Facility: Palo Verde Exam Level: RO [X] SRO-I [ ] SRO-U [ ]	Date of Examination: 11-10-2008 Operating Test No.: 2008 RO

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. **(JS-1)** Parallel Offsite Power to PBB-S03 ***(NEW)***	S N	6
b. **(JS-2)** Verify RAS actuation ***(NEW)***	S A N L E EN	4 (primary)
c. **(JS-3)** Borate the RCS with HPSI pump	S A D L	1
d. **(JS-4)** Isolate SG with SGTR in mode 5	S A D L P	5
e. **(JS-5)** Prepare SBCS for ECC unloading	S D	4 (secondary)
f. **(JS-6)** Respond to High Pressurizer Pressure (failed channel)	S D	3
g. **(JS-7)** Bypass FBEVAS	S D	7
h. **(JS-8)** Loss of NCW, trip	S D	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. **(JP-1)** Put CEAs on Hold bus	D R	1
j. **(JP-2)** Start AFN Locally using Standard Appendix 41	D E A	4 (secondary)
k. **(JP-3)** Secure Air Dryer from parallel operations ***(NEW)***	N E	8

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

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

Facility: Palo Verde
Exam Level: RO ☐ SRO-I ☒ SRO-U ☐

Date of Examination: 11-10-2008
Operating Test No.: 2008 SRO-I

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. **(JS-1)** Parallel Offsite Power to PBB-S03 ***(NEW)***	S N	6
b. **(JS-2)** Verify RAS actuation ***(NEW)***	S A N L E EN	4 (primary)
c. **(JS-3)** Borate the RCS with HPSI pump	S A D L	1
d. **(JS-4)** Isolate SG with SGTR in mode 5	S A D L P	5
e. **(JS-5)** Prepare SBCS for ECC unloading	S D	4 (secondary)
f. **(JS-6)** Respond to High Pressurizer Pressure (failed channel)	S D	3
g. **(JS-7)** Bypass FBEVAS	S D	7
h.		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. **(JP-1)** Put CEAs on Hold bus	D R	1
j. **(JP-2)** Start AFN Locally using Standard Appendix 41	D E A	4 (secondary)
k. **(JP-3)** Secure Air Dryer from parallel operations ***(NEW)***	N E	8

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

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

Facility: Palo Verde
Exam Level: RO ☐ SRO-I ☐ SRO-U ☒

Date of Examination: 11-10-2008
Operating Test No.: 2008 SRO-U

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. **(JS-1)** Parallel Offsite Power to PBB-S03 ***(NEW)***	S N	6
b. **(JS-2)** Verify RAS actuation ***(NEW)***	S A N L E EN	4 (primary)
c. **(JS-4)** Isolate SG with SGTR in mode 5	S A D L P	5
d.		
e.		
f.		
g.		
h.		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. **(JP-1)** Put CEAs on Hold bus	D R	1
j. **(JP-2)** Start AFN Locally using Standard Appendix 41	D E A	4 (secondary)
k.		

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

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

JP 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1100020401, Operate CEDMCS

TASK STANDARD: Subgroup 16 placed on the hold bus.

K/A: 3.1.001.A2.14 K/A RATING: RO: 3.7 SRO: 3.9

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 10 minutes

REFERENCES: 40AL-9SF01 Local Alarm Panel J-SFN-C01D Responses

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [X]

JPM TYPE

Time Critical? *(Yes/No)* **Yes** Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Willie Drey Date: 7/13/2000

Revised By: Jordan Johnston Date: 4/25/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JP 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: N/A

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40AL-9SF01.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **You are the Area 3 operator.**
- **The Unit is at 100% power.**
- **The control room has received a CEDMCS Trouble alarm. Continuous Gripper High Voltage is indicated.**
- **The CRS directs you to carry out the actions of the local Alarm Response Procedure and place the affected subgroup on the hold bus.**
- **This is a time critical JPM.**

