114-100, "Mid Atlantic State/Local Notifications"
- Label Book containing "Brief Non-Technical Descriptions" of the EALs
- State/Local Notification Limerick Hard Card, EPA 179

When applicant is ready to start JPM:

- Record Declaration Time in Section 3.c of the State/Local Event Notification Form (ENF).
- Sign for "Emergency Director Approval" on Page 1 of the ENF.
- Provide "faulted" ENF to applicant.

TASK STANDARD:

1. Applicant recognizes that the "Brief Non-Technical Description" label in Block 4.b (Page 1) of the ENF is missing, notifies the Shift Emergency Director, and ensures proper label is affixed.
2. Applicant completes Initial Roll Call within 15 minutes of the initial classification time and verbally communicates ENF information to (1) PEMA, Montgomery County, and Chester County using Limerick Code 841, and (2) Berks County using one of the two alternate telephone numbers.

TASK CONDITIONS:

A General Emergency has been declared for Unit 1 due to "Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged," while in Mode 4.

INITIATING CUE:

Review the Emergency Notification Form and perform offsite agency notifications within 15 minutes of the Declaration Time recorded in Block 3.c.

THIS IS A TIME CRITICAL JPM

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

★Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Classify a General Emergency and Make Protective Action Recommendations

JPM Number: A-4

Revision Number: 2

K/A Number and Importance: 2.4.39 RO 3.9

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: May be performed inside or outside of the Simulator

Alternate Path: Yes

Time Critical: Yes

Estimated Time to Complete: 15 min. Actual Time Used: _____minutes

References:

1. NUREG 1123 Rev. 2, Supp. 1
2. Label Book containing "Brief Non-Technical Descriptions" of the EALs
3. EP-AA-112-100-F-05, "Shift Communicator Checklist"
4. EP-MA-114-100, "Mid Atlantic State/Local Notifications"
5. EP-MA-114-100-F-01, "State/Local Event Notification Form"
6. EP-AA-112-F-08, "ERO Position Log"
7. State/Local Notification Limerick Hard Card, EPA 179

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

1. Description: This JPM has the applicant (1) identify that the "Brief Non-Technical Description" label in Block 4.b (Page 1) of the ENF is missing, (2) notify the Shift Emergency Director, (3) ensure that the proper label is affixed, and (4) perform offsite agency notifications within 15 minutes of the event classification time using (a) Limerick Code "841" for PEMA, Montgomery County, and Chester County, and (b) either one of the alternate telephone numbers for Berks County.

NOTE: Critical Element(s) indicated by ★ in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. **EVALUATOR NOTE:** **JPM will be performed in the Simulator Conference Room. Evaluator will provide the appropriate cue information when the applicant performs the offsite agency notifications.** **EVALUATOR CUE:** Provide applicant with initiating Cue Sheet. When applicant is ready to start JPM: • Record Declaration Time/Date in Block 3.c of the State/Local Event Notification Form (ENF). • Sign for "Emergency Director Approval" on Page 1 of the ENF. • Provide "faulted" ENF to applicant. **Record DECLARATION TIME (ENF Block 3.c):** _____	Applicant reviews initial conditions and initiating cues.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★**2**. Reviews ENF form for completeness and recognizes that the "Brief Non-Technical Description" label in Block 4.b is missing. Notifies Shift Emergency Director and affixes the CG6 label provided. **EVALUATOR CUE:** When notified by applicant that the "Brief Non-Technical Description" label is missing from the ENF, acknowledges the omission and provides the label for **CG6.**	Recognizes that the "Brief Non-Technical Description" label in Block 4.b of the ENF is missing, notifies the Shift Emergency Director, and affixes the **CG6** label provided. **CG6 Brief Non-Technical Description:** "While in cold shutdown or refueling mode, plant operators have indications that a large amount of water has leaked from the reactor coolant system, which has affected the ability to cool reactor fuel. The ability of the plants containment to function properly is also challenged. Protective actions will be recommended for the public." **EVALUATOR NOTE:** Pre-printed labels containing "Brief Non-Technical Descriptions" of the EALs are located in a Label Book maintained in the simulator.			
3. Performs State/Local notifications in accordance with the "State/Local Notification Limerick Hard Card **OR** EP-MA-114-100, "Mid Atlantic State/Local Notifications" (Located behind Tab 4 of EP-AA-112-100-F-05).	Obtains "State/Local Notification Limerick Hard Card and/or EP-MA-114-100.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★**3a**. Lifts NARS (Nuclear Accident Reporting System) receiver and confirms dial tone **OR** Communicates that the NARS line will be used to make the "15 Minute Notifications." **EVALUATOR CUE:** Instruct applicant to simulate the call.	Lifts the NARS receiver **OR** communicates that the NARS line will be used to make the "15 Minute Notifications."			
★**3b**. Simulates and/or verbalizes entering Limerick Code "841" using the NARS line. **EVALUATOR CUE:** "PEMA has joined the call."	Simulates and/or verbalizes entering Limerick Code "841" using NARS.			
★**3c**. Reads the initial "standby" notification message while allowing agencies to come online: "This is Limerick Generating Station. Please standby for a notification message." **EVALUATOR CUE:** Simulate a failure of Berks County to join the party line, by NOT including Berks County, as indicated by the following cue: "Montgomery and Chester Counties have joined the call." **EVALUATOR NOTE:** Applicant may repeat the initial "standby" message following the cue that Montgomery and Chester Counties have joined the call.	Communicates the initial standby notification message.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★**3d**. Reads the follow-up "standby" notification message: "This is Limerick Generating Station. Please standby to receive a notification message and respond as the roll is called."	Communicates the follow-up standby notification message.			
★**3e**. Conducts Initial Roll Call for the agencies listed on Page 3 of the ENF form **AND** Records the time that each agency responds. **EVALUATOR CUE:** Respond for PEMA, Montgomery County, and Chester County **only** during the Initial Roll Call.	Conducts Initial Roll Call and records times. **EVALUATOR NOTE:** Completion of the Initial Roll Call (contact made via dedicated or commercial line with agencies listed on the ENF) must be performed within 15 minutes of the initial classification time.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★**3f**. Recognizes that Berks County did not respond during Initial Roll Call. Notifies the other agencies to standby and initiates contact with Berks County using either of the alternate telephone numbers listed on the ENF. Records time that Berks County responds **AND** time Initial Roll Call completed. **EVALUATOR CUE:** When applicant simulates contacting Berks County using either of the alternate numbers, provide the following cue: "Berks County has joined the call." **Record Time Critical NOTIFICATION TIME:** _____ **Initial Roll Call must be made within 15 minutes of the DECLARATION TIME recorded in Step 1 above.**	Uses one of the alternate numbers listed in the ENF to initiate contact with Berks County: **Berks County:** • EXT. 119 or • 9-1-610-655-4931 **EVALUATOR NOTE:** It is acceptable for the applicant to communicate the ENF information to PEMA, Montgomery County, and Chester County prior to initiating contact with Berks County. Contact with Berks County must be established and the Initial Roll Call completed for all four offsite agencies within 15 minutes of the initial classification time.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★**3g**. Reads each Block from the approved ENF: • Uses the Phonetic Alphabet for clarity • Speaks clearly and slowly **EVALUATOR CUE (If necessary):** If applicant did not identify that the "Brief Non-Technical Description Label" was missing from Block 4.b of the ENF (Step 2 above), and reads the ENF information without communicating the Label description, provide the following cue: "This is PEMA. Has a description of the event been provided?"	When all agencies have responded, applicant reads the ENF Block-by-Block, providing the following information (**See Key**): • "This is a DRILL." • His/Her Name. • Limerick Generating Station • Phone Number • Current Time (in 24 hr clock) • Unit 1 affected • Initial Declaration • Declaration Time/Date • Event Classification (CG6) • Brief Non-Technical Description • Radiological Release status • Meteorological Information • PAR Information			
3h. Performs Final Roll Call and checks agencies off on the ENF as they respond. **EVALUATOR CUE:** Respond for PEMA, Montgomery County, Chester County, and Berks County during the Final Roll Call.	Performs Final Roll Call and documents individual agency response on the ENF.			
EVALUATOR CUE: JPM is complete.				

JPM Stop Time _____

CUE SHEET:

TASK CONDITIONS

A General Emergency has been declared for Unit 1 due to "Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged," while in Mode 4.

INITIATING CUE

Review the Emergency Notification Form and perform offsite agency notifications within 15 minutes of the Declaration Time recorded in Block 3.c.

THIS IS A TIME CRITICAL JPM

CUE SHEET:

TASK CONDITIONS

A General Emergency has been declared for Unit 1 due to "Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged," while in Mode 4.

INITIATING CUE

Review the Emergency Notification Form and perform offsite agency notifications within 15 minutes of the Declaration Time recorded in Block 3.c.

THIS IS A TIME CRITICAL JPM

RO KEY

Exelon. Nuclear

STATE/LOCAL EVENT NOTIFICATION FORM

(OR ELECTRONIC FACSIMILE)

UTILITY MESSAGE NO. 1

VERIFIED WITH: John Doe *EMERGENCY DIRECTOR APPROVAL:* John Smith

PERFORM INITIAL ROLL CALL PRIOR TO TRANSMITTING – Refer to Page 3 of Form

1. CALL STATUS is:	2. This is Applicant
[X] This is a DRILL. [ ] This is an ACTUAL EVENT.	for [X] LIMERICK / [ ] PEACH BOTTOM / [ ] TMI My phone number is Number The current time is Time *(Communicator will provide his/her NAME, PHONE NUMBER, and CURRENT TIME (in 24-hour clock) when notification is read.)*

3.a EMERGENCY CLASSIFICATION	b. AFFECTED UNIT(S) is/are:	d. THIS REPRESENTS A/AN:
[ ] UNUSUAL EVENT [ ] ALERT [ ] SITE AREA EMERGENCY [X] GENERAL EMERGENCY [ ] RECOVERY [ ] TERMINATION	[X] ONE [ ] TWO [ ] THREE c. DECLARED AT: TIME: * *(24-hr clock)* DATE: **	[ ] INITIAL DECLARATION [X] ESCALATION [ ] NO CHANGE [ ] REDUCTION - IN CLASSIFICATION STATUS

4. a. EMERGENCY ACTION LEVEL (EAL) NO. is: CG6 "CHARLIE GOLF SIX"

b. A BRIEF NON-TECHNICAL DESCRIPTION OF THE EVENT is as follows:

LGS LGS LGS LGS LGS

CG6: "While in the cold shutdown or refueling mode, plant operators have indications that a large amount of water has leaked from the reactor coolant system, which has affected the ability to cool reactor fuel. The ability of the plants containment to function properly is also challenged. Protective actions will be recommended for the public."

5. NON-ROUTINE RADIOLOGICAL RELEASE STATUS is:

[X] a. NO radiological release in-progress

[ ] b. AIRBORNE radiological release in-progress

[ ] c. LIQUID radiological release in-progress

[ ] d. Radiological release TERMINATED

6. METEOROLOGY is:

a. WIND DIRECTION is *FROM*: 63 (degrees)

b. WIND SPEED is: 11 (miles per hour)

* JPM Start Time
** Exam Date

RO KEY

STATE/LOCAL EVENT NOTIFICATION FORM

7. UTILITY PROTECTIVE ACTION RECOMMENDATION: (a or b) – No action should be taken until government officials have been notified: by State:

[ ] a. NOT APPLICABLE *(Unusual Event, Alert, Site Area Emergency, Termination or Recovery only)*

(Complete the following for Shelter or Evacuation for a General Emergency only for the applicable station):

[X] b. The PROTECTIVE ACTION RECOMMENDATION (PAR) from the utility is:

LGS/PBAPS

[ ] SHELTER 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO _____ MILES
AND
SHELTER THE FOLLOWING SECTORS FROM _____ MILES TO _____ MILES:

[ ] N	[ ] E	[ ] S	[ ] W
[ ] NNE	[ ] ESE	[ ] SSW	[ ] WNW
[ ] NE	[ ] SE	[ ] SW	[ ] NW
[ ] ENE	[ ] SSE	[ ] WSW	[ ] NNW

AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those sectors where shelter is recommended and advise remainder of the EPZ to monitor EAS Messages.

[X] EVACUATE 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO 2 MILES
AND
EVACUATE THE FOLLOWING SECTORS FROM 2 MILES TO 5 MILES:

[ ] N	[ ] E	[ ] S	[X] W
[ ] NNE	[ ] ESE	[ ] SSW	[ ] WNW
[ ] NE	[ ] SE	[X] SW	[ ] NW
[ ] ENE	[ ] SSE	[X] WSW	[ ] NNW

AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those sectors where evacuation is recommended and advise remainder of the EPZ to monitor EAS Messages.

TMI

[ ] SHELTER 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO _____ MILES
AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those areas where shelter is recommended and advise remainder of the EPZ to monitor EAS Messages.

[ ] EVACUATE 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO _____ MILES
AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those areas where evacuation is recommended and advise remainder of the EPZ to monitor EAS Messages.

8. CONCLUSION: [X] This is a DRILL. [ ] This is an ACTUAL EVENT.

- PERFORM FINAL ROLL CALL UPON COMPLETION – Refer to Page 3 of Form
- ASK if there are any questions regarding message or repeat backs needed
- READ "This concludes the notification message"
- FAX completed copies of all form pages to the Control Room, TSC and EOF, as applicable.
- INFORM the Shift Manager (Shift Emergency Director), TSC Director or EOF Director, as applicable, when notification is completed to required contacts.

RO KEY

STATE/LOCAL EVENT NOTIFICATION FORM

"15 Minute Notifications"

PEACH BOTTOM (833)

"Notification Line": Dial "833" for conference call. Stay on the line until agencies come on
"3 Digit Extensions". Make these calls from 3-digit lines.
"Commercial # From PBAPS": Make these calls from a 4-digit line. Dial "9-1-Area Code-Number"
"Commercial # From 3-digit lines": Dial "7-1-9-1-Area Code-Number"

Initial Roll Call (Time Contacted: 24-hour clock)		Final Roll Call (√)
_____	Pennsylvania EMA Ext. 216 or 9-1-800-424-7362 / 9-1-717-651-2001	☐
_____	Maryland EMA Ext. 205 or 9-1-410-517-3600	☐
_____	York County Ext. 219 or 9-1-717-854-5571	☐
_____	Harford County Ext. 214 or 9-1-410-638-3400 / 9-1-410-638-4900	☐
_____	Cecil County Ext. 234 or 9-1-410-392-2010	☐
_____	Lancaster County Ext. 217 or 9-1-800-808-5236 / 9-1-717-664-1190	☐
_____	Chester County Ext. 218 or 9-1-610-344-5100	☐
_____	Initial Roll Call Completed	

FOLLOW-UP NOTIFICATIONS * (PEACH BOTTOM ONLY)

[ ] Maryland Dept. of the Environment
Emergency ext. 292 or 235
9-1-866-633-4686
Contacted at: _____ (time: 24-hour clock)

[ ] PA State Police, York Barracks
Ext. 284 or 9-1-717-428-1011
Contacted at: _____ (time: 24-hour clock)

* NOT required within 15 minutes of Classification

"15 Minute Notifications"

LIMERICK (841)

Initial Roll Call (Time Contacted: 24-hour clock)		Final Roll Call (√)
Time	Pennsylvania EMA Ext. 116 or 9-1-800-424-7362 or 9-1-717-651-2001	☑
Time	Montgomery County Ext. 117 or 9-1-610-631-6541	☑
Time	Chester County Ext. 118 or 9-1-610-344-5100	☑
Time	Berks County Ext. 119 or 9-1-610-655-4931	☑
Time	Initial Roll Call Completed	

"15 Minute Notifications"

TMI (44)

"Notification Line": Dial "44" for all-call. if necessary, dial 3-digit extension #'s to notify individual agencies
Commercial or Toll-Free # From TMI: Dial the #'s as they appear below
Commercial or Toll-Free # From EOF: Dial "9" and the #'s as they appear below

Initial Roll Call (Time Contacted: 24-hour clock)		Final Roll Call (√)
_____	Pennsylvania EMA Ext. 315 or 1-800-424-7362 or 1-717-651-2001	☐
_____	Cumberland County Ext. 319 or 1-717-238-9676, 1-717-243-4121 or 1-717- 532-8878	☐
_____	Lebanon County Ext. 321 or 1-717-272-2025 / -7621 / -2054	☐
_____	Lancaster County Ext. 318 or 1-717-664-1190 / -1200	☐
_____	York County Ext. 317 or 1-717-854-5571, 1-717-840-2955 or 1-800-427-8347	☐
_____	Dauphin County Ext. 320 or 1-717-558-6900	☐
_____	Initial Roll Call Completed	

FOLLOW-UP NOTIFICATIONS * (TMI)

[ ] York Haven Power Station
1-717-266-3654 or 1-717-818-3962
Contacted at: _____ (time: 24-hour clock)

Limerick Generating Station

Job Performance Measure

Classify an SAE with Escalation to a GE and Make Protective Action Recommendations

(TIME CRITICAL)

SRO JPM Designation: A-4

Revision Number: 3

Date: 09/13/12

Developed By:	**DeMarshall**	**09/13/12**
	Author	**Date**
Reviewed By:	**Lally**	**09/13/12**
	Examiner	**Date**
Approved By:	**Caruso**	**09/13/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0 (4/16/12)

Rev 1 (6/29/12) Inserted the new CG6 "Brief Non-Technical Description" label in Block 4.b (Page 1) of the SRO ENF Key.

Rev 2 (8/17/12) Revised JPM to classify an Alert with Escalation to a General Emergency and make Protective Action Recommendations (PAR)

Rev 3 (9/12/12) Changed initial classification from Alert to SAE.

JPM Setup Instructions:

Ensure the following are available for applicant use:

1. Label Book containing "Brief Non-Technical Descriptions" of the EALs
2. EP-AA-1008, Table LGS 3-1 Emergency Action Level Matrix (Hot and Cold)
3. EP-AA-111, Emergency Classification and Protective Action Recommendations
4. EP-AA-111-F-08, Limerick / Peach Bottom Plant Based PAR Flowchart
5. EP-AA-112-100-F-01, Shift Emergency Director Checklist
6. EP-MA-114-100, "Mid Atlantic State/Local Notifications"
7. EP-MA-114-100-F-01, State/Local Event Notification Form
8. EP-AA-114-F-02, BWR Release in Progress Determination Guidance

TASK STANDARD:

1. Declaration of an SAE based on classification CS6 **(Cold Matrix)** within 15 minutes of applicant acceptance of the initiating cue #1.
2. Declaration of a GENERAL EMERGENCY based on classification CG6 **(Cold Matrix)** within 15 minutes of applicant acceptance of the initiating cue #2.
3. Make Protective Action Recommendation (PAR) [evacuate 360 degrees from 0-2 miles, evacuate downwind Sectors SW / WSW / W from 2-5 miles, recommend KI for the General Public in Evacuated Areas].
4. Completed Event Notification Form provided to Shift Communicator, and State/Local Notifications initiated within 15 minutes of declaring the General Emergency (includes PAR).

CUE SHEET #1:

TASK CONDITIONS

Unit 1 plant conditions:

T=0:

- 'B' RHR in Shutdown Cooling at 10,000 gpm with an RCS temperature of 173 °F
- Suppression Pool Level 24'-0"
- Earthquake of magnitude 0.080g felt in the plant and confirmed by seismic instrumentation as observed on panel 00C693:
- Primary Containment established

At T+1 min:

- A Large Break LOCA occurs coincident with a Loss of Offsite Power
- D12 and D14 Diesels fail to start
- D13 Diesel starts but fails to auto load (attempts to manually load D13 are unsuccessful)
- D11 Diesel starts and loads

At T+ 4 min:

- RPV water level is -170" and down slow, '1A' RHR and '1A' Core Spray Pumps are injecting with the inability to restore level above TAF
- Suppression Pool Level 24'-3"

INITIATING CUE

At T + 4 min:

You are the Shift Manager. Evaluate plant conditions provided in accordance with the Emergency Plan and document on the Cue Sheet.

THIS IS A TIME CRITICAL JPM

CUE SHEET #2

TASK CONDITIONS

Unit 1 plant conditions:

At T+ 29 minutes:

- With 'A' Low Pressure ECCS injecting, RPV level is -172" and lowering slowly
- Primary Containment Hydrogen concentration is 6.2%
- Primary Containment Oxygen concentration is 5.5%
- RCS coolant activity 350 uCi/gm
- Unit 1, North and South stack readings indicate NO radiological release in-progress

INITIATING CUE

Assuming the previous initial conditions are still valid, determine if these new plant conditions will affect the current EAL classification, AND if so, as Shift Manager, perform any other required notifications by completing the State/Local Event Notification Form.

THIS IS A TIME CRITICAL JPM

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

★Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Classify an SAE with Escalation to a GE and Make Protective Action Recommendations

JPM Number: A-4

Revision Number: 3

K/A Number and Importance: 2.4.44 SRO 4.4

Suggested Testing Environment: Classroom

Actual Testing Environment: Classroom

Testing Method: Perform in Classroom

Alternate Path: No

Time Critical: Yes

Estimated Time to Complete: 30 min. Actual Time Used: _____minutes

References:

1. NUREG 1123 Rev. 2, Supp. 1
2. Label Book containing "Brief Non-Technical Descriptions" of the EALs
3. EP-AA-1008, Table LGS 3-1 Emergency Action Level Matrix (Hot and Cold)
4. EP-AA-111, Emergency Classification and Protective Action Recommendations
5. EP-AA-111-F-08, Limerick / Peach Bottom Plant Based PAR Flowchart
6. EP-AA-112-100-F-01, Shift Emergency Director Checklist
7. EP-MA-114-100, "Mid Atlantic State/Local Notifications"
8. EP-MA-114-100-F-01, State/Local Event Notification Form
9. EP-AA-114-F-02, BWR Release in Progress Determination Guidance

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the applicant review plant conditions, declare SAE based on cue #1, and escalate the declaration to a General Emergency (Cold Matrix) based on cue #2. The applicant will also make Protective Action Recommendations, complete the Event Notification Form, and initiate State/Local notifications.

NOTE: Critical Element(s) indicated by ★ in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. **EVALUATOR NOTE:** Ensure the following are available for applicant use: • Label Book, Brief Non-Technical Descriptions • EP-AA-1008, Table LGS 3-1 Emergency Action Level Matrix (Hot and Cold) • EP-AA-111, Emergency Classification and Protective Action Recommendations • EP-AA-111-F-08, Limerick / Peach Bottom Plant Based PAR Flowchart • EP-AA-112-100-F-01, Shift Emergency Director Checklist • EP-MA-114-100, "Mid Atlantic State/Local Notifications" • EP-MA-114-100-F-01, State/Local Event Notification Form • EP-AA-114-F-02, BWR Release in Progress Determination Guidance **EVALUATOR NOTE:** Provide applicant with initiating Cue Sheet. When applicant is ready to begin the JPM, inform the applicant this is a TIME CRITICAL JPM. **Record START TIME:**_____ Reviews Cue Sheet and asks any questions regarding the task conditions or initiating cue.	Applicant reviews task conditions and initiating cue.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
2. Identifies operating MODE for the affected Unit.	Recognizes EP-AA-1008, Table LGS 3-1, Cold Matrix, is applicable (Unit 1 RCS temperature 173 °F with 'B' RHR in Shutdown Cooling, prior to OBE earthquake)			
★3. (EP-AA-1008, Table LGS 3-1, Cold Matrix) Classifies the Event per the given plant conditions. **EVALUATOR NOTE:** When applicant declares the EAL classification, **Record TIME: _____** **Time to determine correct EAL must be made within 15 minutes of START TIME recorded in Step 1 above.**	Uses EP-AA-1008, Table LGS 3-1, Cold Matrix to classify Event. Declares an SITE AREA EMERGENCY in accordance with Classification **CS6**, "Loss of RPV inventory affecting core decay heat removal capability." **EAL Threshold Values:** **Note:** The Emergency Director should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 2. With CONTAINMENT CLOSURE established, RPV level **< -161 inches**			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
4. When applicant has completed documenting his/her conclusion on answer sheet with Highest Event Classification and EAL No., provide the below cue. **<u>EVALUATOR CUE:</u>** Another SRO will complete the State/Local Event Notification Form, and the shift communicator will make the appropriate call outs. No further actions are required with respect to the previous classification. **Provide applicant with CUE SHEET #2**. When applicant is ready to begin, inform the applicant this is a TIME CRITICAL JPM. **Record START TIME: _____** Reviews Cue Sheet #2 and asks any questions regarding the task conditions or initiating cue.	Applicant reviews task conditions and initiating cue.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★5. (EP-AA-1008, Table LGS 3-1, Cold Matrix) Classifies the Event per the given plant conditions. **<u>EVALUATOR NOTE:</u>** When applicant declares the EAL classification, **Record TIME: _____** **Time to determine correct EAL must be made within 15 minutes of START TIME recorded in Step 4 above.**	Uses EP-AA-1008, Table LGS 3-1, Cold Matrix to classify Event. Declares a GENERAL EMERGENCY in accordance with Classification **CG6**, "Loss of RPV inventory affecting fuel clad integrity with containment challenged." **<u>EAL Threshold Values:</u>** **Note:** The Emergency Director should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1.a RPV level **< - 161 inches** for **> 30 minutes** **AND** 1.b Any Containment Challenge Indication (Table C5). **Table C5 – Containment Challenge Indications** • Primary Containment Hydrogen concentration **> 6%** and Oxygen **> 5%**			
6. Refers to Section 1.4 of EP-AA-112-100-F-01, "Shift Emergency Director Checklist," for GENERAL EMERGENCY initial actions.	Obtains a copy of EP-AA-112-100-F-01 and refers to Section 1.4 to perform GENERAL EMERGENCY initial actions.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
7. (EP-AA-112-100-F-01, Step 1.4.D) **SELECT** the Emergency Public Address Announcements from the form **and DIRECT** performance of the public address announcement within 15 minutes of event classification (*Located behind Tab 1)*. **EVALUATOR CUE:** If step performed, inform applicant that the public address announcement has been made.	Selects Emergency Public Address Announcement from form located behind Tab 1, and Directs performance of announcement within 15 minutes of event classification.			
8. (EP-AA-112-100-F-01, Step 1.4.E) If the ERO has **not** been activated, **then DIRECT** the "ERO Response Required" steps of the ERO Notification or Augmentation form (*Located behind Tab 2)*. **EVALUATOR CUE:** If step performed, inform applicant that ERO activation has been initiated.	Directs ERO activation using the ERO Notification or Augmentation form located behind Tab 2.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★ 9. (EP-AA-112-100-F-01, Step 1.4.F) Determines correct PAR in accordance with EP-AA-111-F-08, "Limerick / Peach Bottom Plant Based PAR Flowchart," *(Located behind Tab 7).* **EVALUATOR CUE:** When Meteorological data is requested, provide the following information for Tower 1 (175 ft elevation): • Wind Direction (From) is 63° • Wind Speed is 11 mph	Evaluates EP-AA-111-F-08 flowchart for Limerick PAR determination: • Has a GE been declared? **YES** • Release via Controlled direct containment vent < 1 hr? **NO** • Loss of 'FUEL CLAD' Barrier? **YES** • Loss of 'REACTOR COOLANT SYSTEM' Barrier: **YES** • Loss of 'PRIMARY CONTAINMENT' Barrier? **NO** **PAR:** ➢ Evacuate **360** degrees from **0-2** miles ➢ Evacuate downwind Sectors **SW / WSW / W** from **2-5** miles ➢ Recommend **KI** for General Public in Evacuated Areas			
★10. (EP-AA-112-100-F-01, Step 1.4.G) Completes EP-MA-114-100-F-01, "State/Local Event Notification Form" *(Located behind Tab 4).* **EVALUATOR CUE:** Provide Event Notification Form if requested.	Completed Event Notification Form matches the key; Critical aspects include: • Declaration Time/Date • EAL No.: CG6 • Brief Non-Technical Description • Radiological Release status • Meteorological Information • PAR			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
★11. (EP-AA-112-100-F-01, Step 1.4.G) Provides completed Event Notification Form to Shift Communicator **AND** Directs Shift Communicator to Initiate State/Local Notifications **EVALUATOR NOTE:** When applicant provides completed Event Notification Form to Shift Communicator AND directs Shift Communicator to initiate State/Local Notifications, **Record TIME: _____** **Completed Event Notification Form must be provided to the Shift Communicator AND State/Local Notifications must be initiated within 15 minutes of the Classification Time recorded in Step 5 above.**	Shift Communicator provided with Event Notification Form AND directed to initiate State/Local Notifications **within 15 minutes** of event classification.			
EVALUATOR CUE: When Event Notification Form is given to Shift Communicator with direction to initiate State/Local Notifications, inform applicant "This JPM is complete."				

JPM Stop Time _____

CUE SHEET:

TASK CONDITIONS

Unit 1 plant conditions:

T=0:

- 'B' RHR in Shutdown Cooling at 10,000 gpm with an RCS temperature of 173 °F
- Suppression Pool Level 24'-0"
- Earthquake of magnitude 0.080g felt in the plant and confirmed by seismic instrumentation as observed on panel 00C693:
- Primary Containment established

At T+1 min:

- A Large Break LOCA occurs coincident with a Loss of Offsite Power
- D12 and D14 Diesels fail to start
- D13 Diesel starts but fails to auto load (attempts to manually load D13 are unsuccessful)
- D11 Diesel starts and loads

At T+ 4 min:

- RPV water level is -170" and down slow, '1A' RHR and '1A' Core Spray Pumps are injecting with the inability to restore level above TAF
- Suppression Pool Level 24'-3"

INITIATING CUE

At T + 4 min:

You are the Shift Manager. Evaluate plant conditions provided in accordance with the Emergency Plan and document on the Cue Sheet.

THIS IS A TIME CRITICAL JPM

CUE SHEET #2:

TASK CONDITIONS

Unit 1 plant conditions:

At T+ 29 minutes:

- With 'A' Low Pressure ECCS injecting, RPV level is -172" and lowering slowly
- Primary Containment Hydrogen concentration is 6.2%
- Primary Containment Oxygen concentration is 5.5%
- RCS coolant activity 350 uCi/gm
- Unit 1, North and South stack readings indicate NO radiological release in-progress

INITIATING CUE

Assuming the previous initial conditions are still valid, determine if these new plant conditions will affect the current EAL classification, AND if so, as Shift Manager, perform any other required notifications by completing the State/Local Event Notification Form.

CUE SHEET:

TASK CONDITIONS

Unit 1 plant conditions:

T=0:

- 'B' RHR in Shutdown Cooling at 10,000 gpm with an RCS temperature of 173 °F
- Suppression Pool Level 24'-0"
- Earthquake of magnitude 0.080g felt in the plant and confirmed by seismic instrumentation as observed on panel 00C693:
- Primary Containment established

At T+1 min:

- A Large Break LOCA occurs coincident with a Loss of Offsite Power
- D12 and D14 Diesels fail to start
- D13 Diesel starts but fails to auto load (attempts to manually load D13 are unsuccessful)
- D11 Diesel starts and loads

At T+ 4 min:

- RPV water level is -170" and down slow, '1A' RHR and '1A' Core Spray Pumps are injecting with the inability to restore level above TAF
- Suppression Pool Level 24'-3"

INITIATING CUE

At T + 4 min:

You are the Shift Manager. Evaluate plant conditions provided in accordance with the Emergency Plan and document on the Cue Sheet.

THIS IS A TIME CRITICAL JPM

CUE SHEET #2:

TASK CONDITIONS

Unit 1 plant conditions:

At T+ 29 minutes:

- With 'A' Low Pressure ECCS injecting, RPV level is -172" and lowering slowly
- Primary Containment Hydrogen concentration is 6.2%
- Primary Containment Oxygen concentration is 5.5%
- RCS coolant activity 350 uCi/gm
- Unit 1, North and South stack readings indicate NO radiological release in-progress

INITIATING CUE

Assuming the previous initial conditions are still valid, determine if these new plant conditions will affect the current EAL classification, AND if so, as Shift Manager, perform any other required notifications by completing the State/Local Event Notification Form.

Exelon. Nuclear

SRO KEY

STATE/LOCAL EVENT NOTIFICATION FORM

(OR ELECTRONIC FACSIMILE)

UTILITY MESSAGE NO. 1

VERIFIED WITH: _____ *EMERGENCY DIRECTOR APPROVAL:* John Smith

PERFORM INITIAL ROLL CALL PRIOR TO TRANSMITTING – Refer to Page 3 of Form

1. CALL STATUS is:	2. This is _____
[X] This is a DRILL.	for [X] LIMERICK / [ ] PEACH BOTTOM / [ ] TMI
[ ] This is an ACTUAL EVENT.	My phone number is _____ The current time is _____. *[Communicator will provide his/her NAME, PHONE NUMBER, and CURRENT TIME (in 24-hour clock) when notification is read.]*

3.a EMERGENCY CLASSIFICATION	b. AFFECTED UNIT(S) is/are:	d. THIS REPRESENTS A/AN:
[ ] UNUSUAL EVENT	[X] ONE [ ] TWO [ ] THREE	[ ] INITIAL DECLARATION
[ ] ALERT		[X] ESCALATION
[ ] SITE AREA EMERGENCY	c. DECLARED AT:	[ ] NO CHANGE
[X] GENERAL EMERGENCY	TIME: Time *(24-hr clock)*	[ ] REDUCTION
[ ] RECOVERY	DATE: / / Date	- IN CLASSIFICATION STATUS
[ ] TERMINATION		

4. a. EMERGENCY ACTION LEVEL (EAL) NO. is: CG6 "CHARLIE GOLF SIX"

b. A BRIEF NON-TECHNICAL DESCRIPTION OF THE EVENT is as follows:

LGS LGS LGS LGS LGS

CG6: "While in the cold shutdown or refueling mode, plant operators have indications that a large amount of water has leaked from the reactor coolant system, which has affected the ability to cool reactor fuel. The ability of the plants containment to function properly is also challenged. Protective actions will be recommended for the public."

5. NON-ROUTINE RADIOLOGICAL RELEASE STATUS is:

[X] a. NO radiological release in-progress

[ ] b. AIRBORNE radiological release in-progress

[ ] c. LIQUID radiological release in-progress

[ ] d. Radiological release TERMINATED

6. METEOROLOGY is:

a. WIND DIRECTION is *FROM*: 63 (degrees)

b. WIND SPEED is: 11 (miles per hour)

SRO KEY

STATE/LOCAL EVENT NOTIFICATION FORM

7. UTILITY PROTECTIVE ACTION RECOMMENDATION: (a or b) – No action should be taken until government officials have been notified: by State:

[ ] a. NOT APPLICABLE *(Unusual Event, Alert, Site Area Emergency, Termination or Recovery only)*

(Complete the following for Shelter or Evacuation for a General Emergency only for the applicable station):

[X] b. The PROTECTIVE ACTION RECOMMENDATION (PAR) from the utility is:

LGS/PBAPS

[ ] **SHELTER** 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO _____ MILES
AND
SHELTER THE FOLLOWING SECTORS FROM _____ MILES TO _____ MILES:

[ ] N	[ ] E	[ ] S	[ ] W
[ ] NNE	[ ] ESE	[ ] SSW	[ ] WNW
[ ] NE	[ ] SE	[ ] SW	[ ] NW
[ ] ENE	[ ] SSE	[ ] WSW	[ ] NNW

AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those sectors where shelter is recommended and advise remainder of the EPZ to monitor EAS Messages.

[X] **EVACUATE** 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO 2 MILES
AND
EVACUATE THE FOLLOWING SECTORS FROM 2 MILES TO 5 MILES:

[ ] N	[ ] E	[ ] S	[X] W
[ ] NNE	[ ] ESE	[ ] SSW	[ ] WNW
[ ] NE	[ ] SE	[X] SW	[ ] NW
[ ] ENE	[ ] SSE	[X] WSW	[ ] NNW

AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those sectors where evacuation is recommended and advise remainder of the EPZ to monitor EAS Messages.

TMI

[ ] **SHELTER** 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO _____ MILES
AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those areas where shelter is recommended and advise remainder of the EPZ to monitor EAS Messages.

[ ] **EVACUATE** 360 DEGREES FROM 0 MILES (SITE BOUNDARY) TO _____ MILES
AND
The utility recommends that government officials notify the general public to take potassium iodide (KI) for those areas where evacuation is recommended and advise remainder of the EPZ to monitor EAS Messages.

8. CONCLUSION: [X] This is a DRILL. [ ] This is an ACTUAL EVENT.

- **PERFORM** FINAL ROLL CALL UPON COMPLETION – Refer to Page 3 of Form
- **ASK** if there are any questions regarding message or repeat backs needed
- **READ** "This concludes the notification message"
- **FAX** completed copies of all form pages to the Control Room, TSC and EOF, as applicable.
- **INFORM** the Shift Manager (Shift Emergency Director), TSC Director or EOF Director, as applicable, when notification is completed to required contacts.

Facility: Limerick	Date of Examination: 10/9/12
Exam Level: RO ■ SRO-I ☐ SRO-U ☐	Operating Test No.: 1

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Start Reactor Recirculation Pump / 202001	A, N, S	1
*b. HPCI Manual Start / 206000	A, EN, N, S	2
**c. Perform Turbine Bypass Valve Testing IAW ST-6-001-761-1 / 241000	D, S	3
d. SDC Restoration / 223002	A, L, N, S	4
**e. Synchronize and Load D12 Diesel Generator to 1000 KW / 264000	A, E, N	6
f. Scram Channel A1 and A2 Functional Test / 212000	A, M, S	7
g. Restore RECW, DWCW, and Instrument Gas / 400000	D, S	8
*h. Standby Gas Treatment Manual Startup with Charcoal Enclosure Hi Temp / 261000	A, M, S	9

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Maximize CRD Flow After Shutdown During Emergency Conditions (T-240) Unit 2 / 295031	E, L, N, R	1
j. Alignment of Equipment for Manual Operation of LPCI / 203000	A, N, R	2
k. Venting Primary Containment Using the 24" Suppression Pool Purge Supply / 295010 223001	E, N	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

*** JPM B & H are paired to run simultaneously.**
**** JPM C & E are paired with a stagger start. JPM E will be followed by JPM C.**

Facility: Limerick	Date of Examination: 10/9/12
Exam Level: RO ☐ SRO-I ■ SRO-U ☐	Operating Test No.: 1

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
a. Start Reactor Recirculation Pump / 202001	A, N, S	1
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**c. Perform Turbine Bypass Valve Testing IAW ST-6-001-761-1 / 241000	D, S	3
d. SDC Restoration / 223002	A, L, N, S	4
**e. Synchronize and Load D12 Diesel Generator to 1000 KW / 264000	A, E, N	6
f. Scram Channel A1 and A2 Functional Test / 212000	A, M, S	7
*h. Standby Gas Treatment Manual Startup with Charcoal Enclosure Hi Temp / 261000	A, M, S	9

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Maximize CRD Flow After Shutdown During Emergency Conditions (T-240) Unit 2 / 295031	E, L, N, R	1
j. Alignment of Equipment for Manual Operation of LPCI / 203000	A, N, R	2
k. Venting Primary Containment Using the 24" Suppression Pool Purge Supply / 295010 223001	E, N	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

*** JPM B & H are paired to run simultaneously.**
**** JPM C & E are paired with a stagger start. JPM E will be followed by JPM C.**

Facility: Limerick	Date of Examination: 10/9/12
Exam Level: RO ☐ SRO-I ☐ SRO-U ■	Operating Test No.: 1

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

System / JPM Title	Type Code*	Safety Function
*b. HPCI Manual Start / 206000	A, EN, N, S	2
d. SDC Restoration / 223002	A, L, N, S	4
**e. Synchronize and Load D12 Diesel Generator to 1000 KW / 264000	A, E, N	6

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Maximize CRD Flow After Shutdown During Emergency Conditions (T-240) Unit 2 / 295031	E, L, N, R	1
k. Venting Primary Containment Using the 24" Suppression Pool Purge Supply / 295010 223001	E, N	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

*** JPM B & H are paired to run simultaneously.**
**** JPM C & E are paired with a stagger start. JPM E will be followed by JPM C.**

Limerick Generating Station

Job Performance Measure

Start Reactor Recirculation Pump (Alternate Path)

JPM Designation: A

Revision Number: 1

Date: 9/13/12

Developed By:	**Chris Lally**	**9/13/12**
	Author	**Date**
Review By:	**Manan Patel**	**9/14/12**
	Examiner	**Date**
Approved By:	**John Caruso**	**9/14/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0 (2/27/12)

Rev 1 (9/13/12) Changed Malfunction code from VIC106A3 to VIC106A4 in JPM Setup Instruction #3. Revised procedure step reference numbers in Elements 1 through 6. Added an Evaluator Cue to Element #3 to ensure that the applicant remains focused on the task of starting the 1A Recirc pump. Revised Element #13 to include a second option for tripping the 1A Recirc pump. Added an Evaluator Note to Element #13 indicating that it is acceptable for the applicant to use either of the two methods identified for tripping the 1A Recirc Pump. Added an Evaluator Cue to Element #9 to provide information regarding 1A Recirc pump vibration levels if requested by the applicant.

JPM Setup Instructions:

1. Reset to single loop IC, post recirc pump trip with sufficient control rod insertion as necessary to allow for recirc pump restart
2. Ensure 1A RRP shutdown IAW S43.2.A, and startup of 1A RRP complete up to and including step 4.3.6
3. Insert the following malfunctions to trigger when 1A RRP discharge valve is full open:
   a. VIC105A6, VIC106A4, VIC106A5: 1 minute ramp time to 20 mils
   b. ARC-MRC-111 D2 30 second time delay

TASK STANDARD:

1A Reactor Recirculation Pump started and then secured due to high vibration

TASK CONDITIONS:

1. 1A Recirculation Pump tripped due to ASD setpoint programming error
2. The cause has been found and corrected
3. Reactor power is currently at ~ 22%, ready for startup of 1A RRP
4. S43.1.A, Unit 1 Start Up of Recirculation System, is complete up to and including step 4.3.6
5. ST-6-043-391-1, "Reactor Recirculation Single Loop Operation Temperature and Flow Check," was last performed 2 minutes ago. It has been reviewed and temperatures are satisfactory by SSV

INITIATING CUE:

You have been directed by Shift Supervision to start up 1A Reactor Recirculation Pump in accordance with S43.1.A

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is

marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ❑ NLO ❑ RO ❑SRO ❑ STA ❑ SRO Cert

JPM Title: Start Reactor Recirculation Pump (Alternate Path)

JPM Number: A

Revision Number: 1

K/A Number and Importance: 202001 A3.02 3.1/3.0

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform

Alternate Path: Yes

Time Critical: No

Estimated Time to Complete: 15 minutes Actual Time Used: _____minutes

References:
1. Nureg 1123, Rev. 2, Supp. 1 202001 A3.02 3.1/3.0
2. S43.1.A Start Up of Recirculation System, Rev. 3
3. ARC MCR 1AC802 111 D-2 1A Recirc Pump Motor HI Vibration Rev. 1
4. S43.2.A Shutdown of A Recirculation Pump, Rev. 30

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ **Satisfactory** ❑ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the applicant perform a startup of the 'A' Reactor Recirculation Pump. Upon receipt of a high vibration alarm indicative of a problem with the pump, the applicant will trip the 'A' Reactor Recirculation Pump.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
CAUTION				
1. Step 4.3.9 should be performed as promptly as possible to prevent Recirc Pp trip on discharge valve position.		[ ]		
2. Operation of Recirc Pp for more than one minute with HV-43-1F031A, DISCHARGE, closed may cause pump damage.		[ ]		
3. **IF** HV-43-1F031A, DISCHARGE, is **not** fully open within three minutes of the supply breaker closing, **THEN** the ASD breaker will trip.		[ ]		
NOTE				
Step 4.3.7 will initiate the following sequence of actions:				
1. The ASD starts the pre-charge cycle.		[ ]		
2. The pre-charge 'In progress' light illuminates on MCR panel 10C602.		[ ]		
3. If the pre-charge completes in<45 seconds, the 'pre-charge complete' light illuminates on MCR 10C602. (The pre-charge status 'complete' light may illuminate and then extinguish quickly)		[ ]		
4. The 13.2KV breaker for the ASD will close once the pre-charge cycle is complete.		[ ]		
5. The reactor recirc pump motor will start and ramp up to 466 RPM speed as indicated on XR-043-101A recorder at 10C602 panel.		[ ]		
6. The Pump "A Running" light on 10C602 will illuminate when the recirc pump motor gets to approximately 333 RPM.		[ ]		
NOTE				
During the pre-charge cycle MINOR, MAJOR AND TRIP alarms will annunciate but will reset.				

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
CAUTION 1. **WHEN** starting a Recirc Pump at power, power **AND** level changes should be limited by jogging open HV-43-1F031A DISCHARGE for 1 to 2 seconds. **THEN** allowing approximately 5 to 10 seconds for power **AND** level to stabilize before proceeding. This may need to be performed 2 to 3 times as required. [ ] 2. Recirc Pump Discharge Valves must be jogged to the full open position within 3 minutes of the Supply Breaker closing **OR** the pump will trip. [ ]				
*1. (Step 4.3.7) **PLACE** ASD 'START A' switch to **"START"**	Applicant places ASD 'START A' switch to "START" and observes startup sequence			
2. (Step 4.3.8) When the pre-charge cycle is complete, **AND** the ASD supply breaker closes, **THEN** perform the following: a. Verify the Recirc Pump is ramping up in speed as indicated on XR_043-101A on 10C602 panel b. Verify either "Pump A RUNNING" light is lit **OR** pump speed is >333 RPMs c. Press PB-043-107A "A FAULT RESET" Pushbutton twice to clear any resettable HMI alarms.	Applicant verifies that ASD supply breaker closes and 1A RRP begins ramping up in speed. Verifies either Pump A RUNNING light lit or pump speed is >333 RPMs PB-043-107A depressed as necessary to reset HMI alarms **Evaluator Note:** In the following step, applicant must ensure previous transient has subsided before next jog, while also ensuring discharge valve is full open before 3 minutes has elapsed; else a pump trip will occur.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*3. (Step 4.3.9) JOG OPEN HV-43-1F031A, DISCHARGE, at 10C602 for 1 to 2 seconds allowing 5 to 10 seconds for power **AND** level to stabilize. Repeat as necessary until both the following conditions are met: • Recirc Pp speed is stable at 466 rpms • FI-42-1R611A, "Total Jet Pump Loop Flow" (FL) is approximately 15 lbs/hr X10E6 or higher **Evaluator Cue (If necessary):** If the applicant starts to review the position of power to flow map, notify the applicant that CRS will evaluate the power to flow map and you are directed to proceed with start up of 1A reactor recirculation pump.	Applicant alternates turning HV-43-1F031A control switch to OPEN and PULL TO LOCK to jog the discharge valve open in 1 to 2 second intervals. **Evaluator Note:** The first few discharge valve opening strokes will have a pronounced effect on core power and reactor water level. Once conditions are met as described, larger valve strokes can be used to obtain full open indication on HV-43-1F031A			
*4. (Step 4.3.10) Ensure HV-43-1F031A is full OPEN.	Applicant verifies full open indication on HV-43-1F031A			
5. (Step 4.3.11) Press PB-043-107A(B) twice to clear any resettable alarms	Applicant attempts to reset any HMI alarms that may have come in during the startup cycle			
6. (Step 4.3.12) Verify Recirc Pp normal operating conditions per S43.9.A U/1, "Routine inspection of the Reactor Recirculation System".	Applicant acquires S43.9.A if vibration alarm has not yet come in			

Note to Evaluator:

Ensure Annunciator 111 D-2 1A RECIRC M-G PUMP MOTOR HI VIBRATION inserted 30 seconds after Discharge Valve is fully open

Ensure Malf VIC105A6 0-20 mils inserted over 1 minute after Discharge Valve is fully open
Ensure Malf VIC106A3 0-20 mils inserted over 1 minute after Discharge Valve is fully open
Ensure Malf VIC106A5 0-20 mils inserted over 1 minute after Discharge Valve is fully open

Note to Evaluator (If Candidate attempts to respond to VMS), provide the following Cue:
The CRS informs you another operator will respond to the VMS alarms on 107 REACTOR

JPM A

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
ALTERNATE PATH BEGINS HERE 7. (ARC-111-D2, Step 1) If vibration monitoring system indicates a problem, THEN reduce speed of 1A Recirc Pump to clear annunciator.	***ALTERNATE PATH BEGINS*** Applicant notes Recirc Pump at minimum speed and no further speed reduction can be accomplished			
8. (Step 2) Attempt to clear alarm by pressing reset button at 10C602 for several seconds	Applicant presses reset button at 10C602 for several seconds			
9. (Step 3) IF annunciator cannot be cleared after reducing flow to the low speed setpoint, AND Vibration monitoring system indicates a problem, THEN secure 1A Recirc Pump per S43.2.A **Evaluator Cue (If necessary):** If the applicant requests 1A Recirc Pump vibration levels, inform applicant that vibration levels are continuing to rise.	Applicant verifies recirculation pump vibration is not instrument malfunction and is worsening; proceeds to S43.2.A to secure the 1A Recirc Pump			
10. (S43.2.A, Step 3.1) Operation with less than two Reactor (Rx) Coolant Recirc Loops requires actions per Technical Specification (TS) 3.4.1.1	Applicant notifies SSV that actions per TS 3.4.1.1 are required **Evaluator Note:** Roleplay as SSV and acknowledge report			
11. (Step 4.4) IF Rx is at power, THEN monitor position on Power/Flow Map in accordance with GP-5 Appendix 2, Planned Rx Maneuvering Without Shutdown AND/OR OT-112 Recirculation Pump Trip, as applicable	Applicant monitors position on Power/Flow Map **Evaluator Note:** Plant conditions support plant trip without any subsequent action, as plant was stable and ready for pump start at beginning of JPM			
12. (Step 4.5.1) Ensure that recirc pump is at min speed, 466 RPM as indicated on recorder XR-043-101A(B), "ASD 1A(B) Speed/Demand Recorder on panel 10C602	Applicant ensures that recirc pump is at min speed, 466 RPM as indicated on recorder XR-043-101A on panel 10C602			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*13. (Step 4.5.2) **TRIP** the 1A(B) ASD system via push button PB-043-102A(B) on 10C602 panel "1A(B) ASD Normal Stop" **AND VERIFY** that the 1A ASD 13.2 KV breaker opens **OR** Places the ASD 1 'A START' hand switch to "STOP" and verify that the 1A ASD 13.2 KV breaker opens IAW S43.2.A, Shutdown of Recirculation pump. **Evaluator Note:** Applicant may choose any one of the two methods listed above to trip the 1A recirculation pump. Either one of those is acceptable for completion of critical task.	Applicant trips the 1A ASD system via push button PB-043-102A on 10C602 panel "A Normal Stop" AND verifies that the 1A ASD 13.2 KV breaker opens OR Applicant places the ASD 1 'A START' hand switch to "STOP" and verifies that the 1A ASD 13.2 KV breaker opens.			
CUE: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. 1A Recirculation Pump tripped due to ASD setpoint programming error
2. The cause has been found and corrected
3. Reactor power is currently at ~ 22%, ready for startup of 1A RRP
4. S43.1.A, Unit 1 Start Up of Recirculation System, is complete up to and including step 4.3.6
5. ST-6-043-391-1, "Reactor Recirculation Single Loop Operation Temperature and Flow Check," was last performed 2 minutes ago. It has been reviewed and temperatures are satisfactory by SSV

INITIATING CUE:

You have been directed by Shift Supervision to start up 1A Reactor Recirculation Pump in accordance with S43.1.A

HANDOUT PAGE

TASK CONDITIONS:

1. 1A Recirculation Pump tripped due to ASD setpoint programming error
2. The cause has been found and corrected
3. Reactor power is currently at ~ 22%, ready for startup of 1A RRP
4. S43.1.A, Unit 1 Start Up of Recirculation System, is complete up to and including step 4.3.6
5. ST-6-043-391-1, "Reactor Recirculation Single Loop Operation Temperature and Flow Check," was last performed 2 minutes ago. It has been reviewed and temperatures are satisfactory by SSV

INITIATING CUE:

You have been directed by Shift Supervision to start up 1A Reactor Recirculation Pump in accordance with S43.1.A

Limerick Generating Station

Job Performance Measure

HPCI MANUAL START (ALTERNATE PATH)

JPM Designation: B

Revision Number: 2

Date: 08/17/12

Note: This JPM is paired with JPM H with silenced overhead alarms.

