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PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	1290020301, Conduct of Shift Operations						
TASK STANDARD:	Determine Current License Status						
K/A:	2.1.4	K/A RATING:	RO:	3.3	SRO:	3.8	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	10 minutes				
REFERENCES:	40DP-9OP02, Conduct of Shift Operations						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 10/04/2011

Revised By: _____ Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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1. SIMULATOR SETUP:

- IC#:

- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION

- SPECIAL INSTRUCTIONS:
  - None
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40DP-9OP02. This JPM was written using Revision 53 of 40DP-9OP02 This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **You are currently licensed at PVNGS.**
- **You have been assigned to work control for last 4 months.**
- **Today is December 27th.**
- **You attended LOCT training November 8th -11th but did not take the written exam.**
- **The LOCT cycle completed Friday, December 2nd.**
- **Attached is a spreadsheet of shifts you covered in the last quarter.**
- **You met all license maintenance requirements for the 3rd quarter.**
- **You have been asked to take the dayshift on December 31st and January 1st.**

INITIATING CUE:

- **You are directed to determine if you:**
  1. **are current in Training**
  2. **meet requirements to assume RO duties on December 31st**
  3. **meet requirements to assume RO duties on January 1st.**

Provide your answers on the attached sheet.

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	3.6.1.1 of 40DP-9OP02 An Operator's training is current when all required material in an LOCT Training Cycle is completed. If any LOCT material is missed during a training cycle, make-up training shall be completed no later than 6 weeks from the end of the training cycle that the training was part of.		Examinee determines that it has been less than 6 weeks since the completion of the last training cycle and they are therefore current in LOCT.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	3.6.2 of 40DP-9OP02 ACTIVE NRC Operators License exists when an operator has a valid license and has "actively performed" the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.		Examinee determines that since they are current in training and met license maintenance requirements in the 2nd quarter they can take the shift on December 31st.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	3.6.2 of 40DP-9OP02 ACTIVE NRC Operators License exists when an operator has a valid license and has "actively performed" the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.		Examinee determines that they CAN NOT take the shift on January 1st because they did not perform 5-12 hour shift in the 4th quarter.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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Answer Key

October 15th	12 hour day shift (RO)
October 16th	10 hour shift 0630 to 1630 (RO)
November 24th	12 hour day shift (CO)
December 11th	6.5 hours 1200 to 1830 (CO)
December 25th	12 hour day shift (RO)

1. Are you current in Training **YES** / **NO**

   If **NO** what must be done to become current?

   _____

   _____

2. Can you assume RO duties on December 31st? **YES** / **NO**

   If **NO** why not?

   _____

   _____

3. Can you assume RO duties on January 1st ? **YES** / **NO**

   If **NO** why not?
   The operator did not perform at least 5 -12 hour shifts of license proficiency time in the 4th quarter therefore the operator CAN NOT assume the RO duties in the next quarter.

Answer Key

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PVNGS JOB PERFORMANCE MEASURE
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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	10/04/2011		New JPM for 2012 NRC Initial Exam

REASON REVISED Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **You are currently licensed at PVNGS.**
- **You have been assigned to work control for last 4 months.**
- **Today is December 27th.**
- **You attended LOCT training November 8th -11th but did not take the written exam.**
- **The LOCT cycle completed Friday, December 2nd.**
- **Attached is a spreadsheet of shifts you covered in the last quarter.**
- **You met all license maintenance requirements for the 3rd quarter.**
- **You have been asked to take the dayshift on December 31st and January 1st.**

INITIATING CUE:

- **You are directed to determine if you:**
  1. **are current in Training**
  2. **meet requirements to assume RO duties on December 31st**
  3. **meet requirements to assume RO duties on January 1st.**

Provide your answers on the attached sheet.

October 15th	12 hour day shift
October 16th	10 hour shift 0630 to 1630
November 24th	12 hour day shift
December 11th	6.5 hours 1200 to 1830
December 21st	12 hour day shift

1. Are you current in Training **YES / NO**

   If **NO** what must be done to become current?

   _____
   _____

2. Can you assume RO duties on December 31st? **YES / NO**

   If **NO** why not?

   _____
   _____

3. Can you assume RO duties on January 1st ? **YES / NO**

   If **NO** why not?

   _____
   _____

3.6 Licensed Operator Watchstanding Proficiency

3.6.1 A VALID NRC Operators License exists when the holder of that license is current in Licensed Operator Continuing Training (LOCT).

3.6.1.1 An Operator's training is current when all required material in an LOCT Training Cycle is completed. If any LOCT material is missed during a training cycle, make-up training shall be completed no later than 6 weeks from the end of the training cycle that the training was part of.

3.6.1.2 If the operator fails to make up the classroom training and simulator training within 6 weeks of the end of the training cycle, the operator shall be removed from license duties until the make-up training is completed.

3.6.2 An ACTIVE NRC Operators License exists when an operator has a valid license and has “actively performed” the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.

- Actively Performed means that the operator held a position on the shift crew that required the individual to be licensed as defined in the Technical Specifications and that the operator carried out and was responsible for the duties covered by that position.
- For maintenance of an active SRO license any shift spent in either the SM or CRS position will be credited.
- An SRO must stand at least one complete shift per calendar quarter in an SRO-only supervisory position. The remainder of the shifts required in a calendar quarter may be performed in either a credited SRO or RO position.
- For time to be credited it must be a continuous shift (i.e., 4 hours of watch shift responsibilities spent on each of 3 different shifts does not equal one 12 hour shift).
- Overtime may be credited if the overtime work is in a position appropriately credited for watchstanding proficiency. Overtime as an extra helper after the official watch has been turned over to another watchstander does not count toward proficiency time.

3.6.3 A third Reactor/Control Operator in excess of those required by technical specifications may be credited with license proficiency hours if the following administrative controls are in place:

- The licensee shall list all licensed shift crew positions, including titles, descriptions of duties and which positions are required by technical specification.
- For those shift crew positions in excess of those required by technical specifications, a description of how the position is meaningfully and fully engaged in the function and duties of the license position required by technical specification.
- If theses administrative controls are not met, the individual shall not be given watch-standing proficiency credit for shift positions in excess of technical specification requirements.

3.6.3.1 At the conclusion of an individual shift, the Shift Manager will determine and concur that the 3rd RO was engaged in the functions and duties of a licensed operator in the Control Room and therefore can utilize the shift time towards their proficiency. This determination will be made by verifying that the 3rd RO:

- Completed the full 12 hour shift
- Participated in shift turnover both at the beginning and end of shift
- Participated in licensed operator functions and performed licensed operator duties in the Control Room. Examples of these functions and duties include:
  - Control Board manipulations and monitoring,
  - Performing peer checks and Independent Verifications,
  - Responding to alarms or off-normal conditions,
  - Providing briefings as needed,
  - Performing permit and clearance activities.

3.6.3.2 Should the Shift Manager determine that the 3rd RO did not satisfy these requirements, then their completed shift time could not be used towards their proficiency requirement.

3.6.4 Only one excess Reactor/Control Operator above the minimum licensed positions required by technical specifications can be credited per shift per Unit.

3.6.5 Each licensed individual is responsible to report the completion of the license proficiency hours each quarter to the Nuclear Training department, Operations Training. Failure to complete this notification will result in the suspension of qualifications for licensed duties.

3.6.5.1 Open CORA\AutoLog.

3.6.5.2 From the Tools Menu, select the License Hot Time Tracking Tool.

3.6.5.3 Generate an Individual Licensed Operator Proficiency report and

3.6.5.4 Send it to the Training System Administrator, Nuclear Training Department, Operations Training.

This report should be sent as early in the quarter as possible after you have completed the required proficiency time, to allow enough time for the data to be entered into training records.

3.6.6 An individual is classified active for the current calendar quarter if they meet any one of the following conditions:

- The individual meets the requirements of step 3.6.2.
- The individual has completed the Operator License Reactivation Job Qualification Card in the current or previous calendar quarter. (NLR10-xx-001, xx references the revision number.)
- The individual has been issued (not renewed) an Operators License (RO or SRO) in the current or previous calendar quarter.

3.6.7 Each individual attempting to reactivate an inactive but valid license shall complete the Operator License Reactivation Job Qualification Card prior to resuming licensed operator duties.

3.6.8 An SRO being reactivated to assume an SM position shall function under instruction as the SM.

3.6.9 An SRO being reactivated to assume the CRS position can function under instructions as either the CRS or SM.

3.6.10 SRO licensed personnel functioning as ROs being reactivated to assume an SRO position shall perform 40 hours under direction of the SM/CRS prior to assuming an SRO position.

3.6.11 An SRO/RO that reactivates their SRO license also reactivates their ability to perform RO duties.

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	270130401, Implement Reactor Coolant System draining operations					
TASK STANDARD:	Determine Pzr level and RCS volume to be drained to the RWT					
K/A:	2.1.25	K/A RATING:	RO:	3.9	SRO:	4.2
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes			
REFERENCES:	40OP-9ZZ16, RCS Drain Operations					
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 10/05/2011

Revised By: _____ Date: _____

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9ZZ16. This JPM was written using Revision 71 of 40OP-9ZZ16. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **The plant is in mode 5.**
- **Pressurizer pressure is 50 PSIA.**
- **Pressurizer temperature is 150 °F.**
- **RCN-LI-103 indicates 30%.**
- **RCA-LI-110X indicates 42%.**
- **RCB-LI-110Y indicates 38%.**
- **Preparations are being made to lower RCS level.**

INITIATING CUE:

- **The CRS directs you to determine the following per 40OP-9ZZ16:**

  1. **ACTUAL PRZR level based on current indications**
  2. **Using appendix E, calculate the expected change in RWT level if the RCS were drained from actual level to the top of the Reactor Vessel Flange level.**

  Use the spaces on the cue sheet to document your answers.

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Precautions and Limitations 3.1.4 Correct channels RCA-LI-110X & RCB-LI-110Y using Appendix B - Pressurizer Indicated Vs. Actual Level For RCA-LI-110X And RCBLI-110Y.		Using Appendix A examinee determines that : RCA-LI-110X level is 32% ± 2%. RCB-LI-110Y level is 30% ± 2%.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Precautions and Limitations 3.1.4 Correct RCN-LI-103 using Appendix C - Pressurizer Indicated Vs. Actual Level For RCN-LI-103.		Using Appendix A examinee determines that : RCN-LI-103 level is 31% ± 2%.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Using appendix E the examinee determines the change in RWT level if the RCS were drained from ~30% pressurizer level to flange level (114 feet).		Determine amount of water (in gallons) to be drained by in the pressurizer by interpreting from the table or the chart the amount of water at ~ 30% level. Examinee should determine actual level based on instrument reading from the previous step. Gallons should be between 9300-10140 gallons. The examinee determines the level increase in the RWT by using the graph to determine the gallons of water drained from RCS is 9300-10140 gallons divided by 7538 gallons / % in the RWT = a change of 1.23 to 1.35% Acceptable answer 1.23 to 1.35 % change in RWT Level.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

ANSWER KEY

1. **Actual pressurizer level per:**

   - **RCN-LI-103 31% (+2%)**
   - **RCA-LI-110X 32% (+2%)**
   - **RCB-LI-110Y 30% (+2%)**

2. **Expected change in RWT level 1.23 to 1.35%**

ANSWER KEY

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PVNGS JOB PERFORMANCE MEASURE
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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	10/06/2011		New JPM

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **The plant is in mode 5.**
- **Pressurizer pressure is 50 PSIA.**
- **Pressurizer temperature is 150 °F.**
- **RCN-LI-103 indicates 30%.**
- **RCA-LI-110X indicates 42%.**
- **RCB-LI-110Y indicates 38%.**
- **Preparations are being made to lower RCS level.**

INITIATING CUE:

- **The CRS directs you to determine the following per 40OP-9ZZ16:**

  1. **ACTUAL PRZR level based on current indications**
  2. **Using appendix E, calculate the expected change in RWT level if the RCS were drained from actual level to the top of the Reactor Vessel Flange level.**

Provide your answers in the spaces below:

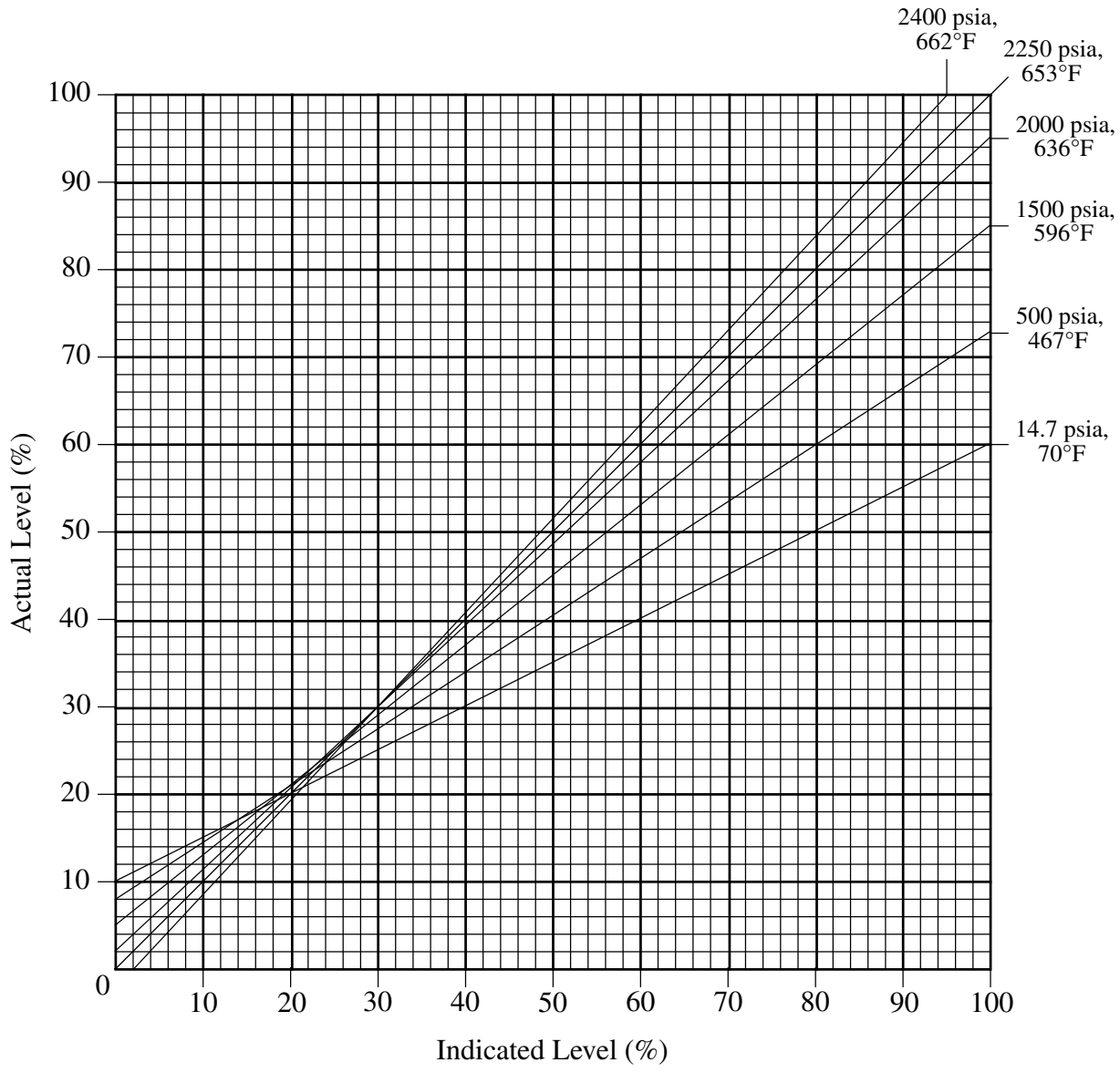
1. **Actual pressurizer level per:**
   - **RCN-LI-103 _____**
   - **RCA-LI-110X _____**
   - **RCB-LI-110Y _____**

2. **Expected change in RWT level _____ %**

Appendix B - Pressurizer Indicated Vs. Actual Level For RCA-LI-110X And RCB-LI-110Y

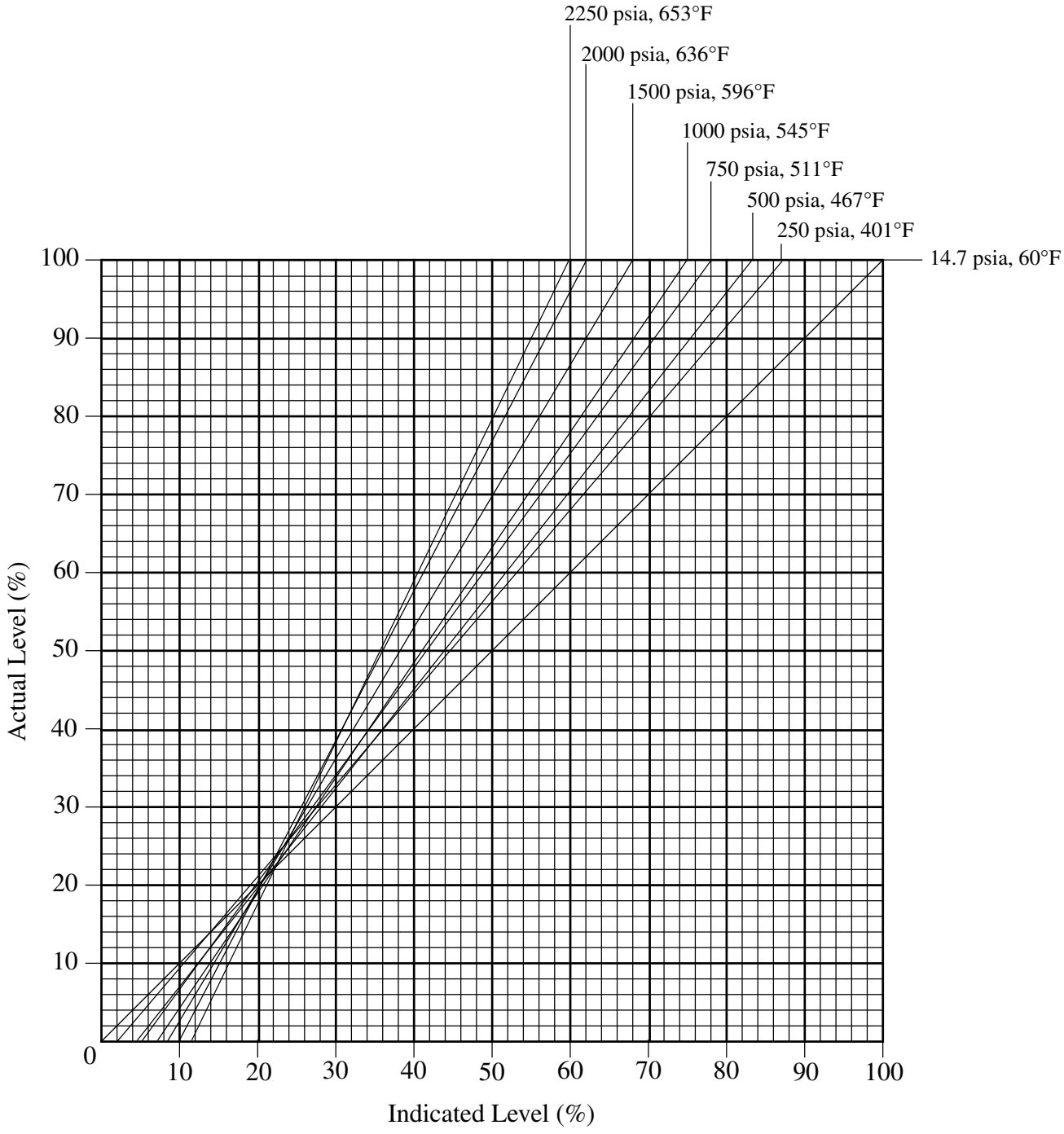
Pressurizer Indicated Vs. Actual Level for RCA-LI-110X and RCB-LI-110Y

Pressurizer Indicated vs. actual level
for deviation from normal operating
to cold pressurizer conditions.

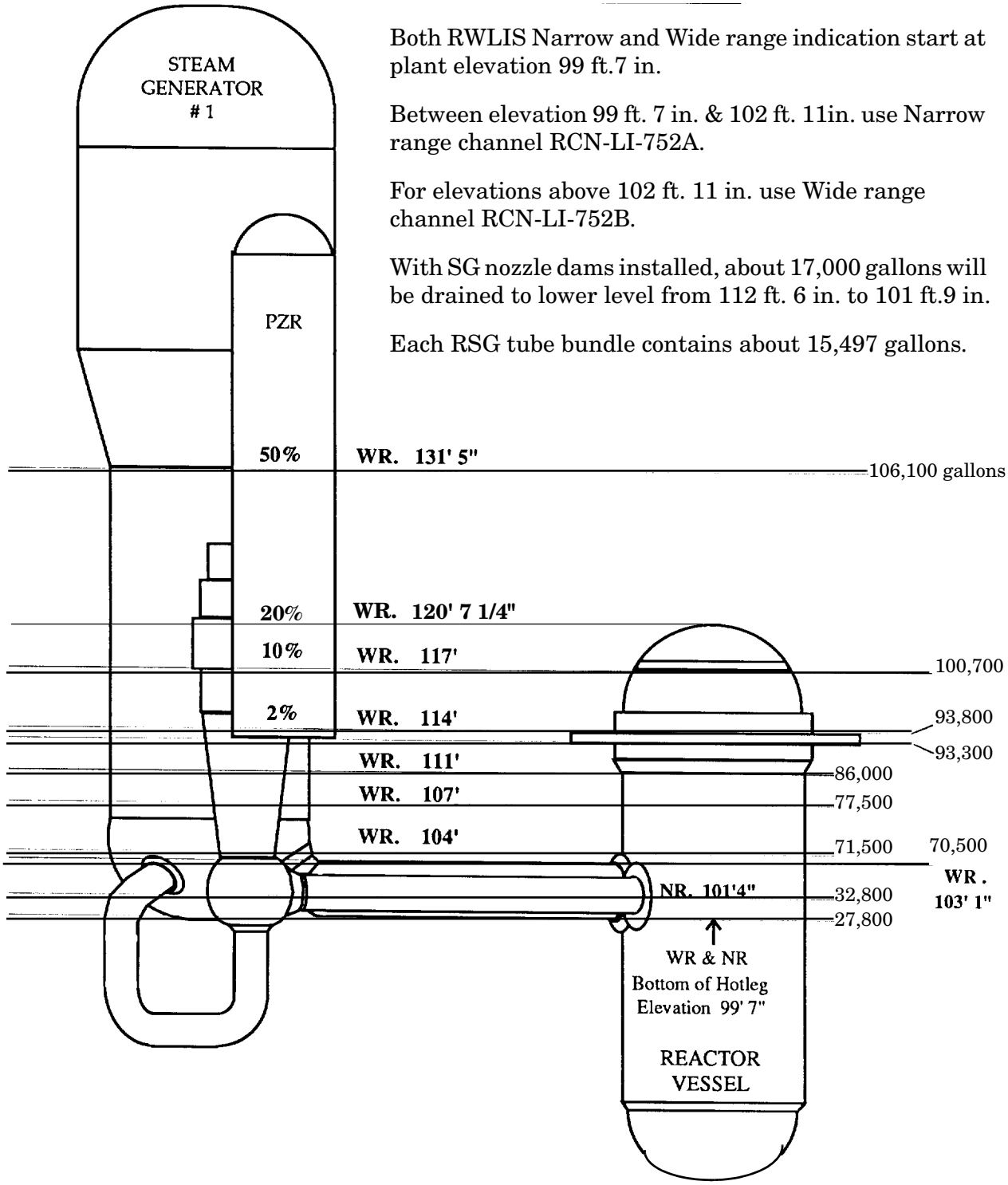


Appendix C - Pressurizer Indicated Vs. Actual Level For RCN-LI-103

Pressurizer Indicated Vs. Actual Level for RCN-LI-103



Appendix E - Determination of Volume to be Drained



Both RWLIS Narrow and Wide range indication start at plant elevation 99 ft.7 in.

Between elevation 99 ft. 7 in. & 102 ft. 11in. use Narrow range channel RCN-LI-752A.

For elevations above 102 ft. 11 in. use Wide range channel RCN-LI-752B.

With SG nozzle dams installed, about 17,000 gallons will be drained to lower level from 112 ft. 6 in. to 101 ft.9 in.

Each RSG tube bundle contains about 15,497 gallons.

Determination Of Volume To Be Drained

REFERENCE	(1) RWLIS INDICATION	(2) RCS INVENTORY FOR GIVEN ELEVATION cubic ft / gallons	(3) HUT LEVEL GAIN - ft	(3) RWT LEVEL GAIN - %
50% PZR Level	131 ft 5 in WR	14,183 / 106,100	+8.4	+14.1
10% PZR Level	117 ft WR	13,463 / 100,700	+7.9	+13.4
Top of Rx Vessel Flange 2% PZR Level	114 ft WR	12,533 / 93,800	+7.4	+12.4
Refueling Water Level	113 ft 6 in WR	12,473 / 93,300	+7.3	+12.4
Enter Reduced Inventory	111 ft WR	11,499 / 86,000	+6.8	+11.4
Limited to 1 SDC Pump / Loop	107 ft WR	10,365 / 77,500	+6.1	+10.3
Limited to 1 SDC Pump & 1 SDC Loop	104 ft WR	9,559 / 71,500	+5.6	+9.5
Top of the Hot Leg - Enter Mid-Loop Ops	103 ft 1 in WR	9,420 / 70,500	+5.5	+9.4
Centerline of RCS Hotleg	101 ft 4 in WR & NR	4,380 / 32,800	+2.6	+4.4

(1) WR. is Wide Range RCN-LI-752B, and NR. is Narrow Range RCN-LI-752A.

(2) Values were determined as follows: gal = c.f. x 7.4805 gal/c.f. then rounding the product to nearest 100 gal.

(3) HUT Δ level assumes 12,704 gallons/foot in tank.
RWT Δ level assumes 7,538 gallons/% in tank.

Volume to be drained = Initial Volume minus Final Volume.

Example: Draining the RCS from 50% Pzr level to Mid-Loop condition using gallons:

$I_{vo}l - F_{vol} = Vol_{drained}$: 106,100 - 32,800 = 73,300 gallons drained.

D HUT level: 73,300 divided by 12,704 gal/foot = + 5.8 ft. increase in HUT level.

D RWT level: 73,300 divided by 7,538 gal/% = + 9.7% level increase in RWT level.

Using the previous example another way to determine the HUT/RWT level increase is to use the starting RCS inventory at 50% Pzr level, 8.4 ft. for the HUT or 14.1% for the RWT then subtract the final RCS inventory value at midloop, 2.6 ft. for the HUT or 4.4% for the RWT, or 8.4 ft. minus 2.6 ft. = 5.8 ft. level increase in HUT and 14.1% minus 4.4 = 9.7% level increase in RWT level. These level increases are in addition to existing tank levels.

Volume to be drained may be determined several hours prior to actual drain. Under these circumstances, normal plant operations such as VCT divert/makeup may cause a change in assumed initial conditions. The result is an unexpected volume change. Document assumed initial and final levels below:

Assumed Conditions	
Initial Pzr. Level:	Final RWLIS:

Significant Plant Elevations

RWLIS Level Indication (Note 1)	Plant Reference Point	Significance
149 ft.		Pressurizer Manway
141 ft.		Versa-Vent Removal
141 ft		RCE-V007 - RVHV Vent Valve
131 ft. 5 in. W.R.	50% Pzr Level	
117 ft. W.R.	**10% Pzr Level**	Enter **PARTIAL DRAIN** condition. Required to monitor and record RCS level indication.
114 ft. 1 in.	ICI Seal Table	
114 ft. W.R.	Top Rx Vessel Flange	Enter Lowered Inventory
113 ft. 6 in. W.R.		Normal level when entering Mode 6
<111 ft. W.R.		Enter **REDUCED INVENTORY CONDITION**
<107 ft. W.R.		May continue to operate both SDC loops, but are limited to 1 SDC pump per loop.
<104 ft. W.R.	104 ft is top of RCP bowl	Limited to 1 SDC pump and loop.
103 ft. 1 in. W.R.	(103 ft. 1 in. down to 102 ft.)	Maintain SDC flow rate between 3780 - 4600 gpm.
103 ft. 1 in.W.R.	Top of Hot Leg	SG tubes begin to drain. **ENTER MID-LOOP**
102 ft. 11 in.		Theoretical level to remove SG Primary Manways
102 ft. 4 in. N.R.	Hot Leg Lip	Elevation at which RCS fluid will start spilling over into the SG bowls from the Hot Leg.
102 ft. N.R.	(102 ft. down to 101 ft. 6 in.)	Maintain SDC flow rate between 3780 - 4150 gpm.
102 ft. N.R.	Cold Leg Lip	Elevation at which RCS fluid will start spilling over into the SG bowls from the cold leg.
101 ft. 10 in. N.R.		Optimum level for Steam Generator nozzle dam installation.
101 ft, 6 in. N.R.	2 in. above RCS Hot Leg Centerline	Minimum Level for **MID-LOOP** Operations.
99 ft. 7 in. N.R./W.R.	Bottom of Hot Leg	Bottom range of Control Room RWLIS indication.

Note 1 - From 117 ft. 8 3/8 in. to 102 ft. 11in., use Wide Range indicator RCN-LI-752B.
From 102 ft. 11in. to 99 ft. 7 in., use Narrow Range indicator RCN-LI-752A.

Appendix F - Shiftly Verification

1.0 Requirements:

1.1 This Appendix shall be performed when RCS level is less than or equal to 111 ft. with fuel in the vessel.

1.2 This Appendix is required when **any** of the following exists:

- End of shift.
- Prior to rendering a current makeup path unusable.
- When directed by the Shift Manager.

1.3 Completed appendix shall be attached to the Shift Manager's Turnover Sheet.

2.0 Verification Checklist:

_____ 2.1 Record the SDC Train in service: _____

_____ 2.2 Makeup flow rate required to prevent boiling has been determine. REFER TO Step 7.2.13.

Req'd HPSI Makeup	_____ gpm/cold leg

_____ 2.3 Ensure that the status board at the RP Island has been updated with the current time-to-boil data prior to reduced inventory and mid-loop operations and updated shiftly.

_____ 2.4 Record the two designated makeup sources and Appendices used to align/check the source. (REFER TO the completed Appendix for directions on how to initiate flow from the selected source.)

	When Required	Makeup Train (circle)	
HPSI Makeup to Cold Leg (Appendix G)	Cold leg is intact	A	B
Gravity Makeup Flowpath (Appendix H)	ALWAYS required	A	B
HPSI Makeup to HOT Leg (Appendix S)	Anytime the cold leg is NOT intact	A	B

A-3
PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	1290310301 Perform a Tech Review of a Permit					
TASK STANDARD:	3 errors found during a permit Tech Review					
K/A:	2.2.13	K/A RATING:	RO:	4.1	SRO:	4.3
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	20 minutes			
REFERENCES:	40DP-9OP29, Permit and Tagging Process, Various Plant Drawings					

SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Alan Malley Date: 10/04/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- A computer available for access to procedures and plant drawings.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

Unit 1 is 100% power

The 'A' High Pressure Safety Injection (HPSI) Pump (SIA-P02) has a severe seal leak on the pump. The CRS has directed that a permit be hung to isolate and drain the 'A' HPSI pump.

Permit 12-0003 was generated manually due to the Site Work Management System (SWMS) being down.

The CRS has addressed Tech Specs.

INITIATING CUE:

The CRS has directed you to perform a Tech Review of Permit 12-0003.

- **Identify the errors (Non-clerical – not typos) on the permit.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Reviews Permit to determine scope of work to be performed.		Examinee reviews Permit and determines work scope to be repair seal leak on 1-M-SIA-P02.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Identifies one (1) error on the permit with Tag 2.		Examinee determines the following inaccuracy/inadequacy. • Tag 2 is the wrong circuit breaker (breaker is for the "A" LPSI pump) The order of identification of the errors in steps 2, 3, and 4 of this JPM is not critical.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Identifies one (1) error on the permit with Tag 5.		Examinee determines the following inaccuracy/inadequacy. Tag 5 has the wrong position (CLOSED) for the breaker for the Recirc Valve SIA-UV-666. The breaker position should be OPEN The order of identification of the errors in steps 2, 3, and 4 of this JPM is not critical.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Identifies one (1) error on the permit with Tag 9.		Examinee determines the following inaccuracy/inadequacy. • Tag 9 has the wrong valve number. It identifies the drain valve as SIA-V550 (which is the drain valve for SIA-P01) and it could be SIA-V980, 955 or 956. The order of identification of the errors in steps 2, 3, and 4 of this JPM is not critical.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

FOR 2012 NRC EXAM ONLY

Tag Assignment Sheet
Unit No: __1____ Permit No: __12-0003__ Page __1__ of __1__

Tag No.	Equipment ID.	Tag Color	TAG PLACEMENT				TAG REMOVAL		
			Hang Order	Component Position	Placed By	Verified By	Restore Order	Restore Position	Restored By
1	1J-SIA-HS001 Handswitch for SIA-P02 (HPSI A pump)	Yellow	1	N/A					
2	1E-PBA-S03F, 4.16KV Breaker for 1-M-SIA-P01	Red	3	RACKED OUT		Wrong Breaker			
3	1P-SIA-V470 SIA-P02 Suction Valve	Red	6	CLOSED					
4	1P-SIA-UV-666, SIA-P02 Recirc Valve	Red	7	DO NOT OPERATE					
5	1E-PHA-M3507, 480VAC Breaker to SIA-UV666 (SIA-P02 Recirc Valve)	Red	4	CLOSED			Wrong Position		
6	1J-SIA-HS-666, Handswitch for SIA-UV666 (SIA-P02 Recirc Valve)	Yellow	2	N/A					
7	1P-SIA-V476, SIA-P02 Discharge Valve	Red	5	CLOSED					
8	1P-SIA-V1024 SIA-P02 Vent Valve	Yellow	9	N/A					
9	1P-SIA-V550 SIA-P01 Drain Valve	Yellow	8	N/An		Wrong Valve			

*** Special instructions on yellow tag**

ANSWER KEY

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

Unit 1 is 100% power

The 'A' High Pressure Safety Injection (HPSI) Pump (SIA-P02) has a severe seal leak on the pump. The CRS has directed that a permit be hung to isolate and drain the 'A' HPSI pump.

Permit 12-0003 was generated manually due to the Site Work Management System (SWMS) being down.

The CRS has addressed Tech Specs.

INITIATING CUE:

The CRS has directed you to perform a Tech Review of Permit 12-0003.

- **Identify the errors (Non-clerical – not typos) on the permit.**

Palo Verde
Nuclear Generating Station

Permit Form

Page 1 of 2

Facility No.	Permit No.	System
UNIT 1	12-003	SI

EQ I.D.	EQ Description
1MSIAP02	High Pressure Safety Injection Pump 'A'

Reason For Permit:
Isolate the pump due to severe pump seal leakage

Equip Conditions Required For Work			Special Instructions
De-energized	[X] Yes	[ ] No	
Depressurized	[X] Yes	[ ] No	
Continuously Vented	[ ] Yes	[X] No	
Drained	[X] Yes	[ ] No	
Purged	[ ] Yes	[X] No	
Isolated	[X] Yes	[ ] No	
SWMS Search	[ ] Yes	[X] No	
TSCCR	[X] Yes	[ ] No	
TSCCR No. 3712771			

Prepared By:	Ext:	Date:	Time:
JOE TAGGER	2648	3/19/2012	0650
Tag Placement Authorized (responsible supervisor)	Ext:	Date:	Time:
EQ Conditions Established (operator)	Ext:	Date:	Time:
Tag Removal Authorized: (responsible supervisor)	Ext:	Date:	Time:
Permit Cancelled: (responsible supervisor)	Ext:	Date:	Time:

Requestor/Ext. (Print)	Work Document	Signature/Date/Time
Operations Unit 1 Shift Manager X82-1206	N/A	Tech. Rev: Authorized: Accepted: Released:

FOR 2012 NRC EXAM ONLY

Tag Assignment Sheet
Unit No: __1____ Permit No: __12-0003____ Page __1__ of __1__

Tag No.	Equipment ID.	Tag Color	TAG PLACEMENT				TAG REMOVAL		
			Hang Order	Component Position	Placed By	Verified By	Restore Order	Restore Position	Restored By
1	1J-SIA-HS001 Handswitch for SIA-P02 (HPSI A pump)	Yellow	1	N/A					
2	1E-PBA-S03F, 4.16kV VAC Breaker for 1-M-SIA-P01	Red	3	RACKED OUT					
3	1P-SIA-V470 SIA-P02 Suction Valve	Red	6	CLOSED					
4	1P-SIA-UV-666, SIA-P02 Recirc Valve	Red	7	DO NOT OPERATE					
5	1E-PHA-M3507, 480VAC Breaker to SIA-UV666 (SIA-P02 Recirc Valve)	Red	4	CLOSED					
6	1J-SIA-HS-666, Handswitch for SIA-UV666 (SIA-P02 Recirc Valve)	Yellow	2	N/A					
7	1P-SIA-V476, SIA-P02 Discharge Valve	Red	5	CLOSED					
8	1P-SIA-V981 SIA-P02 Seal Cavity Vent Valve	Yellow	9	N/A					
9	1P-SIA-V550 SIA-P01 Drain Valve	Yellow	8	N/A					

CANDIDATE

A-4
PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	Determine proper REP task, determine RCA entry requirements					
TASK STANDARD:	Proper REP task determined, RCA entry requirements determined					
K/A:	2.3.7	K/A RATING:	RO:	3.5	SRO:	3.6
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes			
REFERENCES:	NGW01, Initial Radiation Worker Practices					
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Phil Capehart Date: 06/07/2005

Revised By: Alan Malley Date: 10/12/2010

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- A copy of the Emergency Response REP 9-9999-0.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIATING CUE:

- **You have been directed to align SDC after control room fire.**
- **The OSC has been manned and RP has mandated the use of the Emergency Response REP, 9-9999-0.**

INITIATING CUE:

Your tasks are to locate the Emergency Response REP 9-9999-0 and determine:

1. **the proper task for this evolution.**
2. **if a RP Pre-Job Brief is required prior to entering the RCA?**
3. **RP coverage during job performance.**
4. **dress-out requirements and dosimetry.**
5. **required EPD settings.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Examinee reviews REP and survey and determines task he can enter on.		Examinee determines entry on **TASK1** is required.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Examinee determines if RP pre-job Brief is required for entry into the RCA.		Determines must perform **RP pre-job brief**.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Examinee determines RP coverage requirements during job performance.		RP coverage is: • Intermittent
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Examinee determines dress-out requirements and Dosimetry		PC and respiratory protection equipment requirements per direction from the RPM / RPC / RAC or designee. Dosimetry – • Record TLD • EPD
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Determine the REP required EPD settings.		Examinee determines EPD is required with alarm settings of : • **500mRem dose** and • **5,000 mRem/hr Dose Rate (as stated on the REP)**
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparednessorganization for resolution.

NORMAL TERMINATION POINT

ANSWER KEY

1. Determine proper task for this evolution.

Proper task is TASK 1.

2. Is a RP Pre-Job Brief required prior to entering the RCA?

Yes**.**

3. Determine RP coverage during job performance.

Intermittent.

4. Determine dress-out requirements and dosemetry.

PC and respiratory protection equipment requirements per direction from the RPM / RPC / RAC or designee.

Dosemetry – Record TLD and EPD.

5. Determine required EPD settings.

Examinee determines EPD is required with Dose alarm settings of 500mRem and Dose Rate alarm setting of 5,000 mrem/hr.

(may list alarm warning at 400 mRem).

ANSWER KEY

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
0	06/08/05	6	New Admin Task JPM
1	7/11/05	NRC	Revised to combine with JPM JP2
2	10/12/11	6	Revised to latest JPM format and REP

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

CANDIDATE

INITIATING CUE:

- **You have been directed to align SDC after control room fire.**
- **The OSC has been manned and RP has mandated the use of the Emergency Response REP, 9-9999-0.**

INITIATING CUE:

Your tasks are to locate the Emergency Response REP 9-9999-0 and determine:

1. **the proper task for this evolution.**
2. **if a RP Pre-Job Brief is required prior to entering the RCA?**
3. **RP coverage during job performance.**
4. **dress-out requirements and dosimetry.**
5. **required EPD settings.**

USE THE ANSWER SHEET ON THE NEXT PAGE TO DOCUMENT YOUR ANSWERS.

CANDIDATE

CANDIDATE

1. **Determine the proper task for this evolution.**

2. **Is a RP Pre-Job Brief required prior to entering the RCA?**

3. **Determine RP coverage during job performance.**

4. **Determine dress-out requirements and dosemetry.**

5. **Determine required EPD settings.**

CANDIDATE

PVNGS

RADIATION EXPOSURE PERMIT

REP Title	REP Number
EMERGENCY RESPONSE	**9-9999 Rev. 00**

Comments: JOB SCOPE: Emergency response.

Locations

Buildings	Elevations	Rooms
All buildings with RCAs	ALL	N/A

Radiological Conditions		Unit
LHRA Work Area Dose Rates as communicated in Formal Pre-job briefing and recorded in RP Logbook.	LHRA(s)	N/A
Pre-job or Historical survey(s) attached.	N/A	N/A
Review current work area survey(s).	Prior to entering RCA	N/A

Tasks

(1) LHRA - Emergency Plan implementation and Plant support tasks.

(2) LHRA - Emergency Plan implementation and Plant support tasks as authorized by RPM or RPC.

(3) VHRA - Life-saving actions and Plant protective measures as explicitly authorized by Site Emergency Coordinator.

(4) RA - Drill Support.

Global Instructions

Prerequisites:

General:

RP Hold Points:

Attachments

ALARA Plan 9-9999 Rev 00.pdf

Classification / Estimates

1.16 Task: REACTOR OPERATION + SURVEIL

REP Type:	REP Status:	Begin Date:	Close On Date:
SREP, JHES Cat. 1	ACTIVE	7/31/2009	

Estimated Dose: 100 mrem	Estimated Hours: 735.00	Actual Dose:	Actual Hours:
Prepared By: GYGER, JEFFREY M		Leader:	

Approvals

Approver Title	Name	Date
Department Leader	MCDONNELL, JAMES P	08/28/2009
Section Leader	WAGNER, MARTHA M	08/28/2009
Technician	GYGER, JEFFREY M	08/28/2009

PVNGS

RADIATION EXPOSURE PERMIT

Task Number One	REP No.: 9-9999 Rev.: 00

Task Description: LHRA - Emergency Plan implementation and Plant support tasks.
INCLUDES:
• Radiation exposure not to exceed PVNGS Administrative Hold Points.

HRA Entry: YES	LHRA Entry: YES	Minimum Available Dose: 200 mRem

Dosimeter Settings

Dose (mRem)	Rate (mRem/hr)	Time (HH:MM)	Chirp Rate
Warning: 400	Warning: 5000		
Alarm: 500	Alarm: 5000	Alarm: 13:00	0.1 mrem

Authorization List

Required: NO	Authorization Expires: NO

Requirements

Requirement Groups	Requirement Descriptions
ALARA Review	NO
PROTECTIVE AND MONITORING (PC, Respiratory, Dosimetry)	Other: - -- Additional exposure monitoring equipment per direction from the RPM / RPC / RAC or designee. -- PC and Respiratory protective equipment requirements per direction from the RPM / RPC / RAC or designee.
	Review and implement REP Standard Instructions [75RP-9RP02, App. P, attached]
RP COVERAGE	CONTINUOUS IN LHRA
	INTERMITTENT
	RPTs: Implement Radiological Controls Directions contained in associated ALARA Plan(s).
RP PRE-JOB BRIEFING	YES

Additional Instructions

Prerequisites:

• Review available radiological survey data with RP prior to entry.
• Complete radiation protection briefing and obtain RP authorization prior to each RCA entry as directed by RPM, RPC, or RAC.
• Entry to areas where no current radiological survey exists requires RP evaluation and authorization.
• LHRA entry requires RPM, RPC, RAC, or authorized designee approval.

General:

• Dosimetry requirements may be modified and EPD setpoints adjusted per RPM, RPC, RAC or authorized designee.
• The 10 CFR 20.1201(a) Occupational Dose Limits apply to non-emergency conditions. All reasonable efforts should be made to observe these limits during emergency conditions.

RP Hold Points:

Attachments

N/A

PVNGS

RADIATION EXPOSURE PERMIT

Task Number Two	REP No.: 9-9999 Rev.: 00

Task Description: **LHRA - Emergency Plan implementation and Plant support tasks as authorized by RPM or RPC.**
INCLUDES:
• Potential to exceed PVNGS radiation exposure Administrative Hold Points anticipated.

HRA Entry: YES	LHRA Entry: YES	Minimum Available Dose: 0 mRem

Dosimeter Settings

Dose (mRem)	Rate (mRem/hr)	Time (HH:MM)	Chirp Rate
Warning: 800	Warning: 5000		
Alarm: 1000	Alarm: 5000	Alarm: 13:00	10 mrem

Authorization List

Required: NO	Authorization Expires: NO

Requirements

Requirement Groups	Requirement Descriptions
ALARA Review	YES
PROTECTIVE AND MONITORING (PC, Respiratory, Dosimetry)	Other: - -- Additional exposure monitoring equipment per direction from the RPM / RPC / RAC or designee. -- PC and Respiratory protective equipment requirements per direction from the RPM / RPC / RAC or designee. -- Administration of Potassium Iodide (KI) for projected Thyroid CDE doses in excess of 25 REM as authorized by Emergency Coordinator.
	Review and implement REP Standard Instructions [75RP-9RP02, App. P, attached]
RP COVERAGE	CONTINUOUS IN LHRA
	INTERMITTENT
	RPTs: Implement Radiological Controls Directions contained in associated ALARA Plan(s).
RP PRE-JOB BRIEFING	YES

Additional Instructions

Prerequisites:

• Review available radiological survey data with RP prior to entry.
• Complete radiation protection briefing and obtain RP authorization prior to each RCA entry as directed by RPM, RPC, or RAC.
• An Emergency Classification of "Notification of Unusual Event" (NUE) or an Emergency requiring immediate attention or higher has been declared.
• RPM or RPC authorization required prior to entry on this task.
• Entry to areas where no current radiological survey exists requires RP evaluation and authorization.

General:

• Dosimetry requirements may be modified and EPD setpoints adjusted per RPM, RPC, RAC or authorized designee.
• The 10 CFR 20.1201(a) Occupational Dose Limits apply to non-emergency conditions. All reasonable efforts should be made to observe these limits during emergency conditions.
• The RPM or RPC may authorize personnel radiation exposure within the Occupational Dose limits specified in 10 CFR 20.1201(a).

RP Hold Points:

Attachments

N/A

PVNGS

RADIATION EXPOSURE PERMIT

Task Number Three	REP No.: 9-9999 Rev.: 00

Task Description: **VHRA - Life-saving actions and Plant protective measures as explicitly authorized by Site Emergency Coordinator.**
INCLUDES:
• Potential to exceed 10CFR20 radiation exposure limits anticipated.

HRA Entry: YES	LHRA Entry: YES	Minimum Available Dose: 0 mRem

Dosimeter Settings

Dose (mRem)	Rate (mRem/hr)	Time (HH:MM)	Chirp Rate
Warning: 20000	Warning: 250000		
Alarm: 25000	Alarm: 250000	Alarm: 13:00	10 mrem

Authorization List

Required: NO	Authorization Expires: NO

Requirements

Requirement Groups	Requirement Descriptions
ALARA Review	YES
PROTECTIVE AND MONITORING (PC, Respiratory, Dosimetry)	Other: - -- Additional exposure monitoring equipment per direction from the RPM / RPC / RAC or designee. -- PC and Respiratory protective equipment requirements per direction from the RPM / RPC / RAC or designee. -- Administration of Potassium Iodide (KI) for projected Thyroid CDE doses in excess of 25 REM as authorized by Emergency Coordinator.
	Review and implement REP Standard Instructions [75RP-9RP02, App. P, attached]
RP COVERAGE	CONTINUOUS
	RPTs: Implement Radiological Controls Directions contained in associated ALARA Plan(s).
RP PRE-JOB BRIEFING	YES

Additional Instructions

Prerequisites:

- Review available radiological survey data with RP prior to entry.
- Complete radiation protection briefing and obtain RP authorization prior to each RCA entry as directed by RPM, RPC, or RAC.
- An Emergency Classification of "Notification of Unusual Event" (NUE) or higher has been declared.
- Emergency Coordinator has authorized entry on this task.
- Entry to areas where no current radiological survey exists requires RP evaluation and authorization.
- LHRA entry requires RPM, RPC, RAC or authorized designee approval.

General:

- NOTE: Each emergency responder to obtain a pre-set fast response EPD [located in 140Æ auxiliary building RCA access control EPD racks, right hand column, labeled "Emergency use EPDs, REP 9-9999 Task 3"].
- Dosimetry requirements may be modified and EPD setpoints adjusted per RPM, RPC, RAC, EC or authorized designee.
- The 10 CFR 20.1201(a) Occupational Dose Limits apply to non-emergency conditions. All reasonable efforts should be made to observe these limits during emergency conditions.
- The Emergency Coordinator, after consultation with Radiation Protection staff, must authorize any projected personnel radiation exposure in excess of the limits specified in 10 CFR 20.1201(a).

RP Hold Points:

Attachments

N/A

PVNGS

RADIATION EXPOSURE PERMIT

Task Number Four	REP No.: 9-9999 Rev.: 00

Task Description: RA - Drill Support.
INCLUDES:
• Drill support entry, radiation exposure not to exceed EPD setpoints.

HRA Entry: NO	LHRA Entry: NO	Minimum Available Dose: 15 mRem

Dosimeter Settings

Dose (mRem)	Rate (mRem/hr)	Time (HH:MM)	Chirp Rate
Warning: 12	Warning: 75		
Alarm: 15	Alarm: 75	Alarm: 13:00	0.1 mrem

Authorization List

Required: NO	Authorization Expires: NO

Requirements

Requirement Groups	Requirement Descriptions
ALARA Review	YES
PROTECTIVE AND MONITORING (PC, Respiratory, Dosimetry)	Other: - PC and Respiratory protection equipment requirements per direction from RPM / RPC / RAC or designee.
	Review and implement REP Standard Instructions [75RP-9RP02, App. P, attached]
RP COVERAGE	INTERMITTENT
	RPTs: Implement Radiological Controls Directions contained in associated ALARA Plan(s).
RP PRE-JOB BRIEFING	YES

Additional Instructions

Prerequisites:

• Review available radiological survey data with RP prior to entry.
• Entry to areas where no current radiological survey exists requires RP evaluation and authorization.

General:

RP Hold Points:

• NO HRA, LHRA, or VHRA entries on this task.

Attachments

N/A

Radiation Exposure Permit Standard Instructions

All RCA entrants shall comply with the following PVNGS REP Standard Instructions except where REP provides specific alternate direction:

Monitoring and Protective Equipment:

Dosimetry – EPD/TLD

Protective Clothing -

- RP Authorized Work at CA Boundaries – Lab Coat and Gloves
- CA entry – Full Set
- HCA / HPCA entry – Double Set
- Wet work – Wet set

General:

- Contact RP prior to each RCA entry.
- Review current radiological survey data for work area prior to entry.
- Notify RP prior to contaminated system opening, contaminated surface destroying activities, or insulation removal.
- Stand by in low dose "Cold Area" when not actively involved in job.
- To limit exposure to airborne radioactive material when working in High Contamination Areas, apply engineered controls as directed by RP. This typically involves misting work area surfaces and maintaining damp while working.
- Work at CA Boundaries (e.g. Removing Tools, Equipment or Materials from CAs) requires RP Authorization.
- Radiation Worker's PC requirements may be modified with RP Leader authorization.
- Personnel may enter a HCA / HPCA wearing a modified Double Set (consisting of a Full Set with outer shoe covers and gloves) to perform minor tasks with low probability of personnel contamination as determined and authorized by an RP Leader prior to each entry.
- Within contaminated areas, RP authorization required for body position other than standing.

RP personnel shall observe the following REP Standard Instructions in addition to the above:

- EPD dose rate setpoint may be adjusted as determined prudent by RP Leader based on review of work plan and radiological conditions. RP Leader to document all setpoint adjustments in RP electronic log.
- Ensure worker dosimetry is positioned appropriately to monitor highest whole body exposure (Ref. 75RP-9RP16).
- Task Specific TEDE /ALARA Screening required for: Work area conditions >500,000 dpm/100cm^2 ($\beta\gamma$), >500 dpm/100cm^2 (α), Contaminated system breach, Contaminated surface destroying activity or where a job/work area air sample yields >1.0 DAC (excluding Noble gas).
- RP Technicians entering an HPCA / HCA to perform RP monitoring tasks with low probability of personnel contamination may wear a modified Double Set consisting of a Full Set with outer shoe covers and gloves.
- RP Technicians, meeting the experience requirements of Section 4.5.2 of ANSI/ANS 3.1-1978, may relax RP Technician's Protective Clothing requirements for minor tasks with low probability of contamination.
- If individual is unable to self monitor (read dosimeter) due to any instance including but not limited to: telemetric dosimeter use, re-positioning of dosimetry by RP, multi-dosimeter use, or outer set of PCs being worn, then RP will assume exposure monitoring for that individual (Ref: 75RP-9RP16, 75RP-9RP29, 75DP-0RP02).

ALARA PLAN

Plan #: 9-9999 **Revision #: 00**

Title: EMERGENCY RESPONSE

Plan Type: ☑ **PRIMARY** ☐ **SUPPLEMENTAL** (Preparer to ensure compatibility with Primary ALARA Plan) **WM / Supplement # :** **Work Description :**
Prepared by / date: Jeff Gyger 08-27-2009 Jeff Gyger
Approved by / date: Martha Wagner 08-27-2009 Martha Wagner

CONTENTS:

ALARA PLAN

Plan #: 9-9999 Revision #: 00

Title: EMERGENCY RESPONSE

Section One

REP Task Number	REP Task Description
1	LHRA - Emergency Plan implementation and Plant support tasks.
2	LHRA - Emergency Plan implementation and Plant support tasks as authorized by RPM or RPC.
3	VHRA - Life-saving actions and Plant protective measures as explicitly authorized by Site Emergency Coordinator.
4	RA - Drill Support.

Radiological Controls Directions

Task					PREREQUISITE:
1	2	3	4	_	
1	2	3			HRA Entry – RP Pre-job brief and RP authorization required as directed by RPM, RPC, or RAC.
1	2	3			LHRA / VHRA Entry – Formal RP Pre-job brief and RP authorization required as directed by RPM, RPC, or RAC.
	2				Fast entry EPD's are set to Task-2 set points.
1	2	3			The EDE / TEDE ratio will be used to track internal exposure.

Task					GENERAL:
1	2	3	4	_	

ALARA PLAN

Plan #: 9-9999 Revision #: 00

Title: EMERGENCY RESPONSE

Section One

Task					RP HOLD POINT:
1	2	3	4	_	

Section Two

NOTE:
There are no REP requirements contained in this section. The following is provided as supplemental background information.

Operating Experience / Lessons Learned

FUEL BUILDING RADIOLOGICAL CONDITIONS AFTER LOCA

After a Loss of Coolant Accident (LOCA) a Recirculation Actuation Signal (RAS) will occur. Highly radioactive water will fill the suction lines to the Safety Injection pumps. Back-leakage from the suction lines past check valves to the Refueling Water Tank is assumed and this will cause radioactive material to build up in the Refueling Water Tank. The Refueling Water Tank is vented to the Fuel Building normal ventilation. The normal building ventilation exhaust is isolated after a Safety Injection Actuation Signal so the Refueling Water Tank radioactive material (airborne nobles gasses and iodines) will migrate into the Fuel Building and remain there.

After a design basis LOCA, the disposition to CRDR 97-Q-0265 indicates that the following tasks may need to be performed in the Fuel Building:

- Obtaining iodine and particulate samples from RU-145/146
- Restart of the spent fuel pool (PC) cooling pumps
- Alignment of EW to the spent fuel pool heat exchangers
- Makeup to the spent fuel pool
- Periodic checks of spent fuel pool temperature and level

Very high airborne levels may build up in the Fuel Building after a LOCA and continue to rise for several days after shutdown. Calculation 13-NC-CH-0314 rev 3 indicates 10,000 Rem/hr Thyroid CDE, 80 Rem/hr skin dose, and 7 Rem/hr TEDE are possible 100 hours after shutdown. Use of PCs, plastics, and SCBAs would be required for entries into the Fuel Building.

SPRAY POND VALVE OPERATION

Within 24 hours of a LOCA, Operations will need to open the Essential Spray Pond cross-tie valves. The valves are located at the Essential Spray Ponds. This job should be performed when the Essential Spray Ponds are upwind of the affected unit to minimize radiation exposure to Operations personnel.

.

ALARA PLAN

Plan #: 9-9999 **Revision #: 00**

Title: EMERGENCY RESPONSE

Section Three

REP development Worksheet

NOTE: *Pre-job development information only. There are no REP requirements contained in this section.*

ALARA Measures:

☐ 1. Temporary Shielding	☐ 12. Special Anti-Cs (beta protection or other)
☐ 2. Component/System Flushing	☐ 13. Reduced PC/Anticipated PCE authorization
☐ 3. Remote monitoring	☐ 14. TEDE ALARA Screening/Evaluation
☐ 4. Remote radiation survey techniques	☐ 15. Pre-Job Decontamination
☐ 5. Robotic support	☐ 16. Contamination fixatives
☐ 6. Planning Walk down with Work Group	☐ 17. Wrap/Sleeve/Cover components
☐ 7. Relocate Component (low dose area)	☐ 18. Contamination containment tent/enclosure
☐ 8. Minimize Crew size	☐ 19. HEPA filtration (ventilation syst. or vacuum)
☐ 9. Mock-up practice	☐ 20. Other: _____
☐ 10. Specialized Tooling [e.g., long-handled]	☐ 21. Other: _____
☐ 11. Re-schedule to optimal ALARA window	☐ 22. Other: _____

Comments:

Job Estimate:

REP Task	Activity Description	Location	Craft	# Persons	# Entries	Actual [hours]	Eff. mR/ hr	Actual [mRem]
All	2009 Actual dose received	All areas	N/A	N/A	126	682	N/A	0.000
All	2008 Actual dose received	All areas	N/A	N/A	322	1,415	N/A	0.000
All	2007 Actual dose received	All areas	N/A	N/A	227	873	N/A	0.001
All	2006 Actual dose received	All areas	N/A	N/A	105	325	N/A	0.000
All	2005 Actual dose received	All areas	N/A	N/A	119	391	N/A	0.000
All	2004 Actual dose received	All areas	N/A	N/A	239	725	N/A	0.004
TOTAL					**Average's**	**735**	**/////// /**	**0.000**

Developmental survey(s): N/A

ALARA PLAN

Plan #: 9-9999 **Revision #: 00**

Title: EMERGENCY RESPONSE

Section Three

REP development Worksheet

NOTE: *Pre-job development information only. There are no REP requirements contained in this section.*

Estimate basis / assumptions: Historical averages from the last six years. Although little to no radiation exposure has been received over the last six years on this REP, 100 mRem is used in this estimate to allow minor surveillance activities.

Job-REP required (estimate >300 mRem) ? : ☐ YES ☑ NO

New REP # : _____

Assign to existing REP # : 9-9999

Do identified ALARA Measures or Radiological Controls Directions necessitate a REP revision (new or upgraded; Protective, Surveillance, or Controls requirements to the existing REP/ALARA Plan) ? :

☐ YES ☑ NO ☐ N/A

A-5
PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	1290020301, Conduct of Shift Operations						
TASK STANDARD:	Determine Shift Manning Requirements						
K/A:	2.1.4	K/A RATING:	RO:	3.3	SRO:	3.8	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	SRO	VALIDATION TIME:	15 minutes				
REFERENCES:	40DP-9OP02, Conduct of Shift Ops						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 10/12/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- 40DP-9OP02 available. This JPM was written using Revision 53 of 40DP-9OP02 This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

A-5
PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

INITIAL CONDITIONS:

- **You are the CRS for a crew that is scheduled to take the Unit 1 dayshift tomorrow April 1st (new quarter).**
- **Unit 1 is in Mode 1.**
- **STA position will be filled by a non-licensed STA**
- **Unit 2 is providing the Fire Team Advisor.**
- **The crew was in the 4th week of the training cycle.**
- **The training cycle completed 7 weeks ago, there was no evaluated scenario.**
- **The table below reflects your crew's status of Training and License Maintenance times.**

Operator	Training	Shifts previous Quarter
SM	Attended all classes Passed written exam	Every shift for the quarter in the SM position
CRS	Attended all classes Passed written exam	One (1) 12 hour shift as CRS Remaining shifts in RO positions
RO	Attended all training Passed written exam	Every shift in an RO positions
CO	Attended all classes Passed written exam	Short term disability 6 hour shift as RO 10 hour shift as CO Four (4) 12 hour shifts as RO
TRO	Attended all classes Did not take written exam	Every shift in an RO positions

INITIATING CUE:

You are directed to determine:

1. **The current status of the 5 licensed positions.**
2. **If the crew meets the procedural requirements to assume the shift.**
3. **If not, what position(s) need to be filled to meet these requirements?**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Obtain 40DP-9OP02, Conduct of Shift Operations.		Obtain 40DP-9OP02, Conduct of Shift Operations.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	3.6.1.1/.2 of 40DP-9OP02 An Operator's training is current when all required material in an LOCT Training Cycle is completed. If any LOCT material is missed during a training cycle, make-up training shall be completed no later than 6 weeks from the end of the training cycle that the training was part of.		Examinee determines that the TRO is not current in LOCT training due to not completing their training within 6 weeks of the end of the cycle.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	3.6.2 of 40DP-9OP02 ACTIVE NRC Operators License exists when an operator has a valid license and has "actively performed" the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.		Examinee determines that the CRS meets the requirements of at least one 12 hour shift in the SRO position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	3.6.2 of 40DP-9OP02 ACTIVE NRC Operators License exists when an operator has a valid license and has "actively performed" the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.		Examinee determines that the CO does not meet "Watchstanding Proficiency' requirements as they did not stand five (5) 12 hour shifts n the previous quarter.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	3.1 of 40DP-9OP02 The minimum required shift crew manning per Unit is: • 1 Shift Manager. • 1 Control Room Supervisor. • 2 Reactor/Control Operators.		Examinee determines that at least one more Reactor Operator is required to meet minimum shift manning requirements.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

ANSWER KEY

INITIAL CONDITIONS:

- **You are the CRS for a crew that is scheduled to take the Unit 1 dayshift tomorrow April 1st (new quarter).**
- **Unit 1 is in Mode 1.**
- **STA position will be filled by a non-licensed STA**
- **Unit 2 is providing the Fire Team Advisor.**
- **The crew was in the 4th week of the training cycle.**
- **The training cycle completed 7 weeks ago, there was no evaluated scenario.**
- **The table below reflects your crew's status of Training, License Maintenance times and Medical requirements.**

Operator	Training	Shifts previous Quarter
SM	Attended all classes Passed written exam	Every shift for the quarter in the SM position
CRS	Attended all classes Passed written exam	One (1) 12 hour shift as CRS Remaining shifts in RO positions
RO	Attended all training Passed written exam	Every shift in an RO positions
CO	Attended all classes Passed written exam	Short term disability 6 hour shift as RO 10 hour shift as CO Four (4) 12 hour shifts as RO
TRO	Attended all classes Did not take written exam	Every shift in an RO positions

INITIATING CUE:

- **You are directed to determine:**
  1. **The current status of the 5 licensed positions.**
  2. **If the crew meets the procedural requirements to assume the shift.**
  3. **If not, what positions need to be filled to meet these requirements?**

Provide your answers on the attached sheet.

ANSWER KEY

1. **The current status of the 5 licensed positions.**

Operator	Qualified Training?	Qualified License Maintenance time?
SM	YES / NO	YES / NO
CRS	YES / NO	YES / NO
RO	YES / NO	YES / NO
CO	YES / NO	YES / NO
TRO	YES / NO	YES / NO

2. **Does the crew meet the procedural requirements to assume the shift.**
   YES / NO

3. **If not, what position(s) need to be filled to meet these requirements?**

   There is only one qualified reactor Operator for the shift. At least one more Reactor Operator is required to meet minimum shift requirements.