JP 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JP 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Proceed to CEDMCS room and obtain alarm response procedure.		Examinee goes to CEDMCS room and obtains copy of 40AL-9SF01. TIME START: _____ **NOTE:** Start time is when examinee has entered the RCA.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Evaluate supervisory panels for alarms and indications.	**(When Examinee looks at XJ-SFN-C01C for subgroup 16)** **INFORM CUE: Red LED's 17 and 19 for continuous gripper high voltage on subgroup 16 are lit. No other LED's are lit.**	Examinee evaluates local panel for indications and alarms.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	**Examiner Note: There ARE subgroups affected, making Step 1 N/A.** Step 2: Notify the Reactor Operator of the alarm.	**INFORM CUE: Reactor Operator acknowledges communication and instructs you to continue with alarm response and place the affected subgroup on the hold bus.**	Examinee contacts control room and notifies them of alarm.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 3: Determine number of CEDM subgroups affected by checking for lit CGHV LED's on the bays of each cabinet where CEA subgroup power assemblies exist.	**If requested CUE: CRS instructs you to place subgroup 16 on the hold bus IAW the alarm response procedure.**	Examinee determines subgroup 16 is the only subgroup affected and proceeds to step 9
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 9a: Notify the Reactor Operator to place CEDMCS in standby. **Examiner Note: Steps 4 and 5 are N/A, Step 6 sends to Step 9.**	**If requested CUE: RO acknowledges communication and reports CEDMCS is in standby.**	Examinee instructs RO to place CEDMCS in standby.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 9b: Check that no other subgroups are on the Hold Bus.	**INFORM CUE: All subgroups lights are extinguished on the Hold Bus panel**	Examinee determines that no other subgroups are on the hold bus.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 9d: Check for Hold Bus voltage of greater than 50 volts. **Examiner Note: Step 9c is N/A.**	**If requested CUE: Hold Bus voltage 70 VDC.**	Examinee simulates verifying Hold Bus voltage greater than 50 volts.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 9e: Select subgroup 16 by adjusting the SG/SEL thumbwheel to 16.	**Inform CUE: SG/SEL thumbwheel indicates 16.**	Examinee selects subgroup 16 on the SG/SEL thumbwheel.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 9f: Operate transfer switch to latch the subgroup selected.	**If Requested CUE: Transfer switch is in the transfer position. Transfer light and subgroup 16 lights are illuminated.**	Examinee simulates placing transfer switch in transfer position and notes red "Transfer" light illuminates as well as the affected subgroup light.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10. *	Sep 9g: One at a time, open the four individual CEA breakers on the appropriate Subgroup Power Switch Assembly for the Subgroup that was placed on the Hold Bus. Check with the RO to verify the correct breaker is opened by ensuring no CEA's drop.	**When Requested CUE: No CEA's have dropped.**	Examinee simulates opening the following breakers and verifies with the Control Room that no CEA's drop. • XESFNCEA55 • XESFNCEA58 • XESFNCEA61 • XESFNCEA64 End Time _____ **Examiner Note: End time is when final breaker is open.** **CEA's must be transferred to hold bus within 10 minutes.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
11.	Step 9h: Notify the Reactor Operator that subgroup 16 is on the Hold Bus.	**INFORM CUE: Another AO will investigate the problem with I&C assistance.**	Examinee notifies RO that subgroup 16 is on the Hold Bus.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JP 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	4/24/2008	3	Procedure and format change.

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)

EXAMINER CUE SHEET

JPM STEP 2

Red LED's 17 and 19 for continuous gripper high voltage on subgroup 16 are lit. No other LED's are lit.

JPM STEP 3

Reactor Operator acknowledges communication and instructs you to continue with alarm response and place the affected subgroup on the hold bus.

JPM STEP 4

CRS instructs you to place subgroup 16 on the hold bus IAW the alarm response procedure.

JPM STEP 5

RO acknowledges communication and reports CEDMCS is in standby.

JPM STEP 6

All subgroups lights are extinguished on the Hold Bus panel.

JPM STEP 7

Hold Bus voltage 70 VDC.

JPM STEP 8

SG/SEL thumbwheel indicates 16.

JPM STEP 9

Transfer switch is in the transfer position. Transfer light and subgroup 16 lights are illuminated.

JPM STEP 10

No CEA's have dropped.

INITIATING CUE:

- **You are the Area 3 operator.**
- **The Unit is at 100% power.**
- **The control room has received a CEDMCS Trouble alarm. Continuous Gripper High Voltage is indicated.**
- **The CRS directs you to carry out the actions of the local Alarm Response Procedure and place the affected subgroup on the hold bus.**
- **This is a time critical JPM.**

CANDIDATE

JP2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1240023901 Perform local operation of AFN-P01

TASK STANDARD: Non-Essential Aux Feed Pump AFN-P01 Manually Started Locally.