Developed By:	**DeMarshall**	**08/17/12**
	Author	**Date**
Reviewed By:	**Patel**	**08/20/12**
	Examiner	**Date**
Approved By:	**Caruso**	**08/20/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

(2/21/12, Rev 0) New Alternate Path JPM requiring the applicant to trip the HPCI turbine on a low oil pressure alarm condition, after placing HPCI in Full Flow Test using the Manual Quick Start Method.

(4/11/12, Rev 1) Dispositioned applicant's 4/6/12 comments.

(8/17/12, Rev 2) Dispositioned applicant's Pre-Validation comments. Added a Cue to Element 16 for the Evaluator to prompt the receipt of silenced Annunciator 117 HPCI (E2), if the applicant is unaware of the alarm condition (JPM alarms are silenced due to pairing of JPMs). Added a Note to Element 19 to inform the Evaluator that ARC-MCR-117 (E2) direction to ensure the Aux Oil Pump running may not be performed if the applicant does not refer back to the ARC after tripping HPCI in accordance with S55.2.A.

JPM Setup Instructions:

1. Reset Simulator to any IC with reactor pressure greater than 500 psi.
2. Place Suppression Pool Cooling in service.
3. Provide copy of S55.1.D, HPCI System Full Flow Functional Test.
4. Provide copy of S55.2.A, HPCI Shutdown From Automatic OR Manual Initiation.
5. Program override for Annunciator 117 HPCI (E2) to ON 60 seconds after HPCI Turbine speed reaches 2300 rpm.

TASK STANDARD:

HPCI started in accordance with S55.1.D and secured following a low oil pressure alarm condition.

TASK CONDITIONS:

1. All prerequisites for HPCI operation have been completed in accordance with S55.1.D.
2. Vibration Monitoring System (VMS) is in service.
3. Suppression Pool Cooling in service to support HPCI run.
4. ST-6-060-390-1, Suppression Pool Temperature Check, is being performed by another operator.
5. No maintenance has been performed on the Turbine oil system or governor control system.
6. No water was drained from any part of the system.

INITIATING CUE:

The SRO has directed you to place Unit 1 HPCI in Full Flow Test using the Manual Quick Start Method per S55.1.D.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local

operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: HPCI Manual Start (Alternate Path)

JPM Designation: B

Revision Number: 2

K/A Number and Importance: 206000 A2.15 RO 3.4 SRO 3.5

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform

Alternate Path: Yes

Time Critical: No

Estimated Time to Complete: 15 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2, Supp. 1, 206000 A2.15 RO 3.4 SRO 3.5
2. S55.1.D, Rev. 41
3. S55.2.A, Rev. 14
4. ARC-MCR-117 (E2), Rev. 1
5. Module/LP ID: LL0T0055, HPCI, Rev. 0

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description:
This JPM has the operator place Unit 1 HPCI in Full Flow Test using the Manual Quick Start Method, and upon receipt of Annunciator HPCI 117 (E2), HPCI OIL LO PRESS, has the operator immediately trip the HPCI turbine.

Evaluator Note:
The steps of S55.1.D are listed for reference and tracking of applicant's actions.

JPM B

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtains procedure and reviews.	Applicant obtains current revision of S55.1.D, reads section 2.0 Prerequisites and 3.0 Precautions.			
2. Verify procedure being performed on Unit 1 HPCI train.	Applicant verifies Unit 1 HPCI train.			
3. (S55.1.D, Step 4.1.5) **ENSURE** the following valves aligned as indicated: • HV55-1F071, TEST OUTBOARD is **closed**. • HV55-1F008, TEST ISOL is **closed**. • HV55-1F011, CONDENSATE RETURN is **closed**. • HV49-1F022, TEST ISOL is **closed**.	Applicant ensures the **GREEN** CLOSED indicating lamp **ILLUMINATED** for the following valves: • HV55-1F071 • HV55-1F008 • HV55-1F011 • HV49-1F022			
*4. (Step 4.1.6) PERFORM the following to open HV-55-1F011: a. Place HS-55-111 in OPEN at panel 10C647 b. WHEN HV-55-1F011 is full open THEN place HS-55-111 in STOP	Applicant places the HV-55-1F011 handswitch to **OPEN** and Observes: a. **RED** OPEN indicating lamp **ILLUMINATED.** b. **GREEN** CLOSED indicating lamp **EXTINGUISHED**. c. HS-55-111 placed in STOP			
5. (Step 4.1.7) **START** 10P216, "Barometric Condenser Vacuum Pump" (VACUUM PUMP).	Applicant places the 10P216 handswith to **START** and Observes the **RED** RUNNING indicating lamp **ILLUMINATED**.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
6. (Step 4.1.8) **MONITOR** Suppression Pool temperature per ST-6-060-390-1, Suppression Pool Temperature Check. **Evaluator Note:** If status of Suppression Pool temperature monitoring is requested, Evaluator prompts applicant to review Task Conditions.	Applicant verbalizes that ST-6-060-390-1 is in progress (as stated in the Task Conditions).			
7. (Step 4.1.9) **INFORM** HP of changing radiological conditions due to Unit 1 HPCI system start. **Evaluator Roleplay (HP):** "This is HP. I understand that radiological conditions will change when Unit 1 HPCI is started."	Applicant notifies HP of impending HPCI start and associated changes in radiological conditions.			
8. (Step 4.3.1) **ENSURE** FIC-55-1R600, "HPCI Pump Discharge Flow Controller" (FL), set to 5,600 gpm in "AUTO."	Applicant ensures FIC-55-1R600 M/A selector switch in the "A" position **AND** FIC-55-1R600 set to 5,600 gpm (between 5,500 and 5,700 GPM).			
9. Make plant announcement stating that Unit 1HPCI will be started. **Evaluator Cue:** Evaluator informs applicant that another operator has already made the plant announcement.	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*10. (Step 4.3.2) Simultaneously **OPEN** HV-55-1F001, "HPCI Steam Supply"(INLET) **AND START** 10P213, "Auxiliary Oil Pump (AUX OIL PUMP).	Applicant simultaneously places the HV-55-1F001 handswitch to **OPEN** and the 10P213 handswitch to **START**, and Observes: a. HV-55-1F001 **RED** OPEN indicating lamp **ILLUMINATED.** b. HV-55-1F001 **GREEN** CLOSED indicating lamp **EXTINGUISHED**. c. 10P213 **RED** RUNNING indicating lamp **ILLUMINATED**.			
*11. (Step 4.3.3) **WHEN** SI-56-161, "Turbine Speed" (S) starts to go up, **THEN** immediately **THROTTLE** open HV-55-1F008, "HPCI Test Loop Shutoff" (TEST ISOL), until desired flow is obtained, while maintaining turbine speed greater than 2200 rpm. **Evaluator Note:** If HV-55-1F008 cannot be opened in Step 4.3.3 due to high differential pressure across the valve (> 1000 psid), then Step 4.3.4 below is performed to open the 1F008. **IF** Step 4.3.4 is performed, it replaces Step 4.3.3 as the Critical Step, otherwise it is N/A.	Applicant Observes greater than zero rpm speed indication on SI-56-161, and immediately jogs the HV-55-1F008 handswitch OPEN as required to establish flow of ≥ 1000 gpm with turbine speed greater than 2200 rpm.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*12. (Step 4.3.4) **IF** HV-55-1F008 will **not** open, **THEN PERFORM** the following: • **PLACE** FC-55-1R600 in "MANUAL." • **LOWER** FC-55-1R600 output to obtain 2,200 rpm on SI-56-161 "Turbine" (S). • **THROTTLE** open HV-55-1F008. • Slowly **RAISE** FC-55-1R600 output **AND MATCH** setpoint to actual flow. • **WHEN** setpoint and actual flow are matched, **THEN PLACE** FC-55-1R600 to "AUTO."	Applicant Observes HV-55-1F008 does not open on initial attempt **AND** performs the following: • **PLACES** FC-55-1R600 in "MANUAL." • **LOWERS** FC-55-1R600 output to obtain 2,200 rpm on SI-56-161 "Turbine" (S). • **THROTTLES** open HV-55-1F008. • Slowly **RAISES** FC-55-1R600 output **AND MATCHES** setpoint to actual flow. • **WHEN** setpoint and actual flow are matched, **THEN PLACES** FC-55-1R600 to "AUTO."			
13. (Step 4.3.5) **VERIFY** FV-56-112, "Turbine Stop Valve" (STOP), OPEN.	Applicant verifies FV-56-112 OPEN as indicated by: a. FV-56-112 **RED** OPEN indicating lamp **ILLUMINATED.** b. FV-56-112 **GREEN** CLOSED indicating lamp **EXTINGUISHED**.			
14. (Step 4.3.6) **VERIFY** FV-56-111, "Turbine Control Valve" (CONTROL), OPEN.	Applicant verifies FV-56-111 throttled OPEN as indicated by: a. FV-56-111 **RED** OPEN indicating lamp **ILLUMINATED.** b. FV-56-11 **GREEN** CLOSED indicating lamp **ILLUMINATED**.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
15. (Step 4.3.7) **WHEN** FV-56-112, "Turbine Stop Valve" (STOP) Opens, **THEN VERIFY** HV-56-1F059, "HPCI Lube Oil Cooling Water Valve," OPEN.	Applicant verifies HV-56-1F059 OPEN as indicated by: a. HV-56-1F059 **RED** OPEN indicating lamp **ILLUMINATED.** b. HV-56-1F059 **GREEN** CLOSED indicating lamp **EXTINGUISHED**.			
ALTERNATE PATH BEGINS HERE 16. Annunciator response to HPCI OIL LO PRESS [ARC-MCR-117 (E2)]. **Evaluator Note:** Programmed malfunction for receipt of Annunciator 117 HPCI (E2), set for 60 seconds after HPCI Turbine speed reaches 2300 rpm. **Evaluator Cue:** Alarms associated with paired JPMs are silenced. When Annunciator 117 HPCI (E2) flashes, wait approximately 10 seconds, point to the alarm, and state the following if the applicant is unaware of the alarm condition: **"Annunciator 117 E2 is your alarm."**	***ALTERNATE PATH BEGINS*** Applicant: a. Acknowledges alarm b. Reports alarm to Unit Supervisor c. References alarm response for ARC-MCR-117 (E2)			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Evaluator Note: Operator Action in accordance with ARC-MCR-117 (E2), "HPCI OIL LO PRESS," is to immediately trip the HPCI turbine. Guidance for HPCI turbine shutdown is provided in Section 4.7 of S55.2.A, "HPCI SHUTDOWN FROM AUTOMATIC OR MANUAL INITIATION." It is acceptable for the applicant to either shutdown the HPCI turbine from memory by performing the actions specified in Steps 17 and 18 below, at which point S55.2.A should be referenced to ensure all required actions have been completed **OR** shutdown the HPCI turbine with procedure S55.2.A in hand.	N/A			
*17. (S55.2.A, Step 4.7.1) Simultaneously **DEPRESS AND HOLD** "Turbine Trip" (TURBINE TRIP) pushbutton, **AND CLOSE** HV-55-1F001, "HPCI Steam Supply" (INLET).	Applicant simultaneously **DEPRESSES** and **HOLDS** the "Turbine Trip" pushbutton **AND** places HV-55-1F001 handswitch to **CLOSE**.			
*18. (S55.2.A, Step 4.7.2) **WHEN** HV-55-1F001, "HPCI Steam Supply" (INLET), is fully closed, **THEN RELEASE** "Turbine Trip" (TURBINE TRIP) pushbutton.	Applicant **RELEASES** "Turbine Trip" when HV-55-1F001 is fully closed as indicated by: a. HV-55-1F001 **RED** OPEN indicating lamp **EXTINGUISHED.** b. HV-55-1F001 **GREEN** CLOSED indicating lamp **ILLUMINATED.**			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
19. (ARC-MCR-117 (E2) **VERIFY** 10P213, Auxiliary Oil Pump (AUX OIL PUMP), is running, **AND** if not, **THEN START** 10P213. **Evaluator Note:** The ARC direction to ensure the HPCI Aux Oil Pump is running is not included in Section 4.7 of S55.2.A, "HPCI SHUTDOWN FROM AUTOMATIC OR MANUAL INITIATION." The applicant may not perform this action if he/she does not refer back to the ARC after tripping HPCI in accordance with S55.2.A. A follow up question asking the basis for performance of the step may be warranted in this case.	Applicant places the 10P213 handswitch to **START** if the Auxiliary Oil Pump is not running as indicated by: a. 10P213 **RED** RUNNING indicating lamp **EXTINGUISHED.**			
Evaluator Cue: JPM is complete				

JPM Stop Time _____

JPM B

HANDOUT PAGE

TASK CONDITIONS:

1. All prerequisites for HPCI operation have been completed in accordance with S55.1.D.
2. Vibration Monitoring System (VMS) is in service.
3. Suppression Pool Cooling in service to support HPCI run.
4. ST-6-060-390-1, Suppression Pool Temperature Check, is being performed by another operator.
5. No maintenance has been performed on the Turbine oil system or governor control system.
6. No water was drained from any part of the system.

INITIATING CUE:

The SRO has directed you to place Unit 1 HPCI in Full Flow Test using the Manual Quick Start Method per S55.1.D.

JPM B

HANDOUT PAGE

TASK CONDITIONS:

1. All prerequisites for HPCI operation have been completed in accordance with S55.1.D.
2. Vibration Monitoring System (VMS) is in service.
3. Suppression Pool Cooling in service to support HPCI run.
4. ST-6-060-390-1, Suppression Pool Temperature Check, is being performed by another operator.
5. No maintenance has been performed on the Turbine oil system or governor control system.
6. No water was drained from any part of the system.

INITIATING CUE:

The SRO has directed you to place Unit 1 HPCI in Full Flow Test using the Manual Quick Start Method per S55.1.D.

Limerick Generating Station

Job Performance Measure

Perform Turbine Bypass Valve Testing IAW ST-6-001-761-1

JPM Designation: C

Revision Number: 1

Date: 8/9/12

Note: This JPM is paired with JPM E with a staggered start. Start and complete JPM E with first applicant before beginning this JPM

Developed By:	**Chris Lally**	**2/7/12**
	Author	**Date**
Review By:	**Manan Patel**	**2/16/12**
	Examiner	**Date**
Approved By:	**John Caruso**	**2/28/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0
Rev 1: Changed procedure starting point from last 2 BPV to first 2 BPV

JPM Setup Instructions:

1. Reset simulator to IC-17 or another 100% power IC
2. Acknowledge annunciators and reset alarms
3. Prepare a yellow copy of ST-6-001-761-1 completed up to and including Step 4.3.1 and Att. 1

TASK STANDARD:

BPV-1 and BPV-2 cycled full open and closed

TASK CONDITIONS:

1. Unit 1 is at 100% power
2. No other testing is in progress on Unit 1
3. ST-6-001-761-1 is complete up to and including Step 4.3.1
4. Permission to perform the ST is obtained from the CRS and RO, all prerequisites are met

INITIATING CUE:

You have been directed by the CRS to perform ST-6-001-761-1, Main Turbine Bypass Valve Exercising

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Perform Turbine Bypass Valve Testing IAW ST-6-001-761-1

JPM Number: C

Revision Number: 1

K/A Number and Importance: 241000 A4.06 (3.9/3.9)

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 15 min. Actual Time Used:_____minutes

References:
1. NUREG-1123 Rev.2 Supp. 1
2. ST-6-001-761-1 Rev. 20

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the applicant perform operational tests on two main turbine bypass valves to verify operability of the main turbine bypass valves.

History: Not used on 2008/2010 Limerick Initial License Exams

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtain ST-6-001-761-1 in progress **Evaluator Cue:** Provide examinee with yellow copy of ST-6-001-761-1 completed up to and including step 4.3.1.	Applicant reviews procedure and cue **Evaluator Note:** Applicant may review ARCs for BYPASS VALVE OPEN and turbine vibration alarms			
2. (Step 4.3.2) PERFORM the following for one valve at a time:	N/A			
3. (Step 4.3.2.1) VERIFY READY TO SELECT light lit, at panel 10C670. **Evaluator Note:** Alarm ARC-MCR-106 D4, BYPASS VALVE OPEN is an expected alarm for the next step. Additionally, ARC-MCR-107 I-2 and I-3 vibration alarms may annunciate, but require no action.	Applicant verifies READY TO SELECT green light is lit on 10C670.			
*4. (Step 4.3.2.2) POSITION BYPASS VALVE TEST selector switch to appropriate position. **Evaluator Cue:** If prompted by applicant, as RO, report that all plant parameters are stable and ready to commence testing.	Applicant rotates BYPASS VALVE TEST selector to position 1.			
*5. (Step 4.3.2.3) DEPRESS AND HOLD TEST BYPASS VALVE pushbutton.	Applicant depresses and holds TEST Bypass Valve pushbutton.			
6. (Step 4.3.2.4) VERIFY TESTING AND DO NOT SELECT lights lit while valve is being exercised.	Applicant verifies TESTING and DO NOT SELECT amber lights are lit.			
*7. (Step 4.3.2.5) WHEN Bypass Valve is full open, THEN RELEASE TEST BYPASS VALVE pushbutton.	When #1 Bypass Valve indicates 100% on 10C670, applicant then releases TEST BYPASS VALVE pushbutton.			
8. (Step 4.3.2.6) VERIFY Bypass Valve recloses AND ENTER initials in appropriate blank in step 4.3.3.	Applicant verifies #1 Bypass Valve indicates 0%, and enters initials in blank for BPV-1.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
9. (Step 4.3.2.7) VERIFY BYPASS VALVE OPEN annunciator on 106 MAIN STEAM clears.	Applicant acknowledges and resets BYPASS VALVE OPEN alarm.			
10. (Step 4.3.2.8) WHEN READY TO SELECT light lit AND plant conditions are stable, THEN REPEAT steps 4.3.2.1 through 4.3.2.7 for next valve to be tested. **Evaluator Cue:** If prompted by applicant, as RO, report that all plant parameters are stable and ready to continue testing.	Applicant verifies that power, pressure and level have all stabilized before proceeding on to testing BPV-2.			
11. (Step 4.3.2.1) VERIFY READY TO SELECT light lit, at panel 10C670.	Applicant verifies READY TO SELECT green light is lit on 10C670.			
*12. (Step 4.3.2.2) POSITION BYPASS VALVE TEST selector switch to appropriate position. **Evaluator Note:** Alarm ARC-MCR-106 D4, BYPASS VALVE OPEN is an expected alarm for the next step. Additionally, ARC-MCR-107 I-2 and I-3 vibration alarms may annunciate, but require no action.	Applicant rotates BYPASS VALVE TEST selector to position 2.			
*13. (Step 4.3.2.3) DEPRESS AND HOLD TEST BYPASS VALVE pushbutton.	Applicant depresses and holds TEST Bypass Valve pushbutton.			
14. (Step 4.3.2.4) VERIFY TESTING AND DO NOT SELECT lights lit while valve is being exercised.	Applicant verifies TESTING and DO NOT SELECT amber lights are lit.			
*15. (Step 4.3.2.5) WHEN Bypass Valve is full open, THEN RELEASE TEST BYPASS VALVE pushbutton.	When #2 Bypass Valve indicates 100% on 10C670, applicant then releases TEST BYPASS VALVE pushbutton.			
16. (Step 4.3.2.6) VERIFY Bypass Valve recloses AND ENTER initials in appropriate blank in step 4.3.3.	Applicant verifies #2 Bypass Valve indicates 0%, and enters initials in blank for BPV-2.			
17. (Step 4.3.2.7) VERIFY BYPASS VALVE OPEN annunciator on 106 MAIN STEAM clears.	Applicant acknowledges and resets BYPASS VALVE OPEN alarm.			
CUE: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. Unit 1 is at 100% power
2. No other testing is in progress on Unit 1
3. ST-6-001-761-1 is complete up to and including Step 4.3.1
4. Permission to perform the ST is obtained from the CRS and RO, all prerequisites are met

INITIATING CUE:

You have been directed by the CRS to perform ST-6-001-761-1, Main Turbine Bypass Valve Exercising

HANDOUT PAGE

TASK CONDITIONS:

1. Unit 1 is at 100% power
2. No other testing is in progress on Unit 1
3. ST-6-001-761-1 is complete up to and including Step 4.3.1
4. Permission to perform the ST is obtained from the CRS and RO, all prerequisites are met

INITIATING CUE:

You have been directed by the CRS to perform ST-6-001-761-1, Main Turbine Bypass Valve Exercising

Limerick Generating Station

Job Performance Measure

SDC Restoration (Alternate Path)

JPM Designation: D

Revision Number: 4

Date: 9/12/12

Note: Pre-Brief JPM in Simulator Conference Room.

Developed By:	Patel	9/12/12
	Author	**Date**
Review By:	C. Lally	9/13/12
	Examiner	**Date**
Approved By:	J. Caruso	9/13/12
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 1

- Changed task conditions to include TS action statement for 1C RHR pump per licensee's recommendations
- Added Evaluator Cue for Element 3 to Prompt RO Applicant to enter ON-121, if needed, as this is an SRO decision making step (per licensee's recommendation).
- Added N/A steps 2.1.1 – 2.1.6 standards of ON-121 for evaluation purpose.

Rev2

- Added element 3 based on Licensee's comments.
- Added cooldown criteria to initiating cue based on Licensee's comments.

Rev3

- Based on pre-validation comments added 1B RHR pump aligned to LPCI per S51.1A.
- Removed some tasks as critical tasks post pre-validation due to task involving verifying open or closed position.
- Added element 2 and 4 as critical task. Applicant should be able to demonstrate/understand that loss of SDC has occurred based on malfunction.

Rev4

- Added Note on Cover Sheet to Pre-Brief JPM in Simulator Conference Room.
- Added Item #7 to the JPM Setup Instructions to pre-stage Equipment Status Tags in the simulator.
- Added an additional Evaluator Cue to Element 1 to address any questions posed by the applicant regarding the label designation associated with the controller for valve HV-C-51-103A.

JPM Setup Instructions:

1. Reset simulator to IC-189 (or other IC specifically developed with 'A' RHR in SDC in service, reduced decay heat load and RCS temperature 160°F).
2. Ensure Rx in OPCON 4 with reactor coolant temperature at 160°F.
3. Build trigger to initiate MNS157B when HIC-051-103C meter is at 0.
4. Apply mousetraps to the following:
   - HV51-1F027A and B, SUPP POOL SPRAY
   - HV51-1F040 and 49, LETDOWN TO RW
   - HV51-1F024A, SUPP POOL CLNG
   - HV43-1F023A and B, RECIRC SUCTION
5. Prepare a copy of S51.8.B marked up to and including 4.4.24.4
6. Pre-stage Equipment Status Tags

TASK STANDARD:

Successfully establish Alternate Shutdown Cooling using RHR/CS, SRV's & Suppression Pool.

TASK CONDITIONS:

1. Unit 1 is in OPCON 4 with reactor coolant temperature at ~ 160°F.
2. 1A RHR pump has been placed in service for Shutdown Cooling with Reactor Coolant temperature at ~ 160°F as read on XI-36-101 (Primary DAS) TE-51-1N004A.
3. 0A & 0B RHRSW pumps are in service providing flow to "1A" & "1B" RHR Heat Exchangers.
4. HV-C-51-103A, RHR Heat Exchanger Outlet Bypass (POS), is full open and additional cooling is required to lower reactor coolant temperature within the 75°F to 85°F band.
5. 1D RHR pump is OOS for maintenance, expected time to recovery is 8 hours.
6. 1C RHR pump is INOP due to an I&C error during surveillance testing, expected time to recovery is 2.5 hours. T.S. 3.4.9.2 has been entered appropriately.
7. HV-051-1F015B SDC injection outboard is blocked out for maintenance.
8. 1B LPCI is aligned per S51.1A step for automatic operation in LPCI mode.
9. 1A and 1C CS pumps are operable.
10. The Unit 1 Reactor Operator is performing the cooldown ST.

INITIATING CUE:

The CRS has directed you to continue performing S51.8.B at step number 4.4.24.4, to lower reactor coolant temperature to 85°F.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: SDC Restoration

JPM Number: D

Revision Number: 4

K/A Number and Importance: 295021 AA1.04 3.7/3.7 (RO/SRO)

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform in Simulator

Alternate Path: Yes

Time Critical: No

Estimated Time to Complete: 30 min. Actual Time Used:_____minutes

References:
1. NUREG 1123, 295021 AA1.04 3.7/3.7 (RO/SRO)
2. ON-121, Rev. 29
3. S51.8.B, Rev. 71
4. ST-6-107-640-1, Rev. 50
5. S41.7B, Rev. 7
6. S51.8.A, Rev. 42

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator establish preferred Alternate Shutdown Cooling using CS, SRV's & RHR Suppression Pool in service upon isolation of the normal SDC due to a spurious auto closure of HV-051-1F008 RHR inboard isolation valve.

History: Not used on 2008/2010 Limerick Initial License Exams, New JPM

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Applicant obtains procedure S51.8.B and determines step 4.4.24.5 is applicable. Step 4.4.24.5 1. IF additional cooling is required, Then PERFORM the following: a. **OPEN** HV-C-51-1F048A, HEAT EXCH BYPASS b. **OPEN** HV-51-1F003A, OUTLET c. **CLOSE** HV-C-51-103A, POS **Evaluator Cue(if needed):** Additional cooling is required **Evaluator Cue(if needed):** Simulator Label designation for HV-C-51-103A controller is **HI-C-51-103A**. Provide applicant with the following cue if questioned about the difference between the controller label and the valve designation specified in Step 4.4.24.5 of S51.8.B (i.e., HI-C-51-103A versus HV-C-51-103A): *"HI-C-51-103A is the controller for HV-C-51-103A."* **Evaluator Note:** Booth operator will insert malfunction when HV-C-51-103A is taken to close position.	• HV-C-51-1F048A handswitch to OPEN • HV-51-1F003A handswitch to OPEN • Depress HV-C-51-103A controller "CLOSE" pushbutton to reduce meter output to 0%			
Alt Path begins here: Insert malfunction MNS157B spurious auto closure of HV-051-*F008 RHR Shutdown Cooling Outboard PCIV, when HV-C-51-103A is taken to close.				

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*2. Applicant acknowledges the following alarms associated with RHR 1A pump trip on loss of suction path: • 113, F-3, 1A RHR disch hi/low pressure • 113, F-2, 1A RHR motor OC/trip * Applicant should report loss of SDC to CRS. **Evaluator Cue(if needed):** If the applicant does NOT report loss of SDC, **ask applicant the significance of the alarms**.	Acknowledges the following alarms associated with RHR 1A pump trip on loss of suction path: • 113, F-3, 1A RHR disch hi/low pressure • 113, F-2, 1A RHR motor OC/trip			
3. Applicant dispatches operator to investigate problem at breaker enclosure D11-04 and 1A RHR pump room.	Dispatches operator to investigate problem at breaker enclosure D11-04 and 1A RHR pump room.			
*4. Applicant will **enter** ON-121, "Loss of Shutdown Cooling." **Evaluator Cue:** For RO applicant, ask the following questions, prior to cuing: What is the status of the plant with respect to shutdown cooling? What procedures would address the shutdown cooling condition? **RO Evaluator Cue:** SRO enters ON-121, Loss of Shutdown Cooling, and directs you to perform all required actions IAW ON-121 to establish SDC. **SRO Evaluator Cue:** If SRO references TS 3.4.9.2 for required actions, then inform the applicant that another SRO will review & implement required actions IAW TS.	**Enter** ON-121, "Loss of Shutdown Cooling."			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 2.1.1 (ON-121) 5. **IF** an inadvertent isolation caused the loss of Shutdown Cooling **AND** the inadvertent isolation is **no** longer present **THEN RESET** isolation per GP-8 **AND RESTORE** Shutdown Cooling per S51.8.B.	Applicant determines from PMS group isolation computer that Group II isolation has occurred and the signal is still present. Step N/A.			
Step 2.1.2 (ON-121) 6. **IF** a pump trip of RHR or RHRSW caused the loss of Shutdown Cooling **THEN RESTART** associated pump **OR RESTORE** Shutdown Cooling by placing alternate Loop of Shutdown Cooling in service per applicable procedure **Evaluator Cue:** OCC has been contacted to restore 1C RHR pump to OPERABLE status, the restoration process will take 2.5 hours.	Applicant determines from PMS group isolation computer that Group II isolation has occurred and caused the RHR pump trip. Applicant determines that 1C RHR pump cannot be restored within reasonable time for alternate Loop of Shutdown Cooling. Step N/A.			
Step 2.1.3 (ON-121) 7. **IF** exceeding the time to boil is expected **OR** an OPCON change to OPCON 3 has occurred, **THEN ENSURE** secondary containment is established. **Evaluator Cue:** Time to boil condition is ~ 2 hours.	Applicant determines step N/A.			
Step 2.1.4 (ON-121) 8. **IF** isolation caused by loss of power to *AY160 **OR** a loss of Inboard NSSSS logic power **THEN PERFORM** Attachment 1. **Evaluator Cue:** It has been determined that the isolation was not caused by a loss of power to BY160 & loss of power to NSSS logic. It has been also determined that the isolation will not be cleared for at least 2 hours.	Applicant determines from PMS group isolation computer that Group II isolation has occurred and the signal is still present. Step N/A.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 2.1.5 (ON-121) 9. **IF** isolation caused by loss of power to *BY160 **OR** a loss of Outboard NSSSS logic power **THEN PERFORM** Attachment 2.	Applicant determines from PMS group isolation computer that Group II isolation has occurred and the signal is still present. Step N/A.			
Step 2.1.6 (ON-121) 10. **IF** caused by inadvertent Inboard isolation signal to HV-51-*F009, "RHR Shutdown Clg Suction Inboard PCIV (INBOARD), **THEN PERFORM** Attachment 3.	Applicant determines from PMS group isolation computer that Group II isolation has occurred and the signal is still present. Step N/A.			
Step 2.1.7 (ON-121) 11. **IF** caused by inadvertent Outboard isolation signal to any of the following valves: **THEN PERFORM** Attachment 4. • HV-51-*F008, "RHR Shutdown Clg Suction Outboard PCIV" (OUTBOARD) • HV-51-*F015A, "A RHR Shutdown Clg Injection PCIV" (OUTBOARD) • HV-51-*F015B, "B RHR Shutdown Clg Injection PCIV" (OUTBOARD) **Evaluator Cue**: When applicant determines that Attachment 4 is applicable, then inform the applicant that Attachment 4 will be completed by another operator to install jumpers in the Aux Equipment Room. **Evaluator Cue**: After 30 sec, inform applicant that Attachment 4 attempts to open HV-51-*F008 were unsuccessful.	Applicant determines from PMS group isolation computer that spurious Group II isolation has occurred and HV-51-*F008, HV-51-*F015A , and HV-51-*F015B closed. Applicant determines that Alternate Shutdown Cooling is needed to be aligned per Attachment 4.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 2.1.8 (ON-121) 12. **IF** required to reduce Rx pressure to within the shutdown cooling pressure limits **THEN PERFORM** Attachment 5	Applicant determines that Rx pressure is within the shutdown cooling pressure limits. (<75 psig)			
Step 2.1.9 13. **IF** required to implement Alternate Shutdown Cooling due to the failure of HV-51-*F008 **OR** HV-51-*F009 **THEN PERFORM** Attachment 6.	Applicant determines that Alternate Shutdown Cooling is needed to be aligned per Attachment 6.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 1.0 (Attachment 6) 14. **IF** Alternate Shutdown Cooling using RHR, SRV's & Suppression Pool Cooling (NOT in OPCON 5) is required, **THEN PERFORM** the following: • **VERIFY** at least one SRV will operate by ensuring ST-4-041-470-* is in surveillance. • **VERIFY** at least one loop of RHR is capable of being placed in Suppression Pool Cooling per S51.8.A. • **VERIFY** one loop of LPCI is lined up for operation per S51.1.A **OR** one loop of Core Spray is lined up for operation per S52.1.A **Evaluator Cue**: Steps 1.1 to 1.3 of ON-121, Attachment 6 are completed SAT. Another operator has verified that at least one SRV (ALL SRVs) will operate IAW ST-4-041-470-1 and at least one loop of RHR is capable of being placed in Suppression Pool Cooling per S51.8A. (Cont.)	**Based on Cue, applicant**: **DETERMINES** that at least one SRV will operate by ensuring ST-4-041-470-* is in surveillance. **DETERMINES** that at least one loop of RHR is capable of being placed in Suppression Pool Cooling per S51.8.A. **DETERMINES** that one loop of LPCI is lined up for operation per S51.1.A **OR** one loop of Core Spray is lined up for operation per S52.1.A.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Evaluator Note: Note that only one method is preferred in the current situation, SRVs and one loop of Core Spray should be used for an alternate shutdown cooling method. The applicant should recognize that ONLY the "B" RHR pump is lined up for LPCI injection (per initiating cue) to support suppression pool cooling.				
Step 2.0 (Attachment 6) 16. **PERFORM** S41.7.B **Evaluator Cue:** Inform applicant that all prerequisites for S41.7B have been verified to be met by another operator.	**Obtains** S41.7.B, USE OF SRV'S AND SUPPRESSION POOL COOLING AS AN ALTERNATE SHUTDOWN COOLING METHOD			
Step 4.2 (S41.7.B) **Warning:** Personnel must be evacuated from Drywell prior to operating this decay heat removal method. 17. **IMPLEMENT** Suppression Pool Cooling per S51.8.A, Suppression Pool Cooling Operation (Startup and Shutdown) And Level Control **AND PLACE** mousetraps on affected handswitches. **Evaluator Cue:** For exam purposes, do not use plant page or other radio equipment to evacuate personnel from Drywell. Verbally communicate that to me.	**Obtains** S51.8.A, Suppression Pool Cooling Operation (Startup and Shutdown) And Level Control			

JPM D

<table>
<tr><th>ELEMENT</th><th>STANDARD</th><th>SAT</th><th>UNSAT</th><th>Comment Number</th></tr>
<tr><td>S51.8.A, Step 4.2.1
18. START selected RHR Service Water loop per S12.1.A, RHR Service Water System Startup.
<u>Evaluator Cue:</u> Inform applicant that all prerequisites for S51.8.A have been verified to be met by another operator.</td><td>N/A
Determines that RHR Service Water pump 0A and 0B are already running.</td><td></td><td></td><td></td></tr>
<tr><td>Step 4.2.2
19. ENSURE HV-51-*F006A(B), "Shutdown Cooling Suction" (SUCTION), closed.</td><td>ENSURES HV-51-*F006A(B), "Shutdown Cooling Suction" (SUCTION), closed.</td><td></td><td></td><td></td></tr>
<tr><td>Step 4.2.3
20. ENSURE alignment of the following valves as indicated:
<table><tr><td>HV-51-*F047B</td><td>"RHR Heat Exchanger Shell Side Inlet" (INLET)</td><td>OPEN</td></tr><tr><td>HV-51-*F003B</td><td>"RHR Heat Exchanger Shell Side Outlet" (OUTLET)</td><td>OPEN</td></tr><tr><td>HV-51-*F004B</td><td>"Suppression Pool Suction" (SUCTION)</td><td>OPEN</td></tr></table></td><td>ENSURES alignment of the following valves as indicated:
<table><tr><td>HV-51-*F047B</td><td>"RHR Heat Exchanger Shell Side Inlet" (INLET)</td><td>OPEN</td></tr><tr><td>HV-51-*F003B</td><td>"RHR Heat Exchanger Shell Side Outlet" (OUTLET)</td><td>OPEN</td></tr><tr><td>HV-51-*F004B</td><td>"Suppression Pool Suction" (SUCTION)</td><td>OPEN</td></tr></table></td><td></td><td></td><td></td></tr>
</table>

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.2.5 21. **DISPATCH** Equipment Operator to inspect breaker for Trips **OR** Flags prior to pump start unless a plant transient requires a start of pump. **Evaluator Cue:** No abnormal indications are present locally at the breaker.	**DISPATCHES** Equipment Operator to inspect breaker for Trips **OR** Flags prior to pump start unless a plant transient requires a start of pump.			
Step 4.2.6 *22. **START** *B P202, RHR Pump (PUMP).	**STARTS** *B P202, RHR Pump (PUMP).			
Step 4.2.7 *23. Throttle **OPEN** HV-51-*F024B, "RHR Pump Full Flow Test Return" (SUPP POOL CLG), **AND PERFORM** the following: 1. **MAINTAIN** flow indicated on FI-51-*R603B. "RHR Loop Flow," between 8000 to 8500 gpm 2. **IF** greater than 8500 gpm required to maximize cooling, **THEN MINIMIZE** amount of time to reduce amount of water added to Suppression Pool.	Throttle **OPENS** HV-51-*F024B, "RHR Pump Full Flow Test Return" (SUPP POOL CLG) to **MAINTAIN** flow indicated on FI-51-*R603B. "RHR Loop Flow," between 8000 to 8500 gpm.			
Step 4.2.8 *24. **CLOSE** HV-C-51-*F048B, HEAT EXCH BYPASS	**CLOSES** HV-C-51-*F048B, HEAT EXCH BYPASS			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.2.9 25. **MONITOR** Suppression Pool temperature on SPOTMOS **OR** TE-51-*04B "RHR Pump B Suction" on XI-36-*01 at panel *0C614 **AND PERFORM** the following: 1. **MAINTAIN** temperature below 92°F.	**MONITOR** Suppression Pool temperature on SPOTMOS **OR** TE-51-*04B "RHR Pump B Suction" on XI-36-*01 at panel *0C614 to **Maintain** temperature below 92°F.			
Step 4.2.4 (S41.7.B) 26. At 10C601, **CLOSE** the following: HV-041-*F022A(B, C,D) — "Main Steam Isolation Valve" HV-041-*F028A(B, C,D) — "Main Steam Isolation Valve" HV-041-*F016 — "Main Steam Line Drain Valve" HV-041-*F019 — "Main Steam Line Drain Valve"	At 10C601, **VERIFY CLOSED** the following: HV-041-*F022A(B, C,D) — "Main Steam Isolation Valve" HV-041-*F028A(B, C,D) — "Main Steam Isolation Valve" HV-041-*F016 — "Main Steam Line Drain Valve" HV-041-*F019 — "Main Steam Line Drain Valve"			
Step 4.2.5 (S41.7.B) 27. At 10C602, **CLOSE** the following: HV-041-*F001 — "Vessel Head Vent Valve" HV-041-*F002 — "Vessel Head Vent Valve"	At 10C602, **VERIFY CLOSED** the following: HV-041-*F001 — "Vessel Head Vent Valve" HV-041-*F002 — "Vessel Head Vent Valve"			
Step 4.2.5 (S41.7.B) * 28. At 10C602, **CLOSE** the following: HV-041-*F005 — "Vessel Head Vent Valve"	At 10C602, **CLOSES** the following: HV-041-*F005 — "Vessel Head Vent Valve"			

JPM D

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.2.6 (S41.7.B) 29. At 10C648, **CLOSE** the following: HV-049-*F007 "RCIC Steam Supply Valve" HV-049-*F008 "RCIC Steam Supply Valve" HV-049-*F076 "RCIC Steam Warmup Line PCIV"	At 10C648, **VERIFY CLOSED** the following: HV-049-*F007 "RCIC Steam Supply Valve" HV-049-*F008 "RCIC Steam Supply Valve" HV-049-*F076 "RCIC Steam Warmup Line PCIV"			
Step 4.2.7 (S41.7.B) 30. At 10C647, **CLOSE** the following: HV-055-*F002 "HPCI Main Steam Supply Valve" HV-055-*F003 "HPCI Main Steam Supply Valve" HV-055-*F100 "HPCI Steam Warmup Line PCIV"	At 10C647, **VERIFY CLOSED** the following: HV-055-*F002 "HPCI Main Steam Supply Valve" HV-055-*F003 "HPCI Main Steam Supply Valve" HV-055-*F100 "HPCI Steam Warmup Line PCIV"			
Step 4.2.8 (S41.7.B) *31. **PLACE** any one SRV handswitch in "OPEN" at *0C626 **AND PLACE** Equipment Status Tag on handswitch. **Evaluator Cue:** Provide applicant an equipment status tag.	**PLACES** any one SRV handswitch in "OPEN" at *0C626 **AND PLACES** Equipment Status Tag on handswitch			
Step 4.2.9 (S41.7.B) *32. **IF** two SRVs are operable, **THEN PLACE** an additional SRV handswitch in "OPEN" at *0C626 **AND PLACE** Equipment Status Tag on handswitch. **Evaluator Cue:** Provide applicant an equipment status tag. **Evaluator Cue (if needed):** All SRVs are available.	**PLACES** an additional SRV handswitch in "OPEN" at *0C626 **AND PLACES** Equipment Status Tag on handswitch			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
CUE: JPM evaluation is complete, another operator will continue on with the procedure to establish alternate shutdown cooling.				

JPM Stop Time _____

JPM D

TASK CONDITIONS:

1. Unit 1 is in OPCON 4 with reactor coolant temperature at ~ 160°F.
2. 1A RHR pump has been placed in service for Shutdown Cooling with Reactor Coolant temperature at ~ 160°F as read on XI-36-101 (Primary DAS) TE-51-1N004A.
3. 0A & 0B RHRSW pumps are in service providing flow to "1A" & "1B" RHR Heat Exchangers.
4. HV-C-51-103A, RHR Heat Exchanger Outlet Bypass (POS), is full open and additional cooling is required to lower reactor coolant temperature within the 75°F to 85°F band.
5. 1D RHR pump is OOS for maintenance, expected time to recovery is 8 hours.
6. 1C RHR pump is INOP due to an I&C error during surveillance testing, expected time to recovery is 2.5 hours. T.S. 3.4.9.2 has been entered appropriately.
7. HV-051-1F015B SDC injection outboard is blocked out for maintenance.
8. 1B LPCI is aligned per S51.1A step for automatic operation in LPCI mode.
9. 1A and 1C CS pumps are operable.
10. The Unit 1 Reactor Operator is performing the cooldown ST.

INITIATING CUE:

The CRS has directed you to continue performing S51.8.B at step number 4.4.24.4, to lower reactor coolant temperature to 85°F.

JPM D

TASK CONDITIONS:

1. Unit 1 is in OPCON 4 with reactor coolant temperature at ~ 160°F.
2. 1A RHR pump has been placed in service for Shutdown Cooling with Reactor Coolant temperature at ~ 160°F as read on XI-36-101 (Primary DAS) TE-51-1N004A.
3. 0A & 0B RHRSW pumps are in service providing flow to "1A" & "1B" RHR Heat Exchangers.
4. HV-C-51-103A, RHR Heat Exchanger Outlet Bypass (POS), is full open and additional cooling is required to lower reactor coolant temperature within the 75°F to 85°F band.
5. 1D RHR pump is OOS for maintenance, expected time to recovery is 8 hours.
6. 1C RHR pump is INOP due to an I&C error during surveillance testing, expected time to recovery is 2.5 hours. T.S. 3.4.9.2 has been entered appropriately.
7. HV-051-1F015B SDC injection outboard is blocked out for maintenance.
8. 1B LPCI is aligned per S51.1A step for automatic operation in LPCI mode.
9. 1A and 1C CS pumps are operable.
10. The Unit 1 Reactor Operator is performing the cooldown ST.

INITIATING CUE:

The CRS has directed you to continue performing S51.8.B at step number 4.4.24.4, to lower reactor coolant temperature to 85°F.

Limerick Generating Station

Job Performance Measure

Synchronize and Load D12 Diesel Generator to 1000 KW (Alternate Path)

JPM Designation: E

Revision Number: 3

Date: 09/12/12

Note: This JPM is paired with JPM C with a staggered start. Start and complete this JPM with first applicant before beginning JPM C.

Developed By:	**DeMarshall**	**09/12/12**
	Author	**Date**
Reviewed By:	**Patel**	**09/13/12**
	Examiner	**Date**
Approved By:	**Caruso**	**09/13/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

(2/21/12, Rev 0) New Alternate Path JPM requiring the applicant to perform a Rapid Shutdown of the D12 Diesel Generator (following a Remote Manual start and load to 2000 KW), after the Generator Output breaker fails to trip on a Generator Differential Overcurrent condition.

(4/11/12, Rev 1) Dispositioned applicant's 4/6/12 comments. Revised JPM to start with D12 D/G running at synch speed and ready to synchronize.

(8/17/12, Rev 2) Dispositioned applicant's Pre-Validation comments. Revised JPM by (1) directing the applicant to load the diesel to 1000 KW instead of 2000 KW, (2) changing trigger initiation time from 45 to 15 seconds after reaching 1000 KW, (3) adding an Evaluator Cue to Element 12 to facilitate the use of time compression when raising generator load at a rate of 350 KW/min, (4) denoting Steps 9 and 10 as Critical Steps, (5) adding a Cue to Element 13 for the Evaluator to prompt the receipt of silenced Annunciators 122 D12 (C1/D1), if the applicant is unaware of the alarm condition (JPM alarms are silenced due to pairing of JPMs), and (6) enhancing the Evaluator Notes in Elements 14 and 15, to address the fact that the applicant may **not** take the action to place diesel generator breaker and/or the diesel generator control switch in the "PULL TO LOCK" position when shutting down the engine.

(9/12/12, Rev 3) Removed Cue from Element 13 for the Evaluator to prompt the receipt of silenced Annunciators 122 D12 (C1/D1). JPM alarms are **NOT** silenced during paired performance of JPMs 'C' and 'E'.

JPM Setup Instructions:

1. The simulator can be set up to any IC that the plant is stable.
2. Ensure copy of S92.1.O, "Local and Remote Manual Startup of a Diesel Generator," available.
3. Ensure copy of S92.2.N, "Shutdown of the Diesel Generators," available.
4. D12 D/G running at synch speed (S92.1.O completed up to and including Step 4.4.2).
5. Initiate trigger for Annunciator 122 D12 (C1) and Annunciator 122 D12 (D1) to ON 15 seconds after 1000 KW load has been achieved.

TASK STANDARD:

Synchronize D12 Diesel Generator per S92.1.O, starting at Step 4.4.3.
Load the D12 Diesel Generator to 1000 KW per S92.1.O.
Perform a Rapid Shutdown of the D12 Diesel Generator after the Generator Output breaker fails to trip open on a Generator Differential Overcurrent condition.

TASK CONDITIONS:

1. All prerequisites for Remote Manual Startup of the D12 Diesel Generator have been completed in accordance with S92.1.O.
2. D12 D/G running at synch speed; S92.1.O completed up to and including Step 4.4.2.
3. D12 Safeguard Bus supplied from 201 Safeguard Transformer.
4. EO stationed locally at D12 Diesel Generator.
5. Technical Specifications have been entered due to the D12 Diesel Generator being INOP during this test.

INITIATING CUE:

You are directed by Shift Supervision to synchronize and load D12 Diesel Generator to 1000 KW from the Main Control Room, starting at Step 4.4.3 of S92.1.O.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Perform A Remote Manual Start of the D12 Diesel Generator and Load to 2000 KW (Alternate Path)

JPM Designation: E

Revision Number: 3

K/A Number and Importance: 264000 A4.04 RO 3.7 SRO 3.7

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform

Alternate Path: Yes

Time Critical: No

Estimated Time to Complete: 25 min. Actual Time Used:_____minutes

References:
1. NUREG 1123, Rev. 2, Supp. 1, 264000 A4.04 RO 3.7 SRO 3.7
2. S92.1.O, Rev. 53
3. S92.2.N, Rev. 33
4. Module/LP ID: LL0T0092B, Diesel Generators and Auxiliaries, Rev. 0
5. ARC-MCR-122 (C1), Rev. 0
6. ARC-MCR-122 (D1), Rev. 0

EVALUATION SUMMARY:

1. Were all the Critical Elements performed satisfactorily? ☐ **Yes** ☐ **No**
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**

Comments:_____

_____

_____

_____

_____

_____

Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description:

This JPM has the operator (1) perform a Remote Manual start of the D12 Diesel Generator, (2) load the D12 Diesel Generator to 1000 KW, and (3) perform a Rapid Shutdown of the Diesel Generator after the Generator Output breaker fails to trip open on a Generator Differential Overcurrent condition.