ANSWER KEY

A-5
PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	10/12/2011		New JPM for 2012 NRC Initial Exam

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

Candidate Handout

INITIAL CONDITIONS:

- **You are the CRS for a crew that is scheduled to take the Unit 1 dayshift tomorrow April 1st (new quarter).**
- **Unit 1 is in Mode 1.**
- **STA position will be filled by a non-licensed STA**
- **Unit 2 is providing the Fire Team Advisor.**
- **The crew was in the 4th week of the training cycle.**
- **The training cycle completed 7 weeks ago, there was no evaluated scenario.**
- **The table below reflects your crew's status of Training, License Maintenance times and Medical requirements.**

Operator	Training	Shifts previous Quarter
SM	Attended all classes Passed written exam	Every shift for the quarter in the SM position
CRS	Attended all classes Passed written exam	One (1) 12 hour shift as CRS Remaining shifts in RO positions
RO	Attended all training Passed written exam	Every shift in an RO positions
CO	Attended all classes Passed written exam	Short term disability 6 hour shift as RO 10 hour shift as CO Four (4) 12 hour shifts as RO
TRO	Attended all classes Did not take written exam	Every shift in an RO positions

INITIATING CUE:

- **You are directed to determine:**
  1. **The current status of the 5 licensed positions.**
  2. **If the crew meets the procedural requirements to assume the shift.**
  3. **If not, what position(s) need to be filled to meet these requirements?**

Provide your answers on the attached sheet.

Candidate Handout

1. **The current status of the 5 licensed positions.**

Operator	Qualified Training?	Qualified License Maintenance time?
SM	YES / NO	YES / NO
CRS	YES / NO	YES / NO
RO	YES / NO	YES / NO
CO	YES / NO	YES / NO
TRO	YES / NO	YES / NO

2. **Does the crew meet the procedural requirements to assume the shift.**
   YES / NO

3. **If not, what positions need to be filled to meet these requirements?**

_____

_____

_____

Candidate Handout

3.0 SHIFT MANNING

3.1 Shift Composition

3.1.1 The minimum required shift crew manning is

- 1 Shift Manager per Unit.
- 1 Control Room Supervisor per Unit.
- 2 Reactor/Control Operators per Unit.
- In addition to the 2 Reactor/Control Operators per Unit, one Unit shall have an additional Reactor/Control Operator (may be filling a Nuclear Auxiliary Operator position) to fulfill the requirement of Site Fire Team Advisor.
- 4 Auxiliary Operators per Unit.
- 1 Auxiliary Operator for Area 9. (Unit 1 only)
- At least 1 Auxiliary Operator per Site crew will be Radwaste Operator qualified.
- 1 Shift Technical Advisor (STA) per Unit
  or
  2 STAs for the site and 1 NRC Communicator (RO or SRO not assigned a watchstation).

3.1.2 Except for the Shift Manager, the composition of the shift crew may be one less than the minimum manning required for sections 3.1.1 for a period not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members, provided immediate action is taken to restore crew manning to the minimum requirements of section 3.1.1 This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crew member being late or absent.

---------- **NOTE** ----------

Within the unit is defined as the area containing each unit bounded by the protected area fence and the fences running north and south between the spray ponds and the adjacent unit.

3.1.3 At least 2 Reactor/Control Operators and 3 Auxiliary Operators shall be present within each unit at all times.

3.1.4 Auxiliary Operators are considered to be part of the shift crew composition if they are on site and in direct communication with the Control Room via radio or pager

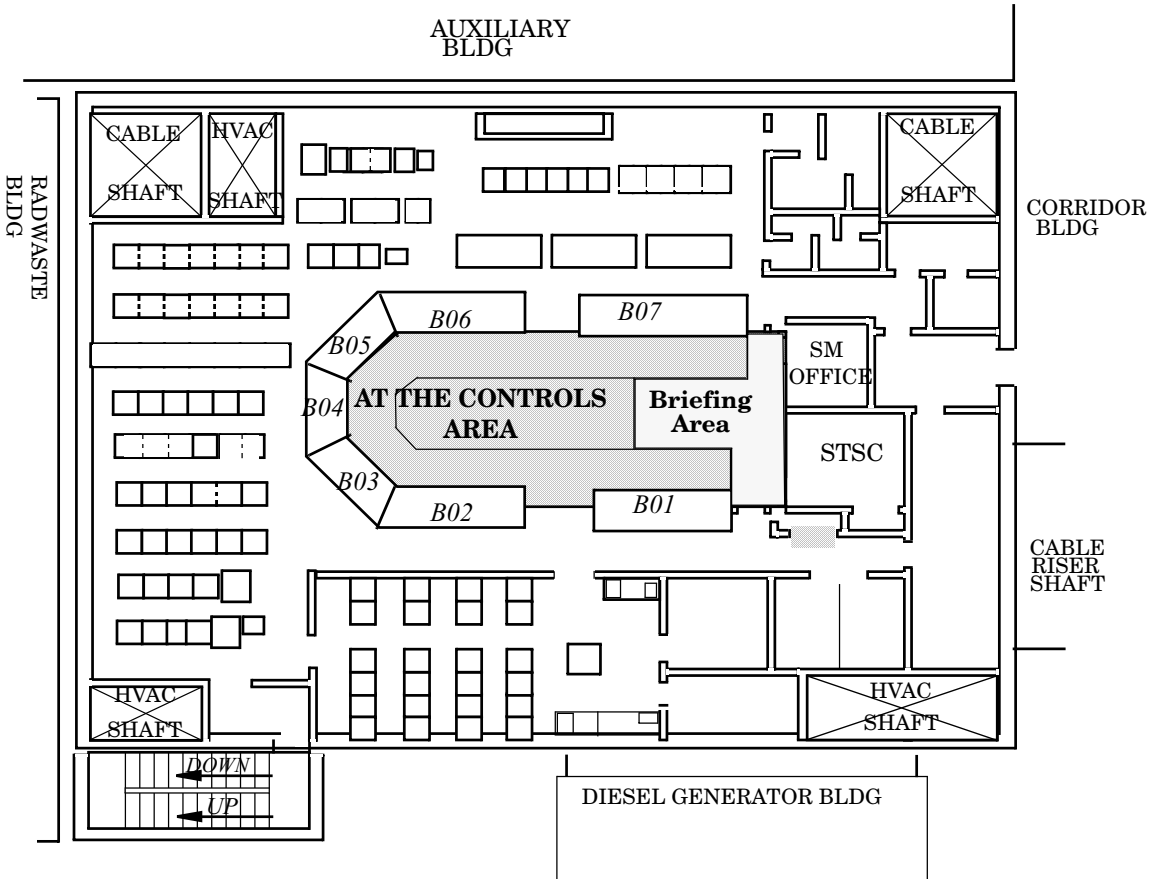
3.1.5 Conduct of all core alterations shall be observed and directly supervised by a Refueling SRO/LSRO who has no other concurrent responsibilities during this operation.

3.1.6 Each on-shift crew shall have a designated communicator. This individual will be stationed when continuous communications with the NRC is required (Alert or higher) or requested and shall be an STA or another Licensed Individual. This communicator is independent of and in addition to the Emergency Plan (STSC) Communicator.

3.2 Staffing Requirements for the Control Room

3.2.1 When fuel is in the vessel, at least one Licensed Individual shall be in the "At the Controls Area" shown below.

Control Room Layout



3.2.2 The RO shall not leave the "At the Controls Area" without proper relief except during an emergency effecting plant safety which requires entering other areas within the Control Room. At least one RO/CO or CRS is expected to be in the "At the Controls Area" and normally in the B02 to B06 horseshoe area.

3.2.3 The CRS should normally be in a position to visually observe the Control Boards.

3.6 Licensed Operator Watchstanding Proficiency

3.6.1 A VALID NRC Operators License exists when the holder of that license is current in Licensed Operator Continuing Training (LOCT).

3.6.1.1 An Operator's training is current when all required material in an LOCT Training Cycle is completed. If any LOCT material is missed during a training cycle, make-up training shall be completed no later than 6 weeks from the end of the training cycle that the training was part of.

3.6.1.2 If the operator fails to make up the classroom training and simulator training within 6 weeks of the end of the training cycle, the operator shall be removed from license duties until the make-up training is completed.

3.6.2 An ACTIVE NRC Operators License exists when an operator has a valid license and has “actively performed” the functions of an operator or senior operator on a minimum of five 12-hour shifts per calendar quarter.

- Actively Performed means that the operator held a position on the shift crew that required the individual to be licensed as defined in the Technical Specifications and that the operator carried out and was responsible for the duties covered by that position.
- For maintenance of an active SRO license any shift spent in either the SM or CRS position will be credited.
- An SRO must stand at least one complete shift per calendar quarter in an SRO-only supervisory position. The remainder of the shifts required in a calendar quarter may be performed in either a credited SRO or RO position.
- For time to be credited it must be a continuous shift (i.e., 4 hours of watch shift responsibilities spent on each of 3 different shifts does not equal one 12 hour shift).
- Overtime may be credited if the overtime work is in a position appropriately credited for watchstanding proficiency. Overtime as an extra helper after the official watch has been turned over to another watchstander does not count toward proficiency time.

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	1270130401 Implement reactor coolant system draining operations					
TASK STANDARD:	Determine if time shutdown is met and makeup flow to prevent boiling					
K/A:	2.1.20	K/A RATING:	RO:	4.6	SRO:	4.6
K/A:	2.1.25	K/A RATING:	RO:	3.9	SRO:	4.2
APPLICABLE POSITION(S):	SRO	VALIDATION TIME:	15 minutes			
REFERENCES:	40OP-9ZZ16, RCS Drain Operations; Unit 3 Safety Analysis Operational Data Manual					
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Alan Malley Date: 09/08/2009

Revised By: Alan Malley Date: 07/07/2011

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9ZZ16, RCS Drain Operations available. This JPM was written using Revision 71 of 40OP-9ZZ16. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.
- Unit 3 Safety Analysis Operational Data Manual available. This JPM was written using Revision 4 of the Unit 3 Safety Analysis Operational Data Manual. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Unit 3 was shutdown 91 hours ago.**
- **The Decay heat load is 15.5 MWs.**
- **The crew is preparing to drain the RCS for a Hot Mid-Loop.**
- **You are an extra SRO in Unit 3.**
- **It is anticipated that the crew will have to reduce Shutdown Cooling flow to 3780 gpm during Mid-Loop operations.**

- **RWT temperature as read on 1-J-CHN-TT-210 is 70 °F.**
- **EW Heat Exchanger temperature as read on 3-J-EWN-TT-083 and TT-084 is 86 °F.**

INITIATING CUE:

The Control Room Supervisor has directed that you perform the following two tasks:

1. **Perform prerequisite step 7.2.12 of 40OP-9ZZ16 (RCS Drain Operations) to determine if Essential Cooling Water temperature vs. Time Post Shutdown requirements of the Safety Analysis Operational Data portion of the Core Data Book is met before SDC flow is lowered to 3780 gpm.**
2. **Perform prerequisite step 7.2.13 of 40OP-9ZZ16 (RCS Drain Operations) to determine makeup flow rate required to prevent boiling using HPSI cold leg injection.**

Provide your answers below:

1. **Prerequisite step 7.2.12 is met / is not met.**
   (Circle one)
2. **Required makeup flow to prevent boiling - _____ gpm per cold leg.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Step 7.2.12 of 40OP-9ZZ16: Essential Cooling Water temperature vs. Time Post Shutdown requirements of the Safety Analysis Operational Data portion of the Core Data Book are met before SDC flow is lowered to 3780 gpm. REFER TO Step 4.2 for additional information		Examinee refers to the Safety Analysis Operation Data Manual to verify Essential Cooling Water temperature Vs Time Post Shutdown requirements are met. Examinee may refer to step 4.2 of 40OP-9ZZ16. Examinee determines that for an EW temperature of 86 °F the time for shutdown has to be 87 hours, therefore being 91 hours after shutdown does meet the requirements.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Step 7.2.13 of 40OP-9ZZ16: Makeup flow rate required to prevent boiling has been determined by **one** of the following: Hot Mid Loop (pre core offload) • This is applicable for HPSI makeup via the cold leg and should be N/Ad if this makeup path is not selected. • Decay heat load, in MW, has been determined. Target decay heat load is equal to or less than 16.0 MW. • Required HPSI makeup flow per loop has been determined from Appendix W - Makeup Flow to Prevent Boiling. (REFER TO Step 4.30 for additional discussion)		Examinee determines HSPI Cold leg injection flow should be ~ 212 gpm (+ 10 gpm) per cold leg using Appendix W and the 70°F line for 15.5 MWs.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	07/07/2011	6	Converted from a NRC Initial License Exam JPM

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 3 was shutdown 91 hours ago.**
- **The Decay heat load is 15.5 MWs.**
- **The crew is preparing to drain the RCS for a Hot Mid-Loop.**
- **You are an extra SRO in Unit 3.**
- **It is anticipated that the crew will have to reduce Shutdown Cooling flow to 3780 gpm during Mid-Loop operations.**

- **RWT temperature as read on 1-J-CHN-TT-210 is 70 °F.**
- **EW Heat Exchanger temperature as read on 3-J-EWN-TT-083 and TT-084 is 86 °F.**

INITIATING CUE:

The Control Room Supervisor has directed that you perform the following two tasks:

1. **Perform prerequisite step 7.2.12 of 40OP-9ZZ16 (RCS Drain Operations) to determine if Essential Cooling Water temperature vs. Time Post Shutdown requirements of the Safety Analysis Operational Data portion of the Core Data Book is met before SDC flow is lowered to 3780 gpm.**
2. **Perform prerequisite step 7.2.13 of 40OP-9ZZ16 (RCS Drain Operations) to determine makeup flow rate required to prevent boiling using HPSI cold leg injection.**

Provide your answers below:

1. **Prerequisite step 7.2.12 is met / is not met.**
   (Circle one)
2. **Required makeup flow to prevent boiling - _____ gpm per cold leg.**

4.0 PERSONAL INDOCTRINATION

4.1 Plant activities may preclude the performance of specific steps in the order presented. The Shift Manager may re-sequence or delay steps as necessary to accomplish the procedure objectives, except for those portions of the procedure requiring the securing of plant draining at specified plant elevations since these will be used to allow for entire RCS pressure equalization/level stabilization.

4.2 The analyses that supports SDC operation at reduced flow rate (3780 gpm) have been revised to reduce conservatism and permit more expedient entry into Mid-Loop.

- Table 2.8.1 has been added to the Safety Analysis Operational Data portion of the Core Data Book which defines the criteria necessary to reduce SDC flow. Supplements to Table 2.8.1 for specific unit and outage applications may be applicable and incorporated in the SAOD.
- SAOD Table 2.8.1 is applicable anytime the plant is in mode 5 or mode 6 and it is required to reduce SDC flow. The table is independent of RCS level.
- This table shows the required number of hours post shutdown, as a function of Essential Cooling Water temperature, after which a single train of SDC can provide sufficient cooling at reduced flow (i.e.: 3780 gpm), to maintain the RCS at or below 135°F in accordance with LCO 3.4.8, LCO 3.9.4, and LCO 3.9.5. Flow may be reduced to 3780 gpm to preclude vortexing at the SDC suction nozzle during Mid-Loop operations.
- Normal SDC flow is defined by Tech Specs as 3780 to 5000 gpm (indicated). In most situations, SDC flow is maintained at or near 4,000 gpm. If Operations had 1 train SDC available and elected to reduce flow to 3780 shortly after shutdown, it is likely that RCS temperature will increase. Compensatory action is to increase SDC flow.
- There are some situations where SDC flow could NOT be significantly increased. For example we have administrative controls preventing SDC flow greater than 4150 gpm while in mid-loop. The analyses supporting the data in the SAOD demonstrate that the SDC will provide sufficient cooling capacity thereby providing some assurance that the plant will be cooled in lieu of increasing flow.
- By meeting the SAOD Essential Cooling Water temperature/time post shutdown requirements, there is assurance that the core will be maintained at refueling mode temperature (135°F) in the unlikely event that SDC flow is reduced and Operations does NOT have to ability to increase SDC flow to mitigate an increasing RCS temperature.

____ 7.2.10 Verify the Containment Equipment Hatch is in place and closed prior to entering Reduced Inventory Operations.

____ 7.2.11 The Mid-Loop Operations Coordinator is stationed and the requirements of 40DP-9ZZ30, Reduced Inventory Operations are met. This step does not need to be completed until just prior to lowering RCS level below 111 ft. as indicated by the RWLIS.

____ 7.2.12 Essential Cooling Water temperature vs. Time Post Shutdown requirements of the Safety Analysis Operational Data portion of the Core Data Book are met before SDC flow is lowered to 3780 gpm. REFER TO Step 4.2 for additional information

____ 7.2.13 Makeup flow rate required to prevent boiling has been determined by **one** of the following:

Hot Mid Loop (pre core offload)	Cold Mid Loop (post core reload)
____ This is applicable for HPSI makeup via the cold leg and should be N/Ad if this makeup path is not selected.	____ This is applicable for HPSI makeup via the cold leg and should be N/Ad if this makeup path is not selected
NOTE **RCP SEAL REPLACEMENT ONLY:** Recent RETRAN analysis has shown that with RCS level equal to or greater than 10% (117 ft.) and SG tubes full, there is sufficient inventory available to mitigate a Loss of SDC as long as decay heat is less than 19.4 MW (48 hrs shutdown) and the pressurizer manway is removed. The 16 MW limit may be N/Ad.	____ Determine hours after shutdown.
____ Decay heat load, in MW, has been determined. Target decay heat load is equal to or less than 16.0 MW.	____ REFER TO 40EP-9EO10, Standard Appendices, Appendix 203 to determine required makeup flow.
____ Required HPSI makeup flow per loop has been determined from Appendix W - Makeup Flow to Prevent Boiling. (REFER TO Step 4.30 for additional discussion)	____ Required HPSI makeup flow per loop has been determined from Appendix W - Makeup Flow to Prevent Boiling. (REFER TO Step 4.30 for additional discussion)

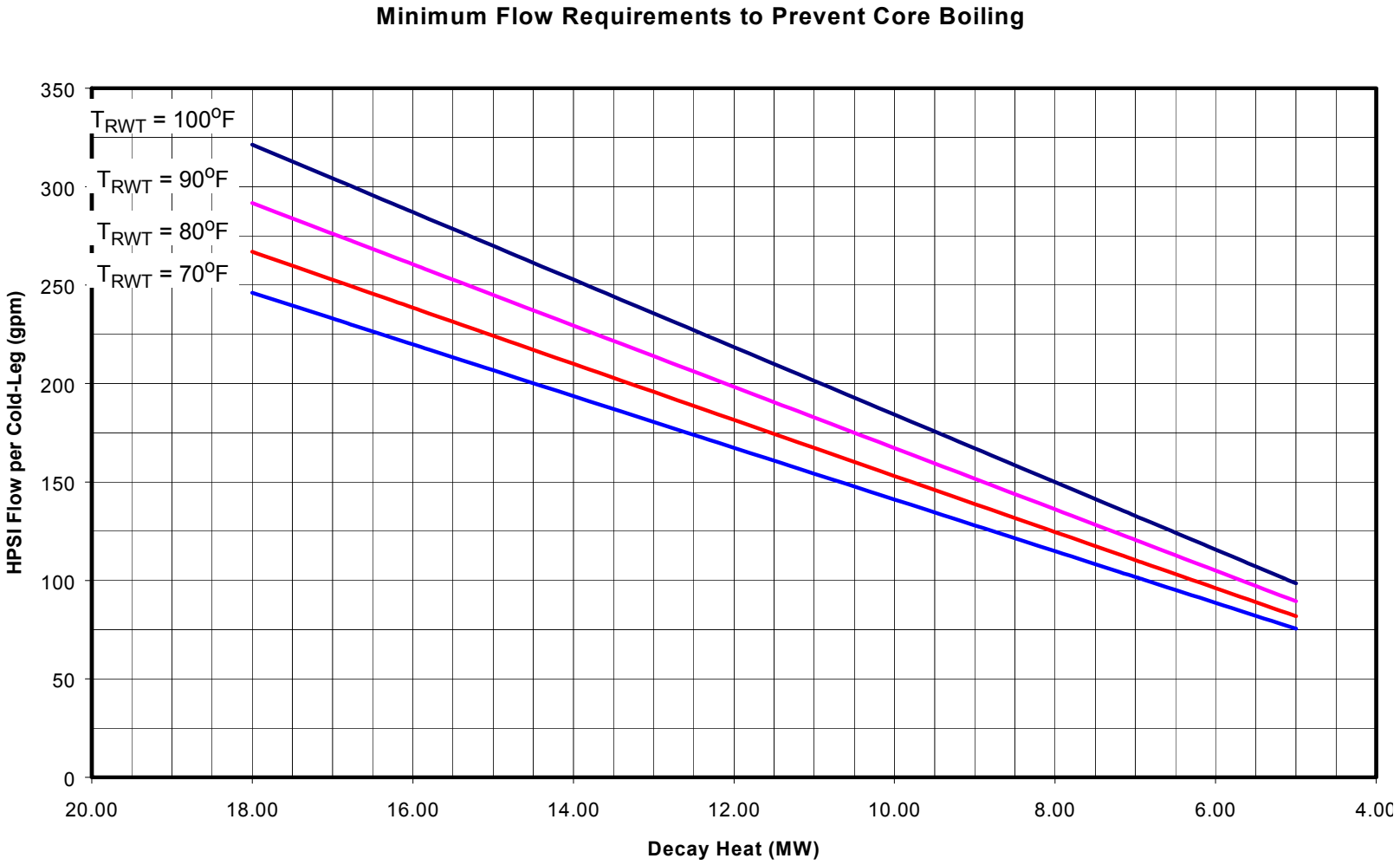
7.2.13.1 Log required makeup flow below.

Req'd HPSI Makeup	_____ gpm.

Appendix W - Makeup Flow to Prevent Boiling

1.0 General Information

1.1 This table correlates decay heat to the required HPSI flow to EACH loop to prevent boiling in the RCS.



ANALYSIS TITLE SHEET

Document Contains:			
Proprietary Information?	Yes	No	X
Association Changes?	Yes	No	X

ANALYSIS NUMBER		REV.
SAOD Unit 3		4
QR	[redacted]	NQR X

Analysis Title: **SAOD 3990 MWt - Unit 3**

Analysis Description: This document supersedes revision 3 of the SAOD Unit 3 manual in SWMS. due to the implementation of the replacement steam generators and power uprate per ACT 3105774. . This revision also updates references.

		Revision **4**
CROSS DISCIPLINE REVIEW	Dependent Engineer Date	N/A
	Responsible Engineer Date	Arshad Taufiq Taufiq, Arshad M (Z93839) Digitally signed by Taufiq, Arshad M (Z93839) DN: cn=Taufiq, Arshad M(Z93839), email=Arshad.Taufiq@aps.com Reason: I am the author of this document Date: 2007.12.13 15:52:25 -07'00'
	Operations (STAs) Date	N/A
	Outage Mgmt Date	N/A
	NED Date	N/A
	Other (Ops Standards) Date	N/A
	Mentor Date	N/A
	Independent Reviewer Date	Ness Kilic Kilic, Arif N(Z99533) Digitally signed by Kilic, Arif N (Z99533) DN: cn=Kilic, Arif N(Z99533), email=Arif.Kilic@aps.com Reason: I have reviewed this document Date: 2007.12.13 16:15:02 -07'00'
	Responsible Section Leader Date	Brian Blackmore Blackmore, Brian S (Z99910) Digitally signed by Blackmore, Brian S(Z99910) DN: cn=Blackmore, Brian S (Z99910) Reason: Flagged TA section leader. Date: 2007.12.13 16:32:44 -07'00'
	Responsible Department Leader Date	N/A

ANALYSIS SUMMARY SHEET

Description (continued from Analysis Title Sheet)	N/A			
Conclusion	The SAOD manual simply documents the results from various calculations and analysis packages in a convenient document readily accessible to Operations. No calculations are performed in this manual and no computer codes are used for this manual. The conclusions drawn in the various referenced calculations remain valid.			
Contingencies	**Contingency**			**Clearing Org.**
	None			
Associations	Procedural not required at this time.			
Incorporated Impacts	**Type**	**Number**	**Description**	
	ACT	3105774	Update the Unit 3 SAOD for Power Uprate/Steam Generator Replacement. This ACT is a mode 2 restraint for Unit 3 restart	
Superseded or Archived Documents	**Document No.**	**Revision**	**Status**	
	SAOD Unit 3	3	Superceded	
Initiated Impacts or Changes to Design Documents	**Type (ACT, DBCP etc.)**	**Number**	**Description of Impact/Change**	
	None			

Analysis Revision History Sheet

Revision 4	Updates the Unit 3 SAOD for Power Uprate/Steam Generator Replacement per ACT 3105774 and updates references		
Revision 3	Provided clarification for RCS loop check valve restrictions and updated references.		
Revision 2	Clarification was provided to allow emergent RCS loop check valve work during U3R11.		
Revision 1	Steam Generator manway and nozzle dam operating guidance were clarified in this revision.		
Revision 0	This document superseded revision 20 of the SAOD manual in SWMS. This document replaced the old SAOD format. The update was done in preparation for SGR/PUR as requested by Operations and to reflect new decay heat values. In addition, the stagnant boron mixing section and table 2.7.1 were deleted (no longer used).		

Table of Contents

1.0 OBJECTIVE

The Safety Analysis Operational Data (SAOD) manual provides information to Operations and Outage Planning for certain outage shutdown activities. Specifically, this manual provides outage decay heat values, reactor coolant system expected heat up rates, outage time to boil values, outage time to core uncovery values, makeup flow for boiloff, minimum time to reduced flow shutdown cooling operations, and RCS forced flow and RWT temperature requirements to maintain sub-cooled conditions following a loss of shutdown cooling (HPSI once-through cooling).

This information is provided to clarify the time constraints needed for the refueling outage activities that are adversely affected by decay heat following reactor shutdown. It is essential that these constraints be observed in order to ensure that the unit remains in an analyzed condition for postulated events involving a loss of shutdown cooling at reduced inventories.

Questions concerning SAOD Sections 1.0 through 2.7 should be referred to the Transient Analysis section leader. Questions regarding SAOD Sections 2.8 through 2.9 should be referred to the Design Mechanical NSSS section leader.

2.0 METHOD OF SOLUTION AND RESULTS

The SAOD manual simply documents the results from various calculations and analysis packages in a convenient document readily accessible to Operations. No calculations are performed in this manual and no computer codes are used for this manual. The assumptions and input data are documented in the source calculations which are referenced with each table provided.

2.1 Decay Heat Constraints for Outages

The following constraints are required to support the assumptions in the Loss of Shutdown Cooling (LSDC) analyses. (Reference 2, 7, & 12)

- **The pressurizer manway may be removed to provide a hot leg vent path, when the reactor vessel is full (120 ft. elevation) and core decay heat rate is $\leq$ 20 MW.** At 48 hours post-shutdown, the decay heat rate is not expected to exceed 20.02[1] MW for a rated thermal power of 3990 MWt. A LSDC event with the pressurizer manway removed and Reactor Coolant System level at 131 ft. 5 inches (~ 50% pressurizer level) would not result in uncovering the reactor core for at least a 1-hour period.

- RCS drain operations should not commence unless indicated **RWT level is $\geq$ 73%** ($\geq$ 50% for cold core post refueling conditions).

- 1-hour after SDC is lost, it is assumed that operators will have reestablished either SDC or forced flow cooling of the RCS using High Pressure Safety Injection (HPSI). The 1-hour period is based on the anticipated maximum time that it may take to place a Gas Turbine Generator (GTG) in service.

1. Even though 20.02 is slightly larger than 20 MW, the 0.1% difference is considered negligible in comparison to the analytical conservatisms described in reference 2.

- **The reactor vessel may be drained down (to the 103'8" elevation), when the pressurizer manway is removed and the core decay heat rate is < 20 MW.** This occurs at a time > 48 hours after shutdown. With the pressurizer manway removed and the RCS drained to the 103'8" elevation (with water in the steam generator tubes), a LSDC event would not result in uncovering of the reactor core for at least 1 hour, even if no credit was given for gravity feed or HPSI during that hour.

- **The reactor vessel may be drained down to midloop (101'6" to 103'1") when the pressurizer manway is removed and the core decay heat is < 16 MW. A decay heat of 16 MW occurs 87 hours after plant shutdown. With the Unit at midloop no credit can be given for liquid in the SG tubes. A LSDC event would not result in uncovering of the reactor core for at least 1 hour period.**

- **The steam generator manways may be removed and nozzle dams installed when the core decay heat is < 16 MW.** This occurs at t > 87 hours after shutdown. If a LSDC event were to occur while the plant was in this configuration, then operator intervention would be critical to achieve a 1-hour coping period. For this level of decay heat the analysis assumes the following:

  1 For hot core mid-loop the hot leg steam generator (SG) manways should be removed close to the same time without delay (minimizing the time reduces steam entrainment concerns) with the manway for the hot leg used for gravity feed removed last.

  2 The hot leg nozzle dams should be installed sequentially without delay (minimizing the time reduces potential steam entrainment inventory losses) with the nozzle dam on the leg used for gravity feed installed first.

  3 Both cold leg nozzle dams should be installed on a SG before installation of the hot leg dam. Additionally, the last nozzle dam installed should be on the hot leg opposite that to which RWT gravity feed is aligned. Installing cold leg dams prior to hot leg dams ensures a flow path for HPSI once through cooling.

- **After nozzle dam installation, the RCS may be reflooded as high as elevation 120 ft. (approximately 20% pressurizer level).** At a decay heat rate of 16 MW and nozzle dams installed, a LSDC event will not result in an RCS peak pressure that exceeds the nozzle dams' rating of 50 psig (i.e., ASME B&PV Code Level D Service Limit), if RCS level is at or below the 120 ft. elevation. This conclusion is valid both for early initiation of cold leg HPSI flow (at 10 minutes), or for hot leg gravity feed for 1 hour followed by cold leg HPSI.

- **If plant operators initiate gravity feed from the RWT to the RCS in response to a LSDC event, the DC-powered valve (J-SIC-UV-0653 or J-SID-UV0654, depending upon the train selected) should initially be throttled approximately 30% open and then throttled as needed so that RWT level decreases approximately 3% every 15 minutes.**

- **No cold leg openings (e.g. RCP impeller work or shaft replacement, RCS cold leg check valves SIEV2x7) before decay heat rate is < 14 MW. This occurs around 118 hours after shutdown.**

- RCP seal work when RCS level is above the bottom of the hot leg is allowed only if maintenance uses a shaft blocking device to prevent lifting the shaft and creating a large cold leg breach.

2.2 Midloop Operation

NOTES 2.2.0

Key Reactor Core Parameters Following a Loss of SDC During Midloop Operation with A Large or Small Cold Leg Opening

The key reactor core parameters following a loss of shutdown cooling (SDC) with a large (RCP impeller) or small (RCP seal) cold leg opening are based in part on a computer analysis using the RETRAN code.

Decay heat power is based on Branch Technical Position 9-2 utilizing a 550 EFPD cycle length at 100% power. (3990 MWt)(Reference TA-13-C00-1999-009)

Time to boil is based on the time for the water in the vessel to reach 210 ^{0}F. This is a function of decay heat, mass of water in vessel and initial RCS bulk temperature (inlet Shutdown Cooling Heat Exchanger temperature). It is determined by subtracting the RCS bulk temperature from 210 ^{0}F , and then dividing by the heatup rate.

Heatup rate is determined by dividing the decay heat by the specific heat capacity for water and by the mass of water available in the vessel at the start of the event.

Time to core uncovery is conservatively assumed to be the amount of time it takes to boil off the water volume below the bottom of the hot leg and above the top of the core. The time associated with the pressurization effects, which result in water lost out the cold leg opening, is neglected. The water lost out the cold leg opening is conservatively assumed to result in a water level at the bottom of the hot leg. Thus, time to core uncovery is a function of decay heat, this volume of water and the pressure over the water. Time to core uncovery does not include the time associated with reaching the boiling temperature.

Makeup rate is the amount of flow required to reach the core to compensate for water loss through boil off. Note that this is the volume that must be delivered to the core in order to maintain constant inventory. Flow diverted out any cold leg opening must be accounted for (i.e. flowrate indications may not be actual flowrates reaching the core).

NOTE: VALUES NOT EXPLICITLY FOUND IN THE TABLES SHALL BE DETERMINED VIA LINEAR INTERPOLATION PERFORMED BY THE SHIFT TECHNICAL ADVISOR

TABLE 2.2.1

Key Reactor Core Parameters Following a Loss of SDC

During Midloop Operation with A Large or Small Cold Leg Opening

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	24.44	8.97	173.5	10	10.42	3.82	74.0
2.0	20.02	7.35	142.1	11	10.05	3.69	71.4
3.0	17.25	6.33	122.5	12	9.72	3.57	69.0
3.5	16.19	5.94	114.9	13	9.43	3.46	67.0
4.0	15.30	5.62	108.6	14	9.16	3.36	65.0
4.5	14.54	5.34	103.2	15	8.92	3.27	63.3
5.0	13.88	5.09	98.5	16	8.70	3.19	61.8
5.5	13.31	4.88	94.5	17	8.48	3.11	60.2
6.0	12.83	4.71	91.1	18	8.29	3.04	58.9
6.5	12.39	4.55	88.0	19	8.10	2.97	57.5
7.0	12.01	4.41	85.3	20	7.93	2.91	56.3
7.5	11.67	4.28	82.9	25	7.15	2.62	50.8
8.0	11.37	4.17	80.7	30	6.53	2.40	46.4
8.5	11.10	4.07	78.8	40	5.59	2.05	39.7
9.0	10.85	3.98	77.0	50	4.92	1.81	34.9
9.5	10.62	3.90	75.4	80	3.76	1.38	26.7

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.2.2

Key Reactor Core Parameters Following a Loss of SDC

During Midloop Operation with A Large or Small Cold Leg Opening

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	19.06	7.00	135.3	10	8.13	2.98	57.7
2.0	15.62	5.73	110.9	11	7.84	2.88	55.7
3.0	13.46	4.94	95.5	12	7.58	2.78	53.8
3.5	12.63	4.63	89.7	13	7.36	2.70	52.2
4.0	11.93	4.38	84.7	14	7.14	2.62	50.7
4.5	11.34	4.16	80.5	15	6.96	2.55	49.4
5.0	10.83	3.97	76.9	16	6.79	2.49	48.2
5.5	10.38	3.81	73.7	17	6.61	2.43	47.0
6.0	10.01	3.67	71.1	18	6.47	2.37	45.9
6.5	9.66	3.55	68.6	19	6.32	2.32	44.9
7.0	9.37	3.44	66.5	20	6.19	2.27	43.9
7.5	9.10	3.34	64.6	25	5.58	2.05	39.6
8.0	8.87	3.25	63.0	30	5.09	1.87	36.2
8.5	8.66	3.18	61.5	40	4.36	1.60	31.0
9.0	8.46	3.11	60.1	50	3.84	1.41	27.2
9.5	8.28	3.04	58.8	80	2.93	1.08	20.8

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.2.3

Time to Boil Following a Loss of SDC During Midloop Operation with A Large or Small Cold Leg Opening

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	12.3	11.1	10.0	8.9	8.4	7.8	10	28.8	26.1	23.5	20.9	19.6	18.3
2.0	15.0	13.6	12.2	10.9	10.2	9.5	11	29.8	27.1	24.4	21.7	20.3	19.0
3.0	17.4	15.8	14.2	12.6	11.8	11.1	12	30.8	28.0	25.2	22.4	21.0	19.6
3.5	18.5	16.8	15.1	13.5	12.6	11.8	13	31.8	28.9	26.0	23.1	21.7	20.2
4.0	19.6	17.8	16.0	14.2	13.4	12.5	14	32.7	29.7	26.8	23.8	22.3	20.8
4.5	20.6	18.7	16.9	15.0	14.1	13.1	15	33.6	30.5	27.5	24.4	22.9	21.4
5.0	21.6	19.6	17.7	15.7	14.7	13.7	16	34.5	31.3	28.2	25.1	23.5	21.9
5.5	22.5	20.5	18.4	16.4	15.4	14.3	17	35.3	32.1	28.9	25.7	24.1	22.5
6.0	23.4	21.2	19.1	17.0	15.9	14.9	18	36.2	32.9	29.6	26.3	24.7	23.0
6.5	24.2	22.0	19.8	17.6	16.5	15.4	19	37.0	33.6	30.3	26.9	25.2	23.5
7.0	25.0	22.7	20.4	18.2	17.0	15.9	20	37.8	34.4	30.9	27.5	25.8	24.1
7.5	25.7	23.3	21.0	18.7	17.5	16.3	25	41.9	38.1	34.3	30.5	28.6	26.7
8.0	26.4	24.0	21.6	19.2	18.0	16.8	30	45.9	41.7	37.6	33.4	31.3	29.2
8.5	27.0	24.5	22.1	19.6	18.4	17.2	40	53.6	48.7	43.9	39.0	36.6	34.1
9.0	27.6	25.1	22.6	20.1	18.8	17.6	50	60.9	55.4	49.8	44.3	41.5	38.8
9.5	28.2	25.7	23.1	20.5	19.2	18.0	80	79.7	72.5	65.2	58.0	54.4	50.7

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.2.4

Time to Boil Following a Loss of SDC During Midloop Operation with A Large or Small Cold Leg Opening

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	15.7	14.3	12.9	11.4	10.7	10.0	10	36.9	33.5	30.2	26.8	25.1	23.5
2.0	19.2	17.4	15.7	14.0	13.1	12.2	11	38.2	34.8	31.3	27.8	26.1	24.3
3.0	22.3	20.3	18.2	16.2	15.2	14.2	12	39.5	35.9	32.3	28.8	27.0	25.2
3.5	23.7	21.6	19.4	17.3	16.2	15.1	13	40.7	37.0	33.3	29.6	27.8	25.9
4.0	25.1	22.8	20.5	18.3	17.1	16.0	14	42.0	38.1	34.3	30.5	28.6	26.7
4.5	26.4	24.0	21.6	19.2	18.0	16.8	15	43.1	39.2	35.2	31.3	29.4	27.4
5.0	27.7	25.2	22.7	20.1	18.9	17.6	16	44.2	40.2	36.1	32.1	30.1	28.1
5.5	28.9	26.2	23.6	21.0	19.7	18.4	17	45.3	41.2	37.1	33.0	30.9	28.8
6.0	30.0	27.2	24.5	21.8	20.4	19.1	18	46.4	42.1	37.9	33.7	31.6	29.5
6.5	31.0	28.2	25.4	22.6	21.1	19.7	19	47.4	43.1	38.8	34.5	32.3	30.2
7.0	32.0	29.1	26.2	23.3	21.8	20.4	20	48.5	44.1	39.6	35.2	33.0	30.8
7.5	32.9	29.9	26.9	23.9	22.5	21.0	25	53.7	48.9	44.0	39.1	36.6	34.2
8.0	33.8	30.7	27.7	24.6	23.0	21.5	30	58.8	53.5	48.1	42.8	40.1	37.4
8.5	34.6	31.5	28.3	25.2	23.6	22.0	40	68.7	62.5	56.2	50.0	46.9	43.7
9.0	35.4	32.2	29.0	25.8	24.1	22.5	50	78.1	71.0	63.9	56.8	53.3	49.7
9.5	36.2	32.9	29.6	26.3	24.7	23.0	80	102.2	92.9	83.6	74.3	69.7	65.0

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.2.5

Time to Core Uncovery Following a Loss of SDC

During Midloop Operation with A Large or Small Cold Leg Opening

(3990 MW Core)

Notes: (1) ***Caution; No cold leg openings (i.e. RCP impeller work or shaft replacement) before 14 MW (Source TA-03-C09-2001-004)***

(2) Table values can be used to estimate time to core uncovery after boiling begins assuming no leg openings. RCP seal replacement with the RCP shaft on the stop seal is allowed as long as a blocking device is installed on the shaft in the event LSDC occurs. This condition prevents a large cold leg breach.

(3) Times do not include time to boil.

Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)		Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)
24.44	18		10.42	42
20.02	22		10.05	44
17.25	25		9.72	45
16.19	27		9.43	46
15.30	28		9.16	48
14.54	30		8.92	49
13.88	31		8.70	50
13.31	33		8.48	52
12.83	34		8.29	53
12.39	35		8.10	54
12.01	36		7.93	55
11.67	37		7.15	61
11.37	38		6.53	67
11.10	39		5.59	79
10.85	40		4.92	89
10.62	41		3.76	117

Source of Data: TA-13-C00-2001-006, Appendix A

2.3 RCS Drained to Reactor Vessel Flange with Reactor Head Removed

NOTES 2.3.0

Key Reactor Core Parameters Following a Loss of SDC

With The RCS Drained to the Reactor Vessel Flange

Reactor Head and Upper Guide Structure Removed

The key reactor core parameters following a loss of shutdown cooling (SDC) with the RCS drained to the 114' elevation and head or UGS off are for 550 EFPD at 100% RTP. These results are based in part on a computer analysis using the RETRAN code.

Decay heat power is based on Branch Technical Position 9-2 utilizing a 550 EFPD cycle length at 100% power. (3990 MWt)(Reference TA-13-C00-1999-009)

Time to boil is based on the time for the water in the vessel to reach 210 ^{0}F. This is a function of decay heat, mass of water in vessel and initial RCS bulk temperature (inlet Shutdown Cooling Heat Exchanger temperature). It is determined by subtracting the RCS bulk temperature from 210 ^{0}F, and then dividing by the heatup rate.

Heatup rate is determined by dividing the decay heat by the specific heat capacity for water and by the mass of water available in the vessel at the start of the event.

Time to core uncovery is based on the time it takes the water above the top of the core to drop to the top of the core. Time to core uncovery is the time for the mass above the core to boil off and does not include the time associated with reaching the boiling temperature. Time to core uncovery is a function of decay heat, this volume of water, and the pressure over the water.

Makeup rate is the amount of flow required to reach the core to compensate for water loss through boil off. Note that this is the volume that must be delivered to the core in order to maintain constant inventory. Flow diverted out any cold leg opening must be accounted for (i.e. flowrate indications may not be actual flowrates reaching the core).

NOTE: VALUES NOT EXPLICITLY FOUND IN THE TABLES SHALL BE DETERMINED VIA LINEAR INTERPOLATION PERFORMED BY THE SHIFT TECHNICAL ADVISOR

TABLE 2.3.1

Key Reactor Core Parameters Following a Loss of SDC

With the RCS Drained to the Reactor Vessel Flange

Reactor Head and Upper Guide Structure Removed

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	24.44	5.67	173.5	10	10.42	2.42	74.0
2.0	20.02	4.64	142.1	11	10.05	2.33	71.4
3.0	17.25	4.00	122.5	12	9.72	2.26	69.0
3.5	16.19	3.76	114.9	13	9.43	2.19	67.0
4.0	15.30	3.55	108.6	14	9.16	2.13	65.0
4.5	14.54	3.37	103.2	15	8.92	2.07	63.3
5.0	13.88	3.22	98.5	16	8.70	2.02	61.8
5.5	13.31	3.09	94.5	17	8.48	1.97	60.2
6.0	12.83	2.98	91.1	18	8.29	1.92	58.9
6.5	12.39	2.87	88.0	19	8.10	1.88	57.5
7.0	12.01	2.79	85.3	20	7.93	1.84	56.3
7.5	11.67	2.71	82.9	25	7.15	1.66	50.8
8.0	11.37	2.64	80.7	30	6.53	1.51	46.4
8.5	11.10	2.58	78.8	40	5.59	1.30	39.7
9.0	10.85	2.52	77.0	50	4.92	1.14	34.9
9.5	10.62	2.46	75.4	80	3.76	0.87	26.7

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.3.2

Key Reactor Core Parameters Following a Loss of SDC

With the RCS Drained to the Reactor Vessel Flange

Reactor Head and Upper Guide Structure Removed

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	19.06	4.42	135.3	10	8.13	1.89	57.7
2.0	15.62	3.62	110.9	11	7.84	1.82	55.7
3.0	13.46	3.12	95.5	12	7.58	1.76	53.8
3.5	12.63	2.93	89.7	13	7.36	1.71	52.2
4.0	11.93	2.77	84.7	14	7.14	1.66	50.7
4.5	11.34	2.63	80.5	15	6.96	1.61	49.4
5.0	10.83	2.51	76.9	16	6.79	1.57	48.2
5.5	10.38	2.41	73.7	17	6.61	1.53	47.0
6.0	10.01	2.32	71.1	18	6.47	1.50	45.9
6.5	9.66	2.24	68.6	19	6.32	1.47	44.9
7.0	9.37	2.17	66.5	20	6.19	1.44	43.9
7.5	9.10	2.11	64.6	25	5.58	1.29	39.6
8.0	8.87	2.06	63.0	30	5.09	1.18	36.2
8.5	8.66	2.01	61.5	40	4.36	1.01	31.0
9.0	8.46	1.96	60.1	50	3.84	0.89	27.2
9.5	8.28	1.92	58.8	80	2.93	0.68	20.8

Current outage schedules do not support reloads in less than 10 days.

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.3.3

Time to Boil Following a Loss of SDC with the RCS Drained to the Reactor Vessel Flange

Reactor Head and Upper Guide Structure Removed

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	19.4	17.6	15.9	14.1	13.2	12.3	10	45.5	41.4	37.2	33.1	31.0	29.0
2.0	23.7	21.5	19.4	17.2	16.1	15.1	11	47.2	42.9	38.6	34.3	32.2	30.0
3.0	27.5	25.0	22.5	20.0	18.7	17.5	12	48.8	44.3	39.9	35.5	33.3	31.0
3.5	29.3	26.6	24.0	21.3	20.0	18.6	13	50.3	45.7	41.1	36.6	34.3	32.0
4.0	31.0	28.2	25.4	22.5	21.1	19.7	14	51.8	47.1	42.4	37.6	35.3	32.9
4.5	32.6	29.6	26.7	23.7	22.2	20.8	15	53.2	48.3	43.5	38.7	36.2	33.8
5.0	34.2	31.1	27.9	24.8	23.3	21.7	16	54.5	49.5	44.6	39.6	37.2	34.7
5.5	35.6	32.4	29.1	25.9	24.3	22.7	17	55.9	50.8	45.7	40.7	38.1	35.6
6.0	37.0	33.6	30.2	26.9	25.2	23.5	18	57.2	52.0	46.8	41.6	39.0	36.4
6.5	38.3	34.8	31.3	27.8	26.1	24.4	19	58.5	53.2	47.9	42.6	39.9	37.2
7.0	39.5	35.9	32.3	28.7	26.9	25.1	20	59.8	54.4	48.9	43.5	40.8	38.0
7.5	40.6	36.9	33.2	29.5	27.7	25.9	25	66.3	60.3	54.3	48.2	45.2	42.2
8.0	41.7	37.9	34.1	30.3	28.4	26.5	30	72.6	66.0	59.4	52.8	49.5	46.2
8.5	42.7	38.8	34.9	31.1	29.1	27.2	40	84.8	77.1	69.4	61.7	57.8	54.0
9.0	43.7	39.7	35.8	31.8	29.8	27.8	50	96.4	87.6	78.8	70.1	65.7	61.3
9.5	44.6	40.6	36.5	32.5	30.4	28.4	80	126.1	114.6	103.2	91.7	86.0	80.2

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.3.4

Time to Boil Following a Loss of SDC with the RCS Drained to the Reactor Vessel Flange

Reactor Head and Upper Guide Structure Removed

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	24.9	22.6	20.3	18.1	17.0	15.8	10	58.3	53.0	47.7	42.4	39.8	37.1
2.0	30.4	27.6	24.8	22.1	20.7	19.3	11	60.5	55.0	49.5	44.0	41.2	38.5
3.0	35.2	32.0	28.8	25.6	24.0	22.4	12	62.5	56.9	51.2	45.5	42.6	39.8
3.5	37.5	34.1	30.7	27.3	25.6	23.9	13	64.5	58.6	52.7	46.9	44.0	41.0
4.0	39.7	36.1	32.5	28.9	27.1	25.3	14	66.4	60.3	54.3	48.3	45.2	42.2
4.5	41.8	38.0	34.2	30.4	28.5	26.6	15	68.1	62.0	55.8	49.6	46.5	43.4
5.0	43.8	39.8	35.8	31.9	29.9	27.9	16	69.9	63.5	57.2	50.8	47.6	44.5
5.5	45.7	41.5	37.4	33.2	31.1	29.1	17	71.7	65.2	58.6	52.1	48.9	45.6
6.0	47.4	43.1	38.8	34.5	32.3	30.2	18	73.3	66.7	60.0	53.3	50.0	46.7
6.5	49.1	44.6	40.1	35.7	33.5	31.2	19	75.0	68.2	61.4	54.6	51.2	47.8
7.0	50.6	46.0	41.4	36.8	34.5	32.2	20	76.7	69.7	62.7	55.7	52.3	48.8
7.5	52.1	47.4	42.6	37.9	35.5	33.1	25	85.0	77.3	69.6	61.8	58.0	54.1
8.0	53.5	48.6	43.7	38.9	36.5	34.0	30	93.1	84.6	76.2	67.7	63.5	59.2
8.5	54.8	49.8	44.8	39.8	37.3	34.8	40	108.7	98.9	89.0	79.1	74.1	69.2
9.0	56.0	50.9	45.8	40.7	38.2	35.7	50	123.6	112.3	101.1	89.9	84.2	78.6
9.5	57.2	52.0	46.8	41.6	39.0	36.4	80	161.7	147.0	132.3	117.6	110.2	102.9

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.3.5

Time to Core Uncovery Following a Loss of SDC with the RCS Drained to the Reactor Vessel Flange, Reactor Head and Upper Guide Structure Removed (3990 MW Core)

Note: Times do not include time to boil.

Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)		Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)
24.44	146		10.42	343
20.02	178		10.05	356
17.25	207		9.72	368
16.19	221		9.43	380
15.30	234		9.16	391
14.54	246		8.92	401
13.88	258		8.70	411
13.31	269		8.48	422
12.83	279		8.29	432
12.39	289		8.10	442
12.01	298		7.93	451
11.67	307		7.15	501
11.37	315		6.53	548
11.10	322		5.59	641
10.85	330		4.92	728
10.62	337		3.76	953

Source of Data: TA-13-C00-2001-006, Appendix A

2.4 RCS Drained to Reactor Vessel Flange with Reactor Head Installed

NOTES 2.4.0

Key Reactor Core Parameters Following a Loss of SDC

With The RCS Drained to the Reactor Vessel Flange

Reactor Vessel Head On

The key reactor core parameters following a loss of shutdown cooling (SDC) with the RCS drained to the 114' elevation and head or UGS in place are for 550 EFPD at 100% RTP. These results are based in part on a computer analysis using the RETRAN code.

Decay heat power is based on Branch Technical Position 9-2 utilizing a 550 EFPD cycle length at 100% power. (3990 MWt)(Reference TA-13-C00-1999-009)

Time to boil is based on the time for the water in the vessel to reach 210 ^{0}F. This is a function of decay heat, mass of water in vessel and initial RCS bulk temperature (inlet Shutdown Cooling Heat Exchanger temperature). It is determined by subtracting the RCS bulk temperature from 210 ^{0}F, and then dividing by the heatup rate.

Heatup rate is determined by dividing the decay heat by the specific heat capacity for water and by the mass of water available in the vessel at the start of the event.

Time to core uncovery is conservatively assumed to be the amount of time it takes to boil off the water volume below the bottom of the hot leg and above the top of the core. The time associated with the pressurization effects, steaming, entrainment, and surge line flooding are neglected. Thus, time to core uncovery is a function of decay heat, this volume of water and the pressure over the water. Time to core uncovery does not include the time associated with reaching the boiling temperature.

Makeup rate is the amount of flow required to reach the core to compensate for water loss through boil off. Note that this is the volume that must be delivered to the core in order to maintain constant inventory. Flow diverted out any cold leg opening must be accounted for (i.e. flowrate indications may not be actual flowrates reaching the core).

NOTE: VALUES NOT EXPLICITLY FOUND IN THE TABLES SHALL BE DETERMINED VIA LINEAR INTERPOLATION PERFORMED BY THE SHIFT TECHNICAL ADVISOR

TABLE 2.4.1

Key Reactor Core Parameters Following a Loss of SDC

With the RCS Drained to the Reactor Vessel Flange

Reactor Vessel Head On

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	24.44	5.67	173.5	10	10.42	2.42	74.0
2.0	20.02	4.64	142.1	11	10.05	2.33	71.4
3.0	17.25	4.00	122.5	12	9.72	2.26	69.0
3.5	16.19	3.76	114.9	13	9.43	2.19	67.0
4.0	15.30	3.55	108.6	14	9.16	2.13	65.0
4.5	14.54	3.37	103.2	15	8.92	2.07	63.3
5.0	13.88	3.22	98.5	16	8.70	2.02	61.8
5.5	13.31	3.09	94.5	17	8.48	1.97	60.2
6.0	12.83	2.98	91.1	18	8.29	1.92	58.9
6.5	12.39	2.87	88.0	19	8.10	1.88	57.5
7.0	12.01	2.79	85.3	20	7.93	1.84	56.3
7.5	11.67	2.71	82.9	25	7.15	1.66	50.8
8.0	11.37	2.64	80.7	30	6.53	1.51	46.4
8.5	11.10	2.58	78.8	40	5.59	1.30	39.7
9.0	10.85	2.52	77.0	50	4.92	1.14	34.9
9.5	10.62	2.46	75.4	80	3.76	0.87	26.7

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.4.2

Key Reactor Core Parameters Following a Loss of SDC

With the RCS Drained to the Reactor Vessel Flange

Reactor Vessel Head On

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	19.06	4.42	135.3	10	8.13	1.89	57.7
2.0	15.62	3.62	110.9	11	7.84	1.82	55.7
3.0	13.46	3.12	95.5	12	7.58	1.76	53.8
3.5	12.63	2.93	89.7	13	7.36	1.71	52.2
4.0	11.93	2.77	84.7	14	7.14	1.66	50.7
4.5	11.34	2.63	80.5	15	6.96	1.61	49.4
5.0	10.83	2.51	76.9	16	6.79	1.57	48.2
5.5	10.38	2.41	73.7	17	6.61	1.53	47.0
6.0	10.01	2.32	71.1	18	6.47	1.50	45.9
6.5	9.66	2.24	68.6	19	6.32	1.47	44.9
7.0	9.37	2.17	66.5	20	6.19	1.44	43.9
7.5	9.10	2.11	64.6	25	5.58	1.29	39.6
8.0	8.87	2.06	63.0	30	5.09	1.18	36.2
8.5	8.66	2.01	61.5	40	4.36	1.01	31.0
9.0	8.46	1.96	60.1	50	3.84	0.89	27.2
9.5	8.28	1.92	58.8	80	2.93	0.68	20.8

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.4.3

Time to Boil Following a Loss of SDC with the RCS Drained to the Reactor Vessel Flange

Reactor Vessel Head On

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	19.4	17.6	15.9	14.1	13.2	12.3	10	45.5	41.4	37.2	33.1	31.0	29.0
2.0	23.7	21.5	19.4	17.2	16.1	15.1	11	47.2	42.9	38.6	34.3	32.2	30.0
3.0	27.5	25.0	22.5	20.0	18.7	17.5	12	48.8	44.3	39.9	35.5	33.3	31.0
3.5	29.3	26.6	24.0	21.3	20.0	18.6	13	50.3	45.7	41.1	36.6	34.3	32.0
4.0	31.0	28.2	25.4	22.5	21.1	19.7	14	51.8	47.1	42.4	37.6	35.3	32.9
4.5	32.6	29.6	26.7	23.7	22.2	20.8	15	53.2	48.3	43.5	38.7	36.2	33.8
5.0	34.2	31.1	27.9	24.8	23.3	21.7	16	54.5	49.5	44.6	39.6	37.2	34.7
5.5	35.6	32.4	29.1	25.9	24.3	22.7	17	55.9	50.8	45.7	40.7	38.1	35.6
6.0	37.0	33.6	30.2	26.9	25.2	23.5	18	57.2	52.0	46.8	41.6	39.0	36.4
6.5	38.3	34.8	31.3	27.8	26.1	24.4	19	58.5	53.2	47.9	42.6	39.9	37.2
7.0	39.5	35.9	32.3	28.7	26.9	25.1	20	59.8	54.4	48.9	43.5	40.8	38.0
7.5	40.6	36.9	33.2	29.5	27.7	25.9	25	66.3	60.3	54.3	48.2	45.2	42.2
8.0	41.7	37.9	34.1	30.3	28.4	26.5	30	72.6	66.0	59.4	52.8	49.5	46.2
8.5	42.7	38.8	34.9	31.1	29.1	27.2	40	84.8	77.1	69.4	61.7	57.8	54.0
9.0	43.7	39.7	35.8	31.8	29.8	27.8	50	96.4	87.6	78.8	70.1	65.7	61.3
9.5	44.6	40.6	36.5	32.5	30.4	28.4	80	126.1	114.6	103.2	91.7	86.0	80.2

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.4.4

Time to Boil Following a Loss of SDC with the RCS Drained to the Reactor Vessel Flange

Reactor Vessel Head On

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	24.9	22.6	20.3	18.1	17.0	15.8	10	58.3	53.0	47.7	42.4	39.8	37.1
2.0	30.4	27.6	24.8	22.1	20.7	19.3	11	60.5	55.0	49.5	44.0	41.2	38.5
3.0	35.2	32.0	28.8	25.6	24.0	22.4	12	62.5	56.9	51.2	45.5	42.6	39.8
3.5	37.5	34.1	30.7	27.3	25.6	23.9	13	64.5	58.6	52.7	46.9	44.0	41.0
4.0	39.7	36.1	32.5	28.9	27.1	25.3	14	66.4	60.3	54.3	48.3	45.2	42.2
4.5	41.8	38.0	34.2	30.4	28.5	26.6	15	68.1	62.0	55.8	49.6	46.5	43.4
5.0	43.8	39.8	35.8	31.9	29.9	27.9	16	69.9	63.5	57.2	50.8	47.6	44.5
5.5	45.7	41.5	37.4	33.2	31.1	29.1	17	71.7	65.2	58.6	52.1	48.9	45.6
6.0	47.4	43.1	38.8	34.5	32.3	30.2	18	73.3	66.7	60.0	53.3	50.0	46.7
6.5	49.1	44.6	40.1	35.7	33.5	31.2	19	75.0	68.2	61.4	54.6	51.2	47.8
7.0	50.6	46.0	41.4	36.8	34.5	32.2	20	76.7	69.7	62.7	55.7	52.3	48.8
7.5	52.1	47.4	42.6	37.9	35.5	33.1	25	85.0	77.3	69.6	61.8	58.0	54.1
8.0	53.5	48.6	43.7	38.9	36.5	34.0	30	93.1	84.6	76.2	67.7	63.5	59.2
8.5	54.8	49.8	44.8	39.8	37.3	34.8	40	108.7	98.9	89.0	79.1	74.1	69.2
9.0	56.0	50.9	45.8	40.7	38.2	35.7	50	123.6	112.3	101.1	89.9	84.2	78.6
9.5	57.2	52.0	46.8	41.6	39.0	36.4	80	161.7	147.0	132.3	117.6	110.2	102.9

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.4.5

Time to Core Uncovery Following a Loss of SDC with the RCS Drained to the Reactor Vessel Flange, Reactor Vessel Head On (3990 MW Core)

Note: Times do not include time to boil and assume no cold leg openings.

Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)		Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)
24.44	18		10.42	42
20.02	22		10.05	44
17.25	25		9.72	45
16.19	27		9.43	46
15.30	28		9.16	48
14.54	30		8.92	49
13.88	31		8.70	50
13.31	33		8.48	52
12.83	34		8.29	53
12.39	35		8.10	54
12.01	36		7.93	55
11.67	37		7.15	61
11.37	38		6.53	67
11.10	39		5.59	79
10.85	40		4.92	89
10.62	41		3.76	117

Source of Data: TA-13-C00-2001-006, Appendix A

2.5 RCS Filled to 120' (Vessel Full) and Reactor Vessel Head Installed

NOTES 2.5.0

Key Reactor Core Parameters Following a Loss of SDC With The RCS Filled to 120' (Vessel Full) and Reactor Vessel Head On

The key reactor core parameters following a loss of shutdown cooling (SDC) with the RCS drained to the 120' elevation (vessel full) and head on are for 550 EFPD at 100% RTP. These results are based in part on a computer analysis using the RETRAN code.

Decay heat power is based on Branch Technical Position 9-2 utilizing a 550 EFPD cycle length at 100% power. (3990 MWt)(Reference TA-13-C00-1999-009)

Time to boil is based on the time for the water in the vessel to reach 210 ^{0}F. This is a function of decay heat, mass of water in vessel and initial RCS bulk temperature (inlet Shutdown Cooling Heat Exchanger temperature). It is determined by subtracting the RCS bulk temperature from 210 ^{0}F, and then dividing by the heatup rate.

Heatup rate is determined by dividing the decay heat by the specific heat capacity for water and by the mass of water available in the vessel at the start of the event.

Time to core uncovery is based on the time it takes the water above the top of the core to drop to the top of the core. Total time to uncover is the summation of Time to Boil plus the time for the mass above the core to boil off. This also considers the pressurization effects, steaming, entrainment and surge line flooding.

Time to core uncovery is conservatively assumed to be the amount of time it takes to boil off the water volume below the bottom of the hot leg and above the top of the core. The time associated with the pressurization effects, steaming, entrainment, and surge line flooding are neglected. Thus, time to core uncovery is a function of decay heat, this volume of water and the pressure over the water. Time to core uncovery does not include the time associated with reaching the boiling temperature.

Makeup rate is the amount of flow required to reach the core to compensate for water loss through boil off. Note that this is the volume that must be delivered to the core in order to maintain constant inventory. Flow diverted out any cold leg opening must be accounted for (i.e. flowrate indications may not be actual flowrates reaching the core).