K/A: 3.4-061-A2.03 K/A RATING: RO: 3.1 SRO: 3.4

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 10 minutes

REFERENCES: 40EP-9EO10, Standard Appendices, Appendix 41

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [X]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* **Yes**

APPROVAL

Developed By: Mike Selland Date: 9/12/2006

Revised By: Jordan Johnston Date: 4/24/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JP2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: N/A

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of Standard Appendix 41, Attachment 41-A
- Pictures of 4.16 kV breaker cubicle as required

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **A Loss of All Feedwater event has occurred.**
- **There has also been a loss of 125V DC control power to breaker PBA-S03S.**
- **The CRS directs you to perform a Local Manual start of the non-class Aux Feed Pump, AFN-P01 per 40EP-9EO10, Standard Appendix 41 - Attachment 41-A.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JP2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 1: Check that the closing springs indicator for breaker PBA-S03S "Aux Feedwater Pump M-AFN-P01" indicates "CHGD"	**If needed, CUE: "There are no lights illuminated on the panel front."** **Once the examinee locates PBA-S03S, provide examinee with breaker pictures.** **When the examinee shows the charging spring indicator provide the following cue:** **Closing springs do <u>not</u> indicate charged.**	**NOTE:** Examinee simulates opening cubicle. Examinee will explain operation of components inside cubicle. Examinee simulates observing closing spring indicator. **NOTE:** Charging spring indicator located in middle left side of cubicle.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Contingency Action Step 1.1a: Obtain All the following equipment from FPN-C02 "Emergency Equipment Cabinet" • Ratchet • Extension • 5/8" Socket	**You have obtained the indicated equipment.**	Examinee simulates obtaining from FPN-C02 "Emergency Equipment Cabinet" **NOTE:** 5/8" socket and ratchet wrench located in Emergency Equipment Locker FPN-C02 on the 100' level of the Control Bldg. in the 'B' switchgear room.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Contingency Action Step 1.1b: Open RRA the 125VDC Control Power Breaker.	Using pictures already provided when examinee indicates where control power breaker is located give the following cue: **The Control Power Breaker is open.**	Examinee simulates opening Control Power Breaker. **NOTE**: Control Power Breaker is located inside breaker cubicle, top right-hand side.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Contingency Action Step 1.1c: Manually charge the closing springs by ratcheting the hexed charging stud counter-clockwise to obtain a "CHGD" indication on the closing spring indicator.	Using pictures already provided when examinee indicates where control power breaker is located give the following cue: **Closing springs indicate charged.**	Examinee simulates manually charging closing spring by pointing out closing springs driving stud and indicating that he would rotate stud in the counter-clockwise direction.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Contingency Action Step 1.1d: Close RRA the 125 V DC Control Power Breaker.	Using pictures already provided when examinee indicates where control power breaker is located give the following cue: **Control Power Breaker for PBA-S03S is closed.**	Examinee simulates closing Control Power Breaker for PBA-S03S. (RRA)
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Step 2: Press the "Manual Close" plunger for the breaker, PBA-S03S.	Using pictures already provided when examinee indicates where control power breaker is located give the following cue: **The Manual Close plunger for breaker PBA-S03S has been pressed in.**	Examinee simulates pressing the manual close push-button to close PBA-S03S.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 3: Check that the mechanical breaker indication for the breaker PBA-S03S indicates closed.	Using pictures already provided when examinee indicates where control power breaker is located give the following cue: **PBA-S03S mechanical breaker indication indicates closed.**	Examinee simulates verifying PBA-S03S closed by observing closed flag on breaker (or breaker position indicator).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	Step 4: Inform the responsible operator that the attachment 41-A is complete.	**Control Room is informed of Attachment 41-A completion.**	Examinee simulates informing the responsible operator that attachment 41-A is complete.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JP2
PVNGS JOB PERFORMANCE MEASURE
2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
001	09/12/06	3	Updated JPM to 40EP-9EO10 Rev. 41.
002	08/09/2007	6	Changed to Alternate path, verified with current procedure revision
003	4/24/2008	6	JPM format change

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)

INITIAL CONDITIONS

INITIATING CUE:

- **A Loss of All Feedwater event has occurred.**
- **There has also been a loss of 125V DC control power to breaker PBA-S03S.**
- **The CRS directs you to perform a Local Manual start of the non-class Aux Feed Pump, AFN-P01 per 40EP-9EO10, Standard Appendix 41 - Attachment 41-A.**

CANDIDATE

JP 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1250060402E1 Direct recovery actions for loss of Instrument Air

TASK STANDARD: "C" Air Dryer secured.