Evaluator Note:

The steps of S92.1.O and S92.2.N are listed for reference and tracking of applicant's actions.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtains procedure and reviews.	Applicant obtains current revision of S92.1.O, reviews Section 2.0 Prerequisites and 3.0 Precautions.			
*2. (Step 4.4.3) **INSERT** synchroscope switch handle into Synchroscope Switch for the 1BG501Diesel Generator Breaker **AND PLACE** to "ON."	Applicant inserts Synch Switch handle for 1BG501 and places Synchroscope Switch 125-11607/SS in the "ON" position.			
3. (Step 4.4.4) **OBSERVE** Synchroscope for the 1BG501 Diesel Generator operates properly: a. Synchroscope rotating. b. **WHEN** synchroscope is at 180°, **THEN** both lights are lit **AND** fully bright. c. **WHEN** synchroscope is at 0°, **THEN** both lights are not LIT.	Applicant observes proper operation of the 1BG501 Synchroscope as indicated by: a. Synchroscope rotating. b. **WHEN** synchroscope is at 180°, **THEN** both lights are lit **AND** fully bright. c. **WHEN** synchroscope is at 0°, **THEN** both lights are not LIT.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
4. (Step 4.4.5) **VERIFY** speed controls operate properly as follows: a. **OBSERVE** diesel generator frequency as indicated by syncroscope. b. **PLACE** 165-BG501/CS, "Diesel Generator Speed Control," to "RAISE" **AND** to "LOWER." c. **VERIFY** change in synchroscope rotation rate or direction of rotation.	Applicant verifies proper operation of the speed controls by observing changes in synchroscope rotation rate and direction of rotation, in response to placing Switch 165-BG501/CS to "RAISE" **AND** to "LOWER."			
5. (Step 4.4.6) **VERIFY** voltage controls operating properly as follows: a. **OBSERVE** diesel generator voltage as indicated on Incoming Voltmeter. b. **PLACE** 170-BG502/CS VOLTAGE REGULATOR to "RAISE" **AND** to "LOWER." c. **VERIFY** change on Incoming Voltage meter.	Applicant verifies proper operation of voltage controls by observing changes in diesel generator voltage on the Incoming Voltage meter, in response to placing Switch 170-BG502/CS to "RAISE" **AND** to "LOWER."			
*6. (Step 4.4.7) **ADJUST** engine speed using 165-BG501/CS, "Diesel Generator Speed Governor Control," until synchroscope is rotating slowly in FAST direction (clockwise).	Applicant **ADJUSTS** engine speed using 165-BG501/CS, until synchroscope is rotating slowly in FAST direction (clockwise).			
*7. (Step 4.4.8) **ADJUST** diesel generator voltage using 170-BG502/CS, "Diesel Generator Voltage Regulator," until Synchronizing Incoming Voltmeter is slightly higher than Synchronizing Running Voltmeter.	Applicant **ADJUSTS** generator voltage using 170-BG502/CS, until Synchronizing Incoming Voltmeter reads 0.5 to 5 volts higher than Synchronizing Running Voltmeter.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*8. (Step 4.5.1) **WHEN** Synchroscope is within 3 degrees before 12 o'clock, **THEN CLOSE** Diesel Generator Breaker.	Applicant **CLOSES** D12 output breaker 152-11607/CS when Synchroscope is within 3 degrees before the 12 o'clock position, and verifies: a. D12 output breaker 152-11607/CS "red flagged" indication. b. D12 output breaker 152-11607 shuts and remains closed.			
*9. (Step 4.5.2) Immediately **RAISE** load to between 200 to 300 KW by turning 165-BG501CS "Diesel Generator Speed Governor Control," to "RAISE."	Applicant immediately **RAISES** load to between 200 to 300 KW as indicated on kilowatt meter W/BG501-2, by turning 165-BG501CS to "RAISE."			
*10. (Step 4.5.3) Immediately **LOAD** 100 KVAR by turning 170-BG502/CS, "Diesel Generator Voltage Regulator" to "RAISE."	Applicant immediately **LOADS** 100 KVAR as indicated on kilovar meter VAR/BG501-2, by turning 170-BG502/CS to "RAISE."			
11. (Step 4.5.4) **TURN** Synchroscope Switch to "OFF."	Applicant **TURNS** Synchroscope Switch 125-11607/SS to the OFF position.			
*12. (Step 4.5.5) Gradually **RAISE** diesel generator load at rate of less than or equal to 350 KW/min to desired value. **Evaluator Cue:** For exam purposes, time compression will be utilized when raising generator load in accordance with the above step. Provide the following cue each time the applicant raises load by 350 KW: **"For exam purposes, one minute has elapsed."**	Applicant gradually **RAISES** diesel generator load at a rate of less than or equal to 350 KW/min, to 1000 KW as indicated on kilowatt meter W/BG501-2, with KVARS less than 1500 KVARS.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
ALTERNATE PATH BEGINS HERE 13. Annunciator response to: D12 D-G DIFF / GROUND LOCKOUT [ARC-MCR-122 (C1)] **AND** D12 D-G TROUBLE [ARC-MCR-122 (D1)]. **Evaluator Note:** Programmed malfunction for receipt of Annunciator 122 D12 (C1) and Annunciator 122 D12 (D1), set for 15 seconds after 1000 KW load has been achieved.	***ALTERNATE PATH BEGINS*** Applicant: a. Acknowledges alarms b. Reports alarms to Unit Supervisor c. References alarm responses for: • ARC-MCR-122 (C1) • ARC-MCR-122 (D1)			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Evaluator Note: D12 Diesel Generator output breaker fails to trip on Differential Overcurrent. Operator Action in accordance with ARC-MCR-122 (C1), "D12 D-G DIFF / GROUND LOCKOUT," is to verify the Automatic Action, which is a trip of the engine and the output breaker. Guidance for performing a diesel generator "Rapid Shutdown Due to Alarm **OR** Abnormal Condition," is provided in Section 4.2 of S92.2.N, "Shutdown of the Diesel Generators." It is acceptable for the applicant to either shutdown the D12 Diesel Generator from memory by performing the actions specified in Steps 14 and 15 below, at which point S92.2.N should be referenced to ensure all required actions have been completed **OR** shutdown the D12 Diesel Generator with procedure S92.2.N in hand.	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*14. (S92.2.N, 4.2.1) **PLACE** Diesel Generator Breaker to "PULL TO LOCK." **Evaluator Note:** Applicant may OPEN the Diesel Output Breaker without going to the "PULL TO LOCK" position, if using ARC-MCR-122 (C1) guidance to open the breaker. ARC-MCR-122 (C1) does **not** provide specific direction to place the Diesel Generator Breaker to "PULL TO LOCK." If the Diesel Generator Breaker is not placed in "PULL TO LOCK," a follow up question to assess the applicant's understanding of diesel status should be asked.	Applicant places D12 output breaker 152-11607/CS in "PULL TO LOCK" position and verifies: a. D12 output breaker 152-11607/CS "green flagged" indication b. D12 output breaker 152-11607 opens and remains opens.			
*15. (4.2.2) **PLACE** 101-BG501/CS, "Diesel Generator Control," to "PULL TO LOCK." **Evaluator Note:** Applicant may **PLACE** 101-BG501/CS, "Diesel Generator Control," to the "STOP" position without going to "PULL TO LOCK," if using ARC-MCR-122 (C1) guidance to shut down the engine. ARC-MCR-122 (C1) does **not** provide specific direction to place 101-BG501/CS, "Diesel Generator Control," to "PULL TO LOCK." If 101-BG501/CS, "Diesel Generator Control," is not placed in "PULL TO LOCK," a follow up question to assess the applicant's understanding of diesel status should be asked.	Applicant places Switch 101-1BG501/CS to "PULL TO LOCK" position and verifies "green flagged" indication.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Evaluator Cue: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. All prerequisites for Remote Manual Startup of the D12 Diesel Generator have been completed in accordance with S92.1.O.
2. D12 D/G running at synch speed; S92.1.O completed up to and including Step 4.4.2.
3. D12 Safeguard Bus supplied from 201 Safeguard Transformer.
4. EO stationed locally at D12 Diesel Generator.
5. Technical Specifications have been entered due to the D12 Diesel Generator being INOP during this test.

INITIATING CUE:

You are directed by Shift Supervision to synchronize and load D12 Diesel Generator to 1000 KW from the Main Control Room, starting at Step 4.4.3 of S92.1.O.

HANDOUT PAGE

TASK CONDITIONS:

1. All prerequisites for Remote Manual Startup of the D12 Diesel Generator have been completed in accordance with S92.1.O.
2. D12 D/G running at synch speed; S92.1.O completed up to and including Step 4.4.2.
3. D12 Safeguard Bus supplied from 201 Safeguard Transformer.
4. EO stationed locally at D12 Diesel Generator.
5. Technical Specifications have been entered due to the D12 Diesel Generator being INOP during this test.

INITIATING CUE:

You are directed by Shift Supervision to synchronize and load D12 Diesel Generator to 1000 KW from the Main Control Room, starting at Step 4.4.3 of S92.1.O.

Limerick Generating Station

Job Performance Measure

SCRAM CHANNEL A1 and A2 FUNCTIONAL TEST (Alternate Path)

JPM Designation: F

Revision Number: 4

Date: 9/18/12

Developed By:	Patel	9/18/12
	Author	**Date**
Review By:	C. Lally	9/18/12
	Examiner	**Date**
Approved By:	J. Caruso	9/18/12
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 0

JPM Setup Instructions:

1. The simulator can be reset to any IC that has RPS reset and the reactor is stable. (IC-17)
2. A1/A2 day selected under full core display.
3. Override C71-S3A-PB "A1 manual pushbutton" AND C71-S3C-PB "A2 manual pushbutton" to "Fail-as-is" when "A2" Arming Collar is placed in "ARMED"
4. Added examiner cue for step 4.3.6 to notify applicant that reactor auto-scram trip logic lights are not lit at local 10C609 panel, and step 4.3.13 to notify applicant that local 10C609 lights are lit.

TASK STANDARD:

Upon identification of failure to Scram for RPS channel A2, place the reactor mode switch to shutdown.

TASK CONDITIONS:

1. Plant is in OPCON 1 with no half scram signals present.
2. No rod movement anticipated.
3. All prerequisites for ST-6-071-306-1 are completed.
4. Aux Operator is staged in AER.

INITIATING CUE:

The CRS has directed you to perform ST-6-071-306-1, Unit 1 Channel A1/A2 RPS Manual Scram Channel Functional Test.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: SCRAM CHANNEL A1 and A2 FUNCTIONAL TEST

JPM Number: F

Revision Number: 0

K/A Number and Importance: 212000 A1.11 3.4/3.3 (RO/SRO)

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform in Simulator

Alternate Path: Yes

Time Critical: No

Estimated Time to Complete: 15 min. Actual Time Used:_____minutes

References:
1. NUREG 1123, 212000 A1.11 3.4/3.3 (RO/SRO)
2. ST-6-071-306-1, Rev. 13

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator to verify the reactor manual scram logic channels A1 and A2 function by performing ST-6-071-306-1. The operator will determine that channel A2 manual scram logic fails, and half-scram failed to actuate. The operator will enter OT-117, RPS failures, and manually scram the reactor.

History: Not used on 2008/2010 Limerick Initial License Exams. Modified Bank JPM #003. Changed alternate path functional test occurrence to Channel A2.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtain a copy of ST-6-071-306-1.	Obtains a copy of ST-6-071-306-1.			
Step 4.3.1 2. **VERIFY** the following SCRAM SYSTEM LOGIC lights Lit at panel 10C603: • B1 (DS9D) • B2 (DS9H) • B3 (DS9F) • B4 (DS9B)	**VERIFIES** the following SCRAM SYSTEM LOGIC lights are Lit at panel 10C603: • B1 (DS9D) • B2 (DS9H) • B3 (DS9F) • B4 (DS9B)			
Step 4.3.2 *3. **POSITION** CH A1 collar in ARMED, at panel 10C603 **AND VERIFY** "MANUAL SCRAM SWITCH ARMED A, B" alarm annunciates at panel 108 REACTOR.	**ROTATES** CH A1 pushbutton collar in ARMED, at panel 10C603 **AND VERIFIES** "MANUAL SCRAM SWITCH ARMED A, B" alarm annunciates at panel 108 REACTOR.			
Step 4.3.3 *4. Fully **DEPRESS** CH A1, at panel 10C603.	Fully **DEPRESSES** CH A1 pushbutton, at panel 10C603.			
Step 4.3.4 *5. **RELEASE** CH A1 **AND VERIFY** the following at panel 108 REACTOR. • MANUAL SCRAM SYSTEM A alarm annunciates. • AUTO SCRAM CHANNEL A1 alarm annunciates.	**RELEASES** CH A1 pushbutton **AND VERIFIES** the following at panel 108 REACTOR. • MANUAL SCRAM SYSTEM A alarm annunciates. • AUTO SCRAM CHANNEL A1 alarm annunciates.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.3.5 6. **VERIFY** the following SCRAM SYSTEM LOGIC lights **not** Lit at panel 10C603: • A1 (DS9C) • A2 (DS9G) • A3 (DS9E) • A4 (DS9A)	**VERIFIES** the following SCRAM SYSTEM LOGIC lights are **not** Lit at panel 10C603: • A1 (DS9C) • A2 (DS9G) • A3 (DS9E) • A4 (DS9A)			
Step 4.3.6 7. **VERIFY** REACTOR AUTO-SCRAM TRIP LOGIC A1 DS1 **not** lit at panel 10C609. **Evaluator Cue:** REACTOR AUTO-SCRAM TRIP LOGIC A1 DS1 is **not** lit at panel 10C609.	**VERIFIES** REACTOR AUTO-SCRAM TRIP LOGIC A1 DS1 is **not** lit at panel 10C609.			
Step 4.3.8 8. **VERIFY** "MANUAL SCRAM SYSTEM A" alarm can be cleared at panel 108 REACTOR.	**Depresses** alarm reset pushbutton and **VERIFIES** "MANUAL SCRAM SYSTEM A" alarm can be cleared at panel 108 REACTOR			
Step 4.3.9 *9. **POSITION** CH A1 collar in DISARMED at panel 10C603, **AND VERIFY** "MANUAL SWITCH ARMED A, B" alarm can be cleared at panel 108 REACTOR.	**POSITIONS** CH A1 collar in DISARMED at panel 10C603, **AND VERIFY** "MANUAL SWITCH ARMED A, B" alarm can be cleared at panel 108 REACTOR			
Step 4.3.10 *10. **POSITION** "SCRAM RESET" to the following at panel 10C603: • Group 1/4 • Group 2/3	**POSITIONS** "SCRAM RESET" to the following at panel 10C603: • Group 1/4 • Group 2/3			
Step 4.3.11 11. **VERIFY** "AUTO SCRAM CHANNEL A1" alarm can be cleared at panel 108 REACTOR	**Depresses** alarm reset pushbutton and **VERIFIES** "AUTO SCRAM CHANNEL A1" alarm can be cleared at panel 108 REACTOR			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.3.12 12. **VERIFY** the following SCRAM SYSTEM LOGIC lights lit at panel 10C603: • A1 (DS9C) • A2 (DS9G) • A3 (DS9E) • A4 (DS9A)	**VERIFIES** the following SCRAM SYSTEM LOGIC lights are lit at panel 10C603: • A1 (DS9C) • A2 (DS9G) • A3 (DS9E) • A4 (DS9A)			
Step 4.3.13 13. **VERIFY** "REACTOR AUTO-SCRAM TRIP LOGIC A1 DS1" lit at panel 10C609. **Evaluator Cue:** REACTOR AUTO-SCRAM TRIP LOGIC A1 DS1 **is** lit at panel 10C609.	**VERIFIES** "REACTOR AUTO-SCRAM TRIP LOGIC A1 DS1" is lit at panel 10C609.			
Alt Path begins here: When applicant places "A2" Arming Collar to "ARMED", C71-S3A-PB "A1 manual pushbutton" AND C71-S3C-PB "A2 manual pushbutton" Fail-as-is.				
Step 4.4.1 14. **VERIFY** the following SCRAM SYSTEM LOGIC lights Lit at panel 10C603: • B1 (DS9D) • B2 (DS9H) • B3 (DS9F) • B4 (DS9B)	**VERIFIES** the following SCRAM SYSTEM LOGIC lights are Lit at panel 10C603: • B1 (DS9D) • B2 (DS9H) • B3 (DS9F) • B4 (DS9B)			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.4.2 *15. **POSITION** CH A2 collar in ARMED, at panel 10C603 **AND VERIFY** "MANUAL SCRAM SWITCH ARMED A, B" alarm annunciates at panel 108 REACTOR.	**POSITIONS** CH A2 collar in ARMED, at panel 10C603 **AND VERIFIES** "MANUAL SCRAM SWITCH ARMED A, B" alarm annunciates at panel 108 REACTOR			
Step 4.4.3 *16. Fully **DEPRESS** CH A2, at panel 10C603.	Fully **DEPRESSES** CH A2, at panel 10C603.			
Step 4.4.4 *17. **RELEASE** CH A2 **AND VERIFY** the following at panel 108 REACTOR:. • MANUAL SCRAM SYSTEM A alarm annunciates • AUTO SCRAM CHANNEL A2 alarm annunciates	Applicant recognizes that on Panel 108 window B-2 "AUTO SCRAM CHANNEL A2" is **NOT Lit**.			
Step 4.4.5 *18. **VERIFY** the following SCRAM SYSTEM LOGIC lights **not** Lit at panel 10C603: • A1 (DS9C) • A2 (DS9G) • A3 (DS9E) • A4 (DS9A)	Applicant recognizes that indicating lights A1, A2, A3, and A4 are still **LIT** on 10C603.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*19. Enter OT-117, "RPS Failures" and attempts to **INSERT** manual **half SCRAM** on **A1** IAW OT-117 Step 3.2.1: **IF** half SCRAM has been initiated **AND** associated white SCRAM lights do **not** go off, **THEN** immediately **INSERT** manual half SCRAM on affected RPS side **RO Evaluator Cue (if needed):** If needed, ask RO which procedure would the CRS direct at this point? Direct the RO applicant to enter OT-117, "RPS Failures". **SRO Evaluator Cue (if needed):** Ask which procedure would you direct? And proceed with that procedure.	Applicant enters OT-117, "RPS Failures" and attempts to **INSERT** manual **half SCRAM** on **A1** IAW OT-117 Step 3.2.1 by **POSITIONING** CH A1 collar in ARMED position and Fully **DEPRESSING** CH A1 pushbutton on panel 10C603.			
*20. Applicant recognizes that white SCRAM lights still remain Lit, and require manual **SCRAM** IAW OT-117 Step 3.2.1.1: **IF** white SCRAM lights remain Lit, **THEN** manually **SCRAM** the reactor **AND PLACE** Reactor Mode Switch in "SHUTDOWN," **AND ENTER** T-101 **AND EXIT** this procedure.	Applicant recognizes that white SCRAM lights still remain Lit, and require manual **SCRAM** IAW OT-117 Step 3.2.1.1. Applicant **Places** Rx Mode Switch in "SHUTDOWN"			
CUE: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. Plant is in OPCON 1 with no half scram signals present.
2. No rod movement anticipated.
3. All prerequisites for ST-6-071-306-1 are completed.
4. Aux Operator is staged in AER.

INITIATING CUE:

The CRS has directed you to perform ST-6-071-306-1, Unit 1 Channel A1/A2 RPS Manual Scram Channel Functional Test.

HANDOUT PAGE

TASK CONDITIONS:

1. Plant is in OPCON 1 with no half scram signals present.
2. No rod movement anticipated.
3. All prerequisites for ST-6-071-306-1 are completed.
4. Aux Operator is staged in AER.

INITIATING CUE:

The CRS has directed you to perform ST-6-071-306-1, Unit 1 Channel A1/A2 RPS Manual Scram Channel Functional Test.

Limerick Generating Station

Job Performance Measure

Restore RECW, DWCW, and Instrument Gas (E-1AY160) (TIME CRITICAL)

JPM Designation: G

Revision Number: 2

Date: 08/17/12

Developed By:	**DeMarshall**	**08/17/12**
	Author	**Date**
Reviewed By:	**Lally**	**08/20/12**
	Examiner	**Date**
Approved By:	**Caruso**	**08/20/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

(2/21/12, Rev 0) Direct Bank JPM editorially enhanced to incorporate NRC standards, and verified not to have been used in the previous two initial license exams dated October 2008 and October 2010.

(4/11/12, Rev 1) Dispositioned applicant's 4/6/12 comments.

(8/17/12, Rev 2) Dispositioned applicant's Pre-Validation comments. Revised JPM by (1) deleting Element 1, (2) deleting Elements 2 and 3, and incorporating associated information into the "Task Conditions," (3) Renumbering the Elements accordingly, (4) adding an Evaluator Note to Element 5 (previously Element 8 in Revision 1) to provide information indicating that restart of the tripped Drywell Chiller will be accomplished in accordance with S87.1.A App. 1, "Startup of Standby/Tripped Drywell Chiller Hardcard," (5) adding new Elements 5.a through 5.f and denoting them as Critical Steps, and (6) correcting editorial errors.

JPM Setup Instructions:

1. Reset the Simulator to IC-17.
2. Provide copy of Event Procedure E-1AY160, Loss of 1A RPS UPS Power.
3. Insert Malfunction MED280A (Loss of 1AY160).

TASK STANDARD:

Restore RECW to the Recirc Pump, restore DWCW flow to the drywell, restore Instrument Gas to the Drywell, and restore Instrument Gas Block and Vent Valves.

TASK CONDITIONS:

1. 1AY160 was de-energized 1 minute ago.
2. '1B' DW Chiller was running.
3. Recirc Pumps are still running
4. CRS has entered ON-113, "Loss of RECW" and E-1AY160, "Loss of 1A RPS UPS Power."
5. A Brief has been conducted by the CRS, identifying the need to prioritize restoration of RECW to the Recirc Pump seals to prevent seal failure.

INITIATING CUE:

This is a Time Critical JPM

You are directed by Shift Supervision to perform the initial actions of E-1AY160 to:

1. Restore RECW to the Recirc Pumps
2. Restore DWCW to the Drywell
3. Restore Instrument Gas
4. Restore Instrument Gas Block and Vent Valves

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is

marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Restore RECW, DWCW, and Instrument Gas (E-1AY160)

JPM Designation: G

Revision Number: 2

K/A Number and Importance: 400000 A4.01 RO 3.1 SRO 3.0

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform

Alternate Path: No

Time Critical: Yes

Estimated Time to Complete: 15 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2, Supp. 1, 400000 A4.01 RO 3.1 SRO 3.0
2. E-1AY160, Rev. 21
3. Module/LP ID: LL0T0013, RECW, Rev. 0
4. Module/LP ID: LGSOPS0087, DCWS, Rev. 0
5. Module/LP ID: LGSOPS0059, Instrument Gas System, Rev. 1
6. Module/LP ID: LL0T0093, 480 And 120 VAC Power Distribution, Rev. 0

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description:
This JPM has the operator restore (1) RECW to the Recirc Pump, (2) DWCW flow to the drywell, (3) Instrument Gas, and (4) Instrument Gas Block and Vent Valves.

Evaluator Note:
The steps of E-1AY160 are listed for reference and tracking of applicant's actions.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____ (Official start time for Time Critical portion of the JPM recorded when applicant acknowledges the initiating cue)

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. (Step 2.3) **PERFORM** the following to restore RECW to Recirc Pump seal **AND** motor oil coolers, on 10C655:	N/A			
*1a. (Step 2.3.1) **PLACE** HS-13-112, "Seals/ Oils Clrs Inbd Isol Bypass" to "BYPASS"	Applicant places HS-13-112 keylock switch to BYPASS within 9 minutes of start time.			
*1b. (Step 2.3.2) **PLACE** HS-13-106, "Recirc Pumps Seals/Oil Coolers" (IN), to "OPEN"	Applicant places HS-13-106 handswitch to OPEN within 9 minutes of start time **AND** verifies HV-13-106 OPEN.			
*1c. (Step 2.3.3) **PLACE** HS-13-107, "Recirc Pumps Seals/Oil Cooler" (OUT), to "OPEN" **Time Critical Stop Time** _____ **Evaluator Note:** **Time must be ≤ 9 minutes from JPM start time for SAT grade.**	Applicant places HS-13-107 handswitch to OPEN within 9 minutes of start time **AND** verifies HV-13-107 OPEN			
2. (Step 2.3.4) **REFER TO** Tech Spec 3.6.3 **AND** Tech Spec 3.3.2.b **AND TAKE** action for an inoperable isolation valve.	Applicant notifies CRS that Tech. Specs. 3.6.3 and 3.3.2.b are applicable.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
3. (Step 2.4) **PERFORM** the following to restore Drywell Cooling:	N/A			
*3a. (Step 2.4.1) **PLACE** HS-87-116, D/W CHILL WTR OUTBD ISOL BYPASS, keylock switch to "BYPASS" at 10C681.	Applicant places HS-87-116 keylock switch to BYPASS.			
3b. (Step 2.4.2) **ENSURE** compliance with Tech. Spec. Action Statement 3.6.3.a. **AND** 3.3.2.b	Applicant notifies CRS that Tech. Specs. 3.6.3 and 3.3.2.b are applicable.			
4. (Step 2.4.3) **OPEN** the following Drywell Chilled Water Isolation valves as required:	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*4a. (Step 2.4.3) 1) Handswitch #: HSS-87-121A (Loop A) Valve Number -- Description HV-87-120A "Chld Wtr In" HV-87-121A "Chld Wtr Out"	Applicant places HSS-87-121A handswitch in CHILLED WATER **AND** verifies HV-87-120A and HV-87-121A OPEN.			
*4b. (Step 2.4.3) 2) Handswitch #: HSS-87-121B (Loop B) Valve Number -- Description HV-87-120B "Chld Wtr In" HV-87-121B "Chld Wtr Out"	Applicant places HSS-87-121B handswitch in CHILLED WATER **AND** verifies HV-87-120B and HV-87-121B OPEN.			
5. (Step 2.4.4) **IF** Drywell Chiller trips, **THEN REFER TO** S87.1.A, Startup of Drywell Chilled Water System, **AND START** Drywell Chilled Water System. **Evaluator Note:** Applicant restarts the tripped Drywell Chiller by performing S87.1.A App. 1, "Startup of Standby/Tripped Drywell Chiller Hardcard."	Applicant performs S87.1.A App. 1, "Startup of Standby/Tripped Drywell Chiller Hardcard," to restart the tripped Drywell Chiller.			
*5a. (S87.1.A APP 1, Step 2.1) **PLACE** 1BK111 Drywell Chiller (CHILLER) to STOP (Green Flagged).	Applicant places 1BK111 Chiller to STOP.			
*5b. (S87.1.A APP 1, Step 2.2) **PLACE** DW Chilled water pump 1A-P161 to OFF.	Applicant places 1A-P161 to OFF.			
*5c. (S87.1.A APP 1, Step 2.3) **PLACE** DW Chilled water pump 1B-P161 to OFF.	Applicant places 1B-P161 to OFF.			
*5d. (S87.1.A APP 1, Step 4.0) **PLACE** 1BK111, Drywell Chiller (CHILLER) in "START."	Applicant places 1BK111 to START.			

JPM G

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*5e. (S87.1.A APP 1, Step 4.0) **ENSURE** 1A-P161 in RUN."	Applicant ensures 1A-P161 in RUN.			
*5f. (S87.1.A APP 1, Step 4.0) **ENSURE** 1B-P161 in RUN."	Applicant ensures 1B-P161 in RUN.			
6. (Step 2.5) **PERFORM** the following to restore Instrument Gas on 10C601, ISOLATION:	N/A			
*6a. (Step 2.5.1) **PLACE** HS-59-129A, "Instrument Gas Supply" (DRYWELL A), in "CLOSE".	Applicant places HS-59-129A handswitch in CLOSE.			
*6b. (Step 2.5.2) **PLACE** HSS-57-191A, "Containment Isolation Bypass" (A), in "BYPASS".	Applicant places HSS-57-191A keylock switch in BYPASS.			
*6c. (Step 2.5.3) **PLACE** HS-59-129A, "Instrument Gas Supply (DRYWELL A), in "AUTO".	Applicant places HS-59-129A handswitch in AUTO **AND** verifies HV-59-129A OPEN.			
*6d. (Step 2.5.4) **PLACE** HS-59-101, "Instrument Gas Suction" (INBOARD), in "OPEN".	Applicant places HS-59-101 handswitch in OPEN **AND** verifies HV-59-101 OPEN			
6e. (Step 2.5.5) **ENSURE** compliance with Tech. Spec. Action Statement 3.6.3.a. **AND** 3.3.2.b	Applicant notifies CRS that Tech Specs 3.6.3.a and 3.3.2.b are applicable			
7. (Step 2.6) **PERFORM** the following to restore Instrument Gas Blocks AND Vents:	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*7a. (Step 2.6.1) **PLACE** HSS-57-191C, "Containment Isolation Bypass" (C), in "BYPASS".	Applicant places HSS-57-191C keylock switch in BYPASS			
*7b. (Step 2.6.2) **PLACE** HS-59-140, "Instrument Gas Block Valve Control Switch" to "OPEN".	Applicant places HS-59-140 handswitch to OPEN **AND** verifies HV-59-140 OPEN **AND** HV-59-142 CLOSED			
7c. (Step 2.6.3) **ENSURE** compliance with Tech. Spec. Action Statement 3.6.3.a. **AND** 3.3.2.b.	Applicant notifies CRS that Tech Specs 3.6.3.a and 3.3.2.b are applicable			
Evaluator Cue: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. 1AY160 was de-energized 1 minute ago.
2. '1B' DW Chiller was running.
3. Recirc Pumps are still running.
4. CRS has entered ON-113, "Loss of RECW" and E-1AY160, "Loss of 1A RPS UPS Power."
5. A Brief has been conducted by the CRS, identifying the need to prioritize restoration of RECW to the Recirc Pump seals to prevent seal failure.

INITIATING CUE:

This is a Time Critical JPM.

You are directed by Shift Supervision to perform the initial actions of E-1AY160 to:

1. Restore RECW to the Recirc Pumps
2. Restore DWCW to the Drywell
3. Restore Instrument Gas
4. Restore Instrument Gas Block and Vent Valves

HANDOUT PAGE

TASK CONDITIONS:

1. 1AY160 was de-energized 1 minute ago.
2. '1B' DW Chiller was running.
3. Recirc Pumps are still running.
4. CRS has entered ON-113, "Loss of RECW" and E-1AY160, "Loss of 1A RPS UPS Power."
5. A Brief has been conducted by the CRS, identifying the need to prioritize restoration of RECW to the Recirc Pump seals to prevent seal failure.

INITIATING CUE:

This is a Time Critical JPM.

You are directed by Shift Supervision to perform the initial actions of E-1AY160 to:

1. Restore RECW to the Recirc Pumps
2. Restore DWCW to the Drywell
3. Restore Instrument Gas
4. Restore Instrument Gas Block and Vent Valves

Limerick Generating Station

Job Performance Measure

Standby Gas Treatment Manual Startup With Charcoal Enclosure HI Temp (Alternate Path)

JPM Designation: H

Revision Number: 3

Date: 09/14/12

Note: This JPM is paired with JPM B with silenced overhead alarms.

Developed By:	DeMarshall	09/14/12
	Author	**Date**
Reviewed By:	Lally	09/14/12
	Examiner	**Date**
Approved By:	Caruso	09/14/12
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

(2/21/12, Rev 0) Bank Alternate Path JPM modified to (1) eliminate the option of shutting down the affected train of SGTS per S76.8.A prior to taking action to isolate the train per S76.7 B, and (2) change the train with the charcoal filter high temperature alarm condition from B to A.

(4/11/12, Rev 1) Dispositioned applicant's 4/6/12 comments.

(8/17/12, Rev 2) Dispositioned applicant's Pre-Validation comments. Revised JPM by (1) specifying the 'A' Filter Train to be placed in service, (2) adding JPM Setup Instruction #5 to ramp TI-76-010A indication to 250 °F over a two minute period from the time Annunciator 002 VENT (G5) alarms, (3) adding an Evaluator Note to Element 5 to indicate that the applicant may log Exhaust Fan Run Time when starting the 'A' Fan, (4) adding a Cue to Element 6 for the Evaluator to prompt the receipt of silenced Annunciator 002 VENT (G5), if the applicant is unaware of the alarm condition (JPM alarms are silenced due to pairing of JPMs), and (5) correcting an editorial error.

(9/14/12, Rev 3) (1) Added Evaluator Cue for Element 9 to acknowledge applicant's report of filter status to SSV, and provide information to applicant that Health Physics has been notified. (2) Added Evaluator Note and Cue to Element 12 for expected Annunciator 002 VENT (G1) alarm related to SGTS filter isolation and SGTS fan trip.

JPM Setup Instructions:

1. Reset simulator to IC-17
   NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.
2. Provide copy of S76.8.A, Manual Startup and Shutdown of SGTS.
3. Provide copy of S76.7.B, Standby Gas Treatment System Charcoal Filter High Temperature Response.
4. Initiate trigger for Annunciator 002 VENT (G5) to ON 45 seconds after HS-76-040A ('A' SGTS Exhaust Fan) taken to RUN.
5. Ramp TI-76-010A indication to 250 °F over a two minute period from the time Annunciator 002 VENT (G5) alarms.

TASK STANDARD:

'A' Exhaust Fan and 'A' Filter Train of SGTS placed in service per S76.8.A.
'A' Filter Train of SGTS subsequently isolated per S76.7.B on a charcoal filter high temperature alarm condition.

TASK CONDITIONS:

1. Secondary Containment isolation signal is not present.
2. No containment purging or inerting is in progress.
3. An EO is standing by to assist.
4. Brief has been performed for placing the 'A' Exhaust Fan and 'A' Filter Train of SGTS in service.
5. Radiation Protection has been notified of the potential for contamination level change prior to startup or shutdown of SGTS.

INITIATING CUE:

Post Maintenance Testing is required on the 'A' Exhaust Fan and 'A' Filter Train of SGTS. You are directed by Shift Supervision to place the 'A' Exhaust Fan and 'A' Filter Train of SGTS in service per S76.8.A for a 15 minute run.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Standby Gas Treatment Manual Startup With Charcoal Enclosure HI Temp (Alternate Path)

JPM Designation: H

Revision Number: 3

K/A Number and Importance: 261000 A2.03 RO 2.9 SRO 3.2

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator

Testing Method: Perform

Alternate Path: Yes

Time Critical: No

Estimated Time to Complete: 15 min. Actual Time Used: _____minutes

References:
1. NUREG 1123, Rev. 2, Supp. 1, 261000 A2.03 RO 2.9 SRO 3.2
2. S76.7.B, Rev. 13
3. S76.8.A, Rev. 18
4. Module/LP ID: LL0T0200, Reactor Enclosure HVAC, Rev. 18
5. ARC-MCR-002 (G5), Rev. 0

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description:

This JPM has the operator place the A train of SGTS in service, and subsequently secure the A train on a charcoal filter high temperature alarm condition.

Evaluator Note:

The steps of S76.7.B and S76.8.A are listed for reference and tracking of applicant's actions.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtains procedure and reviews.	Applicant obtains current revision of S76.8.A, reads section 2.0 Prerequisites and 3.0 Precautions.			
2. (S76.8.A, Step 4.2.1) **CLOSE** "B" SGTS Filter Train by placing HS-076-013B to "AUTO."	Applicant places HS-076-013B handswitch to "AUTO."			
3. (Step 4.2.2) **PLACE** SGTS fan 0BV163 in standby, by placing HS-076-040B to "STANDBY."	Applicant places HS-076-040B (EXH FAN B) handswitch to "STANDBY."			
Step 4.3 NOTE Step 4.3 will cause 004 VENT B-2 "Reactor Enclosure Refueling Floor Isolation System Armed/Bypassed" Alarm. Step 4.3 will open RE-SGTS Connection Valve, HV-76-196 to establish flowpath from Reactor Enclosure HVAC to SGTS system. **Evaluator Note:** When applicant directs EO to Place HS-76-196 to "TEST" or to perform Step 4.3 of S76.8.A, Remote Function RRE180 is inserted (simulates HS-76-196 Test Switch to "TEST").	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*4. (Step 4.3) **PLACE** HS-76-196, "RE-SGTS Connection Valve HV-76-196 Test Switch," to 'TEST" at 0AC124. **Evaluator Roleplay (EO):** AFTER Remote Function RRE180 has been inserted to simulate HS-76-196 Test Switch to "TEST," report either: "HS-76-196 Test Switch is in TEST" **OR** "Step 4.3 of S76.8.A is complete."	Applicant directs EO to place HS-76-196, "RE-SGTS Connection Valve HV-76-196 Test Switch," to "TEST" at 0AC124.			
*5. (Step 4.4) **PLACE** HS-76-040A, "SGTS Exhaust Fan" (EXH FAN A) to "RUN" at 00C681 to start SGTS Exhaust Fan A. **Evaluator Note:** Applicant may log Fan Run Time.	Applicant places HS-76-040A, (EXH FAN A) handswitch to "RUN" at 00C681 to start SGTS Exhaust Fan A. **AND** Observes expected flow of 6000 to 7000 scfm as indicated on FI-76-032, "Purge Fan/SGTS Hi" at 00C681.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
ALTERNATE PATH BEGINS HERE	***ALTERNATE PATH BEGINS***			
6. Annunciator response to A REAC ENCL SGTS CHARCOAL FLT HI TEMP [ARC-MCR-002 (G5)]. **Evaluator Note:** Programmed malfunction for receipt of Annunciator 002 VENT (G5), set for 45 seconds after HS-76-040A placed to "RUN." **Evaluator Cue:** Alarms associated with paired JPMs are silenced. When Annunciator 002 VENT (G5) flashes, wait approximately 10 seconds, point to the alarm, and state the following if the applicant is unaware of the alarm condition: **"Annunciator 002 G5 is your alarm."**	Applicant: a. Acknowledges alarm b. Reports alarm to Unit Supervisor c. References alarm response for ARC-MCR-002 (G5)			
7. (ARC-MCR-002 (G5)) **VERIFY** high temp using TI-76-010A on 00C681.	Applicant observes TI-76-010A indicates ≥ 200 °F.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
8. (ARC-MCR-002 (G5)) Refer to S76.7.B (SGTS Charcoal Filter High Temperature Response). **Evaluator Note:** The 'A' Filter of SGTS is isolated in accordance with S76.7.B, Section 4.2, "Inspection of Affected SGTS Filter Train," (Steps 4.2.1 through 4.2.4). S76.7.B is referenced in ARC-MCR-002 (G5). **Evaluator Cue:** Prerequisite 2.5 states "Briefing performed as required." If a brief is requested, inform applicant that the brief has been completed.	Applicant obtains current revision of S76.7.B, reads section 2.0 Prerequisites and 3.0 Precautions.			
9. (S76.7.B, Step 4.2.1) Immediately **NOTIFY** SSV **AND** Health Physics of SGTS Filter status. **Evaluator Cue:** Acknowledge filter status as SSV and notify the applicant that Health Physics has been notified.	Applicant notifies SSV and Health Physics of the SGTS ~~B~~ A train Charcoal Filter high temperature condition.			
*10. (Step 4.2.2) **PLACE** unaffected HS-76-013B, "SGTS Filter Isolation," at 00C681 in "OPEN" to ensure filter train flow path.	Applicant places HS-076-013B handswitch in "OPEN."			
*11. (Step 4.2.3) **PLACE** affected HS-76- 013A, "SGTS Filter Isolation," in "CLOSE" to isolate affected SGTS Filter Train.	Applicant places HS-076-013A handswitch in "CLOSE."			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
12. (Step 4.2.4) **ENSURE** HV-76-012A, "Filter Outlet" **AND** HV-76- 011A, "Filter Inlet" for affected SGTS filter train closed. **Evaluator Note:** Annunciator ARC-MCR-002 (G1), "A Exhaust Fan 0AV163 Trouble" is an **expected alarm** associated with SGTS filter isolation and fan trip. If applicant does not identify the alarm as expected, then the following cue will be necessary: **Evaluator Cue (If Necessary):** Why did Annunciator ARC-MCR-002 (G1), "A Exhaust Fan 0AV163 Trouble," come into alarm?	Applicant verifies HV-76-012A, "Filter Outlet," **AND** HV-76- 011A, "Filter Inlet closed.			
Evaluator Cue: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. Secondary Containment isolation signal is not present.
2. No containment purging or inerting is in progress.
3. An EO is standing by to assist.
4. Brief has been performed for placing the 'A' Exhaust Fan and 'A' Filter Train of SGTS in service.
5. Radiation Protection has been notified of the potential for contamination level change prior to startup or shutdown of SGTS.

INITIATING CUE:

Post Maintenance Testing is required on the 'A' Exhaust Fan and 'A' Filter Train of SGTS. You are directed by Shift Supervision to place the 'A' Exhaust Fan and 'A' Filter Train of SGTS in service per S76.8.A for a 15 minute run.

HANDOUT PAGE

TASK CONDITIONS:

1. Secondary Containment isolation signal is not present.
2. No containment purging or inerting is in progress.
3. An EO is standing by to assist.
4. Brief has been performed for placing the 'A' Exhaust Fan and 'A' Filter Train of SGTS in service.
5. Radiation Protection has been notified of the potential for contamination level change prior to startup or shutdown of SGTS.

INITIATING CUE:

Post Maintenance Testing is required on the 'A' Exhaust Fan and 'A' Filter Train of SGTS. You are directed by Shift Supervision to place the 'A' Exhaust Fan and 'A' Filter Train of SGTS in service per S76.8.A for a 15 minute run.

Limerick Generating Station

Job Performance Measure

Maximizing CRD Flow After Shutdown During Emergency Conditions

JPM Designation: I

Revision Number: 2

Date: 9/18/12

Developed By:	**Chris Lally**	**9/18/12**
	Author	**Date**
Review By:	**Manan Patel**	**9/18/12**
	Examiner	**Date**
Approved By:	**John Caruso**	**9/18/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

1. Rev 0
2. Rev 1: Revised to reflect new procedure revision and add to task conditions
3. Rev. 2: Based on validation changed evaluator cue for element 7.

JPM Setup Instructions:

1. Provide copy of Unit 2 T-240 for applicant use

TASK STANDARD:

Successfully maximize CRD flow using T-240 to open the CRD pump suction filter bypass and start the standby CRD pump

TASK CONDITIONS:

1. Unit 2 is SHUTDOWN
2. RPV water level is -100", down slow
3. TRIP procedures direct RPV level restoration using T-240
4. CRD system is in operation
5. It has been determined that step 4.8 is not required to be performed at this time
6. S46.7.A, Control Rod Drive Hydraulic System Operation Following Reactor Scram, has NOT been performed

INITIATING CUE:
Take actions necessary to restore RPV level per T-240, Maximizing CRD Flow After Shutdown During Emergency Conditions

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐SRO Cert

JPM Title: Maximizing CRD Flow After Shutdown During Emergency Conditions

JPM Number: I

Revision Number: 1

K/A Number and Importance: 295031 EA1.10 3.6/3.7

Suggested Testing Environment: Plant

Actual Testing Environment: Plant

Testing Method: Simulate

Alternate Path: No

Time Critical: No

Estimated Time to Complete: **20 min.** **Actual Time Used:** _____minutes

References:

1. T-240 U2 Rev. 18
2. Nureg-1123 Rev. 2, Supp. 1

EVALUATION SUMMARY:

1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**

Comments:_____

_____

_____

_____

_____

_____

Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM directs the applicant to perform T-240 to maximize CRD system flow after shutdown. This will be completed by opening the CRD pump suction filter bypass and starting the standby CRD pump.

History: Not used on 2008/2010 Limerick Initial License Exams, New JPM

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtain current revision of Unit 2 T-240 **Evaluator Cue:** Once applicant demonstrates ability to obtain current revision of Unit 2 T-240, provide him/her a copy	Applicant describes where they would obtain T-240			
2. (Step 3.1) TRIP **OR** SAMP procedures must direct the use of this procedure	Applicant verifies T-240 directed from TRIP/SAMP by referring to initiating cue			
3. (Step 3.2) CRD System in operation	Applicant verifies CRD system in operation by referring to initiating cue			
4. (Step 3.3) **IF** step 4.8 to be performed, **THEN** the following tools / equipment obtained from Unit 2 T-200 "Hose Storage Cabinet", (580-R17-283) (ATTACHMENT 3) BL-840 key required: ¾" Drive Socket Wrench (1) 1 5/8" x ¾" Drive Socket 14" Pipe wrench 12" Adjustable Wrench (1) Flashlight	Applicant verifies that step 4.8 is not required to be performed at this time by referring to initiating cue			
CAUTION 1. High flow **AND** high CRD pump suction filter dP will lower NPSH 2. Lowering reactor pressure will cause rising CRD pump flow 3. CRD pumps trip at 4.5 inches HG vacuum suction pressure 4. To prevent CRD Pump runout local pump discharge pressure must be greater than 1,200 psig on PI-46-208A(B), "CRD Pump Discharge"	Applicant reads and acknowledges caution			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
5. (Step 4.1) **IF** S46.7.A, Control Rod Drive Hydraulic System Operation Following Reactor Scram, has been performed, **THEN ENSURE** the following valves are open: •46-2F060, "CRD Water Pressure Control Station Inlet Valve" •46-2F069, "CRD Stabilizing Valves Return Header Stop Valve" •46-2F034, "CRD Charging Water Header Supply Valve"	Applicant verifies that step S46.7.A has NOT been performed by referring to initiating cue and N/A the step			
*6. (Step 4.2) Fully **OPEN** HV-46-2F003 "Drive Water Pressure Control" (DRIVE WATER PRESSURE), at 20C603 (MCR) **Evaluator Cue:** This is Unit 2 control room, HV-46-2F003 is fully open	Applicant simulates contacting reactor operator to fully OPEN HV-46-2F003 "Drive Water Pressure Control" (DRIVE WATER PRESSURE)			
*7. (Step 4.3) **OPEN** FV-C-46-2F002A at 20C603 (MCR) using FC-46-2R600 "Rod Drive Flow Controller" (FL), in "MANUAL" to maximize CRD flow, while maintaining greater than 1200 psig as indicated on PI-46-208A, "CRD Pump Discharge" (270-T10-200) **Evaluator Cue:** Unit 2 control room has throttled opened FV-C-46-2F002A(B) and the PI-46-208A(B) is reading 1225 psig.	Applicant simulates contacting reactor operator to OPEN FV-C-46-2F002A, "Flow control" and verifies > 1200 psig is maintained as indicated on PI-46-208A(B), "CRD Pump Discharge" (270-T10-200).			
*8. (Step 4.4) **OPEN** 46-2F045, "CRD Pump Suction Filter Bypass" (270-T10-200). **Evaluator Cue:** 46-2F045, "CRD Pump Suction Filter Bypass" is OPEN	Applicant simulates opening 46-2F045, "CRD Pump Suction Filter Bypass"			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
9. (Step 4.5) If additional CRD flow is required THEN PLACE second CRD pump in service: **Evaluator Cue:** Unit 2 Reactor Operator reports that reactor water level trend is still down slow	Applicant proceeds to Step 4.5.1			
CAUTION **IF** one of two running pumps trip, **THEN** immediate operator action is needed to reduce flow **OR** other running pump may be damaged by exceeding runout flow (200 gpm).	Applicant reads and acknowledges caution			
10. (Step 4.5.1 **ENSURE** 46-2F014B(A), the on-coming CRD pump Discharge Stop Check (270-T10-200), (Attachment 1), is CLOSED **Evaluator Cue:** 46-2F014B(A) is CLOSED	Applicant simulates closing/checking closed 46-2F014 for non-running pump			
*11. (Step 4.5.2) **START** 2B(A) CRD pp with HS-46-208B(A) at 20C603 (MCR) **Evaluator Cue:** Acknowledge request and tell applicant they hear the previously non-running pump come up to speed	Applicant simulates contacting control room to START 2B(A) CRD pp			
*12. (Step 4.5.3) Slowly **OPEN** 46-2F014B(A), "CRD Pump Discharge Stop Check" (270-T10-200), for the on-coming pump (ATTACHMENT 1) **Evaluator Cue:** 46-2F014B(A) is OPEN	Applicant simulates slowly opening 46-2F014B(A) for the on-coming pump			
*13. (Step 4.5.4) **OPEN** FV-C-46-2F002B, "Flow control" at 20C603 (MCR) using FC-46-2R600 "Rod Drive Flow Controller" (FL), to maximize CRD flow, while maintaining > 1200 psig as indicated on PI-46-208A(B), "CRD Pump Discharge" (270-T10-200). **Evaluator Cue:** FV-C-46-2F002A(B), "Flow control" is throttled open at 20C603. Unit 2 Reactor Operator reports RPV water level is rising slowly	Applicant simulates contacting control room to OPEN FV-C-46-2F002B, to maximize CRD flow, while verifying > 1200 psig is maintained as indicated on PI-46-208A(B), "CRD Pump Discharge" (270-T10-200)			
CUE: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. Unit 2 is SHUTDOWN
2. RPV water level is at -100", down slow
3. TRIP procedures direct RPV level restoration using T-240
4. CRD system is in operation
5. It has been determined that step 4.8 is not required to be performed at this time
6. S46.7.A, Control Rod Drive Hydraulic System Operation Following Reactor Scram, has NOT been performed

INITIATING CUE:

Take actions necessary to restore RPV water level per T-240, Maximizing CRD Flow After Shutdown During Emergency Conditions

HANDOUT PAGE

TASK CONDITIONS:

1. Unit 2 is SHUTDOWN
2. RPV water level is at -100", down slow
3. TRIP procedures direct RPV level restoration using T-240
4. CRD system is in operation
5. It has been determined that step 4.8 is not required to be performed at this time
6. S46.7.A, Control Rod Drive Hydraulic System Operation Following Reactor Scram, has NOT been performed

INITIATING CUE:

Take actions necessary to restore RPV water level per T-240, Maximizing CRD Flow After Shutdown During Emergency Conditions

Limerick Generating Station

Job Performance Measure

Alignment of Equipment For Manual Operation of LPCI

JPM Designation: J

Revision Number: 2

Date: 08/10/12

Developed By:	**DeMarshall**	**08/10/12**
	Author	**Date**
Reviewed By:	**Lally**	**08/13/12**
	Examiner	**Date**
Approved By:	**Caruso**	**08/13/12**
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

(2/23/12, Rev 0) Not used on the 2008/2010 Limerick initial license exams.

(4/11/12, Rev 1) Dispositioned applicant's 4/6/12 comments. Originally written as a new Alternate Path JPM. Alternate Path deleted at the request of the applicant to reduce the total number of Alternate Path JPMs from 7 to 6.

(8/10/12, Rev 2) Editorial revision. Changed Alternate Path field from "Yes" to "No."

JPM Setup Instructions:

1. Provide copy of 1FSSG-3045E, Fire Area 045E Fire Guide.

TASK STANDARD:

Perform Alignment of Equipment for B LPCI Operation (Unit 1) per 1FSSG-3045E, due to fire in the CRD Hydraulic Equipment Area.