NOTE: VALUES NOT EXPLICITLY FOUND IN THE TABLES SHALL BE DETERMINED VIA LINEAR INTERPOLATION PERFORMED BY THE SHIFT TECHNICAL ADVISOR

TABLE 2.5.1

Key Reactor Core Parameters Following a Loss of SDC

With the RCS Filled to 120' (Vessel Full) and Reactor Vessel Head On

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	24.44	4.99	173.5	10	10.42	2.13	74.0
2.0	20.02	4.08	142.1	11	10.05	2.05	71.4
3.0	17.25	3.52	122.5	12	9.72	1.98	69.0
3.5	16.19	3.30	114.9	13	9.43	1.92	67.0
4.0	15.30	3.12	108.6	14	9.16	1.87	65.0
4.5	14.54	2.97	103.2	15	8.92	1.82	63.3
5.0	13.88	2.83	98.5	16	8.70	1.77	61.8
5.5	13.31	2.72	94.5	17	8.48	1.73	60.2
6.0	12.83	2.62	91.1	18	8.29	1.69	58.9
6.5	12.39	2.53	88.0	19	8.10	1.65	57.5
7.0	12.01	2.45	85.3	20	7.93	1.62	56.3
7.5	11.67	2.38	82.9	25	7.15	1.46	50.8
8.0	11.37	2.32	80.7	30	6.53	1.33	46.4
8.5	11.10	2.26	78.8	40	5.59	1.14	39.7
9.0	10.85	2.21	77.0	50	4.92	1.00	34.9
9.5	10.62	2.17	75.4	80	3.76	0.77	26.7

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.5.2

Key Reactor Core Parameters Following a Loss of SDC

With the RCS Filled to 120' (Vessel Full) and Reactor Vessel Head On

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)**	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Makeup Flowrate (gpm)
1.0	19.06	3.89	135.3	10	8.13	1.66	57.7
2.0	15.62	3.19	110.9	11	7.84	1.60	55.7
3.0	13.46	2.74	95.5	12	7.58	1.55	53.8
3.5	12.63	2.58	89.7	13	7.36	1.50	52.2
4.0	11.93	2.43	84.7	14	7.14	1.46	50.7
4.5	11.34	2.31	80.5	15	6.96	1.42	49.4
5.0	10.83	2.21	76.9	16	6.79	1.38	48.2
5.5	10.38	2.12	73.7	17	6.61	1.35	47.0
6.0	10.01	2.04	71.1	18	6.47	1.32	45.9
6.5	9.66	1.97	68.6	19	6.32	1.29	44.9
7.0	9.37	1.91	66.5	20	6.19	1.26	43.9
7.5	9.10	1.86	64.6	25	5.58	1.14	39.6
8.0	8.87	1.81	63.0	30	5.09	1.04	36.2
8.5	8.66	1.77	61.5	40	4.36	0.89	31.0
9.0	8.46	1.73	60.1	50	3.84	0.78	27.2
9.5	8.28	1.69	58.8	80	2.93	0.60	20.8

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

** The makeup flowrate listed is to compensate for boil off (not required flow to prevent boiling)

TABLE 2.5.3

Time to Boil Following a Loss of SDC with the RCS Filled to 120' (Vessel Full) and Reactor Vessel Head On

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	22.1	20.1	18.1	16.0	15.0	14.0	10	51.7	47.0	42.3	37.6	35.3	32.9
2.0	26.9	24.5	22.0	19.6	18.4	17.1	11	53.7	48.8	43.9	39.0	36.6	34.1
3.0	31.3	28.4	25.6	22.7	21.3	19.9	12	55.5	50.4	45.4	40.3	37.8	35.3
3.5	33.3	30.3	27.2	24.2	22.7	21.2	13	57.2	52.0	46.8	41.6	39.0	36.4
4.0	35.2	32.0	28.8	25.6	24.0	22.4	14	58.9	53.5	48.2	42.8	40.1	37.5
4.5	37.1	33.7	30.3	27.0	25.3	23.6	15	60.5	55.0	49.5	44.0	41.2	38.5
5.0	38.8	35.3	31.8	28.3	26.5	24.7	16	62.0	56.3	50.7	45.1	42.3	39.4
5.5	40.5	36.8	33.1	29.5	27.6	25.8	17	63.6	57.8	52.0	46.2	43.4	40.5
6.0	42.0	38.2	34.4	30.6	28.7	26.7	18	65.0	59.1	53.2	47.3	44.3	41.4
6.5	43.5	39.6	35.6	31.7	29.7	27.7	19	66.6	60.5	54.5	48.4	45.4	42.4
7.0	44.9	40.8	36.7	32.7	30.6	28.6	20	68.0	61.8	55.6	49.5	46.4	43.3
7.5	46.2	42.0	37.8	33.6	31.5	29.4	25	75.4	68.6	61.7	54.8	51.4	48.0
8.0	47.4	43.1	38.8	34.5	32.3	30.2	30	82.6	75.1	67.6	60.1	56.3	52.5
8.5	48.6	44.2	39.7	35.3	33.1	30.9	40	96.5	87.7	78.9	70.2	65.8	61.4
9.0	49.7	45.2	40.7	36.1	33.9	31.6	50	109.6	99.6	89.7	79.7	74.7	69.7
9.5	50.8	46.2	41.5	36.9	34.6	32.3	80	143.4	130.4	117.3	104.3	97.8	91.3

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.5.4

Time to Boil Following a Loss of SDC with the RCS Filled to 120' (Vessel Full) and Reactor Vessel Head On

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)						Time after Reactor Shutdown (days)	Time to Boil (minutes) Shutdown Cooling Heat Exchanger Inlet Temperature (F)					
	100	110	120	130	135	140		100	110	120	130	135	140
1.0	28.3	25.7	23.1	20.6	19.3	18.0	10	66.3	60.3	54.3	48.3	45.2	42.2
2.0	34.5	31.4	28.3	25.1	23.5	22.0	11	68.8	62.5	56.3	50.0	46.9	43.8
3.0	40.1	36.4	32.8	29.1	27.3	25.5	12	71.1	64.7	58.2	51.7	48.5	45.3
3.5	42.7	38.8	34.9	31.1	29.1	27.2	13	73.3	66.6	60.0	53.3	50.0	46.7
4.0	45.2	41.1	37.0	32.9	30.8	28.8	14	75.5	68.6	61.7	54.9	51.5	48.0
4.5	47.5	43.2	38.9	34.6	32.4	30.3	15	77.5	70.5	63.4	56.4	52.8	49.3
5.0	49.8	45.3	40.8	36.2	34.0	31.7	16	79.5	72.2	65.0	57.8	54.2	50.6
5.5	51.9	47.2	42.5	37.8	35.4	33.1	17	81.5	74.1	66.7	59.3	55.6	51.9
6.0	53.9	49.0	44.1	39.2	36.7	34.3	18	83.4	75.8	68.2	60.6	56.9	53.1
6.5	55.8	50.7	45.7	40.6	38.0	35.5	19	85.3	77.6	69.8	62.1	58.2	54.3
7.0	57.6	52.3	47.1	41.9	39.2	36.6	20	87.2	79.3	71.3	63.4	59.4	55.5
7.5	59.2	53.9	48.5	43.1	40.4	37.7	25	96.7	87.9	79.1	70.3	65.9	61.5
8.0	60.8	55.3	49.7	44.2	41.5	38.7	30	105.9	96.2	86.6	77.0	72.2	67.4
8.5	62.3	56.6	51.0	45.3	42.5	39.6	40	123.7	112.4	101.2	89.9	84.3	78.7
9.0	63.7	57.9	52.1	46.3	43.4	40.5	50	140.5	127.7	115.0	102.2	95.8	89.4
9.5	65.1	59.2	53.3	47.3	44.4	41.4	80	183.9	167.1	150.4	133.7	125.4	117.0

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.5.5

Time to Core Uncovery Following a Loss of SDC with the RCS Filled to 120' (Vessel Full) and Reactor Vessel Head On

(3990 MW Core)

Note: Times do not include time to boil and assume no cold leg openings.

Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)		Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (minutes)
24.44	18		10.42	42
20.02	22		10.05	44
17.25	25		9.72	45
16.19	27		9.43	46
15.30	28		9.16	48
14.54	30		8.92	49
13.88	31		8.70	50
13.31	33		8.48	52
12.83	34		8.29	53
12.39	35		8.10	54
12.01	36		7.93	55
11.67	37		7.15	61
11.37	38		6.53	67
11.10	39		5.59	79
10.85	40		4.92	89
10.62	41		3.76	117

Source of Data: TA-13-C00-2001-006, Appendix A

2.6 RCS Filled to Refueling Level Operation

NOTES 2.6.0

Key Reactor Core Parameters Following a Loss of SDC

With The RCS Filled to Refueling Level

The key reactor core parameters following a loss of shutdown cooling (SDC) with the RCS filled to the refueling level are for 550 EFPD at 100% RTP. These results are based in part on a computer analysis using the RETRAN code.

Decay heat power is based on Branch Technical Position 9-2 utilizing a 550 EFPD cycle length at 100% power. (3990 MWt)(Reference TA-13-C00-1999-009)

Time to boil is based on the time for the water in the vessel to reach 210 ^{0}F. This is a function of decay heat, mass of water in vessel and initial RCS bulk temperature (inlet Shutdown Cooling Heat Exchanger temperature). It is determined by subtracting the RCS bulk temperature from 210^0, and then dividing by the heatup rate. The only value of RCS bulk temperature provided is 135 degrees F, the maximum allowed temperature for Mode 6.

Heatup rate is determined by dividing the decay heat by the specific heat capacity for water and by the mass of water available in the vessel at the start of the event.

Time to core uncovery is based on the time it takes the water above the top of the core to drop to the top of the core. Time to core uncovery is the time for the mass above the core to boil off and does not include the time associated with reaching boiling temperature. Time to core uncovery is a function of decay heat, this volume of water and the pressure over the water.

Makeup rate is the amount of flow required to reach the core to compensate for water loss through boil off. Note that this is the volume that must be delivered to the core in order to maintain constant inventory. Flow diverted out any cold leg opening must be accounted for (i.e. flowrate indications may not be actual flowrates reaching the core).

NOTE: VALUES NOT EXPLICITLY FOUND IN THE TABLES SHALL BE DETERMINED VIA LINEAR INTERPOLATION PERFORMED BY THE SHIFT TECHNICAL ADVISOR

TABLE 2.6.1

Time to Boil and Heatup Rates Following a Loss of SDC With the RCS Filled to the Refueling Level

Prior to Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Time to Boil (hours)	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Time to Boil (hours)
1.0	24.44	0.42	3.0	10	10.42	0.18	7.0
2.0	20.02	0.34	3.6	11	10.05	0.17	7.2
3.0	17.25	0.30	4.2	12	9.72	0.17	7.5
3.5	16.19	0.28	4.5	13	9.43	0.16	7.7
4.0	15.30	0.26	4.7	14	9.16	0.16	7.9
4.5	14.54	0.25	5.0	15	8.92	0.15	8.1
5.0	13.88	0.24	5.2	16	8.70	0.15	8.4
5.5	13.31	0.23	5.5	17	8.48	0.15	8.6
6.0	12.83	0.22	5.7	18	8.29	0.14	8.8
6.5	12.39	0.21	5.9	19	8.10	0.14	9.0
7.0	12.01	0.21	6.1	20	7.93	0.14	9.2
7.5	11.67	0.20	6.2	25	7.15	0.12	10.2
8.0	11.37	0.20	6.4	30	6.53	0.11	11.1
8.5	11.10	0.19	6.5	40	5.59	0.10	13.0
9.0	10.85	0.19	6.7	50	4.92	0.08	14.8
9.5	10.62	0.18	6.8	80	3.76	0.06	19.3

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.6.2

Time to Boil and Heatup Rates Following a Loss of SDC With the RCS Filled to the Refueling Level

After Core Reload (3990 MW Core)

Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Time to Boil (hours)	Time after Reactor Shutdown (days)	Decay Heat Load (MWth)	Heatup Rate (F/Min.)	Time to Boil (hours)
1.0	19.06	0.33	3.8	10	8.13	0.14	8.9
2.0	15.62	0.27	4.7	11	7.84	0.13	9.3
3.0	13.46	0.23	5.4	12	7.58	0.13	9.6
3.5	12.63	0.22	5.8	13	7.36	0.13	9.9
4.0	11.93	0.21	6.1	14	7.14	0.12	10.2
4.5	11.34	0.20	6.4	15	6.96	0.12	10.4
5.0	10.83	0.19	6.7	16	6.79	0.12	10.7
5.5	10.38	0.18	7.0	17	6.61	0.11	11.0
6.0	10.01	0.17	7.3	18	6.47	0.11	11.2
6.5	9.66	0.17	7.5	19	6.32	0.11	11.5
7.0	9.37	0.16	7.8	20	6.19	0.11	11.7
7.5	9.10	0.16	8.0	25	5.58	0.10	13.0
8.0	8.87	0.15	8.2	30	5.09	0.09	14.3
8.5	8.66	0.15	8.4	40	4.36	0.07	16.7
9.0	8.46	0.15	8.6	50	3.84	0.07	18.9
9.5	8.28	0.14	8.8	80	2.93	0.05	24.8

Current outage schedules do not support reloads in less than 10 days.

Source of Data: SA-13-C00-1996-004, Appendix A

TABLE 2.6.3

Time to Core Uncovery Following a Loss of SDC

RCS at Refueling Level *(3990 MW Core)*

Note: Times do not include time to boil and assume no cold leg openings.

Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (hours)		Decay Heat (MW)	Time to Core Uncovery After Boiling Starts (hours)
24.44	34.9		10.42	81.8
20.02	42.6		10.05	84.8
17.25	49.4		9.72	87.7
16.19	52.6		9.43	90.4
15.30	55.7		9.16	93.0
14.54	58.6		8.92	95.5
13.88	61.4		8.70	98.0
13.31	64.0		8.48	100.5
12.83	66.4		8.29	102.8
12.39	68.8		8.10	105.2
12.01	71.0		7.93	107.5
11.67	73.0		7.15	119.2
11.37	75.0		6.53	130.5
11.10	76.8		5.59	152.5
10.85	78.5		4.92	173.2
10.62	80.2		3.76	226.7

Source of Data: TA-13-C00-2001-006, Appendix A

2.7 Spent Fuel Pool Operation

NOTES 2.7.0

Spent Fuel Pool Parameters for a Loss of SDC

Spent Fuel Pool (SFP) parameters will be determined on a cycle to cycle basis due to changing inventories in the SFP.

Information concerning the existing decay heat load currently in the SFP can be found in the unit specific "As-Left Decay Heat Projection" analysis maintained by Reactor Engineering. The decay heat loads for the reactor core (for periods of time during or after core offload) are included in SAOD sections 2.2 through 2.6.

Once the decay heat has been determined, the Heatup Rate (HUR) in ^{0}F/hr can be calculated from:

$$HUR = \frac{DH \cdot 1000\frac{kW}{MW_t} \cdot 3412\frac{(BTU)/(hr)}{kW}}{2,114,850 lbm \cdot C_p}$$

Time to Boil (TTB) in hours can be calculated from:

$$TTB = \frac{210 - T_{initial}}{HUR}$$

where:

DH: total SFP decay heat, current decay heat load + additional off-loaded fuel, in MWt

2,114,850 lbm is the assumed mass of water in the SFP, this is less than value based on these references (References: (1) NRC letter from M.B. Fields to G.R. Overbeck, March 2, 2000, addresses minimum SFP capacity of 320,000 gallons; (2) Updated Final Safety Analysis Report, Table 9.1-2, Maximum SFP temperature of 167 ^{0}F)

Cp: 1.0 BTU/lbm ^{0}F

210 ^{0}F assumed boiling point of SFP water

$T_{initial}$: SFP temperature at time of loss of cooling in ^{0}F

2.8 Minimum Time to Reduced Flow SDC Operations

NOTES 2.8.0

Minimum Time to Reduced Flow SDC Operations Following Reactor Shutdown to Maintain RCS Temperature at or Below 135 Deg. F

Table 2.8.1 presents the EW cooling water temperature and post-shutdown time criteria prior to reducing SDC system total flow rate to 3780 gpm (indicated) to support reduced inventory conditions while providing sufficient cooling capacity to maintain the RCS temperature at or below 135 ^{0}F. Specifically, this table correlates the time after shutdown where the core decay heat is equal to or less than the cooling capacity of the SDC system at the corresponding EW cooling water temperature and with the RCS temperature at 135 ^{0}F.

The data presented in Table 2.8.1 is predicated on stable RCS temperature prior to reducing SDC flow rate. Upon reduction of SDC flow rate and prior to reducing RCS water level, Operations shall monitor RCS temperature to verify that sufficient cooling capacity exists to maintain RCS temperature at or below 135 ^{0}F. Engineering recommends that RCS temperature be monitored for a period of not less than one hour (reference letter 448-00525).

Data presented in Table 2.8.1 is based on the SDC performance analyses contained in PVNGS calculation 13-MC-SI-231 for a rated thermal power of 3990 MW. EW temperature instrument uncertainty included in Table 2.8.1 is based on total loop uncertainty for instruments 1,2,3JEWNTI083/84 as indicated on the ERFDADS display. Verification of actual EW temperature by alternative means using appropriate M&TE is considered acceptable.

Notes 2.8.0 and Table 2.8.1 are maintained by Design Mechanical Engineering, NSSS. Questions concerning this information should be directed to the Design Mechanical NSSS section leader.

TABLE 2.8.1

Minimum Time to Reduced Flow SDC Operations Following Reactor Shutdown To Maintain RCS Temperature at or Below 135 Deg. F

Note: Refer to Note 2.8.0 for information regarding the use of this table

EW Inlet Temperature (Actual - ^{0}F)	EW Inlet Temperature (Indicated - ^{0}F) (1,2,3JEWN083/84)	Decay Heat / SDC capacity (MW)	Time After Shutdown (Hrs)
92	87	15.5	91
91	86	15.9	87
90	85	16.3	82
89	84	16.6	79
88	83	17.0	75
87	82	17.4	71

Source of Data: 13-MC-SI-231, Revision 4

2.9 RCS Forced Flow and RWT Temperature Requirements

NOTES 2.9.0

RCS Forced Flow and RWT Temperature Requirements

To Maintain Subcooled Conditions

Following a Loss of Shutdown Cooling

Table 2.9.1 presents the Refueling Water Tank fluid temperature and time requirements following reactor shutdown to be satisfied prior to reduced inventory conditions. These criteria must be satisfied prior to reducing RCS water level to ensure that sufficient cooling is available to maintain the core covered and subcooled by HPSI forced cooling in the event of a loss of shutdown cooling. The RWT temperature requirements in Table 2.9.1 ensure that the total heat dissipated by a single train of HPSI injection is equal to or greater than the corresponding core decay heat at the specified time after shutdown.

The data presented in Table 2.9.1 is based on the forced flow cooling analysis contained in PVNGS calculation 13-MC-SI-231 for a rated thermal power of 3990 MW. RWT temperature instrument uncertainty included in Table 2.9.1 is based on total loop uncertainty for instruments 1,2,3CHNTI200 as indicated on the ERFDADS display. Operations will establish the need to circulate the RWT volume to ensure that the tank is thermally well mixed.

Notes 2.9.0 and Table 2.9.1 are maintained by Design Mechanical Engineering, NSSS. Questions concerning this information should be directed to the Design Mechanical NSSS section leader.

TABLE 2.9.1

RCS Forced Flow and RWT Temperature Requirements To Maintain Subcooled Conditions Following a Loss of Shutdown Cooling

Note: Refer to Note 2.9.0 for information regarding the use of this table

RWT Temperature (Actual - ^{0}F)	RWT Temperature (Indicated - ^{0}F)	Decay Heat (MW)	Time After Shutdown (Hrs)
74	72	18.0	65
76	74	17.7	68
78	76	17.4	71
80	78	17.1	75
82	80	16.8	77
84	82	16.5	80
86	84	16.2	83
88	86	15.9	86
90	88	15.6	90

Source of Data: 13-MC-SI-231, Revision 4

3.0 IMPACT REVIEW

The SAOD provides information to the operations staff and shift technical advisors should a loss of shutdown cooling occur, but does not affect any procedures they use.

This document satisfies the design control requirements but is not a QR analysis package. This document is a collection of data from QR analyses. Changes to these referenced analyses require the performance of the impact review and other analysis package requirements (i.e. AD documentation, etc.).

During the revision of SAOD Unit 1 (Rev 2) where the document was updated to incorporate the information from 3876 Mwt configuration to 3990 Mwt (same scope as this analysis), Operations, Outage Management, OPS standards, Design Engineering, System Engineering, and NFM were contacted to determine the potential impacts. No impact to any outside organization or procedure resulted for the Unit 1 SAOD revision. Likewise, no impacts result from this revision. Also no SABD exists for the SAOD.

4.0 REFERENCES

1) TA-13-C00-1999-009, “Outage Decay Heats”, Revision 4, 10/11/2006.

2 TA-13-C00-2001-005, “Loss of Shutdown Cooling Analyses for RCS Drain Operations and Nozzle Dam Installation”, Revision 1, 3/28/2003

3 TA-13-C00-2001-006, “SAOD Input Data of Estimated Times to Vaporize RCS Inventory Above the Reactor Core”, Revision 1, 5/7/2003.

4 SA-13-C00-1996-004, “Stretch Power SAOD”, Revision 4, 8/5/2003.

5 13-MC-SI-231, “Calculation of Minimum Time to Reduced Flow Shutdown Cooling Operation”, Revision 4, 4/06/2005

6 Deleted.

7 Letter 162-09970-KCP dated March 5, 2002. *(Note; this letter was supplemented by the letter in reference 12 below).*

8 TA-03-C09-2001-004, “Loss of Shutdown Cooling Analysis for RCP Removal During U3C9 SNOW Outage”, Revision 1, 2/20/2001.

9 NRC letter from M.B. Fields to G.R. Overbeck, March 2, 2000.

10 UFSAR revision 14 dated June 2007.

11 Letter 448-00525-MAB/JAB dated August 17, 2001.

12 Letter 162-10794-CAH/DAM dated February 25, 2004 and CRDR 2686238

Appendix A 10 CFR 50.59 Applicability Determination

This document satisfies the design control requirements but is not a QR analysis package. This document is a collection of data from QR analyses. Changes to these referenced analyses require AD documentation and are performed under those analyses packages. For example Reference 1 performed applicability determination for change of that document. Per 93DP-0LC17 Section 2.1.1, "Relocating design information that already exists in design output documents to another location is considered editorial in nature and there is no requirement to review the 50.59 or 72.48 screening/evaluation performed to place the information in the design documents". Thus this analysis does not require a 10 CFR 50.59 Screening of Procedure.

In addition, the other changes specified in this analysis revision are considered administrative and do not require a 10 CFR 50.59 Screening per 93DP-0LC17, section 2.1.3. These applicable changes include reformatting the analysis documentation to comply with current NFM design and procedures 05DP-0NF09 and 05DP-0NF22.

This Applicability Determination was performed by Arshad Taufiq

Appendix B Reload Verification

Not Applicable since the information provided in SAOD is not part of the Reload process

Appendix C Design Document Interfaces and Associations

Not Applicable since this document is a collection of data from QR analysis. Changes to these referenced analyses require the performance of the design verifications e.g. see Ref. 1 Appendix C for design document interface summary. Procedure 05DP-0NF09, Step 3.2.4.3 says in part, "Associations are ***not*** required at this time, but may be specified for use in NFM at the SL's discretion." NFM-TA section leader has concurred that the Interface & Associations are not required for this revision.

APPENDIX D Design Review and Verification

Design Review Area	Results of Review	
	YES	N/A[1]
1. Were the inputs correctly selected and properly documented?	X	
2. Are assumptions necessary to perform the analysis adequately described and reasonable? Where necessary, are they identified for subsequent reverification? contingencies?		X
3. Are the appropriate quality and quality assurance requirements specified?	X	
4. Are the applicable standards, acceptance criteria, and regulatory requirements properly identified? Are their requirements met?		X
5. Have applicable operating experience, conditions, issues, & plant configuration been considered?	X	
6. Are the systems, structures, and components credited/used/considered/specified in the analysis allowed/suitable for the required application?	X	
7. Was an appropriate design method used? Were the input and assumptions correctly incorporated in the design process?	X	
8. Is the output reasonable compared to design inputs? Are the conclusions appropriately drawn?	X	
9. Have the design interface requirements been satisfied? Are the impacts on other design documents properly identified? Have change mechanisms been initiated?	X	
10. If the analysis results need verification by further testing, are the criteria for verification that the design requirements have been satisfactorily accomplished identified?		X
11. Are the requirements for record preparation, review, approval, retention etc. met?	X	
Comments/Explanations: *For Questions 2, 4, and 10: This document is a collection of data from several QR analyses. No new assumptions, acceptance criteria, or verification requirements are established by this document.*		
Review Performed By: Ness Kilic	**Date:12/13/2007**	

1.N/A (Not Applicable) - If marked, an explanation shall be provided in the "Comments/Explanation" Box.

Design Verification Comment Sheet

Comment Number	Reviewer's Comment	Response Required?	Preparer's Response	Response Accepted?
1	Some of the source analyses provide the 3990 MW data in Appendices. It may help the user to specify the appendices where the data is extracted from	NO	Appendices specified	YES
2	Procedural (AD): Section 2.1.6 of 93DP-0LC17 is applicable to specific analyses. This analysis does not meet those criteria. Recommend use of other justification for non-applicability	YES	Non-applicability now is based on Section 2.1.1 of the AD procedure	YES
3	Procedural (Analysis Control): Need SL's decision to include Associations in App. C. Also package needs DRC.	YES	TA-SL concurred with no changes to Associations. DRC is included	YES

REVIEWER: A. N. Kilic **DATE: 12/13/07**

SCOPE OF REVIEW AND VERIFICATION: This document is a collection of data from several QR analyses. Thus, the review consisted of verification that the information is correctly and completely extracted from the source documents and translated into SAOD for applicable unit.

TYPE OF VERIFICATION (check all that apply):

Design Review (attach Design Review Checklist)	X
Alternate Calculations (attach Design Review Checklist and alternate calculations)	
Qualification Testing (attach Design Review Checklist and test results)	
Other (specify and attach supporting documentation and Design Review Checklist)	

VERIFICATION NOTES: (Attach relevant information)

A-7
PVNGS JOB PERFORMANCE MEASURE

JPM BASIS INFORMATION

TASK:	1290190102 Ensure Compliance with Tech Specs						
TASK STANDARD:	Status of MSIV LCOs determined						
K/A:	2.2.22	K/A RATING:	RO:	3.4	SRO:	4.1	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	SRO	VALIDATION TIME:	15 minutes				
REFERENCES:	Technical Specifications						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Jordan Johnston Date: 05/18/2007

Revised By: Alan Malley Date: 01/12/2012

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SIMULATOR SETUP:

Tech Specs available
Computer available

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

Unit 1 is in Mode 1 and has had a series of events associated with the Main Steam Isolation Valves (MSIVs).

INITIATING CUE:

Your task is to evaluate MSIV status for the time line (attached) and determine what LCO and action should have been applied for each time.

The following chart gives a chronological order of conditions that existed with Unit 1's MSIVs. Fill out all LCO actions that are entered.

Time	MSIV number	Accumulator Train	Pressure	LCO and action entered
T=0	170	A	4950	
T=1 hr	180	A	4975	
T=2 hrs	171	B	4950	
T=3 hrs	170	A	5200	

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1. *	Examinee determines LCO and condition for T=0 time.		Examinee enters LCO 3.7.2 condition 'a'.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Examinee determines LCO and condition for T= 1 hr. time.		Examinee enters LCO 3.7.2 condition 'c'.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Examinee determines LCO and condition for T= 2 hr. time.		Examinee enters LCO 3.7.2 condition 'e'.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Examinee determines LCO and condition for T= 3 hr. time.		Examinee enters LCO 3.7.2 condition 'b'.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: [ ]

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparednessorganization for resolution.

NORMAL TERMINATION POINT

ANSWER KEY

Time	MSIV number	Accumulator Train	Pressure	LCO and action entered
T=0	170	A	4950	LCO 3.7.2 condition ‘a’
T=1 hr	180	A	4975	LCO 3.7.2 condition ‘c’
T=2 hrs	171	B	4950	LCO 3.7.2 condition ‘e’
T=3 hrs	170	A	5200	LCO 3.7.2 condition ‘b

ANSWER KEY

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	01/12/2012	6	Reformatted and modified times and conditions.

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

CANDIDATE

INITIAL CONDITIONS:

Unit 1 is in Mode 1 and has had a series of events associated with the Main Steam Isolation Valves (MSIVs).

INITIATING CUE:

Your task is to evaluate MSIV status for the time line (attached) and determine what LCO and action should have been applied for each time.

The following chart gives a chronological order of conditions that existed with Unit 1's MSIVs. Fill out all LCO actions that are entered.

Time	MSIV number	Accumulator Train	Pressure	LCO and action entered
T=0	170	A	4950	
T=1 hr	180	A	4975	
T=2 hrs	171	B	4950	
T=3 hrs	170	A	5200	

CANDIDATE

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

JPM BASIS INFORMATION

TASK:	1290020301, Conduct On Shift Operations IAW Conduct of Shift Operations						
TASK STANDARD:	Determine hold points exceeded, approval needed, and which AO will perform the task						
K/A:	2.3.4	K/A RATING:	RO:	3.2	SRO:	3.7	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	SRO	VALIDATION TIME:	20 minutes				
REFERENCES:	75DP-9RP01, Radiation Exposure and Access Control						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT		OTHER	X	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 10-11-2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

1. 75DP-9RP01 This JPM was written using Revision 17 of 75DP-9RP01. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.
2. Calculator
3. Pen and Paper

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

You are the Outage SRO. You will be assigning a job to one AO from a work pool of three (listed below).

The job is to depressurize and drain piping associated with Main Spray valve 100F.

RP surveys show the AO will be in a 150 mr/hr field. The job will take 45 minutes.

Evaluate the information about each AO below and answer the questions below.

2010 Exposure (in mrem)	G. Norman RW Operator	A. Palmer Shift AO	F. Couples FIN Operator
Previous 4 years dose (2007-2010)	8227	527	832
1st Quarter (2011)	1446 Most exposure was from Spent resin operations	103	414
2nd Quarter (2011)	113	62	317
3rd Quarter (2011)	122	24	188
4th Quarter (to date)	65	1207 Most exposure was from RCP lineups at outage beginning	982 Most exposure was from EDT sludge lancing support.

INITIATING CUE:

Use the worksheet on the following page to document answers.

- **List any hold point that may occur during this job (assuming each one performed the evolution).**
- **List whose approval would be necessary for any hold points that would be exceeded. (Assume authorization for current dose levels have already been obtained.)**
- **Ascertain which AO will perform the job based on total dose.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Examinee determines total dose received for the job.		Examinee calculates that 112.5 mrem will be accumulated on this job.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Examinee determines the hold points that will be exceeded for each operator.		Examinee determines hold points exceeded are: **G. Norman** – would exceed 10 rem cumulative exposure in 5 years. **A. Palmer** – would exceed 1500 mrem for the calendar year. **F. Couples** – would exceed 2000 mrem for the calendar year.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Examinee determines whose approval required		Examinee determines the approval need for each operator is as follows: G. Norman – Vice President, Nuclear Operations A. Palmer – RP Dept. Leader F. Couples – RP Director
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Examinee ascertains which Auxiliary Operator will perform the job based on ALARA criteria.		Examinee determines A. Palmer, Shift AO has the lowest year to date exposure.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

ANSWER KEY

List any hold point that may occur during this job (assuming each one performed the evolution):

Norman	10 rem in 5 years
Palmer	1500 mrem for the calendar year
Couples	2000 mrem for the calendar year

List whose approval would be necessary for any hold points that would be exceeded:

Norman	V.P. Nuclear Operations
Palmer	RP Department Leader
Couples	RP Director

Ascertain which AO will perform the job based on ALARA criteria:

AO to perform work	A. Palmer

ANSWER KEY

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PVNGS JOB PERFORMANCE MEASURE
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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
003	10/11/2011	6	Modified JPM from 2010 NRC Initial Exam

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

Examinee Handout

INITIAL CONDITIONS:

You are the Outage SRO. You will be assigning a job to one AO from a work pool of three (listed below).

The job is to depressurize and drain piping associated with Main Spray valve 100F.

RP surveys show the AO will be in a 150 mr/hr field. The job will take 45 minutes.

Evaluate the information about each AO below and answer the questions below.

2010 Exposure (in mrem)	G. Norman RW Operator	A. Palmer Shift AO	F. Couples FIN Operator
Previous 4 years dose (2007-2010)	8227	527	832
1st Quarter (2011)	1446 Most exposure was from Spent resin operations	103	414
2nd Quarter (2011)	113	62	317
3rd Quarter (2011)	122	24	188
4th Quarter (to date)	65	1207 Most exposure was from RCP lineups at outage beginning	982 Most exposure was from EDT sludge lancing support.

INITIATING CUE:

Use the worksheet on the following page to document answers.

- **List any hold point that may occur during this job (assuming each one performed the evolution).**
- **List whose approval would be necessary for any hold points that would be exceeded. (Assume authorization for current dose levels have already been obtained.)**
- **Ascertain which AO will perform the job based on total dose.**

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC Exam

Candidate Worksheet

Exposure (in mrem)	G. Norman RW Operator	A. Palmer Shift AO	F. Couples FIN Operator
Previous 4 years dose 2007-2010	**8227**	**527**	**832**
1st Quarter (2011)	**1446** Most exposure was from Spent resin operations	**103**	**414**
2nd Quarter (2011)	**113**	**62**	**317**
3rd Quarter (2011)	**122**	**24**	**188**
4th Quarter (to date)	**65**	**1207** Most exposure was from RCP lineups at outage beginning	**982** Most exposure was from EDT sludge lancing support.

List any hold point that may occur during this job (assuming each one performed the evolution):

G. Norman _____

A. Palmer _____

F. Couples _____

List whose approval would be necessary for any hold points that would be exceeded:

G. Norman _____

A. Palmer _____

F. Couples _____

Ascertain which AO will perform the job based on total dose:

AO to perform work _____

This procedure provides the minimum administrative controls for personnel exposure to radiation or radioactive materials including Radiological Control Area (RCA) access/egress, administrative exposure hold points and Radiation Exposure Permit (REP) generation.

This procedure contains the following appendices which define requirements for pre-natal exposure, requesting new administrative exposure hold points, reporting personnel overexposures to the NRC, authorizing waivers of RCA access prerequisites, and requesting RCA access for visitors:

Appendix A - Request for a Higher Administrative Exposure Hold Point

Appendix B - Pre-Natal Dose Limit Statement

Appendix C - Criteria for Reporting Personnel Overexposures to the USNRC

Appendix E - Radiation Protection Requirement Waiver

Appendix F -Visitor Request for RCA Access

Appendix G - Embryo / Fetus Dose Assessment

Appendix H - Off Site Support Agency Radiological Determination Matrix

Appendix I - Supplemental Exposure Notification

Information Use:	• Activity can be performed from memory. • Review the procedure before using, if not done recently. • Document is available and referenced for review as needed. • The procedure can be carried out section by section, allowing resequencing of steps within the section.	All

Table of Contents

1.0 PURPOSE and SCOPE

1.1 Purpose

This procedure provides administrative controls for working with or in the vicinity of radiation or radioactive materials within the Restricted Area to ensure that personnel radiation exposure is maintained as low as is reasonably achievable (ALARA). (RCTS2 002495-01, RG 8.8R3, RCTS2 010602-01, FSAR 12.3.1.2)

1.2 Scope

1.2.1 This procedure encompasses responsibilities for entering and exiting a Radiological Controlled Area (RCA), administrative exposure hold points, Radiation Exposure Permit (REP) generation, authorizing waivers of RCA access prerequisites, and requesting RCA access for visitors.

1.2.2 Planned Special Exposures shall be conducted and authorized in accordance with 75RP-9RP19, "Planned Special Exposures."

2.0 RESPONSIBILITIES

2.1 Individuals

Although Radiation Protection (RP) personnel oversee radiological controls within the station, each individual involved in work within the Restricted Area must remain constantly aware of potential radiological problems.

- Each individual's actions directly affect his/her exposure to radiation when working in the vicinity of radiation sources.

Each individual has the following responsibilities:

2.1.1 Not to loiter in Radiological Controlled Areas (RCA).

2.1.2 Not to move or adjust any Radiation Protection boundary, barrier or posting without the approval of Radiation Protection.

2.1.3 Remaining aware of their individual exposure status and ensuring they remain below their administrative exposure hold point (see Section 3.10, Radiation Exposure Limitations and Controls).

2.1.4 Complying fully with the instructions of RP personnel in all matters pertaining to radiation protection.

2.1.5 Complying with standard operating procedures, warning signs, and barriers that concern radiation/contamination control.

2.1.6 Reading the applicable Radiation Exposure Permit (REP) for their specific job or task and obeying all instructions and requirements (i.e., dosimetry and protective clothing requirements).

2.1.7 Correctly wearing designated dosimetry devices, protective clothing, and respiratory protection equipment as prescribed by procedures or instructions.

- RP Personnel may relieve individuals of the responsibility to Self Monitor dosimetry due to contamination control or when employing remote monitoring technologies.

2.1.8 Promptly notifying RP personnel of any known or suspected change in radiological conditions.

2.1.9 Ensuring activities do not create unnecessary radiological problems for others, and being alert for the possibility that activities of others may change the work area's radiological conditions.

2.1.10 Notifying RP supervision of any aspects of radiation protection that they believe are not being properly administered.

2.1.11 Promptly notifying RP personnel of any known or suspected overexposure, or lost or damaged dosimetry.

2.1.12 Reporting all open wounds to RP prior to entering the RCA and reporting any wounds or skin contamination received while in the RCA.

2.1.13 Notifying Dosimetry of any medical diagnosis or treatment involving the intake of radioactive pharmaceuticals (e.g., I-131, Tc-99m, Tl-201), or medical treatments such as cobalt implantation before entering the Restricted Area.

2.1.14 Not smoking, eating, drinking, chewing, or having possession of such items while in a RCA, unless authorized by RP Management.

2.1.15 Immediately leaving the affected area and contacting RP when an Area Radiation Monitor alarms.

2.1.16 Preventing the spread of contamination by contacting RP personnel for direction on the removal of tools, equipment, and/or trash from contaminated areas and following RP instructions for the disposition of these items.

2.1.17 Surveying for personal contamination when leaving a contaminated area or radiological control point, as directed by RP.

2.1.18 Ensuring that prior to removing tools and equipment from the RCA, those tools and equipment are surveyed by RP personnel, as applicable.

2.1.19 Notifying the supervisor and providing Dosimetry with a completed Appendix B, "Pre-Natal Dose Limit Statement" if a female decides to declare her pregnancy or her intent to become pregnant or she suspects she may be pregnant.

2.1.20 Providing bioassay samples for the purpose of detection of radionuclides when requested by RP personnel.

2.1.21 Notifying Dosimetry of any personal information changes such as name, address, department number, employer, etc., to allow updates of the dosimetry records.

2.1.22 Informing Dosimetry of any occupational exposure received at an offsite facility while an employee of PVNGS.

- See Appendix I - Supplemental Exposure Notification (CRAI 2977470)

2.1.23 Keeping RP informed of the nature of work being performed in the RCA and any of changes that should occur to the work scope.

2.1.24 Ensuring monitoring is performed as follows, or as directed by RP, if protective clothing is worn while working in an RCA.

- Whole body monitoring by PCM or equivalent (e.g., CM-11, FHZ380AB) is performed at approximately eight (8) hr intervals.
- Monitoring for hot particles when exiting an HPCA with a stay time not to exceed six (6) hours if an HPCA was entered

2.1.25 Obtaining an exit bioassay analysis count prior to terminating at PVNGS

2.1.26 Performing RCA access and egress via ARACS for those REPs which allow automated access.

2.2 Work Group Section Leaders

Work Group Section Leaders are responsible for planning and coordinating tasks to be performed within a RCA with RP. Other responsibilities include:

2.2.1 Evaluating each work order to determine the requirement for a REP, based upon system, location, and radiological conditions.

2.2.2 Providing work orders, as requested by RP, via electronic routing location code 360 for RP evaluation and REP assignment. (IIR 010301-01)

2.2.3 The exception to Step 2.2.2 will be those work orders determined to be emergent work.

- If the work order requires a REP, the planner should contact RP as soon as practicable to allow time for RP preparation.

2.2.4 High Profile / High Risk Activities (REP JHES Cat 1) require Work Group Leadership's (or designee) increased involvement in the REP Planning and REP ALARA Review processes. See 75RP-9RP02, Radiation Exposure Permits. (CRAI 3152607, 3152614, SOER 01-01 #3)

2.2.5 Ensuring that RP related steps, hold points, and comments resulting from work order reviews are incorporated into the work order or resolved in conjunction with RP.

2.2.6 Ensuring that employees under their supervision have completed required radiation protection training and are fully qualified for use of respiratory protection equipment, if applicable.

2.2.7 Ensuring their personnel are familiar with the task to be performed so that maximum task benefit is derived when worker exposure to radiation is involved.

2.2.8 Ensuring that workers assigned to the tasks have sufficient remaining exposure available to contribute significantly to the completion of the task and that requests for new administrative exposure hold points are submitted to RP in a timely manner with proper justification.

2.2.9 Coordinating the activities of their workers with those of other work groups to achieve maximum efficiency in the task as a whole and to minimize the potential for unnecessary exposure due to poor communications or lack of proper planning/scheduling.

2.2.10 Ensuring that workers under their supervision comply fully with RP personnel in matters pertaining to radiation protection and that they follow the specific instructions and requirements on the REP.

2.2.11 Routinely monitoring the activities of their personnel during job performance to ensure that proper radiological protection measures are being used.

- REP JHES Cat 1 activities require increased levels of work group supervisory oversight. (CRAI 3152616, SOER 01-01 #3)

2.2.12 Ensuring that parts, tools, and equipment necessary to perform the task are proper for the job, readily available, and have proper power sources available.

2.2.13 Developing man-Rem estimates for each job.

2.3 Director, Site Radiation Protection

The Director, Site Radiation Protection, is responsible for:

2.3.1 Establishing the radiation exposure control procedures. (RCTS2 010553-01)

2.3.2 Ensuring the investigation of all actual or suspected personnel overexposures.

2.3.3 Approving requests for administrative exposure hold points above 2 rem/year.

2.4 Radiation Protection Department Leaders

Radiation Protection Department Leaders are responsible for approving requests for administrative exposure hold points above 1.5 rem/year.

2.5 ALARA Committee Chairman

The ALARA Committee Chairman is responsible for approving requests for administrative exposure hold points greater than 2500 mrem/yr up to 4000 mrem/yr and any new hold point which would allow an individual's cumulative lifetime exposure (in rem) to exceed the individual's age (in years).

2.6 Vice President, Nuclear Production

The Vice President, Nuclear Production is responsible for approving any administrative exposure hold points which would allow an individual to accumulate more than 10 rem in 5 years.

2.7 Radiation Protection

Radiation Protection sections, as applicable, are responsible for:

2.7.1 Controlling the initiation, revision, and termination of REPs.

2.7.2 Specifying REP requirements, such as the personnel dosimetry, protective clothing, and respiratory protection equipment requirements.

2.7.3 When necessary, issuing dosimetry to individuals as specified by the REP.

2.7.4 Relieving the Radworker of the responsibility to self-monitor dosimetry when the worker is unable to self-monitor.

2.7.5 Evaluating radiological conditions throughout the site.

2.7.6 Updating radiological postings and access control requirements.

2.7.7 Documenting (via manual records or by computer access control system) personnel access/egress into RCAs on those REPs which do not allow automated access via ARACS and when ARACS is not available.

2.8 Dosimetry

The Dosimetry Section is responsible for:

2.8.1 Providing, when necessary, TLDs to monitor an individual's exposure.

2.8.1.1 By issuing personnel record thermoluminescence dosimeters (TLDs) and performing a periodic change-out and evaluation of these record TLDs.

2.8.1.2 By providing special dosimetry to RP for issue to individuals.

2.8.2 Making available to site departments involved in radiological work, a periodic listing of the exposure to date for departmental personnel.

2.8.3 Performing whole body counts.

2.9 Operations Shift Manager

The Operations Shift Manager is responsible for ensuring that RP is informed of changes in plant conditions which are known to have significant impact on radiological conditions.

3.0 PROCEDURE

3.1 General

3.1.1 Administrative controls are placed on access to the RCA due to the proximity of direct sources of radiation and the possibility of entering areas that are contaminated or contain airborne radioactivity.

3.1.2 Computerized access control systems are used as tools to control personnel access to the RCA. The systems provide exposure data and user messages to assist RP personnel in this task. (QATS 390346-08, UFSAR 12.5.2.2.7)

3.1.2.1 When the computerized system(s) are available, their services may be used during the performance of this procedure.

3.1.2.2 When the computerized system(s) are not available, methods of control should be performed in accordance with guidance provided in the appropriate RP written instruction.

3.2 Personnel Radiation Dosimetry

3.2.1 The Radiation Protection requirements for issuing an individual a record TLD include:

- A current NRC Form 4 or
- A written signed statement from the individual indicating occupational exposure received during the current year and previous years.

3.2.2 The Radiation Protection requirements for unescorted access within an RCA include:

3.2.2.1 Successful completion of Radiological Work Practices (RWP) training.

3.2.2.2 Whole body count performed at PVNGS.

3.2.2.3 If necessary, the 3.2.2.1 and/or 3.2.2.2 RP requirement(s) for unescorted access may be waived with approval of the Director, Site Radiation Protection.

- Document the approval and any assigned restrictions on Appendix E, "Radiation Protection Requirement Waiver."

3.2.3 Personnel requiring entry into the Restricted Area who may be expected to receive radiation exposure in excess of 100 mrem/year DDE or 10% of the exposure limits specified in 10CFR20.1201(a) shall be issued a personnel dosimetry device. (RCTS2 010512-01, RG 8.4R0, RCTS2 041015-01, FSAR 12.5.3.3, RP 046012-01, 10CFR20.1502(a), ICR 00120 - ANI recommendation)

- Record TLDs are normally issued at the Dosimetry Office, and thereafter should be returned and picked up at the security entrance to the Restricted Area.

3.2.4 Personnel will obtain dosimetry (as specified on the REP) which shall be worn at all times within an RCA. (RCTS 010827-01, RCTS2 010523-01, RG 8.2R0, RCTS2 041026-01, FSAR 12.5.3.6)

- An approved exception to this requirement is when Special Dosimetry is issued that includes HEAD Dosimetry. With RP permission, Head Dosimetry may be hand carried by the Radworker to the job site.
- An approved exception to this requirement is during RCA egress when dosimetry is removed and surveyed.
- An approved exception to this requirement is when Protective Clothing is being doffed.

3.2.4.1 Self-indicating dosimeters (SID), such as an Electronic Personal Dosimeter (EPD), provides an individual's current exposure status in between record TLD evaluations.
(RCTS2 010679-01, RCTS2 041027-01, FSAR 12.5.3.6)

- The exposure information obtained from the SID is used for job exposure tracking and by departments for budgeting job exposure for their personnel.

3.2.4.2 RP may also require an alarming dosimeter or special dosimetry to be worn on certain jobs.

- Special dosimetry is used for monitoring the extremities, monitoring neutron radiation fields, or obtaining localized readings in an abnormal, varying, or non-uniform radiation environment.

3.2.4.3 DMC-2000 EPDs equipped with a PAM-1 (or equivalent) are:

- Required in High Radiation Areas when the workers ability to hear an alarm is impaired by high noise environment, hearing protection use, use of audio headset or personal hearing loss. (CRAI 3218552) (CRAI # 2817781)
- To be considered in Radiation Area in situations where a worker’s hearing is impaired (for instance while using audio headsets) based on plant conditions and the probability of radiological conditions changing during the work.

- RP Leader's authorization is required to deviate from these requirements on a case by case basis. (CRAI 3218533)

- In addition to having workers wear an external alarming device; the following additional dose control measures should be emphasized:

  More frequent monitoring of dosimetry,

  Reduced stay times in high noise/high radiation work areas. (ICR 00349 and ICR 00483)

3.2.5 Placement of dosimetry devices should be as follows:

3.2.5.1 Dosimetry devices (e.g., TLDs, SIDs) should normally be worn on the front of the body between the thigh and head, unless directed otherwise by RP.

3.2.5.2 TLDs should be worn on the outside of protective clothing when skin is exposed and shallow-dose equivalent is of concern (e.g., noble gas environment).

3.2.5.3 TLDs should be placed under the protective clothing if all skin is covered (i.e., full PCs plus respirator).

3.2.5.4 Special dosimetry shall be worn as specified on the REP.

- SIDs should be worn on the same approximate location of the body as the special dosimetry.

3.2.5.5 SIDs should be worn so that they are easily retrieved and read.

3.2.5.6 The neutron TLD should normally be worn face out on the front and center of the body between the thigh and the head.

- The neutron TLD should be held tightly to the body by either a pouch or belt, or by use of tape.

3.2.6 Personnel are responsible for the safekeeping of their dosimetry devices and shall not tamper with nor cause the dosimetry to be exposed to radiation except during the performance of work requirements. Examples include: do not pass dosimetry device (TLD or EPD) through the security x-ray and do not wear dosimetry following the administration of radiopharmaceuticals unless directed by Radiation Protection. (CRAI 3165248)

- Lost or damaged dosimetry shall be immediately reported to

Radiation Protection and a report filed in accordance with 75RP-9ME23, "Lost or Damaged Dosimetry," by RP personnel.

3.2.6.1 Off-scale readings from SIDs shall be reported to RP personnel immediately for a dose evaluation.

3.2.6.2 If an individual's dosimeter alarms, the individual shall:
- warn other workers in the vicinity (ACT 3075200)
- relocate to a low dose area
- contact RP to determine requirements for remaining in the RCA (e.g., reset/replace dosimeter, have TLD read).

3.2.7 When working in a contaminated area, dosimetry devices should be worn so as to prevent them from becoming contaminated.

- Dosimetry devices should be protected from contamination (both radiological and non-radiological) as much as practical, without interfering with the device's proper operation. Whirl pack or zip-lock bags are normally used for this purpose.
- When practical, dosimetry should not be covered up such that it cannot be seen and/or heard or impair self-monitoring of exposure by the worker.
- In the event that dosimetry is worn under protective clothing impairing the worker's ability to see and/or hear the dosimetry, RP Personnel shall assume responsibility for monitoring the worker's exposure. (ICR 00483 and ICR 00432)

3.2.8 Exposures received by personnel monitored by dosimetry devices, as outlined in this section, should be recorded under the applicable REP number. (RCTS2 009656-01, RG 8.10R1R 2.A)

3.2.9 Visitors entering the RCA should be issued dosimetry and be continuously escorted to ensure that radiological requirements are met.

3.2.10 For assistance in determining dosimetry and training requirements, exposure limits, etc. for Off Site Agencies assigned to PVNGS, consult Appendix H "Off Site Support Agency Radiological Determination Matrix". (CRAI 2853889 and ICR 450)

3.3 Dosimetry for Visitors

Issue, exchange, evaluate, and terminate Visitor dosimetry as follows:

3.3.1 Dosimetry Device - Use an EPD to monitor exposure.

3.3.2 Access Restrictions

- RCA entries - Must be escorted by a qualified radworker.
- Exposure allowed - 100 mrem TEDE per visit.
- No entries allowed into the following areas:
  - High Radiation Area (HRA)
  - Locked High Radiation Area (LHRA)
  - Airborne Radioactivity Area (ARA)
  - Hot Particle Control Area (HPCA)
  - High Contamination Area (HCA)
- Contaminated Area (CA) entry - *Allowed if approved by an RP Department Leader.*

3.3.3 Requesting RCA ACCESS

3.3.3.1 The requester shall ensure completion of Section A of Appendix F, "Visitor Request for RCA Access" and provide the completed form to the appropriate RP leader for approval.

3.3.3.2 The appropriate RP leader will complete Section B.

3.3.3.3 The Visitor and Escort will complete Section C.

3.3.4 Dosimetry Issue - (Section D of Appendix F)

3.3.4.1 Ensure the requirements in 3.3.3 have been completed.

3.3.4.2 Verify if a record TLD has been previously issued to the individual during the current year. (A computer access control system may be used to perform verification.)

- The name of the individual completing the verification shall be entered on the line provided in Appendix F, Part 2, line b.

3.3.4.3 If the following are met, issue an EPD:

- The individual was not issued a record TLD at PVNGS during the current year, and
- The individual's current year TEDE is less than 1800 mrem

or

- RP management approval has been obtained for those individuals whose current year TEDE is greater than 1800 mrem and were not previously issued a record TLD at PVNGS during the year.

3.3.4.4 If the individual does not meet the items in 3.3.4.3, the visitor process cannot be used to allow entry into an RCA.

- If the individual was previously issued a record TLD at PVNGS during the current year, they must be issued another record TLD in accordance with 75RP-9ME21 "TLD Issue, Exchange and Termination" to enter an RCA.

3.3.4.5 Enter the appropriate information in Section D, "Dosimetry Device Issue and Results" of Appendix F for each RCA entry. (e.g., Issue Date, EPD Serial Number, RP Initials)

3.3.4.6 The visitor's escort is responsible for ensuring the visitor obtains an EPD prior to entering an RCA.

3.3.5 Documentation

Use Section D, "Dosimetry Device Issue and Results" of Appendix F to keep track of the visitor's RCA entries.

- The visitor's escort is responsible for maintaining possession of the paperwork and ensuring it is properly filled out for each RCA entry.

3.3.6 Exposure Evaluation

Evaluate the visitor's exposure after each RCA entry by:

- Recording the EPD exit reading on Appendix F, and
- Calculating the exposure received for the entry, and
- Calculating the "Accumulated Total Dose" (in mrem)
- Ensuring the "Accumulated Total Dose" remains below 100 mrem.

3.3.6.1 Do not allow further RCA entries if they would cause the visitor's accumulated total dose to exceed 100 mrem.

3.3.6.2 If the individual requires further RCA entries and does not have sufficient visitor exposure remaining, then issue the individual a TLD in accordance with 75RP-9ME21 "TLD Issue Exchange and Termination".

3.3.7 Reporting of Exposure

3.3.7.1 Forward the completed Appendix F to Dosimetry.

3.3.7.2 Reporting of visitor exposure is not required.

- If requested, a copy of Appendix F may be provided to the individual after it has been reviewed by Dosimetry.

3.4 Radiation Exposure Permits (REP)

3.4.1 General

3.4.1.1 REPs are the principal administrative means to manage radiation exposure received by personnel at PVNGS.
(RCTS2 010665-01, FSAR 12.5.3.2.C)

3.4.1.2 A REP should specify the job to be performed, the radiological conditions at the job location (except Standing REPs), the protective clothing, dosimetry and respiratory protection requirements for the job, the Reg. Guide 1.16 work classification for the job, and the date(s) and time that the REP is valid.
(RG 1.16, C.1.b.3)

- Additionally, any special instructions for completing the job in a radiologically safe manner should be specified on the REP.

3.4.1.3 An active REP shall be required for the following:

- Any job or task within a RCA.
  (RCTS2 010664-01, FSAR 12.5.3.2.C)
- Any use of radioactive sources which could result in significant exposures to individuals
  (RCTS 010913-01; RCTS2 010683-01, FSAR 12.5.3.7)

3.4.1.4 RP has the capability to expedite entries by individuals into RCAs should it become necessary to meet critical operational needs.

- This can be done by providing an RP technician to escort personnel in lieu of generating a new REP.

3.4.2 Initiating a REP

3.4.2.1 Personnel needing to perform work requiring a REP should provide the RP Operations ALARA Planning Section, with information pertaining to the work to be performed (e.g., component ID, location, scope of work, etc.).

3.4.2.2 The work group supervisor or designee may be required to supply a list of personnel authorized to enter on that REP.

3.4.2.3 Copies of REPs are posted or made available at the access point(s) to RCAs where work is to be performed. The original will be kept on file by RP while that REP is active.

3.4.3 Revising a REP

All revisions to REPs should be made by RP personnel, who should ensure all copies are revised.

3.4.4 Terminating a REP

3.4.4.1 When all work covered by the REP is completed, the originator should notify RP.

3.4.4.2 RP personnel should terminate all associated REPs and ensure all copies are removed.

3.4.4.3 When the expiration date of the REP has been reached, RP should terminate the REP unless requested by the originator to extend the REP.

3.4.4.4 RP may terminate the REP if they determine the radiological conditions at the job site have changed (or will change), or if the REP is improperly used (i.e., scope of the original job has changed).

3.5 Restricted Area Access and Egress

3.5.1 Personnel issued a TLD shall pick up and wear the TLD upon entering a Restricted Area. (RCTS2 010660-01, FSAR 12.5.3.2.A)

- Visitors without a designated TLD storage location should pick up their dosimetry at the Dosimetry Office during normal working hours or from RP at the applicable unit.

3.5.2 All personnel issued a TLD shall return their TLD to the designated storage location upon exiting a Restricted Area except as noted below. (CRAI 3165249)

3.5.2.1 Individuals whose work involves radioactive material outside of an established Restricted Area.

NOTE

The Emergency Plan exception is applicable for drills as well as an actual emergency.

3.5.2.2 Individuals required to exit a Restricted Area due to the Emergency Plan for:

- Assembly and Accountability, or
- Evacuation, or
- Emergency Plan assignment(s)

3.5.2.2 Security personnel while working in Protected Area Security Access Facilities and the Sally Ports. (CRAI 3391284)

3.5.3 All personnel exiting the Protected Area through the Security Building should be monitored by passing through a radiation portal monitor.

3.5.4 If the portal monitors alarms, the individual shall attempt monitoring a second time.

3.5.4.1 If a portal monitor alarms on the second monitoring attempt, the individual shall ensure RP Operations in Unit 2 is notified (with the exception of those individuals who have a valid "Portal Monitor Release" form) (RP ICR 00216, RP ICR 00219)

- When notified, RP will perform an evaluation of the situation and take the appropriate actions.(CRDR 2548498)
- The individual causing the alarm shall not exit the restricted area until receiving authorization from RP Leadership

3.6 Radiological Controlled Area Entry

3.6.1 Normal Unit RCA access is established at the 140' Access Control Area located adjacent to the Unit RP Island using an Access Control Turnstile, although other RCAs may exist within the Restricted Area.
(RCTS2 010661-01, FSAR 12.5.3.2.B, CRAI 2510316)

CAUTION

Minimize Unit RCA Entries from other than the 140' Aux RP Control Point. (CRAI 3065824)

- Personnel who must enter a Unit RCA other than at the Aux. 140', must be approved by RP prior to entry.
- Personnel who must enter a non-unit RCA located inside or outside the permanent Restricted Area boundary (e.g., Service Bldg., LLRMSF, ISFSI) must be approved by RP prior to entry.

3.6.2 The RP requirements for unescorted entry into an RCA are:

- Have a TLD and SID,
- Up to date whole body count (WBC),
- RWP training is current,
- Read the appropriate REP,
- Received any associated Pre-Job Briefing, and
- Signed onto the appropriate REP via a REP Sign-in Sheet or electronic signature as applicable.

3.6.2.1 By signing the REP, individuals indicate they have read and understand the REP requirements and will comply with them.
(RCTS 010915-01)

3.6.2.2 Personnel should read their appropriate REP prior to each subsequent entry.

3.6.2.3 If necessary, the requirements for a WBC and/or RWP may be waived to allow an RCA entry with approval of the Director, Site Radiation Protection.

- Document the approval and any restrictions on Appendix E.

3.6.3 If there are any questions about the REP, radiological conditions of the work area, specific requirements set by RP, or if required by the REP, contact RP.

3.6.4 Personnel should obtain any protective clothing, additional dosimetry and/or respiratory protection equipment required by the REP.

3.7 Monitoring/Coverage of Radiological Work

3.7.1 Work group supervision (e.g., section leaders, team leaders) should routinely monitor the activities of their personnel during job performance to ensure that proper radiological protection measures are being used.

- Improper work practices should be immediately stopped and reported to RP personnel for an evaluation of any radiological impact.

3.7.2 RP personnel should monitor the performance of radiation workers periodically and correct improper work practices on the spot.

- Issuance of a Palo Verde Action Request (PVAR), see 01DP-0AP12 may also be necessary based on the severity of any violations.

3.7.3 Continuous surveillance by RP personnel may be necessary when potentially extreme radiological conditions exist in a work area. (RCTS 039536-02, NRC IR 529/88-22-01, LER 2-88-011-01)

Examples of these types of conditions include, but are not limited to, the following:

a) High radiation levels *See section 3.9 for specific requirements.* (e.g., more than 1 rem/hr whole body, 5 rem/hr extremity, etc.)

b) High potential for uptakes of radioactivity, such as:

- High loose surface contamination levels (e.g., above 1.0E6 dpm/100 cm^2 $\beta\gamma$ or 1000 dpm Alpha) or
- High particulate/iodine airborne radioactivity levels (e.g., 10 DAC or greater).

c) Radiological conditions which are unknown or may change significantly or rapidly due either to the nature of the work to be performed or the operation of plant systems, or as determined by RP.

3.7.3.1 Jobs requiring continuous surveillance should clearly identified on the applicable REP.

3.7.4 APS employees meeting the minimum RP experience requirements of Section 4.5.2 of ANSI/ANS 3.1 – 1978 may change a worker's REP and/or Task while in the RCA. (CRAI 3314054)

3.7.4.1 A second RP Technician meeting the minimum RP experience requirements of Section 4.5.2 of ANSI/ANS 3.1 – 1978 shall perform a peer check verifying:.

- EPD display is in run mode and displays 0.0.
- DMC viewer software shows the dosimeter is in **RUN** mode and the correct REP and task are displayed.
- Document REP and/or task change in the appropriate log book.

3.8 Radiological Controlled Area Exit:

3.8.1 Personnel Monitoring at RCA Exits (e.g., Aux. Bldg. 140')

Personnel exiting an RCA are required to be monitored by a contamination monitor (e.g., personnel contamination monitor- PCM) and, if operable, a radiation portal monitor (e.g., PM-7).

- If the RCA does not have an operable PCM, then direct personnel to perform a whole body frisk and proceed to another location having an operable PCM for monitoring, as appropriate. (RP ICR 00097)
- If the RCA does not encompass or contain a Contaminated Area, then when authorized by the cognizant RP Department Leader, personnel contamination monitoring and monitoring of personal items at the RCA exit is not required.

3.8.2 Personnel Monitoring for Radioactive Material Transfer between RCAs (e.g., exiting through an RCA Yard gate)

Personnel involved in the transfer of radioactive material may perform a whole body frisk prior to exiting an RCA under the following conditions:

a) Personnel have not entered a Contaminated Area or have been monitored by a PCM upon exiting a Contaminated Area.

b) RP must observe the whole body frisk being performed.

c) Personnel are monitored by a PCM prior to exiting the receiving location's RCA.

- If the receiving location does not have an operable PCM, then ensure monitoring by a PCM occurs as soon as practicable after completion of the transfer. (RP ICR 00224)

3.8.3 Except for Security gun belts, tool belts should be removed prior to entering a PCM.

NOTE

Plant personnel should be reminded that all PCM alarms are to be treated as actual contamination alarms until proven otherwise by Radiation Protection.

3.8.4 If the PCM alarms, take the following actions, as appropriate:

PCM alarm during initial monitoring:

- If you receive a PCM alarm during the initial monitoring, notify RP and remain near the PCM.

3.8.5 Make applicable items to be removed from the RCA available for survey by RP personnel.

NOTE

Additional guidance on PCM alarm response is provided in 75DP-0RP02, "Radioactive Contamination Control."

3.8.6 If the RCA portal monitor alarms when exiting (e.g., PM-7), the individual shall notify Radiation Protection.

- The RP representative will evaluate the situation and take the appropriate actions.

3.8.7 Except as specified in step 3.8.8 and 3.8.9, personnel should return all dosimetry other than their permanent whole body TLD to RP upon exiting an RCA. (QATS 391132-05)

3.8.8 Operations, Radiation Protection, Chemistry, Security, and Fire Protection (including roving firewatch) personnel may retain their dosimetry (e.g., EPD, Special dosimetry) provided:

- They are logged in on an appropriate REP and,
- The potential exists to need immediate access to an RCA and,
- They do not leave the permanent Restricted Area.

3.8.9 Personnel may retain their dosimetry for work in RCAs located outside of the permanent Restricted Area boundary (e.g., LLRMSF) provided:.

- They are logged in on an appropriate REP, and,
- The dosimetry is returned to the appropriate issue point when the work is completed (or prior to leaving the site for the day).

3.9 Special Area Access

NOTE

RP Personnel or personnel escorted by RP may be exempt from the REP issuance requirement during the performance of their assigned duties, provided they are otherwise following plant RP procedures for entry into High Radiation Areas.

3.9.1 High Radiation Area Access (RP 046013-01, 10CFR20.1601(a)(3))

3.9.1.1 Access into a High Radiation Area requires the issuance of a specific REP authorizing entry.
(RCTS2 010601-01, RCTS 011131-01, Tech Spec 5.7.1)

- RP shall ensure that an individual authorized access has sufficient remaining exposure to work in the area.
- Access into an HRA is **NOT Authorized** for individual's using Appendix F, "Visitor Access Request" (i.e., provided monitoring by EPD only).

3.9.1.2 Any individual or group permitted to enter a High Radiation Area shall be provided with, or accompanied by one or more of the following: (RCTS 011132-01, Tech Spec 5.7.1)

(a) Radiation dose rate meter.

(b) Alarming dosimeter (e.g. EPD) - Entry with an alarming dosimeter may be made after the dose rate levels in the area have been determined and personnel have been made aware of them by receiving a specific high radiation area briefing from RP personnel.

(c) An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified in the REP.

3.9.2 Locked High Radiation Area Access (Tech Spec 5.7.2, RCTS2 010663-01)

In addition to the HRA requirements stated in 3.9.1.1 and 3.9.1.2 above, access to Locked High Radiation Areas (areas where radiation levels could result in an individual receiving a dose equivalent in excess of 1000 mrem in 1 hour), shall be controlled as follows:

3.9.2.1 Doors shall remain locked except during periods of access by personnel under an approved REP that shall specify the dose rate levels in the immediate work areas and the maximum allowable stay times for individuals in those areas.
(RCTS 010594-01, Tech Spec 5.7.2)

3.9.2.2 In lieu of the stay time specification of the REP, direct or remote (such as closed circuit TV cameras) continuous surveillance may be made by personnel qualified in radiation protection procedures to provide positive exposure control over the activities being performed within the area. (Tech Spec 5.7.2)

3.9.3 Very High Radiation Areas (RP 046014-01, 10CFR20.1602)

In addition to the HRA and LHRA requirements above, personnel access to a Very High Radiation Area (areas where radiation levels from sources external to the body could result in an individual receiving an absorbed dose in excess of 500 rads in 1 hour at 1 meter from any surface that the radiation penetrates) shall be controlled as follows:

3.9.3.1 Access shall be under a REP which is specific to the individual VHRA and requires continuous surveillance by RP.

3.9.3.2 Entry shall be authorized by an RP department leader.

3.9.3.3 The Operations Control Room Supervisor shall be contacted prior to entry into a VHRA.

3.9.4 Contaminated Area Access/Egress

Contaminated Area access and egress should be performed in accordance with the Radioactive Contamination Control procedure. Special clothing requirements should be determined by RP and should be specified on the REP. (RCTS2 010616-01, FSAR 12.5.1.3.B)

3.9.5 Airborne Radioactivity Area Access

Respiratory protection equipment should be determined by RP and specified on the REP. (RCTS2 010673-01, FSAR 12.5.3.5)

- 01DP-0IS08, "PVNGS Respiratory Protection Equipment Usage" provides additional guidance and restrictions.