K/A: 4.2-065-AA1.03 K/A RATING: RO: 2.9 SRO: 3.1

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): AO/RO/SRO VALIDATION TIME: 20 minutes

REFERENCES: 40AO-9ZZ06, Loss of Instrument Air, Appendix E

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [X]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Jordan Johnston Date: 4/24/2008

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JP 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: N/A

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Copy of 40AO-9ZZ06, Appendix E.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **A Loss of Instrument Air occurred 2 hours ago.**
- **Both Air Dryers were placed in service per 40AO-9ZZ06, Loss of Instrument Air.**
- **Instrument Air has been restored and recovery operations are in progress.**
- **The CRS has directed you to align Instrument Air Dryers for normal operations by securing the "C" Air Dryer in accordance with the Loss of Instrument Air abnormal operating procedure, 40AO-9ZZ06 Appendix E.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JP 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 1: Open the solenoid air supply valve for IAN-M13, Moisture Trap, from the dryer that is to remain in service.	Inform cue: **Valve stem is out, will not move (in the open direction)**	Examinee ensures the air supply from "D" dryer is open.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Step 2: Close the solenoid air supply valve for IAN-M13, Moisture Trap, from the dryer that is to be taken out of service.	Inform cue: **Valve stem moved down, and has now stopped.**	Examinee closes the air supply from "C" dryer.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Step 3: Close the After Filter Outlet Isolation valve for the dryer to be taken out of service: IAN-VF51	Inform cue: **Valve handle is turned to the right.**	Examinee closes IAN-VF51.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 4: Place the Power Disconnect Annunciator Alarm Bypass switch to "OFF" for the dryer to be taken out of service.	**Inform Cue: The switch is in the off position.**	Examinee takes switch to OFF on the "C" Dryer.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 5: Close the Prefilter Inlet Isolation valve for the dryer being taken out of service: IAN-VF48	Inform cue: **Valve stem moved down, and has now stopped.**	Examinee closes IAN-VF48.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 6: Close the Moisture Indicator Isolation Valve for the dryer being removed from service.	Inform cue: **Valve handle is turned to the right.**	Examinee closes the Moisture Indicator Isolation Valve for the "C" dryer.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 7: Close the Moisture Trap Isolation valve for the dryer being removed from service: IAN-VF55	Inform cue: **Valve handle is perpendicular to the pipe.**	Examinee closes IAN-VF55.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 8: Close the air supply valve for the dryer being removed from service: IAN-M11	Inform cue: **Valve handle is turned to the right.**	Examinee closes IAN-M11.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9.	Step 9: **When** the off-stream desiccant chamber has depressurized for regeneration, **Then** check that the purge pressure is set at 62 psig as read on: IAN-PI-248, Purge Pressure	**Inform Cue: The off-steam desiccant chamber is depressurized.** **If requested cue: IAN-PI-243 reads 62 psig.**	Examinee checks IAN-PI-248, Purge Pressure.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10.	Step 10: Inform the responsible Operator that the Instrument Air Dryers are aligned for normal operation.		Examinee informs Control Room.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JP 3

PVNGS JOB PERFORMANCE MEASURE

2008 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)

INITIAL CONDITIONS

INITIATING CUE:

- **A Loss of Instrument Air occurred 2 hours ago.**
- **Both Air Dryers were placed in service per 40AO-9ZZ06, Loss of Instrument Air.**
- **Instrument Air has been restored and recovery operations are in progress.**
- **The CRS has directed you to align Instrument Air Dryers for normal operations by securing the "C" Air Dryer in accordance with the Loss of Instrument Air abnormal operating procedure, 40AO-9ZZ06 Appendix E.**

CANDIDATE

JS_1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

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/SRO VALIDATION TIME: 15 minutes

REFERENCES: 40OP-9PB01

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* NO Alternative Path? *(Yes/No)* NO