TASK CONDITIONS:

Initial Conditions:

1. Unit 1 is SHUTDOWN in OPCON 3.
2. RPV pressure is 285 psig.
3. Condensate is unavailable.
4. HPCI and RCIC are unavailable due to large governor control oil leaks identified on both systems during EO rounds.
5. "1B" RHR Pump, with flow through the "1B" RHR HX, is being used to maintain RPV level between +12.5" AND +54" in accordance with Step RC/L-4 of TRIP procedure T-101, RPV Control.
6. "1A" RHR Pump is unavailable due to emergent corrective maintenance on pump motor breaker 152-11504.
7. Special Event Procedure SE-3, SABOTAGE, is being implemented.

Subsequently, a Fire is reported in Unit 1 CRD Hydraulic Equipment Area (El. 253'). As a result:

1. HV-051-1F017B has **LOST** MCR indication, can **NOT** be positioned normally, and needs to be in the **OPEN** position.
2. The following valves have **LOST** MCR indication, can **NOT** be positioned normally, and need to be in the **CLOSED** position:
   - HV-051-1F015B "1B RHR SHUTDOWN CLG INJECTION PCIV (OUTBOARD)"
   - HV-051-1F027B "1B RHR SUPP POOL SPRAY LINE PCIV"
   - HV-C-051-1F048B "1B RHR HTX SHELL SIDE BYPASS VLV (HEAT EXCH BYPASS)

INITIATING CUE:

You are directed by Shift Supervision to perform Alignment of Equipment for B LPCI Operation (Unit 1) per 1FSSG-3045E.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Alignment of Equipment for Manual Operation of LPCI (Alternate Path)

JPM Designation: J

Revision Number: 2

K/A Number and Importance: 203000 K4.14 RO 3.6 SRO 3.7

Suggested Testing Environment: Plant

Actual Testing Environment: Plant

Testing Method: Simulate

Alternate Path: No

Time Critical: No

Estimated Time to Complete: **25 min.** **Actual Time Used:** _____minutes

References:
1. NUREG 1123 Rev. 2, Supp.1, 203000 K4.14 RO 3.6 SRO 3.7
2. 1FSSG-3045E, Rev. 15
3. Module/LP ID: LL0T0735, Remote Shutdown Panel, Rev. 13
4. Module/LP ID: LL0T0051, Residual Heat Removal (RHR) System, Rev. 0

EVALUATION SUMMARY:

1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**

Comments:_____

_____

_____

_____

_____

_____

Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description:

This JPM has the operator perform Alignment of Equipment for Unit 1 "B" LPCI Operation, including restart of the "1B" RHR pump after the pump trips, per 1FSSG-3045E, due to fire in the CRD Hydraulic Equipment Area (El. 253').

Evaluator Note:

The steps of 1FSSG-3045E are listed for reference and tracking of applicant's actions.

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Obtain current revision of 1FSSG-3045E. **Evaluator Cue:** Once applicant demonstrates ability to obtain current revision of the procedure, provide copy.	Applicant demonstrates where to obtain 1FSSG-3045E **AND** verifies current revision.			
2. Review Section 3.0, Contingency Actions.	Applicant reviews Step 3.0, Contingency Actions, **AND** recognizes that Attachment 2 is applicable.			
3. **Step 3.3.1 and 3.3.2 NOTE** A flathead screwdriver from the OSC Equipment Box **OR** the RSP Safe Shutdown Equipment Box is required to perform steps 3.3.1 **AND** 3.3.2. **Evaluator Note:** Use of the screwdriver will be necessary for the applicant to gain physical access to panels 10-C601-X2 (Step 3.3.1) and 10-C601-X1 (Step 3.3.2).	Applicant reads NOTE and obtains flathead screwdriver.			

JPM J

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*4. (1FSSG-3045E, Attachment 2, Step 3.3.1) **IF** HV-51-1F017B, "1B RHR LPCI INJ PCIV (OUTBOARD B)" can **NOT** be positioned normally, **THEN POSITION** valve from 10-C601-X2, "1B RHR EMERGENCY LOCAL VALVE CONTROL PANEL X2" (16-283-506), using Transfer Switch, HSS51-117BX. **Evaluator Cue:** After Transfer switch HSS51-117BX is placed to "EMER" (simulated), Evaluator informs applicant of the following valve position indication at 10-C601-X2: HSS51-117BX - **RED** indicating light **ON**, **GREEN** indicating light **OFF**.	Applicant accesses panel 10-C601-X2 and simulates **POSITIONING** Transfer Switch HSS51-117BX to "EMERG."			
5. Inform MCR that HV-51-1F017B indicates **OPEN** at 10-C601-X2. **Evaluator Cue:** Roleplay as control room and acknowledge report.	Applicant: • Recognizes HV-51-1F017B, "1B RHR LPCI INJ PCIV (OUTBOARD B)," is **OPEN**. • Informs MCR that HV-51-1F017B is in the required **OPEN** position.			

JPM J

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*6. (Step 3.3.2) **IF** any of the following valves: • HV-051-1F015B • HV-051-1F027B • HV-C-051-1F048B can **NOT** be positioned normally, **THEN POSITION** valve from 10-C601-X1, "1B RHR EMERGENCY LOCAL VALVE CONTROL PANEL X1," (12-217-304), using Transfer Switches: • HSS51-115BX (HV-051-1F015B) • HSS51-127BX (HV-051-1F027B) • HSS51-148BX (HV-C-051-1F048B) **Evaluator Cue:** After the three Transfer Switches are placed to "EMER" (simulated), Evaluator informs applicant of the following valve position indications at 10-C601-X1: • HSS51-115BX - **RED** indicating light **OFF**, **GREEN** indicating light **ON**. • HSS51-127BX - **RED** indicating light **OFF**, **GREEN** indicating light **ON**. • HSS51-148BX - **RED** indicating light **ON**, **GREEN** indicating light **OFF**.	Applicant accesses panel 10-C601-X1 and simulates **POSITIONING** the following Transfer Switches to "EMERG": • HSS51-115BX • HSS51-127BX • HSS51-148BX			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
7. Inform MCR that HV-C-51-1F048B, "1B RHR HTX SHELL SIDE BYPASS VLV (HEAT EXCH BYPASS)," indicates **OPEN** at 10-C601-X1, **AND** that the valve will be taken to **CLOSE**. **Evaluator Cue:** Roleplay as control room and acknowledge report.	Applicant: • Recognizes that HV-C-051-1F048B is **OPEN** and needs to be **CLOSED**. • Informs the MCR that HV-C-51-1F048B is not in the required **CLOSED** position, **AND** that action will be taken to **CLOSE** the valve.			
*8. **CLOSE** HV-C51-1F048B, "1B RHR HTX SHELL SIDE BYPASS VLV (HEAT EXCH BYPASS)," from panel 10-C601-X1. **Evaluator Note:** HV-C51-1F048BX MOV Control Switch must be positioned to close the valve (simulated). The Transfer Switch only aligns power to the MOV. **Evaluator Cue:** After HV-C51-1F048BX MOV Control Switch at panel 10-C601-X1 is positioned to close the valve (simulated), Evaluator informs applicant of the following valve position indication at 10-C601-X1: HV-C-051-1F048B valve closing "dual indication" followed by full closed "Green light **ON**, Red light **OFF**" indication after appropriate time delay.	Applicant simulates positioning HV-C51-1F048BX Control Switch at panel 10-C601-X1 to **CLOSE** HV-C-51-1F048B.			
9. Inform MCR that HV-C-51-1F048B indicates **CLOSED** at 10-C601-X1. **Evaluator Cue:** Roleplay as control room and acknowledge report.	Applicant informs MCR that HV-C51-1F048B indicates **CLOSED** at 10-C601-X1.			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Evaluator Cue: JPM is complete.				

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

Initial Conditions:

1. Unit 1 is SHUTDOWN in OPCON 3.
2. RPV pressure is 285 psig.
3. Condensate is unavailable.
4. HPCI and RCIC are unavailable due to large governor control oil leaks identified on both systems during EO rounds.
5. "1B" RHR Pump, with flow through the "1B" RHR HX, is being used to maintain RPV level between +12.5" AND +54" in accordance with Step RC/L-4 of TRIP procedure T-101, RPV Control.
6. "1A" RHR Pump is unavailable due to emergent corrective maintenance on pump motor breaker 152-11504.
7. Special Event Procedure SE-3, SABOTAGE, is being implemented.

Subsequently, a Fire is reported in Unit 1 CRD Hydraulic Equipment Area (El. 253'). As a result:

1. HV-051-1F017B has **LOST** MCR indication, can **NOT** be positioned normally, and needs to be in the **OPEN** position.
2. The following valves have **LOST** MCR indication, can **NOT** be positioned normally, and need to be in the **CLOSED** position:
   - HV-051-1F015B "1B RHR SHUTDOWN CLG INJECTION PCIV (OUTBOARD)"
   - HV-051-1F027B "1B RHR SUPP POOL SPRAY LINE PCIV"
   - HV-C-051-1F048B "1B RHR HTX SHELL SIDE BYPASS VLV (HEAT EXCH BYPASS)

INITIATING CUE:

You are directed by Shift Supervision to perform Alignment of Equipment for B LPCI Operation per 1FSSG-3045E (Unit 1).

HANDOUT PAGE

TASK CONDITIONS:

Initial Conditions:

1. Unit 1 is SHUTDOWN in OPCON 3.
2. RPV pressure is 285 psig.
3. Condensate is unavailable.
4. HPCI and RCIC are unavailable due to large governor control oil leaks identified on both systems during EO rounds.
5. "1B" RHR Pump, with flow through the "1B" RHR HX, is being used to maintain RPV level between +12.5" AND +54" in accordance with Step RC/L-4 of TRIP procedure T-101, RPV Control.
6. "1A" RHR Pump is unavailable due to emergent corrective maintenance on pump motor breaker 152-11504.
7. Special Event Procedure SE-3, SABOTAGE, is being implemented.

Subsequently, a Fire is reported in Unit 1 CRD Hydraulic Equipment Area (El. 253'). As a result:

1. HV-051-1F017B has **LOST** MCR indication, can **NOT** be positioned normally, and needs to be in the **OPEN** position.
2. The following valves have **LOST** MCR indication, can **NOT** be positioned normally, and need to be in the **CLOSED** position:
   - HV-051-1F015B "1B RHR SHUTDOWN CLG INJECTION PCIV (OUTBOARD)"
   - HV-051-1F027B "1B RHR SUPP POOL SPRAY LINE PCIV"
   - HV-C-051-1F048B "1B RHR HTX SHELL SIDE BYPASS VLV (HEAT EXCH BYPASS)

INITIATING CUE:

You are directed by Shift Supervision to perform Alignment of Equipment for B LPCI Operation per 1FSSG-3045E (Unit 1).

Limerick Generating Station

Job Performance Measure

Venting Primary Containment Using the 24" SUPPRESSION POOL PURGE SUPPLY

JPM Designation: K

Revision Number: 4

Date: 09/18/12

Developed By:	Patel	09/18/12
	Author	**Date**
Review By:	C. Lally	09/18/12
	Examiner	**Date**
Approved By:	J. Caruso	09/18/12
	Chief Examiner	**Date**

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

NOTE:	All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 through 11 below.

_____ 1. Task description and number, JPM description and number are identified.

_____ 2. Knowledge and Abilities (K/A) references are included.

_____ 3. Performance location specified. (in-plant, control room, or simulator)

_____ 4. Initial setup conditions are identified.

_____ 5. Initiating and terminating cues are properly identified.

_____ 6. Task standards identified and verified by Examiner review.

_____ 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

_____ 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure:
Procedure Rev. _____ Date _____

_____ 9. Pilot test the JPM:
a. verify cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

_____ 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

_____ 11. When JPM is revalidated, Examiner sign and date JPM cover page.

REVISION RECORD (Summary):

Rev 1 – Revised JPM to vent primary containment using 24" Suppression Pool Purge Supply line instead of 6" ILRT line, as requested by the licensee due to the 6" ILRT JPM actions being too long.
Rev 2 – Based on the Licensee's comments, added an examiner note to end JPM upon appropriate demonstration of opening first 2 valves as necessary, for element 16.
Rev 3 – Based on pre-validation walkdown, added initial task conditions to include that nitrogen bottles have been obtained for use, and removed the task for applicant to close all steam flooding dampers on panel 10C234 on 253' elevation.
Rev 4 – Based on validation, added evaluator cue/feedback for step 4.6.11.

JPM Setup Instructions:

- Provide markup copy of T-200 up to step 4.6.3.

TASK STANDARD:

Vent Primary Containment using the 24" Suppression Pool Purge Supply using section 4.6 of the T-200 procedure.

TASK CONDITIONS:

1. TRIP procedures direct containment venting in accordance with T-200.
2. Primary Containment pressure is rising (60 psig and rising) requiring 24" Suppression Pool Purge Supply vent path to be established.
3. Suppression Pool level is 28 feet and rising very slowly due to HPCI/RCIC operation.
4. The required steps in T-200 have been performed up to section 4.6.
5. Radiation Protection has unlocked the outside truck access door 295.
6. Dose assessment personnel are directed to monitor offsite dose.
7. Operators are standing by in the MCR.
8. Two Nitrogen bottles have been obtained and staged for use.

INITIATING CUE:

You are directed by Shift Supervision to perform Section 4.6 of T-200 on UNIT 1 to support venting primary containment through the 24" Suppression Pool Purge Supply.

Information for Evaluator's Use:

UNSAT requires written comments on respective step.

* Denotes CRITICAL steps.

Number any comments in the "Comment Number" column. Then annotate that comment in the "Comments" section. The comment section should be used to document the reason that a step is marked as unsatisfactory and to document unsatisfactory performance relating to management expectations.

Some operations that are performed from outside of the control room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the initiating cue.

Operator's Name: _____
Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Venting Primary Containment Using the 24" Suppression Pool Purge Supply

JPM Number: K

Revision Number: 0

K/A Number and Importance: 223001 A2.07 4.2/4.3 (RO/SRO)

Suggested Testing Environment: Plant

Actual Testing Environment: Plant

Testing Method: Simulate

Alternate Path: No

Time Critical: No

Estimated Time to Complete: 15 min. Actual Time Used:_____minutes

References:
1. NUREG 1123, 223001, A2.07 4.2/4.3 (RO/SRO)
2. T-200, Rev. 23

EVALUATION SUMMARY:
1. Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No
2. Was the task standard met?

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ **Satisfactory** ☐ **Unsatisfactory**
Comments:_____
_____
_____
_____
_____
_____
Note: Any grade of UNSAT requires a comment.

Evaluator's Name: _____(Print)

Evaluator's Signature: _____ **Date:** _____

Description: This JPM has the operator establish Primary Containment Vent path using 24" Suppression Pool Purge Supply to release through the truck access doors to the Reactor Enclosure.

History: Not used on 2008/2010 Limerick Initial License Exams, New JPM

NOTE: Critical Element(s) indicated by * in Performance Checklist.

PERFORMANCE CHECKLIST:

JPM Start Time _____

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1. Applicant obtains procedure T-200 and determines step 4.6.3 is applicable.	Applicant obtains procedure T-200 and determines step 4.6.3 is applicable.			
Step 4.6.3 2. **INSTALL** jumper from MM-59 to MM-53, in Panel 10C601, Door #4, to open HV-57-124 (Main Control Room) (ATTACHMENT 5). **Evaluator Cue:** Another Operator has installed this jumper in the Main Control Room.	N/A			
Step 4.6.4 *3. **LIFT AND TAPE** lead GGG8-05 at Panel 10C623, to inhibit containment isolation closure signal for HV-57-147 (Auxiliary Equipment Room) (ATTACHMENT 6).	Applicant simulates **LIFT AND TAPE** of lead GGG8-05 at Panel 10C623, to inhibit containment isolation closure signal for HV-57-147 (Auxiliary Equipment Room) IAW (ATTACHMENT 6)			
Step 4.6.5 *4. **INSTALL** jumper from GGG8-07 to GGG8-08 in Panel 10C623, to bypass containment isolation signals for HV-57-147 (Auxiliary Equipment Room) (ATTACHMENT 6)	Applicant simulates **INSTALLATION** of jumper from GGG8-07 to GGG8-08 in Panel 10C623, to bypass containment isolation signals for HV-57-147 (Auxiliary Equipment Room) IAW (ATTACHMENT 6)			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.6.6 5. **INSTALL** jumper from DDD2-10 to DDD2-11 in Panel 00C624 (Main Control Room). **Evaluator Cue:** Another Operator has installed this jumper in the Main Control Room.	N/A			
Step 4.6.7 6. **INSTALL** jumper from DDD2-15 to DDD2-16 in Panel 00C624 (Main Control Room) **Evaluator Cue:** Another Operator has installed this jumper in the Main Control Room.	N/A			
Step 4.6.8 7. **DEPRESS** HS-57-045, NORTH STACK RAD ISOL, on Panel 00C624 (Main Control Room) **Evaluator Cue:** Another Operator has **DEPRESSED** HS-57-045, NORTH STACK RAD ISOL, on Panel 00C624 in the Main Control Room.	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4.6.9 *8. **PERFORM** the following to provide Reactor Enclosure venting: **CLOSE** all steam flooding dampers by momentarily placing each keylock switch in "TEST" at Panel 10C234 (402A-R15-253) (ATTACHMENT 7) **AND** Panel 10C245 (506-R11-283) (ATTACHMENT 8) to minimize steam flooding in critical areas (PA2235 key required.) **Evaluator Cue:** When step 4.6.8 is completed, and applicant is about to go to 253', inform the applicant that another operator has been dispatched to 10C234 (on 253') to close all steam flooding dampers for panel 10C234 **ONLY**. **Evaluator Cue:** Ask the applicant for the normal location of the PA2235 key and upon successful identification of the location, direct applicant to move on without the key, and assume correct key is in your hand, if necessary.	Applicant simulates **CLOSING** all steam flooding dampers by momentarily placing each keylock switch in "TEST" at Panel 10C245 (506-R11-283) (ATTACHMENT 8) to minimize steam flooding in critical areas (PA2235 key required.)			
Step 4.6.10 9. **PLACE** HS-76-193A, "Reactor Enclosure Recirc," **AND** HS-76-193B to "OFF" on Panel 10C681 (Main Control Room). **Evaluator Cue:** Another Operator has **PLACED** HS-76-193A, "Reactor Enclosure Recirc," **AND** HS-76-193B to "OFF" on Panel 10C681 in the Main Control Room.	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4. 6.11 10. **PLACE** the following hand switches to "OFF" on Panel 10C206 (608-R15-313) (ATTACHMENT 9). • HS-76-105A, "Reactor Enclosure Air Supply" • HS-76-105B, "Reactor Enclosure Air Supply" • HS-76-105C, "Reactor Enclosure Air Supply" **Evaluator Cue:** After taking each of the hand switches to "OFF", notify the applicant that lights associated with each hand switch is indicating "GREEN".	11. Applicant simulates **PLACING** the following hand switches to "OFF" on Panel 10C206 (608-R15-313) IAW (ATTACHMENT 9). • HS-76-105A, "Reactor Enclosure Air Supply" • HS-76-105B, "Reactor Enclosure Air Supply" • HS-76-105C, "Reactor Enclosure Air Supply"			
Step 4. 6.12 15. **PROVIDE LONG TERM GAS SUPPLY TO ADS VALVES** • **ENSURE** the following at Panel 10C626 (Main Control Room): o HV-59-151A, "ADS Instrument Gas PCIV" (A), open o HV-59-151B, "ADS Instrument Gas PCIV" (B), open **Evaluator Cue:** **BOTH** HV-59-151A, "ADS Instrument Gas PCIV" and HV-59-151B, "ADS Instrument Gas PCIV" indicate **OPEN** at the Panel 10C626 in the Main Control Room.	N/A			

ELEMENT	STANDARD	SAT	UNSAT	Comment Number
Step 4. 6.12 *16. **CONNECT** Nitrogen Gas Bottles at following valves **AND OPEN** as necessary to ensure long term gas supply to ADS valves: • 59-1118, "B Long Term N2 Supply To ADS Outside Connection" (336-A8-217) (ATTACHMENT 10) • 59-1119, "B Long Term N2 Supply To ADS Outside Connection" (336-A8-217) (ATTACHMENT 10) • 59-1137, "A Long Term N2 Supply To ADS Outside Connection" (313-DG-217) (ATTACHMENT 11) • 59-1138, "A Long Term N2 Supply To ADS Outside Connection" (313-DG-217) (ATTACHMENT 11) • 59-1211, "Air Supply To Long Term N2 Instrument Gas Test Valve" (313-DG-217) (ATTACHMENT 11) **Evaluator Cue:** Two Nitrogen bottles are staged for your use next to the valves (59-1118 & 59-1119). **Evaluator Note:** Have the applicant explain how to connect N2 bottles to the first 2 valves (59-1118 & 59-1119), after successful demonstration of first 2 valves, **END JPM.**	Applicant simulates **CONNECTING** Nitrogen Gas Bottles at following valves **AND OPENS** as necessary to ensure long term gas supply to ADS valves: • 59-1118, "B Long Term N2 Supply To ADS Outside Connection" (336-A8-217) (ATTACHMENT 10) • 59-1119, "B Long Term N2 Supply To ADS Outside Connection" (336-A8-217) (ATTACHMENT 10) • 59-1137, "A Long Term N2 Supply To ADS Outside Connection" (313-DG-217) (ATTACHMENT 11) • 59-1138, "A Long Term N2 Supply To ADS Outside Connection" (313-DG-217) (ATTACHMENT 11) • 59-1211, "Air Supply To Long Term N2 Instrument Gas Test Valve" (313-DG-217) (ATTACHMENT 11)			
CUE: JPM is Complete; END JPM, after first 2 valves.	N/A			

JPM Stop Time _____

HANDOUT PAGE

TASK CONDITIONS:

1. TRIP procedures direct containment venting in accordance with T-200.
2. Primary Containment pressure is rising (60 psig and rising) requiring 24" Suppression Pool Purge Supply vent path to be established.
3. Suppression Pool level is 28 feet and rising very slowly due to HPCI/RCIC operation.
4. The required steps in T-200 have been performed up to section 4.6.
5. Radiation Protection has unlocked the outside truck access door 295.
6. Dose assessment personnel are directed to monitor offsite dose.
7. Operators are standing by in the MCR.
8. Two Nitrogen bottles have been obtained and staged for use.

INITIATING CUE:

You are directed by Shift Supervision to perform Section 4.6 of T-200 on UNIT 1 to support venting primary containment through the 24" Suppression Pool Purge Supply.

HANDOUT PAGE

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5. Radiation Protection has unlocked the outside truck access door 295.
6. Dose assessment personnel are directed to monitor offsite dose.
7. Operators are standing by in the MCR.
8. Two Nitrogen bottles have been obtained and staged for use.

INITIATING CUE:

You are directed by Shift Supervision to perform Section 4.6 of T-200 on UNIT 1 to support venting primary containment through the 24" Suppression Pool Purge Supply.

Facility: Limerick Scenario No.: 1 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Unit 1 at 95% power to recover HCU maintenance rods, D11 EDG out of service for overhaul, day 2 of 30 day LCO

Turnover: Recover the HCU maintenance rods and return Unit 1 to 100% power

Event No.	Malf. No.	Event Type*	Event Description
1		R-ATC	Recover HCU maintenance rods
2	MPR011B	I-ATC, TS-SRO	1B RBM Fails Inop
3	MMC077B	C-BOP	Hotwell level controller failure
4	MED015D, MGD422B, MED012	C-BOP, C-ATC	Closure failure of 101-D12/Temporary loss of D124-G-D Load Center/Temporary loss of ability to drive control rods
5	MSL001A, MCU195A	C-ATC, TS-SRO	SLC spurious injection with RWCU isolation failure
6	MRP029C, MRP407C, MSL559	M-ALL	Electric ATWS/RRCS failure/SLC header rupture
7	MEH110, MEH108	C-ATC, C-BOP	T-221 failure, main turbine trip, bypass valve closure
8	MRSW600A/C	C-BOP	RHRSW Pump Trip in Suppression Pool Cooling

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario Summary

Event 1: The crew begins with the plant at 95% power following a load drop for recovery of HCU maintenance rods. The crew is directed as part of turnover to raise reactor power using control rods and recirc to 100%.

Event 2: During withdrawal of the second control rod, the 1B Rod Block Monitor will fail Inop, causing RBM Upscale/Inop alarms and also a rod withdrawal block. The crew will take action per alarm response to bypass the malfunctioning RBM and the SRO will reference Tech Specs.

Event 3: Once the Tech Spec call is complete and the RBM has been bypassed, the hotwell level transmitter output signal will fail to minimum, resulting in a loss of automatic hotwell level control. Priority is to either swap level transmitter input to the level controller or take manual control of hotwell level control.

Event 4: When hotwell level control has been restored and stabilized, the 201-D12 breaker will trip and the 101-D12 breaker will fail to close automatically, resulting in a loss of the D12 bus. The crew will enter E-D12, Loss of D12 Safeguard Switchgear. Priority is to re-energize the bus by closing the 101-D12 breaker or D12 EDG output breaker, restore drywell cooling and restore ability to move control rods by resetting RDCS.

Event 5: Once power to D12, drywell cooling, condenser vacuum, and RDCS have been restored, SLC pump A will receive a spurious start signal. In addition, the RWCU isolation valve will fail to close. The crew will enter OT-104 for negative reactivity addition. Priority is to secure the A SLC pump and close the RWCU isolation valve. Once those actions are complete, OT-104 directs a manual SCRAM be inserted due to the injection of SLC.

Events 6-8: When the crew attempts to perform a manual reactor SCRAM, an electrical ATWS will occur and no control rods will insert. The crew will enter T-117, Power/Level Control and begin taking ATWS mitigating actions. The remaining SLC pump will fail to start automatically, requiring crew action to start SLC. Several minutes after injection begins, the SLC header will rupture inside primary containment, resulting in a loss of SLC injection.

While reactor water level is being lowered using T-270, the main turbine will trip, leaving bypass valves and SRV for pressure control. Shortly after the turbine trip, the bypass valves will slowly fail closed, forcing more steam flow through SRVs to the Suppression Pool. When the Suppression Pool temperature reaches 110°F, the crew will take action to reduce reactor water level further. Inability to perform T-221 jumper installation will result in MSIV closure, loss of reactor feedwater, bypass valves, and the main condenser at -129" RPV water level. The crew will transition level and pressure control to HPCI/RCIC and SRVs.

Due to the heat addition to the Suppression Pool, the crew will take action per T-102 to place two loops of Suppression Pool Cooling in service. Once Suppression Pool Cooling has been established, one of the running RHRSW pumps will trip, forcing the crew to start the standby RHRSW pump to maintain Suppression Pool Cooling in two loops. Once level control has been re-established and stabilized using HPCI/RCIC, control rods will successfully be inserted by performance of T-215. Once all control rods have been verified inserted, RPV water level >-161" and being restored to +12.5" to +54", the scenario may be terminated.

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	7
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	2
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2) T-101/T-102	2
6. EOP contingencies requiring substantive actions (0–2) T-117	1
7. Critical tasks (2–3)	3

Critical Tasks

1.

★ **Inhibit ADS per T-117 LQ-3**

Safety Significance

Inhibiting ADS prevents uncontrolled injection of large amounts of relatively cold, unborated low pressure ECCS water when the reactor is not shutdown with control rods.

Indications/Cues for Event Requiring Critical Task

ATWS with reactor power level above 4% APRM power

Performance Criteria

Auto ADS inhibited by placing both Auto Inhibit switches at 10C626 back panel to INHIBIT

Performance Feedback

Successful ADS inhibiting is indicated by white indicating lights at switches illuminating

Consequences for Failure to Perform Task

LQ-3 INHIBIT AUTO ADS

DISCUSSION

LGS TRIP Step LQ-3 directs actions to inhibit the automatic initiation of the Automatic Depressurization System (ADS). In order to effect a reduction in reactor power, actions in T-117, Level/Power Control, may deliberately lower RPV level to a level below the automatic initiation setpoint of the ADS. Actuation of the ADS imposes a severe thermal transient on the RPV and complicates efforts to maintain RPV level within the ranges specified in T-117. Further, rapid and uncontrolled injection of large amounts of relatively cold, unborated water from low pressure injection systems may occur as RPV pressure drops to and below the shutoff head pressures of these pumps. Such an occurrence would quickly dilute in-core boron concentration and reduce reactor coolant temperature. ***When the reactor is not shutdown, or when the shutdown margin is small, sufficient positive reactivity might be added in this way to cause a reactor power excursion large enough to severely damage the core. Therefore, ADS initiation is purposely prevented as the first action of T-117***. When required, explicit direction to depressurize the RPV is provided in the TRIP procedures, thereby negating any requirement to maintain the automatic initiation capability of the ADS.

2.

- **Inserts control rods per T-117 RC/Q-12 and RC/Q-13**

Safety Significance

Control rod insertion initiates power reduction immediately

Indications/Cues for Event Requiring Critical Task

Exceeding an RPS scram setting with NO reactor scram signal, and RPS/ARI failure to fully insert all control rods.

Performance Criteria

Insert Control Rods by one or more of the following methods:
Drive control rods with RMCS after bypassing RWM after resetting RDCS
Direct performance of T-215 to remove SCRAM solenoid fuses
Re-start of the previously running CRD pump following LOCA signal

Performance Feedback

Successful insertion of control rods will be indicated by:
Rod position full in indication for manual insertion of control rods, and all rods indicating full in once SCRAM solenoids for control rods have been de-energized.

Consequences for Failure to Perform Task

Failure to insert control rods allows power to remain elevated with resultant power oscillations and potential core damage.

3.

★ **Lower RPV water level to reduce power per T-117 LQ-5 and LQ-11/12**

Safety Significance

Core damage due to unstable operation can be prevented or at least mitigated by promptly reducing feedwater flow so that level is lowered below the feedwater spargers, and subsequently to the top of active fuel when it has been determined that the primary containment is being threatened due to the failure-to-scram event.

Indications/Cues for Event Requiring Critical Task

ATWS with reactor power level above 4% APRM power and RPV water level above -50"

ATWS with reactor power level above 4% APRM power with:

- RPV water level above -161"
- Suppression Pool Temperature above 110°F
- SRV open or Drywell Pressure above 1.68 psig

Performance Criteria

Lower reactor water level by manually controlling injection rate from Feedwater, HPCI (through feedwater ONLY via performance of T-251) and/or RCIC to the bands prescribed by T-117 LQ-5 and LQ-12

Performance Feedback

Lowering water level to –60 to –100 (and later to -161 to -186) inches will result in power level lowering as indicated on the Average Power Range Monitors

Consequences for Failure to Perform Task

LQ-5 **IF** reactor power above 4% OR unknown

AND

RPV level above –50",

THEN lower RPV level below –50" by terminating AND preventing RPV injection per T-270 except from:

- Boron Injection Systems
- RCIC
- CRD

AND

continue at step LQ-6

DISCUSSION

LGS TRIP Step LQ-5 is a continue re-checking step, and as such, should be referred to frequently to determine if both of the conditions listed exist, and if so, to carry out the specified action. Step LQ-5 directs actions to deliberately lower RPV level below -50 inches when reactor power is above 4% or cannot be determined.

To prevent or mitigate the consequences of any large irregular neutron flux oscillations induced by neutron flux/thermal-hydraulic instabilities, RPV level is lowered below -50 inches, which corresponds to an RPV level two feet below the elevation of the feedwater sparger nozzles. ***This places the feedwater spargers in the steam space, thereby providing effective heating of the relatively cold feedwater and eliminating the potential for high core inlet subcooling. For plant conditions that are susceptible to reactor power oscillations, the initiation and growth of these oscillations is principally dependent upon the subcooling at the core inlet; the greater the subcooling, the more likely that reactor power oscillations will commence and rise in magnitude.***

If reactor power is at or below 4%, it is highly unlikely that the core bulk boiling boundary would be below that which provides suitable stability margin for operation at high powers and low flows. (A minimum boiling boundary of four feet above the bottom of active fuel has been shown to be effective as a stability control because a relatively long two-phase column is required to develop a coupled neutron flux/thermal-hydraulic instability.) Furthermore, flow/density variations would be limited with reactor power this low since the core has a relatively low average void content. Therefore, there is significant stability margin with power at or below 4%.

Two feet below the feedwater sparger nozzles has been selected as the upper bound of the RPV level control band. This level is sufficiently low that steam heating of the injected water will be at least 65% to 75% effective (i.e., the temperature of the injected water will be increased to 65% to 75% of its equilibrium value in the steam environment). This level is sufficiently high that the capability to bypass the low RPV level MSIV isolation should be able to control RPV level with feedwater pumps to preclude the isolation. However, if RPV level must be lowered to or below the low RPV level MSIV isolation setpoint, direction is given to bypass selected interlocks to prevent the unintended loss of the main condenser and preserve the operability of the Feedwater and Condensate Systems.

Lowering RPV level is accomplished by terminating and preventing all injection into the RPV, except from boron injection systems, the Reactor Core Isolation Cooling (RCIC) System, and the Control Rod Drive (CRD) System. Boron injection systems, the RCIC System, and the CRD System are relatively low flow systems. Additionally, boron injection systems and the CRD System may be needed to establish and maintain reactor shutdown conditions. When restoration of injection is subsequently required, but other outside core shroud injection systems are incapable of injection, continued RCIC System operation (along with boron injection systems and CRD) may prevent RPV level from dropping to the level that requires emergency RPV depressurization. The marginal drop in the rate of RPV level reduction resulting from continued RCIC System operation has a negligible impact on lowering core inlet subcooling.

With RPV injection terminated, RPV level and reactor power will drop at the maximum possible rate allowed by boiloff. Failure to completely stop RPV injection flow (with the above noted exceptions) would delay the reduction in core inlet subcooling, thus raising the potential for neutron flux oscillations.

To facilitate RPV level reduction in an expeditious and controlled manner, interlocks which interfere with terminating and preventing injection into the RPV may be defeated. These include injection valve and test valve control logic, pump start logic, etc. and are identified in T-270, Terminate And Prevent Injection Into The RPV.

When RPV level has been lowered below -50 inches, operators are directed to continue at Step LQ-6.

LQ-11 Terminate AND prevent RPV injection per T-270 except from:

- Boron Injection Systems
- RCIC
- CRD

REGARDLESS of any reactor power OR RPV level oscillations

DISCUSSION

LGS TRIP Step LQ-11 directs actions which attempt to lower reactor power by deliberately lowering RPV level when it has been determined that the primary containment is being threatened during a failure-to-scram event.

The combination of plant conditions which indicate a threat to the primary containment, combined with the inability to shut down the reactor through control rod insertion, dictate a requirement to promptly reduce reactor power since, as long as these conditions exist, suppression pool heatup will continue. Reactor power must be reduced so that injection of the Hot Shutdown Boron Weight (HSBW) of boron can be completed before suppression pool temperature exceeds the Heat Capacity Temperature Limit (HCTL).

Reactor power is reduced by terminating RPV injection to deliberately lower RPV level. Since RPV level is allowed to drop only to the top of active fuel (TAF, -161 inches) before RPV injection is restored, Step LQ-7 is conditioned upon RPV level being above TAF. If RPV level is initially below TAF, the objective of this step has already been accomplished. Injection will, therefore, not be terminated since RPV level might drop too far before injection is restored.

If the primary containment is being threatened during failure-to-scram conditions, operators are, or have been, directed to reject as much heat as possible from the RPV to the main condenser (T-101, RPV Control, Step RC/P-9), to place all available suppression pool cooling into operation (in T-102, Primary Containment Control, Step SP/T-4), to trip the Reactor Recirculation Pumps (T-101 Step RC/Q-10), and to concurrently inject boron and manually insert control rods (actions beginning at T-101 Step RC/Q-11). One additional action remains available to mitigate the consequences of a failure-to-scram event: deliberately lowering RPV level to effect a reduction in reactor power. Lowering RPV level reduces the natural circulation driving head and core flow, thereby reducing reactor power and the heat addition rate to the suppression pool. The reactor power reduction achieved by lowering RPV level may be sufficient to reduce reactor power below the BIIT, thus ensuring that boron injection can be completed before the HCTL is reached.

The process by which reactor power is reduced by lowering RPV level occurs as follows:

1. The reactor is in a natural circulation mode following Reactor Recirculation Pump trip (accomplished in T-101 Step RC/Q-10). The natural circulation driving head is a function of the fluid density difference between the regions inside and outside of the core shroud (void fraction directly affects the fluid density inside the shroud) and the height of the fluid columns (RPV level).
2. As RPV level is lowered, the height of the fluid columns is reduced, thereby reducing the natural circulation driving head.
3. As the natural circulation driving head is reduced, natural circulation flow through the core is reduced.
4. The reduced core flow results in a reduced rate of steam removal from the core.
5. The reduced rate of steam removal results in an increased void fraction inside the core shroud.
6. The increased void fraction adds negative reactivity to the reactor.
7. The negative reactivity drives the reactor slightly subcritical and reactor power begins to decrease.
8. The reduced reactor power results in a reduced steam generation rate.
9. The reduced steam generation rate results in a reduced void fraction.
10. When the void fraction drops to its original value (with some slight adjustment to account for reduced Doppler reactivity), the reactor returns to criticality at a lower power.

Lowering RPV level is accomplished by terminating and preventing all injection into the RPV, except from boron injection systems, the RCIC System, and the CRD System. Boron injection systems, the RCIC System, and the CRD System are relatively low flow systems. Additionally, boron injection systems and the CRD System may be needed to establish and maintain reactor shutdown conditions. When restoration of RPV injection is subsequently required, but other outside shroud injection systems are incapable of injection, continued RCIC System operation (along with boron injection systems and the CRD System) may prevent RPV level from dropping to the level that requires emergency RPV depressurization. The marginal rise in integrated power resulting from continued RCIC System operation while RPV level is deliberately lowered has a negligible impact on suppression pool temperature.

With RPV injection terminated and prevented, RPV level and reactor power will drop at the maximum possible rate allowed by boiloff. Failure to completely stop RPV injection flow (with the above noted exceptions) prolongs the elevated reactor power condition, thus depositing more energy than necessary into the suppression pool. For RPV level reductions which uncover the feedwater spargers, failure to completely stop RPV injection flow also delays reduction in core inlet subcooling, thus raising the possibility of neutron flux/thermal-hydraulic instabilities.

Even in the absence of large irregular neutron flux oscillations induced by neutron flux/thermal-hydraulic instabilities, reactor power oscillations of relatively smaller magnitude may occur when RPV level is lowered significantly below the normal operating range with the reactor still at power. Typically, the magnitude of these oscillations is below the Large Oscillation Threshold (LOT) value of 25%, which is discussed in detail in the T-101 Bases document section associated with Step RC/Q-17. These smaller oscillations have been analyzed and determined to result in thermal transients well within the design capabilities of the fuel. Oscillations are noted at this point to indicate that they are to be expected, and were considered in developing the steps which require deliberately lowering RPV level with the reactor at power.

To facilitate RPV level reduction in an expeditious and controlled manner, any interlocks which may prevent terminating and preventing injection into the RPV are allowed to be defeated, and are identified in T-270, Terminate And Prevent Injection Into The RPV. The specified interlocks include those such as injection valve and test valve control logic, pump start logic, etc. Operators are directed to continue at Step LQ-12.

The scenario may be terminated once the ATWS has been terminated by verifying all control rods fully inserted with RPV level >-161" and being restored to +12.5" to +54"with Condensate or Low Pressure ECCS and upon direction of the Chief Examiner

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Reset simulator to IC181 ■ Take out of FREEZE and ensure the following: - Reactor Power is 95% with stable reactor water level - 1A CRD pump in service
	■ Apply Information Tags on the following components: - D11 EDG - D11 EDG Output Breaker
	■ Ensure materials for applicants: - ReMa package for load drop marked up through power reduction - Turnover sheet: o D11 EDG out of service for overhaul, day 2 of 30 day LCO o 95% reactor power o Power was reduced to 95% in the previous shift to allow recovery of HCU maintenance rods o Recover HCU maintenance rods per ReMa o Return Unit 1 to 100% power IAW ReMa
	■ Ensure the following malfunctions are loaded: - MPR011B (Trigger 1) 1B RBM Fails Inop at position 12 (Manual) - MMC077B (Trigger 2) Hotwell Level Controller Failure - MED015D (Trigger 3) Trip of 201-D12 - MED012 (Active at scenario start) Closure failure of 101-D12 - MGD422B (Active at scenario start) Closure failure of D12 EDG Output Breaker - MSL001A (Trigger 4) SLC Spurious Injection - MCU195A (Active at scenario start) RWCU Isolation Failure - MRP029C (Active at scenario start) Electric ATWS - MRP407C (Active at scenario start) RRCS Failure - MEH110 (Trigger 6) Main Turbine Trip - MRSW600A/C (Trigger 7) Selected RHRSW Pump Trip ■ **Ensure** the following remote functions are loaded: - None ■ **Ensure** the following overrides are loaded: - None

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION

■ **Ensure** the following triggers are built:

- MSL559, SLC header rupture in drywell, trigger to insert 5 minutes after Mode Switch to SHUTDOWN
- MEH108 trigger to ramp close bypass valves over 10 minute period, beginning 30 seconds after turbine trip (Activation of trigger 6)

The following should be used to verify proper scenario setup:

Interventions Summary

Hide Malfunctions - 14 | Show Remotes - 0 | Show Overrides - 0 | Show Annunciators - 0

Malfunction Summary

Mall ID	Mult ID	Description	Current Value	Target Value	Rmptime	Actime	Dactime	Trig
MPR011B		RBM Channel B Failure Inoperative	False	True				1
MMC077B		Main Condenser Hotwell Level Controllers in Auto Fail Low	False	True				2
MEH110		Main Turbine-Generator Trip	False	True				6
MRSW600A		RHR Service Water Pump 0AP506 Elect Fault	FALSE	TRUE				7
MED015D		Safeguard 201-D12 Breaker Trips 152-11602	False	True				3
MSL001A		Spurious Initiation Signal for SLC Pump A	False	True				4
MCU195A		RWCU Isolation Valve HV44-1F001 Fails As-is	False	True				
MRP029C		RPS Fails to Scram Channel A	False	True				
MRP407C		BOTH RRCS Divisions ARI Fails to Initiate	False	True				
MSL559		SLC Injection Line Rupture Inside the Drywell	False	True		00:05:00		5
MEH108		Turbine Bypass Valves Fail to Selected Value (0-100%)	0.00	0.00	00:05:00	00:00:30		6
MRSW600C		RHR Service Water Pump 0CP506 Elect Fault	FALSE	TRUE				8
MDG422B		Diesel Generator D12 Output Breaker Bkr Fail to Auto Close	FALSE	TRUE				
MED012		Defeat Auto Transfer of 4KV Brkrs on D12	False	True				

Timer Pause | Delete All | Active | Pending

Event Trigger Builder / Viewer

Favorites Triggers

Trigger #	Trigger Text
1	
2	
3	
4	
5	ZRPS1SDN
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	

Operators:

Arithmetic:
- * Multipication
- / Division
- + Addition
- - Subtraction

Relational:
- > Greater than
- >= Greater Than or equal
- < Less than
- <= Less than or equal
- == Equal to
- != Not equal to

Logical:
- && And
- || Or
- ! Not

Other:
- (Open Paren
-) Close Paren

Trigger Now | Clear | Clear All | Accept | Exit

■ Reset any annunciators that should not be present

INSTRUCTIONS FOR SIMULATOR OPERATOR

EVENT 1: Control Rod Withdrawal

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Respond to request for assistance as appropriate

EVENT 2: 1B RBM Fails Inop

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Upon completion of withdrawal of the first control rod, monitor position of the second control rod, and insert MPR011B (Trigger 1) for 1B RBM Inop failure at position 12 for the second control rod
	■ As EO sent to investigate failure of 1B RBM, report: "The 'B' RBM INOP light is lit on the ODA."
	■ If contacted as RE to continue with rod withdrawal following bypass of RBM, state that all thermal limits are within limits and approve continuing with rod withdrawal.
	■ Respond to request for assistance as appropriate

EVENT 3: Hotwell Level Controller Malfunction

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When 1B RBM bypassed, TS call complete, and chief examiner ready to proceed, insert MMC077B (Trigger 2), Hotwell Level Controller Failure
	■ Respond to request for assistance as appropriate

EVENT 4: Momentary Loss of D12

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once hotwell level control has been restored with stable hotwell level, and chief examiner ready to proceed, insert MED015D (Trigger 3) for 201-D12 breaker trip
	■ If directed as EO to reset RDCS, wait three minutes, toggle remote function **RRD001** to reset, and report: "Unit 1 RDCS has been reset in the AER."
	■ Respond to request for assistance as appropriate

EVENT 5: SLC Spurious Injection with RWCU Isolation Failure

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once power restored to D12, RDCS is reset, condenser vacuum is stable, and the chief examiner is ready to proceed, insert MSL001A and MCU195A (Trigger 4) for 1A SLC pump spurious start with RWCU isolation valve failure.
	■ When dispatched as EO to open breaker for 1A SLC, wait 5 minutes, delete MSL001A malfunction, override 1A SLC pump lights off, and override 1A SLC pump control switch to OFF and then return to AUTO; report that breaker for 1A SLC pump is opened (Crew is expected to call off this action once they recognize that an ATWS is in progress) ■ If requested to re-close 1A SLC pump breaker, wait 2 minutes and delete override for pump indicating lights and control switch
	■ Respond to request for assistance as appropriate

EVENT 6-8: Electric ATWS, Loss of SLC, CRD Pump Trip, RHRSW Pump Trip

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When reactor water level **stable in band -60"→-110", reactor power ≤29%**, and chief examiner ready to proceed, insert turbine trip MEH110 and bypass valve closure ramp MEH108 (Trigger 6)
	■ Once Suppression Pool cooling has been initiated on an RHR loop, wait approximately 1 minute and insert malfunction MRSW600A(C) (Trigger 7 or 8,depending on first RHRSW pump started) to trip the first running RHRSW pump
	■ As EO sent to perform T-270, wait 7 minutes and trigger **RTR220 through RTR227** or load T-270 scenario file. When complete, report that T-270 is complete in the AER.
	■ As EO sent to perform T-251, wait two minutes, then contact PRO to verify that HPCI to Core Spray valve HV-55-1F006, Closed. Activate **RTR309** and report T-251 complete.
	■ If requested to report status of T-214, report that T-214 cannot be completed, cannot reposition either 'A' ARI keylock switch
	■ If requested to report status of T-216, report that T-216 cannot be completed due to inability to open RV-047-101
	■ As EO sent to perform T-221, wait three minutes and report that T-221 cannot be completed, you cannot get the panel doors open
	■ If requested to report status of T-209, report that lineup is in progress, estimated time to complete is 45 minutes
	■ As EO sent to perform T-215, wait until level has been stabilized between -161" →-186", and report that you are about to pull scram fuses per T-215. **DELETE MRP029C** and report that T-215 is complete
	■ Respond to request for assistance as appropriate
	■ **Once ATWS has been terminated with RPV water level >-161" with level restoration using condensate or low pressure ECCS and upon direction of the Chief Examiner, place the simulator in freeze**

Op-Test No.: _____ Scenario No.: 1 Event No.: 1 Page ___ of ___

Event Description: Control Rod Withdrawal
Priority: Withdraw control rods to raise reactor power as directed

Time	Position	Applicant's Actions or Behavior
	SRO	Directs ATC and BOP to raise reactor power via control rod withdrawal **Evaluator Note:** Scenario will proceed to next event, 1B RBM Inop failure, at approximately position 12 of the second control rod
	ATC	Applicant acquires S73.1.A, Normal Operation of RMCS, section 4.3 Establish 48 as target position for control rods **Evaluator Note:** If notch position 48 is the target position, then it is acceptable to hold CONTINUOUS WITHDRAW until position 48 is displayed
	ATC	(Step 4.3.1) Applicant reviews Attachment 1, and determines that no rods are channel distortion susceptible (Step 4.3.2) Applicant verifies drive water pressure is 255 to 265 psid, as indicated on PDI-46-1R602, "Drive Water Differential Pressure Indicator." (Step 4.3.3) Selects the control rod to be withdrawn at 10C603, "Reactor Control Console." (Step 4.3.4) Verifies correct rod position is indicated on the Four Rod Display (Step 4.3.5) Applicant verbally informs peer checker of target position (48) and obtains peer checker concurrence (Step 4.3.6) Applicant verbally informs peer checker of notch position that the WITHDRAW and CONTINOUS WITHDRAW push buttons will be released (48) and obtains peer checker concurrence (Step 4.3.7) Applicant simultaneously depresses WITHDRAW and CONTINUOUS WITHDRAW pushbuttons at 10C603

	ATC	**NOTE** **WHEN** WITHDRAW **AND** CONTINUOUS WITHDRAW pushbuttons are depressed, **THEN** the proper RDCS light sequence is: 1. INSERT light Lit **AND THEN** extinguishes after approximately 0.6 seconds. 2. WITHDRAW **AND** CONTINUOUS WITHDRAW lights Lit. (Step 4.3.8) Applicant verifies proper RDCS light sequence, and releases WITHDRAW and CONTINUOUS WITHDRAW pushbuttons when control rod reaches position 48. **Evaluator Note:** Applicant is expected to observe APRMs for proper NI response and monitor RBM indicated levels and rod position indication change to ensure proper rod motion. Applicant may receive an RBM rod block due to local power change around withdrawing control rod. If this happens, applicant will communicate to SRO, and deselect/reselect the desired control rod to re-initialize the RBM and continue with control rod withdrawal
	ATC	(Step 4.3.11) Applicant verifies SETTLE light lit and then extinguishes after approximately 6.1 seconds (Step 4.3.13) Applicant verifies that the control rod has been withdrawn to target notch position (48) at Four Rod Display (Step 4.3.14) If control rod is positioned to notch position 48, then perform an overtravel check per ST-6-107-730-1, Control Rod Coupling Check
	ATC	(ST-6-107-730-1, Step 4.3.2) When a control rod is withdrawn to FULL OUT position, the notch withdraw or continuous withdraw selected rod at panel 10C603 (Step 4.3.3) Applicant verifies the following: -ROD OVERTRAVEL annunciator remains clear at panel 108 REACTOR -Individual rod selected indicates 48 on Four Rod Display (ROD HEIGHT) at panel 10C603 -Individual rod selected RED out light is lit at the Full Core Display at panel 10C649 (Step 4.3.4) Applicant documents successful completion of coupling check for selected control rod **Evaluator Note:** The above steps will be repeated for subsequent rods until RBM Inop failure begins Event 2