3.9.6 Containment Building Access

After shutdown, the containment is accessible for limited periods of time and all access is controlled, using an Access Control Turnstile. Areas within the containment building should be surveyed by RP personnel to determine allowable working times and establish any special access requirements which may be necessary.
(RCTS2 010606-01, FSAR 12.3.2.2.2, CRAI 2510316)

3.10 Radiation Exposure Limitations and Controls

3.10.1 10CFR20.1201 Occupational Dose Limits (RP 046002-01, 10CFR20.1201(a))

3.10.1.1 Annual Occupational radiation dose to adults (except for planned special exposures) shall be limited to:

(a) 5 rem total effective dose equivalent (TEDE) or 50 rem total organ dose equivalent (TODE), whichever is more limiting and,

(b) 15 rem lens dose equivalent (lens of the eye) and,

(c) 50 rem shallow-dose equivalent (skin or any extremity).

3.10.1.2 Occupational dose limits authorized by 10CFR20.1201 shall be reduced by 1.25 rem TEDE and 12.5 rem shallow-dose equivalent for each quarter that occupational radiation exposure records are not available (i.e., no signed statement of previous occupational exposure or incomplete NRC Form 4).
(RP 046036-05, 10CFR20.2104(e)(1))

3.10.1.3 Personnel with an incomplete NRC Form 4 shall not be available for planned special exposures.

3.10.2 PVNGS Annual Exposure Goal

To keep exposures ALARA, PVNGS has established an annual exposure goal of 2 rem TEDE for each individual receiving occupational radiation exposure at PVNGS (not to exceed 10 rem TEDE in any 5 year period).

- The annual exposure may be increased up to 2.5 rem TEDE to accommodate occupational radiation exposure received at other licensed facilities within the current year.

3.10.3 Administrative Exposure Hold Points

To further maintain exposures ALARA, individuals are assigned an initial administrative exposure hold point of 1.5 rem/year TEDE.

- To ensure exposures are kept ALARA, management must approve requests for assignment of higher administrative hold points (see 3.11)

3.10.4 Exposure of Pregnant Women

3.10.4.1 **Declared Pregnant Woman**: Female radiation workers who choose to declare their pregnancy or suspect they might be pregnant should fill out and sign a "Pre-Natal Dose Limit Statement" (Appendix B), acknowledging their exposure limitation to 50 mrem per month during pregnancy and an exposure limitation to the embryo/fetus of 500 mrem for the entire gestation period. (RCTS2 010505-01, RG 8.13 R3, RP 046008-01, RP 046008-02, 10CFR20.1208(a) & (b))

(a) Fill out the top section of the "Pre-Natal Dose Limit Statement," read the block for "Declared Pregnant Woman," then sign the "Employee's Signature" line.

(b) Obtain the "Section Leader's Acknowledgement" signature.

- The female's direct supervisor should assign her tasks which ensure the dose restriction are adhered to.

(c) Deliver the "Pre-Natal Dose Limit Statement" to Dosimetry after signature by the supervisor. (ICR00130)

(d) Upon receipt of the Appendix B, Dosimetry will perform the following in order to establish baseline monitoring for the declared pregnant woman: (RP ICR 00232)

- Whole body count the individual
- Issue a new TLD and process the individual's current TLD *(if they have been issued one)*
- Establish a lower Administrative Exposure Hold Point

3.10.4.2 **Declared Fertile Woman:** Female radiation workers who choose to declare their intention to become pregnant (declared fertile woman) should fill out and sign a "Pre-Natal Dose Limit Statement" acknowledging their exposure limitation to 50 mrem per month.

(a) Fill out the top section of the "Pre-Natal Dose Limit Statement," read the block for "Declared Fertile Woman," then sign the "Employee's Signature" line.

(b) Obtain the "Section Leader's Acknowledgement" signature.

- The female's direct supervisor should assign her tasks which ensure the dose restriction are adhered to.

(c) Deliver the "Pre-Natal Dose Limit Statement" to Dosimetry after signature by the supervisor. (RP ICR 00130)

(d) Upon receipt of the Appendix B, Dosimetry will perform the following in order to establish baseline monitoring for the declared pregnant woman: (RP ICR 00232)

- Whole body count the individual
- Issue a new TLD and process the individual's current TLD *(if they have been issued one)*
- Establish a lower Administrative Exposure Hold Point

(e) Declared fertile women that become pregnant should declare their pregnancy acknowledging their exposure limitation for the gestation period in accordance with step 3.10.4.1, Declared Pregnant Woman.

(f) Declared fertile women whose status has not changed after six months should resubmit the "Pre-Natal Dose Limit Statement" in accordance with step 3.10.4.2, Declared Fertile Woman.

3.10.4.3 If the dose equivalent to the female radiation worker has exceeded 500 mrem or is within 50 mrem of the 500 mrem gestation limit, by the time she declares her pregnancy, then she may receive an additional 50 mrem during the remainder of her pregnancy. (RP 046008-04, 10CFR20.1208(d))

3.10.4.4 NRC Regulatory Guide 8.13 states any monthly dose of less than 0.1 rem may be considered as not a substantial variation above a uniform monthly dose rate and as such will not require licensee justification. (10CFR20.1208(b), ICR 00088, RG 8.13, C.5)

- If a monthly dose greater than 0.1 rem is received, then a justification for the exposure should be written.

3.10.4.5 If a female radiation worker no longer requires a pre-natal dose limit, she needs to inform Dosimetry, in writing, using the following method:

(a) Obtain a new Appendix B, "Pre-Natal Dose Limit Statement"

- Fill out the personnel information at the top of the form.
- Place signature in the section titled "Dose Limit Correction."

(b) Obtain the "Section Leader's Acknowledgement" signature.

(c) Deliver the "Pre-Natal Dose Limit Statement" to Dosimetry after signature by the supervisor.

(d) Upon receipt of the Appendix B informing a pre-natal dose limit is no longer required, Dosimetry will perform the following in order to close out dose monitoring for the embryo/fetus:

- Whole body count the individual
- Issue a new TLD and process the individual's current TLD used to establish the baseline monitoring.
- Returned the individual to their normal administrative exposure hold point.

3.10.5 Exposure of Visitors

3.10.5.1 Visitors who have not been issued permanent dosimetry and who require entry into an RCA shall be limited to 100 mrem/visit TEDE at PVNGS.

3.10.5.2 Normally, visitors should enter the RCA using Standing REPs (SREPs), and enter only those areas and perform those functions permitted by those SREPs.

3.10.5.3 Refer to Section 3.3, "Dosimetry for Visitors" for additional information, requirements, and restrictions.

3.10.6 Exposure of Minors

No individual under 18 years of age should be permitted to receive occupational exposure to radiation or airborne radioactivity at PVNGS.
(RP 046007-01, 10-CFR20.1207, RCTS2 010506-01, RG 8.13)

3.11 Assignment of Higher Administrative Exposure Hold Points

3.11.1 Requests for a Higher Hold Point

3.11.1.1 Management approval is needed to obtain a higher hold point. Appendix A, "Request for a Higher Administrative Exposure Hold Point", is used to request the new hold point. These are available at the RP Island, Dosimetry office, or as an electronic form in the Palo Verde Site Specific Forms Menu under Radiation Protection.

- If the request is due to an individual exceeding an assigned hold point, RP management ensures a documented evaluation is performed for the cause.

3.11.1.2 The requesting supervisor completes the Originator section of the form, ensuring the ALARA concept is maintained within their department and the request for a higher individual administrative exposure hold point is warranted. (i.e., No other qualified personnel are available who have sufficient remaining exposure below their hold point.)

3.11.1.3 Submit Appendix A to RP for concurrence, (i.e., the job scope and radiological conditions warrant the new exposure hold point).

3.11.1.4 If concurrence is obtained from RP, the request is forwarded to Dosimetry. A Dosimetry technician performs a records search to obtain appropriate information necessary to complete the Dosimetry section of the form.

(a) All occupational exposure received at licensed facilities other than PVNGS during the current year should be verified unless an exception is authorized by the Director, Site Radiation Protection.

(b) The technician completing this section should sign and date in the designated space.

3.11.1.5 The requesting supervisor should route Appendix A to applicable management in the approval chain.

3.11.2 Approvals

3.11.2.1 The individual for whom the higher administrative exposure hold point is requested signs the request to verify all occupational exposure is accounted for in their PVNGS Dosimetry Records. (RCTS 040337-02, NRC IR 528/90-55-01 NCV)

NOTE

In the event that any management in the approval chain declines to sign the request, no further approval can be sought through other management.

3.11.2.2 In addition to the following approvals, any request for a higher administrative exposure hold point which would allow a worker's cumulative lifetime exposure (in rem) to exceed the worker's age (in years) are reviewed and approved by the ALARA Committee Chairman.

(a) For a Hold Point higher than 1500 mrem/year, RP Department Leader approval required.

(b) For a Hold point higher than 2000 mrem/year, Director, Site Radiation Protection approval required.

(c) For a Hold Point higher than 2500 mrem/year up to 4000 mrem/year, the ALARA Committee review and approval is required (as signified by the signature of an ALARA Committee Chairman).

(d) For any Hold Point that would cause an individual's exposure to exceed 10 rem cumulative site exposure in 5 years the Vice President, Nuclear Operations approval is required.

3.11.2.3 The request is then returned to the Dosimetry Office for processing.

3.12 Personnel Overexposures

3.12.1 Personnel who exceed or suspect they have exceeded any exposure limit in 3.10.1.1, shall immediately report to the appropriate RP Department or the Dosimetry Office.

3.12.2 RP should obtain all pertinent information concerning the potential overexposure from the individual and initiate reporting in accordance with 90DP-0IP10, "Condition Reporting"

- The Director, Site Radiation Protection, ensures the incident is investigated.

3.12.3 The individual should then be directed to the Dosimetry Office.

3.12.4 Dosimetry evaluates the individual's record TLD and restricts the individual from entering the RCA until the record TLD is reissued.

3.12.5 Any overexposure meeting the criteria of Appendix C, "Criteria for Reporting Personnel Overexposure to the USNRC", shall be reported as described in Appendix C.

3.12.6 Any report, as described in Appendix C, shall require a written report to be provided to the affected individuals(s) no later than the time of official written notification to the NRC. This report should be prepared in accordance with the Radiological Reports procedure. (RCTS 039454-01)

3.13 Director, Site Radiation Protection Review of Radworker Error

3.13.1 At the discretion of the Director, Site Radiation Protection, review and resolution of Radworker Error (including inappropriate, unauthorized possession or use of contraband materials in the RCA) should include: (CRAI 3214174)

3.13.1.1 The affected Radworker's Director (and Site Coordinator for Non Utility Radworkers) and the Director, Site Radiation Protection meet, review and discuss the circumstances surrounding the Radworker Error.

3.13.1.2 The decision to lift the Radworker's RCA Access restriction is at the sole discretion of the Director, Site Radiation Protection.

3.14 Documentation

Turnover documents to NIRM in accordance with the appropriate NIRM Turnover Instruction(s).

4.0 DEFINITIONS and ABBREVIATIONS

4.1 Definitions

4.1.1 **Administrative Exposure Hold Point** - An administrative control measure used as an aid to maintain individual and collective doses ALARA and prevent exceeding regulatory dose limits.

4.1.2 **Annual Limit On Intake (ALI)** - Means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5 rems or a committed dose equivalent of 50 rems to any individual organ or tissue. (ALI values for intake by ingestion and by inhalation of selected radionuclides are given in Table 1, Columns 1 and 2, of Appendix B to 20.1001-20.2401).

4.1.3 **Automated Radiological Access Control System (ARACS)** - is a computer based system which utilizes worker information, REP data and TLD data to facilitate individual automated RCA access and egress transactions. (ICR 00114)

4.1.4 **Committed Dose Equivalent ($H_{T,50}$)** - Means the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

4.1.5 **Committed Effective Dose Equivalent ($H_{E,50}$)** - Is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues ($H_{E,50} = W_T H_{T,50}$).

4.1.6 **Declared Fertile Woman** - A woman who has voluntarily informed the licensee, in writing, of her intent to become pregnant.

4.1.7 **Declared Pregnant Woman** - A woman who has voluntarily informed the licensee, in writing, of her pregnancy and the estimated date of conception. The declaration remains in effect until the declared pregnant woman withdraws the declaration in writing or is no longer pregnant.

4.1.8 **Deep-Dose Equivalent (DDE)** - External whole-body exposure, the dose equivalent at a tissue depth of one centimeter (1000 mg/cm^2).

4.1.9 **Derived Air Concentration (DAC)** - Means the concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate 1.2 cubic meters of air per hour), results in an intake of one ALI. DAC values are given in Table 1, Column 3, of Appendix B to 20.1001-20.2401.

4.1.10 **Emergent Work** - Work orders of a priority nature, not appearing on the approved work list.

4.1.11 **Electronic Personal Dosimeter (EPD)** - an electronic dosimetry device which provides convenient monitoring of accumulated exposure by workers in an RCA, and has the capability to alarm, both audibly and visibly, at preset dose and dose rate values. The EPD can function as both a SID and an alarming dosimeter.

4.1.12 **Electronic Signature** - A process within the computerized access control system to document an individual worker's acknowledgement that they have read and understand the REP. Answering "yes" to the computer screen prompt asking the individual "Have you read and understood the REP" constitutes the worker's "signature" of acknowledgement.

4.1.13 **Individual Qualified in Radiation Protection Procedures** - Individuals are considered qualified in radiation protection procedures when they are certified as capable of successfully accomplishing the following activities as required by federal regulations, license conditions, and facility procedures pertaining to radiation protection: (HPPOS-015)

1. Conducting and evaluating special and routine radiation, contamination and airborne radioactivity surveys.
2. Establishing protective barriers and posting appropriate radiological signs.
3. Establishing a means of limiting exposure rates and accumulated radiation doses, including the use of protective clothing and respiratory protection equipment.
4. Performing operability checks of radiation monitors and survey meters.
5. Recommending appropriate immediate actions in the event of a radiological problem, and performing necessary activities until the arrival of health physics personnel.
6. Conducting other routine radiological duties as required on backshifts or weekends.

4.1.14 **Lens Dose Equivalent (LDE)** - The external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 mg/cm^2).

4.1.15 **Personnel Contamination Monitor** (PCM) - An instrument used to provide automatic WHOLE BODY MONITORING of personnel for external radioactive contamination.

4.1.16 **Radiation Exposure Permit (REP)** - An administrative control which describes a specific job or task within a Radiological Controlled Area, identifies radiological conditions, and specifies the radiation protection measures required for performance of a task.

4.1.17 **Radiological Controlled Area (RCA)** - Any area so posted, which features positive controls for the purpose of protecting personnel from radiation exposure and radioactive contamination.

4.1.18 **Restricted Area** - An area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure of radiation and radioactive materials. The restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area. At PVNGS, the permanent restricted area boundary coincides with the security protected area boundary. Satellite or temporary restricted areas may also need to be established outside the permanent restricted area.

4.1.19 **Self Indicating Dosimeter (SID)** - a dosimetry device used to monitor a worker's radiation exposure between TLD processing periods, which is easily read by the worker in the field. Examples consist of pocket ion chamber type and electronic personal dosimeter type.

4.1.20 **Shallow Dose Equivalent** (SDE) - applies to the external exposure of the skin of the whole body or the skin of an extremity and is taken as the dose equivalent at a tissue depth of 0.007 cm (7 mg/cm^2).

4.1.21 **Total Effective Dose Equivalent (TEDE)** - The sum of the effective dose equivalent, EDE, (for external exposures) and the committed effective dose equivalent, CEDE, (for internal exposure). (CRAI 3120698)
(This change to 10CFR20.1003, "Definitions," as documented in the Federal Register, Vol. 72, No. 232, Tuesday, December 4, 2007, delineates that Effective Dose Equivalent (EDE) may be substituted for Deep Dose Equivalent (DDE) for external exposures. While EDE is the primary quantity in the definition of TEDE for external exposures, licensees are required to use the DDE in place of EDE when measuring dose from external exposure unless the EDE is determined by a dosimetry method approved by the NRC.)

4.1.22 **Total Organ Dose Equivalent (TODE)** - The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye.

4.1.23 **Visitor** - Individual who has been assigned a Visitor ACAD or badge from Security and requires an escort while in the Restricted Area.

4.1.24 **Visitor Escort** - An individual currently issued a TLD with an active status assigned to continuously escort a visitor in restricted areas and radiological controlled areas.

4.2 Abbreviations

4.2.1 **ACAD** - Automated Control Access Device.

4.2.2 **ARA -** - Airborne Radioactivity Area

4.2.3 **ARACS** - Automated Radiological Access Control System

4.2.4 **CA** - Contaminated (Contamination) Area (CRAI 3373967)

4.2.5 **EPD** - Electronic Personal Dosimeter

4.2.6 **ISFSI** - Independent Spent Fuel Storage Installation

4.2.6 **HCA -** - High Contamination Area

4.2.7 **HPCA** - Hot Particle Control Area

4.2.8 **HPPOS** - NRC Health Physics Position (from *NUREG/CR-5569*)

4.2.9 **HRA -** - High Radiation Area

4.2.10 **JHES** - A job classification system which dictates required levels of RP management review and approval for REP's, based upon the radiological conditions and hazards associated with the job.

4.2.11 **LHRA -** - Lock High Radiation Area

4.2.12 **LLRMSF** - Low Level Radioactive Material Storage Facility

4.2.13 **PCM** - Personnel Contamination Monitor

4.2.14 **RCA -** - Radiological Controlled Area

4.2.15 **SID** - Self Indicating Dosimeter

4.2.16 **TEDE -** - Total Effective Dose Equivalent

4.2.17 **VHRA** - Very High Radiation Area

4.2.18 **WBC** - Whole Body Count

5.0 REFERENCES

5.1 Implementing

5.1.1 01DP-0IS08, PVNGS Respiratory Protection Equipment Usage

5.1.2 01DP-0AP12, Palo Verde Action Request Processing

5.1.3 75DP-0RP02, Radioactive Contamination Control

5.1.4 75RP-9ME21, TLD Issue, Exchange and Termination

5.1.5 75RP-9ME23, Lost or Damaged Dosimetry

5.1.6 75RP-9RP09, Release of Vehicles, Equipment, and Material from Radiological Controlled Areas.

5.1.7 75RP-9RP19, Planned Special Exposures

5.1.8 84DP-0RM31, Handling of Proprietary, Confidential and Highly Confidential Information.

5.1.9 75RP-9RP02, Radiation Exposure Permits.

5.2 Developmental

5.2.1 Title 10 Code of Federal Regulations Part 20, Standards for Protection Against Radiation.

5.2.2 USNRC Regulatory Guide 8.4, Direct-Reading and Indirect-Reading Pocket Dosimeters; Rev. 0, Feb 1973.

5.2.3 USNRC Regulatory Guide 8.8, Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As is Reasonably Achievable, Rev. 3, June 1978.

5.2.4 USNRC Regulatory Guide 8.13, Instruction Concerning Prenatal Radiation Exposure, Rev. 3, June 1999.

5.2.5 USNRC Regulatory Guide 8.36, Radiation Dose to the Embryo/Fetus, July 1992

5.2.6 USNRC I.E. Circular No. 81-07, Control of Radioactively Contaminated Material; May 1981.

5.2.7 PVNGS Updated Final Safety Analysis Report.

5.2.8 PVNGS Technical Specifications Units 1, 2, and 3.

5.2.9 IE Information Notice No. 86-107, "Entry Into PWR Cavity With Retractable Incore Detector Thimbles Withdrawn," Dec. 29, 1986.

5.2.10 INPO Significant Operating Experience Report (SOER) 85-3, "Excessive Personnel Radiation Exposures," April 30, 1985.

5.2.11 IE Information Notice No. 84-19, "Two Events Involving Unauthorized Entries Into PWR Reactor Cavities." March 21, 1984.

5.2.12 IE Information Notice No. 82-51, "Overexposure in PWR Cavities," December 21, 1982.

5.2.13 IE Circular No. 76-03, "Radiation Exposure in Reactor Cavities," September 13, 1976.

5.2.14 INPO 05-008, "Guidelines for Radiological Protection at Nuclear Power Stations," December 2005.

5.2.15 Commitment Action Tracking System (CATS) Actions (Appendix D).

5.2.16 INPO Significant Event Report (SER) 88-37, "Personnel Radiation Overexposure Due To Work Generated Hot Spots," December 22, 1988.

5.2.17 American Nuclear Insurers (ANI) "Nuclear Insurance Inspection Report," Document #L060800.266, dated June 14, 2000

5.2.18 National Council on Radiation Protection and Measurements, "Limitations of Exposure to Ionizing Radiation," NCRP Report No. 16, 1993.

5.2.19 USNRC Regulatory Guide 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants, May 2006.

5.2.20 USNRC NUREG-1736, “Consolidated Guidance: 10 CFR 20 – Standards for Protection Against Radiation,” October 2000

5.2.21 USNRC NUREG/CR-5569 ORNL/TM-12067, “Health Physics Positions Data Base,” May 1992

5.2.22 Site Integrated Business Plan CRAI 3084518, “Review recommendation #3 of SOER 01-01.”

6.0 SUMMARY OF CHANGES

Rev	Description
16	1.) 3.2.4.3 - Revised step to match wording in 75RP-9ME27. 2.) 3.7.4 - Revised requirements for changing EPD setpoints while in the RCA. (CRAI 3314054) 3.) Appendix D - Added CRAI 3314054.
17	4.) 4.1.17 – Changed definition of RCA to allow RCA posting use outside of the Protected Area (ACT 3033630) 5.) 3.11.2.2 and App A - Changed VP Nuclear Production to VP Nuclear Operations. (ACT3382938) 6.) 2.2.13 – Step added: Develop man-rem dose estimates for each job. (ACT 3354775) 7.) 3.3.4.3 - Reduced annual limit that RP Management approval required to issue new TLD from 2500 to 1800 mRem. (ACT 3333202) 8.) Initial line added to App. A form for technician performing record search described in step 3.3.4.2. Bullet added to 3.3.4.2 (ACT 3100983) 9.) App. F, Visitor Access Request form Section B note added to complete Part 2 prior to approval. Steps 3.3.3.1 – 3.3.3.3 added. (ACT 2991367) 10.) 4.2.4 - Changed to allow Contamination Area as well as Contaminated Area. (CRAI 3373967) 11.) App. A – Footnote added to clarify that lifetime exposure need not be obtained for workers not in a PSE program. (CRAI 3120700) 12.) 4.1.2.1 - Updated definition of TEDE to new rule. (CRAI 3120698) 13.) 3.5.2.2 – Changed to allow MSF to retain TLDs when working in the sally port. (CRAI 3391284)

7.0 APPENDICES

Appendix A - Request for a Higher Administrative Exposure Hold Point

Appendix B - Pre-Natal Dose Limit Statement

Appendix C - Criteria for Reporting Personnel Overexposure to the USNRC

Appendix D - Commitment Action Tracking System

Appendix E - Radiation Protection Requirement Waiver

Appendix F - Visitor Request for RCA Access

Appendix G - Embryo / Fetus Dose Assessment

Appendix H - Off Site Support Agency Radiological Determination Matrix

Appendix I - Supplemental Exposure Notification

Request for a Higher Administrative Exposure Hold Point

ORIGINATOR

1. A higher Administrative Exposure Hold Point is requested for:

Name:	Social Security No[1]:	HPID No:
Exposure Hold Point Requested: _____ mrem for the year of _____		

2. No other qualified personnel are available who have sufficient exposure remaining below their hold point:

Supervisor's Name:	Signature:	Extension:	Date:

3. Reasons for request (include REP No.): _____

RADIATION PROTECTION

RP Concurrence: Job scope and radiological conditions warrant the higher administrative exposure hold point.

Signature: _____ Date: _____

DOSIMETRY

1. Radiation Exposure (mrem): (*Fill in as applicable*)

EXPOSURE PERIOD	CURRENT EXPOSURE	CURRENT HOLD POINT	EXPOSURE REMAINING	ADDITIONAL INFORMATION	
Current Year				☐ Record Dose ☐ Included estimate of: _____	☐ APS Dose = _____ ☐ Offsite Dose = _____
5 Year					
Lifetime[2]				Is exposure greater than age? ☐ Yes ☐ No	

* for assigning a hold point > 2500 mrem/year, all dose for current year must be record dose.

2. Dosimetry records search completed by:

Name: _____ Date: _____

APPROVALS

I have reviewed my exposure records at PVNGS Dosimetry and find them to be correct and complete.

X _____ _____
(*Radiation Worker*) (*Date*)

X _____ _____
(*Radiation Protection Department Leader* for new hold point up to 2000 mrem) (*Date*)

X _____ _____
(*Director, Site Radiation Protection* for new hold point up to 2500 mrem) (*Date*)

X _____ _____
(*ALARA Committee Chairman* * for new hold point up to 4000 mrem, or cumulative lifetime exposure will exceed worker's age in years) (*Date*)

X _____ _____
V.P. Nuclear Operations for new hold point that would cause worker to exceed 10 rem cumulative site exposure in 5 years) (*Date*)

RECORDS

1. New Administrative Exposure Hold Point assigned _____ for the period of. _____.
   Effective beginning: _____ .
2. Personnel Exposure file / RRAC System updated: _____ _____
   RP Technician Signature Date
3. **Form Distribution** (a) **Original to:** Worker's Exposure File (b) **Copies to:** Dosimetry, Radiation Protection, Originator

[1] SSN use requires marking Appendix A as CONFIDENTIAL, see 84DP-0RM32

[2] Lifetime exposures need not be obtained for individuals not participating in a planned special exposure program. (CRAI 3120700)

Pre-Natal Dose Limit Statement

Employee Name:	Social Security No.[1]:	Employee No.:
Telephone Extension:	HPID No.:	Employee Date of Birth:

I understand federal regulation 10 CFR 20.1208, "Dose equivalent to an embryo / fetus," contains the radiation exposure limits applicable to the embryo / fetus during the duration of the pregnancy.

Check one:

☐ **Declared Pregnant Woman**

I hereby notify APS of my pregnancy and request that my allowable exposure be limited to 500 mrem for the duration of my pregnancy and 50 mrem per month.

I also request that, if my exposure at the time of declaration exceeds 500 mrem or is within 50 mrem of the 500 mrem gestation limit, my allowable exposure for the remainder of my pregnancy be limited to 50 mrem.

The estimated date of my conception is _____ and my estimated due date is _____ .

☐ **Declared Fertile Woman**

I hereby notify APS of my fertile female status and request that my allowable exposure for the next six months be limited to 50 mrem per month.

I understand that after six months my allowable exposure will be re-established to 1500 mrem per year unless I submit an updated Pre-Natal Dose Limit Statement.

As a Declared Pregnant Woman / Declared Fertile Woman, I understand I am responsible for limiting my radiation exposure. I will also inform Dosimetry of any exposure to radiation I receive outside Palo Verde Nuclear Generating Station, while employed at the Palo Verde Nuclear Generating Station.

_____ _____
Employee's Signature Date

_____ _____
Section Leader's Acknowledgement Date

DOSE LIMIT CORRECTION

☐ I am informing Dosimetry that I no longer require a pre-natal dose limit.

I understand that my administrative hold point at Palo Verde Nuclear Generating Station will be reestablished to 1500 mrem per year.

_____ _____
Employee's Signature Date

_____ _____
Section Leader's Acknowledgement Date

DOSIMETRY - Initiate Baseline Monitoring
When Pre-Natal Dose Limits Requested

(ICR 00282)

☐ Whole Body Count performed _____ Dosimetry Initial

☐ Individual's TLD processed _____ Dosimetry Initial

☐ Establish lower Admin Exposure Hold Point _____ Dosimetry Initial

_____ _____
Dosimetry Senior RP Technician Date

DOSIMETRY - Close out Embryo / Fetus Monitoring
When Limits are No Longer Required

☐ Whole Body Count performed _____ Dosimetry Initial

☐ Individual's TLD processed _____ Dosimetry Initial

☐ Establish Normal Admin Exposure Hold Point _____ Dosimetry Initial

_____ _____
Dosimetry Senior RP Technician Date

[1] SSN use requires marking Appendix B as CONFIDENTIAL, see 84DP-0RM32

Criteria for Reporting Personnel Overexposure to the USNRC

NOTE

All reporting to the USNRC should be performed in accordance with 75DP-0RP04, Radiological Reports.

	T E D E	L D E	S D E
IMMEDIATE NOTIFICATION 10CFR20.2202(a)	25 rem	75 rem	250 rads
NOTIFICATION Within 24 HOURS 10CFR20.2202(b)	5 rem	15 rem	50 rem
WRITTEN REPORT Within 30 DAYS 10CFR20.2203	1. Any incident for which an IMMEDIATE NOTIFICATION or NOTIFICATION within 24 Hours is required. 2. 0.5 rem TEDE to an embryo/fetus. 3. 0.1 rem TEDE in one year to a member of the public.		

Commitment Action Tracking System

Partition	Commitment/ Action #		Procedure Step
IIR	010301	01	2.2.2
QATS	390346	08	3.1.2
QATS	391132	05	3.8.7
RCTS	010594	01	3.9.2.1
RCTS	010827	01	3.2.4
RCTS	010913	01	3.4.1.3
RCTS	010915	01	3.6.2.1
RCTS	011131	01	3.9.1.1
RCTS	011132	01	3.9.1.2
RCTS	039454	01	3.12.6
RCTS	039536	02	3.7.3
RCTS	040337	02	3.11.2.1
RCTS2	002495	01	1.1
RCTS2	009656	01	3.2.8
RCTS2	010505	01	3.10.4.1
RCTS2	010506	01	3.10.6
RCTS2	010512	01	3.2.3
RCTS2	010523	01	3.2.4
RCTS2	010553	01	2.3.1
RCTS2	010601	01	3.9.1.1
RCTS2	010602	01	1.1
RCTS2	010606	01	3.9.6
RCTS2	010616	01	3.9.4
RCTS2	010660	01	3.5.1
RCTS2	010661	01	3.6.1
RCTS2	010663	01	3.9.2
RCTS2	010664	01	3.4.1.3
RCTS2	010665	01	3.4.1.1
RCTS2	010673	01	3.9.5
RCTS2	010679	01	3.2.4.1
RCTS2	010683	01	3.4.1.3
RCTS2	041015	01	3.2.3
RCTS2	041026	01	3.2.4
RCTS2	041027	01	3.2.4.1
RP	046002	01	3.10.1
RP	046007	01	3.10.6
RP	046008	01	3.10.4.1
RP	046008	02	3.10.4.1, 3.10.4.4
RP	046008	04	3.10.4.3
RP	046012	01	3.2.3
RP	046013	01	3.9.1
RP	046014	01	3.9.3
RP	046036	05	3.10.1.2
CRAI	3314054		3.7.4
CRAI	3120698		4.1.21
CRAI	3120700		Appendix A
CRAI	3373967		4.2.4
CRAI	3120700		App. A
CRAI	3120698		4.1.2.1
CRAI	3391284		3.5

RADIATION PROTECTION REQUIREMENT WAIVER

Purpose: Radiation Protection has requirements in place to control unescorted access into a Radiological Controlled Area (RCA)

Two of these Radiation Protection requirements are:
1. A Whole Body Count (WBC), and
2. Successful completion of Radiological Work Practices (RWP) training

On a case-by-case basis, the Director, Site Radiation Protection may allow an individual unescorted access into an RCA without completing all of the required items. If needed, the WBC and/or RWP requirement(s) may be waived with approval from the Director, Site Radiation Protection.

The approval and any assigned restrictions are documented using this form.

Section A Waiver Request

Name: _____
First Middle Last

SSN[1]: _____ HPID #: _____ Job Title: _____

Employer: _____ Phone: _____

Waiver requested for: ☐ Whole Body Count ☐ Radiological Work Practices

Reason for request: _____

_____

Requested by (Print) Name: _____ Date: _____

Dept.: _____ Ext.: _____

Section B Approval and Restrictions

Approval to waive the requested RP requirement(s) is indicated below with the following restrictions assigned:

Whole Body Count – Yes / No / n/a **Radiological Work Practices** – Yes / No / n/a

Assigned Restrictions: (check all that apply)

- ☐ Waiver expiration date: _____
- ☐ Allowed dose to be received during waiver period: _____ mrem
- ☐ Individual must be escorted within the RCA by a qualified radworker
- ☐ No entries into High Radiation Areas (i.e., HRA, LHRA, VHRA)
- ☐ No entries into Airborne Radioactivity Areas (ARA)
- ☐ No entries into Hot Particle Controlled Areas (HPCA)
- ☐ Additional: _____

Reason for Approving the Waiver: _____

Director, Site Radiation Protection:

Name _____ Signature: _____ Date: _____

Individual's acknowledgement of the assigned restrictions: (must be signed prior to allowing unescorted RCA access)

Name _____ Signature: _____ Date: _____

[1] SSN use requires marking Appendix E as CONFIDENTIAL, see 84DP-0RM32

VISITOR REQUEST for RCA ACCESS Page 1 of 2

Section A Visitor Access Request

Part 1. Visitor Information Date : _____

Name: _____
First Middle Last (Jr., Sr.)

Date of Birth : _____ Sex: _____ SSN[1] or ID # _____

Home Address : _____
Street City State Zip

Employer Name: _____ Employer Phone: _____

Employer Address: _____
Street City State Zip

Part 2. Current Year Exposure History : **Year:** _____

a. Is the visitor's current year Total Effective Dose Equivalent greater than 1800 mrem ? **Yes** ☐ **No** ☐

b. Has the visitor been monitored with a record TLD at PVNGS during the current year? **Yes** ☐ **No** ☐

(If "yes" the individual cannot enter an RCA at PVNGS as a visitor, must be issued a record TLD.) Search Verified By: _____

- If all questions above are answered as "No", an RP Section Leader can approve the visitor's RCA access request.

If current year TEDE is greater than 1800 mrem, RP Department Leader approval is required to allow RCA access.

Part 3. RCA Entry Information RCA Entry Date(s) Requested - Beginning: _____ Ending**:** _____

Reason for Entry : (Include discussion of plant areas planned to be accessed, e.g., Aux 120', Fuel Bldg 140', etc.)

_____

_____

_____

Will the visitor need to enter any Contaminated Areas (CA) while within an RCA ? **Yes** ☐ **No** ☐
(If "Yes" then RP Department Leader approval is required prior to allowing entry into CAs)

Requested by (Print) Name : _____ Date : _____

Dept. : _____ Ext.: _____

Part 4 **Visitor Acknowledgement**
(ACT 2991367) I have verified the information provided in Section A of this request is accurate
Signature of Visitor : _____ Date : _____

Section B Approval for RCA Entry (Section A must be completed prior to approval.)

RP Section Leader: Visits of 1 day or less and all Part 2 answers are "No" Name (print): Signature:	Date:
RP Department Leader: Visits of greater than 1 day and/or TEDE is greater than 2500 mrem Name (print): Signature:	Date:
RP Department Leader: Approval for visitor to enter Contaminated Areas if needed Name (print): Signature:	Date:

[1] SSN use requires marking page 1 of Appendix F as CONFIDENTIAL, see 84DP-0RM32

VISITOR REQUEST for RCA ACCESS Page 2 of 2

Section C Visitor and Escort Acknowledgement

This section must be completed and signed by each visitor and escort prior to allowing entry into an RCA at PVNGS.
RCA Access Requirements:

1. Visitor shall be escorted by a qualified radworker at all times while within an RCA to ensure all radiological requirements are met.
2. Visitor shall be limited to 100 mrem TEDE per visit at PVNGS.
3. Visitor shall not enter any High Radiation Areas (i.e., HRA, LHRA, & VHRA).
4. Visitor shall not enter any Airborne Radioactivity Areas (ARA).
5. Visitor shall not enter any High Contamination Areas (HCA) or Hot Particle Control Areas (HPCA).
6. Visitor shall not enter any Contaminated Areas (CA) without approval from an RP Department Leader.
7. Visitor shall not perform any task or activity which has not been approved by Radiation Protection.
8. Visitor shall wear the assigned dosimetry device at all times while within an RCA.
9. The visitor shall wear the dosimetry device on the front portion of the body between the waist and head.
10. If the visitor loses the assigned dosimetry device, immediately inform the escort and exit the RCA.
11. The visitor's dose shall be recorded after each RCA entry.
12. The visitor shall comply with all instructions given for their safety by their assigned escort and/or Radiation Protection personnel.
13. The visitor shall inform Dosimetry if they have had any recent medical treatment which involved radioactivity introduced into the body.

Part 1. Visitor Acknowledgement

Name: _____
First Middle Last (Jr., Sr.)

I acknowledge that I have read, understand, and will comply with the above RCA access requirements.

Signature of Visitor: _____ Date: _____

Part 2. Escort Acknowledgement

Escort's HPID # : _____

Name: _____
First Middle Last (Jr., Sr.)

I acknowledge that I have read, understand, and will comply with the above RCA access requirements.
In addition, if needed, I will ensure other escorts of this visitor are briefed and understand the requirements.

Signature of Escort: _____ Date: _____

Section D Dosimetry Device Issue and Results

Date **Issue and Each Entry**	**EPD Serial Number**	**RCA Access Authorization Verified by** **RP Initials**	**Radiation Exposure Permit** (REP)	**Visitor Dose** (mrem)	**Accumulated Total Dose** (mrem)	**RP or Escort Signature** Record "Visitor Dose" and calculate "Accumulated Total Dose" after each RCA entry

Send completed form to Dosimetry

Embryo/Fetus Dose Assessment

Regulatory Guide 8.36 clearly recognized that the calculation of prenatal radiation dose from internal radioactivity has many associated difficulties. When the regulatory guide was first published, it was expected that embryo/fetus dose assessments would evolve over the years, but little has been written since then. In ICRP 56, it states that embryo/fetus dose can be approximated by the dose to the uterus: i.e., the dose to the embryo/fetus due to internal activity in the mother can be estimated using the committed dose equivalent (CDE) to the uterus. For the primary radionuclides encountered at PVNGS, the uterine CDE is approximately equal to or less than the committed effective dose equivalent (CEDE) to the mother. Therefore, control of the mother's internal dose would provide the control of the embryo/fetus dose. Further, if an intake occurred that was estimated to be greater than 50 mrem, an outside expert in the field could be contacted.

The uptake of radionuclides by a pregnant worker, however, is a rare event. Site RP procedures are designed to minimize uptakes through engineering controls, decontamination, occupancy factors, and workplace airborne evaluations. Monitoring is required at 10% of the limit, i.e., if an individual is likely to exceed 50 mrem of internal dose to the embryo/fetus. As stated above, control of internal dose to the declared pregnant women (DPW), or declared fertile woman (DFW) will control the dose to the embryo/fetus. It has been concluded that DPWs and DFWs are NOT likely to exceed 10% of the limit. The following PVNGS historical information is provided to support that conclusion:

- No radworker has incurred 20 DAC-hours in a year since 1994. Onsite efforts have been directed to the reduction of internal exposure through workplace monitoring, engineering controls, and occupancy factors.
- Most intakes at PVNGS have followed the ingestion pathway. Therefore, an intake of 20 DAC-hrs would usually not approach 50 mrem CEDE and an embryo/fetus would not be expected to receive 50 mrem.
- DFWs and DPWs have less opportunity for uptake because they work in less hazardous and lower dose rate environments through general cooperation between the supervisor and the worker.
- Federal Guidance Report No. 11 shows that dose factor for the uterus is approximately equal to or less than the effective dose factor for the whole body for the radionuclides typically encountered at PVNGS.
- Internal exposure tracking is performed for all radworkers. Therefore, although it is not required monitoring, internal exposures to a DPW or DFW would be tracked.

To assess an internal activity at time of declaration, the DFW / DPW should be whole body counted at the time of declaration and their TLD should be processed. All subsequent intakes would be tracked and further external dose would be with a new TLD.

Embryo / Fetus Dose Assessment

From NRC Regulatory Guide 8.36, "Radiation Dose to the Embryo/Fetus," July 1992

C.2 – Simplified Method for Determining Embryo/Fetus Dose from Material Intakes

Based on these premises (uterus dose similar to fetal dose and the data in Revision 1 to NUREG/CR-5631 (Ref. 2)), a set of dose factors has been developed for use in calculating an embryo/fetus dose. Except for those radionuclides addressed in Revision 1 to NUREG/CR-5631 (Ref. 2), the dose factors presented in Appendix A to this guide represent the committed dose equivalent to the uterus per introduction of unit activity into the first transfer compartment (i.e., blood) of the woman.[1] For the radionuclides in Revision 1 to NUREG/CR-5631, the dose factors in Appendix A represent the maximum dose equivalent to the embryo/fetus for the gestation period from the introduction of unit activity into the first transfer compartment of the woman at any time during the gestation period.

- [1] The committed dose equivalent factors for the uterus presented in Appendix A were calculated based on the modeling employed during the development of the ICRP 30 (Ref. 3) data. It is recognized that the metabolism of the pregnant woman may not be adequately represented by the standard metabolic model. However, partly because of the lack of more definitive data, this modeling has been used for determining the dose commitment factors for the uterus that may be used for evaluating compliance with the embryo/fetus dose limit.

Off Site Support Agency Radiological Determination Matrix

Normal Operations

Situation	Badging	Limits	Part 19.12	Training
Off Site support agencies are at PVNGS but not entering the Restricted Area	N/A	Public Dose Limits 10CFR20.1301(a)(1) apply	N/A	After 7 days, complete training and obtain site badge.
Off Site Support agencies are at PVNGS entering the Restricted Area but not the RCA	N/A	Public Dose Limits 10CFR20.1301(a)(1) apply	If Occupational, 10CFR19.12 applies	After 7 days, complete training and obtain unescorted access.
Off Site Support agencies are at PVNGS entering the Restricted Area and the RCA	75DP-9RP01, Sections 3.2. and 3.3	PVNGS may classify these personnel as occupational workers. If so, the Occupational Dose Limits of 10CFR20.1201 apply	If Occupational, 10CFR19.12 applies	Escort, Complete Rad Worker Training or Waive Training

Emergencies

Situation	Badging	Limits	Part 19.12	Training	KI	Evacuation
Offsite support agencies are at PVNGS and not supporting an emergency in progress	N/A	Protective Action Guide for public EPA 400 Section 2.3, Table 2.1 apply	N/A	N/A	Responsibility of the State of Arizona	Evacuate the site with other non-essential personnel
Offsite support agencies are at PVNGS: Supporting an emergency in progress, Not entering the Restricted Area, AND there is no RAD release in progress	N/A	Emergency Worker Limits of EPA 400 Section 2.5, Table 2.2 apply	N/A	N/A	N/A	N/A
Offsite support agencies are at PVNGS supporting an emergency in progress when radiation exposure is likely.	E Plan section 6.7.1. Emergency workers carry dosimeters in addition to TLDs. PVNGS may provide to other agencies if requested.	Emergency Worker Limits of EPA 400 Section 2.5, Table 2.2 apply	N/A	Briefing provided in EPIP-99	E Plan Section 6.6.3.3. EC authorizes use of KI. PVNGS may provide to other agencies if requested.	N/A

Supplemental Exposure Notification

Name: _____ Employee ID: _____ HP ID: _____

Department: _____ Home Unit #: _____ Mail Station: _____ Ext: _____

Date of Last Whole Body Count: _____ Type: _____

Reason for Notice: _____

_____

Leaders Name: _____ Mail Station: _____ Ext: _____

Expected Return Date: _____

I am aware that my access to the RCA will be suspended until I return to the Dosimetry Department and receive a Post Trip Whole Body Count. I am aware that I might be required to complete an exposure request for the purpose of ascertaining what if any exposure I may have received as a part of this trip. I am aware that if I am qualified for E-Plan that I may be delayed from responding in the event of a drill or actual emergency. I am also aware that if I fail to return to the Dosimetry Department within 30 days of the expected return date that a PVAR may be issued stating that I am not in compliance with 75DP-9RP01 "Radiation Exposure and Access Control".

_____ _____

Signature Date

Action	Completed by:	Date:
Pre Trip Whole Body Count Performed		
Open Exception Entered into ARACS		
Post Trip Whole Body Count Performed		
Request Letter Signed (If Required)		
Open Exception Closed		

File active forms with WBC Operator, File completed forms in workers file.

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JPM BASIS INFORMATION

TASK:	1240100202 Classify events requiring emergency plan implementation					
TASK STANDARD:	An Alert is declared within 15 minutes. NAN Form EP-0541 is completed per the EP procedures and notification initiated within 14 minutes.					
K/A:	2.4.40	K/A RATING:	RO:	2.7	SRO:	4.5
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	SRO	VALIDATION TIME:	15 minutes			
REFERENCES:	EP-0900 Appendix L (Emergency Coordinator – STSC), EP-0901(Classifications), EP-0902 (Notifications), and EP-0905 (Protective Actions), EAL Charts					

SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER	X

JPM TYPE

Time Critical? *(Yes/No)* ***Yes*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 02/12/2008

Revised By: Alan Malley Date: 05/20/2011

Technical Review _____ Operations Approval _____

EP Review _____ Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____
Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. **This JPM can be performed in the simulator or as an Admin JPM.**

2. **SPECIAL TOOLS/EQUIPMENT:**
   - EP-0900 Appendix L, EP-0901, EP-0902, EP-0905. This JPM was written using revision 00 of these procedures. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM. EAL Chart available
   - Form EP-0803 B (PAR Flowchart) available (Sample of Form in EP-0903, Appendix A)
   - Form EP-0804 B (Release Evaluation Flowchart) available (Sample of Form in EP-0905, Section 5.1.4)
   - A copy of form 541 is available (if not performed in the simulator). The current revision of the form is 541AA but other revisions may be used if it does not affect the information needed for completion of this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **You are the Unit 1 CRS.**
- **The plant is under a tornado warning from the National Weather Service.**
- **The crew has implemented 40AO-9ZZ21, Acts of Nature, and the applicable actions have been completed OR in progress.**
- **Site Security reports a tornado has touched down and caused structural damage to the Auxiliary Building with no injury to plant personnel.**
- **The SM was at the morning meeting in Unit 2 and is waiting until tornado has left immediate area before returning to the Unit.**

INITIATING CUE:

- **You are to perform the duties of the Emergency Coordinator until relieved.**

THIS IS A TIME CRITICAL JPM

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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JPM START TIME: _____

	STEP	CUE	STANDARD
1.	The examinee enters EP-0901, Classifications to classify the event.		Examinee refers to the EAL charts to determine the classification.
			Start Time: _____ **(Begins when examinee receives and acknowledges Initiating CUE)**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Examinee determines classification.		The examinee determines the classification is an ALERT based on EAL HA1.2.
			End Time: _____ **Classification Time: _____** **(this time must be < 15 minutes)** **Notification Start Time: _____**
SAT / UNSAT Comments (required for UNSAT):			

	STEP	CUE	STANDARD
3. *	The examinee enters EP-0902 to make notifications.	**<u>Inform Cue</u> (when the examinee calls for the Area 2 operator):** **I am the Area 2 operator** **<u>When Requested Cue</u>:** **The STA has performed and independent review and concurs with your classification.** **<u>Inform Cue:</u> After examinee hands the communicator form 541:** **This concludes this JPM.**	The examinee completes form 541 and hands the form to the STSC communicator. The form must contain the following information: Fills out NAN Form EP-0541 as follows: o Step 1 marked "This is a drill" box. o Step 2 – **ALERT**, date and time, Status code [**HA1.2**]. o Step 3 – ERFDADS data and Authenticator Code are already filled in on the form. o Step 4 - No Radioactive release is in progress. o Step 5 -PAR is NONE. o Step 6 signed with time and date.
			Evaluator Note: Critical portion of this step is to correctly identify an **ALERT,** status codes; **NO** release is occurring and no PAR with the correct date and time on the form.
			End Time:_____ **Notification Time:_____** **(this time must be less than 14 minutes to allow the communicator 1 minute to start notifications)**
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ☐

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
002	3-9-05	3	Revised for new EPIP-01
003	9-18-07	6	Shortened to 18 steps, remaining steps do not apply to NUE or Alert classification
004	10/19/07	6	Removed affected Unit reference from step 17
005	10/26/07	3	
006	12/05/07	6	Changed cue in step 4 to other units entering NUE, EAL 6-7
007	02/29/08	3	Revision 26 of EPIP-01
008	10/09/2009	3, 6	Incorporated NEI 99-01 EALs per Rev. 32 of EPIP-01 and Rev. 28 of EPIP-99, revised evaluator cue(s) and Initiating CUE to current JPM standard, and updated to current JPM format template.
009	05/20/2011	3	Revised for changes in E-Plan procedures and to upgrade to a new format.

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **You are the Unit 1 CRS.**
- **The plant is under a tornado warning from the National Weather Service.**
- **The crew has implemented 40AO-9ZZ21, Acts of Nature, and the applicable actions have been completed OR in progress.**
- **Site Security reports a tornado has touched down and caused structural damage to the Auxiliary Building with no injury to plant personnel.**
- **The SM was at the morning meeting in Unit 2 and is waiting until tornado has left immediate area before returning to the Unit.**

INITIATING CUE:

- **You are to perform the duties of the Emergency Coordinator until relieved.**

THIS IS A TIME CRITICAL JPM

PALO VERDE NAN EMERGENCY MESSAGE FORM

1. (check one) ❒ This is a drill ❒ This is an actual event

2. This is Palo Verde Nuclear Generating Station Notification of a(n) (Check highest applicable classification level for event notifications) (Check Event Termination for terminating event)

❒ UNUSUAL EVENT ❒ ALERT ❒ SITE AREA EMERGENCY ❒ GENERAL EMERGENCY

Declared at _____ (time) on ____/____/____ (MM/DD/YY) EAL: _____ (driving current classification only)

❒ EVENT TERMINATION AT _____ (time) ____/____/____ (MM/DD/YY)

3. The wind speed is 22 (35 foot elevation - 15 min avg) MPH from 320 (35 foot elevation - 15 min avg) degrees

Authenticator Code Bravo Zulu

This is _____ (name) ❒ STSC Comm. ❒ NAN Comm (Check one)

4. ❒ There is NO radioactive release due to this event.
❒ A radioactive release is occurring which does NOT exceed federally approved limits due to this event.
❒ A radioactive release is occurring that exceeds federally approved limits due to this event.

5. The following action is recommended:
❒ There are NO PROTECTIVE ACTIONS required.
❒ Shelter 2-mile radius
❒ Evacuate 2-mile radius and 5-miles in sectors _____
❒ Evacuate 5-mile radius and 10-miles in sectors _____
❒ Recommend consideration of KI as a protective measure for: ❒ emergency workers ❒ general public [check appropriate box(es)]
❒ Other _____

6. Approval _____ (EC/EOD signature) (time) ____/____/____ (MM/DD/YY)

7. ❒ Independent review completed (If time permits while still meeting 15 minutes reporting requirement) (Checked by EC/EOD qualified person)

8.

Responding Agency	Alternate Link	Time	Message Rec'd
-	NAN Radio B/U		
-	NAN Radio B/U		
-	NAN Radio B/U		
-	NAN Radio B/U		
-	NAN Radio B/U		
-	NAN Radio B/U		

P-1
PVNGS JOB PERFORMANCE MEASURE

JPM BASIS INFORMATION

TASK:	1250440201 Respond to a Control Room Fire					
TASK STANDARD:	First 7 steps of Appendix W of 40AO-9ZZ19 to align SDC for service completed.					
K/A:	4.2 067 AA2.16	K/A RATING:	RO:	3.3	SRO:	4.0
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	AO/RO	VALIDATION TIME:				
REFERENCES:	40AO-9ZZ19, Control Room Fire, Appendix W					
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT	X	OTHER	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***Yes***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Alan Malley Date: 09-30-2012

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- A copy of 40AO-9ZZ19, Control Room Fire, Appendix W (up to Step 7) available. This JPM was written using Revision 26 of 40AO-9ZZ19. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **A Control Room fire has occurred.**
- **The CRS has entered 40AO-9ZZ19, Control Room Fire.**
- **The plant is being cooled down to SDC conditions.**

INITIATING CUE:

- **The CRS directs you to perform Appendix W, Placing SDC Train B in Service. The vent hoses have been installed per Attachment W-2.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

P-1
PVNGS JOB PERFORMANCE MEASURE

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Step 1 of Appendix W: Enter Appendix Entry Time and Date:		Examinee enters current date and time.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 2 of Appendix W: Ensure vent hoses have been installed per Attachment W-2, Periodic Venting of SDC Train B.	**INFORM CUE: Vent hoses have been installed per Attachment W-2**	
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Step 3 of Appendix W: Close SIB-HV-689, CS B Discharge. (PHB-M3804)	**If Requested Cue** (before valve operation): **Red light is ON, Green light is OFF.** **INFORM CUE** (after handswitch operation): **Red light is OFF, Green light is ON**	Examinee uses the handswitch on breaker PHB-M3804 to close SIB-HV-689.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 4 of Appendix W: Close SIB-HV-695, LPSI-CS From SDHX B X-Tie. (PHB-M3810)	**If Requested Cue** (before valve operation): **Red light is ON, Green light is OFF.** **INFORM CUE** (after handswitch operation): **Red light is ON, Green light is OFF**	Examinee attempts to close SIB-HV-695 from the breaker handswitch. Valve does not close so examinee goes to contingency step 4.1.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 4.1 of Appendix W: Manually close SIB-HV-695 (SDC Hx Valve Gallery)	**Inform Cue** (after examinee simulates closing valve): **The handwheel has been rotated in the closed direction and has stopped moving as expected.**	Examinee engages clutch on SIB-HV-695 and turns handwheel in the counter-clockwise direction. **ALTERNATE PATH**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Step 5 of Appendix W: Close SIB-UV-668, LPSI Pump B Recirc. (PHB-M3609)	**If Requested Cue** (before valve operation): **Red light is ON, Green light is OFF.** **INFORM CUE** (after handswitch operation): **Red light is OFF, Green light is ON**	Examinee uses the handswitch on breaker PHB-M3609 to close SIB-UV-668.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 6 of Appendix W: Close SIB-HV-692, LPSI Pump Suction from RWT. (PHB-M3805)	**If Requested Cue** (before valve operation): **Red light is ON, Green light is OFF.** **INFORM CUE** (after handswitch operation): **Red light is OFF, Green light is ON**	Examinee uses the handswitch on breaker PHB-M3805 to close SIB-HV-692.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 7 of Appendix W: Close SIB-HV-658, SDHX B Outlet to RC Loops 2A/2B Valve. (PHB-M3412)	**If Requested Cue** (before valve operation): **Red light is ON, Green light is OFF.** **INFORM CUE** (after handswitch operation): **Red light is OFF, Green light is ON**	Examinee uses the handswitch on breaker PHB-M3412 to close SIB-HV-658.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

P-1
PVNGS JOB PERFORMANCE MEASURE

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
0	09/30/2012	6	Record created.

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **A Control Room fire has occurred.**
- **The CRS has entered 40AO-9ZZ19, Control Room Fire.**
- **The plant is being cooled down to SDC conditions.**

INITIATING CUE:

- **The CRS directs you to perform Appendix W, Placing SDC Train B in Service. The vent hoses have been installed per Attachment W-2.**

Appendix W, Placing SDC Train B in Service

INSTRUCTIONS		CONTINGENCY ACTIONS	
____ 1.	Enter Appendix Entry Time and Date: _____		
___ 2.	Ensure vent hoses have been installed per Attachment W-2, Periodic Venting of SDC Train B.		
___ 3.	Close SIB-HV-689, CS B Discharge. (PHB-M3804)	___ 3.1	Manually close SIB-HV-689. (CS Pump Room B)
___ 4.	Close SIB-HV-695, LPSI-CS From SDHX B X-Tie. (PHB-M3810)	___ 4.1	Manually close SIB-HV-695 (SDC Hx Valve Gallery)
___ 5.	Close SIB-UV-668, LPSI Pump B Recirc. (PHB-M3609)	___ 5.1	Manually close SIB-UV-668. (LPSI B Pump Room)
___ 6.	Close SIB-HV-692, LPSI Pump Suction from RWT. (PHB-M3805)	___ 6.1	Manually close SIB-UV-692. (LPSI B Pump Room)
___ 7.	Close SIB-HV-658, SDHX B Outlet to RC Loops 2A/2B Valve. (PHB-M3412)	___ 7.1	Manually close SIB-HV-658. (SDHX B Room)
___ 8.	Ensure that **BOTH** of the following LPSI Injection Valves are closed: • SIB-UV-615 (PHB-M3606) • SIB-UV-625 (PHB-M3621)		

Appendix W, Placing SDC Train B in Service

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 9. Open SIB-UV-652, SDC Suction Valve. (PHB-M3604)	___ 9.1 Manually open SIB-UV-652. (90' CTMT outside 2A RCP Room)
___ 10. Unlock and close PKD-B44, Power Supply Disconnect for SID-UV-654. (Battery Room D)	
___ 11. Open SID-UV-654, Loop 2 to Shutdown Cooling LPSI Pump Suction Valve, using the local keyswitch. (Battery Room D)	___ 11.1 Manually open SID-UV-654. (90' CTMT East)
___ 12. Open SIB-UV-656, RC Loop 2 SDC-LPSI Pump Suction Valve. (PHB-M3605)	___ 12.1 Manually open SIB-UV-656 (East Pen Room)
___ 13. Open SIB-HV-690, RC Loop B Warmup Bypass Valve. (PHB-M3806)	___ 13.1 Manually open SIB-HV-690 (East Pen Room)
___ 14. Open SIB-HV-694, LPSI-CS to SDHX B X-Tie Valve. (PHB-M3414)	___ 14.1 Manually open SIB-HV-694 (SDC Valve Gallery)
___ 15. Open SIB-HV-696, SDHX B Outlet to RC Loops 2A/2B Valve. (PHB-M3415)	___ 15.1 Manually open SIB-HV-696 (SDC Valve Gallery)

Appendix W, Placing SDC Train B in Service

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 16. Throttle SIB-HV-307, LPSI-SDHX B Bypass Valve to approximately 20% open. (PHB-M3803)	___ 16.1 Manually throttle SIB-HV-307 to approximately 20% open. (LPSI B Pump Room)
___ 17. Inform the CRS that LPSI B is ready to be started.	
___ 18. **WHEN** LPSI B is running, **THEN** throttle SIB-HV-307, to establish a flowrate of 4000 - 5000 gpm as indicated by a d/p of 2.5 - 3.3 psid on the temporary flow instrument. (PHB-M3803)	___ 18.1 **WHEN** LPSI B is running, **THEN** manually throttle SIB-HV-307 to establish a flowrate of 4000 - 5000 gpm as indicated by a d/p of 2.5 - 3.3 psid on the temporary flow instrument. (LPSI B Pump Room)
___ 19. Perform the following to begin heating up the SDC Loop:	
a. Throttle open SIB-UV-615, LPSI Header to RC Loop 2A to begin the heatup. (PHB-M3606)	a.1 Manually open SIB-UV-615. (88' East Wrap)
b. **WHEN** the SDC Loop heatup rate has stabilized, **THEN** throttle open SIB-UV-625, LPSI Header to RC Loop 2B to continue the heatup. (PHB-M3621)	b.1 **WHEN** the SDC Loop heatup rate has stabilized, **THEN** manually open SIB-UV-625. (88' East Wrap)

Appendix W, Placing SDC Train B in Service

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 20. **IF** the heatup rate on the SDHX exceeds 19°F/min,
THEN adjust warmup flow through the SDC Loop to reduce the heatup rate.

___ 21. Maintain **ALL** of the following while SDC is in service:

- SDC flowrate
- Desired RCS cooldown rate
- A SDHX heatup rate less than 19°F/min

___ 22. Incrementally adjust **ALL** of the following valves to stop the warm up bypass flow:

- SIB-UV-615 (PHB-M3606)
- SIB-UV-625 (PHB-M3621)
- SIB-HV-690 (PHB-M3806)

Appendix W, Placing SDC Train B in Service

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 23. **WHEN** closed indication for SIB-HV-690 is received, **THEN** perform the following:

a. Hold the handswitch in the closed position for five seconds. (PHB-M3806)

b. Direct a second operator to hold the handswitch closed for an additional five seconds.

___ 24. Incrementally adjust **ALL** of the following valves to fully open the loop injection valves:

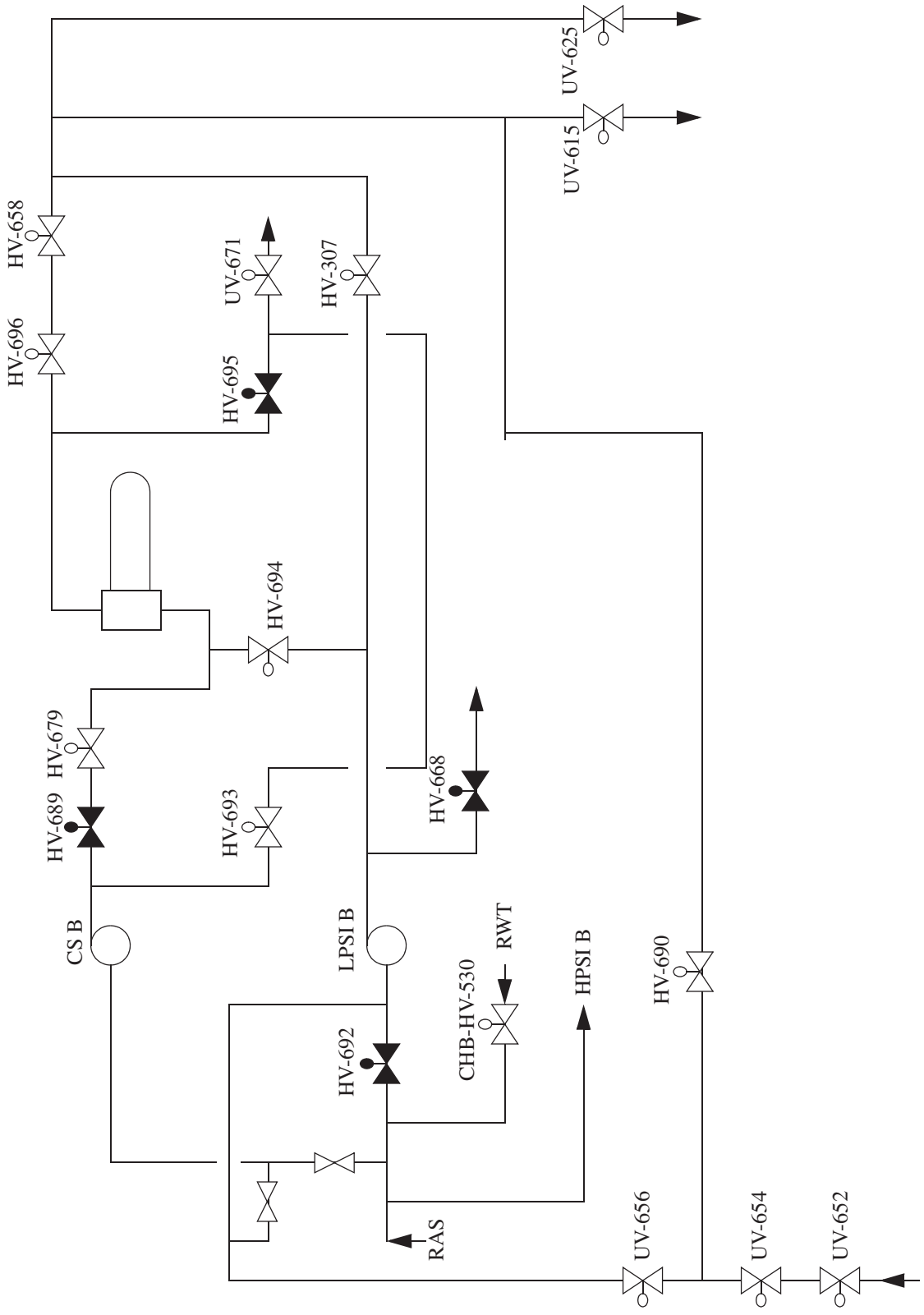
- SIB-UV-615 (PHB-M3606)
- SIB-UV-625 (PHB-M3621)
- SIB-HV-307 (PHB-M3803)

___ 25. Adjust SIB-HV-658 (PHB-M3412) and SIB-HV-307 (PHB-M3803) as needed to maintain **BOTH** of the following:

- SDC flowrate 4000 - 5000 gpm as indicated by a d/p of 2.5 - 3.3 psid on the temporary flow instrument
- Desired RCS cooldown rate

Attachment W-1, SDC-B Simplified Drawing

Page 1 of 1



Attachment W-2, Periodic Venting of SDC Train B [Ref. Step 4.13] Page 1 of 5

INSTRUCTIONS CONTINGENCY ACTIONS

---------- **NOTE** ----------

Implement this Appendix, as necessary, per the following criteria:

- As soon as possible after lowering SDCHX inlet temperature below 190°F.
- Once per shift when heating up or cooling down.
- Once every three days while at steady state condition (no change in temperature or pressure) after three successive gas free vents have occurred at steady state.

___ 1. Remove pipe cap from the following vent valves:

- SIB-V886 (Upper Level in the East Penetration Room)
- SIB-V870 (Upper Level in the East Penetration Room)
- SIB-V019 (CS Pump B Room)
- **Unit-1 Only**
  SIB-V1029 (Upper level of the East Penetration Room)

Attachment W-2, Periodic Venting of SDC Train B

INSTRUCTIONS	CONTINGENCY ACTIONS

___ 2. Install a hose adaptor on the following vent valves:

- SIB-V886
- SIB-V870
- SIB-V019
- **Unit-1 Only**
  SIB-V1029

___ 3. Connect hoses as follows:

a. Connect one hose end to hose adaptor of the following valves:

- SIB-V886
- SIB-V870
- SIB-V019
- **Unit-1 Only**
  SIB-V1029

b. Connect other hose end to **ONE** of the following:

- Floor drain
- As directed by Radiation Protection

Attachment W-2, Periodic Venting of SDC Train B [Page 3 of 5

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 4. Ensure SDC temperature is less than 190°F. (SIB-TI-352X at RSP).	
___ 5. Inform Radiation Protection that SDC header B is to be vented.	
___ 6. Perform the following to vent through SIB-V886:	
a. Open SIB-V886 1/4 to 1/2 turn.	
b. Check no air is present, during the vent.	b.1 Open SIB-886 to 2 turns.
c. Maintain SIB-V886 open for 2 to 3 minutes after a solid stream of water is observed.	
d. Close SIB-V886.	

Attachment W-2, Periodic Venting of SDC Train B

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 7. Perform the following to vent through SIB-V870	
a. Unlock SIB-V870 per 40AC-0ZZ06, Locked Valve, Breaker and Component Control.	
b. Open SIB-V870 1/4 to 1/2 turn.	
c. Check no air is present, during the vent.	c.1 Open SIB-V870 to 2 turns.
d. Maintain SIB-V870 open for 2 to 3 minutes after a solid stream of water is observed.	
e. Close SIB-V870.	
___ 8. Perform the following to vent through SIB-V019	
a. Open SIB-V019 1/4 to 1/2 turn.	
b. Check no air is present, during the vent.	b.1 Open SIB-V019 to 2 turns.
c. Maintain SIB-V019 open for 2 to 3 minutes after a solid stream of water is observed.	
d. Close SIB-V019.	

Attachment W-2, Periodic Venting of SDC Train B

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 9. **Unit-1 Only** Perform the following to vent through SIB-V1029	
a. Open SIB-V1029 1/4 to 1/2 turn.	
b. Check no air is present, during the vent.	b.1 Open SIB-V1029 to 2 turns.
c. Maintain SIB-V1029 open for 2 to 3 minutes after a solid stream of water is observed.	
d. Close SIB-V1029.	
___ 10. Verify the following valves closed using independent verification per 02DP-0ZZ01, Verification of Plant Activities:	
a. SIB-V886	
b. SIB-V870	
c. SIB-V019	
d. **Unit-1 Only** SIB-V1029	
___ 11. Inform the Shift Manager/CRS that venting of the SDC header B is complete.	

End of Appendix

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PVNGS JOB PERFORMANCE MEASURE
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JPM BASIS INFORMATION

TASK:	1240023901 Perform operation of AFA-P01 at the Remote Shutdown Panel					
TASK STANDARD:	Feeding the Steam Generators with AFA-P01 from the Remote Shutdown Panel					
K/A:	3.4-061-A3.01	K/A RATING:	RO:	4.2	SRO:	4.2
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	20 minutes			
REFERENCES:	40AO-9ZZ18, Shutdown Outside Control Room, Appendix E					

SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT	X	OTHER	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***Yes***

APPROVAL

Developed By: Alan Malley Date: 10/02/2007

Revised By: Alan Malley Date: 08/24/2011

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- A copy of Appendix E of 40AO-9ZZ18. This JPM was written using Revision 11 of 40AO-9ZZ18. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.
- Replacement locking devices (obtained from Shift Manager) to relock the RSP after each JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **The CRS has entered 40AO-9ZZ18, Shutdown Outside Control Room.**

INITIATING CUE:

- **The CRS directs you to perform Appendix E, Auxiliary Feed Pump Operations, to start and feed the Steam Generators using AFA-P01 (Train 'A' Auxiliary Feedwater Pump) from the Remote Shutdown Panel.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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PVNGS JOB PERFORMANCE MEASURE
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JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Step 1 of Appendix E: Enter Appendix Entry Time and Date:_____		Examinee enters date and time
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 2 of Appendix E: **IF** AFB-P01 will be used, **THEN** perform the following:…..		Examinee NAs this step since initiating cue directed use of AFA-P01.
SAT / UNSAT **Comments (required for UNSAT):**			

Note prior to step 3:
AFA-HS-52A, Turbine Driven AFW Pump Speed Control Transfer, switch position must be changed as rapidly as possible to minimize the chances of an overspeed trip.

	STEP	CUE	STANDARD
3.	Step 3.a of Appendix E: **IF** AFA-P01 will be used, **THEN** perform the following: Adjust AFA-SK-52B, Auxiliary Feedwater Pump A Speed to minimum.	**Inform Cue:** **After the examinee simulates turning the speed potentiometer counter-clockwise provide the following cue:** **The potentiometer has stopped moving and reads "0".**	Examinee simulates turning the speed potentiometer in the counter-clockwise direction until the dial is at minimum.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 3.b of Appendix E: Place AFA-HS-52A, Speed Control Transfer, to the "REMOTE SHUTDOWN" position.	**Inform Cue:** **After the examinee simulates turning the speed control transfer handswitch to the "REMOTE SHUTDOWN" position provide the following cue:** **The handswitch is pointing to the left.**	Examinee simulates turning the speed control transfer switch left to the "REMOTE SHUTDOWN" position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 3.c of Appendix E: Open **ONE** of the following Steam Supply Valves: • SGA-UV-134 • SGA-UV-138	**If Requested Cue:** **The CRS states you can use either valve.** **Inform Cue:** **After the examinee simulates turning handswitch for either SGA-UV-134 or SGA-UV-138 provide the following cue for the appropriate valves:** **The indication for SGA-UV-134(8)A red light is on. 30 seconds later the red light for SGA-UV-134 came on and both Green lights are off.**	Examinee simulates opening either SGA-UV-134 or SGA-UV-138.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Step 3.d of Appendix E: Adjust turbine speed using AFA-SK-52B to **ONE** of the following: **Unit 1 & 3 only –** • 3590-3600 rpm **Unit 2 only** • 3560-3570 rpm	**Inform Cue:** **As the examinee goes to increase on the speed potentiometer use a pen to indicate the following**: **Unit 1 and 3 Cue:** • **Speed is 3600 rpm** **Unit 2 Cue:** • **Speed is 3560 rpm**	The examinee adjusts the potentiometer to raise speed to 3590-3600 rpm in Unit 1 and 3 or 3560-3570 in Unit 2..
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 3.e of Appendix E: Open **BOTH** of the following AFW Pump A to Steam Generator Downstream Valves: • AFA-UV-37 • AFC-UV-36	**Inform Cue:** **When the examinee takes the handswitches for AFA-UV-37 and AFC-UV-36 to open provide the following cue:** **The red lights for AFA-UV-37 and AFC-UV-36 are on and the green lights are off.**	Examinee simulates placing the handswitches for AFA-UV-37 and AFC-UV-36.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 3.f of Appendix E: Maintain steam generator levels 35-80% WR with **ANY** of the following AFA Pump A to Steam Generator Upstream Valves:: • AFA-HV-32 • AFC-HV-33	**Inform Cue:** **When examinee looks at SG level transmitters provide the following cue using a pen to indicate Steam Generator Wide Range Levels are 30% WR.**	Examine determines SG WR level and throttles open both SG Upstream valves.
		If requested Cue: The as found position of AFA-HV-32 and AFC-HV-33 are as indicated on the panel.	
		Inform Cue: **When the examinee simulates jogging open AFA-UV-32 and AFC-HV-33 provide the following cue:** **AFA-UV-32 and AFC-HV-33 red and green lights are on.**	
		Inform Cue: **When examine looks at position indication for valves use a pen to show valve position (**depending on what operator says was the final valve position).	
		Inform Cue: **When examine looks at AF flow indicator use a pen to indicate flow is 350 gpm.**	
		Inform Cue: **After feed is established provide the following cue:** **Another operator will finish Appendix E.**	
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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PVNGS JOB PERFORMANCE MEASURE
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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
02	03/28/07	6	Updated initiating cue to include that FWPT and Main Turbine shafts have stopped turning. Editorial updates.
03	12/02/09	6	Updated to new format and removed non-critical steps at the end of the JPM.
04	08/24/2011	6	Updated to new format.

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **The CRS has entered 40AO-9ZZ18, Shutdown Outside Control Room.**

INITIATING CUE:

- **The CRS directs you to perform Appendix E, Auxiliary Feed Pump Operations, to start and feed the Steam Generators using AFA-P01 (Train 'A' Auxiliary Feedwater Pump) from the Remote Shutdown Panel.**

Appendix E, Auxiliary Feed Pumps Operation

INSTRUCTIONS	CONTINGENCY ACTIONS
____ 1. Enter Appendix Entry Time and Date: _____	
___2. **IF** AFB-P01 will be used, **THEN** perform the following: a. Direct an operator to start AFB-P01 locally at PBB-S04S. b. Open **BOTH** of the following AFW Pump B to Steam Generator Downstream Valves: • AFB-UV-34 • AFB-UV-35 c. Maintain steam generator levels 35 - 80% WR with **ANY** of the following AFW Pump B to Steam Generator Upstream Valves: • AFB-HV-30 • AFB-HV-31	

Appendix E, Auxiliary Feed Pumps Operation

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

AFA-HS-52A, Turbine Driven AFW Pump Speed Control Transfer, switch position must be changed as rapidly as possible to minimize the chances of an overspeed trip.

___3. **IF** AFA-P01 will be used,
THEN perform the following:

a. Adjust AFA-SK-52B, Auxiliary Feedwater Pump A Speed to minimum.

b. Place AFA-HS-52A, Speed Control Transfer, to the "REMOTE SHUTDOWN" position.

c. Open **ONE** of the following Steam Supply Valves:

- SGA-UV-134
- SGA-UV-138

(continue)

Appendix E, Auxiliary Feed Pumps Operation

INSTRUCTIONS	CONTINGENCY ACTIONS

___3. (continued)

d. Adjust turbine speed using AFA-SK-52B to **ONE** of the following:

Unit 1 & 3 only -

- 3590 - 3600 rpm.

Unit 2 only -

- 3560 - 3570 rpm.

e. Open **BOTH** of the following AFW Pump A to Steam Generator Downstream Valves:

- AFA-UV-37
- AFC-UV-36

f. Maintain steam generator levels 35 - 80% WR with **ANY** of the following AFW Pump A to Steam Generator Upstream Valves:

- AFA-HV-32
- AFC-HV-33

Appendix E, Auxiliary Feed Pumps Operation

INSTRUCTIONS CONTINGENCY ACTIONS

CAUTION

AFA-HS-52A, Turbine Driven AFW Pump Speed Control Transfer, switch position must be changed as rapidly as possible to minimize the chances of an overspeed trip.

___4. **IF** control of AFA-P01 will be transferred to the Control Room, **THEN** perform the following:

a. Set AFA-SK-52B, Remote Shutdown Panel speed control to minimum.

b. Ensure that AFA-SK-52A, Control Room speed control is set to minimum.

c. Place AFA-HS-52A to the "CONT ROOM" position.

d. Adjust turbine speed using AFA-SK-52A to **ONE** of the following:

Unit 1 & 3 only -

- 3590 - 3600 rpm

Unit 2 only -

- 3560 - 3570 rpm

End of Appendix

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JPM BASIS INFORMATION

TASK:	1250440201 Respond to a control room fire					
TASK STANDARD:	Appendix C of 40AO-9ZZ19 completed.					
K/A:	3.6 062 A2.06	K/A RATING:	RO:	3.4	SRO:	3.9
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	20 minutes			
REFERENCES:	40AO-9ZZ19, Control Room Fire					
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR		PLANT	X	OTHER	

JPM TYPE

Time Critical? *(Yes/No)* ***Yes*** Alternative Path? *(Yes/No)* ***Yes***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Alan Malley Date: 02/16/2011

Revised By: N/A Date: N/A

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Planning organization for resolution.

1. SPECIAL TOOLS/EQUIPMENT:

- 40AO-9ZZ19, Control Room Fire, Appendix C available. This JPM was written using Revision 25 of 40AO-9ZZ19. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **The Control Room has been evacuated due to a fire.**
- **The CRS has entered 40AO-9ZZ19, Control Room Fire**

INITIATING CUE:

- **The CRS directs you to perform Appendix C, PBB-S04 Energized from Offsite Power.**

THIS JPM IS TIME CRITICAL

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Step 1 of Appendix C: Enter Appendix Entry Time **AND** Date: _____		Examinee enters Entry time and date. START TIME: _____
SAT / UNSAT **Comments (required for UNSAT):**			

Notes before step 2:
NOTE
The telephone number for the B Train Remote Shutdown Panel is:
Unit 1 - 1235 **Unit 2** - 2235 **Unit 3** – 3235
NOTE
Actions directed by this appendix are time critical and must be performed as quickly as possible to ensure that effects of the fire do not prevent safe shutdown of the unit.
NOTE
Portable lanterns should be used when performing actions in response to a fire. This will ensure that lighting is available if the emergency lighting system is degraded.

	STEP	CUE	STANDARD
2.	Step 2 of Appendix C: Obtain a portable lantern from the Emergency Equipment Cabinet, FPN-C02. (B Switchgear Room, Northwest corner)	**INFORM CUE: You have obtained the portable lantern from the Equipment Cabinet.**	Examinee proceeds to the Emergency Equipment Cabinet.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Step 3 of Appendix C: On PHB-M32, place **ALL** of the following Control Room Circuits Disconnect Switches in "LOCAL": (Switchgear Room B) • PHB-M3209, Battery Charger D PKD-H14 • PHB-M3205, Control Room Circuits Disconnect Switches (4 switches)	**INFORM CUE (as examinee simulates turning each disconnect): Indicate that the disconnect switch is pointing to LOCAL.**	Examinee places the following disconnects in "LOCAL". _____ PHB-M3209, Battery Charger D PKD-H14 _____ PHB-M3205, Control Room Circuits Disconnect Switches (4 switches)
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 4 of Appendix C: Place all of the disconnect switches on DGB-C01, DG Disconnect Cabinet in "LOCAL". (5 switches) (Switchgear Room B)	**INFORM CUE (as examinee simulates turning each disconnect): Indicate that the disconnect switch is pointing to LOCAL.**	Examinee simulates placing all 5 disconnect switches to "LOCAL".
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 5 of Appendix C: Ensure the disconnect switches for **ALL** of the following breakers on PBB-S04 are in "LOCAL": • PBB-S04S, Aux Feed Water Pump AFB-P01 • PBB-S04N, 4160 - 480 LC PGB-L36 • PBB-S04M, Essential Cooling Water Pump EWB-P01 • PBB-S04L, ESF Service Transformer NBN-X03 • PBB-S04K, ESF Service Transformer NBN-X04 • PBB-S04J, 4160 - 480 LC PGB-L32 • PBB-S04H, 4160 - 480 LC PGB-L34 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04F, LP Safety Injection Pump SIB-P01 • PBB-S04C, Essential Spray Pond Pump SPB-P01 • PBB-S04B, Diesel Generator PEB-G02	**INFORM CUE (as examinee simulates turning each disconnect): Indicate that the disconnect switch is pointing to LOCAL.** **Examiner Note:** The following breakers are the only ones not manipulated: • PBB-S04P – Spare • PBB-S04D – Containment Spray Pump B • PBB-S04E – High Pressure Safety Injection Pump B	Examinee simulates placing the disconnect on each of the following breakers to "LOCAL": _____ PBB-S04S _____ PBB-S04N _____ PBB-S04M _____ PBB-S04L _____ PBB-S04K _____ PBB-S04J _____ PBB-S04H _____ PBB-S04G _____ PBB-S04F _____ PBB-S04C _____ PBB-S04B
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Place **ALL** of the following disconnect switches in "LOCAL": • CS-2/B2 on PGB-L36B1 • CS-1/B2 on PGB-L34B1 • CS-2/C4 on PGB-L32C1 • CS-1/B2 on PGB-L32B1	**INFORM CUE (as examinee simulates turning each disconnect): Indicate that the disconnect switch is pointing to LOCAL.**	Examinee places all the following disconnects in "LOCAL": _____ CS-2/B2 on PGB-L36B1 _____ CS-1/B2 on PGB-L34B1 _____ CS-2/C4 on PGB-L32C1 _____ CS-1/B2 on PGB-L32B1
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Check that breaker PGB-L32C4, Charging Pump 2 CHB-P01, is closed.	**INFORM CUE: The breaker for CHB-P01 indicator says "OPEN".**	Examinee checks PGB-L32C4 breaker position indication.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	**IF** breaker PGB-L32C4, Charging Pump 2 CHB-P01, is open, **THEN** PERFORM the following: a. Ensure charging pump suction is aligned to the RWT per Step 6 of Appendix G, Upper Auxiliary Building Actions. b. Close breaker PGB-L32C4, Charging Pump 2 CHB-P01.	**When Requested cue:** **The Charging pump suction has been aligned to the RWT per Step 6 of Appendix G, Upper Auxiliary Building Actions.** **Inform Cue (after examinee simulates closing PGB-L32C4):** **The breaker position indication says "CLOSED".**	**Examiner Note: Log the time the Charging Pump breaker is simulated closed.** Examinee performs the following: a. Contacts the CRS at the Remote Shutdown panel (or the Aux Bldg AO) to determine if charging pump suction is aligned to the RWT. b. Closes breaker PGB-L32C4 for Charging Pump B **(Time Critical)** Time: _____ There should be less than 30 minutes from the time in step one to when the charging pump breaker is closed. **ALTERNATE PATH**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Ensure that **ALL** of the following breakers are closed: • PBB-S04S, Aux Feed Water Pump AFB-P01 • PBB-S04N, 4160 - 480V LC PGB-L36 • PBB-S04M, Essential Cooling Water Pump, EWB-P01 • PBB-S04J, 4160 - 480V LC PGB-L32 • PBB-S04H, 4160 - 480V LC PGB-L34 • PBB-S04G, Essential Chiller ECB-E01 • PBB-S04C, Essential Spray Pond Pump SPB-P01	**Inform Cue as each breaker is closed (use only cues for indications stated by examinee that he/she is observing):** **Red light is on/ green light is off.** **Amps pegged high and are now steady at _____ amps.** **Breaker made a closing sound.**	**Examiner Note: Log the time each breaker is simulated closed.** Examinee simulates closing the following breakers: _____ PBB-S04S, Aux Feed Water Pump AFB-P01 _____PBB-S04N, 4160 - 480V LC PGB-L36 _____PBB-S04M, Essential Cooling Water Pump, EWB-P01 _____PBB-S04J, 4160 - 480V LC PGB-L32 _____PBB-S04H, 4160 - 480V LC PGB-L34 _____PBB-S04G, Essential Chiller ECB-E01 _____PBB-S04C, Essential Spray Pond Pump SPB-P01 **(Time Critical)** _____There should be less than 15 minutes from step 1 until PBB-S04C is closed, _____There should be less than 45 minutes from step 1 until PBB-S04S is closed _____There should be less than 40 minutes from step 1 until PBB-S04G is closed.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Inform the CRS that **ALL** of the following are running: • Charging Pump B • Aux Feed Pump B • Spray Pond Pump B • Essential Cooling Water Pump B • Essential Chiller B	**Inform Cue:** **The CRS has been informed that the following are running:** • **Charging Pump B** • **Aux Feed Pump B** • **Spray Pond Pump B** • **Essential Cooling Water Pump B** • **Essential Chiller B**	Examinee simulates informing the CRS.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11. *	**IF** Diesel Generator B is running, **THEN** perform the following: (DG Control Panel) a. Press DGB-HS-30, Emergency Stop. b. **IF** a loss of Offsite Power occurs, **THEN** PERFORM **ONE** of the following as appropriate: • Appendix D, PBB-S04 Energized from DG B • Appendix E, PBB-S04 De-energized.	**Inform Cue:** **DG B is running.** **After examinee pushing Emergency Stop button(use only cues for indications stated by examinee that he/she is observing):** • **The DG is slowing.** • **Use pen to indicate RPMs are lowering.** • **DG run alarm is off.** • **Etc.**	Examinee simulates pushing DGB-HS-30 to stop Diesel Generator B.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
12. *	Ensure that DGB-V064, Jacket Water Standpipe Make-up Header Isolation valve, is closed. (DG B Room)	**Inform Cue: The valve has turned clockwise and has stopped moving as expected.**	**Examiner Note: Log the time the valve is simulated closed.** Examinee simulates closing DGB-V064. **(Time Critical)** _____There should be less than 60 minutes from step 1 until DGB-V064 is closed.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: [ ]

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Planning organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
0	02/17/2011	6	Record created

REASON REVISED Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **The Control Room has been evacuated due to a fire.**
- **The CRS has entered 40AO-9ZZ19, Control Room Fire**

INITIATING CUE:

- **The CRS directs you to perform Appendix C, PBB-S04 Energized from Offsite Power.**

THIS JPM IS TIME CRITICAL

Appendix C, PBB-S04 Energized from Offsite Power

INSTRUCTIONS CONTINGENCY ACTIONS

____ 1. Enter Appendix Entry Time and Date:

_____

---------- **NOTE** ----------

The telephone number for the B Train Remote Shutdown Panel is:

Unit 1 - 1235 **Unit 2** - 2235 **Unit 3** - 3235

---------- **NOTE** ----------

Actions directed by this appendix are time critical and must be performed as quickly as possible to ensure that effects of the fire do not prevent safe shutdown of the unit.

---------- **NOTE** ----------

Portable lanterns should be used when performing actions in response to a fire. This will ensure that lighting is available if the emergency lighting system is degraded.

___ 2. Obtain a portable lantern from the Emergency Equipment Cabinet, FPN-C02. (B Switchgear Room, Northwest corner)

Appendix C, PBB-S04 Energized from Offsite Power

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 3. On PHB-M32, place **ALL** of the following Control Room Circuits Disconnect Switches in "LOCAL": (Switchgear Room B)

- PHB-M3209, Battery Charger D PKD-H14
- PHB-M3205, Control Room Circuits Disconnect Switches (4 switches)

___ 4. Place all of the disconnect switches on DGB-C01, DG Disconnect Cabinet in "LOCAL". (5 switches) (Switchgear Room B)

Appendix C, PBB-S04 Energized from Offsite Power

INSTRUCTIONS CONTINGENCY ACTIONS

___ 5. Ensure the disconnect switches for **ALL** of the following breakers on PBB-S04 are in "LOCAL":

- PBB-S04S, Aux Feed Water Pump AFB-P01
- PBB-S04N, 4160 - 480 LC PGB-L36
- PBB-S04M, Essential Cooling Water Pump EWB-P01
- PBB-S04L, ESF Service Transformer NBN-X03
- PBB-S04K, ESF Service Transformer NBN-X04
- PBB-S04J, 4160 - 480 LC PGB-L32
- PBB-S04H, 4160 - 480 LC PGB-L34
- PBB-S04G, Essential Chiller ECB-E01
- PBB-S04F, LP Safety Injection Pump SIB-P01
- PBB-S04C, Essential Spray Pond Pump SPB-P01
- PBB-S04B, Diesel Generator PEB-G02

Appendix C, PBB-S04 Energized from Offsite Power

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 6. Place **ALL** of the following disconnect switches in "LOCAL": • CS-2/B2 on PGB-L36B1 • CS-1/B2 on PGB-L34B1 • CS-2/C4 on PGB-L32C1 • CS-1/B2 on PGB-L32B1	
___ 7. Check that breaker PGB-L32C4, Charging Pump 2 CHB-P01, is closed.	___ 7.1 **IF** breaker PGB-L32C4, Charging Pump 2 CHB-P01, is open, **THEN** PERFORM the following: a. Ensure charging pump suction is aligned to the RWT per Step 6 of Appendix G, Upper Auxiliary Building Actions. b. Close breaker PGB-L32C4, Charging Pump 2 CHB-P01. [Ref. Step 4.13]

Appendix C, PBB-S04 Energized from Offsite Power

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 8. Ensure that **ALL** of the following breakers are closed:

- PBB-S04S, Aux Feed Water Pump AFB-P01
- PBB-S04N, 4160 - 480V LC PGB-L36
- PBB-S04M, Essential Cooling Water Pump, EWB-P01
- PBB-S04J, 4160 - 480V LC PGB-L32
- PBB-S04H, 4160 - 480V LC PGB-L34
- PBB-S04G, Essential Chiller ECB-E01
- PBB-S04C, Essential Spray Pond Pump SPB-P01

___ 9. Inform the CRS that **ALL** of the following are running:

- Charging Pump B
- Aux Feed Pump B
- Spray Pond Pump B
- Essential Cooling Water Pump B
- Essential Chiller B

Appendix C, PBB-S04 Energized from Offsite Power

INSTRUCTIONS CONTINGENCY ACTIONS

___ 10. **IF** Diesel Generator B is running,
THEN perform the following:
(DG Control Panel)

a. Press DGB-HS-30, Emergency Stop.

b. **IF** a loss of Offsite Power occurs,
THEN PERFORM **ONE** of the following as appropriate:

- Appendix D, PBB-S04 Energized from DG B
- Appendix E, PBB-S04 De-energized.

___ 11. Ensure that DGB-V064, Jacket Water Standpipe Make-up Header Isolation Valve, is closed.
(DG B Room)

End of Appendix

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JPM BASIS INFORMATION

TASK:	0500010601 Place containment refueling purge subsystem in service						
TASK STANDARD:	Containment Power Access Purge Subsystem placed in service.						
K/A:	3.8 029 A2.03		K/A RATING:	RO:	2.7	SRO:	3.1
K/A:			K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40OP-9CP01, Containment Purge System						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: John Dedon Date: 09/09/2007

Revised By: Alan Malley Date: 11/17/2011

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Planning organization for resolution.

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PVNGS JOB PERFORMANCE MEASURE
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1. SIMULATOR SETUP:

- IC#: 108 (This JPM is designed to run with JS-2 for the 2012 NRC exam)

- SCENARIOS, MALFUNCTIONS, OVERRIDES,etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
  - None
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40OP-9CP01 available with prerequisites signed off. This JPM was written using Revision 19 of 40OP-9CP01, however, this JPM may be run with later revisions of the procedure if it is verified that the later revisions do not affect this JPM.

If IC-108 is not available perform the following:

- rfCH03 f:open - Opens IA supply to CP-UV-4A, IA-VB47
- rfCH04 f:open - Opens IA supply to CP-UV-5B, IA-VB45
- rfIP38 f:0.00 - Sets Containment pressure to 0.0 psig

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Containment entry is to be made this shift**

INITIATING CUE:

- **The CRS direct you to place the Containment Power Access Purge Subsystem in service per 40OP-9CP01, Containment Purge System, Section 6.0.**
- **An Auxiliary Operator has been briefed and is in the field.**
- **All prerequisites are complete.**
- **The CRS has authorized breaking the ZZ06 locks and the ZZ06 book has been filled out.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Step 6.3.1: Ensure that the channel checks in 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test that are required to meet SR 3.3.8.1 forRU-37 and/or RU-38 are current.	**INFORM CUE:** **Effluents Tech reports that 74ST-9SQ07 is current.**	Examinee contacts Effluent Tech to determine if 74ST-9SQ07 is current.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 6.3.2: Unlock and open IAN-VB45, Air Supply to CPB-UV-5B and CP-HV-43 per40AC-0ZZ06.	**INFORM CUE:** **The Auxiliary Operator reports that IAN-VB45, Air Supply to CPB-UV-5B and CP-HV-43 has been unlocked and opened.**	Examinee directs an Auxiliary Operator to unlock and open IAN-VB45, Air Supply to CPB-UV-5B and CP-HV-43 per40AC-0ZZ06.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 6.3.3: Unlock and open IAN-VB47, Air Supply to CPA-UV-4A per 40AC-0ZZ06.	**INFORM CUE:** **The Auxiliary Operator reports that IAN-VB47, Air Supply to CPA-UV-4Ahas been unlocked and opened.**	Examinee directs an Auxiliary Operator tounlock and open IAN-VB47, Air Supply to CPA-UV-4A.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 6.3.4: **IF** RU-34 is available,**THEN** place it in service as follows: • Ensure CPB-V024 is open. (Isolation between Power Access PurgeDuct and RU-34). • Ensure CPB-V023 is closed. (Isolation between Refueling Purge Ductand RU-34).	**INFORM CUE:** **The Auxiliary Operator reports that CPB-V024 (Isolation between Power Access Purge Duct and RU-34) has been opened and CPB-V023 (Isolation between Refueling Purge Duct and RU-34) has been closed.**	Examinee directs an Auxiliary Operator to: • open CPB-V024 (Isolation between Power Access PurgeDuct and RU-34). • close CPB-V023 (Isolation between Refueling Purge Ductand RU-34).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 6.3.5: Ensure Containment Pressure is less than or equal to 0.03 psig (1" H2O) or negative pressure damage may occur to ductwork when fan CPN-J02starts.		Examinee verifies containment pressure less than or equal to 0.03 psig.
SAT / UNSAT **Comments (required for UNSAT):**			

Note prior to step 6.3.6

NOTE

When starting the Containment Power Access Purge Supplyand Exhaust Units, the "CNTMT PRG SYS TRBL" alarm, Annunciator Window 7A10B, alarms temporarily on"Component Low Differential Pressure" and clears in a fewseconds.

	STEP	CUE	STANDARD
6. *	Step 6.3.6: Place CPN-HS-1, Containment Purge Mode Selector Switch in theACCESS PURGE position to start the Containment Power AccessPurge.		Examinee places CPN-HS-1 in the ACCESS PURGE position.
SAT / UNSAT **Comments (required for UNSAT):**			

Note before step 6.3.7

NOTE

After CPA-HS-4 and CPB-HS-5 are taken to open:

1. CPA-UV-4B, CPB-UV-5B and CPN-PV-43open. If containment pressure is less thanor equal to 0.03 psig, CPA-UV-4A andCPB-UV-5A also open. If UV-4A/5A doesn'topen, dual indication will be received onHS-4 and HS-5.
2. Dampers M03, M06 and M07 open.
3. Fans CPN-A02 and CPN-J02 start.

	STEP	CUE	STANDARD
7. *	Step 6.3.7: Place CPA-HS-4, Containment Power Access Purge Isolation ValvesCP-UV-4A/4B to the OPEN position.		Examinee places CPA-HS-4 to the OPEN position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	Step 6.3.8: **IF** dual position indication is received on CPA-HS-4,**THEN** CPA-HS-4 must be taken to the open position again to openCP-UV-4A.		If the examinee should receive dual indication on CPA-HS-4, the examinee takes CPA-HS-4 to the OPEN position again. Examiner Note: This is not an expected action.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 6.3.9: Place CPB-HS-5, Containment Power Access Purge Isolation ValvesCP-UV-5A/5B to the OPEN position.		Examinee places CPB-HS-5 to the OPEN position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Step 6.3.10: **IF** dual position indication is received on CPB-HS-5,**THEN** CPB-HS-5 must be taken to the open position again to openCP-UV-5A.		If the examinee should receive dual indication on CPB-HS-5 the examinee takes CPB-HS-5 to the OPEN position again. Examiner Note: This is not an expected action.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11.	Step 6.3.11: Check that CPN-PV-43, Vent Valve is open by observing the red ValvePosition Indicator on B07 is illuminated.	**INFORM CUE:** **Another operator will complete the remainder of this procedure.**	Examinee checks that CPN-PV-43 is open.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Planning organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
001	12/04/2003	6	Corrected setting for containment pressure in setup.
002	08/09/2007	6	Updated simulator commands
003	01/12/2011	6	Updated format and procedure revision
004	11/17/2011	6	Added IC for 2012 NRC exam.

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Containment entry is to be made this shift**

INITIATING CUE:

- **The CRS direct you to place the Containment Power Access Purge Subsystem in service per 40OP-9CP01, Containment Purge System, Section 6.0.**
- **An Auxiliary Operator has been briefed and is in the field.**
- **All prerequisites are complete.**
- **The CRS has authorized breaking the ZZ06 locks and the ZZ06 book has been filled out.**

6.1.8 Containment Pressure must be vented to less than or equal to 0.03 psig (1" H_20) before Power Access Purge Subsystem may be started, or damage to supply fan ductwork may occur due to Excessive Positive Pressure from Containment.

6.1.9 The temperature at the outlet of the Power Access Purge AHU is controlled by TIC-12 which controls the Heating Element if the temperature drops below 90°F. TIC-28 controls the Chilled Water to the Air Cooling section if the temperature goes above 90°F. The set point for both CPN-TIC-212 and CPN-TIC-28 is 90°F.

6.1.10 This section of the procedure takes approximately one hour to complete.

6.2 Prerequisites

6.2.1 The Instrument and Service Air System is in service per 40OP-9IA01, Instrument Air System (IA).

6.2.2 The Normal Chilled Water System is in service per 40OP-9WC01, Normal Chilled Water System (WC).

6.2.3 Radioactive Effluent Release Permit has been approved per 774RM-9EF20, Gaseous Radioactive Release Permits and Offsite Dose Assessment or the requirements of step 6.1.2 are met if no Radioactive Effluent Release Permit is required.

6.2.4 Containment pressure has been lowered to less than or equal to 0.03 psig (1" H_20), on Narrow Range Containment Pressure instrument HCP-351A and HCP-351B (HCP-351C and HCP-351D are stable or lowering, consistent with Section 5.0 of this procedure).

6.2.5 The Containment Purge Mode Selector Switch, CPN-HS-1 on B07 in the Control Room is in the STOP position.

6.2.6 Appendix A - Containment Purge Valve Verification List is complete.

6.2.7 Appendix B - Power Access Purge Electrical Verification List is complete.

6.2.8 REP has been issued if required.

6.3 Instructions

___ 6.3.1 Ensure that the channel checks in 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test that are required to meet SR 3.3.8.1 for RU-37 and/or RU-38 are current.

___ 6.3.2 Unlock and open IAN-VB45, Air Supply to CPB-UV-5B and CP-HV-43 per 40AC-0ZZ06.

___ 6.3.3 Unlock and open IAN-VB47, Air Supply to CPA-UV-4A per 40AC-0ZZ06.

6.3.4 **IF** RU-34 is available,
THEN place it in service as follows:

____ 1. Ensure CPB-V024 is open. (Isolation between Power Access Purge Duct and RU-34).

____ 2. Ensure CPB-V023 is closed. (Isolation between Refueling Purge Duct and RU-34).

____ 6.3.5 Ensure Containment Pressure is less than or equal to 0.03 psig (1" H_2O) or negative pressure damage may occur to ductwork when fan CPN-J02 starts.

---------- **NOTE** ----------

When starting the Containment Power Access Purge Supply and Exhaust Units, the "CNTMT PRG SYS TRBL" alarm, Annunciator Window 7A10B, alarms temporarily on "Component Low Differential Pressure" and clears in a few seconds.

____ 6.3.6 Place CPN-HS-1, Containment Purge Mode Selector Switch in the ACCESS PURGE position to start the Containment Power Access Purge.

---------- **NOTE** ----------

After CPA-HS-4 and CPB-HS-5 are taken to open:

1) CPA-UV-4B, CPB-UV-5B and CPN-PV-43 open. If containment pressure is less than or equal to 0.03 psig, CPA-UV-4A and CPB-UV-5A also open. If UV-4A/5A doesn't open, dual indication will be received on HS-4 and HS-5.
2) Dampers M03, M06 and M07 open.
3) Fans CPN-A02 and CPN-J02 start.

____ 6.3.7 Place CPA-HS-4, Containment Power Access Purge Isolation Valves CP-UV-4A/4B to the OPEN position.

____ 6.3.8 **IF** dual position indication is received on CPA-HS-4,
THEN CPA-HS-4 must be taken to the open position again to open CP-UV-4A.

____ 6.3.9 Place CPB-HS-5, Containment Power Access Purge Isolation Valves CP-UV-5A/5B to the OPEN position.

____ 6.3.10 **IF** dual position indication is received on CPB-HS-5, **THEN** CPB-HS-5 must be taken to the open position again to open CP-UV-5A.

____ 6.3.11 Check that CPN-PV-43, Vent Valve is open by observing the red Valve Position Indicator on B07 is illuminated.

____ 6.3.12 Log the time that the 8 inch Containment Purge Valves were opened on the release permit.

6.3.13 Notify **BOTH** of the following of the start time for the release:

____ RMS/Effluents Technician

____ Unit Radiation Protection

____ 6.3.14 **IF** the Containment Power Access Purge will continue beyond the shift, **THEN** contact the RMS/Effluents Technician to ensure the Shiftly ST required by SR 3.3.8.1 is current per 74ST-9SQ07, Radiation Monitoring System Shiftly Surveillance Test.

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JPM BASIS INFORMATION

TASK:	L225164 Borate the RCS to satisfy the Reactivity Control safety function					
TASK STANDARD:	Boration commenced per Standard Appendix Attachment 103-B					
K/A:	3.1 004 A4.07	K/A RATING:	RO:	3.9	SRO:	3.7
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	10 minutes			
REFERENCES:	40EP-9EO10, Standard Appendices, Appendix 103					

SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***Yes***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Alan Malley Date: 10/04/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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1. SIMULATOR SETUP:

- IC#: 108 (This IC is setup to run with JS-1 for the 2012 NRC exam)
- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
  - Set the boric acid totalizer to 100 gallons
  - Ensure the power reset alarm is cleared on CHN-FQIS-210Y,Boric Acid Makeup Totalized Flow Control
- REQUIRED CONDITIONS:
  - Reactor Tripped with >1 CEA stuck out
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40EP-9EO10, Standard Appendices, Appendix 103 available. This JPM was written using Revision 69 (the pages for Appendix 103 will say Rev 69 at top of page) of 40EP-9EO10. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

If IC-108 is not available for this JPM perform the following:
- ImfcmCNCV08CHNFIC210Y_1 f:0 – fails the boric acid controller output to 0.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Unit 1 was tripped manually,**
- **More than 1 full-strength CEA did not fully insert.**

INITIATING CUE:

- **The CRS directs you to borate per Standard Appendix 103 using the normal boration flowpath.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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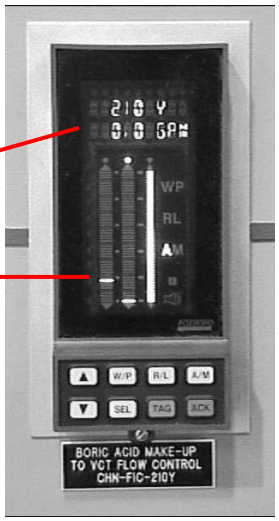
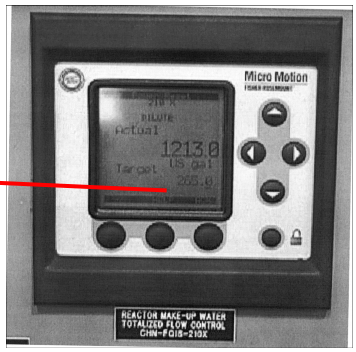
JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Step 1 of Appendix 103: PERFORM **ANY** of the following Attachments based on current plant conditions: **Normal Boration Path** • Attachment 103-A		Examinee determines Attachment 103-A is the Normal Boration Path.
SAT / UNSAT **Comments (required for UNSAT):**			

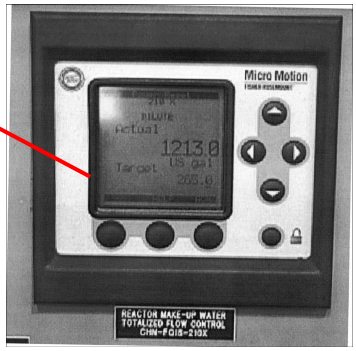
	STEP	CUE	STANDARD
2.	Step 1 of Attachment 103-A: Set the boric acid makeup flowrate on CHN-FIC-210Y, Boric Acid Makeup to VCT Flow Control, to40 gpm or less.	Flowrate Setpoint	Examinee ensures CHN-FIC-210Y is set to less than 40 gpm. 
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 2 of Attachment 103-A: Set the "Target" makeup volume (gallons) on CHN-FQIS-210Y,Boric Acid Makeup Totalized Flow Control, to a minimum of 5000 gallons.	"Target"	The examinee sets the "Target" makeup on CHN-FQIS-210Y to a minimum of 5000 gallons. 
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 3 of Attachment 103-A: Place CHN-HS-210, Makeup Mode Select Switch, in "BORATE".		Examinee places CHN-HS-210 to "BORATE".
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 4 of Attachment 103-A: Check one Boric Acid Makeup Pump is running.		Examinee checks Boric Acid Makeup Pump is running.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 5 of Attachment 103-A: Ensure CHN-UV-527, Makeup to CHRG PMPS (VCT Bypass), is open.		Examinee ensures CHN-UV-527 is open.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 6 of Attachment 103-A: If the left pushbutton onCHN-FQIS-210Y indicates "End", then press the "End" pushbutton.	"Left pushbutton"	The examinee pushes the left pushbutton if it is reading "END". If not the examinee N/As this step. 
SAT / UNSAT/ NA **Comments (required for UNSAT):**			

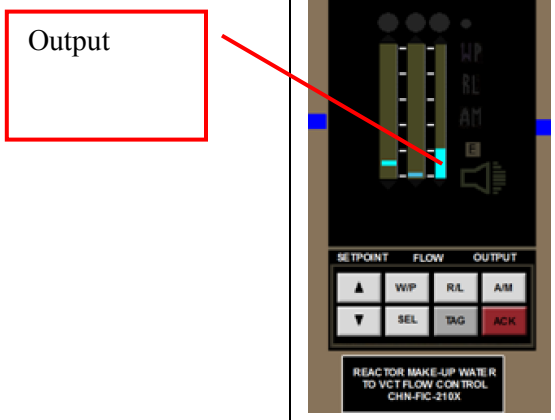
	STEP	CUE	STANDARD
8.	Step 7 of Attachment 103-A: If the left pushbutton onCHN-FQIS-210Y indicates "Reset", then press the "Reset" pushbutton.		The examinee pushes the left pushbutton if it is reading "RESET". If not the examinee N/As this step.
SAT / UNSAT/ NA **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9.	Step 8 of Attachment 103-A: Press the "Start" pushbutton onCHN-FQIS-210Y.		The examinee pushes the "START" pushbutton.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Step 9 of Attachment 103-A: Check for **BOTH** of the following: a) CHN-FIC-210X indicates no Reactor Makeup Water flow.(CHN-FV-210X closed) b) Proper flow indicated onCHN-FIC-210Y.	**Inform Cue (After examinee determines this path will not work):** **The CRS directs you to use Attachment 103B**	Examinee determines that flow is not indicated on CHN-FIC-210Y. The examinee may attempt to operate CHN-FIC-210Y in manual, but the controller will not function in manual. **ALTERNATE PATH STARTS HERE.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11.	Step 1 of Attachment 103-B: Ensure that CHE-HV-532, RWT to Boric Acid Makeup Pumps, is open.		Examinee verifies CHE-HV-532 open.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
12. *	Step 2 of Attachment 103-B: Place CHN-HS-527, VCT Bypass in the "CLOSE" position.		Examinee places CHN-HS-527 in "CLOSE".
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
13.	Step 3 of Attachment 103-B: Ensure CHN-FIC-210X,ReactorMakeup Water to VCT Flow Control, is in manual with 0%output.	Output 	Examinee ensures CHN-FIC-210X in manual with a 0% output.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
14.	Step 4 of Attachment 103-B: Ensure CHE-HV-536, RWT to Charging Pumps, is closed.		Examinee verifies CHN-HV-536 closed.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
15. *	Step 5 of Attachment 103-B: Open CHN-UV-514, Boric Acid Makeup to Charging Pumps.		Examinee opens CHN-UV-514.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
16. *	Step 6 of Attachment 103-B: Close CHN-UV-510, BAMP Recirc to RWT.		Examinee closes CHN-UV-510.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
17.	Step 7 of Attachment 103-B: Start a BAMP.		Examinee starts a BAMP unless it is still running from earlier attempt to borate.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
18.	Step 8 of Attachment 103-B: Start additional Charging Pumps as needed.	**Inform Cue:** **The CRS does not desire to start an additional charging pump.** **Another operator will complete this attachment.**	Examinee may ask CRS if he wants additional charging pumps running or may N/A this step.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS

REASON REVISED Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 was tripped manually,**
- **More than 1 full-strength CEA did not fully insert.**

INITIATING CUE:

- **The CRS directs you to borate per Standard Appendix 103 using the normal boration flowpath.**

Appendix 103,
RCS Makeup / Emergency Boration

INSTRUCTIONS | CONTINGENCY ACTIONS

____ 1. PERFORM **ANY** of the following Attachments based on current plant conditions:

Normal Boration Path

- Attachment 103-A

CHN-UV-514

- Attachment 103-B
  - RWT > 73%
  - BAMP available
- Attachment 103-C
  - RWT > 73%
  - BAMP **NOT** available

CHE-HV-536

- Attachment 103-D
  - RWT > 73%
  - PC Cleanup Pump **NOT** aligned to RWT
- Attachment 103-E
  - RWT > 92%
  - PC Cleanup Pump Recircing RWT
- Attachment 103-F
  - 83%≤ RWT ≤92%
  - PC Cleanup Pump Recircing RWT

Attachment 103-A **Normal Boration Path** **Page 1 of 2**

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 1. Set the boric acid makeup flow rate on CHN-FIC-210Y, Boric Acid Makeup to VCT Flow Control, to 40 gpm or less.	
___ 2. Set the "Target" makeup volume (gallons) on CHN-FQIS-210Y, Boric Acid Makeup Totalized Flow Control, to a minimum of 5000 gallons.	
___ 3. Place CHN-HS-210, Makeup Mode Select Switch, in "BORATE".	
___ 4. Check one Boric Acid Makeup Pump is running.	
___ 5. Ensure CHN-UV-527, Makeup to CHRG PMPS (VCT Bypass), is open.	
___ 6. **IF** the left pushbutton on CHN-FQIS-210Y indicates "End", **THEN** press the "End" pushbutton.	

Attachment 103-A **Normal Boration Path** **Page 2 of 2**

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 7. **IF** the left pushbutton on CHN-FQIS-210Y indicates "Reset", **THEN** press the "Reset" pushbutton.	
___ 8. Press the "Start" pushbutton on CHN-FQIS-210Y.	
___ 9. Check for **BOTH** of the following: a. CHN-FIC-210X indicates no Reactor Makeup Water flow. (CHN-FV-210X closed) b. Proper flow indicated on CHN-FIC-210Y.	
___ 10. Adjust the boric acid makeup setpoint on CHN-FIC-210Y to greater than or equal to 44 gpm.	

End of Attachment

Attachment 103-B **CHN-UV-514 / BAMP** **Page 1 of 2**

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 1. Ensure that CHE-HV-532, RWT to Boric Acid Makeup Pumps, is open.	
___ 2. Place CHN-HS-527, VCT Bypass in the “CLOSE” position.	
___ 3. Ensure CHN-FIC-210X, Reactor Makeup Water to VCT Flow Control, is in manual with 0% output.	
___ 4. Ensure CHE-HV-536, RWT to Charging Pumps, is closed.	
___ 5. Open CHN-UV-514, Boric Acid Makeup to Charging Pumps.	
___ 6. Close CHN-UV-510, BAMP Recirc to RWT.	
___ 7. Start a BAMP.	
___ 8. Start additional Charging Pumps as needed.	

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 9. **WHEN** it is desired to restore charging pump suction to the VCT, **THEN** perform the following: a. Ensure CHN-UV-501 is open. b. Close CHN-UV-514. c. Stop **ANY** running BAMP(s). d. Place CHN-HS-510 in the Open/Auto position.	

End of Attachment

INSTRUCTIONS

___ 1. Ensure that CHE-HV-532, RWT to Boric Acid Makeup Pumps, is open.

___ 2. Place CHN-HS-527, VCT Bypass in the “CLOSE” position.

___ 3. Ensure CHN-FIC-210X, Reactor Makeup Water to VCT Flow Control, is in manual with 0% output.

___ 4. Ensure CHE-HV-536, RWT to Charging Pumps, is closed.

___ 5. Ensure no more than two Charging Pumps are running.

___ 6. Ensure that the third Charging Pump handswitch is in PTL.

___ 7. Direct an operator to open CHN-V164, Boric Acid Filter Bypass. (120 ft. Filter Gallery Room)

CONTINGENCY ACTIONS

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 8. **IF** a PC Cleanup Pump is in service taking a suction from the RWT,
THEN direct an operator to perform the following:

a. **IF** Fuel Pool Cleanup Pump A is being used for RWT transfer or cleanup,
THEN perform the following:

1) Stop "FUEL POOL CLEANUP PUMP 1".
(Local Control Panel PCN-E02, 120' Fuel Bldg)

2) Close PCN-V043, "CLEANUP PMP A DISCH ISO".
(100' FB Fuel Pool Clng, Cleanup Pumps & HX Room)

b. **IF** Fuel Pool Cleanup Pump B is being used for RWT transfer or cleanup,
THEN perform the following:

1) Stop "FUEL POOL CLEANUP PUMP 2".
(Local Control Panel PCN-E02, 120' Fuel Bldg)

2) Close PCN-V059, "CLEANUP PMP B DISCH ISO"
(100' FB Fuel Pool Clng, Cleanup Pumps & HX Room)

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 9. Direct an Operator to open **BOTH** of the following:

- Open CHN-V753, BAMP Discharge to PC System Isolation. (70' Aux Bldg BAMP Rm)
- Open CHN-V144, SFP to BAMP Suction Header Isolation valve. (70' Aux Bldg BAMP Rm)

___ 10. Open CHN-UV-514, Boric Acid Makeup to Charging Pumps.

___ 11. Close CHN-UV-510, BAMP Recirc to RWT.

___ 12. Place and hold CHN-HS-501, VCT Outlet to "CLOSE".

___ 13. Direct an operator to open NHN-M7208, CHN-UV-501.

___ 14. **WHEN** NHN-M7208 is open, **THEN** release CHN-HS-501.

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 15. **IF** one Charging Pump is running, **AND** the second pump will be started, **THEN** perform the following: a. Ensure at least 20 seconds since last pump start or suction valve manipulation. b. Start the second Charging Pump.	

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 16. **WHEN** it is desired to restore charging pump suction to the VCT, **THEN** perform the following: a. Direct an operator to close breaker NHN-M7208. b. Ensure CHN-UV-501 is open. c. Close CHN-UV-514. d. Direct an operator to close **ALL** of the following: • CHN-V164, Boric Acid Filter Bypass. (120' Filter Gallery Room). • CHN-V753, BAMP Discharge to PC System Isolation. (70' Aux Bldg BAMP Rm) • CHN-V144, SFP to BAMP Isolation valve. (70' Aux Bldg BAMP Rm) e. Place CHN-HS-510 in the Open/Auto position.	

End of Attachment

Attachment 103-D **CHE-HV-536 / No PC Cleanup** **Page 1 of 2**

INSTRUCTIONS

___ 1. Ensure that CHE-HV-532, RWT to Boric Acid Makeup Pumps, is open.

___ 2. Place CHN-HS-527, VCT Bypass, in the "CLOSE" position.

___ 3. Ensure CHN-FIC-210X, Reactor Makeup Water to VCT Flow Control, is in manual with 0% output.

___ 4. Place CHN-HS-210, Makeup Mode Select Switch in "MANUAL".

___ 5. Ensure the BAMPs are stopped.

___ 6. Open CHE-HV-536, RWT to Charging Pumps.

___ 7. Close CHN-UV-501, Volume Control Tank Outlet.

CONTINGENCY ACTIONS

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 8. **IF** one Charging Pump is running, **AND** the second pump will be started, **THEN** perform the following: a. Ensure at least 20 seconds since last pump start or suction valve manipulation. b. Start the second Charging Pump.	
___ 9. **WHEN** it is desired to restore charging pump suction to the VCT, **THEN** perform the following: a. Open CHN-UV-501. b. Close CHE-HV-536.	

End of Attachment

Attachment 103-E **CHE-HV-536 / RWT >92% / PC Cleanup** **Page 1 of 2**

INSTRUCTIONS

___ 1. Ensure that CHE-HV-532, RWT to Boric Acid Makeup Pumps, is open.

___ 2. Place CHN-HS-527, VCT Bypass in the “CLOSE” position.

___ 3. Ensure CHN-FIC-210X, Reactor Makeup Water to VCT Flow Control, is in manual with 0% output.

___ 4. Place CHN-HS-210, Makeup Mode Select Switch in “MANUAL”.

___ 5. Ensure the BAMPs are stopped.

___ 6. Ensure no more than two Charging Pumps are running.

___ 7. Ensure that the third Charging Pump handswitch is in PTL.

___ 8. Open CHE-HV-536, RWT to Charging Pumps.

___ 9. Close CHN-UV-501, Volume Control Tank Outlet.

CONTINGENCY ACTIONS

INSTRUCTIONS	CONTINGENCY ACTIONS
___ 10. **IF** additional Charging Pumps will be started, **THEN** perform the following: a. Ensure at least 20 seconds since the last pump start or suction valve manipulation. b. Start additional Charging Pumps as needed.	
___ 11. **WHEN** it is desired to restore charging pump suction to the VCT, **THEN** perform the following: a. Open CHN-UV-501. b. Close CHE-HV-536.	

End of Attachment

Attachment 103-F CHE-HV-536 / RWT 83 - 92% / PC Cleanup Page 1 of 4

INSTRUCTIONS

___ 1. Ensure that CHE-HV-532, RWT to Boric Acid Makeup Pumps, is open.

___ 2. Place CHN-HS-527, VCT Bypass, in the “CLOSE” position.

___ 3. Ensure CHN-FIC-210X, Reactor Makeup Water to VCT Flow Control, is in manual with 0% output.

___ 4. Place CHN-HS-210, Makeup Mode Select Switch in “MANUAL”.

___ 5. Ensure the BAMPs are stopped.

___ 6. Ensure no more than two Charging Pumps are running.

___ 7. Ensure the third Charging Pump handswitch is in PTL.

___ 8. Open CHE-HV-536, RWT to Charging Pumps.

___ 9. Close CHN-UV-501, Volume Control Tank Outlet.

CONTINGENCY ACTIONS

INSTRUCTIONS

CONTINGENCY ACTIONS

___ 10. **IF** one Charging Pump is running,
AND the second pump will be started,
THEN perform the following:

a. **IF** Emergency Boration is not required,
THEN perform the following:

1) Open CHN-UV-501, Volume Control Tank Outlet.

2) GO TO substep c.

b. **IF** Emergency Boration is in progress,
THEN direct an operator to perform the following:

1) **IF** Fuel Pool Cleanup Pump A is being used for RWT transfer or cleanup,
THEN perform the following:

- Stop "FUEL POOL CLEANUP PUMP 1". (Local Control Panel PCN-E02, 120' FB)

- Close PCN-V043, "CLEANUP PMP A DISCH ISO". (100' FB Fuel Pool Clng, Cleanup Pumps & HX Room)

(continue)

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 10. (Continued)

2) **IF** Fuel Pool Cleanup Pump B is being used for RWT transfer or cleanup, **THEN** perform the following:

- Stop "FUEL POOL CLEANUP PUMP 2". (Local Control Panel PCN-E02, 120' Fuel Building)
- Close PCN-V059, "CLEANUP PMP B DISCH ISO" (100' Fuel Bldg Fuel Pool Cooling, Cleanup Pumps & HX Room)

c. Ensure at least 20 seconds since last pump start or suction valve manipulation.

d. Start the second Charging Pump.

e. **IF** CHN-UV-501 was opened, **THEN** close CHN-UV-501.

(continue)

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 10. (Continued)

f. **IF** the Fuel Pool Cleanup Pump has been stopped, **AND** the third Charging Pump will be started, **THEN** perform the following:

1) Ensure at least 20 seconds since the last pump start or suction valve manipulation.

2) Start the third Charging Pump.

___ 11. **WHEN** it is desired to restore charging pump suction to the VCT, **THEN** perform the following:

a. Open CHN-UV-501.

b. Close CHE-HV-536.

End of Attachment

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JPM BASIS INFORMATION

TASK:	L211045 Placing the second Feedwater pump on-line.						
TASK STANDARD:	Second Feedwater pump on-line in automatic						
K/A:	3.4 039 A4.03	K/A RATING:	RO:	2.8	SRO:	2.8	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes				
REFERENCES:	40OP-9FT02, FEEDWATER PUMP TURBINE B						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 09/09/2011

Revised By: _____ Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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1. SIMULATOR SETUP:

- IC#: 109 (This IC is setup to run JS-3 and JS-4 for the 2012 NRC exam).

- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
  - None
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9FT02. This JPM was written using Revision 38 of 40OP-9FT02. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

IF IC-109 is not available, perform the following to setup for this JPM:
- Reset to IC-16
- Startup the B feedpump using section 4.3 of 40OP-9FT02 until feedpump speed is ~ 1000 rpm.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Unit 1 is at 50% power.**
- **40OP-9FT02, Main Feedwater Pump B has been completed thru section 4.3 in preparation of placing the B MFP in service.**

INITIATING CUE:

- **The CRS directs you to place the second Feedpump (MFP B) on-line per Section 4.4 of 40OP-9FT02, Main Feedwater Pump B.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

NOTE

The bias adjustment on SGN-FIC-1108, FWPT Speed Setpoint Controller, will add or subtract RPM from its input signal from the Master Controller.

	STEP	CUE	STANDARD
1	Step 4.4.1 Ensure **BOTH** of the following: ___ SGN-FIC-1108, FWPT Speed Setpoint Controller is in auto. ____ FWPT B bias is set with 100 RPM of FWPT A.		Examinee verifies places SGN-FIC-1108 in auto. **Examiner Note:** Auto is "R" on the controller. Examinee adjust FWPT B bias to within 100 RPM of FWPT A.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 4.4.2 WHEN performing Step 4.4.3 through Step 4.4.5, **THEN** ensure proper steam generator levels are maintained.		Examinee verifies current SG levels.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Step 4.4.3 Adjust FTN-HS-54, Manual Speed Control, to match pump discharge pressure with the other FWPT discharge pressure.		Examinee adjusts FTN-HS-54 potentiometer until FWPT B discharge pressure matches FWPT A discharge pressure.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 4.4.4 Ensure FWN-HV-32, FWPT Discharge Valve, for FWN-P01B is open.		Examinee verifies open FWN-HV-32, FWPT B discharge valve.
SAT / UNSAT **Comments (required for UNSAT):**			

NOTE:

Any of the following may be useful when placing the second feed pump in service.

- DFWCS Auto/manual stations display. AM_STNS_C)
- DFWCS Feedwater pump display. (FWP_C)
- PMS page display "FEED PUMP PERFORMANCE" (PC-3)

	STEP	CUE	STANDARD
5.	Step 4.4.5 Perform **ALL** of the following to place FWPT Speed Setpoint Controllers in Auto:		Examinee proceeds to sub steps 1-5.
SAT / UNSAT **Comments (required for UNSAT):**			

NOTE
Using this option may adversely affect Steam Generator levels **if** the controller is adjusted too fast.

	STEP	CUE	STANDARD
6. *	Step 4.4.5 1. Slowly adjust FTN-HS-54, Manual Speed Control, to match FWPT actual speed with the output as read on SGN-FIC-1108, FWPT Speed Setpoint Controller. (within 10 RPM of each other).		Examinee adjusts FTN-HS 54 until FWPT B actual speed is within 10 RPM of the output on SGN-FIC-1108
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 4.4.5 2. **IF** it is desired to adjust the deviation meter with the bias, **THEN** ensure FWPT speed is greater than 4155 RPM.		Examinee circles or NAs this step.
SAT / UNSAT **Comments (required for UNSAT):**			

NOTE:
Step 4.4.5.3 may be performed in parallel with the rest of this section.

	STEP	CUE	STANDARD
8.	Step 4.4.5 3. Notify the FW Pump Engineer that FW Pump "B" is at minimum pump speed operation (shaft seal operation).	**When Requested Cue:** **The CRS will make the notification to Engineering.**	Examinee informs the CRS that FWPT B is at minimum speed and that an Engineering notification should be made.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 4.4.5 4. Adjust the bias on SGN-FIC-1108, FWPT Speed Setpoint Controller, until there is a zero deviation on FTN-SDI-102, Manual/Auto Control Deviation.		Examinee adjusts the "bias" on SGN-FIC-1108, FWPT Speed Setpoint Controller, until there is a zero (0) deviation on FTN-SDI-102.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10. *	Step 4.4.5 5. Place FTN-HS-100, Auto/Manual Selector Switch, in AUTO. (Control of the FWPT will now be with Speed Setpoint Controllers.)		Examinee places FTN-HS-100 in AUTO.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11. *	Step 4.4.5 6. Balance FWPT A and B discharge pressures, flows, and differential pressures between Main Feedwater Pump Discharge Pressure and Main Steam Header Pressure using the bias on SGN-FIC-1107, FWPT Speed Setpoint Controller, and SGN-FIC-1108, FWPT Speed Setpoint Controller.	**Inform Cue: When FWPT pressure and flows are balanced – This JPM is complete -.**	Examinee adjusts the "bias" on the A and B FWPT Speed Setpoint Controllers (SGN-FIC-1107/1108) as needed to balance discharge pressures, flows and differential pressures between the Main Feed Pumps.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	09/09/2011	New JPM	

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 is at 50% power.**
- **40OP-9FT02, Main Feedwater Pump B has been completed thru section 4.3 in preparation of placing the B MFP in service.**

INITIATING CUE:

- **The CRS directs you to place the second Feedpump (MFP B) on-line per Section 4.4 of 40OP-9FT02, Main Feedwater Pump B.**

4.4 Placing the Second Feedwater Pump On-Line

---------- **NOTE** ----------

The bias adjustment on SGN-FIC-1108, FWPT Speed Setpoint Controller, will add or subtract RPM from its input signal from the Master Controller.

4.4.1 Ensure **BOTH** of the following:

____ SGN-FIC-1108, FWPT Speed Setpoint Controller, is in auto.

____ FWPT B bias is set within 100 RPM of FWPT A.

____ 4.4.2 **WHEN** performing Step 4.4.3 through Step 4.4.5, **THEN** ensure proper steam generator levels are maintained.

____ 4.4.3 Adjust FTN-HS-54, Manual Speed Control, to match pump discharge pressure with the other FWPT discharge pressure.

____ 4.4.4 Ensure FWN-HV-32, FWPT Discharge Valve, for FWN-P01B is open.

---------- **NOTE** ----------

Any of the following may be useful when placing the second feed pump in service.
- DFWCS Auto/manual stations display. (AM_STNS_C)
- DFWCS Feedwater pump display. (FWP_C)
- PMS page display “FEED PUMP PERFORMANCE” (PC-3).

____ 4.4.5 Perform **ALL** of the following to place FWPT Speed Setpoint Controllers in Auto:

---------- **NOTE** ----------

Using this option may adversely affect Steam Generator levels if the controller is adjusted too fast.

____ 1. Slowly adjust FTN-HS-54, Manual Speed Control, to match FWPT actual speed with the output as read on SGN-FIC-1108, FWPT Speed Setpoint Controller.
(within 10 RPM of each other)

____ 2. **IF** it is desired to adjust the deviation meter with the bias, **THEN** ensure FWPT speed is greater than 4155 RPM.

---------- **NOTE** ----------

Step 4.4.5.3 may be performed in parallel with the rest of this section.

____ 3. Notify the FW Pump Engineer that FW Pump "B" is at minimum pump speed operation (shaft seal operation).

____ 4. Adjust the bias on SGN-FIC-1108, FWPT Speed Setpoint Controller, until there is a zero deviation on FTN-SDI-102, Manual/Auto Control Deviation.

____ 5. Place FTN-HS-100, Auto/Manual Selector Switch, in AUTO. (Control of the FWPT will now be with Speed Setpoint Controllers.)

____ 6. Balance FWPT A & B discharge pressures, flows, and differential pressures between Main Feedwater Pump Discharge Pressure and Main Steam Header Pressure using the bias on SGN-FIC-1107, FWPT Speed Setpoint Controller, and SGN-FIC-1108, FWPT Speed Setpoint Controller.

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JPM BASIS INFORMATION

TASK:	0120020701Fill a Safety Injection Tank						
TASK STANDARD:	SIT 2B level restored to the normal band.						
K/A:	3.3 006 A1.13	K/A RATING:	RO:	3.5	SRO:	3.7	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	20 minutes				
REFERENCES:	40OP-9SI03						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 09/09/2011

Revised By: _____ Date: _____

Technical Review _____ Operations Approval _____

EP Review **N/A** Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *
** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC EXAM

1. SIMULATOR SETUP:

- IC#: 109 (This IC is setup to run JS-3 and JS-4 for the 2012 NRC exam.)