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: _____ Scenario No.: 1 Event No.: 2 Page ___ of ___

Event Description: 1B RBM Fails Inop
Priority: Declare 1B RBM inoperable and bypass 1B RBM

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from ATC of RBM Upscale/Inop and Rod Withdrawal Block alarms, and that power, level, and pressure are steady
	SRO	Consults Tech Specs 3.1.4.3 and 3.3.6, notes no required actions due to power >90% and MCPR >1.40 ***(actual MCPR ~1.417)***
	SRO	Declares 1B RBM Inoperable and recognizes the failed RBM should be bypassed.
	SRO	Briefs crew on plant status and directs bypassing 1B RBM May contact RE to obtain concurrence to continue with rod withdrawal with RBM bypassed and direct ATC to continue rod withdrawal **Evaluator Note:** *Once 1B RBM has been bypassed and Tech Specs referenced (or at discretion of chief examiner, control rod withdrawn), proceed to next event, Hotwell Level Controller Failure*
	SRO	Contacts WWM to have FIN/I&C investigate failure of 1B RBM
	ATC	Reports ARC-MCR-108 D-3 RBM UPSCALE/INOP alarm, and ARC-MCR-108 F-3 ROD OUT BLOCK.
	ATC	Refers to the alarm response and verifies the indications on 10C653 and ODAs
	ATC	Based on control room indications, reports INOP trip of 1B RBM
	ATC	(ARC-MRC-108 D-3 Step 5) If the RBM is INOP, THEN perform the following: a. Determine IF the affected RBM can be bypassed (using the BYPASS joystick) per Tech Spec 3.1.4.3 AND 3.3.6 b. If RBM can be BYPASSED, then BYPASS the affected RBM AND contact I&C for troubleshooting
	ATC	Places BLOCK CH BYPASS joystick down to B position
	ATC	Verifies ARC-MCR-108 D-3 RBM UPSCALE/INOPERATIVE alarm, and ARC-MCR-108 F-3 ROD OUT BLOCK alarms clear. Report 1B RBM bypassed to SRO

Op-Test No.: BOP Scenario No.: 1 Event No.: 3 Page ___ of ___

Event Description: Hotwell Level Controller Failure

Priority: Recognize failure, swap level transmitters or take manual control of Hotwell Level

Monitors the following parameters:

a. Hotwell AND CST levels returning to pre-transient levels

b. Reject/makeup valve positions returning to pre-transient levels

c. Condensate pump discharge pressure returns to pre-transient level

d. Reactor feed pump suction pressure returns to pre-transient level

Time	Position	Applicant's Actions or Behavior
	SRO	Verifies power, pressure, level steady with ATC **Evaluator Note:** *Normal Hotwell Level – 47" and Normal CST Level – 52"* Directs BOP to verify proper operation of hotwell level control and perform actions from ARC-MCR-104 D2 Directs performance of actions in ARC-MCR-104 D2, "HP COND HOTWELL HI/LO LEVEL" Contacts Work Week Manger/FIN to troubleshoot failed hotwell level instrument **Evaluator Note:** *Once hotwell level control has been swapped to the alternate transmitter/manual control taken of hotwell level* ***AND*** *hotwell level steady, proceed to next event, Temporary Loss of D12 Bus*
	ATC	Responds to alarm 107 D-5, FWLCS Trouble, and reports to SRO Applicant may reference S06.H.1, "Response to Alarms and Events at FWLCS Station" Applicant may investigate cause of alarm at Feedwater Level Control System station, will discover alarm: "LIC05-101 HP Cond mkup & rjct sig.err" and report this to BOP/SRO
	BOP	(All actions from ARC-MCR-104 D2) 1. Verify proper operation of makeup/reject valves (*Observes rising hotwell level and lowering CST level)* 2. If valves are not responding to level, switch to alternate level transmitter as follows: a. Place level controllers LIC-05-101 AND LIC-05-102 in MANUAL mode at 10C652 b. Select alternate level transmitter (LT-05-101A or LT-05-101B) using HS-05-101, "LEVEL CONTROL SEL," at 10C652 c. Adjust setpoints of LIC-05-101 AND LIC-05-102 to match current hotwell level value d. Place LIC-05-101 AND LIC-05-102 in AUTO mode, AND slowly adjust setpoint to desired hotwell level value

Op-Test No.: _____ Scenario No.: 1 Event No.: 4 Page ___ of ___

Event Description: Inadvertent trip of 201-D12, failure of 101-D12 to automatically close

Priority: Restore power to D12 bus, restore drywell/recirc cooling, restore condenser vacuum, reset RDCS to restore ability to move control rods

●Contains action items to complete critical task 2, Insert control rods per T-117 RC/Q-12 and RC/Q-13

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report of steady power/pressure/level from ATC Receives report of loss of D12 bus, failure of 101-D12 breaker to auto-close from BOP Enters transient alarm response Directs BOP to restore power to D12 bus
	●SRO	References E-D12, Loss of D12 Safeguard Switchgear Briefs crew on E-D12 and actions required, and once power restored, directs performance of restoration actions of E-D12 (Step 4.1.1) Directs BOP to restore Drywell Cooling (Step 4.1.2) Directs BOP to ensure selector switches for drywell equip drain sump and recirc pump motor air coolers selected to the appropriate loop of drywell chill water (Step 4.1.3) Directs BOP to place CV-69-156, Drain Select to "MN COND" (Step 4.1.6) Directs ATC to dispatch EO to reset RHRSW rad monitors **●(Step 4.1.7) Directs ATC to dispatch EO to reset RDCS** (Step 4.1.8) Directs ATC to dispatch EO to reset all Reactor Building ARMs Announces entry into OT-116, Loss of Condenser Vacuum due to SJAE valve closure

		(OT-116 Step 2.1) Directs ATC to coordinate with BOP to reduce reactor power IAW RMSI until condenser vacuum stops dropping (Step 3.4) Directs BOP to ensure SJAE air suction line vents to DRW are closed (Step 3.5) Directs BOP to check for malfunctions or changes in any of the condenser vacuum related systems (*air ejector performance is the cause in this case due to isolation on low flow caused by CV-69-156 swap to Clean Radwaste due to loss of bus D12)* (Step 3.7) Receives report of closed SJAE first stage air valves, directs BOP to REOPEN SJAE first stage air valves
		Requests WWM/FIN/Electrical Maintenance support to determine cause of trip of 201-D12 References Tech Specs (Multiple Tech Specs affected; 3.6.3, 3.5.1, 3.4.3.1, 3.8.1, 3.7.1.1, 3.7.1.2, 3.6.1.4, 3.6.5.3…..TRM 3.4.4) **Evaluator Note:** *Once action has been taken to restore power to D12 bus, reset RDCS, restore drywell cooling and condenser vacuum, proceed to next event, SLC spurious injection with RWCU isolation failure*
	ATC	Acknowledges multiple alarms, and prioritizes response to multiple alarms: 108 E-4 RDCS Inoperative 111 A-5/112 A-5 Recirc Pump Motor Winding Cooling Water Lo Flow
	●ATC	**(ARC-MCR-108 E-4 Step 1) Refer to S73.0.F, Operation of the Rod Drive Control System** **(Step 2) Contacts SRO/Obtains permission to reset RDCS** **(*Once power restored to D12 bus)* Dispatches EO to perform S73.0.F**
	●ATC	**(S73.0.F, Step 4.3, RDCS Reset) Applicant marks step 4.3.2 and 4.3.10 N/A due to immediate need to reset RDCS** **(Step 4.3.3) Communicates to EO that the RDCS inoperative condition has been logged** **(Step 4.3.4) Communicates to EO that SSV permission has been obtained** **(Step 4.3.5) EO in field depresses RESET for at least two seconds at 10C616** **(Step 4.3.9) Applicant resets/verifies reset of RDCS INOPERATIVE at 108 REACTOR (E-4)**

	ATC	Coordinates with BOP and reduces recirc pump speed by depressing LOWER 30/10/5 pushbuttons to reduce reactor power
	BOP	Reports loss of D12 Bus and failure of 101-D12 breaker to auto close **Evaluator Note:** To restore power to D12 bus, applicant will either manually close the 101-D12 breaker, or close the D12 EDG output breaker. *Applicant will perform one of the below two actions to restore power to the D12 bus.* **1. Closing 101-D12 breaker** Applicant inserts key and places synchroscope switch (SYNC) for bus breaker 101-D12 to 'ON' and closes Bus Breaker 101-D12. Applicant verifies power restored to D12 bus **2. Closing D12 EDG output breaker** Applicant inserts key and places synchroscope switch (SYNC) for D12 Diesel Generator breaker to 'ON' and closes D12 EDG output breaker Applicant verifies power restored to D12 bus Applicant performs crew update to announce restoration of D12 bus
	BOP	(E-D12, Step 2.2) Applicant verifies 1A TECW Pump is running at 10C655 (Step 2.3) Start D ESW Pump per S11.1.A **OR** Secure D12 D/G per S92.2.N **Evaluator Note:** *Step 2.3 directs either: starting D ESW Pump or securing D12 D/G. Neither of these actions are likely to be performed, as the bus should have just been restored by the BOP. This step assumes loss of the D12 bus and thus directs placing another source of cooling water in service for the D/G, or securing the D/G. Once power to the bus is restored, B ESW Pump should automatically start, rendering the actions for step 2.3 moot.*
	BOP	(E-D12 Step 2.7) Applicant monitors Hotwell Level using PMS points E1666 or E1667 and manually control reject valves as necessary

	BOP	(Step 2.4/4.1.10) Applicant may reference S43.0.D for problems with drywell chill water due to PCIV closure. Applicant will perform Step 4.1.10 to restore drywell chill water by opening the following: • Loop B Drywell Clg Water Supply PCIV HV-87-122 • Loop B Drywell Clg Water Supply PCIV HV-87-123 • Loop A Drywell Clg Water Supply PCIV HV-87-128 • Loop A Drywell Clg Water Supply PCIV HV-87-129 And monitor Recirc Pump motor winding and chill water return temperatures on XI-036-101/102 at Panel 10C614
	BOP	(E-D12 Step 3.6) Applicant verifies 1AP211 or 1CP211, "Fuel Pool Cooling Water Pump" running at 10C221
	BOP	(E-D12 Step 4.1.3, or in response to ARC-MCR-127 C-2, "1 Unit Recombiner Train Aftercondenser Hi/Lo level") Applicant places CV-69-156, Drain Select, to "MN COND"
	BOP	(E-D12 Step 4.1.6, 4.1.8) Dispatches EO to Aux Equipment Room to reset RHRSW Rad Monitors and Reactor Building ARMs
	BOP	Monitors condenser vacuum (OT-116 Step 3.4) Verifies 07-1109/07-1110 SJAE air suction line vent to DRW are closed (Step 3.5) Checks for malfunctions in condenser vacuum related systems (*air ejector performance is the cause in this case due to isolation on low flow caused by CV-69-156 swap to Clean Radwaste),* reports closure of SJAE first stage air valves (Step 3.7) Re-opens SJAE first stage air valves

Op-Test No.: _____ Scenario No.: 1 Event No.: 5 Page ___ of ___

Event Description: SLC Spurious Injection with RWCU Isolation Failure
Priority: Enter OT-104, secure SLC pump, and perform reactor SCRAM

Time	Position	Applicant's Actions or Behavior
	SRO	Announces entry into OT-104, Unexpected/Unexplained Reactivity Change (Step 3.4) Applicant verifies plant is operating in an authorized region of the Power/Flow Map Directs ATC to secure 1A SLC pump Contacts WWM/FIN May consult TS 3.1.5 (*due to fast moving event, applicant may not reference Tech Specs and should be asked as follow up*) Action a: With only one pump and corresponding explosive valve OPERABLE in OPERATIONAL CONDITION 1 or 2, restore one inoperable pump and corresponding explosive valve to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours (Step 3.8) Once SLC pump secured (or determined that pump will continue to inject unless breaker opened), directs ATC to perform reactor SCRAM **Evaluator Note:** *Once the mode switch is placed in SHUTDOWN, scenario will progress to next event, no cue is necessary*
	ATC	Responds to multiple alarms: 108 I-4, "Standby Liquid Squib Valve Loss of Continuity," and 113 B-5, "Core Spray Line Internal Break" Reports to SRO that 'A' SLC pump has started and is injecting; also reports that 'A' SLC pump stops when control switch taken to STOP but will restart if switch is released Arms and depresses manual SCRAM pushbuttons

	BOP	Reports that HV-44-1F001 (RWCU I/B isolation valve) failed to close when 1A SLC pump started Manually takes control switch for HV-44-1F001 to CLOSE Directs EO to open breaker 34 for 'A' SLC Pump at D114-R-C

Op-Test No.: _____ Scenario No.: 1 Event No.: 6, 7, 8 Page ___ of ___

Event Description: Electric ATWS, Main Turbine Trip, Bypass Valve Closure

★Contains action items to complete critical task 1, Inhibit ADS per T-117 LQ-3
●Contains action items to complete critical task 2, Insert control rods per T-117 RC/Q-12 and RC/Q-13
■Contains action items to complete critical task 3, Lower RPV water level to reduce power per T-117 I 5 and LQ-11/12

Time	Position	Applicant's Actions or Behavior
	SRO	Enters T-101, RPV CONTROL due to SCRAM condition with power above 4%, (Step RC-4 Directs ATC to place the Mode Switch in SHUTDOWN
	SRO	(T-101 RC-6) Directs ATC to insert SRM/IRM
	SRO	(T-101 RC/L-2) Announces exit of RC/L of T-101, RPV Control and entry into T-117, Level/Power Control
	★SRO	**(T-117 LQ-3) Directs BOP to Inhibit Auto ADS**
	SRO	(T-101 RC/Q-6) Directs ATC to manually initiate RRCS and ensure ARI initiation, may dire T-214, Manual Initiation of ARI, when ARI fails from MCR
	SRO	(T-117 LQ-4) Directs BOP to perform T-221, MSIV Isolation Bypass
	SRO	(T-101 RC/Q-8) Directs ATC to ensure Recirc runback to minimum
	■SRO	**(T-117 LQ-5) Directs BOP to terminate/prevent, perform T-270, Terminate and Prever Injection Into the RPV, except from Boron Injection System, RCIC & CRD, to lower le to -60"→-100"** **<u>Evaluator Note</u>:** *Once reactor water level is* ***steady in band -60" → -100" and power*** *≤2 direct booth operator to insert MEH110 to trip the main turbine, forcing pressure control to bypass valves and SRVs*
	SRO	(T-101 RC/Q-10) Directs ATC to trip both Recirc pumps, at least 10 seconds apart
	●SRO	**(T-101 RC/Q-12) Directs ATC to insert rods manually with RWM bypassed**
	●SRO	**(T-101 RC/Q-13) Directs ATC or BOP to perform** T-213, **T-215**, T-216 T-213=Individual control rod scram solenoid deenergization (*fails if attempted)* T-214=Manual Initiation of ARI (*fails if attempted*) **T-215=Deenergization of Scram Solenoids (*success path*)** T-216=Manual Isolation and Vent of Scram Air Header (*fails if attempted)* (T-101 RC/Q-16) Directs ATC to inject SLC

	SRO	When Main Turbine trips: (T-101 RC/P-11) Directs BOP to stabilize RPV pressure below 1096 psig using bypass valves and SRV **Evaluator Note:** *Approximately 30 seconds after the turbine trips, the bypass valves will begin to fail closed, resulting in more SRVs opening, and approaching 110 °F in the Suppression Pool, which will require the crew to perform a second lowering of RPV level reduce power*
	SRO	When Suppression Pool temperature reaches 95°F: Announces entry into T-102, Primary Containment Control, and (SP/T-5) directs BOP to place two loops Suppression Pool Cooling in service
	SRO	When informed SLC injection is no longer occurring: (T-101 RC/Q-20) Directs ATC to perform T-209 to inject SLC with RCIC
	■SRO	**When Suppression Pool temperature reaches 110°F:** **Directs BOP to perform T-270 Terminate and Prevent RPV injeciton except from Boron Injection System, RCIC & CRD, and maintain RPV water level -161"→ -186"** **Directs BOP to perform T-251, Establish HPCI Injection Flow Path Via Feedwater Only, and transition level control to HPCI/RCIC** **Evaluator Note:** *Actual level band will be determined by criterion in step LQ-12. Worst case level control band is -161"→-186"*
	●SRO	Announces SE-10, LOCA, entry at -129" RPV water level **●Directs ATC to re-start running CRD pump due to LOCA load shed trip** Directs BOP to re-start running RECW pump due to LOCA load shed trip
	SRO	Monitors curve SP/T-1. If Suppression Pool temperature approaches HCTL curve due to isolated ATWS: Directs BOP to reduce pressure using SRV to the next lower pressure HCTL band (701-' psig, 501-700 psig, etc.)
	SRO	Once ATWS terminated by verifying all control rods fully inserted, exits T-117 and re-ent T-101 at RC/L-1 (T-101 RC/L-4) Directs ATC/BOP to restore and maintain RPV water level between +12. and +54" using HPCI/RCIC/Condensate/Low Pressure ECCS (*May direct use of HPCI/RCIC initially to ensure RPV level >-161" and then transition lev control to Condensate/Low Pressure ECCS)* **Evaluator Note:** The scenario may be terminated once the ATWS has been terminated verifying all control rods fully inserted with RPV level >-161" and being restored to +12.5' +54"with Condensate or Low Pressure ECCS
	ATC	Reports failure to SCRAM, places Mode Switch in SHUTDOWN

	ATC	Inserts SRM/IRM: • Depresses 'Power On' pushbutton • Depresses 'Select' Pushbuttons for all SRM and IRM • Depresses 'Drive In' Pushbutton • Monitors SRM/IRM indication for verification of instruments driving in
	ATC	Arms and depresses 1A/1B and 2A/2B RRCS Manual Initiation Pushbuttons Places control switch for B SLC Pump to RUN and either: • Directs EO in field to re-close breaker for A SLC pump **OR** • Obtains key and places control switch for C SLC Pump to RUN Reports ARI failure to SRO
	ATC	Applicant depresses 28% Low Limit A/B Recirc Runback pushbutton to run Recirc Pump minimum
	ATC	Applicant depresses Reactor Recirc 'A Normal Stop' and 'B Normal Stop' at least 10 seconds apart
	●ATC	**Applicant takes Rod Worth Minimizer keylock switch to BYPASS and verifies RWM mode indicates BYPASS** **Applicant then references the Reactor Maneuvering Shutdown Instructions. ATC selects and inserts control rods according to RMSI sequence:** • **Selects control rod by depressing desired control rod pushbutton on rod select matrix** • **Verifies rod selected is the desired control rod** • **Depresses Continuous Insert pushbutton until control rod position indicate 00** • **Selects next control rod in sequence** • **Once RMSI control rods inserted, ATC will continue inserting rods as possi concentrating more on inner control rods and alternating quadrants**
	■ATC	**Lower level and control - 60 to -100 inches as directed using feedwater**
	●ATC	**Applicant notes lack of control rod motion and annunciators 108 G-1 '1A CRD Wat Pump Trip' due to LOCA load shed trip** **(SE-10 Step 4.6) Obtains SSV approval to re-start 1A CRD Pump** **Places control switch for 1A CRD pump to start** **Verifies pump start** **(Step 4.7) Dispatches EO to reset RDCS**
	ATC	Reports closure of all bypass valves to SRO

	ATC	Dispatches EO for performance of T-209, Injection from SBLC Storage Tank Using RCIC
	■ATC	**Initially re-performs T-270 to reduce RPV water level to -161" using feedwater by raising and lowering RFPT speed to obtain required feedwater flow rate and RPV water level (*transition to BOP HPCI/RCIC will be forced by closure of MSIV at -129' RPV water level)***
	●ATC	**Reports all control rods fully inserted to SRO**
	ATC	*As directed by SRO, ATC will take over level control from BOP using condensate.* Adjusts LIC-06-138, "A Feedwtr Start-Up Lvl Control" (LV, STARTUP BYPASS), in "Man (MAN) at panel 10C603 as necessary to begin restoring RPV water level to +12.5" to +5
	★BOP	**Inhibits Auto ADS by placing both Auto Inhibit switches at 10C626 back panel to INHIBIT**
	BOP	Directs EO performance of T-214, Manual Initiation of ARI
	BOP	Directs EO performance of T-221, MSIV Isolation Bypass, Steps 4.2.1 and 4.2.3
	BOP	Reports to SRO that A SBLC injection failed, proceeding to inject with B SBLC
	●BOP	**Dispatches EO for T-215**, De-Energization of Scram Solenoids, and T-216, Manual Isolat and Vent of Scram Air Header
	■BOP	**Dispatches EO for T-251, Establish HPCI Injection Flow Path Via Feedwater Only, a reports to EO that HV-55-1F006 is closed**
	■BOP	**<u>Obtains T-270, Termination and Prevention of Injection Into the RPV</u>** **Directs EO performance of Section 4.7** **<u>Terminates/Prevents HPCI injection by</u>:** **(Step 4.2.1) Obtaining PA-2235 key** **(Step 4.2.3.1) Simultaneously DEPRESS and HOLD HS-056-161, "Pushbutton for H Turbine Trip (E41A-519)" (TURBINE TRIP) AND CLOSE HV-55-1F003, "HPCI Main Steam Supply Outbrd PCIV" (OUTBOARD)** **(Step 4.2.3.2) Verify HV-55-1F003, "HPCI Main Steam Supply Outbrd PCIV" (OUTBOARD), closed** **(Step 4.2.3.3) Release HS-056-161, "Pushbutton For HPCI Turbine Trip (E41A-S19)' (TURBINE TRIP)**

	■BOP	(Step 4.4.2) IF required, THEN ENSURE the following valves closed: • HV-52-1F005 "Core Spray Loop A Shutoff PCIV" (OUTBOARD) • HV-52-1F037 "Core Spray B Loop Inboard Disch Vlv" (INBOARD DISCHARGE)
	■BOP	(Step 4.5.2) IF required, THEN ENSURE the following valves closed: • HV-51-1F017A, "1A RHR LPCI Inj PCIV" (OUTBOARD A) • HV-51-1F017B, "1B RHR LPCI Inj PCIV" (OUTBOARD B) • HV-51-1F017C, "1C RHR LPCI Inj PCIV" (OUTBOARD C) • HV-51-1F017D, "1D RHR LPCI Inj PCIV" (OUTBOARD D)

	■BOP	**Terminate and prevent per T-270, except Boron, RCIC and CRD (LQ-5).** **4.6 TERMINATION/PREVENTION OF CONDENSATE/FEEDWATER INJECTION (MAIN CONTROL ROOM)** **4.6.1 ENSURE HV-06-138A, "1A RFP BPV" (BYPASS), closed at panel 10C651.** **4.6.2 ENSURE LIC-06-138, "A Feedwtr Start-Up Lvl Control" (LV, STARTUP BYPASS), in "Manual" (MAN) AND output demand at 0% at panel 10C603.** **4.6.3 ENSURE LIC-06-120, "Reactor Feedpumps Bypass Cont Vlv" (PUMP BYPAS in "Manual" (MAN) AND output demand at 0% at panel 10C603.** **4.6.4 ENSURE FIC-M1-1R601A,B,C, "A,B,C RFPT Speed Controller," in "Manual" (MAN) for all three RFPTs at panel 10C603.** **4.6.5 DEPRESS EMERGENCY STOP pushbutton for all three RFPTs at panel 10C603.** **4.6.6 WHEN EMERGENCY STOP light goes out, THEN DEPRESS AUTO START pushbutton for all three RFPTs at panel 10C603.** **NOTE** **1 IF performing T-270 for emergency RPV depressurization, THEN steps 4.6.7 through 4.6.9 should be performed concurrently. Otherwise, these steps may be performed in any order as desired.** **2 Steps 4.6.7 through 4.6.9 are performed from panel 10C651 in Main Control Room.** **4.6.7 CLOSE HV-06-108A, "1A RFP Discharge" (FEED DISCH A)** **4.6.8 CLOSE HV-06-108B, "1B RFP Discharge" (FEED DISCH B)** **4.6.9 CLOSE HV-06-108C, "1C RFP Discharge" (FEED DISCH C)**
	■BOP	**Lower level and control - 60 to -100 inches as directed using feedwater**
	BOP	Operates EHC/SRV control switches as necessary to stabilize Rx Pressure 990-1096#

	BOP	**<u>Places Suppression Pool Cooling in service</u>:** (S51.8.A Appendix 1 Step 1.1) Refers to S12.1.A Appendix 1 hard card to start RHRSW (Step 1.2) Opens HV-51-1F014A(B), HEAT EXCHANGER OUTLET Throttles open HV-51-1F068A(B) for 18 to 20 seconds (Step 1.3) Verifies PI-51-105A(B)-1, HX DISCH, indicates system static pressure greater than or equal to 15 psig (Step 1.4) Applicant may place HSS-12-002A(B), PUMP TRIP BYPASS to "BYPASS" to bypass HI RAD and/or HI Pump Discharge pressure trips (Step 1.5) IF 'A' loop pump to be placed in service, ensures either 0A-V543 or 0C-543, Spray Pond Pump Room Fan in RUN at 00C681 (Step 1.6) IF 'B' loop pump to be placed in service, ensures either 0B-V543 or 0D-V543, Spray Pond Pump Room Fan in RUN at 00C681 (Step 1.7) Starts 0A(B, C, D)P506, RHRSW Pump (Step 1.8) Throttles HV-51-1F068A(B) to max obtainable position without exceeding 11,(gpm on FI-51-1R602A(B) while maintaining pump discharge pressure (PI-12-001A-1(B)) between 75-85 psig (*Steps repeated for subsequent RHRSW pump)* **<u>Evaluator Note</u>:** *Approximately one minute after Suppression Pool Cooling is in service, first RHRSW pump placed into service will trip on overcurrent. The BOP will report the pump trip to the SRO and proceed to start the alternate RHRSW pump in that loop* (S51.8.A Appendix 1 Step 1.2) Closes HV-51-1F017A(B), OUTBOARD to satisfy valve interlocks with LOCA signal present (Step 1.3) N/A (Step 1.4) Starts 1A(B)P202, RHR Pump (Step 1.5) Opens HV-51-1F024A(B), "RHR Pump Full Flow Test Return" and adjusts val' position to maintain flow indicated on FI-51-1R603A(B), "RHR Loop Flow," between 8000-8500 gpm (*Steps repeated for subsequent loop)*
	BOP	Reports trip of main turbine to SRO
	■**BOP**	**Re-performs T-270 to reduce RPV water level to -161" using HPCI/RCIC by raising lowering flow controller outputs to obtain required flow rate and RPV water level**

	●BOP	Reports closure of all MSIV at -129" RPV water level (SE-10 Step 3.1) Re-closes: -D114 Safeguard L.C. D114-G-D MCC Bkr on 1AC661 -D124 Safeguard L.C. D124-G-D MCC Bkr on 1BC661 (Step 3.2) Places to RESET: -Div. III Non SFGD Instr. Panel (INST AC 201 CONTROL PNL on 1CC661 -Div IV Non SFGD Instr. Panel (INST AC 202 CONTROL PNL on 1DC661 (Step 4.6) Obtains SRO approval and re-starts running RECW pump ● **(Step 4.12) Dispatches EO to perform SE-10 floor actions, prioritizing resetting RDCS** and RHRSW rad monitors
	■BOP	Transitions level control from feedwater to HPCI/RCIC Obtains S55.1.E Appendix 1 to recover HPCI, and adjusts RCIC flow controller as necessary to obtain and maintain RPV water level in the assigned band **HPCI** (S55.1.E Appendix 1) 1.0 N/A 1.0 N/A 2.0 **PLACE** FIC-55-*R600, "HPCI Flow Controller" (PUMP DISCHARGE, FL), in "MANUAL" **AND ADJUST** to obtain a 0% demand signal. 3.0 N/A 4.0 N/A 5.0 N/A 6.0 **OPEN** HV-55-*F100, "HPCI Steam Line Warmup Bypass" (WARMUP BYPASS), **AND MONITOR** pressure on PI-55-*R602, "Turbine Inlet Steam Pressure" (PX). 7.0 **ENSURE** red light indication is lit indicating HV-55-*F100 is open. (**CM-1 T04118** 8.0 **WHEN** pressure in steam line, as indicated by PI-55-*R602, is stable, **THEN OPE** HV-55-*F003, "HPCI Steam Line Outboard Isolation" (OUTBOARD). 9.0 **CLOSE** HV-55-*F100, "HPCI Steam Line Warmup Bypass" (WARMUP BYPASS 10.0 **ADJUST** FIC-55-*R600, "HPCI Flow Controller" (PUMP DISCHARGE, FL), to slowly throttle open FV-56-*11, "HPCI Turbine Control Valve," to obtain a desired flowrate 11.0 **WHEN** a desired flowrate is attained, **THEN ENSURE** FIC-55-*R600, "HPCI Flow Controller" (PUMP DISCHARGE, FL) is matched to actual flow, **AND PLACE** FIC 55-*R600 in "AUTO." **Evaluator Note:** Applicant will adjust HPCI/RCIC flow as necessary to maintain RPV wate level in the assigned level band

	■BOP	Restores RPV level to between +12.5" and +54" using HPCI **Evaluator Note:** *Level control will be transitioned to condensate using the 'A' RFP bypass startup level controller to minimize heat addition to Suppression Pool*
		Evaluator Note: *Scenario may be terminated once the ATWS has been terminated with a control rods verified fully inserted, RPV water level >-161" and being restored to +12.5" t +54" using condensate or low pressure ECCS*

POST SCENARIO: Have the applicant in the CRS position identify the highest EAL classification for the combination of events experienced during the scenario.

Applicable classification: **MS2** based upon Table LGS 3-1 of EP-AA-1008

MS2: Automatic Scram fails to shutdown the reactor and manual actions taken from the reactor control console are not successful in shutting down the reactor

1. Automatic scram was **not** successful as indicated by Reactor Power >4%.

AND

2. Manual scram/ARI actions were **not** successful from the Reactor Console as indicated by Reactor Power >4%

CREW PREBRIEF INSTRUCTIONS

Unit 1 is in OPCON 1 at 95% power

Specific Plant Conditions are as follows:

- Rods 02-23 and 54-23 are fully inserted for HCU maintenance
- HCU maintenance is complete the rods are ready to be fully withdrawn
- Power has been lowered to 95% per ReMA step 1 to recover the rods

Inoperable/Out of Service Equipment and Estimated Time of Return (ETR):

- D11 D/G is OOS for overhaul, day 2 of 30 day LCO

Planned Evolutions;

- The crew is directed to continue with ReMA LG1C15-25.0 at step 2, recovering rods to original withdrawn position and raise power to 100% with flow

Documents provided:

- ReMA LG1C15-25.0

Facility: Limerick Scenario No.: 2 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 100% power following a rod pattern adjustment, MOL, D11 Diesel out of service to repair a Jacket Water System leak (48 hours into a 30 day LCO - 3.8.1, AC Sources Operating); repairs expected to be completed within the next 24 hours

Turnover: Maintain 100% power

Event No.	Malf. No.	Event Type*	Event Description
1	MFW005B	I-ATC TS-SRO	LEFM Spool 'B' Enters Maintenance Mode
2	MHP450	C-BOP	HPCI Spurious Start
3	MFH564B	R-ATC	FWH 12B Level Sensing Line Fails High (Reduce Power ≤ 85%)
4	MRR201A MRR209A1 MRR209A2	C-ATC TS-SRO	'1A' Recirc ASD Loss of Cooling with a Failure of the '1A' ASD 13.2 KV Breaker to Trip / Results in Single Loop Operation in Restricted Region of Power/Flow Map
5	MED282B	C-BOP TS-SRO	Loss of 125/250 VDC Safeguard Bus 1BD105
6	MED261	M-All	Grid Instability Resulting in Loss of Offsite Power
7	MDG420C	C-BOP	D13 Diesel Auto Start Failure (Recoverable)
8	MRR440A MDG418D MRC466	M-All	Small Break LOCA (0.5% to 1% ramp over 5 minutes) with D14 Diesel Trip on Bus Lockout / RCIC Trip on Overspeed (Recoverable after RPV Level reaches -161")

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario Summary

Event 1: The scenario begins with Unit 1 at 100% power following a rod pattern adjustment. Diesel D11 is tagged to repair a leak in the Jacket Water Cooling System. After turnover, the ATC will respond to an LEFM Trouble alarm and discover that LEFM Spool 'B' has entered the Maintenance Mode. The crew will then take action to swap feedwater flow indication from LEFM to Venturi. SRO will enter TRM 3.3.7.13.

Event 2: Once feedwater flow indication has been swapped to Venturi and the TRM call is complete, the HPCI turbine will receive a spurious start signal. The crew will enter OT-104 for positive reactivity addition due to CST water injection. Actions will be taken per OT-104 to reduce reactor power to pre-transient level and isolate HPCI due to the sealed-in initiation signal. Tech Spec 3.5.1 for HPCI Inoperability will not be evaluated as part the scenario.

Event 3: Once HPCI has been isolated and reactor power restored to pre-transient level, Feedwater Heater 12B Level Sensing Line fails such that all level instruments for the 12B FWH provide a false high level signal resulting in isolation of the 'B' Low Pressure Heater String (FWHs 11B through 15B). Condensate isolation valves HV-06-101B and HV-06-102B will auto close, as appropriate, after a 15 second time delay. The crew responds to the positive reactivity insertion caused by the FW inlet temperature reduction, by reducing Rx power to ≤ 85% per OT-104, "Unexpected/Unexplained Positive or Negative Reactvity Insertion," and in accordance with GP-5 Appendix 2, "Planned Rx Maneuvering Without Shutdown," and the Reactor Maneuvering Shutdown Instructions (RMSI).

Event 4: Once the power reduction has been completed, the crew is alerted to a problem with the '1A' Recirc ASD Cooling Water System via ASD overhead annunciators and HMI display alarms at panel 10C626. The crew responds by manually tripping the '1A' ASD 13.2 KV breaker in accordance with the direction provided in S43.1.F U/1, "Responding To Alarms At ASD HMI," and ARC-MCR-111 (B1), after being notified by the field operator that both cooling water pumps have lost power. The crew will implement OT-112, "Recirculation Pump Trip," and OT-104, "Unexpected/Unexplained Positive or Negative Reactivity Insertion," concurrently, review GP-5 Appendix 2, "Planned Rx Maneuvering Without Shutdown," to ensure all required actions are performed for the power reduction, and determine position on the correct Power/Flow Map (OPRM Operable – Any Feedwater Heater Out Of Service). The crew determines that they are operating in the Restricted Region of the Map and must therefore immediately exit the region by inserting control rods using RMSI guidance. The SRO will enter Tech Spec 3.4.1.1 for SLO (i.e., reduction of APRM Simulated Thermal Power Upscale and Rod Block Trip Setpoints and Allowable Values) and prioritize performance of required STs (i.e., Thermal Limits Determination, APRM recalibrations, Jet Pump Operability Verifications, Recirc Pump Shiftly Checks).

Event 5: Once control rod insertion has commenced to exit the Restricted Region of the Power/Flow Map, and Tech Specs for SLO have been addressed, a fault inside the 125/250 VDC Fuse Box for 1BD105 causes the supply fuses for both the batteries and the battery chargers to blow, resulting in a complete loss of power to the bus. The crew will enter E-1FB, "Loss of Division II Safeguard 125/250V DC Bus 1FB," perform MCR panel walkdowns, identify affected systems/components, and manually initiate MCR Chlorine Isolation. The loss of Division II 125/250V DC power renders HPCI completely unavailable (HPCI status after spurious start in Event 2 was Inoperable but available). In addition, the following component breakers will not close or trip due to loss of DC control power:

1B RHR Pump
1B Core Spray Pump
1B TEECE Fan
Div 2 Safeguard AC Breakers
ESW Pump B
RHR SW Pump B
Diesel Generator D12

The SRO will enter multiple Tech Specs, including ECCS-Operating (3.5.1 - multiple ECCS systems inoperable), AC Sources-Operating (3.8.1 – D12 D/G inoperablility due to loss of 1BD105 results in two diesels out of service (D11 and D12)), and Onsite Power Distribution-Operating (3.8.3).

Events 6-8: Once MCR Chlorine Isolation has been manually initiated, a grid instability results in a loss of all power to the 10 Station Aux Transformer, 20 Regulating Transformer, and 11 Unit Aux Transformer. This will immediately result in a Unit 1 Generator Lockout, Main Turbine Trip, and Reactor Scram. A Unit 2 Generator Lockout will also occur. SRO enters T-101, "RPV Control," on RPV Low Level and RPV High Pressure, prioritizing Level control with RCIC (HPCI unavailable due to loss of 1BD105) and Pressure control with SRVs. SRO also enters Event Procedure E-10/20, "Loss of Offsite Power." Crew recognizes inability to cool the Suppression Pool with the D11 Diesel out of service for corrective maintenance (initial condition), and unavailability of the D12 Diesel due to loss of 1BD105. Crew monitors Suppression Pool Temperature and SRO enters T-102, "Primary Containment Control," when temperature reaches 95 °F. D13 Diesel fails to auto start but is recoverable, and can be started (Critical Task) as directed by E-10/20. D14 Diesel starts and loads as expected. Shortly after initial actions to stabilize Reactor level and pressure have been completed, a Small Break LOCA occurs coincident with a trip of D14 Diesel (Bus Lockout). Crew re-enters T-101 and T-102 on high Drywell Pressure and implements both SE-10, "LOCA," and OT-101, "High Drywell Pressure." RCIC subsequently trips on overspeed, leaving the 1A CRD Pump and 1C SLC Pump as the only remaining high pressure injection sources available to maintain level. DIV 3 RHR is the only Low Pressure ECCS system available for RPV injection. 1C Core Spray Pump is not immediately available for injection due to the loss of DIV 1 power to the 'A' Core Spray Subsystem Outboard Injection Valve. RCIC can be recovered (provided Maintenance was dispatched) after level reaches -161", but will not preclude required crew actions to perform an emergency depressurization. The SRO determines that RPV level cannot be maintained above -161", exits the RC/L leg, and enters T-111, "Level Restoration/Steam Cooling." The SRO directs the crew to Inhibit ADS, and when level drops to -161", enters T-112, "Emergency Blowdown. The SRO directs the crew to emergency depressurize the RPV (Critical Task) per T-112, and to maximize RPV injection using the 1C RHR pump. The scenario may be terminated when RPV blowdown is in progress, and RPV water level can be restored and maintained between +12.5" and +54" in accordance with T-101.

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	8
2. Malfunctions after EOP entry (1–2)	1
3. Abnormal events (2–4)	5
4. Major transients (1–2)	2
5. EOPs entered/requiring substantive actions (1–2) T-101	1
6. EOP contingencies requiring substantive actions (0–2) T-111/T-112	2
7. Critical tasks (2–3)	2

Critical Tasks

1.

★ **Start of the D13 Diesel Generator per T-101 RC-5**

Safety Significance

Ensuring emergency diesel generator (EDG) starts is an important action which ensures the reliability of electrical power to, not the least of all, ECCS pumps. Loss of injection systems (i.e., Low Pressure ECCS) impacts the ability to provide adequate core cooling through continued core submergence based on inventory loss.

Consequences for Failure to Perform Task

Failure to start the D13 Diesel Generator with no AC power capability to the D11, D12, and D14 4 KV Safeguard Busses, results in a Station Blackout Condition and subsequent inability to comply with T-111 Step LR-4 (performed concurrent with T-101), which provides direction to maximize injection into the RPV with all available normal and Emergency Core Cooling System (ECCS) injection sources. This will lead to uncovering of the core, the inability to restore and maintain level above -161", and the potential for fuel clad damage. While injection from low pressure ECCSs may not be possible if RPV pressure remains high, available systems should be aligned such that maximum flow will be delivered to the RPV as soon as RPV pressure drops below the system shutoff head pressures and injection interlock setpoints. Without the capability to inject with low pressure ECCS to restore RPV level above TAF, emergency RPV depressurization cannot be performed, and steam cooling would be required per T-111 Step LR-9.

Event Procedure E-1, "Loss of All AC Power "Station Blackout," Bases states: "Step 3.3 provides direction to attempt to start diesel generators which have not already started by one of the three methods available to the operator. If offsite power has not been restored then this step should be performed expeditiously in order to perform step 3.4 which provides direction for cross-tie of the 4 KV buses. This step and step 3.4 must be completed within one hour in order to provide the necessary alternate AC source to satisfy the Limerick design basis for station blackout. The operator should select the method available that will most expeditiously successfully start the diesel generators.

Indications/Cues for Event Requiring Critical Task

D13 BUS UNDERVOLTAGE (B-1) alarmed at 121 D13

D13 DIESEL FAILED TO START (C-2) alarmed at 121 D13

D13 DIESEL RUNNUING (C-4) not in alarm at 121 D13

No Bus voltage on Diesel Generator 13 voltmeter V117-2 at 1CC661

Performance Criteria

Start the D13 D/G manually from the Main Control Room.

Performance Feedback

D13 BUS UNDERVOLTAGE (B-1) alarm clear at 121 D13

D13 DIESEL FAILED TO START (C-2) alarm clear at 121 D13

D13 DIESEL RUNNUING (C-4) in alarm at 121 D13

Indication of D13 Bus voltage on Diesel Generator 13 voltmeter V117-2 at 1CC661

2.

- **Emergency Depressurize RPV (T-112 EB-11) / Maximize RPV injection to restore RPV level above TAF (T-111 LR-18)**

Safety Significance

Emergency RPV depressurization permits RPV injection flow from low head systems, maximizes the total injection flow, and minimizes the flow through any primary system leak. The ability to restore and maintain RPV level above -161" by maximizing injection from Low Pressure ECCS sources, ensures adequate core cooling and helps to preserve fuel clad integrity.

Consequences for Failure to Perform Task

The consequences of not depressurizing the RPV under conditions which require emergency RPV depressurization, could lead to a loss of adequate core cooling or failure of the primary containment.

LGS TRIP Step EB-11 directs actions to open all five Automatic Depressurization System (ADS) safety relief valves (SRVs).

The objective of T-112, Emergency Blowdown, is to depressurize the RPV as rapidly as possible within plant design limits and to maintain it in a "depressurized" state. Two separate aspects must be considered in deciding how these objectives are to be accomplished: the means for releasing the energy from the RPV and the capacity of the heat sink utilized to absorb this energy.

Depressurization of the RPV is most easily and rapidly performed by opening SRVs; thus instructions for operation of these valves are specified first, in preference to steps directing the use of other depressurization systems and mechanisms. Of the SRVs, those dedicated to the ADS function are the most reliable because of their qualifications, pneumatic supply systems, the design and operation of initiation circuitry, and the availability of control power. Additionally, the relative location of their discharge devices uniformly distributes the heat load around the suppression pool.

Concurrent opening of all five ADS valves is within analyzed plant design limits. Other steps in the TRIP procedures provide instructions for maintaining sufficient suppression pool heat capacity to accommodate simultaneous opening of all ADS valves at any RPV pressure.

The reference to LGS TRIP NOTE #5 informs operators that the RPV depressurization performed in accordance with this step may be conducted "regardless of the resulting cooldown rate," since the need for the rapid depressurization of the RPV takes precedence over normal RPV cooldown rate limits.

Indications/Cues for Event Requiring Critical Task

RPV level cannot be maintained above TAF with available high head injection systems.

Performance Criteria

Open 5 ADS valves to emergency depressurize the RPV when level drops to -161".

Performance Feedback

Verify ADS valves are open by observing red light open indication, acoustic monitor indications, lowering RPV pressure, and rising RPV level due to maximum injection from Low Pressure ECCS.

The scenario may be terminated when RPV blowdown is in progress, RPV water level can be restored and maintained between +12.5" and +54" in accordance with T-101, and upon direction of the Chief Examiner

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Reset simulator to IC **182** ■ Take out of FREEZE and ensure the following: - Reactor Power is 100% with stable reactor water level - Simulator DC lights are 'ON'
	■ Apply Information Tags on the following components: - D11 EDG - D11 EDG Output Breaker
	■ Ensure materials for applicants: - Turnover sheet: o 100% power o MOL Core o D11 Diesel Generator is out of service to repair a Jacket Water System leak (48 hours into a 30 day LCO - 3.8.1, AC Sources Operating; repairs expected to be completed within the next 24 hours o Maintain 100% power
	■ Ensure the following malfunctions are active: MRR201A — 1A ASD 13.2 KV Breaker Fails As Is MDG420C — Diesel Generator D13 Fails to Auto Start ■ Ensure the following Triggers are assigned: - {Trigger 1} MFW005B — LEFM Spool 'B' Enters Maintenance Mode - {Trigger 2} MHP450 — HPCI Spurious Start - {Trigger 3} MFH564B — FWH 12B Level Sensing Line Fails High - {Trigger 4} MRR209A1 — Trip 1A ASD Coolant Pump 1 - {Trigger 4} MRR209A2 — Trip 1A ASD Coolant Pump 2 - {Trigger 5} MED282B — Loss of 125/250 VDC Safeguard Bus1BD105 - {Trigger 6} MED261 — Loss of Offsite Power - {Trigger 7} MRR440A — LOCA (Variable 0-100%) - {Trigger 7} MDG418D — Diesel Generator D14 Trips - {Trigger 8} MRC466 — Inadvertent Trip of RCIC Overspeed Mechanism ■ Ensure the following overrides are loaded: - None
	■ Reset any annunciators that should not be present

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION

The following should be used to verify proper scenario setup:

Interventions Summary

Hide Malfunctions - 12 | *Show Remotes - 0* | *Show Overrides - 0* | *Show Annunciators - 0*

Malfunction Summary

Malf ID	Mult ID	Description	Current Value	Target Value	Rmptime	Actime	Dactime	Trig
MFW005B		LEFM Spool B Enters MAINTENANCE Mode	False	True				1
MFH564B		Feedwater Heater 12B Level Sensing Line Fails High	False	True				3
MRR201A		Recirc Pump 1A ASD 13.2 KV Supply Breaker Fails As-Is	FALSE	TRUE				
MHP450		Inadvertent HPCI Start Up	False	True				2
MED282B		Fault on DC Safeguard Bus 1BD105	False	True				5
MED261		Loss of Offsite Power	False	True				6
MDG420C		Diesel Gen D13 Fails to Auto Start	False	True				
MRR440A		Recirculation Loop A Rupture	0.00	1.000000	00:05:00			7
MRC466		Inadvertent Trip of RCIC Overspeed Mechanism	False	True				8
MED263D		Bus Fault on 4 KV Safeguard Bus D14	False	True				7
MRR209A1		ASD 1A Trip of Coolant Pump 1	FALSE	TRUE				4
MRR209A2		ASD 1A Trip of Coolant Pump 2	FALSE	TRUE		00:01:00		4

☐ *Timer Pause* *Delete All* **Active** **Pending**

Event Trigger Builder / Viewer

Favorites Triggers

Trigger #	Trigger Text
1	
2	
3	
4	
5	
6	
7	
8	OCOVAR(3)>1.68
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	

Operators:

Arithmetic:
- * Multipication
- / Division
- + Addition
- - Subtraction

Relational:
- > Greater than
- >= Greater Than or equal
- < Less than
- <= Less than or equal
- == Equal to
- != Not equal to

Logical:
- && And
- || Or
- ! Not

Other:
- (Open Paren
-) Close Paren

Trigger Now | Clear | Clear All | Accept | Exit

INSTRUCTIONS FOR SIMULATOR OPERATOR

EVENT 1: LEFM Spool 'B'Enters Maintenance Mode

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When **instructed by Lead Evaluator to proceed** following crew turnover, activate Trigger 1 (MFW005B), LEFM Spool 'B' Enters Maintenance Mode.
	■ As EO dispatched to LEFM Cabinet 10C986, wait three minutes and report that LEFM 'B' is in Maintenance Mode, no other abnormalities at the cabinet.
	■ Respond to request for assistance as appropriate.

EVENT 2: HPCI Spurious Start

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When Feedwater flow indication has been swapped to Venturi, TSs addressed (TRM), and **instructed by Lead Evaluator to proceed**, activate Trigger 2 (MHP450) for HPCI Spurious Start.
	■ If WWM contacted to investigate spurious start of HPCI, respond: "A team will be assembled to troubleshoot HPCI."
	■ If contacted as RE, acknowledge report of overpower condition and state that you will begin analysis.
	■ Respond to request for assistance as appropriate.

EVENT 3: FWH 12B Level Sensing Line Fails High

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When HPCI has been isolated, reactor power restored to pre-transient level, a determination made regarding whether power exceeded 3515 MWth, and **instructed by Lead Evaluator to proceed**, activate Trigger 3 (MFH564B) for FWH 12B Level Sensing Line Fails High.
	■ As EO dispatched to verify high level in the 12B FWH, wait four minutes and report "12B FWH level is -8 inches."
	■ If WWM contacted to investigate FWH 12B level issue, respond: "A team will be assembled to investigate."
	■ Respond to request for assistance as appropriate.

EVENT 4: 1A Recirc ASD Loss of Cooling with a failure of the '1A' ASD 13.2 KV Breaker to Trip

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When power reduction to ≤ 85% has been completed, the plant stabilized, a determination made regarding whether power exceeded 3515 MWth, and **instructed by Lead Evaluator to proceed**, activate Trigger 4 to (1) insert Malfunction MRR209A1 ('1A' ASD Coolant Pump 1 trip), and (2) insert Malfunction MRR209A2 ('1A' ASD Coolant Pump 2 trip) after a one-minute time delay.
	■ As EO dispatched by the MCR to investigate the status of the '1A' ASD Cooling Water System, wait three minutes and report: "Both cooling water pumps for 1A ASD are tripped."
	■ When contacted as RE to enter a new MCPR Limit for SLO into the PMS, respond that new MCPR limits will be provided.
	■ Respond to request for assistance as appropriate.

EVENT 5: Loss of 125/250 VDC Safeguard Bus 1BD105

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once control rod insertion has commenced, TSs for SLO addressed, and **instructed by Lead Evaluator to proceed**, activate Trigger 5 (MED282B) for Loss of 125/250 VDC Safeguard Bus 1BD105.
	■ If contacted as EO/Floor Supervisor to verify Reactor Enclosure/Refueling Floor Isolations (E-1FB, Step 2.2), acknowledge and comply with request.
	■ If contacted as Floor Supervisor to bypass and remove 1BD160, "1B RPS UPS Static Inverter," from service (E-1FB, Step 2.3), acknowledge and comply with request.
	■ If contacted as EO/Floor Supervisor to investigate the Loss of 1BD105, wait four minutes and report: "There's evidence of a fault inside the Div 2 Main Fuse Panel. There's significant charring inside the panel and it looks like all the fuses are blown. I've contacted Electrical Maintenance for support".
	■ Respond to request for assistance as appropriate.