- SCENARIOS, MALFUNCTIONS, OVERRIDES,etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
  - None
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40OP-9SI03. This JPM was written using Revision 33 of 40OP-9SI03. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
8	Go to simulator diagram page SI1 and click on Components/Motor Operated valves (CRF)/SIBUV667/crMVSI01SIBUV667_9 and adjust slowly as the operator directs. (It should end up ~ f:40)	When directed to throttle SIB-UV-667 to reach 1400 psig.
11	MRF SI05 f:5	When directed to throttle open SIB-V400

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Level in SIT 2B has been lowering over the last 24 hours.**
- **Maintenance has identified a leaking connection.**
- **Engineering is developing a trouble shooting game plan.**
- **HPSI pump "B" pre-start checks have been completed.**
- **SIE-V463, SIT Fill and Drain Line Containment Isolation is OPEN with a dedicated assigned at the valve to close the valve if required. (A manual SESS has been inserted).**
- **SIB-V219, Mini Flow Recirc Orifice Bypass Valve is OPEN.**
- **HPSI "B" has been declared Inoperable and unavailable.**
- **SIB-UV-667, HPSI "B" to the RWT isolation valve has been throttled 9 turns OPEN.**
- **The HPSI discharge header was vented during the previous shift.**
- **SIE-V220, SIT "2B" Fill & Drain Header Manual Isol Valve has been verified open.**
- **Manual HPSI B SESS alarm has been inserted**
- **40OP-9SI03, section 6.3 (Filling the Safety Injection Tanks to Establish or Maintain Normal level has been completed thru step 6.3.5.25.**

INITIATING CUE:

- **The CRS directs you tostart HPSI pump "B" and fill the 2B SIT starting at step 6.3.5.26 of 40OP-9SI03 to maintain/restore normal level in SIT 2B.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

NOTE
When HPSI Pump B is started, it will be recircing to the RWT.

CAUTION
HPSI pump operation between 85 and 225 gpm for greater than 1 hour will result in pump damage.

	STEP	CUE	STANDARD
1. *	Step 6.3.5.26 Start HPSI Pump B using SIB-HS-2, HPSI PUMP B P02.	**If requested cue:** **The Auxiliary Operator reports everyone is clear of the HPSI pump.**	Examinee starts HPSI Pump B using SIB-HS-2.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 6.3.5.27 Verify ALL of the following expected responses: • Discharge pressure is indicated on SIN-PI-309, HPSI HEADER B TO RC LOOPS PRESSURE • **Unit 1 Only -** Motor run current less than 120 amps		Examinee verifies discharge pressure (approximately 1800 psi) indicated on SIN-PI-309 and motor run amps <120.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 6.3.5.28 **IF** anomalous HPSI Pump indications are observed, **THEN** perform the following: a. Notify the CRS immediately. b. Consider stopping HPSI Pump B. c. Evaluate the reason for anomalous indications.		Examinee verifies no anomalous HPSI Pump indications.
SAT / UNSAT **Comments (required for UNSAT):**			

NOTE

When a HPSI pump is first started, some seal leakage is expected for a short duration.

During normal HPSI pump operation, a dripping seal is normally acceptable, a steady stream is indication of seal damage.

	STEP	CUE	STANDARD
4.	Step 6.3.5.29 Inspect HPSI Pump B seals for leakage.	**When Requested Cue:** **AO reports only a dripping seal with no indication of unusual leakage at HPSI pump "B".**	Examinee directs AO to inspect HPSI pump "B" seals for leakage.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 6.3.5.30 **IF** leakage is discovered at the pump seals, **THEN** notify System Engineering.		Examinee NAs step.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 6.3.5.31 Verify that HAB-Z01, Aux. Bldg. HPSI Pump Room Ess. Air Control Unit, has started by ONE of the following methods: • SEAS window 12L blue light at ESB-UA-2F is not on when status display button on ESB-UA-2D is depressed • Local observation that HAB-Z01 is running.	**If Requested Cue:** **AO verifies that HAB-Z01 is running.**	Examinee verifies that HAB-Z01 is running by either SEAS window 12L or local indication.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 6.3.5.32 **IF** HAB-Z01 Aux. Bldg. HPSI Pump Room Ess. Air Control Unit, did NOT start when HPSI Pump B started, **THEN** notify the SM/CRS.		Examinee NAs step.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 6.3.5.33 Throttle manually SIB-UV-667, HPSI "B" to the RWT Isolation Valve, to adjust HPSI Pump B discharge pressure to 1400 psig indicated on SIN-PI-309, HPSI Pmp B HdrDisch Press.		Examinee directs AO to throttle closed on SIB-UV-667 until SIN-PI-309 indicates approximately 1400 psig. **Examiner Note: Driver action required to throttle closed SIB-UV-667.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 6.3.5.34 Open SIA-UV-682 using SIA-HS-682, MISC DRAIN HEADER TO RWT VLV.		Examinee opens SIA-UV-682.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Step 6.3.5.35 Unlock SIB-V400, SIT Fill and Drain Isolation Valve HPSI Recirc, per 40AC-0ZZ06, Locked Valve, Breaker and Component Control.	**When Requested Cue:** **SIB-V400 has been unlocked per 40AC-0ZZ06.**	Examinee directs AO to unlock SIB-V400.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11.	Step 6.3.5.36 Throttle open SIB-V400, SIT Fill and Drain Isolation Valve HPSI Recirc, slowly to control SIT fill rate.	**When Requested Cue:** **AO throttles SIB-V400 as directed.**	Examinee directs AO to throttle open SIB-V400.
SAT / UNSAT **Comments (required for UNSAT):**			

NOTE

If a SIT Fill and Drain Manual Isolation Valve is closed to isolate an inoperable and open SIT Fill and Drain Air Operated Valve, opening the SIT Fill and Drain Manual Isolation Valve makes the associated SIT inoperable and LCO 3.5.1 or LCO 3.5.2 is applicable.

	STEP	CUE	STANDARD
12.	Step 6.3.5.37 **IF** the SIT Fill & Drain Manual Isolation Valve for the SIT to be filled is closed, **THEN** open the SIT Fill & Drain Manual Isolation Valve for the SIT to be filled: • SIE-V220, SIT "2B" Fill & Drain Header Manual Isol Valve	**If Requested Cue:** **SIE-V220 has been verified open.**	Examinee NAs step.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
13.	Step 6.3.5.38 **IF** the unit is in MODES 1 through 4, **THEN** record initial SIT level:		Examinee records current SIT level.
SAT / UNSAT **Comments (required for UNSAT):**			

Note:
- Annunciator window 2B11A, SIT LVL HI-LO, alarms on SIT hi level at 63% NR level.
- Annunciator window 2B11B, SIT LVL HI-HI/LO-LO, alarms on SIT hi-hi level at 69% NR level.

	STEP	CUE	STANDARD
14. *	Step 6.3.5.39 Open the SIT Fill & Drain Valve for the SIT to be filled: • SIB-UV-621 using SIB-HS-621, SIT 2B FILL & DRAIN VLV		Examinee OPENS SIB-UV-621.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
15. *	Step 6.3.5.40 Monitor level of the SIT being filled: SIN-LI-313: R) SIT 2B LVL, LT-333 SIB-LI311: L) SIT 2B LVL LT--321	**Inform CUE:** **Another operator will complete the remaining actions.**	Examinee monitors SIT 2B level increase using SIN-LI-313 (NR) and SIB-LI-311 (WR).
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparednessorganization for resolution.

NORMAL TERMINATION POINT

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PVNGS JOB PERFORMANCE MEASURE
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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	09/30/11		New JPM

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Level in SIT 2B has been lowering over the last 24 hours.**
- **Maintenance has identified a leaking connection.**
- **Engineering is developing a trouble shooting gameplan.**
- **HPSI pump "B" pre-start checks have been completed.**
- **SIE-V463, SIT Fill and Drain Line Containment Isolation is OPEN with a dedicated assigned at the valve to close the valve if required. (A manual SESS has been inserted).**
- **SIB-V219, Mini Flow Recirc Orifice Bypass Valve is OPEN.**
- **HPSI "B" has been declared Inoperable and unavailable.**
- **SIB-UV-667, HPSI "B" to the RWT isolation valve has been throttled 9 turns OPEN.**
- **The HPSI discharge header was vented during the previous shift.**
- **SIE-V220, SIT "2B" Fill & Drain Header Manual Isol Valve has been verified open.**
- **Manual HPSI B SESS alarm has been inserted**
- **40OP-9SI03, section 6.3 (Filling the Safety Injection Tanks to Establish or Maintain Normal level has been completed thru step 6.3.5.25.**

INITIATING CUE:

- **The CRS directs you to start HPSI pump "B" and fill the 2B SIT starting at step 6.3.5.26 of 40OP-9SI03 to maintain/restore normal level in SIT 2B.**

6.3 Filling the Safety Injection Tanks to Establish or Maintain Normal Level

6.3.1 Precautions

6.3.1.1 If a pump fails to develop or maintain expected discharge pressure, flow and/or motor current, then along with system valve alignment, gas or vapor binding of the pump should be among the items considered when determining the reason for anomalous indications.

6.3.1.2 Pump indications, such as pump amps, discharge pressure, and/or pump flow should be monitored upon pump start. Indications such as fluctuation of running current, less than expected running current, failure to develop discharge pressure, and/or failure to develop expected flow can indicate pump gas binding, pump cavitation, an isolated suction source, pump suction vortexing, etc..

6.3.2 Limitations

6.3.2.1 Maximum HPSI pump or motor bearing oil temperature is 180°F.

6.3.2.2 HPSI Motor Start Limitations:

- Frequent starting may result in serious damage to the motor on the HPSI pumps.
- If the motor is shutdown for greater than 1 hour, only two consecutive starts may be attempted, allowing the motor to coast to rest between starts.
- If the motor is shutdown for less than 1 hour, only one start may be attempted.
- Any time the motor windings are energized constitutes a start.
- If the above criteria have been met, an interval of 15 minutes with the motor running or 45 minutes with the motor shutdown must elapse prior to any additional starts.

6.3.2.3 Full load amps for the HPSI motor are as follows:

Unit	Full Load Amperage
1	120 amps
2 and 3	115 amps

6.3.2.4 HPSI flow limits are as follows:

Flow Rate	Time Limit
< 85 gpm	Operation Prohibited
85 gpm to 225 gpm	1 Hour Maximum
> 225 gpm	Continuous Operation Allowed
≥ 1130 gpm	No Operation Allowed

6.3.3 Prerequisites

6.3.3.1 Safety Injection Tanks (SIT) and Reactor Coolant System (RCS) configuration support filling of the SIT.

6.3.4 Initial Conditions

6.3.4.1 Section 5.0, Prerequisites and Initial Conditions, is complete.

6.3.4.2 The Refueling Water Tank (RWT) contains sufficient volume for Safety Injection Tank (SIT) filling. Filling one empty SIT lowers RWT level by 2%.

6.3.4.3 If the SIT Fill and Drain Manual Isolation Valve for the SIT(s) to be filled has been closed, then preparations for a containment entry have been made for opening the SIT Fill and Drain Manual Isolation Valve(s) for the SIT(s) being filled:

- SIE-V210, SIT "2A" Fill & Drain Header Manual Isol Valve
- SIE-V220, SIT "2B" Fill & Drain Header Manual Isol Valve
- SIE-V230, SIT "1A" Fill & Drain Header Manual Isol Valve
- SIE-V240, SIT "1B" Fill & Drain Header Manual Isol Valve

6.3.4.4 Risk Management Action Level (RMAL) has been evaluated for HPSI B being inoperable and unavailable.

A 6.3.4.5 If venting of the SITs is anticipated, then ALL of the following have been notified that nitrogen will be released into Containment as a result of venting SITs:

- A • Radiation Protection
- N/A • Containment Coordinator, if the Containment Coordinator position is filled
- N/A • All personnel in Containment, if personnel are in Containment

NOTE

A Venting the SITs with Power Access Purge in operation could cause the Power Access Purge supply dampers to close at 0.03 psig (1 inch water).

N/A 6.3.4.6 If the Containment Power Access Purge is in service, then the following has been performed:

N/A a. Radiation Protection concurrence has been obtained to shutdown the Containment Power Access Purge.

N/A b. The Containment Power Access Purge has been removed from service per 40OP-9CP01, Containment Purge System.

A 6.3.4.7 The SM/CRS has granted permission to manipulate components controlled by 40AC-0ZZ06, Locked Valve, Breaker and Component Control:

- SIE-V463, SIT Fill and Drain Line Isolation Valve
- SIB-V219, Mini Flow Recric Orfice Bypass Valve
- SIB-UV-667, HPSI "B" to the RWT Isolation Valve
- SIB-V478, HPSI Discharge Isolation Valve
- SIB-V400, SIT Fill and Drain Isolation Valve HPSI Recirc

6.3.5 Instructions

A 6.3.5.1 Notify Radiation Protection that a SIT will be filled to allow coordination of ZIP program walkdowns.

A 6.3.5.2 **IF** the SIT is currently filled and pressurized **AND** requires level raised to maintain operability,
THEN GO TO Step 6.3.5.5.

___ 6.3.5.3 Ensure BOTH the Train A and Train B SI vent valves on the SIT(s) to be filled are closed:

SIT	Initial	Train A Valve	Initial	Train B Valve
1A		SIA-HS-607A		SIB-HS-633A
1B		SIA-HS-608A		SIB-HS-643A
2A		SIA-HS-605A		SIB-HS-613A
2B		SIA-HS-606A		SIB-HS-623A

___ 6.3.5.4 Ensure BOTH Train A/Train B SIT vent valves are de-energized:

___ • SIT Vent Valves Power Supply, using keyswitch SIA-HS-17A, SIT VENT VALVES POWER SUPPLY

___ • SIT Vent Valves Power Supply, using keyswitch SIB-HS-18A, SIT VENT VALVES POWER SUPPLY

A 6.3.5.5 Ensure SIE-HV-661 is closed, using SIN-HS-661, COMBINED SIT & MISC DRN HDR TO RDT VLV.

A 6.3.5.6 Ensure SIA-UV-682 is closed, using SIA-HS-682, MISC DRAIN HEADER TO RWT VLV.

NOTE

A Venting on the HPSI discharge header is not necessary if venting has been completed within the previous 24 hours as long as no work or other evolutions took place that could introduce air/voids into the system.

N/A 6.3.5.7 **IF** ANY of the following:

N/A • The HPSI discharge header has NOT been vented in the past 24 hours.

N/A • Work or evolutions have taken place that could introduce air/voids into the system.

THEN perform 40OP-9SI04, Safety Injection System Venting, section for Train B HPSI Header Venting for Pump Run, prior to starting HPSI Pump B.

A 6.3.5.8 Perform the following pre-start checks on HPSI Pump B:

A a. Check D-Panel Breaker PHB-D3807, HPSI Pump 2 Motor Space Heater SIBP02H, closed.

A b. Check the Motor Space Heater light is on at PHB-M3835, Space Htr Filament Xfmrs and Neon Lights Cubicle.

A c. Ensure HPSI Pump and motor bearing oil levels are normal:

Initial	Location
B	Outboard motor bearing oil level
B	Inboard motor bearing oil level
B	Inboard pump bearing oil level
B	Outboard pump bearing oil level

B d. Ensure SIB-V402, HPSI Suction Isolation Valve, is open. (52' HPSI B Room)

A 6.3.5.9 Perform the following to vent HPSI Pump B seal cavity:
(40' HPSI B Room)

B a. Throttle open SIB-V982, HPSI Pump SIB-P02 Seal Cavity Vent Valve.

B b. **WHEN** a solid stream of water has been observed for 2 to 3 minutes, **THEN** close SIB-V982, HPSI Pump SIB-P02 Seal Cavity Vent Valve.

Signature Joe Operator (Initial Performer) Date XX/XX/XXXX

B c. Throttle open SIB-V983, HPSI Pump SIB-P02 Seal Cavity Vent Valve.

B d. **WHEN** a solid stream of water has been observed for 2 to 3 minutes, **THEN** close SIB-V983, HPSI Pump SIB-P02 Seal Cavity Vent Valve.

Signature Joe Operator (Initial Performer) Date XX/XX/XXXX

A 6.3.5.10 Perform an Independent Verification that SIB-V982, HPSI Pump SIB-P02 Seal Cavity Vent Valve, is closed.

Signature Joe Schmoe (Independent Verifier) Date XX/XX/XXXX

A 6.3.5.11 Perform an Independent Verification that SIB-V983, HPSI Pump SIB-P02 Seal Cavity Vent Valve, is closed.

Signature Joe Schmoe (Independent Verifier) Date XX/XX/XXXX

N/A 6.3.5.12 **IF** any air was observed while venting the seal cavity, **THEN** record the results of any air encountered during venting in the Access database located at V:\ECCS_Venting\SIVenting.mde or at \\fs-pv\common-v\ECCS_Venting.

N/A 6.3.5.13 **IF** the Access database is NOT available, **THEN** notify System Engineering of ALL of the following:

- N/A Location of where the air was found
- N/A Valve position while venting
- N/A Amount of time to get an air free vent

___ 6.3.5.14 **IF** a SIAS occurs during performance of this section, **THEN** perform ALL of the following:

___ a. Ensure the SIT fill and drain valves are closed.

___ b. Close SIB-V219, Mini Flow Recric Orfice Bypass Valve. (40' HPSI B Room)

___ c. Open SIB-UV-667 using SIB-HS-667, HPSI PMP B TO RWT ISOL.

___ d. Close SIE-V463, SIT Fill and Drain Line Isolation Valve. (SW East Penn Room)

___ 6.3.5.15 **IF** the unit is in MODES 1 through 4, **THEN** perform the following:

___ a. Insert a manual Containment Isolation SESS alarm.

NOTE

The dedicated operator for closing SIE-V463 is required until SIE-V463 is closed in Step 6.3.5.62.

___ b. Ensure a dedicated operator in continuous communication with the Control Room is assigned for closing SIE-V463 as required by 40DP-9OP19, Locked Valve, Breaker and Component Tracking.

___ 6.3.5.16 Unlock SIE-V463, SIT Fill and Drain Line Containment Isolation Valve, per 40AC-0ZZ06, Locked Valve, Breaker and Component Control. (SW East Penn Room)

___ 6.3.5.17 Open SIE-V463, SIT Fill and Drain Line Containment Isolation Valve.

___ 6.3.5.18 Unlock SIB-V219, Mini Flow Recric Orfice Bypass Valve, per 40AC-0ZZ06, Locked Valve, Breaker and Component Control. (40' HPSI B Room)

NOTE

Opening SIB-V219 renders HPSI B inoperable and unavailable.

___ 6.3.5.19 Open SIB-V219, Mini Flow Recric Orfice Bypass Valve.

A 6.3.5.20 **WHEN** SIB-V219 is open **AND** the unit is in MODES 1 through 4, **THEN** perform ALL of the following:

A a. Notify the SM/CRS.

A b. Insert a manual HPSI B SESS alarm.

A 6.3.5.21 Ensure SIB-UV-667, HPSI Pmp B to RWT Isol, is open.

A 6.3.5.22 Unlock SIB-UV-667, HPSI "B" to the RWT Isolation Valve, per 40AC-0ZZ06, Locked Valve, Breaker and Component Control. (40' HPSI B Room)

A 6.3.5.23 Throttle closed SIB-UV-667, HPSI "B" to the RWT Isolation Valve, to nine turns from open.

N/A 6.3.5.24 **IF** a HPSI Loop Injection Valve is known to leak **AND** the SM/CRS directs,
THEN perform the following:

N/A a. Unlock SIB-V478, HPSI Discharge Isolation Valve, per 40AC-0ZZ06, Locked Valve, Breaker and Component Control. (52' HPSI B Room)

N/A b. Close SIB-V478, HPSI Discharge Isolation Valve.

N/A c. Insert a manual HPSI B SESS alarm.

N/A d. Notify the SM/CRS.

N/A 6.3.5.25 **IF** the HPSI discharge header is required to be vented by Step 6.3.5.7, **THEN** ensure 40OP-9SI04, Safety Injection System Venting, section for Train B HPSI Header Venting for Pump Run, has been completed.

NOTE

___ When HPSI Pump B is started, it will be recircing to the RWT.

CAUTION

___ HPSI pump operation between 85 and 225 gpm for greater than 1 hour will result in pump damage.

___ 6.3.5.26 Start HPSI Pump B using SIB-HS-2, HPSI PUMP B P02.

___ 6.3.5.27 Verify ALL of the following expected responses:

___ • Discharge pressure is indicated on SIN-PI-309, HPSI HEADER B TO RC LOOPS PRESSURE

___ • **Unit 1 Only**
Motor run current less than 120 amps

___ • **Unit 2 and Unit 3 Only**
Motor run current less than 115 amps

___ 6.3.5.28 **IF** anomalous HPSI Pump indications are observed, **THEN** perform the following:

___ a. Notify the CRS immediately.

___ b. Consider stopping HPSI Pump B.

___ c. Evaluate the reason for anomalous indications.

NOTE

___ • When a HPSI pump is first started, some seal leakage is expected for a short duration.

___ • During normal HPSI pump operation, a dripping seal is normally acceptable, a steady stream is indication of seal damage.

___ 6.3.5.29 Inspect HPSI Pump B seals for leakage.

___ 6.3.5.30 **IF** leakage is discovered at the pump seals, **THEN** notify System Engineering.

___ 6.3.5.31 Verify that HAB-Z01, Aux. Bldg. HPSI Pump Room Ess. Air Control Unit, has started by ONE of the following methods:

- ___ • SEAS window 12L blue light at ESB-UA-2F is not on when status display button on ESB-UA-2D is depressed
- ___ • Local observation that HAB-Z01 is running

___ 6.3.5.32 **IF** HAB-Z01 Aux. Bldg. HPSI Pump Room Ess. Air Control Unit, did NOT start when HPSI Pump B started,
THEN notify the SM/CRS.

___ 6.3.5.33 Throttle manually SIB-UV-667, HPSI "B" to the RWT Isolation Valve, to adjust HPSI Pump B discharge pressure to 1400 psig indicated on SIN-PI-309, HPSI Pmp B Hdr Disch Press.

___ 6.3.5.34 Open SIA-UV-682 using SIA-HS-682, MISC DRAIN HEADER TO RWT VLV.

___ 6.3.5.35 Unlock SIB-V400, SIT Fill and Drain Isolation Valve HPSI Recirc, per 40AC-0ZZ06, Locked Valve, Breaker and Component Control.
(40' HPSI B Room, west wall)

___ 6.3.5.36 Throttle open SIB-V400, SIT Fill and Drain Isolation Valve HPSI Recirc, slowly to control SIT fill rate.

NOTE

___ If a SIT Fill and Drain Manual Isolation Valve is closed to isolate an inoperable and open SIT Fill and Drain Air Operated Valve, opening the SIT Fill and Drain Manual Isolation Valve makes the associated SIT inoperable and LCO 3.5.1 or LCO 3.5.2 is applicable.

___ 6.3.5.37 **IF** the SIT Fill & Drain Manual Isolation Valve for the SIT to be filled is closed,
THEN open the SIT Fill & Drain Manual Isolation Valve for the SIT to be filled:

- ___ SIE-V210, SIT "2A" Fill & Drain Header Manual Isol Valve (100' CNMT SE and E of SIT 2A)
- ___ SIE-V220, SIT "2B" Fill & Drain Header Manual Isol Valve (100' CNMT SW and W of SIT 2B)
- ___ SIE-V230, SIT "1A" Fill & Drain Header Manual Isol Valve (100' CNMT NW and N of SIT 1A)
- ___ SIE-V240, SIT "1B" Fill & Drain Header Manual Isol Valve (100' CNMT NW and S of SIT 1B)

___ 6.3.5.38 **IF** the unit is in MODES 1 through 4,
THEN record initial SIT level:

SIT	Indicator	Level
2A	SIN-LT-312	
2B	SIN-LT-322	
1A	SIN-LT-332	
1B	SIN-LT-342	

NOTE

___ • Annunciator window 2B11A, SIT LVL HI-LO, alarms on SIT hi level at 63% NR level.

___ • Annunciator window 2B11B, SIT LVL HI-HI/LO-LO, alarms on SIT hi-hi level at 69% NR level.

___ 6.3.5.39 Open the SIT Fill & Drain Valve for the SIT to be filled:

___ • SIB-UV-611 using SIB-HS-611, SIT 2A FILL & DRAIN VLV

___ • SIB-UV-621 using SIB-HS-621, SIT 2B FILL & DRAIN VLV

___ • SIB-UV-631 using SIB-HS-631, SIT-1A FILL & DRAIN VLV

___ • SIB-UV-641 using SIB-HS-641, SIT 1B FILL & DRAIN VLV

___ 6.3.5.40 Monitor level of the SIT being filled:

Narrow Range SIT Level	
SIN-LI-313	L) SIT 2A LEVEL, LT-313
	R) SIT 2B LEVEL, LT-323
SIN-LI-333	L) SIT 1A LEVEL LT-333
	R) SIT 1B LEVEL LT-343

Wide Range SIT Level	
SIB-LI-311	L) SIT 2A LEVEL, LT-311
	R) SIT 2B LEVEL, LT-321
SIA-LI-331	L) SIT 1A LEVEL LT-331
	R) SIT 1B LEVEL LT-341

___ 6.3.5.41 **IF** SIT level indications are NOT tracking properly, **THEN** perform the following:

___ a. Close the SIT Fill & Drain Valve opened in Step 6.3.5.39.

___ • SIB-UV-611 using SIB-HS-611, SIT 2A Fill & Drain Vlv

___ • SIB-UV-621 using SIB-HS-621, SIT 2B Fill & Drain Vlv

___ • SIB-UV-631 using SIB-HS-631, SIT-1A Fill & Drain Vlv

___ • SIB-UV-641 using SIB-HS-641, SIT 1B Fill & Drain Vlv

___ b. Notify the SM/CRS.

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JPM BASIS INFORMATION

TASK:	1260010101 Respond to an alarm					
TASK STANDARD:	RMWT water added to RDT to lower RDT temperature/pressure					
K/A:	3.5 007 A2.05	K/A RATING:	RO:	3.2	SRO:	3.6
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes			
REFERENCES:	40AL-9RK3A, Panel B03A Alarm Responses					
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***Yes***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 09/30/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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1. SIMULATOR SETUP:

- IC#: 107 (This IC is designed to run JS-5 and JS-6 together for the 2012 NRC exam)

- SCENARIOS, MALFUNCTIONS, OVERRIDES,etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
See Special Instructions	

- SPECIAL INSTRUCTIONS:
  - **After the IC is loaded, place the simulator in run and perform the following to bring the Reactor Drain Tank Hi Temperature alarm to the top of the alarm screen:**
    - Go to the Panel Overview for B03
    - Click on alarm window B03A window 7A.
    - Override "ALARM_OFF" the Reactor Drain Tank Hi Temperature alarm.
    - Then override "No_override" for the Reactor Drain Tank Hi Temperature alarm.
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- This JPM was written using Revision 27 of 40AL-9RK3A. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
None		

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PVNGS JOB PERFORMANCE MEASURE
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TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **A pressurizer relief valve RCE-PSV-201 had been leaking past its seat.**
- **RCS pressure has been reduced to 2210 psia.**
- **Downstream temperatures from RCE-PSV-201 have stabilized.**

INITIATING CUE:

- **The CRS directs you to take action per 40AL-9RK3A, window 3A07B to clear alarm point CHPS268, Reactor Drain Tank Pressure Hi.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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JPM START TIME: _____

NOTE
If the reactor drain tank pressure continues to increase to 10 psig the RDT vent to gas surge header valve CHN-UV-540 and RDT outlet containment isolation valve CHA-UV-560, will close. At approximately120 psid the RDT rupture disc, CHN-PSE-12 will rupture.

	STEP	CUE	STANDARD
1.	First Priority Action, step 1 Check the reactor drain tank pressure Hi Alarm by reading CHN-PI-268 on B03.		Examinee verifies hi pressure in the RDT, approximately 6.0 psig
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	First Priority Action, step 2 **IF** the RDT Hi Temperature Alarm is received, **OR** RDT temperature is increasing, **THEN** GO TO Alarm Response for Window 3A07A, Group A (page 42).		Examinee verifies high temperature and proceeds to window 3A07A, Group A (page 42).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	First Priority Action (3A07A) 1. Consider performing 40AO-9ZZ02, Excessive RCS Leakage, in conjunction with this procedure. 2. Check the Reactor Drain Tank Temperature is greater than orequal to 140°F **OR** increasing by reading Temperature indicatorCHN-TI-268 on panel B03. 3. Monitor RDT pressure at CHN-PI-268 on B03. 4. Monitor the pressurizer relief to RDT temperatures atRCN-TI-106, RCN-TI-107, RCN-TI-108 and RCN-TI-109 on B04 to determine if pressurizer relief leakage is the cause of the Hi Temperature. 5. **IF** a valid alarm is received while shutdown cooling is in service, **THEN** refer to 40EP-9EO11, Lower Mode Function Recovery.	**If requested cue:** **The CRS will address 40AO-9ZZ02.**	Examinee may refer to cue to verify that the Hi temperature and Pressure were due to a leaking Pressurizer PSV.
SAT / UNSAT **Comments (required for UNSAT):**			

NOTE

This alarm response will mitigate a high temperature condition in the RDT.It will also address RDT Hi-Lo Level and RDT Hi pressure conditions whichresults from hot water leakage into the RDT.

	STEP	CUE	STANDARD
5.	Second Priority Action, step 1 Ensure GRA-UV-1 and GRB-UV-2, Containment Isolation Valves for the RDT/Gas Surge Header, are open.		Examinee verifies GRA-UV-1 and GRB-UV-2 OPEN.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Second Priority Action, step 2 Open CHN-UV-540, RDT Vent to Gas Surge Tank, to establish a vent of the RDT.		Examinee opens CHN-UV-540.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Second Priority Action, step 3.1 <u>Start</u> CHN-P03A or CHN-P03B, RMW pump, from B03.		Examinee starts either RMW pump CHN-P03A/B.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Second Priority Action, step 3.2 Open CHN-UV-580, Makeup Supply Header to RDT Containment Isolation, from B03.		Examinee opens CHN-UV-580, Makeup Supply Header to RDT Containment Isolation, from B03.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9.	Second Priority Action, step 3.3 Direct an Auxiliary Operator to slowly OPEN CHN-V790, RMW header isolation, located on the 110 ft. of the aux. building letdown valve gallery.	**Inform Cue:** **AO reports that CHN-V790 is open.**	Examinee directs an Auxiliary Operator to slowly OPEN CHN-V790, RMW header isolation.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Second Priority Action, step 3.4 **WHEN** RDT temperature is less than 140 degrees,**THEN** close CHN-UV-580, Makeup Supply Header to RDT Containment Isolation.	**Inform Cue:** **After RDT Temperature is less than 140 degrees:** • **The CRS directs you to stop filling the RDT at this time.** **After the examinee closes CHN-UV-580:** • **Another operator will complete steps to reduce RDT level.**	Examinee closes CHN-UV-580.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparednessorganization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

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EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **A pressurizer relief valve RCE-PSV-201 had been leaking past its seat.**
- **RCS pressure has been reduced to 2210 psia.**
- **Downstream temperatures from RCE-PSV-201 have stabilized.**

INITIATING CUE:

- **The CRS directs you to take action per 40AL-9RK3A, window 3A07B to clear alarm point CHPS268, Reactor Drain Tank Pressure Hi.**

RESPONSE SECTION

PT ID	POSSIBLE CAUSE	SETPOINT
CHPS268	Reactor Drain Tank Pressure Hi	5 psig

AUTO ACTION

_____ 1. None.

NOTE

If the reactor drain tank pressure continues to increase to 10 psig the RDT vent to gas surge header valve CHN-UV-540 and RDT outlet containment isolation valve CHA-UV-560, will close. At approximately 120 psid the RDT rupture disc, CHN-PSE-12 will rupture.

FIRST PRIORITY OPERATOR ACTION

_____ 1. Check the reactor drain tank pressure Hi Alarm by reading CHN-PI-268 on B03.

_____ 2. **IF** the RDT Hi Temperature Alarm is received,
OR RDT temperature is increasing,
THEN GO TO Alarm Response for Window 3A07A, Group A (page 42).

SECOND PRIORITY OPERATOR ACTION

_____ 1. Ensure GRA-UV-1 and GRB-UV-2, Containment Isolation Valves for the RDT/Gas Surge Header, are open.

_____ 2. Vent the RDT to the gas surge header using CHN-UV-540 to maintain RDT pressure below 10 psig.

(CONTINUED)

_____ 3. Determine the source of the water being discharged to the RDT and correct the condition causing the discharge. Possible sources include but are not limited to:

_____ 3.1 Pressurizer reliefs.

_____ 3.2 RWT recirc line relief.

_____ 3.3 RCS loop drains.

_____ 3.4 RCP Seal Bleedoff

NOTE

During RCS fill and vent, CHN-UV-540 could be manually open to allow RDT pressure to increase up to 25 psig while releasing to the Gas Surge Header.

_____ 4. **IF** RDT pressure is above 10 psig,
AND the RCS is **not** being filled and vented per 40OP-9RC02, reactor Coolant System Fill and Vent,
THEN notify Radiation Protection that the RDT is being vented into containment.

_____ 4.1 Vent the RDT to containment using CHN-HV-923, RDT Atmospheric Vent Isolation, on B07, until RDT pressure is less than 5 psig on CHN-PI-268 on B03.

_____ 5. **IF** CHN-UV-540, RDT Vent to Gas Surge Tank, is manually open per 40OP-9RC02, reactor Coolant System Fill and Vent,
AND RDT pressure is above 25 psig,
THEN stop the RCS vent to the RDT until RDT pressure is less than 10 psig.

_____ 6. Take further actions as directed by 40AL-9RK3A, 3A07A, Group B.

End of Response

ANNUNCIATOR WINDOW INDEX

GROUP	PT ID	POSSIBLE CAUSE	SETPOINT
A	CHTS268	Reactor Drain Tank Temperature Hi	140°F
B	CHLS268	Reactor Drain Tank Level Hi-Lo	Hi-75% Lo-52%
C	CHPDS258	Reactor Drain Filter Differential Pressure Hi	25 psid
D	CHYS5	CVCS Reactor Drain Pump 1 Overload	
	CHYS6	CVCS Reactor Drain Pump 2 Overload	N/A

RESPONSE SECTION

GROUP A

PT ID	POSSIBLE CAUSE	SETPOINT
CHTS268	Reactor Drain Tank Temperature Hi	140°F

AUTO ACTION

_____ 1. None

FIRST PRIORITY OPERATOR ACTION

_____ 1. Consider performing 40AO-9ZZ02, Excessive RCS Leakage, in conjunction with this procedure.

_____ 2. Check the Reactor Drain Tank Temperature is greater than or equal to 140°F **OR** increasing by reading Temperature indicator CHN-TI-268 on panel B03.

_____ 3. Monitor RDT pressure at CHN-PI-268 on B03.

_____ 4. Monitor the pressurizer relief to RDT temperatures at RCN-TI-106, RCN-TI-107, RCN-TI-108 and RCN-TI-109 on B04 to determine if pressurizer relief leakage is the cause of the Hi Temperature.

_____ 5. **IF** a valid alarm is received while shutdown cooling is in service, **THEN** refer to 40EP-9EO11, Lower Mode Function Recovery.

SECOND PRIORITY OPERATOR ACTION

NOTE

This alarm response will mitigate a high temperature condition in the RDT. It will also address RDT Hi-Lo Level and RDT Hi pressure conditions which result from hot water leakage into the RDT.

_____ 1. Ensure GRA-UV-1 and GRB-UV-2, Containment Isolation Valves for the RDT/Gas Surge Header, are open.

_____ 2. Open CHN-UV-540, RDT Vent to Gas Surge Tank, to establish a vent of the RDT.

(CONTINUED)

NOTE

The following steps may have to be done concurrently or alternately one or more times to control the temperature and level in the reactor drain tank.

_____ 3. Perform the following steps to add Reactor Makeup Water to the RDT for cooling the contents of the RDT:

_____ 3.1 Start CHN-P03A or CHN-P03B, RMW pump, from B03.

_____ 3.2 Open CHN-UV-580, Makeup Supply Header to RDT Containment Isolation, from B03.

_____ 3.3 Direct an Auxiliary Operator to slowly OPEN CHN-V790, RMW header isolation, located on the 110 ft. of the aux. building letdown valve gallery.

_____ 3.4 **WHEN** RDT temperature is less than 140 degrees, **THEN** close CHN-UV-580, Makeup Supply Header to RDT Containment Isolation.

_____ 4. Perform the following steps to pump the RDT to the CVCS HUT.

_____ 4.1 **IF** RDT temperature has been reduced to less than 140 degrees, **THEN** refer to 40OP-9CH01, CVCS Normal Operations, to pump the RDT.

_____ 4.2 Ensure the HUT is NOT being processed through the Reactor Drain Filter.

_____ 4.3 Open CHA-UV-560, RDT outlet isolation valve, from B03.

_____ 4.4 Open CHB-UV-561, RDT containment isolation valve, from B03.

_____ 4.5 Open GAA-UV-2, LP N_2 supply to the RDT, from B07.

_____ 4.6 Place CHE-UV-500, VCT inlet valve to the "VCT RESET" position from B03.

_____ 4.7 Place CHE-UV-565, Preholdup IX divert valve to the "BYPASS" position.

(CONTINUED)

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JPM BASIS INFORMATION

TASK:	1250310201 Respond to an Inadvertent MSIS						
TASK STANDARD:	Inadvertent MSIS reset						
K/A:	3.2 013 A4.01		K/A RATING:	RO:	4.5	SRO:	4.8
K/A:			K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO		VALIDATION TIME:	10 minutes			
REFERENCES:	40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***Yes***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 10/27/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal postcritique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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1. SIMULATOR SETUP:

- IC#: 107 (This IC is setup to run JS-5 and JS-6 together for the 2012 NRC exam)

- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

- SPECIAL INSTRUCTIONS:
  - None
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: N/A Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40AO-9ZZ17 available. This JPM was written using Revision 15 of 40AO-9ZZ17. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

If IC-107 is not available then perform the following to setup for this JPM:
- Imf cm SRRP01IRMSISAB_1 - MSIS relay failure
- Imf cm TRRX12SGALT1114_4 - SG 1 high level transmitter failure
- Override and OPEN Downcomer Isolation and MSIVs for SG 1
- Delete the two malfunctions entered above.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE**any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Unit 1 is at 2% power.**
- **An inadvertent MSIS has occurred due to a power supply failure.**
- **The CRS has implemented 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.**
- **The faulted power supply has been replaced.**

INITIATING CUE:

- **The CRS directs you to reset MSIS, in accordance with appendix B of 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Enter Appendix Entry Time and Date:		Examinee enters appendix entry time and date.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Enter actuation(s) to be reset:		Examinee enters MSIS.
SAT / UNSAT **Comments (required for UNSAT):**			

Notes before step 3:

- Overriding equipment disables automatic ESFAS operation of the equipment. Depending on plant conditions, this action may make the equipment inoperable.
- The HPSI, LPSI and CS pump minimum recirculation flow provides sufficient heat removal for only one hour of pump operation.

	STEP	CUE	STANDARD
3.	**IF** the PPS-ESFAS actuation was caused by failure to reset the SG or PZR Pressure variable setpoints during a controlled cooldown, **THEN** perform the following:		Examinee NAs step based on cue provided.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Check the Bistable Trip Lamps at the PPS Remote Operators Module (B05) for the affected PPS-ESFAS actuation input parameters on all PPS Channels satisfy **ONE** of the following • **NOT** lit • Bypassed		Examinee determines that the "A" train SG 1 level HI Bistable trip lamp is lit.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	**Contingency Actions 4.1.** a. Reset the affected Bistable Trip Lamps at the PPS Remote Operators Module (B05).		Examinee resets the "A" channel Bistable Trip Lamp on B05.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 5 of appendix B Check the affected PPS-ESFAS actuation Initiation Relay lamps are illuminated at the PPS emote Operators Module (B05) on all PPS Channels.		Examinee determines that the "A" train MSIS initiation relay lamp is not lit.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	**Contingency Action 5.2** a. Obtain the PPS Initiation Reset key for the affected Train. b. Unlock the affected Initiation Path Reset Train (PPS Cabinets). c. Reset the affected Initiation Path by depressing the appropriate Initiation Path Reset pushbutton (PPS Cabinets). d. Lock the Initiation Path Reset Train (PPS Cabinets). e. Remove the PPS Initiation Reset key. f. Check the affected Initiation Signal lamps are illuminated for the affected PPS channels (On status panels above PPS Cabinets).		Examinee resets the MSIS initiation paths on channel "A".
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	Step 6 of appendix B. Check the actuated PPS-ESFAS leg 1-3 and leg 2-4 Actuation Signal lamps are illuminated for PPS Train A and Train B Actuation Signals (On status panels above PPS Cabinet A, SBAC01 and PPS Cabinet B, SBBC01).		Examinee determines that the "A" train MSIS signal lamps are not illuminated.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	**Contingency Action 6.1.** Perform the following for the affected Train(s): a. Press the LOCKOUT RESET pushbutton(s) for the affected PPS-ESFAS actuation(s) (Aux Relay Cabinets Bay 6 & 7). b. Check both red "ON" lamps are illuminated for the affected PPS-ESFAS actuation (Aux Relay Cabinets Bay 6 & 7).	Examiner Note: Pressing either pushbutton S64A or S74A will reset the MSIS LOCKOUT. **Inform Cue: Another operator will complete this appendix.**	Examinee resets the "A" train MSIS Lockout.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	10/27/2011		New JPM

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 is at 2% power.**
- **An inadvertent MSIS has occurred due to a power supply failure.**
- **The CRS has implemented 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.**
- **The faulted power supply has been replaced.**

INITIATING CUE:

- **The CRS directs you to reset MSIS, in accordance with appendix B of 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations.**

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS	CONTINGENCY ACTIONS
____ 1. Enter Appendix Entry Time and Date: _____	
___ 2. Enter actuation(s) to be reset: _____	

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS CONTINGENCY ACTIONS

---------- **NOTE** ----------

Overriding equipment disables automatic ESFAS operation of the equipment. Depending on plant conditions, this action may make the equipment inoperable.

---------- **NOTE** ----------

The HPSI, LPSI and CS pump minimum recirculation flow provides sufficient heat removal for only one hour of pump operation.

___3. **IF** the PPS-ESFAS actuation was caused by failure to reset the SG or PZR Pressure variable setpoints during a controlled cooldown,
THEN perform the following:

a. Direct I&C to clear the affected trip signals.

b. Evaluate the need to override and position PPS-ESFAS actuated equipment.
REFER TO the appropriate attachment in Appendix C, PPS-ESFAS Check, for a list of actuated equipment.

c. Override and position equipment as needed.

d. **WHEN** the trip signals are cleared,
THEN continue with this appendix.

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS	CONTINGENCY ACTIONS
___4. Check the Bistable Trip Lamps at the PPS Remote Operators Module (B05) for the affected PPS-ESFAS actuation input parameters on all PPS Channels satisfy **ONE** of the following. • **NOT** lit • Bypassed	___ 4.1 Perform the following for any tripped input parameter: a. Reset the affected Bistable Trip Lamps at the PPS Remote Operators Module (B05). b. **IF** the trip light will **NOT** reset, **AND ANY** parameter is tripped on two or more channels, **THEN** GO TO step 7.1 of this appendix.

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS	CONTINGENCY ACTIONS
___5. Check the affected PPS-ESFAS actuation Initiation Relay lamps are illuminated at the PPS Remote Operators Module (B05) on all PPS Channels.	___ 5.1 **IF** the **AFAS 1 or 2** Initiation Relay lamps are **NOT** lit, **THEN** GO TO step 7.1 of this appendix.
	___ 5.2 Perform the following for any de-energized PPS-ESFAS Initiation Path(s):
	a. Obtain the PPS Initiation Reset key for the affected Train.
	b. Unlock the affected Initiation Path Reset Train (PPS Cabinets).
	c. Reset the affected Initiation Path by depressing the appropriate Initiation Path Reset pushbutton (PPS Cabinets).
	d. Lock the Initiation Path Reset Train (PPS Cabinets).
	e. Remove the PPS Initiation Reset key.
	f. Check the affected Initiation Signal lamps are illuminated for the affected PPS channels (On status panels above PPS Cabinets).
	g. **IF** the Initiation Path will **NOT** reset, **THEN** GO TO step 7.1 of this appendix.

Appendix B, PPS-ESFAS Reset

INSTRUCTIONS	CONTINGENCY ACTIONS
___6. Check the actuated PPS-ESFAS leg 1-3 and leg 2-4 Actuation Signal lamps are illuminated for PPS Train A and Train B Actuation Signals (On status panels above PPS Cabinet A, SBAC01 and PPS Cabinet B, SBBC01).	___ 6.1 Perform the following for the affected Train(s): a. Press the LOCKOUT RESET pushbutton(s) for the affected PPS-ESFAS actuation(s) (Aux Relay Cabinets Bay 6 & 7). b. Check both red "ON" lamps are illuminated for the affected PPS-ESFAS actuation (Aux Relay Cabinets Bay 6 & 7).
___7. **IF** the PPS-ESFAS actuation is reset, **THEN** GO TO **ONE** of the following steps of this procedure as appropriate: • Section 3.0, AFAS, step 10. • Section 4.0, CIAS, step 9. • Section 5.0, CSAS, step 20. • Section 6.0, MSIS, step 13. • Section 7.0, RAS, step 9. • Section 8.0, SIAS OR SIAS/ CIAS, step 16.	___ 7.1 **IF** the PPS-ESFAS actuation will **NOT** reset, **THEN** perform the following: a. Evaluate the need to override and position PPS-ESFAS actuated equipment. REFER TO the appropriate attachment in Appendix C, PPS-ESFAS Check, for a list of actuated equipment. b. Override and position equipment as needed.

End of Appendix

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PVNGS JOB PERFORMANCE MEASURE

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JPM BASIS INFORMATION

TASK:	0720010401 Perform manual PB switching operations						
TASK STANDARD:	Offsite power has been paralleled to PBA-S03.						
K/A:	3.6-062-A4.07	K/A RATING:	RO:	3.1	SRO:	3.1	
K/A:		K/A RATING:	RO:		SRO:		
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes				
REFERENCES:	40OP-9PB01						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***

PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Jordan Johnston Date: 04/18/2008

Revised By: Alan Malley Date: 10/21/2011

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____

(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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PVNGS JOB PERFORMANCE MEASURE

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1. SIMULATOR SETUP:

This JPM is setup to run with either JS-4 or JS-8. Therefore the ICs are for two different situations. Pay close attention to the setup based on which JPM is running in parallel with this JPM.

A. IC#: If running with JS-8 use IC #112
If running with JS-4 use IC #110

B. SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
None	

C. SPECIAL INSTRUCTIONS:

- None

D. REQUIRED CONDITIONS:

- Diesels carrying the class buses
- One offsite power line now supplying the switchyard and down to NAN-X03

E. SIMULATOR EVALUATION PRE-CHECK

- ❑ Correct IC
- ❑ Alarm Silence Off
- ❑ Procedures available, page checked, and clean
- ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

F. Copy of 40OP-9PB01 available. This JPM was written using Revision 24 of 40OP-9PB01. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

G. MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
N/A		

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANT JPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **You are the third RO in Unit 1.**
- **NBN-X03 tripped due to a faulty relay on the supply breaker.**
- **The relay has been repaired.**
- **NBN-X03 is now energized.**

INITIATING CUE:

- **The CRS directs you to parallel offsite power back onto PBA-S03 per section 14 of 40OP-9PB01.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*) denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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PVNGS JOB PERFORMANCE MEASURE

2012 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Perform Prerequisites (section 14.2) • Diesel Generator A is supplying power to PBA-S03, **isolated** from offsite power. • Power is available from ESF Service Transformer NBN-X03. • Diesel Generator "B" is **NOT** paralleled with offsite power. • Breaker PBA-S03L is racked in and available for operation.	**If requested cue (as area operator):** **Breaker PBA-S03L is racked in and available for operation.**	Examinee determines that all prerequisites are complete.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 14.3.1 and 14.3.1.1: **IF** Diesel Generator A is in the emergency mode, **THEN** perform the following: 1. Ensure DG B is NOT in override.		Examinee determines that DG B is not in override.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 14.3.1.2: Ensure **ALL** of the following alarm conditions are reset at DGA-B01: • NEUTRAL OVERVOLTAGE • OVERCURRENT • NEG SEQ TRIP	**If requested Cue (as area operator):** **"Neutral overvoltage, Overcurrent, and Negative Sequential Trip are all clear at the Diesel Generator panel"**	Examinee checks that Neutral overvoltage, Overcurrent, and Negative Sequential Trip are all reset.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 14.3.1.3: **IF ANY** of the alarms are not reset, **THEN** ensure the alarms are reset per 40AL-9DG01, Diesel Generator A Alarm Responses.		Examinee N/As step since there are no alarms.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 14.3.1.4: Obtain Control Room Supervisor permission to override the emergency mode condition.	**When Requested Cue:** **The CRS has given you permission to override Diesel Generator A.**	Examinee obtains CRS permission to override DG A.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Steps 14.3.1.5 and 14.3.1.6: • Take DGA-HS-1 to "Start" • Check the white OVERRIDE light on.		Examinee puts DG A in override.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 14.3.2.1: Ensure PEA-SS-G01D, Diesel Generator A Speed Mode Select switch, is in the "DROOP" position.		Examinee places PEA-SS-G01D in the "DROOP" position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 14.3.2.2: Place PBA-SS-S03L, synchronizing switch for normal supply breaker PBA-S03L, in the "ON" position.		Examinee places PBA-SS-S03L to "ON".
SAT / UNSAT **Comments (required for UNSAT):**			

Note before step 14.3.2.3

Increasing Diesel Generator speed will cause the synchroscope to move in the slow direction and decreasing Diesel Generator speed will cause the synchroscope to move in the fast direction.

	STEP	CUE	STANDARD
9. *	Step 14.3.2.3: Adjust DG A speed using PEA-SC-G01, Diesel Generator A Speed switch, to cause the synchroscope to move slowly in the Fast direction.		Examinee adjusts DG A speed so the synchroscope is moving slowly in the Fast direction.
SAT / UNSAT **Comments (required for UNSAT):**			

Note before step 14.3.2.4
Running Voltmeter MAN-EI-002R represents PBA-S03 Bus voltage. Incoming voltmeter MAN-EI-002I represents ESF Service Transformer voltage.

	STEP	CUE	STANDARD
10. *	Step 14.3.2.4: Match the DG voltage with the ESF Service Transformer voltage using PEA-EC-G01, DG A Voltage Switch.		Examinee matches voltages between DG A and NBN-X03 (ESF Service Transformer) output. **Examiner Note: The meters for this evolution are:** **MAN-EI-002R for DG (PBA-S03)** **MAN-EI-002I for NBN-X03.**
SAT / UNSAT **Comments (required for UNSAT):**			

Caution before Step 14.3.2.5
There is no sync-check protection on the normal supply breaker.

	STEP	CUE	STANDARD
11. *	Step 14.3.2.5: WHEN the synchroscope needle is at the 12 o'clock position, THEN close PBA-S03L.		Examinee closes PBA-S03L when the synchroscope is at the 12 o'clock position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
12.	Step 14.3.2.6: Place the synchronizing switch in the "OFF" position.		Examinee places the synch switch in the "OFF" position.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
13.	Step 14.3.2.7: Unit 1 only: If it is desired to continue to operate DG A, go to 40OP-9DG01.	**INFORM CUE:** **The Diesel Generator will be shut down by another operator.**	
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: [ ]

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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PVNGS JOB PERFORMANCE MEASURE

2012 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **You are the third RO in Unit 1.**
- **NBN-X03 tripped due to a faulty relay on the supply breaker.**
- **The relay has been repaired.**
- **NBN-X03 is now energized.**

INITIATING CUE:

- **The CRS directs you to parallel offsite power back onto PBA-S03 per section 14 of 40OP-9PB01.**

14.0 MANUAL TRANSFER OF PBA-S03 FROM DIESEL GENERATOR A TO NBN-X03

14.1 Personnel Indoctrination

14.1.1 This section of the procedure transfers PBA-S03 from its emergency source of power to its normal source of power.

14.1.2 It should take approximately 10-15 minutes to transfer PBA-S03 from its emergency source of power, the emergency diesel generator, to its normal source of power NBN-X03.

14.2 Prerequisites

____ 14.2.1 Diesel Generator A is supplying power to PBA-S03, **isolated** from offsite power.

____ 14.2.2 Power is available from ESF Service Transformer NBN-X03.

____ 14.2.3 Diesel Generator "B" is **NOT** paralleled with offsite power.

____ 14.2.4 Breaker PBA-S03L is racked in and available for operation.

14.3 Instructions

____ 14.3.1 **IF** Diesel Generator A is in the emergency mode,
THEN perform the following:

____ 1. Ensure Diesel Generator "B" is **NOT** in OVERRIDE.

____ 2. Ensure **ALL** of the following alarm conditions are reset at DGA-B01:

- NEUTRAL OVERVOLTAGE
- OVERCURRENT
- NEG SEQ TRIP

____ 3. **IF ANY** of the alarms are not reset,
THEN ensure the alarms are reset per 40AL-9DG01, Diesel Generator A Alarm Responses.

____ 4. Obtain Control Room Supervisor permission to override the emergency mode condition.

____ 5. Take DGA-HS-1, Diesel Generator A START/STOP switch on B01, to the "START" position.

____ 6. Check the white OVERRIDE light is illuminated.

14.3.2 Parallel Diesel Generator A to offsite power as follows:

____ 1. Ensure PEA-SS-G01D, Diesel Generator A Speed Mode Select switch, is in the "DROOP" position.

____ 2. Place PBA-SS-S03L, synchronizing switch for normal supply breaker PBA-S03L, in the "ON" position.

---------- **NOTE** ----------

Increasing Diesel Generator speed will cause the synchroscope to move in the slow direction and decreasing Diesel Generator speed will cause the synchroscope to move in the fast direction.

____ 3. Adjust DG A speed using PEA-SC-G01, Diesel Generator A Speed switch, to cause the synchroscope to move slowly in the Fast direction.

---------- **NOTE** ----------

Running Voltmeter MAN-EI-002R represents PBA-S03 Bus voltage. Incoming voltmeter MAN-EI-002I represents ESF Service Transformer voltage.

____ 4. Match the Diesel Generator voltage with ESF Service Transformer voltage using PEA-EC-G01, Diesel Generator A Voltage switch.

CAUTION

There is no sync-check protection on the normal supply breaker.

____ 5. **WHEN** the synchroscope needle is at the 12 o'clock position, **THEN** close PBA-S03L.

____ 6. Place the synchronizing switch in the "OFF" position.

____ 7. **UNIT 1 only**
IF it is desired to continue to operate Diesel Generator A to prevent possible BOP-ESFAS lockup,
THEN GO TO 40OP-9DG01 Emergency Diesel Generator A, section 6.0.

____ 8. **IF** it is desired to shutdown Diesel Generator A
THEN GO TO 40OP-9DG01, Emergency Diesel Generator A, section 7.0 to unload and shutdown Diesel Generator A.

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC EXAM

JPM BASIS INFORMATION

TASK:	1240000401 Implement instructions and contingencies for Lower Mode Recovery procedure					
TASK STANDARD:	LM - Placing Train B CS on SDC					
K/A:	3.4 005 A4.01	K/A RATING:	RO:	3.6	SRO:	3.4
K/A:		K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO	VALIDATION TIME:	15 minutes			
REFERENCES:	40EP-9EO10, Standard Appendices, Appendix 240					

SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER	

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***No***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 11/01/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.PVAR # _____*

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC EXAM

1. SIMULATOR SETUP:

- IC#: 112 (This IC is setup to run JS-7 and JS-8 together for the 2012 NRC exam)
- Run scenario file: 2012 NRC JS-7 and 8

- SCENARIOS, MALFUNCTIONS, OVERRIDES,etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
Run scenario file "2012 NRC JS-7 and 8" from the exam jump drive.	

- SPECIAL INSTRUCTIONS:
  - Hang caution tags on LPSI pump "A"
  - Hang supplied equipment status tags on SIA-HV-683 and SIB-HV-692
- REQUIRED CONDITIONS:
  - None
- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: _____ Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40EP-9EO10. This JPM was written using Revision 69 of 40EP-9EO10 (SA-240). This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION
4	(K-1) Closes SIB-V104	CS B Suction Isolation
7	(K-2) Opens SIB-V185	Shutdown Cooling Return to CS

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Unit 1 was on SDC using LPSI pump "B".**
- **LPSI pump "B" has tripped due to an 86 fault.**
- **LPSI Pump "A" is under clearance.**
- **The unit is in Mode 5 with RCS temperature is ~ 150°F.**
- **RCS pressure is ~ 195 psia.**
- **An AO has been briefed and is standing by in the field to operate components as needed.**
- **CS pump "B" is not aligned for SDC operations.**

INITIATING CUE:

- **The CRS directs you to place Containment Spray pump "B" on Shutdown Cooling per Standard Appendix 240.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

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PVNGS JOB PERFORMANCE MEASURE
2012 NRC EXAM

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Step 1 of Appendix 240: Check **ALL** of the following: • CS Pump B is **NOT** running to support another success path • RCS temperature is less than 185°F [185°F] • RCS pressure is less than 210 [210 psia] **One SDC Pump Operation** • RCS level is 101 ft. 6 in. or more **Two SDC Pump Operation** • RCS level is 104 ft. 6 in. or more		Examinee verifies that RCS temperature and pressure are within limits.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 2 of Appendix 240: Inform Radiation Protection and RMS Technician that Train B SDC is being placed in service.	**When Requested Cue:** **RP and the effluent tech acknowledge that CS pump "B" will be used for SDC flow.**	Examinee informs RP that CS pump "B" will be used for SDC flow.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 3 of Appendix 240: Check that **ALL** of the following support systems are in-service: • SP B • EW B • EC B		Examinee verifies that the support systems are running.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 4 of Appendix 240: **IF** CS Pump B is **NOT** aligned for standby SDC, **THEN** perform the following: a. Direct an operator to close SIB-V104, "CS B SUCTION ISOLATION". (CS "B" Room) (continued)	**Inform CUE:** **Direct the driver to activate Key-1, wait 30 seconds then report as AO that SIB-104 (CS pump B Suction Isolation) is CLOSED.**	Examinee verifies CS pump B not running and directs an AO to close SIB-104
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 4.b of Appendix 240: Close **ALL** of the following valves: • SIB-HV-692, LPSI Pump B Suction From RWT • SIB-UV-668, LPSI Pump B Recirc Valve • SIB-UV-665, Cntmt Spray Pump B Recirc • SIB-HV-658, SDCHX B Outlet to Reactor Coolant Loops 2A/2B • SIB-UV-671, Cntmt Spray B Discharge to Spray Header • SIB-HV-693, Cntmt Spray SDC Hx B Bypass • SIB-HV-695, LPSI Containment Spray from SDC Hx B Crosstie • SIB-UV-615, LPSI B Injection Valve • SIB-UV-625, LPSI B Injection Valve (continued)	**If Requested Cue:** **a. SIB-HV-692 is verified closed and de-energized.** **b. SIB-UV-671 is verified closed and de-energized.**	Examinee closes: • SIB-UV-665 • SIB-HV-658 • SIB-HV-693 • SIB-HV-615 • SIB-HV-625
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Step 4.c of Appendix 240: Open **ALL** of the following valves: • SIB-UV-652, Loop 2 to SDC/LPSI Pump B Suction Valve • SID-UV-654, Loop 2 to SDC LPSI Pump B Suction Valve • SIB-UV-656, Loop 2 to SDC LPSI Pump B Suction Valve • SIB-HV-690, SDC Loop B Warm-up Bypass Valve • SIB-HV-689, Cntmt Spray Pump B Discharge to SDCHX B Valve • SIB-HV-679, CS Pump B Discharge to SDCHX B • SIB-HV-694, LPSI/CS to SDCHX B Cross-tie Vlv • SIB-HV-696, SDCHX B Outlet to Reactor Coolant Loops 2A/2B Valve (continued)		Examinee OPENS: • SIB-HV-690 • SIB-HV-689 All other valves are verified OPEN.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 4.d of Appendix 240: Throttle SIB-HV-307, LPSI to SDCHX B Bypass Valve, to 20% open. (continued)		Examinee throttles SIB-HV-307 to ~ 20% open.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 4.e of Appendix 240: Direct an operator to open SIB-V185, "SHUTDOWN COOLING RETURN TO CS"(CS "B" Room) Check SIB-V185,"SHUTDOWN COOLING RETURN TO CS" is open using local valve stem position indication.	**Inform CUE:** **Direct the driver to activate Key-2, wait 30 seconds then report as AO that SIB-V185 (SHUTDOWN COOLING RETURN TO CS) is OPEN.** **The operator has checked the local valve stem position and it indicates SIB-V185 is open.**	Examinee directs AO to open SIB-V185.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 5 of Appendix 240: **WHEN** SIB-V185, SHUTDOWN COOLING RETURN TO CS" is open, **THEN** start CS Pump B.		Examinee starts CS pump "B" using SIB-HS-6.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Step 6 of Appendix 240: Check CS Pump running current is less than 95 amps.		Examinee verifies CS pump current is less than 95 amps.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11.	Step 7 of Appendix 240: **IF** the plant is in Mode 4, **THEN** throttle open SIB-HV-307 to establish a SDC flow of 4000 – 4750 gpm.		Examinee NAs this step since the plant is NOT in Mode 4.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
12.	Step 8 of Appendix 240: **IF** the plant is in Mode 5 or 6, **THEN** throttle open SIB-HV-307 to establish **ONE** of the following: **One SDC Pump with RCS Lvl 101 ft. 6 in. – 102 ft.** • 3780 – 4000 gpm **One SDC Pump with RCS Lvl 102 ft. – 103 ft. 1 in.** • 3780 – 4600 gpm **One SDC Pump with RCS Lvl greater than 103 ft. 1 in.** • 3780 – 4750 gpm **Two SDC Pumps with RCS Lvl greater than 104 ft. 6 in.** • 3780 - 4750 gpm per loop		Examinee verifies that flow is between 3780 and 4750 gpm on SIB-FI-307 (B02).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
13. *	Step 9 of Appendix 240: Perform the following to establish SDC flow: a. Adjust SIB-HV-307 as necessary to maintain the desired SDC flow. b. Throttle open SIB-UV-615 to between 5- 15%. c. Throttle closed SIB-HV-690 d. Maintain the SDC Heat Exchanger heatup rate to19°F/min or less. • SIB-TT-352X onSIB-TR-352 • ERFDADS point SIT352X	**Examiner Note:** **Once the examinee has established flow thru SIB-UV-615 and has commenced throttling SIB-HV-690 closed, then inform the examinee that another operator will complete Standard Appendix 240.**	Examinee establishes and maintains a SDC flow of 3780 – 4750 gpm as indicated on SIB-FI-307.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	11/01/11	6	New JPM

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 was on SDC using LPSI pump "B".**
- **LPSI pump "B" has tripped due to an 86 fault.**
- **LPSI Pump "A" is under clearance.**
- **The unit is in Mode 5 with RCS temperature is ~ 150°F.**
- **RCS pressure is ~ 195 psia.**
- **An AO has been briefed and is standing by in the field to operate components as needed.**
- **CS pump "B" is not aligned for SDC operations.**

INITIATING CUE:

- **The CRS directs you to place Containment Spray pump "B" on Shutdown Cooling per Standard Appendix 240.**

Appendix 240,
LM - Placing Train B CS on SDC

INSTRUCTIONS

____ 1. Check **ALL** of the following:

- CS Pump B is **NOT** running to support another success path
- RCS temperature is less than 185°F [185°F]
- RCS pressure is less than 210 [210 psia]

One SDC Pump Operation

- RCS level is 101 ft. 6 in. or more

Two SDC Pump Operation

- RCS level is 104 ft. 6 in. or more

____ 2. Inform Radiation Protection and RMS Technician that Train B SDC is being placed in service.

CONTINGENCY ACTIONS

____ 1.1 **IF ANY** of the following conditions exist:

- CS Pump is running in support of another success path
- RCS temperature is 185°F [185°F] or more
- RCS pressure 210 psia or more
- RCS level is **NOT** appropriate for the number of SDC Pumps that will be running

THEN inform the CRS to use another heat removal method.

INSTRUCTIONS	CONTINGENCY ACTIONS
____ 3. Check that **ALL** of the following support systems are inservice: • SP B • EW B • EC B	____ 3.1 **IF** any of the support systems are **NOT** inservice, **AND** are available to support Train B SDC, **THEN** place the appropriate support system in service. ____ 3.2 **IF** EW B is **NOT** available, **THEN** ensure that NC is cross tied to EW B for the SDC Hx that will be placed in service, REFER TO Appendix 244, LM - NC Cross Tie to EW Train B.