EVENTS 6/7/8: Loop / D13 EDG Auto Start Failure / LOCA / D14 EDG Trip / RCIC Trip

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once the first Subsection (either 4.4 or 4.5) of S78.8.A to Manually initiate MCR Chlorine Isolation has been completed, and **instructed by Lead Evaluator to proceed**, activate Trigger 6 (MED261) for LOOP.
	■ When RPV level and pressure have been stabilized (RCIC injecting), and **instructed by Lead Evaluator to proceed**, activate Trigger 7 for LOCA (MRR440A) and D14 EDG trip (MDG418D).

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ If CRS directs crew to cross-tie electrical buses, contact CRS on x3891 and role play as the Shift Manager. Inform the Unit 1 CRS that Unit 2 is stable following the LOOP and that the Unit 2 CRS and 4th RO will complete all cross-tie actions.
	■ When contacted as EO to investigate the D14 Bus, wait four minutes and report: "The D14 EDG Output Breaker has tripped on 'A' Phase Differential Overcurrent Bus Lockout."
	■ Trigger 8 Malfunction MRC466 (RCIC Overspeed Trip), automatically activated when Drywell pressure exceeds 1.68 psig.
	■ As EO dispatched to investigate RCIC trip, wait four minutes and report: "Unit 1 RCIC has tripped on overspeed. I'm attempting to reset the overspeed trip."
	■ When dispatched as EO to prepare '1A' CRD pump for start, wait 3 minutes and report: "1A CRD pump ready for start." ■ After '1A' CRD pump has been started and direction given to slowly open the discharge valve, report that the pump discharge valve is open. ■ If directed to support Maximizing CRD Flow in accordance with T-240, then: - Report "PI-046-108A indicates greater than 1,200 psig," when local pressure reading requested by ATC. - Report "CRD Pump Suction Filter Bypass is open," when directed by ATC to open the Suction Filter Bypass.
	■ When RPV level drops below -161", remove Malfunction MRC466 and toggle remote function RRC002 to "Latch" and report: "Unit 1 RCIC Mechanical Overspeed Trip has been reset locally."
	■ Respond to request for assistance as appropriate.
	■ Once RPV blowdown is in progress, RPV water level restored and maintained between +12.5" and +54" in accordance with T-101, and **instructed by Lead Evaluator to terminate the scenario**, place the simulator in freeze.

Op-Test No.: _____ Scenario No.: 2 Event No.: 1 Page ___ of ___

Event Description: LEFM Spool 'B' Enters Maintenance Mode
Priority: Transition feedwater flow input from LEFM to Venturi, TRM entry

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from ATC of Annunciator 101 (G2), "LEFM TROUBLE" Directs ATC to perform S06.7.B, "Operation of the LEFM System" Contacts WWM requesting I&C Maintenance support for troubleshooting the LEFM issue
	SRO	References TRM 3.3.7.13: Notes condition applicable; TRM 3.3.7.13 is applicable in OPCON 1 with Thermal Power >3458 MWth Action: a. With the Leading Edge Flow Meter system inoperable, restore the required instrumentation to OPERABLE status within 72 hours. Otherwise, reduce power to ≤3458 MWth within the next two hours.
		Evaluator Note: *Once feedwater flow indication transitioned to Venturi and TRM call complete,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, HPCI Spurious Start.* • *Booth operator will activate Trigger 2 to insert Malfunction MHP450 (HPCI Spurious Start).*
	ATC	Reports Power/Pressure/Level steady Responds to Annunciator 101 (G2), "LEFM TROUBLE" (Step 1) **Promptly** perform S06.7.B, Operation of the LEFM System (Step 2) Notifies SRO to reference TRM 3.3.7.13

	ATC	S06.7.B, Operation of the LEFM System (Step 3.4) If 101 G-2, "LEFM TROUBLE" alarms, proceed to section 4.2 or 4.3 (applicant proceeds to 4.2; section 4.3 is for local panel operations) (Step 4.2.1.1) Notes that LEFM TROUBLE cannot be reset and proceeds to step 4.2.1.2 (Step 4.2.1.2) Verifies on PMS Screen 984 LEFM Interface Display, that LEFM Health Status is YELLOW, 'MAINT' and continues (Step 4.2.1.3.a) Circles LEFM (Step 4.2.1.3.c) Demands P-1 Monitor Case (Step 4.2.1.3.d) Verifies on PMS Screen 984 that 'Venturi Predicted Core Thermal Power' is less than 3515 MWth. If not, notifies SRO and lowers reactor power by depressing LOWER 1/5/30 RPM pushbuttons to reduce Reactor Recirc Pump speed. (Step 4.2.1.3.e) Single clicks PMS Screen 984, "LEFM Interface Display" Bottom Center Box (Step 4.2.1.3.f) Observes pop-up box appear to the right (Step 4.2.1.3.g) Selects 'Venturi' in pop-up box by single click (Step 4.2.1.3.h) Observes Screen 984, "LEFM Interface Display" Bottom Center Box change to 'Venturi' (Step 4.2.1.3.i) Demands P-1 Monitor Case (Step 4.2.1.3.j) Records the swap from LEFM to Venturi in the Ops Log (Step 4.2.1.3.k) Notifies SRO of need to generate IR
	BOP	Dispatches EO to local LEFM panel Provides peer checks for ATC

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: _____ Scenario No.: 2 Event No.: 2 Page ___ of ___

Event Description: HPCI Spurious Start
Priority: Enter OT-104, Isolate HPCI, restore reactor power to pre-transient level

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from ATC of rising reactor water level and rising reactor power
	SRO	Receives report from BOP that HPCI has initiated and is injecting
	SRO	Enters OT-104: (Step 2.1) Ensures ATC takes Immediate Operator Action to reduce Rx power and maintain at or below initial pre-transient level (100%) in accordance with GP-5 Appendix 2, and RMSI (Step 3.10) Determines cause of positive reactivity insertion (cold water injection from HPCI) (Step 3.11) Is directed to Step 3.13 due to positive reactivity insertion (Step 3.13.6) Determines HPCI inadvertently injecting and not required for adequate core cooling; directs BOP to TRIP HPCI in accordance with S55.2.A, HPCI Shutdown From Automatic Or Manual Initiation RMSI: 1. **IF** Core Flow is **GREATER THAN** 60 Mlb/hr, **THEN REDUCE** power as needed with flow until any of the following occur, A) **Core Flow reaches** 60 Mlb/hr B) An **"APRM UPSCALE"** alarm occurs OTHERWISE N/A this step. 2. **IF FLLLP** exceeds 1.0 **THEN FULLY INSERT** control rods from, "Rods Required for Stability Rod Line" table to lower FLLLP to less than **OR** equal to 1.0, OTHERWISE N/A this step.

	SRO	Determines if Rx power exceeded the licensed maximum rated thermal power of 3515 MWth due to the positivity reactivity insertion: (OT-104, Step 3.13.8) **IF** Rx power is >100% 3515 MWth as indicated by Core Power And Flow Log, **THEN REDUCE** Rx power to <100% in accordance with GP-5 Appendix 2, Planned Rx Maneuvering Without Shutdown, Section 3.1, Reducing Rx Power **AND** Reactor Maneuvering Shutdown Instructions. **Evaluator Note:** *Power reduction to maintain 100% previously performed per Step 2.1 of OT-104.* (Step 3.13.9) **CONSIDER** reportability of Rx power excursion **AND REFER TO** Bases (*OT-104 Bases*) (Step 3.13.10) **DEMAND** a P-1 edit **AND DETERMINE** whether a Thermal Limit violation exists.
	SRO	Contacts WWM requesting FIN/I&C support to investigate the HPCI start Contacts RE for evaluation of overpower condition (*power reaches approximately 106% if HPCI is allowed to inject before being taken out of service*)
	SRO	**Evaluator Note:** *Tech Spec 3.5.1 has been included in the scenario write-up for reference purposes only. This Tech Spec will **NOT** be evaluated as part of the scenario.* Determines that the following ACTION is applicable with respect to TS 3.5.1 for HPCI: **Tech Spec 3.5.1.c.1:** With the HPCI system inoperable, provided the CSS, the LPCI system, the ADS and the RCIC system are operable, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig within the following 24 hours.
		Evaluator Note: *When HPCI has been isolated, reactor power restored to pre-transient level, and a determination made regarding whether power exceeded 3515 MWth, **Lead Evaluator instruct Booth Operator to proceed to next event**, FWH 12B Level Sensing Line Fails High.* • *Booth operator will activate Trigger 3 to insert Malfunction MFH564B (FWH 12B Level Sensing Line Fails High).*

	ATC	Reports rising reactor water level and rising reactor power, exceeding 100% Reports feedwater is responding and reducing as appropriate
	ATC	(OT-104, Step 2.1) Performs Immediate Operator Action to reduce Rx power and maintain at or below initial pre-transient power level using RMSI **DEPRESS** 1A and 1B Recirc Pump Speed Lower Pushbuttons as required **AND VERIFY** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM **Evaluator Note:** *ASD controller manipulations will likely be performed from memory.*
	ATC	Reports RPV water level recovery and reactor power being maintained at or below 100%
	ATC	(OT-104, Step 3.13.10) Generates P-1 edit for SRO to evaluate Thermal Limits
	BOP	Reports HPCI initiation and injection, reports adequate core cooling exists by verifying proper RPV level on multiple indicators

	BOP	**Evaluator Note**: *Following actions to shutdown and isolate HPCI will likely be performed from memory and later verified using procedure S55.2.A.* Applicant places HPCI flow controller in manual and lowers output to approximately 20% to stop HPCI injection Obtains S55.2.A: (Step 4.3) Depresses and releases HPCI SEAL IN reset pushbutton (does not reset) (Step 4.4) If SEAL IN light remains lit, go to step 4.6 (Step 4.6) Performs the following to shutdown HPCI turbine: (Step 4.6.1) Depresses and releases HPCI Manual Isolation (ISOLATION) pushbutton (Step 4.6.2) Verifies HV-55-1F003, "HPCI Steam Line Outboard Isolation" (OUTBOARD), closes (Step 4.6.3) Verifies HPCI turbine comes to rest as indicated by SI-56-161, "HPCI Turbine Speed"(S) (Step 4.6.4) Directs EO to collect Turbine (10-S211) reservoir oil sample (Step 4.6.5) Requests Chemistry perform moisture analysis of oil sample (Step 4.6.6) Ensures 10P216, "Barometric Condenser Vacuum Pump" (VACUUM PUMP), operating (Step 4.6.7) Ensures 10P213, "Auxiliary Oil Pump" (AUX OIL PUMP), operating
	BOP	Reports HPCI trip and isolation to SRO

Op-Test No.: _____ Scenario No.: 2 Event No.: 3 Page ___ of ___

Event Description: FWH 12B Level Sensing Line Fails High, power reduction
Priority: Reduce and maintain reactor power ≤ 85%

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from BOP of the following annunciators: • Annunciator 102 (G4), "F/W HTRS 1&2 HI-HI LEVEL LP HTR STRING ISOLATION" • Annunciator 102 (E2), "2B FEEDWATER HI LEVEL" Directs BOP to perform ARC-MCR-102 G4
	SRO	Receives report from ATC of rising reactor power Announces entry in OT-104, "Unexpected/Unexplained Positive or Negative Reactivity Insertion" (Step 2.1) Ensures ATC takes the Immediate Operator Action to reduce Rx power and maintain at or below initial pre-transient power level in accordance with GP5 Appendix 2, and RMSI (Step 3.13.7.2.b) Determines FW inlet temperature reduction is ≤ 100 °F and directs ATC to perform follow-up action to reduce and maintain Rx power to ≤ 85% due to LP FWH String isolation, in accordance with GP5 Appendix 2, and RMSI (GP-5 Appendix 2, Step 3.1.1.2.c) Provides ATC with additional direction to reduce Rx power in accordance with RMSI, as required, until FW inlet temperature is in the "NORMAL OPERATING REGION" of Attachment 2, "Feedwater Inlet Temperature vs. Core Thermal Power" (Normal Operation) RMSI: 1. **IF** Core Flow is **GREATER THAN** 60 Mlb/hr, **THEN REDUCE** power as needed with flow until any of the following occur, C) **Core Flow reaches** 60 Mlb/hr D) An **"APRM UPSCALE"** alarm occurs OTHERWISE N/A this step. 2. **IF FLLLP** exceeds 1.0 **THEN FULLY INSERT** control rods from, "Rods Required for Stability Rod Line" table to lower FLLLP to less than **OR** equal to 1.0, OTHERWISE N/A this step.

	SRO	Determines if Rx power exceeded the licensed maximum rated thermal power of 3515 MWth due to the positivity reactivity insertion: (OT-104, Step 3.13.8) **IF** Rx power is >100% 3515 MWth as indicated by Core Power And Flow Log, **THEN REDUCE** Rx power to <100% in accordance with GP-5 Appendix 2, Planned Rx Maneuvering Without Shutdown, Section 3.1, Reducing Rx Power **AND** Reactor Maneuvering Shutdown Instructions. **Evaluator Note:** *Power reduction to ≤ 85% previously performed per Step 3.13.7.2.b of OT-104.* (Step 3.13.9) **CONSIDER** reportability of Rx power excursion **AND REFER TO** Bases (*OT-104 Bases*) (Step 3.13.10) **DEMAND** a P-1 edit **AND DETERMINE** whether a Thermal Limit violation exists. **Evaluator Note:** P-1 edit generated by ATC will show that *Thermal Limits have not been violated).*
	SRO	Contacts WWM requesting Maintenance support to investigate FWH 12B level issue.
		Evaluator Note: *Once power reduction to ≤ 85% has been completed, the plant stabilized, and a determination made regarding whether power exceeded 3515 MWth,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, '1A' Recirc ASD Loss of Cooling with a failure of the '1A' ASD 13.2 KV Breaker to Trip (results in Single Loop Operation in Restricted Region of Power/Flow Map).* • *Booth operator will activate Trigger 4 to:* *(1) insert Malfunction MRR209A1 ('1A' ASD Coolant Pump 1 trip), and* *(2) insert Malfunction MRR209A2 ('1A' ASD Coolant Pump 2 trip) after a one-minute time delay.* *[Note: Malfunction MRR201A (failure of the '1A' ASD 13.2 KV breaker to trip open) is 'Active' when the simulator is taken out of freeze to start the scenario.]*

	BOP	Reports the following annunciators: • Annunciator 102 (G4), "F/W HTRS 1&2 HI-HI LEVEL LP HTR STRING ISOLATION" • Annunciator 102 (E2), "2B FEEDWATER HI LEVEL"
	BOP	(All actions from ARC-MCR-102 G4) 1. Verify Automatic Actions (*closure of FWH string inlet and outlet valves HV-06-101B & HV-06-102B*) 2. Attempt to reset alarm on MCR panel 102. **Evaluator Note:** *Alarm will not reset.* 3. IF alarm clears, AND the MOV's are still in mid position, THEN: a. Pull to stop HS-006-101B AND HS-006-102B. b. Re-open HV-006-101B AND HV-006-102B. 4. Dispatch EO to verify high level in feedwater heater via level gauge EL. 239 OR locally at sight glass. For '1' Heaters – LI-003-101B should indicate approximately 23.0 in. For '2' Heaters - LI-003-105B should indicate off scale high 5. Monitor F/W temperature decrease AND positive reactivity insertion caused by loss of feedwater heating.
	ATC	Monitors APRMs for power indication and reports that Rx power is rising

	ATC	(OT-104, Step 2.1) Performs Immediate Operator Action to reduce Rx power and maintain at or below initial pre-transient power level using RMSI **DEPRESSES** 1A and 1B Recirc Pump Speed Lower Pushbuttons as required **AND VERIFIES** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM (OT-104, Step 3.13.7.2.b) Performs follow-up action of OT-104 to reduce and maintain Rx power to ≤ 85%, using RMSI (directed by SRO) **DEPRESSES** 63% LOSS OF FWP A/B Recirc Runback pushbutton **AND VERIFIES** proper response **OR** **DEPRESSES** 1A and 1B Recirc Pump Speed Lower Pushbuttons as required **AND VERIFIES** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM (GP-5 Appendix 2, Step 3.1.1.2.c) Reduces power, as required, until FW inlet temperature is in the "NORMAL OPERATING REGION" of Attachment 2, "Feedwater Inlet Temperature vs. Core Thermal Power," using RMSI (directed by SRO) **Evaluator Note:** *ASD controller manipulations will likely be performed from memory.*
	ATC	(OT-104, Step 3.13.10) Generates P-1 edit for SRO to evaluate Thermal Limits

Op-Test No.: _____ Scenario No.: 2 Event No.: 4 Page ___ of ___

Event Description: '1A' Recirc Adjustable Speed Drive (ASD) Loss of Cooling with a failure of the '1A' ASD 13.2 KV Breaker to Trip

Priority: Manually trip '1A' Recirc ASD 13.2 KV breaker, determine that the plant is operating in the Restricted Region of the Power/Flow Map, insert control rods using RMSI guidance to immediately exit the Restricted Region, address TS for SLO

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from ATC of Annunciators: • 111 B2, "1A RECIRC ASD MAJOR FAILURE" • 111 B3, "1A RECIRC ASD MINOR FAILURE" Informed by ATC that: • The ASD HMI Faults and Alarms screen code indicates a problem with the '1A' ASD Cooling Water System and that the Field Operator has been dispatched. • S43.1.F U/1, "Responding to Alarms at ASD HMI," direction is to trip the ASD if NO cooling is available due to loss of both cooling pumps. Briefs the crew on Single Loop Operations
	SRO	Receives report from ATC of the following annunciators: • Annunciator 111 (C3), "1A RECIRC ASD SPEED HOLD" • Annunciator 111 (B1), "1A RECIRC ASD TRIPPED" • Annunciator 108 (A4), "OPRM TRIPS ENABLED" Informed by ATC that the '1A' ASD 13.2 KV breaker indicates closed Informed by ATC that EO reports the breakers are tripped for both '1A' ASD cooling water pumps and that NO ASD cooling is available **Evaluator Note:** *'1A' Recirc pump will spin down with a failure of the ASD 13.2 KV breaker to open. Crew will still need to take prompt action to open the ASD breaker.* (S43.1.F U/1, Attachment 2, FRR Ref.# 5.12, Action 5) (ARC-MCR-111 (B1), Step 1) • Directs the ATC to trip the '1A' ASD 13.2 KV Breaker

	SRO	Announces entry into OT-112, "Recirculation Pump Trip" Announces entry into OT-104, "Unexpected/Unexplained Positive or Negative Reactivity Insertion" **Evaluator Note:** *Guidance provided for SLO operation is similar in both OT-112 and OT-104. SRO will execute OT-112 and OT-104 concurrently. Scenario identifies actions specified in OT-112.* (Step 3.5) Determines the correct Power/Flow Map to be Attachment 2, "OPRM Operable - Any Feedwater Heater Out Of Service" (Step 3.6) Directs BOP to determine Core Flow (Step 3.7) Determines plant operation in the Restricted Region of the Power/Flow Map using Attachment 2 (OPRM Operable - Any Feedwater Heater Out Of Service) (Step 3.8) Briefs the crew that the Restricted Region of the Power/Flow Map has been entered and directs ATC to immediately exit the region by inserting control rods using RMSI (Step 3.10) Directs ATC to close a "1A' Recirc Pump isolation valve (Step 3.11) Directs ATC to reopen the closed Recirc Pump isolation valve after approximately 5 minutes (Step 3.12) Directs ATC to limit speed of '1B' Recirc to < 1510 RPM (Step 3.13) Directs ATC, if possible, to maintain flow in the operating loop such that total core flow is > 40 Mlb/hr (Step 3.19) Directs ATC to ensure the tripped Recirc Pump is properly shutdown per S43.2.A, "Shutdown of a Recirculation Pump" (Step 3.23) Directs BOP to ensure RWCU is in service
	SRO	Complies with TS 3.4.1.1.a.1 for SLO: (OT-112, Step 3.16) Ensures applicable one Recirc Pump shiftly check sections of ST-6-107-590-1, "Daily Surveillance Log/OPCONS 1, 2, 3" are performed within 4 hours

	SRO	Complies with TS 3.4.1.1.a.2 for SLO: **NOTES** TS ACTION 3.4.1.1.a.2 requires APRM Scram **AND** Rod Block Trip Setpoints **AND** Allowable Values to be reduced for SLO within 6 hours. The direction in Step 3.17 to reduce APRM Scram **AND** Rod Block Trip Setpoints **AND** Allowable Values ensures TS 3.4.1.1.a.2 requirements will be met. (OT-112, Step 3.17) Initiates actions to recalibrate APRM channels for SLO in accordance with the following (*tripped Recirc Pump will not be returned to service within 6 hours*): ST-2-074-526-1, Implementation and Restoration of APRM 1 Single Loop Flow Biased STP Setpoints ST-2-074-527-1, Implementation and Restoration of APRM 2 Single Loop Flow Biased STP Setpoints ST-2-074-528-1, Implementation and Restoration of APRM 3 Single Loop Flow Biased STP Setpoints ST-2-074-529-1, Implementation and Restoration of APRM 4 Single Loop Flow Biased STP Setpoints
	SRO	Complies with SR 4.4.1.2.b for SLO: (OT-112, Step 3.18) Ensures ST-6-043-321-1, "Daily Jet Pump Verification for Single Recirc Loop Operation" is performed
	SRO	Contacts Reactor Engineering to enter new MCPR Limit, as required for SLO into PMS Computer Complies with Tech Specs 3.2.1 (APLHGR), 3.2.3 (MCPR), and 3.2.4 (LHGR) for SLO: (OT-112, Step 3.15) Ensures ST-6-107-889-1, "Thermal Limits Determination for Single Recirc Loop Operation" is performed within 4 hours

	SRO	(OT-112, Step 3.20) Reviews GP-5 Appendix 2, Planned Maneuvering Without Shutdown, Section 3.1, Reducing Power, to ensure all required actions are performed for Rx power reduction
		Evaluator Note: *In the interest of time, and to keep the ATC actively engaged during the Loss of 1BD105 Event (primarily BOP actions), the scenario will proceed with the Loss of 1BD105 before the crew has completed the actions to exit the Restricted Region of the Power/Flow Map.* *Once control rod insertion has commenced, and TSs addressed for SLO,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, Loss of 125/250 VDC Safeguard Bus 1BD105.* • *Booth operator will activate* Trigger 5 (MED282B) for Loss of 125/250 VDC Safeguard Bus 1BD105.
	BOP	(OT-112, Step 3.6) Determines Core Flow and provides information to SRO: (Step 3.6.1) **IF** required **THEN PERFORM** the following for UNIT 1: **IF** speed of operating Recirc Pump is ≤1000 RPM, **THEN USE** Core Plate dP indication (ΔPx) on XR-042-1R613, "Jet Pumps Flow & DP Lo" (RECIRC, FL) **OR** Computer Point B017 to estimate Core Flow Otherwise, **MARK** this step N/A. **IF** speed of operating Recirc Pump is >1000 RPM, **THEN USE** Core Flow indication on XR-042-1R613, "Jet Pumps Flow & DP Lo" (RECIRC, FL) **OR** Computer Point B018 to estimate Core Flow Otherwise, **MARK** this step N/A.
	BOP	(OT-112, Step 3.23) Ensures RWCU is in service using 1A RWCU Pump **OR** Both the 1B **AND** 1C RWCU Pumps
	ATC	Reports the following annunciators: • Annunciator 111 B2, "1A RECIRC ASD MAJOR FAILURE" • Annunciator 111 B3, "1A RECIRC ASD MINOR FAILURE"
	ATC	Dispatches EO to investigate the status of the '1A' ASD Cooling Water System

	ATC	(S43.1.F U/1, Step 4.2 NOTE) **NOTE** There are three levels of alarms that can be activated from the ASD system: 1. MINOR ALARM, an alarm that indicates that an ASD parameter limit has been reached, **OR** that an ASD condition is present, but requires no immediate action. 2. MAJOR ALARM, provides a clear indication that an ASD high parameter limit has been reached **AND** that an ASD trip is pending. Unless the alarm can be cleared by a process change, the ASD will trip. 3. ASD TRIPPED, an ASD system fault has caused the 13 KV CB to open, **OR** the START Hand switch is 'RED FLAGGED' **AND** the 13 KV CB is open. (Step 4.2) RESPONDING TO ALARMS AT XI-043-103A(B), "ASD 1A(B) MCR HMI," IN THE MCR AT PANEL 10C626 OR XI-043-102A(B), "ASD 1A(B) MAIN HMI" AT LOCAL PANEL 1A(B)C042: (Step 4.2.1) **WHEN** an alarm is received, **THEN ACKNOWLEDGE** the alarm by pressing the alarm on the Faults and Alarms section of the HMI Main Window. (Step 4.2.2) **REFER** to Attachment 1 to obtain the Fault Reference Report (FRR) Reference Number. (Step 4.2.3) **REFER** to Attachment 2 **OR** 3 as appropriate using the FRR Reference Number for the cause(s) **AND PERFORM** the associated actions. Informs SRO that: • The ASD HMI Faults and Alarms Screen (Display # 3-49), FRR Reference Number (5.12), indicates a problem with the '1A' ASD Cooling Water System, and that the Field Operator has been dispatched. • S43.1.F U/1, "Responding to Alarms at ASD HMI," direction associated with FRR Reference Number 5.12 (Attachment 2), is to trip the ASD if NO cooling is available due to loss of both cooling pumps.

	ATC	Reports the following annunciators: • Annunciator 111 (C3), "1A RECIRC ASD SPEED HOLD" • Annunciator 111 (B1), "1A RECIRC ASD TRIPPED" • Annunciator 108 (A4), "OPRM TRIPS ENABLED" Informs SRO that the '1A' ASD 13.2 KV breaker indicates closed Informs SRO that EO reports both cooling water pumps for '1A' ASD are tripped
	ATC	**Evaluator Note:** *S43.1.F U/1, Attachment 2, FRR Ref.# 5.12, Action 5, and ARC-MCR-111 (B1), provide direction to trip the ASD. The actual steps for securing the 1A ASD are provided in S43.2.A, "Shutdown of a Recirculation Pump." The following steps to secure the ASD will most likely be performed from memory.* (S43.2.A, Step 4.5.2) **SECURE** the 1A ASD system via pushbutton PB-043-102A, "1A ASD Normal Stop" on 10C602 panel. (S43.2.A, Step 4.5.3) **VERIFY** that the 1A ASD 13.2 KV breaker opens. **NOTE** Placing the ASD START A handswitch to "STOP" will green-flag the switch **AND** allow the Major, Minor **AND** Trip alarms to reset. (S43.2.A, Step 4.5.4) **PLACE** the ASD "START A" handswitch to "STOP" (S43.2.A, Step 4.5.5) **PRESS** PB-043-107A, "1A ASD Fault Reset" pushbutton two times to clear any applicable alarms

	ATC	(OT-112, NOTE applicable to Steps 3.10 thru 3.13): **NOTES** Closing Recirc Pump Isolation Valve stops pump rotation **AND** causes motor thrust bearing engagement. With motor thrust bearing engaged, reverse flow through loop will not cause reverse rotation of pump. To prevent thermal binding/pressure locking, Recirc Pump Isolation Valves should **not** be closed for more than 5 minutes. Maintaining Recirc loop isolation valves open with total core flow > 40% of rated core flow will cause reverse flow through idle loop **AND** will keep idle loop warm. At lower flows, idle loop reverse flow will drop **AND** cool down will occur. (OT-112, Step 3.10) **CLOSE** HV-043-1F031A, "1A Recirc Pump Disch Vlv" (DISCHARGE A) **OR** HV-043-1F023A, "1A Recirc Pp Suction Vlv" (SUCTION A). (OT-112, Step 3.11) **IF** Recirc Pump Isolation Valves are **not** required to be closed **AND** approximately 5 minutes have elapsed, **THEN OPEN** HV-043-1F031A, "1A Recirc Pump Disch Vlv" (DISCHARGE A) **OR** HV-043-1F023A, "1A Recirc Pp Suction Vlv" (SUCTION A), for tripped Recirc Pump. (OT-112, Step 3.12) **LIMIT** speed of '1B' Recirc Pump to < 1510 RPM (OT-112, Step 3.13) If possible, **MAINTAIN** flow in the operating loop such that total core flow is > 40Mlb/hr (OT-112, Step 3.19) Performs applicable steps in S43.2.A, "Shutdown of a Recirculation Pump," to ensure the tripped Recirc Pump is properly shut down.

	ATC	**Evaluator Note:** *The following steps to insert control rods will most likely be performed from memory.* Commences continuous insertion of Control Rod 30-31 to position 00 in accordance with Step 1 of RMSI Table 1, "Rods Required for Stability Rod Line," per S.73.1.A, "Normal Operation of the Reactor Manual Control System" **NOTE** 1. CONTINUOUS INSERT pushbutton bypasses the Rod Motion Timer. 2. CONTINUOUS INSERT **OR** INSERT pushbutton may be used for continuous insert. 3. For continuous rod movement, the intention is to stop the control rod one notch before its target position. A single notch insert is then performed to place the control rod in its target position. 4. The target position is the position where the control rod is required to be when the rod movement is complete. 5. **IF** notch position 00 is the target position, **THEN** it is acceptable to hold CONTINUOUS INSERT **OR** INSERT pushbutton until 00 is displayed. The reactor operator and peer checker shall verbalize at which notch position the rod motion signal will be removed prior to the start of rod motion. (S73.1.A, Step 4.9.5.1) Depresses CONTINUOUS INSERT pushbutton for control rod 30-31 (Step 4.9.5.2) Verifies INSERT light lit (Step 4.9.5.5) Verifies control rod 30-31 has been inserted to position 00 using Four Rod Display Re-performs Steps 4.9.5.1, 4.9.5.2, and 4.9.5.5 to insert the RMSI Table 1 control rod(s) required to exit the Restricted Region of the Power/Flow Map

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Event Description: Loss of 125/250 VDC Safeguard Bus 1BD105
Priority: Manually initiate MCR Chlorine Isolation, recognize HPCI no longer available (previous status was inoperable but available in Event 2), recognize 'B' Low Pressure ECCS (LPCI/CS) and D12 D/G inoperable, address TS

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from BOP of loss of 1BD105 125/250 VDC Safeguard Bus Receives report from ATC that Power, Pressure, and Level are stable Enters Transient Alarm Response Announces entry into E-1FB, "Loss of Division II Safeguard 125/250 VDC Bus"
	SRO	Briefs crew on E-1FB actions required: (E-1FB, Step 2.1) Directs BOP to Manually INITIATE Main Control Room Chlorine Isolation per S78.8.A (Step 2.2) Contacts Floor Supervisor to verify Reactor Enclosure/Refueling Floor Isolations per S76.9.A (Step 2.3) Contacts Floor Supervisor to Bypass and Remove 1BD160, "1B RPS UPS Static Inverter," from service per S94.2.B Contacts WWM requesting Electrical Maintenance support to investigate the Loss of 1BD105 References Tech Specs (Multiple Tech Specs affected): • 3.5.1, ECCS-Operating (multiple ECCS systems inoperable) • 3.8.1, AC Sources-Operating (D12 D/G inoperablility caused by loss of 1BD105 results in two diesels out of service (D11 and D12)) • 3.8.3, Onsite Power Distribution-Operating

	SRO	Determines the following ACTION to be the most restrictive with respect to TS 3.5.1 (HPCI, one LPCI subsystem, one CSS subsystem Inoperable): (ACTION 3.5.1.c.2) With the HPCI system inoperable, and one CSS subsystem, and/or LPCI subsystem inoperable, and provided at least one CSS subsystem, three LPCI subsystems, and ADS are OPERABLE, restore the HPCI to OPERABLE within 8 hours, or be in HOT SHUTDOWN in the next 12 hours, and in COLD SHUTDOWN in the next 24 hours.
	SRO	Determines that the following ACTIONS are applicable with respect to TS 3.8.1 with two diesels inoperable (Initial Conditions have D11 D/G Out of Service). Action 3.8.1.1.b **(bolded below)** is the most restrictive with a 1 Hour Action Time: **(ACTION 3.8.1.1.b) With two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter…Restore at least one of the inoperable diesel generators to OPERABLE status within 72 hours* or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.** (ACTION 3.8.1.1.e.1) For two train systems, with one or more diesel generators of the above required A.C. electrical power sources inoperable, verify within 2 hours and at least once per 12 hours thereafter that at least one of the required two train system subsystem, train, components, and devices is OPERABLE and its associated diesel generator is OPERABLE. Otherwise, restore either the inoperable diesel generator or the inoperable system subsystem to an OPERABLE status within 72 hours* or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. (ACTION 3.8.1.1.e.2) For the LPCI systems, with two or more diesel generators of the above required A.C. electrical power sources inoperable, verify within 2 hours and at least once per 12 hours thereafter that at least two of the required LPCI system subsystems, trains, components, and devices are OPERABLE and its associated diesel generator is OPERABLE. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
	SRO	Determines that the following ACTION is applicable with respect to TS 3.8.3 (ACTION 3.8.3.1.b) With one of the above required Unit 1 D.C. distribution system divisions not energized, reenergize the division within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

		Evaluator Note: *In the interest of time, Tech Specs for the Loss of 125/250 VDC Safeguard Bus 1BD105 may be addressed as follow-up questions after the scenario has concluded.* *Once the first Subsection (either 4.4 or 4.5) of S78.8.A to Manually initiate MCR Chlorine Isolation has been completed,* ***Lead Evaluator instruct Booth Operator to proceed to Major Event*** *(Loop / D13 EDG Auto Start Failure / LOCA / D14 EDG Trip / RCIC Trip).* • *Booth operator will activate Trigger 6 (MED261) for LOOP. [Note: Malfunction MDG420C (D13 EDG Auto Start Failure) is 'Active' when the simulator is taken out of freeze to start the scenario.]* • *When RPV level and pressure have been stabilized after the LOOP (RCIC injecting),* ***D13 D/G HAS BEEN MANUALLY STARTED (Critical Task item preventing a Station Blackout)****, and* ***instructed by Lead Evaluator to proceed,*** *Booth operator will activate Trigger 7 for the LOCA (MRR440A) and D14 EDG trip (MDG418D) Malfunctions.* • *Trigger 8 Malfunction MRC466 (RCIC Overspeed Trip), automatically activated when Drywell pressure exceeds 1.68 psig.*
	ATC	Continues inserting control rods to exit the Restricted Region of the Power/Flow Map
	BOP	Acknowledges multiple alarms and conducts panel walkdowns to identify affected equipment Notifies SRO that HPCI, 'B' Channel Low Pressure ECCS, and D12 D/G are affected by the loss of 1BD105, and prioritizes ARC actions accordingly

	BOP	(E-1FB, Step 2.1) Manually INITIATE Main Control Room Chlorine Isolation per S78.8.A when directed by SRO *(All operations are at 00C681, "MCR Panel Heating and Ventilating Console," unless otherwise indicated).* **Evaluator Note:** *S78.8.A contains instructions to place MCR HVAC System into a Radiation or Chlorine/Toxic Chemical Isolation Lineup. Procedure requires both the 'A' and 'B' Subsections to be performed for chlorine or radiation isolations. Subsections 4.4 and 4.5 are applicable for loss of 1BD105. Only one Subsection, 4.4 or 4.5, will be observed. Accordingly, both subsections are included below. Once the first subsection is completed, proceed to next two events, Grid instability Resulting in Loss of Offsite Power and Failure of D13 D/G to Auto Start (concurrent malfunctions).* (S78.8.A, Step 4.4.1 for 'A' Subsystem) **IF no** chemical isolation has been initiated, **THEN ENSURE** alignment as follows: • HS-78-010A, 'A' CONT RM EMERG FRESH AIR FAN CONT 0AV127, in "AUTO" • HS-78-010B, 'B' CONT RM EMERG FRESH AIR FAN CONT 0BV127, in "STANDBY" (Step 4.4.2) **PLACE** the following Control Room Isolation Valve Reset Keylock Switches to "RESET": 1. HS-78-017C, RESET C 2. HS-78-017A, RESET A (Step 4.4.3) **PLACE** the following Control Room Isolation Valve Trip Switches to "Cl_2": 1. HSS-78-017C, TRIP C 2. HSS-78-017A, TRIP A (Step 4.4.4) **PLACE** the following Control Room Isolation Valve Reset Keylock Switches to "AUTO": 1. HS-78-017C, RESET C 2. HS-78-017A, RESET A (Step 4.4.5) **DEPRESS AND RELEASE** pushbutton portion of the following Trip Switches: 1. HSS-78-017C, TRIP C 2. HSS-78-017A, TRIP A

	BOP	(S78.8.A, Subsection 4.4 for 'A' Subsystem - **continued**) (Step 4.4.6) **RECORD** CREFAS run time in appropriate log. (Step 4.4.7) **ENSURE** CHLOR ISLN Channel A,C amber lights are Lit. (Step 4.4.8) **VERIFY** CONTROL ROOM CHLORINE ISOLATION INITIATED annunciator alarmed at 002 VENT A-2. (Step 4.4.9) **VERIFY** CONTROL ROOM ISOLATION NOT COMPLETE annunciator is **not** alarmed at 002 VENT A-3, after 25 seconds. (Step 4.4.10) **ENSURE** 0A(B)V127, EMERGENCY AIR FAN A(B), is running. (Step 4.4.11) **ENSURE** 0A(B)V116, CONTROL ROOM AIR SUPPLY FAN A(B), running. (Step 4.4.12) **ENSURE** 0A(B)V121, CONTROL ROOM AIR RETURN FAN A(B), running. (Step 4.4.13) **VERIFY** PDI-78-054, CONTROL ROOM AIR INSIDE/OUTSIDE Δ PX, is 0 inches water, after allowing time for positive pressure to decay.

	BOP	(S78.8.A, Step 4.5.1 for 'B' Subsystem) **IF no** chemical isolation has been initiated, **THEN ENSURE** alignment as follows: • HS-78-010B, 'B' CONT RM EMERG FRESH AIR FAN CONT 0BV127, in "AUTO" • HS-78-010A, 'A' CONT RM EMERG FRESH AIR FAN CONT 0AV127, in "STANDBY" (Step 4.5.2) **PLACE** the following Control Room Isolation Valve Reset Keylock Switches to "RESET": 1. HS-78-017B, RESET B 2. HS-78-017D, RESET D (Step 4.5.3) **PLACE** the following Control Room Isolation Valve Trip Switches to "Cl_2": 1. HSS-78-017B, TRIP B 2. HSS-78-017D, TRIP D (Step 4.5.4) **PLACE** the following Control Room Isolation Valve Reset Keylock Switches to "AUTO": 1. HS-78-017B, RESET B 2. HS-78-017D, RESET D (Step 4.5.5) **DEPRESS AND RELEASE** pushbutton portion of the following Trip Switches: 1. HSS-78-017B, TRIP B 2. HSS-78-017D, TRIP D (Step 4.5.6) **RECORD** CREFAS run time in appropriate log. (Step 4.5.7) **ENSURE** CHLOR ISLN Channel B,D amber lights are Lit. (Step 4.5.8) **VERIFY** CONTROL ROOM CHLORINE ISOLATION INITIATED annunciator alarmed at 002 VENT A-2. (Step 4.5.9) **VERIFY** CONTROL ROOM ISOLATION NOT COMPLETE annunciator is **not** alarmed at 002 VENT A-3, after 25 seconds. (Step 4.5.10) **ENSURE** 0B(A)V127, EMERGENCY AIR FAN B(A), is running. (Step 4.5.11) **ENSURE** 0A(B)V116, CONTROL ROOM AIR SUPPLY FAN A(B), running. (Step 4.5.12) **ENSURE** 0A(B)V121, CONTROL ROOM AIR RETURN FAN A(B), running.

	BOP	(S78.8.A, Subsection 4.5 for 'B' Subsystem - **continued**) (Step 4.5.13) **VERIFY** PDI-78-054, CONTROL ROOM AIR INSIDE/OUTSIDE Δ PX, is 0 inches water, after allowing time for positive pressure to decay. (Step 4.5.14) **IF** performing subsection for maintenance, **THEN ENSURE** the device positions for Cl_2 Isolation as per Attachment 2, **OTHERWISE ENSURE** the device positions for Cl_2 Isolation as per Attachment 1 **AND** 2.

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Event Description: LOOP, D13 D/G start failure (recoverable), Small Break LOCA with loss of high pressure feed capability, D14 D/G trip, RCIC trip (recoverable after RPV level reaches -161", Emergency Depressurization

★Contains action items to complete critical task 1, Manual Start of D13 D/G from the MCR after the diesel fails to Auto Start on LOOP

■Contains action items to complete critical task 2, Perform Rapid Depressurization when RPV level cannot be restored and maintained > -161" / Maximize RPV injection to restore level above TAF

Time	Position	Applicant's Actions or Behavior
	SRO	Announces entry into T-101, RPV CONTROL, due to SCRAM condition resulting from LOOP and RPV level < +12.5" Announces entry into E-10/20, "Loss of Offsite Power"
	SRO	(T-101 RC-4) Directs ATC to place the Mode Switch in SHUTDOWN
	SRO	(T-101 RC-5) Ensures SCRAM / Isolations / ECCS initiation
	★SRO	**(T-101 RC-5)** **(E-10/20, Step 2.6.2)** **Directs BOP to start the D13 D/G after a failure of the diesel to start immediately following the LOOP** **Evaluator Note:** *D13 D/G failure to auto start malfunction is 'Active' when the simulator is taken out of freeze to start the scenario. D13 D/G start attempt from the MCR is successful* ***(D/G will start after 3 minutes once the pre-lube has been completed).***
	SRO	(T-101 RC-6) Directs ATC to insert SRMs and IRMs
	SRO	(T-101 RC/Q-3) Announces exit of RC/Q of T-101
	SRO	(T-101 RC/L-4) Directs BOP to restore AND maintain RPV level between +12.5" AND +54" using RCIC
	SRO	(T-101 RC/P-11) Directs BOP to stabilize RPV pressure below 1096 psig using SRVs; provides appropriate pressure band (i.e., 800-1000 psig, etc)
	SRO	Recognizes that Suppression Pool Cooling is unavailable with both the D11 and D12 Safeguard Buses de-energized Announces entry into T-102, Primary Containment Control, should Suppression Pool Temperature exceed 95 °F

	SRO	**Evaluator Note:** *When RPV level and pressure have been stabilized following the LOOP (RCIC injecting), and* ***D13 D/G HAS BEEN MANUALLY STARTED (Critical Task item preventing a Station Blackout), Lead Evaluator instruct Booth Operator to insert Malfunctions for LOCA and D14 D/G Trip.*** Recognizes/Receives report of D14 Diesel trip. Contacts WWM requesting Electrical Maintenance support to investigate the D14 Diesel trip.
	SRO	**Evaluator Note:** *SRO may discuss/brief the cross-tie of emergency buses in accordance with E-10/20 following the Loss of D14 Diesel. The cross-tie evolution is a lengthy process (45 minutes to an hour), that (1) requires actions which defeat separation and independence of the electrical divisional buses and loads, (2) contradicts the USFAR, and (3) requires Shift Manager or Emergency Director approval. The primary focus of the crew during the Major transient part of the scenario should be on providing Adequate Core Coverage, which can be accomplished without the cross-tie. The cross-tie evolution consists of followup actions that are not scripted into the scenario.* If CRS directs the crew to cross-tie electrical buses, CRS will be notified by the Shift Manager (booth communication) that Unit 2 is stable following the LOOP and that the Unit 2 CRS and 4th RO will complete all cross-tie actions.
	SRO	Recognizes indications of rising Drywell Pressure and announces entry into OT-101, High Drywell Pressure (Step 2.1) Directs ATC to MAXIMIZE Drywell cooling **Evaluator Note:** *"Maximize Drywell cooling" means ensure one chiller and both Drywell Chilled Water pumps are operating and one fan is operating for each (8) Drywell Unit Cooler. Both Chilled Water pumps will be unavailable due to de-energization of the 114B and 124B Reactor Area Load Centers. Therefore, attempts to maximize DW cooling will be unsuccessful.*
	SRO	**Evaluator Note:** *When DW Pressure exceeds 1.68 psig, malfunction for RCIC Trip on Overspeed (recoverable below -161 inches) is automatically triggered.* Announces re-entry into T-101 and entry/re-entry into T-102 on High DW pressure 1.68 psig (re-entry into T-102 assumes initial entry was already made on 95°F in the Suppression Pool) Announces entry into SE-10, "LOCA" and directs ATC to perform SE-10 "Floor Actions" *(SE-10 "Floor Actions" are Immediate Operator Actions specified in the procedure. Note that only the Floor Action associated with DIV 3 will be successful since safeguard buses D11, D12, and D14 are de-energized.)*
	SRO	Recognizes/Receives report of RCIC trip. Contacts WWM requesting Maintenance support to investigate the RCIC trip.

	SRO	Announces re-entry into T-102 on High DW Temperature, should DW temperature rise above 145 °F
	SRO	Determines that only available sources of high pressure feed, following trip of D14 D/G and RCIC trip, are '1C' SLC pump and '1A' CRD pump, AND that RPV level CANNOT be restored above +12.5" (T-101 RC/L-4; SE-10, Step 4.6) Directs ATC to start the '1A' CRD pump and maximize flow (CRD flow maximized per T-240) (T-101 RC/L-7; SE-10, Step 4.6) Directs ATC to start the '1C' SLC pump (Boron Tank)
	SRO	(T-101 RC/P-11) Revises RPV pressure band as appropriate due to pressure reduction resulting from LOCA
	SRO	Determines that RPV level cannot be maintained above -161" and briefs crew (T-101 RC/L-9) Announces exit of RC/L of T-101 and entrance into T-111, "Level Restoration/Steam Cooling
	SRO	(T-111 LR-3) Directs BOP to Inhibit ADS
	SRO	(T-111 LR-4) Directs BOP/ATC to Maximize RPV Injection with DIV 3 Low Pressure ECCS, EXCEEDING pump NPSH AND vortex limits if necessary **Evaluator Note:** In addition to starting the '1C' RHR pump, the *applicant may also direct a start of the '1C' Core Spray (CS) pump. Note that CS Outboard Injection Valve HV-052-1F005 (1F037) and Min Flow Valve HV-052-1F031A are both de-energized due to the loss of DIV 1 power. Min flow protection is provided for the CS pump because the 1F031A will be de-energized in the open position (Normal position is open). In order for CS to inject into the RPV, the Outboard Injection Valve would have to be throttled open manually to prevent pump runout with only one '1C' CS pump available in the 'A' CS Subsystem Loop. In addition, the Min Flow Valve would have to be manually closed. The applicant may contact WWM requesting field support for these activities if status of the CS system is understood. Steps for injecting into the RPV with CS have not been scripted.*
	SRO	(T-111 LR-6) Determines that two or more subsystems from Table LR-2 CANNOT be lined up for injection *('A' CS Subsystem Outboard Injection Valve HV-052-1F005 (1F037) is closed and de-energized due to the loss of DIV 1 power).*
	SRO	(T-111 LR-7) Requests field support to line up alt subsystems in Table LR-1, recognizing that power restraints may impact the ability to successfully complete the lineups
	SRO	When RPV level reaches -161 inches: (T-101 RC/P-1) Announces exit of RC/P of T-101 (T-111 LR-17) Announces entry into T-112

	SRO	**Evaluator Note:** *RCIC will be made available at -161 inches, provided the SRO requested Work Management assistance following the overspeed trip. SRO may elect not to issue the order to place RCIC in service, given that Emergency Depressurization is imminent.* At -161 inches, receives report that RCIC Mechanical Overspeed Trip has been reset locally. Directs BOP to reset RCIC Turbine trip and place RCIC in service
	■SRO	**(T-112 EB-11) Directs BOP to open 5 ADS valves**
	■SRO	**(T-111 LR-18) Once rapid depressurization has begun, directs BOP to maximize RPV injection using DIV 3 RHR**
	SRO	(T-111 LR-2) Determines that RPV level can be maintained above -161"and and enters T-101 at Step RC/L-1 (T-101 RC/L-4) Directs BOP to restore AND maintain RPV level between +12.5" AND +54" using DIV 3 RHR Directs ATC to perform follow up actions of SE-10, "LOCA," E-10/20, "Loss of Offsite Power," and OT-101, "High Drywell Pressure
		Evaluator Note: *When RPV blowdown is in progress, and RPV level can be restored AND maintained between +12.5" AND +54" per T-101,* ***Lead Evaluator Instruct Booth Operator to terminate the scenario.***
	ATC	Places Mode Switch in SHUTDOWN and informs SRO
	ATC	Inserts SRM/IRM: • Depresses 'Power On' pushbutton • Depresses 'Select' Pushbuttons for all SRM and IRM • Depresses 'Drive In' Pushbutton • Monitors SRM/IRM indication for verification of instruments driving in
	ATC	Recognizes and reports trip of D14 D/G amidst indications of rising Drywell pressure Dispatches EO to D14 Diesel
	ATC	Informs SRO that Drywell cooling cannot be maximized due to the loss of power **Evaluator Note:** *"Maximize Drywell cooling" means ensure one chiller and both Drywell Chilled Water pumps are operating and one fan is operating for each (8) Drywell Unit Cooler. Both Chilled Water pumps will be unavailable due to de-energization of the 114B and 124B Reactor Area Load Centers. Therefore, attempts to maximize DW cooling will be unsuccessful.*

	ATC	**Evaluator Note:** Applicant may only take action to perform the *Floor Action associated with DIV 3 since safeguard buses D11, D12, and D14 are de-energized.* Performs SE-10 "Floor Actions": (SE-10, Step 3.1) **PLACE** the following to "CLOSE": - 52-20124/CS, "D*14 Safeguard L.C. D*14-G-D MCC Bkr" (SAFEGUARDS A), on *AC661 - 52-20224/CS, "D*24 Safeguard L.C. D*24-G-D MCC Bkr" (SAFEGUARDS B), on *BC661. (SE-10, Step 3.1) **PLACE** to "RESET": - 43-22322/CS, "Div. III Non SFGD Instr. Panel" (INST AC 201 CONTROL PNL), on *CC661 - 43-22422/CS, "Div. IV Non SFGD Instr. Panel" (INST AC 202 CONTROL PNL), on *DC661.
	ATC	Starts '1A' CRD pump per S46.1.A, "Control Rod Drive Hydraulic System Startup": Dispatches EO to prepare '1A' CRD pump for start: (Step 4.18) **START** 1AP158, "1A' CRD Pump" (Step 4.19) Slowly **OPEN** 46-1F014A, "CRD Pump Discharge Valve" (Local)

	ATC	Maximizes CRD flow using T-240, " Maximizing CRD Flow After Shutdown During Emergency Conditions": **CAUTION** 1. High flow **AND** high CRD pump suction filter dP will lower NPSH. 2. Lowering reactor pressure will cause rising CRD pump flow. 3. CRD pumps trip at 4.5 inches HG vacuum suction pressure. 4. To prevent CRD Pump runout local pump discharge pressure must be greater than 1,200 psig on PI-46-108A, "CRD Pump Discharge." (Step 4.1) Fully **OPEN** HV-46-1F003, "Drive Water Pressure Control" (DRIVE WATER PRESSURE), at 10C603 (Main Control Room). (Step 4.2) **OPEN** FV-C-46-1F002A, "Flow Control," at 10C603 (Main Control Room) using FC-46-1R600, "Rod Drive Flow Controller" (FL), in "MANUAL" to maximize CRD flow, while maintaining greater than 1,200 psig as indicated on PI-46-108A, "CRD Pump Discharge" (252-T6-200). (Step 4.3) **OPEN** 46-1F045, "CRD Pump Suction Filter Bypass" (252-T6-200).