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 4. **IF** CS Pump B is **NOT** aligned for standby SDC,
THEN perform the following:

a. Direct an operator to close SIB-V104, "CS B SUCTION ISOLATION". (CS "B" Room)

b. Close **ALL** of the following valves:

- SIB-HV-692, LPSI Pump B Suction From RWT Valve
- SIB-UV-668, LPSI Pump B Recirc Valve
- SIB-UV-665, Containment Spray Pump B Recirc Valve
- SIB-HV-658, SDCHX B Outlet to Reactor Coolant Loops 2A/2B Valve
- SIB-UV-671, Containment Spray B Discharge to Spray Header
- SIB-HV-693, Containment Spray SDC Hx B Bypass Valve
- SIB-HV-695, LPSI Containment Spray from SDC Hx B Crosstie Valve
- SIB-UV-615, LPSI B Injection Valve
- SIB-UV-625, LPSI B Injection Valve

(continue)

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 4. (continued)

c. Open **ALL** of the following valves:

- SIB-UV-652, Loop 2 to SDC/ LPSI Pump B Suction Valve
- SID-UV-654, Loop 2 to SDC LPSI Pump B Suction Valve
- SIB-UV-656, Loop 2 to SDC LPSI Pump B Suction Valve
- SIB-HV-690, SDC Loop B Warm-up Bypass Valve
- SIB-HV-689, Containment Spray Pump B Discharge to SDCHX B Valve
- SIB-HV-679, CS Pump B Discharge to SDCHX B
- SIB-HV-694, LPSI/CS to SDCHX B Cross-tie Valve
- SIB-HV-696, SDCHX B Outlet to Reactor Coolant Loops 2A/2B Valve

d. Throttle SIB-HV-307, LPSI to SDCHX B Bypass Valve, to 20% open.

(continue)

INSTRUCTIONS	CONTINGENCY ACTIONS
____ 4. (Continued) e. Direct an operator to perform **BOTH** of the following: 1) Open SIB-V185, "SHUTDOWN COOLING RETURN TO CS" (CS "B" Room) 2) Check SIB-V185, "SHUTDOWN COOLING RETURN TO CS" is open using local valve stem position indication.	
____ 5. **WHEN** SIB-V185, "SHUTDOWN COOLING RETURN TO CS" is open, **THEN** start CS Pump B.	
____ 6. Check CS Pump running current is less than 95 amps.	____ 6.1 Reduce SDC flow until CS Pump running current is less than 95 amps without allowing SDC flow to fall below **ANY** of the following: • Mode 4 - 4000 gpm • Mode 5 - 3780 gpm • Mode 6 - 3780 gpm ____ 6.2 **IF** CS Pump current can **NOT** be reduced below 95 amps, **THEN** inform the CRS to consider another method of heat removal.

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 7. **IF** the plant is in Mode 4,
THEN throttle open SIB-HV-307
to establish a SDC flow of
4000 – 4750 gpm.

____ 8. **IF** the plant is in Mode 5 or 6,
THEN throttle open SIB-HV-307
to establish **ONE** of the following:

**One SDC Pump with RCS Lvl
101 ft. 6 in. – 102 ft.**

- 3780 – 4000 gpm

**One SDC Pump with RCS Lvl
102 ft. – 103 ft. 1 in.**

- 3780 – 4600 gpm

**One SDC Pump with RCS Lvl
greater than 103 ft. 1 in.**

- 3780 – 4750 gpm

**Two SDC Pumps with RCS Lvl
greater than 104 ft. 6 in.**

- 3780 - 4750 gpm per loop

INSTRUCTIONS	CONTINGENCY ACTIONS
____ 9. Perform the following to establish SDC flow:	
a. Adjust SIB-HV-307 to maintain SDC flow.	
b. Throttle open SIB-UV-615 to between 5-15%.	b.1 **IF** SIB-UV-615 is unavailable, **THEN** throttle open SIB-UV-635 to 5-15%.
c. Throttle closed SIB-HV-690	
d. Maintain the SDC Heat Exchanger heatup rate to 19°F/min or less. • SIB-TT-352X on SIB-TR-352 • ERFDADS point SIT352X	d.1 **IF** at any time the SDC Heat Exchanger heatup rate exceeds 19°F/min, **THEN** reduce the flow through the SDC Heat Exchanger.
e. **WHEN** the SDC Heat Exchanger heatup rate has stabilized, **THEN** throttle open SIB-UV-625 to between 5-15%.	
f. Adjust SIB-HV-658 as necessary to control RCS temperature.	
____ 10. Maintain the RCS cooldown rate for the current plant conditions.	

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 11. Perform the following to close SIB-HV-690:

a. Throttle the following valves incrementally to compensate for the closure of SIB-HV-690:

- SIB-UV-615
- SIB-UV-625

b. Throttle close SIB-HV-690.

c. **WHEN** SIB-HV-690 is closed, **THEN** perform the following:

1) Hold SIB-HS-690 in the closed position for five seconds.

2) Direct a second operator to hold SIB-HS-690 closed for an additional five seconds.

____ 12. Perform the following to fully open the LPSI Injection Valves:

a. Throttle the following valves incrementally to maintain the desired SDC flow while fully opening the LPSI Injection Valves:

- SIB-HV-307
- SIB-HV-658

b. Throttle open the LPSI Injection Valves.

INSTRUCTIONS

CONTINGENCY ACTIONS

____ 13. Adjust **BOTH** of the following valves to control RCS temperature and SDC flow rate:

- SIB-HV-658
- SIB-HV-306

____ 14. **IF** the RWLIS is in service, **THEN** perform the following:

a. **IF** SDC Loop B is the only SDC loop in service, **THEN** place the Refueling Water Level Flow Compensation Selector in the "CHANNEL B" position.

b. **IF** both SDC loops are in service, **THEN** place the Refueling Water Level Flow Compensation Selector in the "BOTH" position.

c. Place the Refueling Water Level Alarm Enable Selector in the "BOTH" position.

____ 15. Inform the CRS that CS Pump B is on SDC.

End of Appendix

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JPM BASIS INFORMATION

TASK:	Verify proper CIAS/CSAS actuation						
TASK STANDARD:	1240060201 - Ensure that a CIAS/CSAS has actuated and that an isolation valve has closed for each required penetration.						
K/A:	3.7 012 A4.02		K/A RATING:	RO:	3.3	SRO:	3.4
K/A:			K/A RATING:	RO:		SRO:	
APPLICABLE POSITION(S):	RO		VALIDATION TIME:		10 minutes		
REFERENCES:	40EP9EO05, Excessive Steam Demand						
SUGGESTED TESTING ENVIRONMENT:	SIMULATOR	X	PLANT		OTHER		

JPM TYPE

Time Critical? *(Yes/No)* ***No*** Alternative Path? *(Yes/No)* ***Yes***
PRA/SRA related? *(Yes/No)* ***No***

APPROVAL

Developed By: Larry Burton Date: 10/27/2011

Revised By: N/A Date: _____

Technical Review _____ Operations Approval _____

EP Review N/A Training Approval _____
(Only required for Emergency Plan JPMs)

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT *

** For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to the Emergency Preparedness organization for resolution.

1. SIMULATOR SETUP:

- IC#: 111

- SCENARIOS, MALFUNCTIONS, OVERRIDES, etc. for Setup:

COMMAND/COMMUNICATION	DESCRIPTION
cm MVSW03WCBUV61_5	WC-UV-61 fail to auto close
cm MVSW03WCAUV62_5	WC-UV-62 fail to auto close
Scenario file -- no CSAS	Prevents CSAS actuation
Scenario file -- no SICI	Prevents CIAS and SIAS actuation
mf MS01A f:10	SG 1 ESD -10%

- SPECIAL INSTRUCTIONS:
  - None
- REQUIRED CONDITIONS:
  - Stop RCPs 1B and 2B.
  - Align AFB flow to SG 2.
  - Wait for sequencer to finish starting equipment.

- SIMULATOR EVALUATION PRE-CHECK
  - ❑ Correct IC
  - ❑ Alarm Silence Off
  - ❑ Procedures available, page checked, and clean
  - ❑ For JPMs administered during transients, another instructor available to control plant parameters.

Verified by: N/A Date: _____

(NA if Simulator setup not required)

2. SPECIAL TOOLS/EQUIPMENT:

- 40EP-9EO05 available. This JPM was written using Revision 25 of 40EP-9EO05. This JPM may be used with later revisions if it is verified that the later revision does not affect this JPM.

3. JPM PERFORMANCE:

- MALFUNCTIONS, OVERRIDES, etc. **during** JPM

STEP	COMMAND/COMMUNICATION	DESCRIPTION

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN-PLANTJPMs ONLY:

- Operation of in-plant equipment is to be **SIMULATED ONLY, DO NOT OPERATE** any equipment.
- Inform the control room staff of any discovered deficiencies.
- Comply with the REP, if it is not possible to enter an area it may be permissible to discuss the equipment to be operated. Do **NOT** enter contaminated, airborne, or high radiation areas.

ALL JPMs:

- You may use any source of information normally available.

INITIAL CONDITIONS:

- **Unit 1 automatically tripped due to an ESD on SG 1.**
- **SPTAs have been completed.**
- **The CRS has implemented 40EP-9EO05, Excess Stream Demand.**

INITIATING CUE:

- **The CRS has directed you to verify plant conditions starting with step 23 of 40EP-9EO05, Excess Steam Demand.**

INFORMATION FOR EVALUATOR'S USE:

- An asterisk (*)denotes a Critical Step
- At the discretion of the Examiner/Evaluator, this JPM may be terminated when the Task Standard is met or adequate time has been allowed to complete the JPM. It shall be terminated when the Examinee has verbalized completion of the JPM.
- Any step marked UNSAT requires comments.
- If this is the first JPM of the set then ensure the examinee has been briefed.
- Step sequence is not critical unless noted or will prevent achieving the task standard.
- Notify the unit Shift Manager of in-plant JPM performance.
- Performance of this JPM may require entry into areas with alarmed doors. Security requirements must be observed.
- Locked valves may be involved. No attempt will be made to actually operate any valves.

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Step 23 of 40EP-9EO05 **IF** containment pressure is 3 psig or more, **THEN** check CIAS is actuated.	**If Requested Cue:** **The CRS concurs with manual CIAS actuation**	Examinee determines that Containment pressure is > 3 psig and manually actuates CIAS.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Step 24 of 40EP-9EO05 **IF** CIAS has actuated, **THEN** check that an isolation valve is closed for each containment penetration required to be closed.	**If Requested Cue:** **The CRS concurs with closing WCB-UV-61 and WCA-UV-62.** **Examiner Note: Closing either valve will meet containment closure criteria.**	Examinee checks SESS panels (B02) after CIAS actuation and determines that the Chill Water (WC) return header has not properly isolated and closes WCB-UV-62 and WCA-UV-61. Valves will stroke closed once they have been taken to close and picked up the Over-ride light
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 25 of 40EP-9EO05 **IF** the following conditions exist: • The Containment Spray Pump(s) are operating on the miniflow(s) • Containment pressure is not expected to exceed 8.5 psig within one hour of the CS Pump start **THEN** stop the Containment Spray Pump(s).		Examinee leaves the CS pumps running because containment pressure is > 8.5 psig.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 26 of 40EP-9EO05 **IF** containment pressure is 8.5 psig or more, **THEN** check CSAS is actuated.	**If Requested Cue:** **The CRS concurs with manual CSAS actuation**	Examinee determines that Containment pressure is > 8.5 psig and manually actuates CSAS.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Step 27 of 40EP-9EO05 **IF** CSAS has actuated, **THEN** perform the following: a. Ensure at least one Containment Spray header flow is greater than 4350 gpm. b. Ensure all RCPs are off. c. Ensure RCP controlled bleedoff flow is isolated. d. PERFORM Appendix 19, Containment Hydrogen Control to align the Hydrogen recombiners.	**Inform Cue: After the examinee closes the BO valves :** **Another operator will perform the remaining steps.**	Examinee performs the following: a. Verifies that both CS header flows are > 4350 gpm. b. Stops RCPs 1A and 2A. c. Isolates controlled bleedoff by closing (B03) o RCN-HS-430 o RCN-HS-431 o RCN-HS-432 o RCN-HS-433
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: ____

NOTE:

Problems/issues identified on E-Plan JPMs during performance will be documented with a formal post-critique using Form 0800 (Electronic Forms under Emergency Preparedness) and forwarded to Emergency Preparedness organization for resolution.

NORMAL TERMINATION POINT

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RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
000	10/27/2011		New JPM

REASON REVISED — Enter the numbers corresponding to the reason revised in the Reason Revised column and brief description of changes in Comments Column. Comments are to be numbered consecutively in each revision.

1. Vendor reference document upgrade
2. Plant modification (include number)
3. Procedure upgrade
4. Internal or External Agency Commitment (indicate item number)
5. Technical Specification Change (indicate amendment number)
6. Other (explain in comments)

EXAMINEE HANDOUT

INITIAL CONDITIONS:

- **Unit 1 automatically tripped due to an ESD on SG 1.**
- **SPTAs have been completed.**
- **The CRS has implemented 40EP-9EO05, Excess Stream Demand.**

INITIATING CUE:

- **The CRS has directed you to verify plant conditions starting with step 23 of 40EP-9EO05, Excess Steam Demand.**

INSTRUCTIONS	CONTINGENCY ACTIONS
22. **IF** the break is inside Containment, **THEN** place the Hydrogen Analyzers in service.	
✱ 23. **IF** containment pressure is 3 psig or more, **THEN** check CIAS is actuated.	23.1 Manually actuate CIAS.

CAUTION

High radiation levels may result in personnel exposure when attempting local manual valve operation.

✱ 24. **IF** CIAS has actuated, **THEN** check that an isolation valve is closed for each containment penetration required to be closed.	24.1 Ensure that an isolation valve is closed for each containment penetration required to be closed.
✱ 25. **IF** the following conditions exist: • The Containment Spray Pump(s) are operating on the miniflow(s) • Containment pressure is not expected to exceed 8.5 psig within one hour of the CS Pump start **THEN** stop the Containment Spray Pump(s).	
✱ 26. **IF** containment pressure is 8.5 psig or more, **THEN** check CSAS is actuated.	26.1 Manually actuate CSAS.

INSTRUCTIONS

CONTINGENCY ACTIONS

* 27. **IF** CSAS has actuated,
THEN perform the following:

a. Ensure at least one Containment Spray header flow is greater than 4350 gpm.

b. Ensure all RCPs are off.

c. Ensure RCP controlled bleedoff flow is isolated.

d. PERFORM Appendix 19, Containment Hydrogen Control to align the Hydrogen recombiners.

* 28. **IF** SIAS has actuated,
THEN perform the following:

a. Energize SIAS Load Shed Panels. REFER TO Appendix 21, List of SIAS Load Shed Panels.

b. PERFORM Appendix 17, Restoration of Containment Cooling.

Facility: PVNGS Scenario No.: 1 Op-Test No: 2012

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: (100% power, MOC).

Turnover: Unit 1 is at 100% power (250 EFPD). Auxiliary Feedwater Pump 'A' and Containment Spray 'A' are tagged out.

Event No.	Malf. No.	Event Type*	Event Description
1	None	N CO/SRO	Shift Turbine Cooling water pumps.
2	cmTRCV05CHNLT227_4	C RO/SRO	Volume Control Tank level transmitter, CHN-LT-227 fails low causing a boration. Crew takes action to return CCP suction to the Volume Control Tank.
3	mfRM01A	I CO/SRO	Control Room monitor, RU-29, fails high. Crew will bypass CREFAS "A".
4	cmCPCC06EWAP01_5 (In setup)	C RO/SRO (TS)	Essential Cooling water pump "A" fails to auto start on CREFAS actuation. RO will start EW pump "A".
5	mfTH06A f:0.02	C ALL (TS)	Steam Generator 1 Tube Leak **40AO-9ZZ02, Excessive RCS Leakrate**
6	mfED16C	C CO/SRO (T/S)	Loss of Class DC power PKC-M43. **40AO-9ZZ13, Loss of Class Instrument or Control Power**
7	mfTH06A f:50	M ALL	Steam Generator 1 Tube Leak degrades to a Rupture. **40EP-9EO04, Steam Generator Tube Rupture**
8	cmCPSI01SIAP02_5 (In setup)	C RO/SRO	HPSI pump "A" fails to auto start on SIAS/CIAS actuation
9	mfRX01 f:0	I CO/SRO	Tave fails low, Requires manual control of Main Feedwater flow.
			CRITICAL TASK – Reset MSIS during cooldown to prevent unmonitored release to public.
End point	Faulted SG is isolated per Standard Appendix 113, SG 1 Isolation		Faulted SG is isolated **CRITICAL TASK –Isolate faulted SG within 70 minutes of initiation of SGTR.**

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

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)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	2

Turnover

Plant conditions:

Unit 1 is at 100% power.

The core is presently at 250 EFPD.

Risk Management Action Level is ORANGE.

Train B is protected equipment.

AF 'B' and AF 'N' are protected.

CS 'B' is protected.

PC is NOT recircing the RWT.

Unit 2 is supplying the Aux Steam cross-tie header.

Vibration shop reported that in a review of data they found some unusual readings with Turbine Cooling Water pump "A". A vibration technician and AO are have been briefed and are standing by for a TCW pump shift. Appendix "D" of 40OP-9TC01 has been completed.

Equipment out of service:

Auxiliary Feedpump 'A' (AFA-P01) is tagged out due to a noisy bearing.

CS 'A' is tagged out for scheduled maintenance.

Planned shift activities:

Remove the "B" Turbine Cooling Water pump from service.

2012 NRC EXAM

Scenario 1

Setup Instructions

1. _____ Reset to IC-20

2. _____ Run scenario "2012 NRC Scenario 1" under "Scenario scenario files" from NRC exam thumb drive

3. _____ Stage radios for operators

4. _____ Alarm Silence to "**OFF**"

5. _____ Ensure CVCS and DFWCS alarms are reset

6. _____ Place the simulator in freeze until the crew enters the simulator.

7. _____ Hang "Train B" protected sign.

8. _____Hang "Protected Equipment" plaques near the handswitches for AF 'B' and AF 'N'.

9. _____Hang "Protected Equipment" plaques near the handswitch for CS 'B.

10. _____ Verify RCS leakrate has stabilized at ~ 0 gpm.

11. _____ Review procedures listed on the next page for marks and missing pages:

2012 NRC EXAM
Scenario 1

Procedures to check:

	74RM-9EF41, RMS Alarm Response (RU-29, RU-4, RU-7, RU-141 and RU-142)		40OP-9TC01, Turbine Cooling Water, (Section 4.3)
	41AL-1RK5A (Windows 4A, 4B, 4C)		41AL-1ES2A (Window 2D – SEAS 18L – pages 3 and 248-251)
	40AL-9RK3A (Windows 8A, 9A and 8B)		40AO-9ZZ02, Excessive RCS Leakrate (Section 5.0)
	40AO-9ZZ13, Loss of Class Instrument or Control Power (Section 7.0 and 8.0)		41AL-1RK2A (Windows 1A and 7A)
	40OP-9CH01, CVCS Normal Operations (Section 4.4) (possible)		41AL-1RK1A (Windows 5A and 5B)
	40EP-9EO01, Standard Post Trip Actions		40EP-9EO04, Steam Generator Tube Rupture
	40EP-9EO10, Standard Appendices (Appendices 5, 10, 16, 103 and 113)		Tech Specs (3.03, 3.7.7.a and 3.4.14.b)
	Copy of 72ST-9RX03, DNBR/LHR/AZTILT/ASI with COLSS Out of Service available		40ST-9EC03, Essential Chilled Water & Ventilation Systems Inoperable Action Surveillance (available)

2012 NRC EXAM

Scenario 1

Driver Station Menu should look like this:

SCENARIOS	TRIGGERS	MALFS	COMP MALFS	REMOTES	COMP REMOTES	I/O OVERRIDES	ALARM OVRDS
0	1	4:0	4:2	3	8	0:0 *	0:0

***If MSIV bypasses are under clearance this will read 2:2**

Complete list of malfunctions.

Triggers	
rpschd	Reactor Trip breaker 'D' open
Malfs	
mfED16C k:6	PKC-M43 LOSS OF PWR CLSS 125VDC BUS
mfRM01A k:3	RU-29 RADIATION MONITOR OUTPUT HIGH
mfRX01 f:0 e:RPSCHC	RRS T-AVE FAILURE - LOW
mfTH06A k:5 f:0.02	S/G 1 STEAM GENERATOR TUBE RUPTURE
Comp Malfs	
cmAVWD07SCNPV4A_2 k:40	POSITIONER CLOSE FAILURE: BLOWDOWN FLASH TK TO HTR DRN TK 4A
cmCPCC06EWAP01_5	FAIL TO AUTO-START: ESSENTIAL COOLING WATER PUMP A
cmCPSI01SIAP02_5	FAIL TO AUTO-START: HP SAFETY INJECTION PUMP A
cmTRCV05CHNLT227_4 k:2	TRANSMITTER FAILURE BELOW BAD VALUE: VOLUME CONTROL TANK
Remotes	
rfCV24 k:34 f:CLOSE	OPR "C" CHG PMP SUCT VLV
rfCV25 k:32 f:OPEN	OPR "A" CHG PMP ALT SUCT VLV
rfCV26 k:33 f:OPEN	OPR "B" CHG PMP ALT SUCT VLV
rfCV27 k:34 f:OPEN	OPR "C" CHG PMP ALT SUCT VLV
rfCV28 k:31 f:OPEN	OPR RWT CHG PMP ALT SUCT VLV
rfCV35 k:33 f:CLOSE	OPR "B" CHG PMP SUCT VLV
rfCV36 k:32 f:CLOSE	OPR "A" CHG PMP SUCT VLV
rfFW57 f:CLOSE	OPR AUX FPT MAIN STM SPLY VLV
rfFW59 f:TRIP	MAN ACT OVSP TRIP OF AFA-P01
rfFW60B f:OFF	CONTROL POWER TO AFA-HV54
Continued on next page	

rfTP20 k:11 f:CLOSE	TC PMP A DISCH
crB2RH02SIAP03_2 f:RACK_OUT	RACK IN/OUT: CONTAINMENT SPRAY PUMP A
crB4CV05CHNUV501_1 k:22 f:OPEN	BKR OPEN/CLOSE: CVCS VOLUME CONTROL TANK OUTLET VALVE
crB4CV08CHEHV536_1 k:21 f:OPEN	BKR OPEN/CLOSE: CVCS RWT GRAVITY FEED LINE TO CHARGING
crB4CV08CHNUV514_1 k:23 f:OPEN	BKR OPEN/CLOSE: CVCS BORIC ACID MAKEUP TO REGEN HEAT EXCH. VALVE
crB4FW08AFAHV32_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4FW08AFAUV37_1 f:OPEN	BKR OPEN/CLOSE: AUX FEEDWATER ISOLATION VALVE
crB4MS13SGAUV134_1 f:OPEN	BKR OPEN/CLOSE: SG 1 TO AUX FWP A STM SUPPLY VLV
crB4MS13SGAUV138_1 f:OPEN	BKR OPEN/CLOSE: SG 2 TO AUX FWP A STM SUPPLY VLV
crB4RH02SIAUV664_1 f:OPEN	BKR OPEN/CLOSE: CTMT SPRAY PUMPS TO RWT ISO VALVE
crB5FW08AFCHV33_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-2
crB5FW08AFCUV36_1 f:OPEN	BKR OPEN/CLOSE: AUX FEEDWATER ISOLATION VALVE

2012 NRC EXAM
Scenario 1
Driver's Page

EVENT	TIME	SYNTAX	DESCRIPTION	MISC.
1	When directed by control room to close TCN-V531			When directed to close TCN-V531, "B" TC Pump TCN-P01B Casing Vent Header Isolation Valve wait 1 minute and report TCN-V531 is closed (not modeled).
	When directed by control room to close TCN-HCV-25 ('A' TC pump discharge valve)	**Wait 2 minutes then insert KEY 11** rfTP20 f:CLOSE	Closes TCN-HCV-25 ('A' TC pump discharge valve)	After valve is closed, report TCN-HCV-25, TC Pump A discharge valve is closed.
	When directed by control room to open TCN-HCV-25 ('A' TC pump discharge valve)	**Mrf TP20 f:OPEN**	Opens TCN-HCV-25 ('A' TC pump discharge valve)	After valve is open, report TCN-HCV-25, TC Pump A discharge valve is open. When directed report no rotation of TC pump A and that the casing vent valve TCN-528 is OPEN.
	When directed by control room to open TCN-V528			When directed to open TCN-V528, "B" TC Pump TCN-P01B Casing Vent Header Isolation Valve wait 1 minute and report TCN-V528 is open (not modeled).
2	When directed by the lead evaluator.	**KEY 2** cmTRCV05CHNLT227_4 k:2	Fails VCT level transmitter CHN-LT-227 low	
	When directed by the control room to open breakers	When directed to open the breaker for CHE-HV-536 (NHN-M7209) insert **KEY 21** crB4CV08CHEHV536_1 f:Open	Opens breaker form CHE-HV-536	Wait 2 minutes (unless sent early) then report that you are standing by at NHN-M72. Report breakers open as operated.
		When directed to open the breaker for CHN-UV-501 (NHN-M7208) insert **KEY 22** crB4CV08CHEHV501_1 f:Open	Opens breaker form CHN-UV-501	
		When directed to open the breaker for CHN-UV-514 (NHN-M1528) insert **KEY 23** crB4CV08CHEHV514_1 f:Open	Opens breaker form CHN-UV-514	

Continued on next page

2012 NRC EXAM
Scenario 1
Driver's Page

3	When directed by the lead evaluator.	**KEY 3** mfRM01A	Fails RU-29 high	When called as Effluent Tech, report that it appears RU-29 failed high due to sudden increase in the output and request the control room bypass RU-29.
4		(In Setup) cmCPCC06EWAP01A_5	EW 'A' pump fails to auto start	In sent as area operator to inspect the breaker (PBA-S03M) for EWA-P01, wait 3 minutes and report that you see nothing abnormal.
5	When directed by the lead evaluator.	**Key 5** mfTH06A f:0.02	SG Tube leak (~1 gpm)	When called as Chemistry about sampling, report you are not sampling the primary at this time. If called as RP acknowledge a leak in SG 1 When directed as Aux Operator to close CDN-V099, Condensate Service Hdr Isolation wait 2 minutes then report valve closed.
	If directed to close SCN-V11 and V12	**Wait 3 minutes then insert Key 40** cmAVWD07SCNPV4A_2	Simulates closing SCN-V11 and V12	
	If directed to close CDN-V099	**None**		Wait three minutes and report CDN-V099 closed.
6	When directed by the lead evaluator.	**KEY 6** mfED16C	Loss of PKC-M43	If called as the Area Operator to inspect PKC-M43, report that the C Battery breaker is open and the 'C' Charger AC battery is tripped. Request electrical assistance.
7	When directed by the lead evaluator.	MMF TH06A f:50	SG Tube leak degrades	
8		(In Setup) cmCPSI01SIAP02_5	HPSI 'A' fails to auto start	
Continued on next page				

9		(In Setup) mfRX01 f:0 e:RPSCHC	Tave fails low	
	If directed align charging pump suction to the RWT per Standard Appendix 10	Insert **KEY 31** rfCV28 k:31 f:OPEN ***Then for Charging Pump A*** Insert **KEY 32** rfCV25 k:32 f:OPEN rfCV36 k:32 f:CLOSE ***Then for Charging Pump B*** Insert **KEY 33** rfCV26 k:33 f:OPEN rfCV35 k:33 f:CLOSE ***Then for Charging Pump E*** Insert **KEY 34** rfCV27 k:34 f:OPEN rfCV24 k:34 f:CLOSE	Opens CHB-V327 (key 31) **(This valve must be open or you will cause a charging pump to trip).** Aligns Charging Pump 'A' to the RWT by closing CHA-V316 and opening CHA-V755. (Key 32) Aligns Charging Pump 'B' to the RWT by opening CHA-V756 and closing CHA-V319 (Key 33) Aligns Charging Pump 'E' to the RWT by opening CHA-V757 and closing CHA-V322 (Key 34).	

Scenario 2 Overview

Event 1	CO shift Turbine Cooling Water Pumps from A running to B running.
Event 2	Low failure of the Volume Control Tank level transmitter CHN-LT-227. This causes the charging pump suction to automatically shift from the Volume Control Tank to the Refueling Water Tank (resulting in boration of the RCS). The operator is directed by the alarm response to hold open the VCT outlet valve and hold closed the valve from the Refueling Water Tank while an auxiliary operator opens the breakers to the valves. The crew may also reduce turbine load depending on how long the boration goes before the valves are repositioned.
Event 3	RU-29 (Control Room intake ventilation radiation monitor) fails high causing a Control Room Essential Filtration Actuation Signal (CREFAS). The crew should determine the rad monitor has failed high (confirmed by the Effluent Technician) and bypass RU-29 on the BOP-ESFAS panel behind the control boards.
Event 4	EW 'A' pump fails to auto start on the previous CREFAS signal. The CRS should address Tech Specs and declare EW 'A' inoperable as well as various other cascading Tech Specs.
Event 5	Steam Generator #1 Tube leak. The CRS should respond by entering Abnormal operating procedure 40AO-9ZZ02 and addressing Tech Specs. The crew should address charging pumps and letdown. The RO will perform a leakrate determination and the CO will minimize the release to environment.
Event 6	Loss of PKC-M43 (125 VDC Motor Control Center). The CRS should respond by entering Abnormal operating procedure 40AO-9ZZ13. The CO should place CEDMCS in standby and place CEAC 2 inop codes in the Core Protection Calculators.
Event 7	SG Tube leak degrades. The CRS should direct starting all available charging pumps, isolating letdown and tripping the reactor since pressurizer level continues to decrease. The crew performs the Standard Post Trip Actions. After the SPTAs are complete, the CRS should enter 40EP-9EO04, SGTR and initiate and cooldown and depressurization of the RCS. Once below 540 °F, the crew should isolate the affected SG.
Event 8	When the Safety Injection Actuation Signal actuates, the Train 'A' High Pressure Safety Injection pump will fail to auto start. The RO should recognize this and manually start the pump.
Event 9	After the trip, the Tave from the Reactor Reg System will fail low. This will require action by the CO to establish feed to the Steam Generators.

Op-Test No.: _____ Scenario No.: __1__ Event No.: __1__

Event Description: _____Shift of the Turbine Cooling Water pumps_____

Time	Position	Applicant's Actions or Behavior
T = 0	CRS	Directs the CO to shift Turbine Cooling Water Pumps.
	CO	Informs the Auxiliary Operator (AO) in the Turbine Building that he will be shifting TC Pumps. Starts the standby pump (TCN-P01B) by placing handswitch, TCN-HS-22, in the "START" position (B07). Directs the AO to close the casing vent valve for TCN-P01B (TCN-HCV-531). Directs the AO to close the discharge valve for TCN-P01A (TCN-HCV-25). When the AO reports the discharge valve for TCN-P01A is closed, the CO stops the TC 'A' pump using TCN-HS-21 (B07). Directs the AO to open the discharge valve for TCN-P01A (TCN-HCV-25). Directs the AO to visually inspect TC pump A to ensure no rotation then Open the casing vent valve (TCN-528). Informs the AO in the Turbine Building that the pump shifting operation is complete.

Op-Test No.: _____ Scenario No.: __1__ Event No.: __2__

Event Description: ____Volume Control Tank level transmitter CHN-LT-227 fails low_____

Time	Position	Applicant's Actions or Behavior
T = 7	Crew	The crew receives alarms on B03 (Windows 9A and 8B).
	RO	Address the alarm response procedure (40AL-9RK3A).
Examiner Note: CHN-LT-227 is not indicated on the control boards but can be seen on the plant computer.		
	RO	Addresses the alarm response procedure (40AL-9RK3A). Verifies that the auto actions have occurred (B03): • Boric acid makeup to charging pumps valve, CHN-UV-514 opens. (Loss of power to CHN-UV-514 will open CHE-HV-536). • Volume Control Tank Outlet valve, CHN-UV-501 closes. • Boric acid makeup pump recirc valve, CHN-UV-510 closes. • One Boric acid makeup pump, CHN-P02A or CHN-P02B starts. Checks the VCT level Lo-Lo alarm by reading level indicator CHN-LI-226 (B03). If the CRS directs, the RO goes to single charging pump operation per 40OP-9CH01, CVCS Normal Operations. This would entail the following: • Manually lowering letdown flow to 20 to 30 gpm using RCN-LIC-110, Level Setpoint Controller (B04). • Place the normally running charging pump (CH 'B') in the Pull-to-Lock position (B03). • Restore one of the following: o Restore Pzr level control to AUTO o Balance charging and letdown flow to stabilize level in the VCT. **(Continued on next page)**

		IF level indicator CHN-LI-226 indicates normal VCT level (i.e., greater than 15% level), **THEN** perform the following to maintain charging pump suction aligned to the VCT:
Examiner Note: The RO may hand off the Alarm Response Procedure to the CO to read as he holds the valves.		
	RO (Continued)	• Holds open CHN-UV-501, Volume Control Tank Outlet valve (B03).
Examiner Note: IF the operator's hand slips and CHN-UV-501 starts going closed, the operator should release the handswitch for CHN-UV-514 or a low suction pressure trip will occur on the charging pumps.		
	RO (Continued)	• Holds closed CHN-UV-514, Boric Acid Makeup to Charging Pumps Valve (B03). **(IF** at any time, CHN-UV-501 begins to stroke closed or indicates intermediate position. **THEN** release CHN-HS-514 and check that CHN-UV-514 opens.) • Directs an AO to open the following breakers (in the following order): o CHE-HV-536 breaker, NHN-M7209 o CHN-UV-501 breaker, NHN-M7208 o CHN-UV-514 breaker, NHN-M1528 • Stations an operator(s) in the vicinity of the MCCs to close the following breakers when directed by the Control Room Operator

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: _____ Scenario No.: __1__ Event No.: __3 and 4__

Event Description: (3) Control Room Radiation Monitor (RU-29) fails high causing a CREFAS
(4) Essential Cooling Water Pump A fails to auto tart

Time	Position	Applicant's Actions or Behavior
T = 23	Crew	The crew receives alarms on B05A (Windows 4A, 4B, and 4C) and on the RMS panel for RU-29.
	CO	The CO addresses the alarm response procedures **(41AL-1RK5A and 74RM-9EF41)**. **74RM-9EF41 Response:** • High alarm initiates a CREFAS. • Notify RP. • Notify Radiation Monitoring Technician (Effluent Tech). • Monitor RU-29 or RU-30 for increasing trends. • Monitor RU-143 and RU-145 readings and trends. **41AL-1RK5A Response:** • Checks the auto actions for a CREFAS (SP pump, EW pump, Essential Chiller and Control Room Essential Ventilation should all start).
	RO	Addresses the alarm response for the blue SEAS light (B02) and determines the EW 'A' pump did not auto start. Addresses the alarm response **(41AL-1ES2A)** for the SESS panel and starts the EW 'A' pump (B02). **41AL-1RK5A Response:** If a CREFAS occurs and no SIAS and no LOP, then within 30 minutes stop the Control Bldg Normal Sply Fan A01 and ESF Swgr Room Norm Sply Fan A03 (B02).

	Crew	When called the Effluent Tech states that RU-29 has failed high due to a sudden increase in the output and requests that the control room place RU-29 in bypass.
	CRS	Addresses Tech Specs and determines the EW 'A' pump is inoperable and enters LCO 3.7.7 condition 'a'. This will cause numerous other LCOs to be entered due to cascading Tech Specs. Addresses Tech Spec (LCO 3.3.9) for RU-29 failing and determines only one Control Room Radiation monitor is required. Directs the CO to bypass RU-29 on the BOP-ESFAS panel per 40OP-9SA01. May elect to quarantine rather than start EW pump "A".
	CO	Bypass RU-29 (CREFAS A) on the BOP-ESFAS Cabinet (back of control panels) per 40OP-9SA01.

Op-Test No.: _____ Scenario No.: __1__ Event No.: __5__

Event Description: _____ Steam Generator #1 Tube Leak _____

Time	Position	Applicant's Actions or Behavior
T = 34	Crew	The crew receives alarms on RU-142, Main Steam Line N16 Monitors.
	CO	The CO addresses the Alarm Response procedure for RMS **74RM-9EF41**. • The CO determines that RU-142, channels 1 and 2 have the highest readings therefore SG #1 is affected. • Monitors RU-4, RU-139, RU-141, and RU-143 for increases. • Reports the leak rate and rate of change when requested by the CRS.
	CRS	Enters **40AO-9ZZ02**, Excessive RCS Leakrate (Section 5.0) and performs the following: • Enter AOP Entry Time and Date. • If pressurizer level is lowering and additional makeup is required, then ensure all available charging pumps are running. • If all available charging pumps are running and pressurizer level is lowering, then isolate letdown.
Examiner Note: The leak rate should be ~ 1 gpm so additional makeup or isolation of letdown is not required at this time.		
	CRS (continued)	• Ensure compliance with LCO 3.4.14 and 3.4.18 (enters condition 'b' of LCO 3.4.14 and condition 'a' of LCO 3.4.18). • Directs Chemistry to perform the Abnormal Occurrence checklist for a SGTL. • Notifies RP that an RCS leak exists. **(Continued on next page)**

	CRS (continued)	• Obtains the leakrate and rate of change of leakrate from RMS. • Refers to Appendix F, Steam Generator Tube Leak Guidelines to determine operator actions and determines a shutdown is required. • Directs the RO to perform Appendix B, ERFDADS Leak Rate Determination. • Commences performance of 40OP-9ZZ05, Power Operations to perform a plant shutdown.
Examiner Note: Since there is no time requirement for the shutdown, there is no need to wait for a down power prior to going to the next event.		
	CRS (continued)	• Directs the CO to perform Appendix C, Minimize Release to the environment.
	RO	Performs Appendix B ERFDADS Leak Rate determination. • Checks that TC is constant (±1°F). • Checks that pressurizer pressure is stable between 2235 and 2265 psia. • Ensures Chemistry is not drawing samples. • Ensures Letdown is aligned to the VCT or isolated. • Ensures Charging pump suction is aligned to the VCT. (The following actions occur on B03): • Places 210X, Reactor Makeup Water to VCT controller, in "MANUAL" with a zero output. • Places 210Y, Boric Acid Makeup to VCT controller, in "MANUAL" with a zero output. • Places CHN-HS-527, Makeup to Charging Pumps Valve in "CLOSED". • WHEN CHN-UV-527 indicates closed, THEN places CHN-HS-210, Makeup Mode Select Switch, in "MANUAL". • Monitors the leakrate on ERFDADs and allows the trend to run for 15 minutes or until VCT level has lowered to 15%.

	CO	CO performs Appendix C to minimize Release to the environment: • Ensures ARN-HS-19, Post Filter Mode Select Switch is in the “THRU FILTER MODE” (B07). • Selects “OFF” on the switches for Steam bypass valves SGN-PV-1007 and 1008 (B06). • Directs an operator to perform Attachment C-1, Condensate Cross-Tie Isolation. • Throttles CDN-HV-275, Demineralizer Water Feed to Condensate Service Header Valve to maintain 50-100 psig on CDN-PI-201 (B05). • Directs an operator to close CDN-V099 “CONDENSATE SERVICE HDR SUPPLY REG VALVE CDN-PV-200 OUTLET ISOL VALVE”. • Ensures that both of the Condensate Pump Overboard Valves (CDN-HV 29 and 30) are closed (B05).

Op-Test No.: _____ Scenario No.: __1__ Event No.: __6__

Event Description: _____ Loss of Channel C 125 VDC power (PKC-M43) _____
_____

Time	Position	Applicant's Actions or Behavior
T= 56	Crew	Receives numerous alarms on Panels B04 and B05. Also receive alarms on B01. Identifies a loss of PKC-M43 by indications on B05 (loss of instrument and lights on B05 and/or ADV permissive lights on B06).
	CRS	Enters 40AO-9ZZ14, Loss of Class Instrument or Control Power AOP Section 7.0 and performs the following: • Checks that PNC-D27 is energized. Goes to contingency step and performs Section 8.0. • Enters LCO 3.0.3 due to failure to meet Tech Spec LCO 3.1.5 Condition B. • Directs an operator to place CEDMCS in STANDBY. • Directs an operator to perform 72ST-9RX03, DNBR/LHR/AZTILT/ASI With COLSS out Of Service within 15 minutes. • Directs an operator to set the CEAC 2 INOP code in ALL operable CPCs. • Determines the effect of the de-energized buses using Appendix E. • Directs an operator to place PPS Channel C bistables in bypass. • Ensures compliance with Tech Specs (LCO 3.0.3 will be the most limiting).
	CO	Places CEDMCS in Standby when directed (B04). Performs 72ST-9RX03 when directed. Sets CEAC 2 INOP codes in A, B, and D CPCs (B05). Bypasses all parameters on Channel C PPS (behind control boards).

Op-Test No.: _____ Scenario No.: __1__ Event No.: __7, 8, and 9__

Event Description: _____Steam Generator Tube leak degrades (Trip Initiator)_____

Time	Position	Applicant's Actions or Behavior
T = 70	Crew	Notices Pzr Level and RCS pressure are lowering.
	CRS	Directs RO to start additional charging pumps and isolate letdown. Due to pressurizer level continuing to lower, directs a manual reactor trip and possibly a SIAS/CIAS based on trend. Directs the crew to perform the Standard Post Trip Actions.
Standard Post Trip Actions		
	CO	Trips the reactor and possibly initiates a SIAS/CIAS when directed (may be done by the RO) (B04). Reports the Reactivity Control Safety Function (CEAs inserted, power dropping, negative startup rate).
Examiner Note: Due to the loss of PKC-M43, 2 of the 3 CEA position indications are not available so the crew should borate the RCS.		
	CO (Continued)	Reports the Main Turbine is tripped and the generator output breakers are open. Reports SG levels and trends and method of feed.
Examiner Note: Due to the low failure of Tave, the CO will have to either take manual control of the downcomer valves or use Auxiliary Feedwater to feed the SGs.(B02)		
	CO (Continued)	Reports the status of the Electric Plant (all buses energized and DGs running with SP pump **IF** SIAS/CIAS initiated). Reports Tcold and trend. **(Continued on next page)**

	CO (Continued)	Reports SG pressures and trends. Reports Containment pressure and status of the Radiation Monitors (may be done by the RO). Reports Containment temperature and pressure (may be done by the RO).
	RO	Borates the RCS using Standard Appendix 103 (B03). May direct the Aux Operator to restore power to CHN-UV-514 and CHE-HV-536. The following reports may be performed by the CO while a boration is being established. • Reports status of pressurizer level and trend (lowering unless post trip heat is still occurring). • Reports RCS Subcooling (lowering). • Reports status of seal injection and Nuclear Cooling Water to the RCPs (in service). • Reports status of RCS pressure (lowering). • Reports status of RCPs, Loop ΔT, and RCS Subcooling. • When SIAS occurs recognizes that HPSI 'A' did not start and starts HPSI 'A" (B02).
SGTR Procedure		
	CRS	Diagnoses a SGTR and goes to **40EP-9EO04**, SGTR and performs the following: • Directs the CO to ensure the Steam Generator Sample Valves are open. • Directs Chemistry to perform the Abnormal Occurrence Checklist. • Directs the SM to classify the event. **(Continued on next page)**

	CRS (continued)	• Checks a SIAS is actuated if pressurizer pressure drops to the SIAS setpoint. • If SIAS has actuated, directs RO to check that HPSI and LPSI pumps have started and that safety injection flow is adequate.
Examiner Note: If RO has not started the HPSI 'A' pump, the CRS should direct him to start the pump at this time.		
	CRS (continued)	• May direct the RO to shift charging pump suction to the RWT per Standard Appendix 10. • Directs the RO to stop one RCP in each loop if pressurizer pressure remains below the SIAS setpoint (this may have been done in the SPTAs). • Directs the RO to perform Appendix 16, RCP Trip Criteria. • Directs the CO to commence a cooldown to a T-hot of less than 540°F using the SBCS. • Directs the CO or RO to perform Appendix 5, RCS and Pressurizer Cooldown Log. • Directs the RO to depressurize the RCS to less than 1135 psia, approximately equal to the SG with the tube leak and within the P/T limits. • Directs the RO or CO to reset the MSIS setpoints.
CRITICAL TASK: Reset the MSIS during the cooldown to prevent an unmonitored release to the public.		
	CRS (continued)	• Determines the most affected SG is SG#1. • When T-hot is less than 540°F, directs the CO to isolate SG#1 using Appendix 113, Steam Generator 1 Isolation.
	RO	Starts the HPSI 'A' pump if not done during the SPTAs (B02). Shifts Charging pump suction to the RWT using Appendix 10 as follows: • Ensures CHB-HV-530 is open (B02). • Places the appropriate Charging Pump in Pull-to-Lock (B03). • Directs an Auxiliary Operator to perform Attachment 10-A for the appropriate charging pump. **(Continued on next page)**

	RO (continued)	Depressurizes the RCS using Main Spray (B04) or Aux Spray (B03). Resets the MSIS setpoints as the SGs depressurize (may be done by CO or combination of both operators).
	CO	Opens SG sample valves as directed (B07). Commences a cooldown to a T-hot of less than 540°F using the SBCS (B06). Resets the MSIS setpoints as the SGs depressurize (may be done by RO combination of both operators). When T-hot is less than 540°F performs Appendix 113 to isolate SG#1 as follows: • Checks both ADVs closed on SG#1 (B06): o ADV-184 o ADV-178 • Closes both SG 1MSIVs using the fast close pushbuttons (B06): o SGE-UV-170 o SGE-UV-180 • Ensure SGE-UV-169, SG1 MSIV Bypass Valve is closed(B06): • Closes both SG 1 Economizer FWIVs using the fast close pushbuttons (B06): o SGA-UV-174 o SGB-UV-132 • Closes both SG 1Downcomer Isolation Valves (B06): o SGA-UV-172 o SGB-UV-130 • Closes both SG 1Blowdown Containment Isolation Valves (B07): o SGA-UV-500P o SGB-UV-500Q • Closes BOTH of the following steam trap isolation valves (B06): o SGA-UV-1133 o SGB-UV-1135A/1135B **(Continued on next page)**

	CO (continued)	• Checks the SG Safety Valves on closed (B06). • Ensures BOTH Aux Feed Pump A Steam Supply Valves are closed (B06): o SGA-UV-134 SG 1 Steam Supply to Aux Feed Pump A o SGA-UV-134A SG1 Steam Supply to Aux Feed Pump A Bypass • Ensures BOTH Auxiliary Feedwater Isolation Valves are closed (B06): o AFB-UV-34 Aux Feedwater to SG1 Downstream Valve o AFC-UV-36 Aux Feedwater to SG 1 Downstream Valve.
CRITICAL TASK: Isolate the ruptured SG within 70 minutes of initiation of the SGTR.		
Scenario termination: The scenario may be terminated when the ruptured SG is isolated.		

Facility: PVNGS Scenario No.: 2 Op-Test No: 2012

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: (100% power, MOC).

Turnover: Unit 1 is at 100% power (250 EFPD). AFA-P01 and Containment Spray 'A' are tagged out.

Event No.	Malf. No.	Event Type*	Event Description
1	None	N CO/SRO	Shift from Hydraulic Fluid Pump B to Pump A per section 4.7 of 40OP-9C001, Electro-Hydraulic Control System.
2	mfNI02C f:0	I CO/SRO	Control Channel 2 fails low (50% Power indicated). Crew selects channel 1 at the RRS system panel. **40AO-9ZZ16, RRS Malfunctions**
3	mfTH01A f:0.01	C RO/SRO (TS)	Small RCS leak. Crew takes action per section 3 of ~16 gpm **40AO-9ZZ02, Excessive RCS Leakrate**
4	mfAN_1A03D1 doeED_ZLS037271DS_W1 doRP_ZLSAAC02ALOP1_W1	C CO/SRO (TS)	LOP relay failure. Crew responds using 41AL-1RK1A (1A03D) Crew determines that a LOP should not have occurred and takes action to bypass the appropriate relays per 40OP-9SA01
5	IOR dims_ZDSGEUV170	R -RO C - CO/SRO	An MSIV goes closed. Crew responds per 40AL-9RK6A and begins a down power to less than 65% power.
6	cmCPTP01CENP01B_6	C CO/SRO	Stator Cooling Pump 'B' trips with standby pump failing to auto start.
7	mfTH01A f:3	M ALL	LOCA RCS leak degrades requiring a reactor trip. **40EP-9EO03, Loss of Coolant Accident**
8	Scenario file noSI/CI	C RO/SRO	SIAS/CIAS/MSIS fail to automatically initiate. **CRITICAL TASK – Initiate SI flow when the SIAS setpoint has been exceeded.**
9	cmCPRH05SIBP03_6	C RO/SRO	CS pump "B" trips on an 86 lockout **CRITICAL TASK –Initiate CS flow when the CSAS setpoint has been exceeded.** **40EP-9EO09, Functional Recovery Procedure**
End point	Scenario may be ended once SIAS and CSAS flow have been established using LPSI.		

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

	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)	2			
6.	EOP contingencies requiring substantive actions (0–2)	1			
7.	Critical tasks (2–3)	2			

Turnover

Plant conditions:

Unit 1 is at 100% power.

The core is presently at 250 EFPD.

Risk Management Action Level is ORANGE.

Train B is protected equipment.

AF 'B' and AF 'N' are protected.

CS 'B' is protected.

PC is NOT recircing the RWT.

Unit 2 is supplying the Aux Steam cross-tie header.

Equipment out of service:

Auxiliary Feedpump 'A' (AFA-P01) is tagged out due to a noisy bearing.

CS 'A' is tagged out for scheduled maintenance.

Planned shift activities:

The crew needs to shift EHC pumps from B to A to support vibration readings. The vibration tech is standing by.

2012 NRC EXAM
Scenario 2

Setup Instructions

1. _____ Reset to IC-20

2. _____ Run scenario “2012 NRC Scenario 2” under “Scenario scenario files” from NRC exam thumb drive

3. _____ Stage radios for operators

4. _____ Alarm Silence to “**OFF”**

5. _____ Ensure CVCS and DFWCS alarms are reset

6. _____ Place the simulator in freeze until the crew enters the simulator.

7. _____ Hang “Train B” protected sign.

8. _____Hang “Protected Equipment” plaques near the handswitches for AF ‘B’ and AF ‘N’.

9. _____Hang “Protected Equipment” plaques near the handswitch for CS ‘B.

10. _____Verify RCS leakrate has stabilized at ~ 0 gpm.

11. _____ Review procedures listed on the next page for marks and missing pages:

2012 NRC EXAM
Scenario 2

Procedures to be checked:

	40OP-9CO01, ELECTRO-HYDRAULIC CONTROL SYSTEM (Section 6.7)		40AL-9RK4A (Window 10B)
	40AL-9RK6A (Window 6A [Reactor Power deviation – 8%] and 7A)		40AO-9ZZ16, RRS Malfunctions (Section 5)
	40AO-9ZZ02, Excessive RCS Leakrate (Section 3)		41AL-1RK1A (Window 3D)
	40OP-9SA01, BOP ESFAS Module Operations (Section 4.6)		40AL-9RK6B (Windows 7A, 7B and 7C))
	74RM-9EF41, RMS Alarm Response (RU-1)		40OP-9ZZ05, Power Operations (Section 6.0)
	40OP-9CH01, CVCS Normal Operations (Section 7.0)		40EP-9EO01, SPTAs
	40EP-9EO03, LOCA		40EP-9EO09, FRP (CTPC-2)
	Tech Specs (3.3.7, 3.7.2 and 3.4.14)		40OP-9SF08, RRS Operations (section 6.0)

2012 NRC EXAM
Scenario 2

Driver Station Menu should look like this:

SCENARIOS	TRIGGERS	MALFS	COMP MALFS	REMOTES	COMP REMOTES	I/O OVERRIDES	ALARM OVRDS
0	0	2:0	11:9	3	8	3:0*	1:0

- May be 5:2 if MSIV bypasses are tagged out.

Complete list of malfunctions.

Malfs	
mfNI02C k:2 f:0	SEN-NG-008 CONT CH 2 SUB CH 1 DET FAIL
mfTH01A f:0.01 k:3	LOOP 1A LOCA - COLD LEG
Comp Malfs	
cmBSRP01BSCNTPRHIAT_1	BISTABLE FAILS ASIS: HI CNT PRESS CHANNEL A TRIP
cmBSRP01BSCNTPRHIBT_1	BISTABLE FAILS ASIS: HI CNT PRESS CHANNEL B TRIP
cmBSRP01BSCNTPRHICT_1	BISTABLE FAILS ASIS: HI CNT PRESS CHANNEL C TRIP
cmBSRP01BSCNTPRHIDT_1	BISTABLE FAILS ASIS: HI CNT PRESS CHANNEL D TRIP
cmBSRP01BSPZRPRLOAT_1	BISTABLE FAILS ASIS: LO PZR PRESS CHANNEL A TRIP
cmBSRP01BSPZRPRLOBT_1	BISTABLE FAILS ASIS: LO PZR PRESS CHANNEL B TRIP
cmBSRP01BSPZRPRLOCT_1	BISTABLE FAILS ASIS: LO PZR PRESS CHANNEL C TRIP
cmBSRP01BSPZRPRLODT_1	BISTABLE FAILS ASIS: LO PZR PRESS CHANNEL D TRIP
cmCPTP01CENP01A_5	FAIL TO AUTO-START: STATOR COOLING PUMP A
cmCPTP01CENP01B_6 k:6	SPURIOUS 86 LOCKOUT RELAY TRIP: STATOR COOLING PUMP B
cmCPRH05SIBP03_6 k:9	SPURIOUS 86 LOCKOUT RELAY TRIP: CONTAINMENT SPRAY PUMP B
Remotes	
rfFW57	OPR AUX FPT MAIN STM SPLY VLV
rfFW59	MAN ACT OVSP TRIP OF AFA-P01
rfFW60B	CONTROL POWER TO AFA-HV54
Comp Remotes	
crB2RH02SIAP03_2 f:RACK_OUT	RACK IN/OUT: CONTAINMENT SPRAY PUMP A
crB4FW08AFAHV32_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4FW08AFAUV37_1 f:OPEN	BKR OPEN/CLOSE: AUX FEEDWATER ISOLATION VALVE
crB4MS13SGAUV134_1 f:OPEN	BKR OPEN/CLOSE: SG 1 TO AUX FWP A STM SUPPLY VLV

crB4MS13SGAUV138_1 f:OPEN	BKR OPEN/CLOSE: SG 2 TO AUX FWP A STM SUPPLY VLV
Continued on next page	
crB4RH02SIAUV664_1 f:OPEN	BKR OPEN/CLOSE: CTMT SPRAY PUMPS TO RWT ISO VALVE
crB5FW08AFCHV33_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-2
crB5FW08AFCUV36_1 f:OPEN	BKR OPEN/CLOSE: AUX FEEDWATER ISOLATION VALVE
I/O Overrides	
doED_ZLS037271DS_W1 f:OFF k:4	4.16KV BUS 1-E-PBA-S03 BUS POTENIAL IND LTS
doRP_ZLSAAC02ALOP1_W1 f:ON k:4	U/V-1 / TST / BYP, LOP/LS
diMS_ZDSGEUV170 f:OFF k:5	DI (Switch for module power to MSIV-170)
Alarm Ovrds	
mfAN_1A03D1 f:ALARM_ON k:4	UNDERVOLTAGE-1 CHANNEL A TRIP

2012 NRC EXAM

Scenario 2

Driver's page

EVENT	TIME	SYNTAX	DESCRIPTION	MISC.
1			Crew shifts Control Oil pumps from B to A.	If requested to inspect the A Control oil pump after the control room shifts pumps, report no abnormalities. Discharge pressure is 1600 psig.
2	When directed by the lead evaluator.	**Key 2** mfNI02C f:0	Control channel 2 fails low (one detector so indicated power is ~50%)	If contacted as I&C maintenance or work control report you will write a PVAR and investigate when Work Mech is generated.
3	When directed by the lead evaluator.	**Key 3** mfTH01A f:0.01	RCS leak of ~16 gpm	If called as Chemistry, report you are not sampling RCS.
	If directed by CR	**Key 31** CmAVWD07SCNPV4A_2	Simulates closing SCN-V11/12	Wait 5 minutes then report that SCN-V11 and 12 have been closed.
4	When directed by the lead evaluator.	**Key 4** mfAN_1A03D1 f:ALARM_ON doeED_ZLS037271DS_W1 f:OFF doRP_ZLSAAC02ALOP1_W1 f:ON	Fails PBA-S03 Undervoltage relay UV-1	If called as electrical, PR&C, or work control report you will write a PVAR and investigate when Work Mech is generated.
5	When directed by the lead evaluator.	**Key 5** IOR dims_ZDSGEUV170	Fails power to MSIV 170 causing it to close.	If called as electrical or work control report you will write a PVAR and investigate when Work Mech is generated.
6	When directed by the lead evaluator.	**Key 6** cmCPTP01CENP01B_6	Trips the B stator cooling pump	If directed as an area operator to inspect the pump, report no abnormal indications at pump but there is an 86 lockout indicated at the breaker.
7	When directed by the lead evaluator.	Mmf TH01A ramp:8 minutes and final severity 3	Modifies the leakrate to a final severity of 3 over an 8 minute period.	
8		(In Setup) Scenario file noSI/CI	No SIAS, CIAS, MSIS	
9	When directed by the lead evaluator and after the crew enters the LOCA procedure.	**Key 9** cmCPRH05SIBP03_6	Trip of the B Containment Spray Pump	If sent as area operator to check out the breaker, report it has an 86 Lockout and ground fault flag tripped.

Scenario 2 Overview

Event 1	The CO shifts the Electro Hydraulic Control (CO) pumps from B running to A running.
Event 2	One detector on Control Channel #2 fails low (resulting in an indication of 50% power). The CRS should enter 40AO-9ZZ16 to address the failure. The CO will select the unaffected channel on the Reactor Reg Test Panel behind the control boards. The CO will also address the alarm on the Digital Feedwater Control System (DFWCS) and place Control channel #2 in maintenance and remove the A-TUN lockout on the DFWCS.
Event 3	A small RCS leak (~ 16 gpm) occurs. The CRS should enter 40AO-9ZZ02 to address the leak. The RO will perform a leakrate calculation.
Event 4	A Loss of Power (LOP) undervoltage relay fails on the class Train A 4160 kV bus. The crew addresses the alarm response procedure and Tech Specs. The CO should place the LOP/LS relay in bypass on the BOP-ESFAS panel behind the control boards.
Event 5	A Main Steam Isolation Valve fails closed. The CO addresses the alarm response procedure which directs a down power to 65%. The RO will borate and the CO will reduce turbine load.
Event 6	Stator Cooling Water Pump 'B' trips with a failure of the 'A' pump to auto start. The CO should address the alarm response and start the 'A' pump within 70 seconds or a turbine trip will occur.
Event 7	The RCS leak degrades causing a LOCA. The crew performs the Standard Post Trip Actions (SPTAs).
Event 8	After the LOCA, a failure of PPS to initiate a Safety Injection Actuation Signal, Containment Isolation Actuation Signal and Main Steam Isolation Signal occurs. The crew should recognize the signals did not occur and manually initiate these actuations.
Event 9	After the crew enters the LOCA procedure, Containment Spray B will trip (CS 'A' is tagged out). This will cause a loss of safety function CTPC. The CRS should transition the Functional Recovery Procedure and align a LPSI pump to supply Containment Spray.

Op-Test No.: _____ Scenario No.: __2_ Event No.: __1__

Event Description: Shift from Hydraulic Fluid (EHC) Pump B to A running

Time	Position	Applicant's Actions or Behavior
T=0	CRS	Directs the CO to shift from Hydraulic Fluid Pump B to Pump A.
	CO	Informs the Auxiliary Operator in the Turbine Building that he will be shifting Hydraulic Fluid (EHC) pumps. Starts Hydraulic Fluid Pump A by momentarily placing handswitch CON-HS-4, HYDRAULIC FLUID PUMP A P01A, to START (B06). Checks ALL the following for Hydraulic Fluid Pump A: • The red START light at handswitch CON-HS-4, HYDRAULIC FLUID PUMP A P01A, is on • Motor amps are less than 219 amps • Pump discharge pressure is between 1500 psig and 1750 psig, indicated locally on CON-PI-007, "A" CO Pump Local Disch Press Indic Performs the following for Hydraulic Fluid Pump B • Stops Hydraulic Fluid Pump B by momentarily placing handswitch CON-HS-5, HYDRAULIC FLUID PUMP B P01B, to STOP. • Checks the green STOP light is on at handswitch CON-HS-5, HYDRAULIC FLUID PUMP B P01B.

Op-Test No.: _____ Scenario No.: __2_ Event No.: __2__

Event Description: Control Channel 2 fails low (50% power indicated)

Time	Position	Applicant's Actions or Behavior
T= 8	Crew	The crew receives alarms on B03 and B05. (Windows 3A10B and 6A6A)
	RO/CO	Address the alarm response procedure **(40AL-9RK4A)**. • Verifies a mismatch in Control Power readings (channel 2 reads 50%) • Verifies that the Reactor Regulating system is not in test. • With CRS concurrence switches CEDMCS out of Auto Sequential (AS) • Verifies pressurizer level is stable.

	CRS	Enters **40AO-9ZZ16**, RRS Malfunctions (section 5).
		• Ensures that CEDMCS in NOT in Auto Sequential.
		• Directs the CO to determine the failed channel.
		• Refers to Appendix B to determine the impact of the failure.
		  ○ AMI on 5% deviation
		  ○ DFWCS uses a canned value of 60% power
		• Directs the CO to select the unaffected instrument at the RRS Test Panel.
		• Verifies that Tavg/Tref mismatch is 3°F or less.
		• Directs the CO to place CEDMCS back in "AS".

	CO	• Determines that Control Channel 2 is reading 50% indicating a failed detector. • Selects channel 1 at the RRS Test Panel • Verifies that the Tavg/Tref mismatch is 3°F or less. • Places CEDMCS in the desired mode of operation as directed. • Addresses alarm response procedure **(40AL-9RK6A)** window 6A due to Reactor Power 8% deviation.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: _____ Scenario No.: _2__ Event No.: __3__

Event Description: Small RCS leak (~16 gpm)

Time	Position	Applicant's Actions or Behavior
T= 14	Crew	Crew observes a slight lowering of trends on pressurizer level and pressure. Crew receives alarms on RU-1, Containment Monitor.
	CO	The CO addresses the Alarm Response procedure for RMS **74RM-9EF41**. • Notifies RP of the alarm. • Notifies Radiation Monitoring Technician (Effluent Tech).
	CRS	Enters **40AO-9ZZ02**, Excessive RCS Leakrate (Section 3.0) and performs the following: • Enter AOP Entry Time and Date. • If pressurizer level is lowering and additional makeup is required, then ensure all available charging pumps are running. • If all available charging pumps are running and pressurizer level is lowering, then isolate letdown.
Examiner Note: The leak rate is ~ 16 gpm so no additional makeup or isolation of letdown is required at this time.		
	CRS (continued)	• Ensure compliance with LCO 3.4.14 condition 'b'. • Directs Chemistry to perform the Abnormal Occurrence checklist for a RCS leak. • Notifies RP that an RCS leak exists. • Directs the RO to perform Appendix B, ERFDADS Leak Rate Determination. • Directs an operator to walkdown charging and letdown piping.

	RO	Performs Appendix B ERFDADS Leak Rate determination. • Checks that TC is constant (±1°F). • Checks that pressurizer pressure is stable between 2235 and 2265 psia. • Ensures Chemistry is not drawing samples. • Ensures Letdown is aligned to the VCT or isolated. • Ensures Charging pump suction is aligned to the VCT. (The following actions occur on B03): • Places 210X, Reactor Makeup Water to VCT controller, in "MANUAL" with a zero output. • Places 210Y, Boric Acid Makeup to VCT controller, in "MANUAL" with a zero output. • Places CHN-HS-527, Makeup to Charging Pumps Valve in "CLOSED". • WHEN CHN-UV-527 indicates closed, THEN places CHN-HS-210, Makeup Mode Select Switch, in "MANUAL". • Monitors the leakrate on ERFDADs and allows the trend to run for 15 minutes or until VCT level has lowered to 15%.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: _____ Scenario No.: _2__ Event No.: __4__

Event Description: LOP relay failure

Time	Position	Applicant's Actions or Behavior
T= 22	Crew	The crew receives alarms on B01A. (Window 3D)
	RO	Address the alarm response procedure **(40AL-9RK1A)**. • Verifies normal PBA-S03 bus voltage using PBA-EI-S03L.
	CO	Places UV-1 in bypass per **40OP-9SA01,** BOP ESFAS Modules Operation. • Verifies that the Sequencer is not in Auto Test. • Performs a lamp test on BOP ESFAS cabinet "A". • Places Bypass Key in slot for UV-1 • Turns the key clockwise ~ ¼ turn or until the bypass light comes on.
	CRS	• Ensures compliance with LCO 3.3.7 condition 'a'. • Directs the CO to place UV-1 in bypass per section 4.6 of **40OP-9SA01,** BOP ESFAS Modules Operation.

Op-Test No.: _____ Scenario No.: __2_ Event No.: __5__

Event Description: MSIV 170 inadvertently goes closed ___

Time	Position	Applicant's Actions or Behavior
T= 32	Crew	The crew receives alarms on B06 (A), window 7A.
	CO	Address the alarm response procedure **(40AL-9RK6A)**. • Checks MSIV handswitches (B06) and determines that MSIV-170 is closed as indicated by SGA-HS-170A & SGB-HS-170B. • Informs CRS that the ARP directs a downpower to ≤ 65% per **40OP-9ZZ05,** Power Operations.
Examiner Note: An MSIV may be considered operable if it is closed and its opening capability is disabled.		
	CRS	Refers to **40OP-9ZZ05**, Power Operations (section 8). • Informs Rx Engineering, ECC and Water Rec. Facility of power reduction. • Refers to the Maneuvering Box Tools for downpower strategies. • Holds a reactivity brief. • Directs Chemistry to monitor secondary chemistry during power reduction. • Ensures that RCN-LIC-110 (B03), Pressurizer Level Control is in Remote Auto. • Directs an operator to close SCN-V011 & SCN-V012, isolation valves for Blowdown Flash Tank controller. • Directs the performance of appendix "U" if CEAs are moved. • Directs the RO to borate per the established game plan (~1800 gallons). **Continued on next page**

	RO	Borates the RCS at the desired rate using **40OP-9CH01**, CVCS Normal Operations. (The following actions occur on B03): • On CHN-FIC-210Y, Boric Acid Makeup flow control module (Foxboro), depresses the "Sel" pushbutton until the blue dot is at the top of the "Auto Setpoint" bar graph - the left bar graph. • Depress the "up" or "down" arrows to vary the auto setpoint. • **WHEN** the auto setpoint is at the desired value, ensures that "A" is illuminated on the A/M indicating light. • **IF** the makeup flow control module is **not** in automatic as indicated by an "A" illuminated on the A/M indicating light, **THEN** depress the "A/M" pushbutton. o Check that "A" illuminates on the A/M indicating light. • Selects the Target makeup flow on the boric acid totalizer/counter module (Micro-Motion), CHN-FQIS-210Y. • Places CHN-HS-210 in "borate". • Depresses the "reset" pushbutton – the left pushbutton on the totalizer/counter module (Micro-Motion). • Depresses the "start" pushbutton – the left pushbutton on the totalizer/counter module (Micro-Motion). o Actual system flow is displayed on the "Process Flow" bar graph – the middle bar graph on the selected makeup flow control module. o Actual flow may be read on recorder CHN-FR 210Y, green pen.
	CO	• Adjust feed pump bias (B06) as directed by CRS • Adjust Δp between the FWP discharge pressure and SG pressure to maintain sufficient feedwater flow. • Inserts CEAs per the power reduction plan. • Unloads the turbine by slowly lowering the Load Limit Potentiometer to maintain Tavg within ± 3° of Tref.

Op-Test No.: _____ Scenario No.: __2_ Event No.: __6___

Event Description: Stator Cooling Pump "B" trips, standby pump "A" fails to auto start ___
_____

Time	Position	Applicant's Actions or Behavior
T= 40	Crew	Crew receives alarms on B06 (B) windows 7A, 7B and 7C.
	CO	• Refers to 40AL-9RK6B (Window 7B) • Starts standby Stator Cooling Water pump CEN-P01A by going to start on handswitch, CEN-HS-30.
Examiner Note: Generator trip circuit has a 70-second delay. If condition persists, generator will trip.		
	CRS	• Directs CO to start Stator Cooling Water pump CEN-P01A.

Op-Test No.: _____ Scenario No.: _2__ Event No.: _7&8_

Event Description: (7) RCS leak degrades to a LOCA, requiring a reactor trip._____
_____(8) No SIAS, CIAS, and MSIS _____

Time	Position	Applicant's Actions or Behavior
T= 44	Crew	Observes Pzr level and RCS pressure lowering.
	CRS	• Directs RO to start additional charging pumps and isolate letdown. • Due to pressurizer level continuing to lower, directs a manual reactor trip and possibly a SIAS/CIAS/MSIS based on trend. • Directs the crew to perform **40EP-9EO01,** Standard Post Trip Actions
Standard Post Trip Actions		
	CO	• Trips the reactor and possibly initiates a SIAS/CIAS/MSIS when directed (may be done by the RO) (B04). • Reports the Reactivity Control Safety Function (CEAs inserted, power dropping, negative startup rate). • Reports main turbine tripped and output breakers open. • Reports Tcold and trend. • Reports SG pressures and trends. • Reports Containment pressure and status of the Radiation Monitors (may be done by the RO). • Reports Containment temperature and pressure (may be done by the RO)

	RO	• Reports the status of the Electric Plant (all buses energized and DGs running with SP pumps **IF** SIAS/CIAS initiated). • Reports status of pressurizer level and trend (lowering). • Reports RCS Subcooling (lowering). • Reports status of seal injection and Nuclear Cooling Water to the RCPs (in service). • Reports status of RCS pressure (lowering). • Reports status of RCPs, Loop ΔT, and RCS Subcooling. • Stops 2 RCPs and 1837 psia, stops all 4 RCPs on the Loss of Subcooling (< 24°).
LOCA Procedure		
	CRS	Diagnoses a LOCA **(40EP-9EO03)** and performs the following: • Confirms the diagnosis by directing the performance of the Safety Function Status Check. • Directs the CO to ensure the Steam Generator Sample Valves are open. • Directs Chemistry to perform the Abnormal Occurrence Checklist. • Directs the SM to classify the event. • Checks a SIAS is actuated if pressurizer pressure drops to the SIAS setpoint.
Examiner Note: If the crew has not yet initiated SIAS/CIAS/MSIS, the CRS should direct manual ESFAS actuations at this time.		
CRITICAL TASK: Initiate Safety Injection flow when the SIAS setpoint has been exceeded.		
	CRS continued	• If SIAS has actuated, directs RO to check that HPSI and LPSI pumps have started and that safety injection flow is adequate. • May direct the RO to shift charging pump suction to the RWT per Standard Appendix 10. • Directs the RO to stop one RCP in each loop if pressurizer pressure remains below the SIAS setpoint (this may have been done in the SPTAs). **(Continued on next page)**

	CRS continued	• Directs the RO to perform Appendix 16, RCP Trip Criteria. • Directs the RO to verify that Letdown is isolated. • Directs the CO to verify that the RCS sample lines are isolated. • Directs the RO to place the Hydrogen Analyzers in service. • Verifies that CIAS is actuated. • Directs the RO to verify that an isolation valve is closed for each containment penetration. • If containment pressure is 8.5 psig or more, then check CSAS is actuated. • If CSAS has actuated, then perform the following: a. Ensure at least one Containment Spray header flow is greater than 4350 gpm. b. Ensure all RCPs are off. c. Ensure RCP controlled bleedoff flow is isolated. d. PERFORM Appendix 19, Containment Hydrogen Control to align the Hydrogen recombiners.

Op-Test No.: _____ Scenario No.: _2__ Event No.: _7&8_

Event Description: Trip of Containment Spray Pump "B"

Time	Position	Applicant's Actions or Behavior
Examiner Note: Direct the driver to activate Key 9 causing CS pump "B" (SIB-P03) to trip on an 86 lockout.		
Functional Recovery Procedure		
T= 57	CRS	Diagnoses a lost Safety Function and goes to **40EP-9EO09**, FRP and performs the following: • Directs the SM to classify the event. • Identify the success path(s) to be used to satisfy each safety function. REFER TO BOTH of the following: o Section 4.0, Safety Function Tracking. o Section 6.0, Resource Assessment Trees. • PERFORM Section 5.0, Safety Function Status Check for those success paths in use. • Identifies **CTPC-2** as Jeopardized. • If CSAS actuated, then check at least one CS header is delivering 4350 gpm or more. o Implements contingency actions to establish CS flow. If it is desired to use LPSI Pump A to supply CS A train, and LPSI Pump A is not needed to support any RC, IC, or HR success path, then perform the following (B02): a. Ensure that LPSI Pump A is running. b. Ensure (closes) that SIA-HV-306, LPSI Shutdown Cooling Heat Exchanger A Bypass Valve, is closed. c. Ensure that SIA-HV-687, LPSI Containment Spray from Shutdown Heat Exchanger a Cross-Tie Valve, is open. **(Continued on next page)**

Examiner Notes:

1. There is no indication of CS flow when using a LPSI pump for CS flow.
2. The CRS may either direct the following steps or give them to the RO to perform.

	CRS continued	d. Ensure that SIA-UV-672, Containment Spray a Discharge to Spray Header 1 Valve, is open. e. Ensure (opens) SIA-HV-685, LPSI-Containment Spray to Shutdown Heat Exchanger a Cross-Tie Valve, is open. f. Check that the LPSI pump is running at less than 60 amps. If it is desired to use LPSI Pump B to supply CS B train, and LPSI Pump B is not needed to support any RC, IC, or HR success path, then perform the following (B02): a. Ensure that LPSI Pump B is running. b. Ensure (closes) that SIB-HV-307, LPSI Shutdown Cooling Heat Exchanger B Bypass Valve, is closed. c. Ensure that SIB-HV-695, LPSI Containment Spray from Shutdown Heat Exchanger B Cross-Tie Valve, is open. d. Ensure that SIB-UV-671, Containment Spray B Discharge to Spray Header 2 Valve, is open. e. Ensure (opens) SIB-HV-694, LPSI-Containment Spray to Shutdown Heat Exchanger a Cross-Tie Valve, is open. f. Check that the LPSI pump is running at less than 60 amps.

CRITICAL TASK: Initiate CS flow when the CSAS setpoint has been exceeded.

Scenario termination: The scenario may be ended once CSAS flow has been established using a LPSI pump.

Facility: PVNGS Scenario No.: 3 Op-Test No: 2012

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: (2% power, MOC).

Turnover: Unit 1 is at 2% power (200 EFPD). AFA-P01 and Containment Spray 'A' are tagged out.

Event No.	Malf. No.	Event Type*	Event Description
1	None	N CO/SRO	Shift the MFP Lube oil pumps per 4.9 of 40OP-9FT02, Feedwater Pump Turbine B.
2	cmAVRC03RCEPV100F_1	C RO/SRO	Pressurizer spray valve fails open.
3	mfRP06L1 mfRP06L2	C CO/SRO (TS)	Inadvertent AFAS, "B" train AFW pumps and valves align to initiate AFW flow to the SGs. Crew takes actions to terminate flow and resulting power increase. **40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations**
4	cmCNCV04CHNFIC243_2 f:100	I RO/SRO	A seal injection controller will fail closed in automatic requiring the crew to take manual control of the controller
5	mfED10B cmBKEG03PBBS04B_3	C RO/SRO (TS)	NBN-X04 faults and the DG breaker does not close causing a LOP of class 4160 bus, PBB-S04 **40AO-9ZZ12, Degraded Electrical.**
6	mfRD10B	M ALL	Continuous CEA withdrawal. Crew places CEDMCS in "STANDBY" then trips the reactor per: **40AO-9ZZ11, CEA Malfunctions**
7	mfRD03G mfRD03L mfRD03M	C RO/SRO	Multiple CEAs stick out on the reactor trip. **CRITICAL TASK – Crew establishes > 44 gpm boration.** **40EP-9EO02, Reactor Trip**
8	cmAVMC01CDNHV45A_1	C CO/SRO	Loss of Main Condenser Vacuum.
9	mfFW21A	C RO/CO/SRO	Trip of AFN-P01 **CRITICAL TASK – Implement the FRP to restore power to PBB-S04 and establish AFW flow to the SGs.** **40EP-9EO09, Functional Recovery Procedure**
End point	Crew has restored AFW flow to the SGs		

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

	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)	3			
3.	Abnormal events (2–4)	3			
4.	Major transients (1–2)	1			
5.	EOPs entered/requiring substantive actions (1–2)	2			
6.	EOP contingencies requiring substantive actions (0–2)	1			
7.	Critical tasks (2–3)	2			

Turnover

Plant conditions:

Unit 1 is at 2% power.

The plant has been at 2% power for 2 days awaiting repair of AFA-P01.

The core is presently at 250 EFPD.

Risk Management Action Level is ORANGE.

Train B is protected equipment.

AF 'B' and AF 'N' are protected.

CS 'B' is protected.

PC is NOT recircing the RWT.

Unit 2 is supplying the Aux Steam cross-tie header.

CEDMCS is in Manual Sequential

Steam Bypass Master Controller SGN-PIC-1010 is in Local Setpoint with SBCV 1004 and 1006 in manual

Pressurizer is in "Boron Equalization"

AFN-P01 is in service feeding the SGs thru the Feedwater Isolation bypasses (SGN-HS-1143/1145)

Maintenance on the breaker was completed on Main Lube Oil pump LON-P07B at the end of last shift and it is ready to be tested.

Equipment out of service:

Auxiliary Feedpump 'A' (AFA-P01) is tagged out due to a noisy bearing. LCO 3.7.5 conditions 'a' and 'c' were entered. Expected to return to service in 7 hours.

CS 'A' is tagged out for scheduled maintenance. LCO 3.6.6 condition 'a' has been entered. Expected to return to service in 12 hours.

Planned shift activities:

Shift the running and standby lube oil pumps on Main Feedpump "B".

2012 NRC EXAM
Scenario 3

Setup Instructions

1. _____ Reset to IC-10

2. _____ Go to trigger file and find

    - PZR Spray selector
    - In the link command space type in "dmf cmAVRC03RCEPV100F_1"
    - Then run scenario "2012 NRC Scenario 3" under "Scenario scenario files" from the NRC exam thumb drive

3. _____ Stage radios for operators

4. _____ Alarm Silence to "**OFF"**

5. _____ Ensure CVCS and DFWCS alarms are reset

6. _____ Place the simulator in freeze until the crew enters the simulator.

7. _____ Hang "Train B" protected sign.

8. _____Hang "Protected Equipment" plaques near the handswitches for AF 'B' and AF 'N'.

9. _____Hang "Protected Equipment" plaques near the handswitch for CS 'B.

10. _____Check COLSS Constants are correct for the present blowdown lineup.

11. _____Review procedures listed below for marks and missing pages:

2012 NRC EXAM
Scenario 3

Procedures to be checked:

40OP-9FT02, Feedwater Pump Turbine (Section 4.9)		40AL-9RK4A (Windows 1A, 1B, and 8A)	
40AL-9RK5B (Window 7B)		40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations (Section 3.0)	
40AL-9RK3A (Window 11A and 11B)		41AL-1RK1C (Windows 16A and 10B)	
40AO-9ZZ12, Degraded Electrical: • Sections 3 and 54 • Appendices O and N		40AO-9ZZ11, CEA Malfunctions	
40AO-9ZZ05, Loss of Letdown (possible)		40EP-9EO01, SPTAs	
40EP-9EO10, Standard Appendices (Appendix 16 and 103)		40EP-9EO02, Reactor Trip	
41ST-1ZZ02, Inoperable Power Sources Action Statement available		40ST-9EC03, Essential Chilled Water & Ventilation System Inoperable Action Surveillance available	
40EP-9EO09, FRP (MVAC-1)		Tech Specs (LCO 3.3.6, 3.7.5, 3.8.1, 3.8.4 and 3.8.9)	

2012 NRC EXAM
Scenario 3

Driver Station Menu should look like this:

SCENARIOS	TRIGGERS	MALFS	COMP MALFS	REMOTES	COMP REMOTES	I/O OVERRIDES	ALARM OVRDS
0	2	8:3	4:1	3	8	0:0	0:0

Complete list of malfunctions.

Triggers	
RPSCHC	Reactor trip breakers open
Pzr Spray Selector	PZR Spray Selector shift to 100-E
Malfs	
mfED10B k:5	NBN-X04 ESSEN SERVICE XFORMER PH-PH FAULT
mfFW21A k:9	AFN-P01 MTR DRIVEN AUX FEED PP TRIP
mfRD03G	CEA 43 STUCK CEA
mfRD03L	CEA 38 STUCK CEA
mfRD03M	CEA 07 STUCK CEA
mfRD10B k:6	ALL MODES UNCONTROLLED ROD WITHDRAW
mfRP06L1 k:3	AFAS-1 TR B LG 1 ESFAS ACT CKT FUS FL
mfRP06L2 k:3	AFAS-1 TR B LG 2 ESFAS ACT CKT FUS FL
Comp Malfs	
cmAVMC01CDNHV45A_1 e:RPSCHC	POSITIONER OPEN FAILURE: CONDENSER SHELL 'A' VACUUM BREAKER
cmAVRC03RCEPV100F_1 k:2	POSITIONER OPEN FAILURE: PZR SPRAY CONTROL VALVE
cmBKEG03PBBS04B_3	MECHANICAL SEIZURE OF BREAKER: DG B 4.16KV BKR
cmCNCV04CHNFIC243_2 f:100 k:4	OUTPUT FAILURE - AUTO MODE: SEAL INJECTION FLOW TO RCP 2A
Remotes	
rfEG21 f:STOP k:21	“B" DSL EMER STOP
rfFW57	OPR AUX FPT MAIN STM SPLY VLV
rfFW59	MAN ACT OVSP TRIP OF AFA-P01
rfFW60B	CONTROL POWER TO AFA-HV54
Continued on next page	

Comp Remotes	
crB2RH02SIAP03_2 f:RACK_OUT	RACK IN/OUT: CONTAINMENT SPRAY PUMP A
crB4FW08AFAHV32_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4FW08AFAUV37_1 f:OPEN	BKR OPEN/CLOSE: AUX FEEDWATER ISOLATION VALVE
crB4MS13SGAUV134_1 f:OPEN	BKR OPEN/CLOSE: SG 1 TO AUX FWP A STM SUPPLY VLV
crB4MS13SGAUV138_1 f:OPEN	BKR OPEN/CLOSE: SG 2 TO AUX FWP A STM SUPPLY VLV
crB4RH02SIAUV664_1 f:OPEN	BKR OPEN/CLOSE: CTMT SPRAY PUMPS TO RWT ISO VALVE
crB5FW08AFCHV33_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-2
crB5FW08AFCUV36_1 f:OPEN	BKR OPEN/CLOSE: AUX FEEDWATER ISOLATION VALVE

2012 NRC EXAM

Scenario 3

Driver's page

EVENT	TIME	SYNTAX	DESCRIPTION	MISC.
1			Crew shifts MFP B lube oil pumps	
2	When directed by the lead evaluator.	**Key 2** cmAVRC03RCEPV100F_1	Fails Spray valve 100F open	It takes ~ 6 minutes for the low pressure alarm to annunciate.
3	When directed by the lead evaluator.	**Key 3** mfRP06L1 mfRP06L2	Inadvertent Train B AFAS	If called as Work Control or I&C, report you will write a PVAR and get a work order ready to troubleshoot the circuit.
4	When directed by the lead evaluator.	**Key 4** cmCNCV04CHNFIC243_2 f:100	Fails the Seal Injection Controller to 100 in AUTO	• If called as Work Control or I&C, report you will write a PVAR and get a work order ready to troubleshoot the controller. • If directed to check Seal Injection filters wait 5 minutes then report that CHN-PDIS-244 indicates 12 psid.
5	When directed by the lead evaluator.	**Key 5** mfED10B cmBKEG03PBBS04B_3(in setup)	Faults NBN-X04 transformer and the DG output will fail to close.	If asked as an area operator to check PBB-S04, wait 3 minutes and report the only flags are Under-voltage flags.
	When directed to emergency stop the B DG	**Key 21** rfEG21 f:STOP	Emergency stops the B DG	• If at the DG wait 30 seconds then Emergency Stop the B DG, if not already at the DG wait 2 minutes. • If requested report that PC cooling pump "A" is in service.
6	When directed by the lead evaluator.	**Key 6** mfRD10B	Continuous CEA withdrawal (all modes).	
7		(In setup) mfRD03G mfRD03L mfRD03M	Multiple CEAs stick out on the trip.	
	Continued on next page			

8		(On RPSCHC trigger) cmAVMC01CDNHV45A_1	Vacuum breaker opens causing a loss of vacuum	
9	When directed by the lead evaluator.	**Key 9** mfFW21A	Trip of AFN-P01	If sent as area operator to check breaker, wait 4 minutes and report 86 lockout with a ground fault flag.

Scenario 3 Overview

This is a 2% power scenario.	
Event 1	The CO will shift the Main Feed Pump B lube oil pumps.
Event 2	A pressurizer spray valve will fail open. The RO should address the alarm response procedure and take the selector switch for spray valves from both to the "E" spray valve position.
Event 3	Inadvertent Train B AFAS. This will require the CRS to enter 40AO-9ZZ17. The CO should override and close the Auxiliary Feedwater Valves to the SG. This will also require the CRS to address Tech Specs for the second Aux Feed pump tagged out. The crew may have to reduce turbine load to clear the Core Operating Limit Supervisory System alarm due to a small power increase.
Event 4	Seal Injection flow controller for RCP 2A fails closed. The RO should address the alarm response procedure and place the controller in manual.
Event 5	A Loss of Power (LOP) to PBB-S04 (Train B class 4.16 kV bus) occurs. The DG starts but the output breaker will not close. The CRS enters 40AO-9ZZ12 and the crew emergency stops the B DG. A loss of letdown will probably occur. The CRS will address Tech Specs.
Event 6	CEAs will commence withdrawing. The crew should recognize there is no demand for the CEAs to withdraw. The CRS should enter 40AO-9ZZ11. The crew should place CEDMCS in standby and recognize that the CEAs are still withdrawing. The CRS should direct a reactor trip.
Event 7	On the trip, multiple CEAs will not insert, requiring the RO to borate per Standard Appendix 103.
Event 8	A loss of vacuum occurs. This will cause a loss of the SBCS and remove any availability of the Main Feedwater Pumps.
Event 9	After the crew enters the Rx Trip procedure, a trip of AFN-P01 will occur requiring the CRS to enter the Functional Recovery Procedure and energize PBB-S04 to recover Aux Feedwater Pump B.

Op-Test No.: _____ Scenario No.: __3_ Event No.: __1__

Event Description: _____Shift the MFP B Lube Oil Pumps_____

Time	Position	Applicant's Actions or Behavior
T = 0	CRS	Directs the CO to shift the Main Feed Pump B lube oil pumps per 40OP-9FT02.
	CO	CO goes to section 4.9 of 40OP-9FT02 and performs the following: • Presses LON-HS-186A, FWPT Oil Pump Test Switch for FWPT B (B06). • Ensures the Auto Oil Pump (P07B) starts. • Releases the test switch. • Places the oil pump whose handswitch is in the AUTO position to the STOP position (LON-HS-126). • Places the handswitch for the oil pump that is in the STOP position to the START position (LON-HS-126). • When 15 seconds has elapsed since the pump in Auto was started, stops the oil pump that was originally running (LON-HS-124). • Places the handswitch for the oil pump that was originally running in the AUTO position (LON-HS-124). • Checks auto amber light is illuminated for **BOTH** oil pumps. o Main Lube Oil Pump LON-P06B o Main Lube Oil Pump LON-P07B.

Op-Test No.: _____ Scenario No.: __3__ Event No.: __2__

Event Description: _____Pressurizer Spray Valve 100F Fails Open _____
_____

Time	Position	Applicant's Actions or Behavior
T= 8	Crew	Notices RCS pressure lowering or receives an alarm on B03 (Window 1B) at 2160 psia.
Examiner Note: It will take ~ 6 minutes for the low pressure alarm to annunciate.		
	CRS	Directs the RO to select the unaffected spray valve.
	RO	Addresses the alarm response procedure **40AL-9RK4A** (window 1B) and performs the following: • Checks pressurizer pressure by observing indications on B04. • Determines that controlling channel has not failed. • Determines controller has not failed. • If only one main spray valve is a problem, selects the unaffected main spray valve (RCN-PV-100E) using RCN-HS-100-10 (B04). • Determines spray valve 100F has closed.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: _____ Scenario No.: __3_ Event No.: __3__

Event Description: _____Inadvertent Train B AFAS_____

Time	Position	Applicant's Actions or Behavior
T = 14	Crew	Receives alarms on B05B (Window 7B) and on RKN-UA-2B on B05.
	CRS	Enters **40AO-9ZZ17**, Inadvertent PPS-ESFAS Actuations and performs the following: • Directs the CO to override and operate Auxiliary Feedwater Valves as needed to control steam generator level. • Informs chemistry that blow down is isolated. • Directs the CO or RO to enter the appropriate COLSS constants. (The CRS may elect not to perform this step because the secondary plant calculation is not being used at this power level). • Directs the CO or RO to perform Appendix C to check equipment actuated as expected. • Ensures compliance with Tech Specs for components that failed or were overridden. The CRS should enter LCO 3.7.5 condition 'c' due to two AF pumps being inoperable.
	CO	Overrides and closes at least one B Train Aux Feed valve to secure feed SG 1 (B06). • AFB-HS-34A • AFB-HS-30A Enters zero for blowdown flow constants in both CPC and PC COLSS if directed. Performs Appendix C-2 to check actuated equipment. (May be performed by RO).

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: _____ Scenario No.: __3__ Event No.: __4__

Event Description: _____Seal Injection Flow Controller Fails __ _____

Time	Position	Applicant's Actions or Behavior
T = 24	Crew	Receives alarms on B03 (Windows 11A and 11B).
	CRS	Directs the RO to take manual control of the RCP 2A seal injection flow controller.
	RO	Addresses the alarm response procedure **40AL-9RK3A** and performs the following: • Determines which of the four seal injection valves has the LO flow (by indication on B03 or the alarm CRT). CHN-FIC-243 has full output. • Takes manual control of the 2A RCP flow controller, CHN-FIC-243, (B03) and adjusts seal injection flow to the normal value of 6.0 to 7.5 gpm (6.6 nominal) (B03).

Op-Test No.: _____ Scenario No.: __3_ Event No.: __5__

Event Description: _NBN-X04 fault causing a LOP on PBB-S04 (DG breaker fails to close)_

Time	Position	Applicant's Actions or Behavior
T = 30	Crew	Receives alarms on B01 and other panels due to the loss of power to PBB-S04.
	RO or CO	Investigates power indications and determines PBB-S04 has lost power due to a fault on NBN-X04 and that DG 'B' output breaker did not close.
	CRS	Enters **40AO-9ZZ12** Degraded Electrical and performs the following: • Goes to section 54.0. • Goes to Appendix 'N' due to DG B running with the output breaker open. • Directs the operator to check DG B frequency and voltage. • Directs the operator to ensure PBB-S04K and PBB-S04L are open (normal and alternate supply breakers to PBB-S04) • Directs the operator to check that the 86 relays are not actuated for PBB-S04K and PBB-S04L. • Directs the operator to check that the 86 relay is not actuated for breaker PBB-S04B (DG B output breaker). • Directs the operator to place the synch switch on and close PBB-S04B, DG B output breaker. • Once it is determined the DG output breaker will not close, directs the operator to have an Auxiliary Operator emergency stop DG B. • Directs an operator to check NNN-D12 and D16 are energized (both are energized). • Directs an operator to ensure PNB-D26 and PND-D28 are energized (both are energized). • If additional charging pumps are needed, then direct the RO to start an additional charging pump. **Continued on next page**

Examiner Note: If the additional charging pump is not started in time, a loss of letdown will occur. PVNGS standards do allow the crew to take action per the expected alarm response on trend then verify actions in accordance with the ARP (B0310A). The CRS may hand of the Loss of Letdown AOP (40AO-9ZZZ05) to the Reactor Operator.		
	CRS (continued)	• Directs an operator to ensure adequate CTMT Normal cooling. • Directs an operator to ensure adequate CEDM cooling. • Directs an operator to check which Spent Fuel Pool Cooling Pump was running. • Directs an operator to ensure In-plant communications are aligned to its normal source. • Directs an operator to ensure SA UPS Cabinet QFN-NO2 is aligned to its alternate source. • Directs an operator to perform 41ST-1ZZ02, Inoperable Power Sources Action Statement and 40ST-9EC03, Essential Chilled Water & Ventilation System Inoperable Action Surveillance. • Refers to PBB-S04 Loads table. • Directs an operator to bypass all parameters on Channel B or D PPS panels within 90 minutes. • Goes to Section 3.0 step 4.0 and addresses MCC and LC loads. • Addresses Tech Specs. CRS should enter numerous LCO associated with Section 3.8 (LCO 3.8.1 conditions ‘a’ and ‘b’, 3.8.5 condition ‘c’).
	RO	Goes to B01 and performs the following: • Checks DG B frequency and voltage. • Ensures PBB-S04K and PBB-S04L are open (normal and alternate supply breakers to PBB-S04). • Checks that the 86 relays are not actuated for PBB-S04K and PBB-S04L. • Checks that the 86 relay is not actuated for breaker PBB-S04B (DG B output breaker). • Places the synch switch, PEB-SS-S04B, (B01) to ON. • Attempts to close PBB-S04B, DG B output breaker. • Determines that the PBB-S04B will not close and informs the CRS. • Directs the Auxiliary Operator to emergency stop DG B.

	RO	Addresses charging pumps and starts the E charging pump or a loss of letdown will occur. If a loss of letdown occurs, the RO may get **40AO-9ZZ05, Loss of Letdown** from the CRS and performs the following: • Places RCN-LIC-110, PLCS Master Control in "MAN" and closes the selected Letdown Control Valve (B04). • Checks that letdown backpressure is less than setpoint (B03). • Ensures no more than one charging pump running (B03). • Informs the CRS to enter LCO 3.4.9 condition 'a' when pressurizer level is 56% or greater. • Goes to Appendix A to restore letdown. • Ensures at least one of the letdown isolation valves (CHB-UV-515, CHA-UV-516, or CHB-UV-523) are closed (B03). • Ensures the selected Letdown Control Valves are closed. • Ensures alarms are set on ERFDADS for Regin HX outlet temperature and Letdown backpressure. • Places CHN-PIC-201, Letdown Backpressure Controller in "MAN" and opens the backpressure control valves to 60% output. • When the selected Letdown Control Valve is closed, ensures all of the following isolation valves are open (CHB-UV-515, CHA-UV-516, and CHB-UV-523) (B03). • Slowly adjust the Letdown Control Valve and Backpressure Control Valve to establish letdown flow. • Starts the second charging pump. • When level is at the setpoint, places controllers in auto.

	CO	• Checks NNN-D12 and D16 are energized (both are energized) (Various indication can be used to verify this). • Checks PNB-D26 and PND-D28 are energized (both are energized) (Various indications can be used to verify this). • Ensures adequate CTMT Normal cooling (B07). • Ensures adequate CEDM cooling (B07). • Directs an operator to check which Spent Fuel Pool Cooling Pump was running. • Directs an operator to ensure In-plant communications are aligned to its normal source. • Directs an operator to ensure SA UPS Cabinet QFN-NO2 is aligned to its alternate source. • Performs 41ST-1ZZ02, Inoperable Power Sources Action Statement and 40ST-9EC03, Essential Chilled Water & Ventilation System Inoperable Action Surveillance. • Bypasses all parameters on Channel B or D (as directed by the CRS) PPS panels within 90 minutes.

Op-Test No.: _____ Scenario No.: __3__ Event No.: __6__

Event Description: _____Continuous CEA Withdrawal_____

Time	Position	Applicant's Actions or Behavior
T = 45	Crew	Notices CEAs inserting or receives CEDMCS TRBL alarm on B04 (Window 8A) for continuous CEA Motion.
	CRS	Enters 40AO-9ZZ11, CEA Malfunctions and performs the following: • Directs an operator to place CEDMCS to "Standby" (B04).
Examiner Note: The CRS may direct placing CEDMCS in "Standby" prior to actually entering the Abnormal Operating procedure.		
	CRS (Continued)	• When it is determined that CEA motion is still continuing, directs an operator to trip the reactor.
	CO or RO	Trips the reactor when directed by the CRS.

Op-Test No.: _____ Scenario No.: __3__ Event No.: __7 and 8__

Event Description: (7) Multiple CEAs stuck out
(8) Loss of vacuum

Time	Position	Applicant's Actions or Behavior
Standard Post Trip Actions		
T = 46	CRS	Directs the crew to perform Standard Post Trip Actions. • When report received of CEAs not inserted, directs RO to borate the RCS using Standard Appendix 103. • When asked by CO, directs CO to use SBCS valves 1007/1008 or Atmospheric Dump Valves (ADVs) to control SG pressure. • Diagnoses a reactor trip and enters 40EP-9EO01, Reactor Trip.
	RO	Borates the RCS using Standard Appendix 103 by performing the following (assumes Attachment 103-A used): (All actions performed on BO3) • Sets the boric acid makeup flow rate on CHN-FIC-210Y (Boric Acid Makeup to VCT Flow Controller) to 40 gpm or less. • Sets the "Target" makeup on CHN-FQIS-210Y (Boric Acid Makeup Totalized Flow Control) to a minimum of 5000 gallons. • Places CHN-HS-210 (Makeup Mode Select Switch) to "BORATE". • Checks on Boric Acid Makeup pump is running. • Ensure CHN-UV-527, Makeup to CHRG PMPS is open. • Presses the "START" button on CHN-FQIS-210Y. • Adjusts flow to greater than or equal to 44 gpm. **continued on next page**
CRITICAL TASK: **Crew establishes > 44 gpm boration prior to the completion of the SPTAs.**		

	RO	Reports the status of the Electric Plant (all buses energized with the exception of PBB-S04). Reports status of pressurizer level and trend (trending to 33%). Reports RCS Subcooling. Reports status of seal injection and Nuclear Cooling Water to the RCPs (in service). Reports status of RCS pressure (recovering to 2250). Reports status of RCPs, Loop ΔT, and RCS Subcooling.
Examiner Note: Some of these reports may be performed by the CO while the RO is establishing the Boration.		
	CO	Verifies the Rx Control Safety Function and reports that more than one Full Strength CEA is not inserted. Reports SG level and method of feed. Reports Tcold and trend. Uses SBCS valves 1007/1008 or ADVs to control SG pressure since vacuum has been lost. Reports Containment pressure and status of the Radiation Monitors (may be done by the RO). Reports Containment temperature and pressure (may be done by the RO)
Examiner Note: After the CRS has entered the Reactor Trip EOP, direct the driver to activate **Key-9** causing a trip of auxiliary feed pump (AFN-P01).		

Op-Test No.: _____ Scenario No.: __3__ Event No.: __9,__

Event Description: __Trip of AFN-P01_____

Time	Position	Applicant's Actions or Behavior
T = 57	Crew	Determines AFN-P01 has tripped due to either SESS alarm (B02) or loss of flow indication/brighter than green light on handswitch for AFN-P01 (B06).
Functional Recovery Procedure		
	CRS	Determines that a loss of all feed water has occurred due to loss of MVAC. Enters the Functional Recovery Procedure (40EP-9EO09) and performs the following: • Ensures the event is being classified. • Directs the RO to perform Appendix 16 for any running RCPs. • Directs the CO to ensure SG sample valves are open. • Direct Chemistry to perform their Abnormal Occurrence Checklist for the FRP. • Directs the RO to place the Train 'A' Hydrogen Analyzer in service. • Identifies the success paths to be used to satisfy each safety function. MVAC-1 and HR-1 should be jeopardized. **Maintenance of Vital Auxiliaries (MVAC-1)** **IF** one vital 4.16 kV AC bus is energized from offsite power, **AND** the equipment needed to maintain Safety Functions is **NOT a**vailable on the energized bus, **THEN** perform the following to cross-tie offsite power to the de-energized bus: a. IF PBB-S04 is to be energized, **THEN** GO TO step 10 and perform the following: **continued on next page**

	CRS	Directs the RO to: 1. Place synchronizing switch PBB-SS-S04L, 4.16 KV Bus S04 Alternate Supply, to “ON”. 2. Close breaker PBB-S04L, 4.16 KV Bus S04 Alternate Supply. 3. Place synchronizing switch PBB-SS-S04L to “OFF”. Directs the CO to start AFB-P01 and establish feedwater flow to the SGs.
Examiner Note: AFB-P01 will auto start and commence feeding SG#1 due to the inadvertent Train B AFAS earlier in the scenario.		
	RO	Places synchronizing switch PBB-SS-S04L, 4.16 KV Bus S04 Alternate Supply, to “ON”. (B01) Closes breaker PBB-S04L, 4.16 KV Bus S04 Alternate Supply. (B01) Places synchronizing switch PBB-SS-S04L to “OFF”.
	CO	Starts AFB-P01 by placing AFB-HS-16 to START (B06). Establishes feedwater flow to the SGs by opening: • AFB-HS-35A • AFB-HS-31A • AFB-HS-34A • AFB-HS-30A
CRITICAL TASK: Implement the FRP to restore power to PBB-S04 to establish AFW flow to the SGs prior to lifting the primary safeties.		
Scenario termination: The scenario may be terminated when AFB-P01 is feeding a SG.		

Facility: PVNGS Scenario No.: 4 Op-Test No: 2012

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: (100% power, MOC).
Turnover: Unit 1 is at 100% power (250 EFPD). AFA-P01 and Containment Spray 'A' are tagged out.

Event No.	Malf. No.	Event Type*	Event Description
1	None	N CO/SRO	Shift Steam Bypass Master Controller, SGN-PIC-1010 from manual to automatic mode of operation.
2	mfTRRX11SGCPT1013C_4	I CO/SRO (TS)	Channel "C" SG 1 pressure transmitter fails low requiring multiple parameters to be placed in bypass. (SGC-PI-1013C)
3	cmTRCV19RCALT110X_4	I RO/SRO (TS)	Pressurizer level transmitter "X" fails low. Crew selects channel "Y" on pressurizer heater and level control selectors.
4	mfCH01B mfCH01D	C CO/SRO	Loss of Control Element Drive Mechanism cooling. HCN-A02A and A02C fans fail to auto-start **40AO-9ZZ20, Loss of HVAC**
5	mfMC01A	R -RO N - CO/SRO	Loss of condenser vacuum requiring the crew to downpower. **40AO-9ZZ07, Loss of Condenser Vacuum**
6	mfCV11A f:100	C SRO/RO	RCP 1A seal failure. Crew evaluates the status of the affected RCP. **40AO-9ZZ04, Reactor Coolant Pump Emergencies**
7	cmCPRC02RCEP01A_6 mfRP04A mfRP04C mfRD12A	M ALL	RCP 1A trips but PPS fails to initiate a reactor trip. RO opens L03B2 and L10B2 breakers on B01. **CRITICAL TASK – Trip the Reactor prior to completion of SPTAs**
8	mfED02 mfEG06B	M ALL	After the Reactivity Safety Function is addressed a Loss of Offsite Power will occur. DG "B" will trip when it starts. **40EP-9EO07, Loss of Offsite Power/Loss of Forced Circulation**
9	cmCPCC08SPAP01_5	C RO/SRO	Spray Pond pump "A" fails to auto start. **CRITICAL TASK – Starts SPA-P01 prior to DG "A" running > 3 minutes with no cooling water.** **CRITICAL TASK – Establish feed to at least one SG using AFN-P01.** **40EP-9EO09, FRP (MVAC-3)**
End point	Once the crew has verified that Natural Circulation flow has been established		

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

	Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1.	Total malfunctions (5–8)	5			
2.	Malfunctions after EOP entry (1–2)	2			
3.	Abnormal events (2–4)	3			
4.	Major transients (1–2)	2			
5.	EOPs entered/requiring substantive actions (1–2)	1			
6.	EOP contingencies requiring substantive actions (0–2)	0			
7.	Critical tasks (2–3)	3			

Turnover

Plant conditions:

Unit 1 is at 100% power.

The core is presently at 250 EFPD.

Risk Management Action Level is ORANGE.

Train B is protected equipment.

AF 'B' and AF 'N' are protected.

CS 'B' is protected.

PC is NOT recircing the RWT.

Unit 2 is supplying the Aux Steam cross-tie header.

I&C have completed testing on the SBCS master controller SGN-PIC-1010 and it can be returned to automatic operation.

Equipment out of service:

Auxiliary Feedpump 'A' (AFA-P01) is tagged out due to a noisy bearing. LCO 3.7.5 conditions 'a' and 'b' have been entered. Expected to return to service in 7 hours.

CS 'A' is tagged out for scheduled maintenance. LCO 3.6.6 condition 'a' has been entered. Expected to return to service in 12 hours.

Planned shift activities:

Shift SGN-PIC-1010 from local/auto to remote/auto mode of operation.

2012 NRC EXAM
Scenario 4

Setup Instructions

1. _____ Reset to IC-20

2. _____ Shift the CEDM fans to B and D running with A and C in standby.

3. _____**Then** Run scenario "2012 NRC Scenario 4" under "Scenario scenario files" from NRC exam thumb drive.

4. _____ Stage radios for operators.

5. _____ Alarm Silence to "**OFF"**.

6. _____ Ensure CVCS and DFWCS alarms are reset.

7. _____ Place the simulator in freeze until the crew enters the simulator.

8. _____ Hang "Train B" protected sign.

9. _____Hang "Protected Equipment" plaques near the handswitches for AF 'B' and AF 'N'.

10. _____Hang "Protected Equipment" plaques near the handswitch for CS 'B'.

11. _____Place the SBCS Master Controller (SGN-PIC-1010) in "AUTO and LOCAL".

12. _____ Review procedures listed on the next page for marks and missing pages:

	40OP-9SF05, Operation of the Steam Bypass Control System (Section 4.4)		40AL-9RK3A (Window 11B)
	41AL-1RK5A (Windows 7C and 7D)		40AL-9RK5B (Windows 8C, 2D, 4D,8D, and 14A)
	40AL-9RK4A (Windows 1A, 2A, 8A, 2B and 6B)		40AL-9RK7A (Windows 1A and 9B (Group E))
	40AO-9ZZ07, Loss of Vacuum, Section 4.0)		40AO-9ZZ04, RCP Emergencies (Section 4.0)
	40AO-9ZZ20, Loss of HVAC (Section 10)		41AL-1ES2B (Window 6D – SEAS 21B)
	40EP-9EO01, SPTAs		40EP-9EO07, LOFC/LOOP
	40ST-9ZZ10 available		40ST-9ZZ22 available
	Tech Specs (3.3.1, 3.3.5, 3.3.10 and 3.3.11)		40EP-9EO09, FRP (MVAC-3) (possible)

2012 NRC EXAM
Scenario 4

Driver Station Menu should look like this:

SCENARIOS	TRIGGERS	MALFS	COMP MALFS	REMOTES	COMP REMOTES	I/O OVERRIDES	ALARM OVRDS
0	0	9:3	10:3	3	8	0:0	1:0

Complete list of malfunctions.

Malfs	
mfCH01B k:4	HCN-A02-B CEDM NOR ACU FAN MTR TRIP
mfCH01D k:4	HCN-A02-D CEDM NOR ACU FAN MTR TRIP
mfCV11A f:100 k:6	RCP-1A RCP #1 SEAL FAILURE
mfED02 k:8	LOSS OF GRID
mfEG06B k:8 d:15	DG-B DG DIFFERENTIAL RELAY TRIP
mfMC01A k:5 f:8	SHELL A CONDENSER AIR INLEAKAGE
mfRD12A	BYPASS TRIP MG SET #1 OUTPUT CONTACTOR
mfRP04A	TCB-1 RTSG FAILS AS IS
mfRP04C	TCB-3 RTSG FAILS AS IS
Comp Malfs	
cmBSEG02DGAPSL3_2 k:31	BISTABLE FAILS TO OPPOSITE STATE: DG A LUBE OIL PRESSURE SW LOW
cmBSEG02DGAPSL5_2 k:31	BISTABLE FAILS TO OPPOSITE STATE: DG A LUBE OIL PRESSURE SW LOW
cmBSEG02DGAPSL7_2 k:31	BISTABLE FAILS TO OPPOSITE STATE: DG A LUBE OIL PRESSURE SW LOW
cmBSEG02DGAPSL9_2 k:31	BISTABLE FAILS TO OPPOSITE STATE: DG A LUBE OIL PRESSURE SW LOW
cmCPCH03HCNA02A_5	FAIL TO AUTO-START: CEDM NORM ACU FAN A02A
cmCPCH03HCNA02B_5	FAIL TO AUTO-START: CEDM NORM ACU FAN A02B
cmCPRC02RCEP01A_6 k:7	SPURIOUS 86 LOCKOUT RELAY TRIP: REACTOR COOLANT PUMP 1A
cmCPCC08SPAP01_5	FAIL TO AUTO-START: ESP PUMP A
cmTRCV19RCALT110X_4 k:3	TRANSMITTER FAILURE BELOW BAD VALUE: XMTR LVL PZR LVL CONT
cmTRRX11SGCPT1013C_4 k:2	TRANSMITTER FAILURE BELOW BAD VALUE: TRANSMITTER PRESSURE SG 1
Continued on next page	

Remotes	
rfED78 k:37 f:CLOSE	SBOG 13.8KV SUPPLY BREAKER CONTROL
rfED85 k:36 f:CLOSE	SBOG 1 OUTPUT BREAKER STATUS
rfFW57	OPR AUX FPT MAIN STM SPLY VLV
rfFW59	MAN ACT OVSP TRIP OF AFA-P01
rfFW60B	CONTROL POWER TO AFA-HV54
Comp Remotes	
crB2RH02SIAP03_2 f:RACK_OUT	RACK IN/OUT: CONTAINMENT SPRAY PUMP A
crB4RH02SIAUV664_1 f:OPEN	BKR OPEN/CLOSE: CS PUMP "A" MINIFLOW VALVE
crB4FW08AFAHV32_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4FW08AFAHV37_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4FW08AFAHV33_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4FW08AFAHV36_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4MS13SGAUV134_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
crB4MS13SGAUV138_1 f:OPEN	BKR OPEN/CLOSE: AUX FW REG VLV PUMP A TO SG-1
ALARM OVRDS	
mfAN_1A02D1 k:31 f:ALARM_ON	DIESEL GENERATOR A LO PRIORITY TROUBLE

2012 NRC EXAM

Scenario 4

Driver's page

EVENT	TIME	SYNTAX	DESCRIPTION	MISC.
1			The crew shifts the SBCS master controller to Remote-Auto.	
2	When directed by the lead evaluator.	**Key 2** mfTRRX11SGCPT1013C_4	Channel "C" SG #1 pressure transmitter fails low	When called as I&C or work control report that you will write a PVAR and start generating a Work Mech.
3	When directed by the lead evaluator.	**Key 3** cmTRCV19RCALT110X_4	Pzr level Channel 'A' transmitter fails low.	When called as I&C or work control report that you will write a PVAR and start generating a Work Mech.
4	When directed by the lead evaluator.	**Key 4** mfCH01B mfCH01D	Trip of the B and D CEDM fans. (A and C will not auto start).	When called as Electrical or work control report that you will write a PVAR and start generating a Work Mech. If directed as the area operator to check the breakers for the B and D CEDM fan (PGB-L32E2 and PGB-L34D3 respectively), wait 3 minutes and report both have an 86 lockout trip.,
5	When directed by the lead evaluator.	**Key 5** mfMC01A f:8	Degrading vacuum in the 'A' Condenser shell.	If sent as an area operator to check vacuum breakers and dog bone seals, wait 10 minutes and report that you have filled the vacuum breakers and have cut in water to the dog bone seals but have no overflow yet.
	When directed to reduce vacuum leak	mrf MC01A f:0		When directed to reduce the leakage, report that you have started getting overflow on the dog bone seals.
6	When directed by the lead evaluator.	**Key 6** mfCV11A f:100	Failure on the #1 seal on RCP 1A.	If called as engineering, report that you will be up to look at the seal indications as soon as you can.
7	When directed by the lead evaluator.	**Key 7** cmCPRC02RCEP01A_6	Trip of the 1A RCP (ATWS will occur).	
8	After the crew opens L03 and L10 and the CEAs insert.	**Key 8** mfED02 mfEG06B d:15	Loss of offsite power and B DG will trip 15 seconds later.	If asked to check B DG as area operator, wait 5 minutes and report that you see nothing obvious.
9		(In setup) cmCPCC08SPAP01_5	SP pump 'A' fails to auto start.	
Continued on next page				

	If directed by the lead evaluator ***(due to the crew not starting SP 'A' pump)***	**Key 31** cmBSEG02DGAPSL3_2 cmBSEG02DGAPSL5_2 cmBSEG02DGAPSL7_2 cmBSEG02DGAPSL9_2 mfAN_1A02D1 f: Alarm_ON	Trips DG 'A'	If sent as area operator, report DG 'A' temperature on high and there is lube oil on the floor.
	If directed to perform Attachment 80	**Run scenario file EOP files/attach80a**	Performs attachment 80A.	
	If directed to start a SBOG and energize NAN-S07	**Key 36** rfED85	Simulates energizing NAN-S07	
	If directed to start a close NAN-S03AB	**None**		Wait 2 minutes and report NAN-S03AB is closed.
	If directed to close NAN-S07D	**Key 37** rfED77	Simulates closing NAN-S07D	

Scenario 4 Overview

Event 1	The CO shifts the Steam Bypass Master Controller from manual to Remote Automatic.
Event 2	A failure of the Channel C SG #1 pressure transmitter. The CO should address the alarm response procedure. The CRS should address Tech Specs. The CO bypasses the correct parameters on the PPS cabinets.
Event 3	Pressurizer Level Transmitter 'X' fails low. The RO addresses the alarm response procedure and selects the unaffected instrument.
Event 4	Loss of CEDM cooling fans A and C with the failure of the B and D to auto start. The CRS should enter 40AO-9ZZ20 and direct the CO to start the standby fans.
Event 5	Loss of condenser vacuum. The CRS enters 40AO-9ZZ07 and the crew downpowers to maintain vacuum.
Event 6	RCP 1A seal failure. The crew responds to B04 alarms and determines a seal has failed on RCP 1A.
Event 7	RCP 1A trips, but an ATWS occurs. The RO opens breakers on Board 1 to trip the reactor. The crew performs the SPTAs.
Event 8	After the crew addresses reactivity control, a loss of offsite power will occur and the B DG causing a loss of PBB-S04.
Event 9	The 'A' Spray Pond pump will fail to auto start requiring the RO to start it manually.

Op-Test No.: _____ Scenario No.: __4_ Event No.: __1__

Event Description: Shifting the Steam Bypass Master Controller, SGN-PIC-1010 from the Manual to Automatic mode of operation.

Time	Position	Applicant's Actions or Behavior
T=0	CRS	Directs the CO to shift the Steam Bypass Master controller from Local/Auto to Remote/Auto mode of operation..
	CO	Depresses the "MAN" pushbutton on the Steam Bypass Master controller, SGN-PIC-1010 (B06) and verifies that the pushbutton backlight illuminates. Places the Remote/Local Setpoint Selector switch on the left side of the Master Controller to the "R" (Remote) position ensuring full movement of switch travel.
Examiner Note: There should be no adjustment of the steam modulation setpoint (black and white pointer)		
		Verifies that the steam header pressure (red pointer) is less than or equal to the SBCS modulation setpoint program (black and white pointer), THEN depress the "AUTO" pushbutton on the bottom of the Master Controller and ensure that the pushbutton backlight illuminates. The Master Controller is now in Remote-Automatic, and its output will be a function of the SBCS modulation setpoint program. Verifies that the Local-Automatic Setpoint (black pointer) thumbwheel on the right side of the Master Controller to 1170 psia.

Op-Test No.: _____ Scenario No.: __4__ Event No.: __2__

Event Description: Channel "C" SG 1 pressure transmitter (SGN-PI-1013C 0 fails low.

Time	Position	Applicant's Actions or Behavior
T= 4	Crew	Receives alarms on B05A windows 7C and 7D along with B05B windows 8C, 8D and 2D. Addresses alarm response procedure **41AL-1RK5A and 40AL-9RK5B**.
	CO	Addresses the alarm response for window 7C (LO SG 1 PRESS CH Trip) and performs the following: • Determines SGC-PI-1013C has failed low • Verifies SG 1 level on B05 class indicators. • Determines SG 1 total feedwater/main steam flow on DFWCS monitor (B06) • Determines Tave on the Tave/Tref recorder, RCN-TR-100 (B04). • When directed, bypasses parameters 11, 18 and 19 on Channel C PPS cabinet behind B06.
Examiner Note: Although the SG-2 HI delta P bistable is tripped, there is no direction for the crew to bypass the parameter as the bypass is non-functional.		
	CRS	Addresses Tech Specs and enters: • LCO 3.3.1 condition A. • LCO 3.3.5 condition A. Refers to Tech Spec Bases and determines that in addition to the failed instrument SG 1 & 2 levels (ESF) must be placed in bypass. Directs the CO to bypass parameters 11, 18 and 19 on Channel "C" PPS.

Appendix D Required Operator Actions Form ES-D-2

Op-Test No.: _____ Scenario No.: _4__ Event No.: __3__

Event Description: Pressurizer level transmitter RCA-LT-110X fails low.

Time	Position	Applicant's Actions or Behavior
T= 14	Crew	Receives alarms on B04 windows 1A (PZR TRBL) and 2B (PZR LVL HI-LO) and addresses alarm response procedure **40AL-9RK4A**.

	RO	Diagnoses and reports that instrument RCA-LT-110X has failed low
		Addresses the Alarm Response procedure and performs the following:
		• Determines RCA-LI-110X has failed low
		• Places the following handswitches on B04 in Channel Y
		  ○ RCN-HS-110, Level Control Selector Channel X/Y
		  ○ RCN-HS-100-3, Heater Control Selector Level Trip Channel X/Y
		• Resets and energizing the proportional heaters by taking the following Pzr heater control handswitches on B04 to "ON":
		  ○ RCN-HS-100-1
		  ○ RCN-HS-100-2

	CRS	Consults Tech Specs and enters: • LCO 3.3.10 Condition 'a' • LCO 3.3.11 Condition 'a'

Op-Test No.: _____ Scenario No.: _4__ Event No.: __4__

Event Description: Loss of Control Element Drive Mechanism cooling. HCN-A02B and A02D fail to auto-start.

Time	Position	Applicant's Actions or Behavior
T= 26	Crew	Receives alarms on B07 window 7A9B (CEDM ACU COOL SYS TRBL) and addresses the alarm response procedure **40AL-9RK7A.**
	CO	Determines that no CEDM fans are running and uses the ARP or direction from the CRS to start the A and C fans using handswitch HCA-HS-49 (B07). Directs the auxiliary operator to check breakers locally (PGBL32E2 and PGB-L34D3.
Examiner Note: • **The crew may elect to wait for an auto-start of HCN-A02A/C.** • **The standby fans are designed to auto-start after a two minute time delay, however the auto-start has been blocked for this scenario.**		
	RO	Responds to alarms on SESS panel (Window 6D). Addresses the alarm response procedure.
	CRS	Directs the CO to start CEDM cooling fans HCNA02A AND A02C per either: • Loss of HVAC procedure, **40AO-9ZZ20 (Section 10)**. • Alarm response procedure, **40AL-9RK7A.** May performs brief to address the failure and contingencies.

Op-Test No.: _____ Scenario No.: _4_ Event No.: __5__

Event Description: Loss of Condenser Vacuum requiring the crew to downpower. _____

Time	Position	Applicant's Actions or Behavior
T= 32	Crew	Receives alarms on B05 window 14A (CNDS SYS TRBL) and address the alarm response procedure **40AL-9RK5B.**
	CO	Determines a loss of Vacuum is occurring in the 'A' Condenser shell.
	CRS	Enters Loss of Condenser Vacuum, **40AO-9ZZ07** and performs the following: • Performs the diagnostic flow chart and goes to Section 4.0, Strategy/Power Reduction • Directs an auxiliary operator to: o Place seal water on the condenser expansion joints (Dog-bone seals), vacuum breakers, and steam packing exhauster Condenser drain o Check for air in leakage at the condenser shells, operation of the gland seal regulators, etc. • Directs the CO to ensure ALL available air removal pumps are in operation
	CO	Starts the 'D' Air Removal pump using handswitch ARN-HS-28 (B07). As directed, opens all Air Removal pump 'D' suction valves using handswitches ARN-HS-14, 15 and 16 (B07).

Examiner Note: A power reduction to improve condenser vacuum will only be effective for plant conditions impacting heat removal from the main condenser. A loss of vacuum due to air in-leakage can only be temporarily improved with a power reduction.		
	CRS	Determines BOTH of the following: • Magnitude of the power reduction • The rate to reduce power Calculates the reactivity needed using ANY of the following: • Total gallons of boric acid and addition rate **(53 gal/percent)** • CEA insertion Directs the RO to commence a boration to reduce power if the CRS uses boration or may allow CEAs to insert in Automatic. Directs the CO to lower turbine load and maintain Tavg/Tref mismatch 5°F or less.
Examiner Note: CRS may choose to use CEAs in Auto Sequential or Manual Sequential for the power reduction.		
	RO	Commences a boration using 40OP-9CH01 at a rate and amount directed by the CRS by performing the following: 1. Sets the desired makeup flow rate on the Foxboro Controller, CHN-FIC-210Y on B03 2. If the makeup rate is greater than 40 gpm, set the makeup flow to not more than 40 gpm initially. 3. Select the “Target” makeup volume (gallons) on the Boric Acid Flow Totalizer CHN-FQIS-210Y on B03 4. Start the boration by: a. Placing CHN-HS-210 on B03 to “BORATE” b. Depress the “RESET” pushbutton on the Totalizer c. Depress the “START” pushbutton on the Totalizer 5. Checks a boric acid pump started 6. Checks no flow on RMW flow indicator CHN-FIC-210X on B03

	RO (continued)	7. Ensures CHN-UV-527 opened by red lights lit on CHN-HS-527 8. Checks flow increases on CHN-FIC-210Y on B03 9. If desired flow is > 40 gpm, raise the flow setpoint on CHN-FIC-210Y to the desired flow rate 10. Informs the CRS that the boration is started.
	CO	Lowers turbine load using the Load Limit Set potentiometer on B06 to maintain Tave within 5°f of Tref.
	CRS	When the vacuum leak is fixed, the CRS may direct the crew to stop the downpower.
	RO	Restores CVCS to a normal lineup when boration is stopped
Examiner Note: After the crew has reduced power ~ 5% direct the driver to delete the Loss of Vacuum malfunction. If the crew trips on this event, have the driver insert Event 6.		

Op-Test No.: _____ Scenario No.: _4__ Event No.: __6___

Event Description: RCP 1A seal failure. Crew evaluates the status of the affected RCP.

Time	Position	Applicant's Actions or Behavior
T=	Crew	Receives alarms on B04 window 2A (RCP 1A TRBL) and address the alarm response procedure **40AL-9RK4A.**
	RO	Monitors RCP 1A seal 2 inlet pressure at RCN-PI-152 (B04). Observes a high pressure condition and determines that the first seal on RCP 1A has failed. Verifies that RCN-HS-430, Controlled Bleed-Off valve, indicates open (B03)
	CRS	Enters Reactor Coolant Pump Motor Emergencies, **40AO-9ZZ04** and implements section 4, Abnormal Seal Parameters. • Directs the RO to verify Seal Injection flow is 6.0 to 7.5 gpm. • Verifies adequate Seal Injection and Nuclear Cooling water flow. • Determines that no RCP trip setpoints have been exceeded. • Contacts engineering to evaluate RCP parameters.

Op-Test No.: _____ Scenario No.: _4_ Event No.: _7_

Event Description: RCP 1A trips but PPS fails to initiate a reactor trip. RO opens L03B2 and L10B2 breakers on B01.

Time	Position	Applicant's Actions or Behavior
T=	Crew	Recognizes that RCP 1A has tripped by alarms (B04 and B05). Recognizes that a Reactor Trip should have occurred by all 4 channels of bistable trip indication on PPS parameter indications on B05 and/or first out annunciator indication on B04. Attempts to trip the reactor using the RTSG pushbuttons, then opens the B2 breakers for L03 and L10 on B01 to trip the reactor using handswitches • NGN-HS-L03B2 • NGN-HS-L10B2
CRITICAL TASK – Trip the Reactor prior to completion of SPTAs		
	CRS	Directs the crew to perform **40EP-9EO01,** Standard Post Trip Actions
Standard Post Trip Actions		
	CO	Reports the Reactivity Control Safety Function (CEAs inserted, power dropping, negative startup rate).
Examiner Note: Instruct the driver to insert the LOOP and DG "B' faults after the reactivity report is completed and all CEAs have fully inserted.		
		Report Main Turbine tripped and output breakers open. Reports Tcold and trend. Reports SG pressures and trends. Reports Containment pressure and status of the Radiation Monitors (may be done by the RO). Reports Containment temperature and pressure (may be done by the RO).

Op-Test No.: _____ Scenario No.: __4__ Event No.: __8 & 9__

Event Description: __(8) Loss of Offsite power and failure of DG "B"_____
_____(9) Failure of SPA-P01 (SP-A) to auto start._____

Time	Position	Applicant's Actions or Behavior
Standard Post Trip Actions (continued)		
T=	Crew	Observes a LOP on PBB-S04 due to a Loss of Offsite power and subsequent non-recoverable failure of DG "B" to start and load.
	RO	Reports the status of the Electric Plant: • Only AC bus energized is PBA-S03 being supplied by DG "A" with SP pump running following manual start. • All class and non-class DC buses are energized
Examiner Note: Electric Plant report may be performed by the CO.		
		Reports status of pressurizer level and trend Reports RCS Subcooling. Reports status of seal injection and Nuclear Cooling Water to the RCPs (in service). Reports status of RCS pressure. (May need to use aux. spray as natural circulation flow develops).. Reports status of RCPs, Loop ΔT, and RCS Subcooling.

Evaluator Note:

1. If the crew fails to start SPA-P01 within 7.5 minutes then instruct the driver to insert Key 31 causing a trip of DG "A" (Key–31).
2. The crew will transition to the FRP.

Loss of Offsite Power / Loss of Forced Circulation		
	CRS	Diagnoses a LOOP/LOFC **(40EP-9EO07)** and performs the following: • Confirms the diagnosis by directing the STA to perform the Safety Function Status Check. • Directs Chemistry to perform the Abnormal Occurrence Checklist. • Directs the SM to classify the event. • Verifies that loads have sequenced on at least one 4.16kV AC vital bus (PBA-S03).. • Directs RO to verify that seal injection is in service. • Directs the CO to actuate an MSIS. • Check that Tcold is being maintained less than 570°. • Inform RP that the unit is steaming to atmosphere. • Ensure at least one SG has level being maintained within or being restored to 45 – 60% NR.
CRITICAL TASK: Establish feed to at least one SG using AFN-P01.		
		Directs CO to verify natural circulation flow in at least one loop by ALL of the following: • Loop ΔT is less than 65°F • Hot and cold leg temperatures are constant or lowering • RCS is 24°F or more subcooled using CET Subcooling • Less than a 30°F ΔT between Th RTDs and the maximum quadrant CET temperature (QSPDS, pages 211 and 213)
Scenario termination: The scenario may be terminated when the AFW flow has been established to the SGs.		

Op-Test No.: _____ Scenario No.: __4__ Event No.: _____

Event Description: _High temperature trip of DG "A" **(If Required)**_____

Time	Position	Applicant's Actions or Behavior
Functional Recovery Procedure		
	CRS	Determines that a loss of all feed water has occurred due to loss of MVAC. Enters the Functional Recovery Procedure (**40EP-9EO09**) and performs the following: • Ensures the event is being classified. • Directs the RO to perform Appendix 16 for any running RCPs. • Directs the CO to ensure SG sample valves are open. • Directs Chemistry to perform their Abnormal Occurrence Checklist for the FRP. • Directs the RO to place the Train 'A' Hydrogen Analyzer in service. • Identifies the success paths to be used to satisfy each safety function. **MVAC-3 and HR-1** should be jeopardized. **Maintenance of Vital Auxiliaries (MVAC-3)** • Opens the Placekeeper • Informs the Energy Control Center of Blackout • Directs the CO to actuate an MSIS.
NOTE The SBOGs cannot supply Units 2 and 3 simultaneously but can supply Unit 1 and 2 or Unit 1 and 3. All operations involving the SBOGs will be coordinated by Unit 1.		
		CRS continued

	CRS	• Directs the RO to place all of the charging pump handswitches in “PULL TO LOCK”. • Directs Appendix 80, Align SBOG to PBA-S03 (BO). • Directs Appendix 53, Align Deenergized Buses. • Once power is restored to PBA-S03, directs the CO to restore feedwater flow to the SGs using AFN-P01.
	RO	Performs Standard appendices 53 and 80 as directed
	CO	Aligns AFN-P01 to feed SGs as directed.
CRITICAL TASK: Establish feed to at least one SG using AFN-P01.		
Scenario termination: The scenario may be terminated when the AFW flow has been established to the SGs.		