	ATC	Starts '1C' SLC Pump per S48.1.B, Appendix 1, "Standby Liquid Control System Manual Initiation Hardcard": (Step 1.0) Insert key into HS-48-104C and **START** '1C' SLC Injection Pump, by holding keylock switch in "RUN" for at least 1 second before releasing *(HS-48-104C spring returns to "NORM" from the "RUN" position only)* • 1CP208, "SLC Injection Pump" (Control Switch normally in "STOP" **AND** key removed, preventing three pump system operation) (Step 2.0) **VERIFY** appropriate Squib Valve fires by loss of the associated continuity white lights: • XV-48-1F004C (Step 3.0) **VERIFY** SBLC is injecting by observing the following: • PI-48-1R600C, "Pump Discharge Pressure" (PX), greater than reactor pressure. LI-48-1R601, "SLC Tank Level" (LV), lowering at a steady rate.
	ATC	Commences performance of follow up actions of SE-10, "LOCA," E-10/20, "Loss of Offsite Power," and OT-101, "High Drywell Pressure"
	★BOP	**Recognizes and reports failure of the D13 D/G to start following LOOP** **Evaluator Note:** E-10/20, Step 2.6.2, *provides direction to manually start a Diesel from the MCR after a failure to auto start. The following step to manually start the Diesel will most likely be performed from memory.* ***D13 D/G will start after 3 minutes once the pre-lube has been completed.*** **(E-10/20, Step 2.6.2)** • **PLACES 101-CG501/CS, "Diesel Generator Control," to "START" at panel 1CC661, DIESEL 13**

	BOP	(Prior to LOCA) Ensures RCIC is injecting: **Evaluator Note:** *If RPV level lowers to -38" following the LOOP, RCIC system will automatically initiate. If level is lowering but has not yet reached -38", the crew may take action to manually initiate RCIC before reaching the -38" low low reactor water level. Manual actions to initiate and control RCIC will likely be performed from memory.* **ARM** AND **DEPRESS** Manual Initiation push button to start RCIC • Control injection using FIC-49-1R600, "RCIC Pump Discharge Flow Controller" (FL) to stabilize RPV level
	BOP	(Prior to LOCA) Stabilizes RPV pressure below 1096 within established pressure band by individually cycling SRV control switches located on 10C626, using the opening sequence specified on the control panel (ensures uniform distribution of heat to the suppression pool)
	BOP	Recognizes and reports trip of RCIC following receipt of 1.68 psig LOCA signal Dispatches EO to investigate RCIC
	BOP	(After LOCA) If necessary, prompts SRO to provide revised pressure band(s) to accommodate pressure reduction resulting from primary leak
	BOP	Inhibits Auto ADS by placing both ADS "NORM - INHIBIT" switches (S15A and S15C) at 10C626 back panel to "INHIBIT" position

	BOP	When directed by SRO to maximize injection into the RPV (prior to level dropping to -161"), Ensures that DIV 3 RHR is aligned such that maximum flow will be delivered to the RPV as soon as RPV pressure drops below the system shutoff head pressure. **Evaluator Note:** *Following step to manually start '1C' RHR pump will likely be performed from memory.* *Applicant may also start the '1C' Core Spray (CS) pump by taking the Control Switch to START. Note that CS Outboard Injection Valve HV-052-1F005 (1F037) and Min Flow Valve HV-052-1F031A are both de-energized due to the loss of DIV 1 power. Min flow protection is provided for the CS pump because the 1F031A will be de-energized in the open position (Normal position is open). In order for CS to inject into the RPV, the Outboard Injection Valve would have to be throttled open manually to prevent pump runout with only one '1C' CS pump available in the 'A' CS Subsystem Loop. In addition, the Min Flow Valve would have to be manually closed. The applicant may contact WWM requesting field support for these activities if status of the CS system is understood. Steps for injecting into the RPV with CS have not been scripted.* **IF ABOVE -129" AND RPV PRESSURE > 455 PSIG WHEN DIRECTED:** Manually start '1C' RHR pump using the 1CP202 Control Switch **IF BELOW -129" WHEN DIRECTED:** Verifies that '1C' RHR pump is running and minimum flow bypass valve HV-51-1F007C is open **Evaluator Note:** Applicant may elect to secure the *'1C' CS pump by taking the Control Switch to STOP if the pump auto starts at -129".*
	BOP	**Evaluator Note:** *RCIC will be made available below -161", provided the SRO requested Work Management assistance following the overspeed trip. SRO may elect not to issue the order to place RCIC in service, given that Emergency Depressurization is imminent. The following Actions to re-start RCIC after the mechanical overspeed trip will likely be performed from memory.* When informed by SRO that RCIC Mechanical Overspeed Trip has been reset locally and that direction is to place RCIC in service: • CLOSES HV-50-112, "RCIC Trip Throttle Valve" • OPENS HV-50-112

	■BOP	**When directed to open all ADS valves, places PSV-41-1F013E, K, H, M, and S "AUTO-OPEN" control switches located on 10C626 to the "OPEN" position, and verifies valve function by acoustic monitors and lowering RPV pressure**
	■BOP	**Evaluator Note:** *Following step to restore level above -161" using RHR will likely be performed from memory:* **Maximizes RPV injection with '1C' RHR to restore level above -161":** • **When RPV pressure drops below 350 psig ('1C' RHR pump shutoff head):** - **ENSURES '1C' RHR LPCI Injection Valve, HV-51-1F017C, is open (opens on 74 psid), and '1C' RHR pump injecting (10C601)**
	BOP	**Evaluator Note:** *The step to restore and maintain level between +12.5" and +54" using DIV 3 RHR will likely be performed from memory:* Restores AND maintains RPV level between +12.5" and +54" as indicated on LI-42-1R606A(B,C), (LV NR), at 10C603:
		Evaluator Note: *Scenario may be terminated when RPV blowdown is in progress, and RPV level can be restored AND maintained between +12.5" AND +54" per T-101*

POST SCENARIO: Have the applicant in the CRS position identify the highest EAL classification for the combination of events experienced during the scenario.

Applicable classifications: **FA1** and **MA1** based upon Table LGS 3-1 of EP-AA-1008 (Revision 23)

FA1: ANY Loss or ANY Potential Loss of either Fuel Clad or RCS (ALERT)

Loss of RCS barrier based upon criteria 3.1: Drywell Pressure > 1.68 psig
AND
Loss of RCS barrier based upon criteria 3.2: Drywell Pressure rise due to RCS leakage

OR

Loss of RCS Barrier based upon criteria 4.2: Emergency RPV Depressurization is required.

MA1: AC power capability to emergency busses reduced to a single power source for 15 minutes or longer such that any additional single failure would result in station blackout. (ALERT)

NOTE: The Emergency Director should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.

1. AC power capability to unit 4 KV Safeguard Buses reduced to only one of the following sources for **> 15 minutes**.
   - 101 Safeguard Transformer
   - 201 Safeguard Transformer
   - D11(21) Diesel Generator
   - D12(22) Diesel Generator
   - D13(23) Diesel Generator
   - D14(24) Diesel Generator

   AND

2. Any additional single power source failure will result in a unit blackout

CREW PREBRIEF INSTRUCTIONS

Unit 1 is in OPCON 1 at 100% power

Specific Plant Conditions are as follows:

- Rod pattern adjustment has just been completed

Inoperable/Out of Service Equipment and Estimated Time of Return (ETR):

- D11 D/G is OOS for jacket water leak, day 2 of 30 day LCO; repairs are expected within the next 24 hours

Planned Evolutions;

- Maintain 100% power

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Limerick Scenario No.: 4 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 100% power

Turnover: The PJM has issued a Maximum Emergency Generation Alert due to grid instabilities. Maintain reactor power at 100% and comply with TSO requests for grid support as necessary.

Event No.	Malf. No.	Event Type*	Event Description
1	MVI232F MRP029A	I-ATC TS-SRO	Rx Level Transmitter LT-42-1N080C Fails Low with No RPS Actuation Signal
2	VIC105A6	R-ATC TS-SRO	'1A' Recirc Pump Motor High Vibration (Power Reduced to ≤ 93% to Clear Annunciator 111 D2)
3	MCU194	C-BOP	RWCU Leak with Auto Isolation Failure (Manual Isolation Successful)
4	MEG095	C-BOP	Main Generator Auto AC Voltage Regulator Failure Resulting in Transfer to the Manual DC Voltage Regulator
5		C-ATC	'1A' Recirc Pump ASD Controller Incremental Speed Increase
6	MED275C	C-BOP TS-SRO	Loss of Safeguard Bus D134 (Loss of Reactor Enclosure Supply, Exhaust, and REECE Fans)
7	MRT001B MMS061A MMS062A MMS136	M-ALL	Main Steam Line High High Radiation (Fuel Failure) / MSL Break in Outboard MSIV Room (Rooms 407 and 518) with Failure of the 'A' Main Steam Line to Isolate
8	MRE001A MRE001B MRE317 RRE013	C-ATC	SGTS Exhaust Fans 0AV163 and 0BV163 Trip (Recoverable) / Leak Propagation

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario Summary

Event 1: The scenario begins with Unit 1 at 100% power. The PJM has issued a Maximum Emergency Generation Alert due to grid instabilities. The oncoming crew has been directed to maintain reactor power at 100% and to comply with TSO requests for grid support as necessary. After turnover, Reactor Level Transmitter LT-42-N080C will fail downscale with no RPS system actuation (A2 half scram does not occur). The crew will enter and execute OT-117, "RPS Failure," and ultimately identify an RPS Trip System A2 failure. The RPS failure will require the crew to insert a manual half scram on the 'A' side RPS. The SRO will enter Tech Spec 3.3.1 for the RPS instrumentation failure.

Event 2: After Tech Specs have been addressed for RPS, the '1A' Recirc Pump Motor experiences a high vibration condition resulting from a pump imbalance as indicated by receipt of Annunciator 111 D2, "1A RECIRC PUMP MOTOR HI VIBRATION." The crew will reduce speed of the '1A' Recirc Pump to clear the annunciator using the direction provided in ARC-MCR-111 D2, resulting in a power reduction of approximately 7% (≤ 93% RTP). Power reduction is performed in accordance with GP-5 Appendix 2, "Planned Rx Maneuvering Without Shutdown," and the Reactor Maneuvering Shutdown Instructions (RMSI). The SRO will refer to Tech Spec 3.4.1.3 and direct the ATC to lower '1B' Recirc pump speed to comply with Tech Spec ACTION 3.4.1.3.a for Recirc Loop Flow Mismatch.

Event 3: Once Recirc Loop Flow Mismatch has been re-established, a primary system coolant leak occurs on the RWCU suction piping between HV-44-1F004 and HV-44-1F040 in the RWCU Isolation Valve Compartment (Rooms 510 and 522). The crew recognizes that the leak is from the RWCU system based upon receipt of Annunciator 112 (I3), "RWCU HI DIFF FLOW ISLN TIMER INITIATED." Rising offsite release rates at the Unit 1 South Stack confirm the existence of an actual leak. The crew recognizes failure of the RWCU system to automatically isolate when Annunciator 112 CLEANUP (I3) does not clear after 30 seconds, and takes prompt actions to manually isolate RWCU as directed by ARC-MCR-112 (I3). The manual isolation is successful. Tech Spec 3.3.2 for failure of RWCU System Isolation Actuation Instrumentation, and TRM Surveillance Requirement 4.4.4.c for continuous recording of reactor coolant conductivity, will not be evaluated as part of the scenario.

Event 4: Once RWCU has been manually isolated, the Main Generator Auto AC Voltage Regulator will fail, resulting in transfer to the Manual DC Voltage Regulator. The crew will notify the TSO that the Voltage Regulator is in Manual. The SRO will direct the BOP to raise Generator MVARS to 350 by adjusting the Manual DC Voltage Regulator per TSO direction.

Event 5: Once Generator Reactive Load has been raised to 350 MVARS, and the required 15 minute notifications made for the Generator Voltage Regulator in Manual, the '1A' Recirc Pump Adjustable Speed Drive (ASD) controller fails such that the speed demand output signal causes an incremental speed increase. The crew identifies the failure of the '1A' Recirc Pump ASD controller and takes actions to (1) place the ASD controller in 'Speed Hold,' and (2) reduce power by lowering '1B' Recirc Pump speed in accordance with OT-104, "Unexpected/Unexplained Positive or Negative Reactivity Insertion," GP-5 Appendix 2, "Planned Rx Maneuvering Without Shutdown," and the RMSI. Tech Spec 3.4.1.3 for Recirc Loop Flow Mismatch, will not be evaluated as part of Event #5 since it was previously evaluated in Event #2.

Event 6: After the plant has been stabilized, and a determination made regarding whether power exceeded 3515 MWth, the plant experiences a loss of the D134 Safeguard Load Center.

The crew will enter E-D134, "Loss of D134 Safeguard Load Center," conduct MCR panel walkdowns, and identify affected systems/components. Equipment availability following loss of D134 will lead SRO to prioritize a Manual Initiation of Rx Enclosure Secondary Containment Isolation due to loss of the Reactor Enclosure (RE) Supply and Exhaust Fans, and the REECE Fans. A Refuel Floor Isolation on Low Zone ΔP, with both SGTS Fans drawing from the Refuel Floor, will occur several minutes into the event. Trip of the '1A' Instrument Air Compressor will not challenge Instrument Air with the '1B' Instrument Air Compressor in service. As such, start of the Backup Service Air Compressor will not be an immediate priority. The SRO will enter multiple Tech Specs, including ECCS - Operating (3.5.1), Primary Containment Isolation Valves (3.6.3), Control Room Emergency Fresh Air Supply System (3.7.2), AC Sources - Operating (3.8.1), DC Sources - Operating (3.8.2), and Onsite Power Distribution Systems - Operating (3.8.3).

Events 7-8: After the plant has been stabilized, a Reactor Fuel Pin Failure occurs (the result of '1A' Recirc Pump incremental speed increase - see Event 5 above) causing a rise in MSL and SJAE Discharge Radiation levels, as well as numerous other high radiation alarms both in containment and in various areas of the plant. The crew will identify the increase in area radiation monitoring, enter ON-102, "Air Ejector Discharge or Main Steam Line High Radiation," and reduce power per GP-5 Appendix 2, "Planned Rx Maneuvering Without Shutdown," and the RMSI, in an attempt to maintain MSL radiation levels below the 1.5X NFPB Alarm setpoint (ARC-MCR-109 (F1/F2)) and air ejector discharge radiation level below the Hi Hi Alarm setpoint (ARC-MCR-109 (G1)). The crew will also enter and take the required actions as directed by T-103, "Secondary Containment Control." Eventually, MSL radiation levels will rise to greater than 3X NFPB Alarm setpoint (ARC-MCR-107 (I1)), requiring a T-103 shutdown and closure of the MSIVs. The crew will manually scram the reactor (Critical Task), enter T-101, "RPV Control," and execute both T-101 and T-103 concurrently. The SRO prioritizes Level Control with HPCI/RCIC, Pressure Control with SRVs, and directs the crew to close the MSIVs.

The 'A' MSL line will rupture downstream of Outboard MSIV HV41-1F028A with a failure of the 'A' MSL to isolate. The leak is located in the MSL and Feedwater Pipe Chase (Rooms 407 and 518). SGTS Exhaust Fans 0AV163 and 0BV163 will trip (recoverable). A Reactor Enclosure Pipeway Penetration Failure between MSL Pipe Chase Room 518 and RWCU Isolation Valve Compartment Room 510, will pressurize and discharge steam to Compartment 510. Reactor Enclosure Door No. 423 between MSL Pipe Chase Room 518 and Corridor 506 was not properly closed the last time operated, resulting in the discharge of steam into Corridor 506 as evidenced by increased activity levels on ARMs in both the RWCU HX and RWCU Pump Areas. In addition, pressure in MSL Pipe Chase Room 518 increases to the setpoint of the 0.25 psid blowout panel, discharging steam from the north wall of the Reactor Enclosure into the Turbine Enclosure Condenser Compartment. Pressure in the Condenser Compartment does not increase to the setpoint of the Condenser Compartment blowout panel, therefore no steam is discharged directly to the atmosphere outside the Turbine Enclosure. The crew recognizes that an unisolable primary discharge is in progress and that an Emergency Blowdown is required as directed by T-103, on either MSO Rad level exceeded in two or more areas or MSO Temperature exceeded in two or more areas. The SRO directs the crew to emergency depressurize the RPV (Critical Task) per T-112, "Emergency Blowdown." The scenario may be terminated when RPV blowdown is in progress and RPV water level is being maintained between +12.5" and +54" in accordance with T-101.

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	8
2. Malfunctions after EOP entry (1–2)	1
3. Abnormal events (2–4)	3
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2) T-101/T-103	2
6. EOP contingencies requiring substantive actions (0–2) T-112	1
7. Critical tasks (2–3)	2

Critical Tasks

1.

★ **Initiate a Manual Scram when MSL Rad Level reaches 3 x NFPB (T-103 SCC/RAD-4)**

Safety Significance

Initiating a manual scram minimizes radiation exposure to the public by reducing primary system energy and radiation levels. Scramming the reactor reduces to decay heat levels the energy that the RPV may be discharging to and from the Reactor Building.

Consequences for Failure to Perform Task

SCC/RAD-4

1. Transfer house loads
2. Runback recirc to minimum
3. Manually SCRAM at 60% core flow

Failure to manually scram prior to closing MSIVs as directed in SCC/RAD-6, would result in an automatic reactor scram on high pressure, complicate T-103 mitigation strategies, and lead to higher radiation levels in the Secondary Containment.

LGS TRIP Step SCC/RAD-4 directs actions to rapidly, but in a controlled manner, shut down the reactor once it has been determined that the rise in main steam line radiation levels is not the result of Hydrogen Water Chemistry (HWC) System operation.

Subsequent steps in this section of the SCC/RAD flowpath direct closure of the main steam isolation valves (MSIVs). These actions should be performed, however, only after the reactor has been shutdown. Therefore, Step SCC/RAD-4 directs actions to rapidly shutdown the reactor.

The actions specified in Step SCC/RAD-4 are consistent with the guidance provided in GP-4, Rapid Plant Shutdown To Hot Shutdown. The phrase "Runback recirc to minimum" means Reactor Recirculation Pump speed should be runback to the low speed stop.

Indications/Cues for Event Requiring Critical Task

Main Steam Line radiation levels exceed 3 times normal full power background as indicated by receipt of Annunciator 107 (I1), "MAIN STEAM LINE HIGH-HIGH RADIATION,' and reading on MCR Instrument RR-41-1R603 (Panel 10C600).

Performance Criteria

Transfer house loads, runback recirc to minimum, and place the Mode Switch in "Shutdown."

Performance Feedback

Reactor shutdown as determined during execution of RC/Q Leg of T-101, "RPV Control."

2.

■ **Emergency Depressurize RPV (T-112 EB-11)**

Safety Significance

RPV depressurization places the primary system in its lowest possible energy state, rejects heat to the suppression pool in preference to outside the containment, and reduces the driving head and flow of primary systems that are unisolated and discharging into the Reactor Building.

Consequences for Failure to Perform Task

The consequences of not depressurizing the RPV under conditions which require emergency RPV depressurization, would result in elevated offsite release rates and significantly challenge Reactor Building integrity.

LGS TRIP Step EB-11 directs actions to open all five Automatic Depressurization System (ADS) safety relief valves (SRVs).

The objective of T-112, Emergency Blowdown, is to depressurize the RPV as rapidly as possible within plant design limits and to maintain it in a "depressurized" state. Two separate aspects must be considered in deciding how these objectives are to be accomplished: the means for releasing the energy from the RPV and the capacity of the heat sink utilized to absorb this energy.

Depressurization of the RPV is most easily and rapidly performed by opening SRVs; thus instructions for operation of these valves are specified first, in preference to steps directing the use of other depressurization systems and mechanisms. Of the SRVs, those dedicated to the ADS function are the most reliable because of their qualifications, pneumatic supply systems, the design and operation of initiation circuitry, and the availability of control power. Additionally, the relative location of their discharge devices uniformly distributes the heat load around the suppression pool.

Concurrent opening of all five ADS valves is within analyzed plant design limits. Other steps in the TRIP procedures provide instructions for maintaining sufficient suppression pool heat capacity to accommodate simultaneous opening of all ADS valves at any RPV pressure.

The reference to LGS TRIP NOTE #5 informs operators that the RPV depressurization performed in accordance with this step may be conducted "regardless of the resulting cooldown rate," since the need for the rapid depressurization of the RPV takes precedence over normal RPV cooldown rate limits.

Indications/Cues for Event Requiring Critical Task

An unisolable primary discharge is in progress and T-103 MSO Rad levels
OR Temperatures exceeded in two or more areas, as determined by performance of T-290, "Instrumentation Available For T-103/SAMP-2."

Performance Criteria

Open 5 ADS valves to emergency depressurize the RPV when an unisolable primary discharge is in progress, and T-103 MSO Rad levels or Temperatures exceeded in two or more areas.

Performance Feedback

Verify ADS valves are open by observing red light open indication, acoustic monitor indications, lowering RPV pressure, and T-103 Radiation levels and Temperatures trending downward.

The scenario may be terminated when RPV blowdown is in progress, RPV water level can be restored and maintained between +12.5" and +54" in accordance with T-101, and upon direction of the Chief Examiner

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION
	■ Reset simulator to IC **183** ■ Take out of FREEZE and ensure the following: - Reactor Power is 100%
	■ Apply Information Tags on the following components: - None
	■ Ensure materials for applicants: - Turnover sheet: o 100% power o The PJM has issued a Maximum Emergency Generation Alert due to grid instabilities o Maintain reactor power at 100% and comply with TSO requests for grid support as necessary
	■ Ensure the following malfunctions are active: - MRP029A — RPS Fails to Scram (Auto only) - MMS061A — Inboard MSIV HV41-1F022A Fails Open - MMS062A — Inboard MSIV HV41-1F028A Fails Open ■ Ensure the following Triggers are assigned: - {Trigger 1} MVI232F — Rx Level Xmtr LT-42-1N080C Fails Low - {Trigger 2} VIC105A6 — 1A Recirc Pump Motor Hi Vib (Pump Imbalance) - {Trigger 3} MCU194 — RWCU Leak with Auto Isolation Failure - {Trigger 4} MEG095 — Auto Voltage Regulator Failure - {Trigger 5} — 1A Recirc Pump ASD Controller Fails Upscale - {Trigger 6} MED275C — Loss of Safeguard Bus D134 (Earthquake) - {Trigger 7} MRT001B — Fuel Cladding Failure - {Trigger 8} MMS136 — MSL Leak in Outboard MSIV Room (518) - {Trigger 8} MRE001A — A SGTS Exhaust Fan Trip / Failure to Start - {Trigger 8} MRE001B — B SGTS Exhaust Fan Trip / Failure to Start - {Trigger 8} MRE317 — OB MSIV Room Leak to Room 510 - {Trigger 8} RRE013 — Door 423 Open B/T OB MSIV Room & Corr 506 ■ Ensure the following overrides are loaded: - None
	■ Reset any annunciators that should not be present

✓	ITEM / MALFUNCTION / REMOTE FUNCTION / CONDITION

The following should be used to verify proper scenario setup:

Interventions Summary - E:\2012 ILT NRC Exam\Scenario 4.scn

Hide Malfunctions - 15 | Show Remotes - 1 | Show Overrides - 0 | Show Annunciators - 1

Malfunction Summary

Mall ID	Mult ID	Description	Current Value	Target Value	Rmptime	Actime	Dactime	Trig
MVI232F		Reactor Vessel Level Transmitter (RPS) N080C Fails Low		True	00:00:00	00:00:00	00:00:00	1
MRP029A		RPS Fails to Scram, Auto Only		True	00:00:00	00:00:00	00:00:00	0
VIC105A6		1A Reactor Recirc Pump Imbalance at Probe 105A06		13.00035	00:02:00	00:00:00	00:00:00	2
MCU002A		RWCU Isol Vlv HV44-1F001 Fails To Autoclose on Isol Signal		True	00:00:00	00:00:00	00:00:00	0
MCU002B		RWCU Isol Vlv HV44-1F004 Fails To Autoclose on Isol Signal		True	00:00:00	00:00:00	00:00:00	0
MEG095		Main Generator Auto Voltage Regulator Failure		True	00:00:00	00:00:00	00:00:00	4
MRE001A		Standby Gas Treatment Fan (SGTS) A Trips		True	00:00:00	00:03:00	00:00:00	8
MED275C		Fault on Safeguard Load Center D134		True	00:00:00	00:00:00	00:00:00	6
MRT001B		Fuel Cladding Failure - # of Fuel Pins		1000	00:25:00	00:00:00	00:00:00	7
MMS061A		Inboard MSIV HV41-1F022A Fails Open		True	00:00:00	00:00:00	00:00:00	0
MMS062A		Outboard MSIV HV41-1F028A Fails Open		True	00:00:00	00:00:00	00:00:00	0
MMS136		Steam Leak Outside Primary Containment (0-100%)		50	00:10:00	00:00:40	00:00:00	8
MRE001B		Standby Gas Treatment Fan (SGTS) B Trips		True	00:00:00	00:03:00	00:00:00	8
MRE317		RWCU Pipeway Leak		50	00:05:00	00:04:00	00:00:00	8
MCU194		RWCU Pump Suction Leak (Primary Leak Outside Drywell)		80	00:02:00	00:00:00	00:00:00	3

Timer Pause | Delete All | Active | Pending

Interventions Summary

Show Malfunctions - 15 | Hide Remotes - 1 | Hide Overrides - 1 | Hide Annunciators - 1

Remotes Summary

Remt ID	Mult ID	Description	Current Value	Target Value	Rmptime	Actime	Trig
RRE013		Rx Encl Door 423, Steam Chase 518 to Corridor 506	CLOSE	OPEN		00:04:00	8

Timer Pause | Clear List | Active | Pending

Override Summary

Tag ID	Description	Position / Target	Actual Value	Override Value	Rmptime	Actime	Dactime	Trig
PB-043-1088-	1B Adjustable Speed Drive 1 RPM Speed Demand Raise	RAISE 1	OFF	OFF				5

Timer Pause | Delete All | Active | Pending

Annunciator Summary

Window	Description	Tagname	Override Type	OVal	AVal	Actime	Dactime	Trig
D2	1A Recirc M-G Pump Motor Hi Vibration	111 RECIRC D2	ON	ON	OFF	00:03:00		2

Timer Pause | Delete All | Active | Pending

Event Trigger Builder / Viewer

Favorites Triggers

Trigger #	Trigger Text
1	
2	
3	
4	
5	
6	
7	
8	ZMS22AA
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	

Operators:

Arithmetic:
- * Multipication
- / Division
- + Addition
- - Subtraction

Relational:
- > Greater than
- >= Greater Than or equal
- < Less than
- <= Less than or equal
- == Equal to
- != Not equal to

Logical:
- && And
- || Or
- ! Not

Other:
- (Open Paren
-) Close Paren

Trigger Now | Clear | Clear All | Accept | Exit

INSTRUCTIONS FOR SIMULATOR OPERATOR

EVENT 1: Rx Level Xmtr LT-42-1N080C Fails Low

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When **instructed by Lead Evaluator to proceed** following crew turnover, activate Trigger 1 (MVI1232F) for Rx Level Xmtr LT-42-1N080C Fails Low. [Note: Malfunction MRP029A (RPS Failure to Auto Scram) is 'Active' when the simulator is taken out of freeze to start the scenario.]
	■ As EO dispatched to 10C609 to determine RPS trip unit status, wait 4 minutes and report: "Trip Unit LIS-42-1N680C RPV level instrument indicates tripped on 10C609."
	■ If WWM contacted to investigate, respond: "I'll contact I&C to troubleshoot."
	■ Respond to request for assistance as appropriate.

EVENT 2: 1A Recirc Pump Motor Hi Vib (Pump Imbalance)

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once the Half SCRAM has been Manually inserted, Tech Specs addressed, and **instructed by Lead Evaluator to proceed**, activate Trigger 2 to insert Malfunction VIC105A6 ('1A' Recirc Pump Motor High Vibration), and turn on MCR Annunciator 111 (D2) after a two-minute time delay.
	■ '1A' Recirc pump motor vibration alarm will clear after ATC has reduced Rx power approximately 7% down to 93% RTP.
	■ Respond to request for assistance as appropriate.

EVENT 3: RWCU Leak with Auto Isolation Failure

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once power has been reduced to clear the '1A' Recirc pump motor vibration alarm, '1B' Recirc pump speed lowered to comply with Tech Spec ACTION 3.4.1.3.a for Recirc Loop Flow Mismatch, and **instructed by Lead Evaluator to proceed**, activate Trigger 3 (MCU194) for RWCU Leak with Auto Isolation Failure.
	■ As Fire Brigade Leader dispatched in response to Annunciator 006 (F-5-U) following crew actions to isolate RWCU, wait 4 minutes and report: "This is the Fire Brigade Leader, there are no indications of a fire on 283' Elev on Unit 1, but the area is very humid."
	■ If contacted as WWM to investigate RWCU leak, respond: "A team will be assembled to investigate."
	■ Respond to request for assistance as appropriate.

EVENT 4: Main Generator Auto AC Voltage Regulator Failure

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once RWCU has been manually isolated and **instructed by Lead Evaluator to proceed**, activate Trigger 4 (MEG095) for Main Generator Auto AC Voltage Regulator Failure.
	■ When contacted as TSO, respond to LGS report, and add: "Due to the Grid Emergency, Limerick Unit 1 is required to raise MVARs to 350."
	■ If contacted as WWM to investigate Voltage Regulator failure, respond: "I&C will be contacted to troubleshoot."
	■ Respond to request for assistance as appropriate.

EVENT 5: 1A Recirc Pump ASD Controller Incremental Speed Increase

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Once Main Generator Reactive Load has been raised to 350 MVARS using the Manual DC Voltage Regulator, and **instructed by Lead Evaluator to proceed**, activate Trigger 5 for '1A' Recirc Pump ASD Controller Incremental Speed Increase. **IMPORTANT NOTE:** In order to continue raising speed, this override must be inserted and then deleted immediately to prevent pushbutton lockout! This same action needs to be repeated until the crew takes action to place the ASD on Speed Hold.
	■ Limit '1A' Recirc pump speed increase to a reactor power equivalent of 101% RTP in the event the crew does not recognize or fails to take action to place the pump in "Speed Hold." The Recirc pump may reach this limit before the crew understands the cause of the positive reactivity insertion. ■ Manually simulate the incremental rise in Recirc pump speed by repeatedly overriding the 10 RPM Raise Pushbutton for the '1A' ASD Controller, and then removing the override.
	■ Respond as WWM as requested.
	■ Respond to request for assistance as appropriate.

EVENT 6: Loss of Safeguard Bus D134

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ Ensure plant equipment / systems aligned as specified above when coming out of freeze, to support Safeguard Bus D134 event.
	■ When power is being maintained at or below the pre-transient power level, the plant stabilized, a determination made regarding whether power exceeded 3515 MWth, and **instructed by Lead Evaluator to proceed**, activate Trigger 6 (MED275C) for Loss of Safeguard Bus D134.
	■ When dispatched as EO to determine status of the Reactor Enclosure HVAC Fans, wait 3 minutes and report: "Unit 1 Reactor Enclosure HVAC is off."
	■ As EO dispatched to investigate trip of D134 Load Center, wait 5 minutes and report: "The D134 Load Center supply breaker has tripped on 'A' Phase Overcurrent."
	■ Respond to request for assistance as appropriate.

EVENTS 7 & 8: MSL High Rad (Fuel Failure), 'A' MSL Failure to Isolate, MSL Break in OB MSIV Rm, Trip of Both SGTS Exhaust Fans

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ When Manual Initiation of the Reactor Enclosure Secondary Containment Isolation Signal has been completed, and **instructed by Lead Evaluator to proceed**, activate Trigger 7 (MRT001B) for Fuel Cladding Failure. Note: Driver may need to pause timer to prevent Main Steam Line Rad from rising too quickly. Fuel Break should be paused at 85 broken pins to allow crew to take ON-102 actions. In order to continue raising rad release, the number of pins that fail should double each time rad levels stabilize. Continue raising the number of broken pins until MAIN STEAM LINE HI HI RAD alarms.
	■ Ensure number of failed fuel pins simulated is large enough to cause MSL radiation levels to exceed 3 x NFPB and T-103 MSO radiation levels to be exceeded in two or more areas
	■ As EO dispatched to the AER to monitor T-290 numbers, provide continuous monitoring of Secondary Containment Rad levels and Temperatures, and report approach to any MNO/MSO threshold value. (Note that MSO Rad and Temperature values will both be exceeded in two or more areas during this scenario; will require multiple reports).
	■ Trigger 8 Malfunction MMS136 (MSL Leak in Outboard MSIV Room), automatically activated approximately 30-45 seconds after the MSIV handswitches for HV-41-1F022A / 1F028A and are taken to CLOSE.
	■ As Fire Brigade Leader dispatched in response to Annunciator 006 (F-5-U) following the steam leak in the Outboard MSIV Room, wait 5 minutes and report: "This is the Fire Brigade Leader, Unit 1 283 area is filled with steam and I can hear the sound of steam. I am pulling out of the area."
	■ Trigger 8 Malfunctions MRE001A ('0A' SGTS Exhaust Fan Trip) and MRE001B ('0B' SGTS Exhaust Fan Trip), automatically activated approximately 3 minutes after Trigger 8 Malfunction MMS136 is activated.

✓	MALFUNCTION / REMOTE FUNCTION / REPORT
	■ **IMPORTANT NOTE:** **Remove SGTS Exhaust Fan Malfunctions MRE001A and MRE001B immediately after the fans have tripped (allows MCR to re-establish/maintain a –ΔP in the Reactor Enclosure by manually starting one or both SGTS Fans).**
	■ Trigger 8 Malfunction MRE317 (OB MSIV Room Leak to RWCU Isolation Valve Compartment Room 510), automatically activated approximately 4 minutes after Trigger 8 Malfunction MMS136 is activated.
	■ Trigger 8 Malfunction RRE013 (Door 423 Open between OB MSIV Room 518 and Corridor 506), automatically activated approximately 4 minutes after Trigger 8 Malfunction MMS136 is activated.
	■ Pressures in the OB MSIV Room will increase to the .25 psid setpoint of the panel that relieves from the North wall of the Reactor Enclosure into the Turbine Building. This blowout panel discharges into the Turbine Enclosure at Elevation 253 ft., above one of the Feedwater Heater Rooms. This area communicates directly with the Condenser Compartment. Pressure in the Condenser Compartment will NOT increase to the setpoint of the Condenser Compartment blowout panel, therefore no steam will be directly discharged to the atmosphere outside the Turbine Building. Offsite Release Rates will remain below Table LGS 3-1 EAL Matrix ALERT threshold levels (T-104 entry unnecessary).
	■ Ensure that T-291 RPV Level Transmitters are providing valid indication when SRO uses the following to determine elevated Reactor Enclosure temperature effects on RPV level instrumentation *(CAUTION preceding T-103 Step SCC/T-1)*: Use SPDS/PMS RPV level validation (#071) **OR** reference leg saturation limit curve (SPDS/PMS curve 044 OR T-103 Curve SCC/T-1)
	■ Ensure that indicated levels for T-291 RPV Level transmitters, following insertion of Trigger 8 Malfunctions MMS136, MRE317, and RRE013, are above the Minimum Indicated Level (MIL) identified in the applicable T-291 Attachments, so the MCR can determine they are Usable based on the Instrumentation usage rule/criteria NOTE pertaining to Step 4.1.1 of T-291.
	■ Respond to request for assistance as appropriate
	■ Once RPV blowdown is in progress, RPV water level restored and maintained between +12.5" and +54" in accordance with T-101, and **instructed by Lead Evaluator to terminate the scenario**, place the simulator in freeze.

Op-Test No.: _____ Scenario No.: 4 Event No.: 1 Page ___ of ___

Event Description: Rx Level Transmitter LT-42-1N080C Fails Low with No RPS Actuation Signal
Priority: Insert a manual half scram on 'A" RPS side, address Tech Specs

Time	Position	Applicant's Actions or Behavior
	SRO	**Evaluator Note:** *Malfunction MRP029A (RPS failure to Auto Scram), is Active when the simulator is taken out of freeze to start the scenario.* Receives report from ATC of Annunciator 107 (H1), "REACTOR WATER BELOW LEVEL 3 TRIP" Receives the following reports from ATC: • Power, Pressure, and Level are stable • Reactor Level +35" and no Rx low level condition exists • No Full SCRAM or Half SCRAM has occurred and all scram lights remain lit. [Note: Annunciator 108 B2, "AUTO SCRAM CHANNEL A2" does not alarm]
	SRO	Determines an RPS level instrument has failed with no RPS actuation, and announces entry into OT-117, "RPS Failures"
	SRO	(OT-117, Step 3.2.1) Directs ATC to INSERT a Manual Half SCRAM on 'A' RPS side
	SRO	Contacts WWM requesting I&C Maintenance support to investigate the RPS failure
	SRO	Initiates R.O.G "Significant Event Reporting" procedure due to unexpected RPS instrument failure with no Half SCRAM actuation signal
	SRO	Determines that the following ACTION is applicable with respect to TS 3.3.1: (ACTION 3.3.1.a) With the number of OPERABLE channels in either trip system for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, within one hour for each affected functional unit either verify that at least one* channel in each trip system is OPERABLE or tripped or that the trip system is tripped, or place either the affected trip system or at least one inoperable channel in the affected trip system in the tripped condition.

		Evaluator Note: *Once the Half SCRAM has been Manually inserted, and Tech Specs addressed,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, '1A' Recirc Pump Motor High Vibration.* • *Booth operator will activate Trigger 2 to insert Malfunction VIC105A6 ('1A' Recirc Pump Motor High Vibration), and turn on MCR Annunciator 111 (D2) after a 2 minute time delay.*
	ATC	Reports the following: • Annunciator 107 (H1), "REACTOR WATER BELOW LEVEL 3 TRIP" alarm • Power, Pressure, and Level are stable • Reactor Level +35" and no Rx low level condition exists • No Full SCRAM or Half SCRAM has occurred and all scram lights remain lit. [Note: Annunciator 108 B2, "AUTO SCRAM CHANNEL A2," does not alarm]
	ATC	Dispatches EO to 10C609 to determine the trip unit in alarm
	ATC	Informs SRO that EO reports Trip Unit LIS-42-1N680C indicates tripped on 10C609
	ATC	When directed by SRO to INSERT a Manual Half SCRAM on 'A' RPS side: (OT-117, Step 3.2.1) Arms AND Depresses RPS Manual Half SCRAM pushbuttons A1 and A2 **AND** verifies 'A' RPS channel white lights extinguished Informs SRO that an 'A' RPS side Half SCRAM has been successfully inserted

Op-Test No.: _____ Scenario No.: 4 Event No.: 2 Page ___ of ___

Event Description: '1A' Recirc Pump Motor High Vibration
Priority: Reduce power to clear Annunciator 111 (D2), address Tech Specs

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from ATC of the following annunciators: • Annunciator 107 (I2), "VIBRATION ALARM ALERT" • Annunciator 111 (D2), "1A RECIRC PUMP MOTOR HI VIBRATION" Informed by ATC that ARC-MCR-111 (D2) direction is to reduce the speed of '1A' Recirc pump to clear the annunciator (ARC-MCR-111 D2, Step 1) Directs BOP to monitor vibrations and directs ATC to reduce the speed of '1A' Recirc pump in accordance with GP5 Appendix 2 and RMSI, to clear the annunciator RMSI: 1. **IF** Core Flow is **GREATER THAN** 60 Mlb/hr, **THEN REDUCE** power as needed with flow until any of the following occur, A) **Core Flow reaches** 60 Mlb/hr B) An **"APRM UPSCALE"** alarm occurs OTHERWISE N/A this step. 2. **IF FLLLP** exceeds 1.0 **THEN FULLY INSERT** control rods from, "Rods required for Stability Rod Line" table to lower FLLLP to less than **OR** equal to 1.0, OTHERWISE N/A this step. **Evaluator Note:** *Annunciator 111 (D2) will clear after power has been reduced by approximately 7% (≤ 93% RTP).*

	SRO	References TS 3.4.1.3 for Recirc Loop Flow Mismatch: 3.4.1.3 Recirculation loop flow mismatch shall be maintained within: a. 5% of each other with core flow greater than or equal to 70% of rated core flow. b. 10% of each other with core flow less than 70% of rated core flow. With the recirculation loop flows different by more than the specified limits, either of the following ACTIONS would be applicable: (ACTION 3.4.1.3.a) Restore the recirculation loop flows to within the specified limit within 2 hours, or (ACTION 3.4.1.3.b) Shutdown one of the recirculation loops within the next 8 hours and take the ACTION required by Specification 3.4.1.1.
	SRO	Directs ATC to lower '1B' Recirc pump speed in accordance with GP5 Appendix 2 and RMSI, to restore recirculation loop flows to within 5% of each other
		Evaluator Note: *Once power has been reduced to clear '1A' Recirc pump motor vibration Annunciator 111 (D2), and '1B' Recirc pump speed lowered to comply with Tech Spec ACTION 3.4.1.3.a for Recirc Loop Flow Mismatch,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, RWCU Leak with Auto Isolation Failure.* • *Booth operator will activate Trigger 3 to insert Malfunction MCU194 (RWCU Leak with Auto Isolation Failure).*
	ATC	Reports the following: • Annunciator 107 (I2), "VIBRATION ALARM ALERT • Annunciator 111 (D2), "1A RECIRC PUMP MOTOR HI VIBRATION,"

	ATC	(ARC-MCR-111 D2, Step 1) When directed by SRO, reduces the speed of '1A' Recirc pump in accordance with GP5 Appendix 2 and RMSI, to clear the annunciator: **DEPRESS** 1A Recirc Pump Speed Lower Pushbutton(s) as required **AND VERIFY** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM **Evaluator Note:** *ASD controller manipulations will likely be performed from memory*
	ATC	(ARC-MCR-111 D2, Step 2) Depresses Pump Vibration Reset button at 10C602 for several seconds to reset the vibration switch (allows the annunciator to clear when below the setpoint)
	ATC	When directed by CRS to lower '1B' Recirc pump speed in accordance with GP5 Appendix 2 and RMSI to restore recirculation loop flows to within 5% of each other: **DEPRESSES** 1B Recirc Pump Speed Lower Pushbutton(s) as required **AND VERIFIES** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM **Evaluator Note:** *ASD controller manipulations will likely be performed from memory*
	BOP	(ARC-MCR-107 I2, Step 3) Acknowledge alarm at MCR vibration terminal and monitors '1A' Recirc pump motor vibration
	BOP	(ARC-MCR-107 I2, Step 4) Perform the following to acknowledge computer alarm AND stop the alarm window from blinking. This allows computer alarm reflash. NOTE: DO NOT clear list. a. Left click on alarm window to display alarm list. b. Right click on alarm window to acknowledge alarm. c. Click on acknowledge alarm. Window will stop blinking.
	BOP	(ARC-MCR-107 I2, Step 5) Click on machine icon, THEN click on bar graph to display real time channel data to monitor vibration levels

Op-Test No.: _____ Scenario No.: 4 Event No.: 3 Page ___ of ___

Event Description: RWCU Leak with Auto Isolation Failure
Priority: Manually isolate the leak from the MCR

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from BOP of Annunciator 112 (I3), "RWCU HI DIFF FLOW ISLN TIMER INITIATED" and that ARC direction is to isolate RWCU if timer does not clear after 30 seconds (ARC-MCR-112-I3, Step 1) Recognizes failure of the leak to isolate and Directs BOP to Manually isolate RWCU **Evaluator Note:** *Crew may take prompt action to isolate RWCU before the 30 seconds is up.*
	SRO	Checks Work Station 00-Z559, "MCR RMDS Work Station In MCR," to monitor offsite release rates at the Unit 1 South Stack
	SRO	**Evaluator Note:** *Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA," is a direct result of the RWCU leak. A Fire does not exist.* Receives report from BOP of Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA" Directs BOP to perform SE-8 Appendix 1, "Fire Hard Card"
	SRO	Contacts WWM requesting I&C Maintenance support to investigate failure of the RWCU Isolation Actuation

	SRO	**Evaluator Note:** *Tech Spec 3.3.2 has been included in the scenario write-up for reference purposes only. This Tech Spec will **NOT** be evaluated as part of the scenario.* Determines that the following ACTION is applicable with respect to TS 3.3.2 for Isolation Actuation Instrumentation **AND** Recognizes that the required ACTIONS have been completed since both trip systems are already tripped and the isolation valves are already closed): (ACTION 3.3.2.c) With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement for both trip systems, place at least one trip system** in the tripped condition within 1 hour and take the ACTION required by Table 3.3.2-1. RWCU Δ Flow - High, Table 3.3.2-1 (ACTION 23): In OPERATIONAL CONDITION 1 or 2, verify the affected system isolation valves are closed within 1 hour and declare the affected system inoperable. In OPERATIONAL CONDITION 3, be in at least COLD SHUTDOWN within 12 hours.
	SRO	**Evaluator Note:** *TRM Surveillance Requirement (SR) 4.4.4.c has been included in the scenario write-up for reference purposes only. This TRM SR will **NOT** be evaluated as part of the scenario.* Determines that the following TRM Surveillance Requirement is applicable with respect to TRM 4.4.4 for RCS Chemistry: (SR 4.4.4.c) Continuously recording the conductivity of the reactor coolant, or, when the continuous recording conductivity monitor is inoperable, obtaining an in-line conductivity measurement at least once per: 1. 4 hours in OPERATIONAL CONDITIONS 1, 2, and 3, and 2. 24 hours at all other times.
		Evaluator Note: *Once RWCU has been manually isolated, **Lead Evaluator instruct Booth Operator to proceed to next event**, Main Generator Auto AC Voltage Regulator Failure.* • *Booth operator will activate Trigger 4 to insert Malfunction MEG095 (Main Generator Auto AC Voltage Regulator Failure).*

	BOP	Reports Annunciator 112 (I3), "RWCU HI DIFF FLOW ISLN TIMER INITIATED" and that ARC direction is to isolate RWCU if timer does not clear after 30 seconds
	BOP	(ARC-MCR-112-I3, Step 1) Isolates RWCU by Manually closing HV-044-1F004 AND HV-044-1F105 Informs SRO that isolation is successful as evidenced by Annunciator 112 (I3) clear and lowering offsite release rates at the Unit 1 South Stack **Evaluator Note:** *Additional action may be taken to close one or more of the following RWCU valves (additional action is not necessary to achieve RWCU isolation):* *HV-44-1F001* *HV-44-1F039* *HV-44-1F042* *Steps taken to manually isolate RWCU will likely be performed from memory*
	BOP	**Evaluator Note:** *Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA," is a direct result of the RWCU leak. A Fire does not exist.* Reports Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA" Performs SE-8 Appendix 1, "Fire Hard Card": (Step 2.0) RECORDS time of Fire Alarm Annunciator 006 (F-5-U) (Step 3.0) ACTIVATES the Fire Brigade Leader (Step 4.0) Selects the following announcement to dispatch the Fire Brigade Leader and Rad Pro to elevation 283 RE, NW Area **FIRE DETECTION ALARM REQUIRING IMMEDIATE FIRE BRIGADE LEADER AND RAD PRO TECHNICIAN RESPONSE** (YELLOW Color Coded Sticker on annunciator window) This is / is not a drill. Fire alarm code (Code number) has been annunciated in (location). Fire Brigade Leader or designated Fire Brigade Member and Rad Pro Tech respond. All personnel evacuate the (location) and assemble at (assembly area). Limit Channel-1 radio traffic to Fire Brigade communications and emergency use only. This is / is not a drill.

Op-Test No.: _____ Scenario No.: 4 Event No.: 4 Page ___ of ___

Event Description: Main Generator Auto AC Voltage Regulator Failure Resulting in Transfer to the Manual DC Voltage Regulator
Priority: Notify TSO that Main Generator Voltage Regulator is in Manual. Take action to raise exciter field voltage and raise Generator Reactive Load to 350 MVARs per TSO direction, by adjusting the Manual DC Voltage Regulator.

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from BOP of Annunciator 125 (D1), "1 GEN VOLT REG AUTO TRANSFER TO MANUAL" Directs BOP to perform actions of ARC-MCR-125 D1
	SRO	Contacts WWM requesting Electrical Maintenance support to investigate the Auto AC Voltage Regulator failure
	SRO	Notifies Transmission System Operator (TSO) and Power Team Generation Dispatcher that Main Generator Voltage Regulator is in Manual and provides expected duration of manual operation *(15 minute notifications per ARC-MCR-125 D1)* **Evaluator Note:** *TSO will direct the SRO to raise Generator Reactive Load to 350 MVARs using the Manual DC Voltage Regulator.* Directs BOP to raise Generator Reactive Load to 350 MVARs using the Manual DC Voltage Regulator per TSO direction
		Evaluator Note: *Once Generator Reactive Load has been raised to 350 MVARS using the Manual DC Voltage Regulator,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, '1A' Recirc Pump ASD Controller Incremental Speed Increase.* • *Booth operator will activate Trigger 5 to initiate the '1A' Recirc Pump ASD Controller Incremental Speed Increase.*

	BOP	Performs ARC actions for Annunciator 125 (D1), "1 GEN VOLT REG AUTO TRANSFER TO MANUAL": (ARC-MCR-125 D1, Step 1) • Verify the transfer to DC manual regulator has occurred as indicated on MCR panel 10C654. (ARC-MCR-125 D1, Step 4) • Adjust the DC Manual Regulator 70-G103/CS as necessary to maintain proper exciter field voltage (*raises Generator Reactive Load to 350 MVARs).* **Evaluator Note:** *Annunciator 125 (D2), "1 GEN AC & DC REGULATORS UNBALANCED," may alarm while adjusting the DC Manual Regulator. Applicant should attempt to clear the Regulator Unbalanced alarm by adjusting Auto Rheostat Control 90P-G103 in accordance with Step 4 of ARC-MCR-125 D2.* (ARC-MCR-125 D1, Step 5) • Inform SRO to notify the Transmission System Operator (TSO) and Power Team Generation Dispatcher that Main Generator voltage regulator is in Manual and provide expected duration of manual operation (15 minute notifications). (ARC-MCR-125 D1, Step 2) • Determine cause of transfer as indicated by the following annunciators on 1AC854: a) 1 Exciter Field Overcurrent, annunciator #12 b) 1 Exciter Max Excitation Limit, annunciator #13 c) 1 Generator Voltage Unbalanced, annunciator #18 d) Unit protective relay energized. (ARC-MCR-125 D1, Step 6) • Record date and time in OPS logs that TSO and Power Team Generation Dispatcher were notified that Main Generator Voltage Regulator was in manual.
	BOP	Informs SRO that Generator Reactive Load has been raised to 350 MVARS

Appendix D **Required Operator Actions** **Form ES-D-2**

Op-Test No.: _____ Scenario No.: 4 Event No.: 5 Page ___ of ___

Event Description: '1A' Recirc Pump Adjustable Speed Drive (ASD) Controller Incremental Speed Increase
Priority: Place '1A' Recirc Pump ASD Controller in Speed Hold AND Reduce '1B' Recirc Pump speed to maintain Rx power at or below the initial pre-transient level

Time	Position	Applicant's Actions or Behavior
	SRO	**Evaluator Note:** *'1A' Recirc pump speed increase will be limited to a reactor power equivalent of 101% RTP in the event the crew does not recognize or fails to take action to place the pump in "Speed Hold."* Receives report from ATC of rising Rx power and that '1A' Recirc pump speed is increasing
	SRO	Announces entry into OT-104, "Unexpected/Unexplained Positive or Negative Reactivity Insertion" (Step 3.13.2) Directs ATC to **PLACE** '1A' Recirc pump ASD Controller in "Speed Hold" at Panel 10C602 (Step 2.1) Ensures ATC takes the Immediate Operator Action to reduce Rx power and maintain at or below initial pre-transient power level in accordance with GP5 Appendix 2, and RMSI, using the '1B' Recirc pump RMSI: 1. **IF** Core Flow is **GREATER THAN** 60 Mlb/hr, **THEN REDUCE** power as needed with flow until any of the following occur, C) **Core Flow reaches** 60 Mlb/hr D) An **"APRM UPSCALE"** alarm occurs OTHERWISE N/A this step. 2. **IF FLLLP** exceeds 1.0 **THEN FULLY INSERT** control rods from, "Rods required for Stability Rod Line" table to lower FLLLP to less than **OR** equal to 1.0, OTHERWISE N/A this step.

	SRO	Determines if Rx power exceeded the licensed maximum rated thermal power of 3515 MWth due to the positivity reactivity insertion: (OT-104, Step 3.13.8) **IF** Rx power is >100% 3515 MWth as indicated by Core Power And Flow Log, **THEN REDUCE** Rx power to <100% in accordance with GP-5 Appendix 2, Planned Rx Maneuvering Without Shutdown, Section 3.1, Reducing Rx Power **AND** Reactor Maneuvering Shutdown Instructions. **Evaluator Note:** *Power reduction to maintain power at or below initial pre-transient power level previously performed per Step 2.1 of OT-104.* (Step 3.13.9) **CONSIDER** reportability of Rx power excursion **AND REFER TO** Bases (*OT-104 Bases*) (Step 3.13.10) **DEMAND** a P-1 edit **AND DETERMINE** whether a Thermal Limit violation exists. **Evaluator Note:** *P-1 edit generated by ATC will show that Thermal Limits have not been violated).*
	SRO	Contacts WWM requesting I&C Maintenance support to investigate the failure of the '1A' Recirc pump ASD Controller
	SRO	**Evaluator Note:** *Tech Spec 3.4.1.3 has been included in the scenario write-up for reference purposes only. Tech Spec 3.4.1.3 was previously evaluated in Event #2 and will **NOT** be evaluated as part of Event #5.* References TS 3.4.1.3 for Recirc Loop Flow Mismatch: 3.4.1.3 Recirculation loop flow mismatch shall be maintained within: a. 5% of each other with core flow greater than or equal to 70% of rated core flow. b. 10% of each other with core flow less than 70% of rated core flow. With the recirculation loop flows different by more than the specified limits, either of the following ACTIONS would be applicable: (ACTION 3.4.1.3.a) Restore the recirculation loop flows to within the specified limit within 2 hours, or (ACTION 3.4.1.3.b) Shutdown one of the recirculation loops within the next 8 hours and take the ACTION required by Specification 3.4.1.1.

		Evaluator Note: *If recirculation loop flows differ by more than 5% of each other following the speed increase on the '1A' Recirc pump, the Crew may assess and take action to raise '1B' Recirc pump speed (provided 3515 MWth will not be exceeded), to comply with Tech Spec ACTION 3.4.1.3.a for Recirc Loop Flow Mismatch.* *When power is being maintained at or below the pre-transient power level, the plant stabilized, and a determination made regarding whether power exceeded 3515 MWth,* ***Lead Evaluator instruct Booth Operator to proceed to next event****, Loss of Safeguard Bus D134.* • *Booth operator will activate Trigger 6 to insert Malfunction MED275C (Loss of Safeguard Bus D134).*
	ATC	Reports indications of rising Rx power and that '1A' Recirc pump speed is increasing
	ATC	(OT-104, Step 3.13.2) **PLACES** the A Speed Hold/Reset" Selector Switch, SS-043-104A, "A SPEED HOLD", to "HOLD" at Panel 10C602 **VERIFIES** ARC-MCR-111 C3, "1A RECIRC ASD SPEED HOLD" in alarm **VERIFIES** that 'HOLD' is displayed next to the "Speed Demand" indication under the Output Power and Motor on XI-043-103A
	ATC	(OT-104, Step 2.1) Takes Immediate Operator Action to reduce Rx power and maintain at or below initial pre-transient power level in accordance with GP5 Appendix 2, and RMSI, using the '1B' Recirc pump **DEPRESS** '1B' Recirc Pump Speed Lower Pushbutton(s) as required **AND VERIFY** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM **Evaluator Note:** *ASD controller manipulations will likely be performed from memory.*
	ATC	(OT-104, Step 3.13.10) Generates P-1 edit for SRO to evaluate Thermal Limits

Op-Test No.: _____ Scenario No.: 4 Event No.: 6 Page ___ of ___

Event Description: Loss of Safeguard Bus D134
Priority: Manually Initiate a Reactor Enclosure Secondary Containment Isolation (restore negative ΔP), address Tech Specs

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from BOP of the following annunciators: • Annunciator 121 B3, "D134 LOAD CENTER XFMR BKR TRIP" • Annunciator 121 D2, "D13 STANDBY AC POWER SYS OUT OF SERVICE" • Annunciator 121 G1, "1 UNIT DIV 3 SFGD BATTERY CHARGER TROUBLE" Receives report from ATC that Power, Pressure, and Level are stable Enters Transient Alarm Response Announces entry into E-D134, "Loss of D134 Safeguard Load Center" Contacts WWM requesting Electrical Maintenance support to investigate Loss of the D134 Load Center **Evaluator Note:** *Equipment availability following the Loss of D134 will lead SRO to prioritize Loss of the Reactor Enclosure (RE) Supply and Exhaust Fans, and the REECE Fans. A Refuel Floor Isolation on Low Zone ΔP, with both SGTS Fans drawing from the Refuel Floor, will occur several minutes into the event. E-D134 does not address the Refuel Floor Isolation. Crew initial actions from E-D134 will focus on Initiation of a Manual Reactor Enclosure Secondary Containment Isolation. Trip of the '1A' Instrument Air Compressor will not challenge Instrument Air with '1B' Instrument Air Compressor in service. As such, start of the Backup Service Air Compressor (Local actions) will not be an immediate priority.*

	SRO	Directs BOP to determine equipment status per E-D134, Step 2.0, Initial Actions: (Step 2.1) **ENSURE** switches on 10C681 are positioned to Loop A to restore cooling to Recirc Pump Motor Coolers & Equipment Drain Cooler *(Switches previously positioned to Loop A; unaffected by loss of D134)* (Step 2.2) **VERIFY** 1BP210, "1B RECW Pump" (PUMP), running at 10C655 *(1AP210 previously I/S; 1BP210 auto starts)* (Step 2.3) **START** 00K400, "Backup Service Air Compressor" per S15.1.B, Normal Starting of Instrument Air, Service Air, or Backup Service Air Compressors," to supply air to refuel floor inflatable seals (Local action). (Step 2.4) **PERFORMANCE** of S44.2.A, "Reactor Water Cleanup Shutdown" (*Steps for performing a RWCU Shutdown are not applicable; RWCU was isolated in Event No. 3.* (Step 2.5) **ENSURE** adequate DW Area Unit Coolers in service to maintain DW pressure/temperature (Step 2.6) **ENSURE** 1BK111, "1B Drywell Chiller," in service at 10-C681 per S87.1.A, "Startup Of Drywell Chilled Water System" or S87.1.A App. 1 *(1BK111 previously I/S; unaffected by loss of D134)* (Step 2.9) **IF** required, **THEN PLACE** 0B MCR Chiller **AND** 'B' MCR HVAC in service per S78.6.A, "Swapping of the Control Enclosure HVAC System Loops and CECW Loops" *('0A' MCR Chiller and 'A' MCR HVAC previously I/S; '0B' MCR Chiller and 'B' MCR HVAC auto start)* Briefs crew on E-D134, and prioritizes Initiation of a Manual Reactor Enclosure Secondary Containment Isolation (E-D134, Step 2.7) Directs BOP to perform S76.8.B for Initiation of a Manual Reactor Enclosure Secondary Containment Isolation (Note that crew may alternately perform the Manual Isolation using MCR-ARC-004 (B3), "REAC ENCL LOW DELTA P / LOSS OF POWER / INOP."
	SRO	Receives report from BOP of Annunciator 004 (B3), "REAC ENCL LOW DELTA P / LOSS OF POWER / INOP" May direct Initiation of a Manual Reactor Enclosure Secondary Containment Isolation to be performed in accordance with MCR-ARC -004 (B3), based upon receipt of the alarm

	SRO	(E-D134, Step 2.8) **REFERS** to CY-LG-170-301 "Offsite Dose Calculation Manual" **AND IMPLEMENTS** compensatory actions for North Stack as required
	SRO	References Tech Specs: • 3.5.1, ECCS - Operating • 3.6.3, Primary Containment Isolation Valves • 3.7.2, Control Room Emergency Fresh Air Supply System • 3.8.1, A.C. Sources Operating • 3.8.2, D.C. Sources Operating • 3.8.3, Onsite Power Distribution-Operating
	SRO	Determines that the following ACTION is applicable with respect to TS 3.5.1 for 'C' LPCI Injection Valve inoperable: (ACTION 3.5.1.b.1) With one LPCI subsystem inoperable, provided that at least one CSS subsystem is OPERABLE, restore the inoperable LPCI pump to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
	SRO	Determines that the following ACTION is applicable with respect to TS 3.6.3 for inoperable Primary Containment Isolation Valves (i.e., RCIC 1F007): (ACTION 3.6.3.a) With one or more of the primary containment isolation valves inoperable,** maintain at least one isolation valve OPERABLE in each penetration that is open and within 4 hours either: 1. Restore the inoperable valve(s) to OPERABLE status, or 2. Isolate each affected penetration by use of at least one de-activated automatic valve secured in the isolated position,* or 3. Isolate each affected penetration by use of at least one closed manual valve or blind flange.* Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. * Isolation valves closed to satisfy these requirements may be reopened on an intermittent basis under administrative control. ** Except for the scram discharge volume vent and drain valves.

	SRO	Determines that the following ACTION is applicable with respect to TS 3.7.2 for CREFAS: (ACTION 3.7.2.a.1) With one control room emergency fresh air supply subsystem inoperable for reasons other than Condition a.2, restore the inoperable subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
	SRO	Determines that the following ACTION is applicable with respect to TS 3.8.1 for D13 EDG Inoperable: (ACTION 3.8.1.1.a) With one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 24 hours and at least once per 7 days thereafter. If the diesel generator became inoperable due to any cause other than an inoperable support system, … Restore the inoperable diesel generator to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. See also ACTION e.
	SRO	Determines that the following ACTION is applicable with respect to TS 3.8.2 for DIV 3 Safeguard Battery Charger 1CD103. Action 3.8.2.1.a **(bolded below)** is the most restrictive with a 2 Hour Action Time: **(ACTION 3.8.2.1.a) With one or two battery chargers on one division inoperable:** **1. Restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours,** **2. Verify associated Division 1 or 2 float current ≤ 2 amps, or Division 3 or 4 float current ≤ 1 amp within 18 hours and once per 12 hours, and** 3. **Restore battery charger(s) to OPERABLE status within 7 days.**
	SRO	Determines that the following ACTION is applicable with respect to TS 3.8.3 for Onsite Power Distribution-Operating: (ACTION 3.8.3.1.a) With one of the above required Unit 1 A.C. distribution system divisions not energized, reenergize the division within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

		Evaluator Note: *In the interest of time, Tech Specs for the Loss of Safeguard Bus D134 may be addressed as follow-up questions after the scenario has concluded.* *When Manual Initiation of Reactor Enclosure Secondary Containment Isolation has been completed,* ***Lead Evaluator instruct Booth Operator to proceed to Major Event*** *(Main Steam Line High High Radiation (Fuel Failure), 'A' MSL Break in Outboard MSIV Room with Failure of the 'A' MSL to Isolate, Trip of Both SGTS Exhaust Fans, Leak Propagation, and Emergency Depressurization).* • *Booth operator will activate Trigger 7 (MRT001B) for Fuel Cladding Failure. [Note: Malfunctions MMS061A (Inboard MSIV HV-41-1F022A failure) and MMS062A (Outboard MSIV HV-41-1F028A failure) are 'Active' when the simulator is taken out of freeze to start the scenario.]* • *Trigger 8 Malfunction MMS136 (MSL Leak in Outboard MSIV Room), automatically activated approximately 30-45 seconds after the MSIV handswitches are taken to Close.* • *Trigger 8 Malfunctions MRE001A ('0A' SGTS Exhaust Fan Trip) and MRE001B ('0B' SGTS Fan Trip), automatically activated approximately 3 minutes after Trigger 8 Malfunction MMS136 (MSL Leak in Outboard MSIV Room) is activated.* ***SGTS Exhaust Fan Malfunctions must be removed immediately after the fans trip to allow the MCR to re-establish/maintain a –ΔP in the Reactor Enclosure by manually starting one or both SGTS Fans****).* • *Trigger 8 Malfunction MRE317 (Outboard MSIV Room Leak to RWCU Isolation Valve Compartment Room 510), automatically activated approximately 4 minutes after Trigger 8 Malfunction MMS136 (MSL Leak in Outboard MSIV Room) is activated.* • *Trigger 8 Malfunction RRE013 (Door 423 Open between Outboard MSIV Room 518 and Corridor 506), automatically activated approximately 4 minutes after Trigger 8 Malfunction MMS136 (MSL Leak in Outboard MSIV Room) is activated.*

	BOP	Reports the following annunciators: • Annunciator 121 B3, "D134 LOAD CENTER XFMR BKR TRIP" • Annunciator 121 D2, "D13 STANDBY AC POWER SYS OUT OF SERVICE" • Annunciator 121 G1, "1 UNIT DIV 3 SFGD BATTERY CHARGER TROUBLE"

	BOP	Reports Annunciator 004 B3, "REAC ENCL LOW DELTA P / LOSS OF POWER / INOP" Dispatches EO to determine status of the Reactor Enclosure HVAC Fans Monitors Reactor Enclosure ΔP using the following indicators at MCR Panel 10C681: • PDI-76-198A, "Rx Encl / Outside DIV A" • PDI-76-198B, "Rx Encl / Outside DIV B" (E-D134, Step 2.7) When directed by SRO, performs S76.8.B, "Initiation of Reactor Enclosure or Refueling Floor Secondary Containment," to Manually Initiate a Reactor Enclosure Secondary Containment Isolation **Evaluator Note:** *Manual Initiation of Reactor Enclosure Secondary Containment Isolation may be performed in accordance with any one of the following:* - *(1) S76.8.B, Section 4.4, "Reactor Enclosure Secondary Containment Manual Pushbutton Isolation Initiation,"* - *(2) S76.8.B, Section 4.5, "Reactor Enclosure Secondary Containment Manual Low DP Isolation," OR* - *(3) MCR-ARC-004 (B3), "REAC ENCL LOW DELTA P / LOSS OF POWER / INOP," Step 8.* *Using S76.8.B, Section 4.4, will cause closure of PCIG Compressor Suction and Discharge Valves.* *Using S76.8.B, Section 4.5, will not result in PCIG Containment Valve isolations.* *Using MCR-ARC-004 (B3), Step 8, only allows the Inboard Instrument Gas Suction Valve (HV-059-101) to remain Open.* *Steps from (1) S76.8.B, Sections 4.4 and 4.5, and (2) MCR-ARC-004 (B3), for Manually Initiating a Reactor Enclosure Secondary Containment Isolation, have been scripted below. Steps for verifying the response of the Secondary Containment Isolation and for resetting PCIG have not been scripted. The scenario will promptly proceed to the Major Event once the Reactor Enclosure Secondary Containment Isolation Signal has been Manually Initiated.*

	BOP	(**S76.8.B, Section 4.4**, "Reactor Enclosure Secondary Containment Manual Pushbutton Isolation Initiation"): (S76.8.B, Step 4.4.2) **PLACE** HS-76-178A, HVAC ISOLATION A, **AND** HS-76-178B, HVAC ISOLATION B, to "ISOLATION" **AND DEPRESS** **AND RELEASE** pushbuttons at 10C681

	BOP	(**S76.8.B, Section 4.5**, "Reactor Enclosure Secondary Containment Manual Low DP Isolation"): (S76.8.B, Step 4.5.1) **IF** a Secondary Containment Low dP Isolation is to be initiated, **THEN PERFORM** the following: (Step 4.5.1.1) **PLACE** HS-76-179A, 'A' Rx Encl. HVAC Isln. Vlvs. Reset" (HVAC RESET A), to "RESET" (Step 4.5.1.2) **PLACE** HS-76-179B, "'B' Rx Encl. HVAC Isln. Vlvs. Reset" (HVAC RESET B), to "RESET" (Step 4.5.5) **IF** "A" Channel Isolation is to be initiated, **THEN ENSURE** HV-57-160A, "N2 Isol" (A), closed **Evaluator Note:** *If crew determines that Section 4.5 cannot be successfully completed based on inability to perform this Step due to the Loss of D134 (i.e., no power to N2 Inerting Block Valve HV-57-160A), then crew should ENSURE a Rx Enclosure Secondary Containment Isolation by performing either Section 4.4 of S76.8.B* ***OR*** *Step 8 of MCR-ARC-004 (B3).* (Step 4.5.6) **IF** "B" Channel Isolation is to be initiated, **THEN ENSURE** HV-57-160B, "N2 Isol" (B), closed (Step 4.5.7) **IF** "A" Channel Isolation is to be initiated, **THEN ENSURE** HV-57-260A, "N2 Isol" (A), closed *(performed by Unit 2 operator)* (Step 4.5.8) **IF** "B" Channel Isolation is to be initiated, **THEN ENSURE** HV-57-260B, "N2 Isol" (B), closed *(performed by Unit 2 operator)* (Step 4.5.10) Place the following switches to TEST to bypass the 50 minute Low ΔP Isolation Timer: - HSXX-076-198A-5 at 0AC124 (*performed locally*) - HSXX-076-198B-5 at 0BC124 (*performed locally*) (Step 4.5.11) **IF** it is desired to equalize RERS fan run times **THEN PERFORM** the following: 1. PLACE HS-76-193B (FAN & FILTER B) to "AUTO" 2. PLACE HS-76-193A (FAN & FILTER A) to "STBY" (Step 4.5.12) Place the following switches listed below back to "AUTO" to initiate the desired Channel Isolation: - HS-76-179A, HVAC RESET A - HS-76-179B, HVAC RESET B

	BOP	(MCR-ARC-004 B3 for Initiating a Manual Reactor Enclosure Secondary Containment Isolation): (Step 8) IF Delta P is offscale positive, THEN: (Step 8.a) Consider initiating a Low Delta P Secondary Containment Isolation per S76.8.B, OR (Step 8.b) Initiate a Manual Secondary Containment Isolation on B Channel <u>only</u>, using pushbutton HS-076-178B at 10-C681 in MCR (Step 8.b.1) Backup 1A Instrument Gas Header to the Drywell with Instrument Air by opening HV-059-128A at 10-C655 NOTE: Isolating the B Channel <u>only</u> allows the Inboard Instrument Gas Suction Valve, HV-059-101 to remain open.

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Event Description: Main Steam Line High High Radiation (Fuel Failure), 'A' MSL Break in Outboard MSIV Room with Failure of the 'A' MSL to Isolate, Trip of Both SGTS Exhaust Fans (Recoverable), Emergency Depressurization

★ Contains action items to complete critical task 1, Initiate a Manual Scram when MSL Rad Level reaches 3 x NFPB (T-103 SCC/RAD-4)

■ Emergency Depressurize RPV (T-112 EB-11)

Time	Position	Applicant's Actions or Behavior
	SRO	Receives report from BOP of rising MSL and SJAE Discharge radiation levels Receives report from BOP of the following annunciators: • Annunciator 109 (F-1), "1 MAIN STEAM LINE DIVISION 1 RAD MONITOR HI/DOWNSCALE" • Annunciator 109 (F-2), "1 MAIN STEAM LINE RAD MON C/D HI/DOWNSCALE" • Annunciator 109 (G-2), "1 AIR EJECTOR OFFGAS DISCHARGE HI RADIATION" • Annunciator 109 (G-1), "1 AIR EJECTOR OFFGAS DISCHARGE HI-HI RADIATION" • Annunciator 109 (F-4), "1 STM EXH DISCH / VAC PUMP / EXH HI RADIATION" • Annunciator 109 (B-5), "TURBINE ENCL AREA HI RADIATION' • Annunciator 003 (B-2), "UNITS 1 & 2 CONTAINMENT LEAK DETECTION HI RADIATION" Enters Transient Alarm Response Announces entry into ON-102, "Air Ejector Discharge or Main Steam Line High Radiation" Announces entry into T-103, "Secondary Containment Control," for Outboard MSIV Room radiation level > MNO value

	SRO	**Evaluator Note:** *Crew will most likely attempt to reduce power using the '1B' Recirc pump, but will transition to control rods after recognizing there is a loss of core flow indication resulting from the Loss of D134. CRS may direct a GP-4 Rapid Plant Shutdown at this point.* (ON-102, Step 2.1) Directs ATC to reduce Rx power in accordance with GP-5 Appendix 2, and RMSI, to maintain air ejector discharge radiation level below Hi Hi Alarm setpoint (ARC-MCR-109 G1) **AND** MSL radiation level below 1.5 x NFPB (ARC-MCR-109 F1/F2) Briefs crew that when MSL radiation levels reach 3 x NFPB, actions per T-103 are to transfer house loads, run Recirc to minimum, manually scram the unit, enter T-101, and close the MSIVs
	SRO	Monitors Power/Flow Map to verify plant is operating in an authorized region
	SRO	Verifies containment radiation increasing, and containment pressure and temperature not increasing
	SRO	**Evaluator Note:** *Booth operator will provide periodic reports for T-290 Rad levels and Temperatures to SRO as plant conditions change. MSO Rad levels and Temperature values will both be exceeded in two or more areas during this scenario.* (T-103 SCC-6) Directs EO to (1) implement T-290, "Instrumentation Available For T-103/SAMP-2," (2) provide continuous monitoring of Secondary Containment Rad levels and Temperatures, and (3) report approach to MNO/MSO values
	SRO	(T-103 SCC-7) Executes SCC/T, SCC/RAD, AND SCC/L concurrently
	SRO	(T-103 SCC/RAD-3) Receives report from BOP of Annunciator 107 (I1), "Main Steam Line High-High Radiation," indicating MSL Rad levels have reached 3 x NFPB, and continues on to SCC/RAD-4
	SRO	(T-103 SCC/RAD-4) Directs BOP to transfer house loads
	SRO	(T-103 SCC/RAD-4) Directs ATC to runback '1B' Recirc pump to minimum
	★SRO	**(T-103 SCC/RAD-4) Directs ATC to manually scram the reactor** **Evaluator Note:** *Core flow indication is unavailable due to Loss of D134. ATC will scram the plant when '1B' Recirc pump is at minimum speed rather than at 60% core flow.*
	SRO	(T-103 SCC/RAD-5) Announces entry into T-101, "RPV Control" and executes concurrently
	SRO	(T-101 RC-5) Ensures SCRAM / 13 KV transfer
	SRO	(T-101 RC-6) Directs ATC to insert SRMs and IRMs
	SRO	(T-101 RC/Q-3) Announces exit of RC/Q of T-101

	SRO	(T-101 RC/L-4) Directs BOP to maintain RPV level between +12.5" AND +54" using HPCI/RCIC
	SRO	(T-103 SCC/Rad-6) Directs ATC to close MSIVs **Evaluator Note:** *'A' MSL will fail to isolate after MSIV handswitches for HV-41-1F022A and HV-41-1F028A are placed to the CLOSE position.*
	SRO	(T-101 RC/P-11) Directs BOP to stabilize RPV pressure below 1096 psig using SRVs; establishes initial pressure band (i.e., 800-1000 psig, etc)
	SRO	Receives report from ATC that 'A' MSL failed to isolate
	SRO	Receives report from BOP of numerous annunciators, including the following: • Annunciator 107 (F-5), "DIV 1 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 107 (G-5), "DIV 2 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 107 (H-5), "DIV 3 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 107 (I-5), "DIV 4 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 114 (C-3), "STEAM TUNNEL HI TEMP" • Annunciator 002 (F-4), "REAC ENCL STEAM FLOODING DAMPERS PNL 10C245 TROUBLE" • Annunciator 002 (F-5), "REAC ENCL STEAM FLOODING DAMPERS PNL 10C234 TROUBLE" • Annunciator 109 (B-4), "REACTOR ENCL AREA HI RADIATION" **Evaluator Note:** *MSL Leak in Outboard MSIV Room (518), to actuate 30-45 seconds after failure of the 'A' MSL to isolate.*
	SRO	Announces re-entry into T-103 on: • Steam Leak Detection alarm conditions for DIV I, II, III and IV • RE Steam Flooding Damper Actuation
	SRO	(T-103 SCC-3) Directs BOP/ATC to read RPV pressure AND level ONLY on: • PAMS • Fuel Zone Level • EQ PMS parameters

	SRO	Receives report from EO performing T-290 that Outboard MSIV Room temperature > MSO Announces re-entry into T-103 on: • Outboard MSIV Room temperature > MNO/MSO values in Table SCC-1/SCC-2 (143/145 °F)
	SRO	(T-103 SCC-6, Note #12) Makes the determination that personnel should be evacuated from the Reactor Enclosure due to high temperature / radiation conditions and announces entry into SE-24, "Inplant Evacuations."
	SRO	**Evaluator Note:** *Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA," will alarm due to the presence of steam in the Outboard MSIV Room. The SRO may enter SE-8, "Fire," and have the Fire Brigade and Rad Pro respond to elevation 283 RE, NW Area. Alternately, the SRO may elect not to dispatch the Fire Brigade and Rad Pro due to the high radiation condition in the steam tunnel and receipt of steam leak detection annunciators for all four divisions.* Receives report of Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA" Directs ATC to perform SE-8 Appendix 1, "Fire Hard Card"
	SRO	Directs BOP to place two loops of Suppression Pool Cooling in service
	SRO	Announces entry in to T-102, "Primary Containment Control," should Suppression Pool Temperature exceed 95 °F
	SRO	Receives report from ATC that SGTS Exhaust Fans have tripped Directs ATC to manually start SGTS Exhaust Fan(s) **Evaluator Note:** *Trip of SGTS Exhaust Fans will occur approximately 3 minutes after the MSL Leak in the Outboard MSIV Room is initiated. Attempts to manually start one or both SGTS Exhaust Fans will be successful.* ***SGTS Exhaust Fan Malfunctions must be removed immediately after the fans trip in order to allow the manual start of one or both SGTS Fans. Confirm with Booth Operator if necessary.***
	SRO	(T-103 SCC/T-1) Directs ATC to implement T-291, "Temperature Effects on Reactor Level Instrumentation" to determine available instrumentation **Evaluator Note:** *CRS may elect to perform T-291.*

	SRO	Addresses CAUTION preceding Step SCC/T-1 to determine elevated Reactor Enclosure temperature effects on RPV level instrumentation: Determines that RPV water level indication is valid based on use of: SPDS/PMS RPV level validation (#071) **OR** reference leg saturation limit curve (SPDS/PMS curve 044 OR T-103 Curve SCC/T-1)
	SRO	Receives report from EO that values recorded per T-290 indicate the following: • RWCU Isolation Valve Compartment Room 510 temperature > MNO value in Table SCC-1 (114 °F) • RWCU HTX Area radiation level > MNO value in Table SCC-1 (Hi Alarm) • RWCU Pump Area radiation level > MNO value in Table SCC-1 (Hi Alarm) **Evaluator Note:** *EO may also report Area radiation levels for HPCI/RCIC > MNO value in Table SCC-1 (Hi Alarm), depending on system usage for level control.*
	SRO	Announces re-entry into T-103 on RWCU Pump and HTX Area radiation levels > MNO value in Table SCC-1 (Hi Alarm) **AND** RWCU Isolation Valve Compartment Room 510 temperature > MNO value in Table SCC-1 (114 °F)
	SRO	Briefs crew that inability to isolate the 'A' MSL has resulted in an unisolable steam leak in the Outboard MSIV Room that is discharging to the Turbine Building and also communicating directly with RWCU Isolation Valve Compartment Room 510. T-290 readings indicate that temperatures and radiation levels have exceeded T-103 Table SCC-1 MNO values in at least two Areas AND Table SCC-2 MSO values for Outboard MSIV Room radiation (3 x NFPB) and temperature (145 °F) have already been exceeded. Briefs crew that an Emergency Depressurization will be performed should temperature or radiation exceed the MSO values in two or more areas. **Evaluator Note:** *SRO does not direct implementation of T-250, "Remote Manual Primary Containment Isolations," per Steps SCC/T-5 or SCC/RAD- 7, on the basis that the leak has been determined to be unisolable.*

	SRO	Receives report from EO that values recorded per T-290 indicate the following: • RWCU Isolation Valve Compartment Room 510 temperature > MSO value in Table SCC-1 (135 °F) • RWCU HTX Area radiation level > MSO value in Table SCC-2 (10,000 mr/hr) • RWCU Pump Area radiation level > MSO value in Table SCC-2 (10,000 mr/hr) **Evaluator Note:** *EO may also report Area radiation levels for HPCI/RCIC > MSO value in Table SCC-2 (10,000 mr/hr), depending on system usage for level control.*
	SRO	(T-103, SCC/T-11 **AND/OR** SCC/RAD-13) Determines that temperatures **AND/OR** radiation levels have exceeded the MSO values for two or more Areas in Table SCC-2
	SRO	(T-103, SCC/T-12 **AND/OR** SCC/RAD-14) Announces entry into T-112, "Emergency Blowdown"
	■SRO	**(T-112 EB-11) Directs BOP to open 5 ADS valves**
	SRO	(T-101 RC/L-4) Once rapid depressurization has begun, directs BOP to restore and maintain level between +12.5" and +54" using Condensate
	SRO	Receives report from ATC that RPV Level Transmitters are providing valid indication and are Usable based on performance of T-291, "Temperature Effects on Reactor Level Instrumentation." **Evaluator Note:** *Indicated RPV level for each transmitter is above the Minimum Indicated Level (MIL), satisfying the "Usable" criteria provided in T-291.*
		Evaluator Note: *When RPV blowdown is in progress, and RPV water level can be restored and maintained between +12.5" and +54" in accordance with T-101, RC/L-4,* ***Lead Evaluator instruct Booth Operator to terminate the scenario.***

	ATC	**Evaluator Note:** ATC *will most likely attempt to reduce power using the '1B' Recirc pump, but will transition to control rods after recognizing there is a loss of core flow indication resulting from the Loss of D134. CRS may direct a GP-4 Rapid Plant Shutdown at this point.* (ON-102, Step 2.1) Upon receipt of Annunciator(s) 109 (F1/F2/G1), takes action to reduce Rx power in accordance with GP5 Appendix 2, and RMSI, to maintain air ejector discharge radiation level below Hi Hi Alarm setpoint (ARC-MCR-109 G1) **AND** MSL radiation level below 1.5 x NFPB (ARC-MCR-109 F1/F2) **DEPRESS** '1B' Recirc Pump Speed Lower Pushbutton(s) as required **AND VERIFY** proper response: • LOWER 30 RPM • LOWER 5 RPM • LOWER 1 RPM **Evaluator Note:** Unless directed to initiate a GP-4 Rapid Plant Shutdown, the *ATC will commence continuous insertion of first control rod to position 00 in accordance with Step 1 of RMSI Table 1, "Rods Required for Stability Rod Line," per S.73.1.A, "Normal Operation of the Reactor Manual Control System". CONTINUOUS INSERT or INSERT pushbutton may be used for continuous insert.* (S73.1.A, Step 4.9.5.1) Depresses CONTINUOUS INSERT pushbutton for first control rod (Step 4.9.5.2) Verifies INSERT light lit (Step 4.9.5.5) Verifies first control rod has been inserted to position 00 using Four Rod Display Re-performs Steps 4.9.5.1, 4.9.5.2, and 4.9.5.5 to insert the RMSI Table 1 control rods as required
	ATC	(T-103 SCC/RAD-4) Takes action to run '1B' Recirc pump to minimum speed by depressing Recirc Runback Low Limit (28%) Pushbutton on 10C603 **Evaluator Note:** *ASD controller manipulations will likely be performed from memory.*
	★ATC	**Places Mode Switch in SHUTDOWN when '1B' Recic pump is at minimum speed and informs SRO**

	ATC	Inserts SRM/IRM: • Depresses 'Power On' pushbutton • Depresses 'Select' Pushbuttons for all SRM and IRM • Depresses 'Drive In' Pushbutton • Monitors SRM/IRM indication for verification of instruments driving in
	ATC	Places the MSIV handswitches to CLOSE: • PLACE HV-041-1F022A, 1A Main Steam Line Inboard Isol Vlv Handswitch" (INBOARD A), to "CLOSE" at panel 10C601 • PLACE HV-041-1F022B, 1B Main Steam Line Inboard Isol Vlv Handswitch" (INBOARD B), to "CLOSE" at panel 10C601 • PLACE HV-041-1F022C, 1C Main Steam Line Inboard Isol Vlv Handswitch" (INBOARD C), to "CLOSE" at panel 10C601 • PLACE HV-041-1F022D, 1D Main Steam Line Inboard Isol Vlv Handswitch" (INBOARD D), to "CLOSE" at panel 10C601 • PLACE HV-041-1F028A, 1A Main Steam Line Outboard Isol Vlv Handswitch" (OUTBOARD A), to "CLOSE" at panel 10C601 • PLACE HV-041-1F028B, 1B Main Steam Line Outboard Isol Vlv Handswitch" (OUTBOARD B), to "CLOSE" at panel 10C601 • PLACE HV-041-1F028C, 1C Main Steam Line Outboard Isol Vlv Handswitch" (OUTBOARD C), to "CLOSE" at panel 10C601 • PLACE HV-041-1F028D, 1D Main Steam Line Outboard Isol Vlv Handswitch" (OUTBOARD D), to "CLOSE" at panel 10C601 **Evaluator Note:** *'A' MSL will fail to isolate after MSIV handswitches for HV-41-1F022A and HV-41-1F028A are placed to the CLOSE position.*
	ATC	Informs SRO that 'A' MSL failed to isolate

	ATC	**Evaluator Note:** *Fire Alarm Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA," will alarm due to the presence of steam in the Outboard MSIV Room. The SRO may enter SE-8, "Fire," and have the Fire Brigade and Rad Pro respond to elevation 283 RE, NW Area. Alternately, the SRO may elect not to dispatch the Fire Brigade due to the high radiation condition in the steam tunnel and receipt of steam leak detection annunciators for all four divisions.* Reports Annunciator 006 (F-5-U), "REAC I EL 283 NW AREA," Performs SE-8 Appendix 1, "Fire Hard Card": (Step 2.0) RECORDS time of Fire Alarm Annunciator 006 (F-5-U) (Step 3.0) ACTIVATES the Fire Brigade Leader (Step 4.0) Selects the following announcement to dispatch the Fire Brigade Leader and Rad Pro to elevation 283 RE, NW Area **FIRE DETECTION ALARM REQUIRING IMMEDIATE FIRE BRIGADE LEADER AND RAD PRO TECHNICIAN RESPONSE** (YELLOW Color Coded Sticker on annunciator window) This is / is not a drill. Fire alarm code (Code number) has been annunciated in (location). Fire Brigade Leader or designated Fire Brigade Member and Rad Pro Tech respond. All personnel evacuate the (location) and assemble at (assembly area). Limit Channel-1 radio traffic to Fire Brigade communications and emergency use only. This is / is not a drill.
	ATC	Reports that SGTS Exhaust Fans have tripped Manually starts SGTS Exhaust Fan(s) per Step 5 of ARC-MCR-002 (G1), "A EXHAUST FAN 0AV163 TROUBLE," **AND/OR** Step 5 of ARC-MCR-002 (H1), "B EXHAUST FAN 0BV163 TROUBLE" (ARC-MCR-002 (G1)/(H1), Step 5) Take HS-076-040A(B), "SGTS Exhaust Fan," momentarily to OFF, THEN to RUN **Evaluator Note:** *Action to manually start an SGTS Exhaust Fan(s) will likely be performed from memory.* *Trip of the SGTS Exhaust Fans will occur approximately 3 minutes after the MSL Leak in the Outboard MSIV Room is initiated. Attempts to manually start one or both SGTS Exhaust Fans will be successful.* ***SGTS Exhaust Fan Malfunctions must be removed immediately after the fans trip in order to allow the manual start of one or both SGTS Fans.***
	ATC	Informs SRO that a SGTS Exhaust Fan(s) have been successfully placed in service

	ATC	If directed by CRS, implements T-291, "Temperature Effects on Reactor Level Instrumentation": **NOTE** Instrumentation usage rule/criteria: **IF** the entire instrument leg is below MRT **OR** indicated RPV level is above MIL, **THEN** RPV level indication may be used (less than MRT **OR** greater than MIL: Usable). **IF** any area of an instrument leg is above MRT, **AND** indicated RPV level is below MIL, **THEN** RPV level indication is **not** valid **AND** should **not** be used (greater than MRT **AND** less than MIL: **Not** usable). (T-291, Step 4.1.1) Using Attachments 1 and 2, determines that indicated RPV Water Level for transmitters listed in T-291 is above the Minimum Indicated Level (MIL). Informs SRO that RPV Water Level Transmitters are Usable based on the Instrumentation usage rule/criteria NOTE pertaining to Step 4.1.1
	BOP	Reports rising MSL and SJAE Discharge radiation levels Reports the following annunciators: • Annunciator 109 (F-1), "1 MAIN STEAM LINE DIVISION 1 RAD MONITOR HI/DOWNSCALE" • Annunciator 109 (F-2), "1 MAIN STEAM LINE RAD MON C/D HI/DOWNSCALE" Annunciator 109 (G-2), "1 AIR EJECTOR OFFGAS DISCHARGE HI RADIATION" • Annunciator 109 (G-1), "1 AIR EJECTOR OFFGAS DISCHARGE HI-HI RADIATION" • Annunciator 109 (F-4), "1 STM EXH DISCH / VAC PUMP / EXH HI RADIATION" • Annunciator 109 (B-5), "TURBINE ENCL AREA HI RADIATION" • Annunciator 003 (B-2), "UNITS 1 & 2 CONTAINMENT LEAK DETECTION HI RADIATION"
	BOP	Reports Annunciator 107 (I1), "Main Steam Line High-High Radiation," indicating that MSL Rad levels have reached 3 x NFPB

	BOP	(T-103 SCC/RAD-4) Transfers house loads using S91.6.B Appendix 1, "Transferring House Loads To S/U Buses Hard Card": (S91.6.B, Step 1.0) **PLACE** "BKR SYNC" switch, in "ON" for the selected 11 Aux Bus Start-up feeder breaker (Step 2.0) **ENSURE** INCOMING **AND** RUNNING voltmeter read less than 8 volts difference (Step 3.0) **CLOSE** the selected 11 Aux Bus Start-up feeder breaker (Step 4.0) **VERIFY** the associated Aux feeder BKR is tripped (Step 5.0) **PLACE** "BKR SYNC" switch in "OFF" (Step 6.0) **FLAG** 11 Aux Bus BKR control switches to correspond to actual Brk position. (Step 7.0) **PLACE** "BKR SYNC" switch in "ON". for the selected 12 Aux Bus Start-up feeder breaker (Step 8.0) **ENSURE** INCOMING **AND** RUNNING voltmeter read less than 8 volts difference (Step 9.0) **CLOSE** the selected 12 Aux Bus Start-up feeder BKR (Step 10.0) **VERIFY** the associated Aux feeder BKR is tripped (Step 11.0) **PLACE** "BKR SYNC" switch in "OFF" (Step 12.0) **FLAG** 12 Aux Bus BKR control switches to correspond to actual Brk position (Step 13.0) **WHEN** conditions permit, **THEN COMPLETE** the full system operating procedure as required

	BOP	Restores AND maintains RPV level between +12.5" AND +54" using HPCI/RCIC per SRO direction: **Evaluator Note:** *Manual actions to initiate and control RCIC will likely be performed from memory.* **ARM** AND **DEPRESS** Manual Initiation push button to start RCIC • Control injection using FIC-49-1R600, "RCIC Pump Discharge Flow Controller" (FL) to restore AND maintain RPV level between +12.5" AND +54" **Evaluator Note:** *Manual actions to initiate and control HPCI will likely be performed from memory.* **ARM** AND **DEPRESS** Manual Initiation push button to start HPCI • Control injection using FIC-55-1R600, "HPCI Pump Discharge Flow Controller" (FL) to restore AND maintain RPV level between +12.5" AND +54"
	BOP	Stabilizes RPV pressure below 1096 psig within established pressure band (i.e., 800-1000 psig, etc) by individually cycling **SRV** control switches located on 10C626, using the opening sequence specified on the control panel (ensures uniform distribution of heat to the suppression pool)
	BOP	Reports the following annunciators: • Annunciator 107 (F-5), "DIV 1 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 107 (G-5), "DIV 2 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 107 (H-5), "DIV 3 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 107 (I-5), "DIV 4 STEAM LEAK DET SYS HI TEMP / TROUBLE" • Annunciator 114 (C-3), "STEAM TUNNEL HI TEMP" • Annunciator 002 (F-4), "REAC ENCL STEAM FLOODING DAMPERS PNL 10C245 TROUBLE" • Annunciator 002 (F-5), "REAC ENCL STEAM FLOODING DAMPERS PNL 10C234 TROUBLE" • Annunciator 109 (B-4), "REACTOR ENCL AREA HI RADIATION" **Evaluator Note:** *MSL Leak in Outboard MSIV Room (518), to actuate 30-45 seconds after failure of the 'A' MSL to isolate.*

	BOP	Places Suppression Pool Cooling in service using S51.8.A Appendix 1 Hard Card: (S51.8.A Appendix 1, Step 1.1) START selected RHR Service Water loop per S12.1.A Appendix 1, "RHR Service Water System Startup Hardcard" (S12.1.A Appendix 1, Step 1.2) **PERFORM** the following: • **OPEN** HV-51-1F014A(B), HEAT EXCHANGER INLET • Throttle **OPEN** HV-51-1F068A(B) for 18 to 20 seconds (Step 1.3) **VERIFY** PI-51-105A-1(B), HX DISCH, indicates system static pressure greater than or equal to 15 psig (Step 1.4) **IF** desired, **THEN PERFORM** the following to bypass the HI RAD **AND/OR** HI Pump Discharge pressure trips: (Step 1.4.1) **ENSURE** the required actions of ODCM Part 1 Control 3.1.1 have been met for the INOPERABLE RHRSW Radiation Monitor (Step 1.4.2) **PLACE** HSS-12-002A(B), PUMP TRIP BYPASS, in "BYPASS" (Step 1.5) **IF** 'A' Loop pump (0A(C)-P506) is to be placed in service, **THEN ENSURE** 0A-V543 **OR** 0C-V543, Spray Pond Pump Room Fans, in "RUN" at 00C681 (Step 1.6) **IF** 'B' Loop pump (0B(D)-P506) is to be placed in service, **THEN ENSURE** 0B-V543 **OR** 0D-V543, Spray Pond Pump Room Fans, in "RUN" at 00C681 (Step 1.7) **START** 0A(B,C,D)P506, RHRSW PUMP (Step 1.8) **THROTTLE** HV-51-1F068A(B) to the maximum obtainable position without exceeding 11,000 gpm on FI-51-*R602A(B) while maintaining pump disch pressure (PI-12-001A-1(B)) between 75 psig to 85 psig *(Steps repeated for subsequent RHRSW pump)* (S51.8.A Appendix 1, Step 1.4) **START** 1A(B)P202, RHR Pump (PUMP) (Step 1.5) **OPEN** HV-51-1F024A(B), "RHR Pump Full Flow Test Return" (SUPP POOL CLG), **AND MAINTAIN** flow indicated on FI-51-1R603A(B), "RHR Loop Flow," between 8000 to 8500 gpm (Step 1.6) **CLOSE** HV-C-51-1F048A(B), HEAT EXCH BYPASS *(Steps repeated for subsequent loop)*

	■BOP	**When directed to open all ADS valves, places PSV-41-1F013E, K, H, M, and S "AUTO-OPEN" control switches located on 10C626 to the "OPEN" position, and verifies valve function by acoustic monitors and lowering RPV pressure**
	BOP	Restores and maintains RPV level between +12.5" and +54" using Condensate per S06.2.C U/1, "Removing the Reactor Feed Pumps From Service to a Standby Condition": **Evaluator Note:** *The following manipulations will likely be performed from memory.* (S06.2.C U/1, Step 4.5.2.5) **WHEN** RPV pressure is at **OR** below 410 psig, **THEN CONTINUE**. (Step 4.5.2.6) **ENSURE** LIC-M1-1R600, "Reactor Level Controller" (MASTER, LV), set at 35 inches. (Step 4.5.2.7) **ENSURE** LIC-006-120, "Reactor Feed Pumps Bypass Cont Vlv" (PUMP BYPASS, LV), in "AUTO." **NOTE** LIC-006-120, "Reactor Feed Pumps Bypass Cont Vlv" (PUMP BYPASS, LV), output signal indication corresponds to position of HV-006-120, "RFP Byp Vlv" (i.e., 0% output is full closed, 100% output is full open) HV-006-120, "RFP Byp Vlv" position indication is available on screen FWLC_01, Process Overview, at FWLCS Operator Station. (Step 4.5.2.8) **IF** LIC-006-120, "Reactor Feed Pumps Bypass Cont Vlv" (PUMP BYPASS, LV), is controlling RPV level **AND** HV-006-120, "Reactor Feedpump Bypass Valve," is fully open, **THEN THROTTLE** HV-006-108A(B,C), "1A(B,C) RFP Disch Vlv" (FEED, DISCH A(B,C)), at panel 10C651 as required, to maintain RPV level. (Step 4.5.2.9) **WHEN** HV-006-108A(B,C), "1A(B,C) RFP Disch Vlv" (FEED, DISCH A(B,C)), is no longer required to maintain RPV level **THEN ENSURE** HV-006-108A(B,C), "1A(B,C) RFP Disch Vlv" (FEED, DISCH A(B,C)), is closed at panel 10C651.
		Evaluator Note: *The scenario may be terminated when RPV blowdown is in progress, and RPV water level can be restored and maintained between +12.5" and +54" in accordance with T-101, RC/L-4.*

POST SCENARIO: Have the applicant in the CRS position identify the highest EAL classification for the combination of events experienced during the scenario.

Applicable classifications: **FS1**and **RU3** based upon Table LGS 3-1 of EP-AA-1008 (Revision 23)

FS1: Loss or Potential Loss of ANY two barriers (SAE)

Loss of Primary Containment Barrier based upon criteria 6.3:

UNISOLABLE primary system leakage outside drywell resulting in **EITHER:**

- Secondary Containment area temperatures **> T-103 / SAMP Max Safe Op Value (MSO).**

  OR

- Secondary Containment area radiation levels **> T-103 / SAMP Max Safe Op Value (MSO).**

AND

Loss of RCS barrier based upon criteria 4.1: UNISOLABLE Main Steam Line (MSL), HPCI, Feedwater, RWCU or RCIC line break.

OR

Loss of RCS barrier based upon criteria 4.2: Emergency RPV Depressurization is required.

RU3: Fuel Clad Degradation (UE)

EAL Threshold Values:

Fuel clad degradation resulting in **EITHER:**

- Air Ejector discharge radiation monitor (RISH 26 1(2)K601A, B) **Hi-Hi alarm**.

  OR

- Coolant activity **> 4.0 µCi/gm** Dose Equivalent I-131.

CREW PREBRIEF INSTRUCTIONS

Unit 1 is in OPCON 1 at 100% power

Specific Plant Conditions are as follows:

- The PJM has issued a Maximum Emergency Generation Alert due to grid instabilities

Inoperable/Out of Service Equipment and Estimated Time of Return (ETR):

- None

Planned Evolutions;

- Maintain 100% power
- Provide grid support as requested by TSO