APPROVAL

Developed By: Jordan Johnston Date: 4/18/2008

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

JS_1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 54

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- **IC 54 is set up to run JS-1 and JS-2 on the 2008 NRC Exam**.
- **Reset to IC 54**
- **Go to run, silence alarms, and then to freeze.**
- **Go to run when examiners are ready.**

D. REQUIRED CONDITIONS:

- Loss of Offsite Power
- 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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **You are the third RO in Unit 1.**
- **The Unit tripped on a loss of offsite power.**
- **Power has been restored to the switchyard.**
- **NBN-X03 is now energized.**
- **The CRS directs you to parallel offsite power back onto PBA-S03 per section 14 of 40OP-9PB01.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS_1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Perform Prerequisites (section 14.2)		Examinee determines that all prerequisites are complete. **Examiner Note: DG B is running but it is NOT paralleled with offsite power.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 14.3.1.1 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 alarms reset at the local DG panel (DGA-B01)	**If requested as AO: "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 Ensure all DG alarms are reset.		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 CRS permission to override DG	**When asked as CRS: "You have 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 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, synch switch for PBA-SO3L, to "ON".		Examinee places PBA-SS-S03L to "ON".
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 14.3.2.3 Adjust DG A speed using PEA-SC-G01 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):**			

	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):**			

	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 14.3.2.7 Unit 1 only, If it is desired to continue to operate DG A, go to 40OP-9DG01.	**"The Diesel Generator will be shut down by another RO".**	
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS_1

PVNGS JOB PERFORMANCE MEASURE

2008 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)

INITIAL CONDITIONS

INITIATING CUE:

- **You are the third RO in Unit 1.**
- **The Unit tripped on a loss of offsite power.**
- **Power has been restored to the switchyard.**
- **NBN-X03 is now energized.**
- **The CRS directs you to parallel offsite power back onto PBA-S03 per section 14 of 40OP-9PB01.**

CANDIDATE

JS 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: E202507 Ensure that a RAS automatically actuates and align the remaining valves to support the recirculation alignment

TASK STANDARD: Proper RAS actuation following a LOCA has been completed.

K/A: 4.4-A16-AA1.1 K/A RATING: RO: 3.4 SRO: 3.6

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 15 minutes

REFERENCES: 40EP-9EO03

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* NO Alternative Path? *(Yes/No)* **YES**

APPROVAL

Developed By: Jordan Johnston Date: 4/18/2008

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 54

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	Included in IC 54
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- **IC 54 is set up to run JS-1 and JS-2 on the 2008 NRC Exam**
- **Reset to IC 54**
- **Go to run, silence alarms, and then to freeze.**
- **Go to run when examiners are ready.**

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **You are the Reactor Operator in Unit 1.**
- **A large break LOCA has occurred.**
- **The CRS directs you to verify a proper RAS actuation per the Loss of Coolant EOP, step 54.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 54 a: Ensure that both LPSI pumps are stopped.		Examinee determines that both LPSI pumps have stopped.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Step 54 b: Ensure that the ESF pump suction has shifted to the containment.		Examinee determines that SIA-UV-673 did not open and attempts to open it. **Examiner note: this valve is stuck shut and will not open.** Examinee determines that SIB-UV-675 did not open and opens it using **SIB-HS-675**. **Examiner note: this valve failed to auto open but will open when attempted.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Step 54 b.1 contingency step: If any ESF pump suctions can NOT be shifted to the containment sump AND any HPSI or CS pumps are running, THEN stop those pumps.		Examinee determines that the A Train side containment sump valve will not open and stops the HPSI A and CS A pumps using **SIA-HS-1** and **SIA-HS-5**.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 54 c: Ensure ALL the following valves are closed: SIA-HS-666 SIA-HS-664 SIB-HS-667 SIB-HS-665		Examinee determines that SIB-UV-667 did not close and closes it using **SIB-HS-667**. **Examiner note: this valve failed to auto close but will close when attempted.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 54 d: Close BOTH of the following valves: CHA-HS-531 CHB-HS-530	**When both valves are closed, cue: "Another RO will finish the procedure".**	Examinee closes **CHA-HS-531** and **CHB-HS-530**.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS 2

PVNGS JOB PERFORMANCE MEASURE

2008 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)

INITIAL CONDITIONS

INITIATING CUE:

- **You are the Reactor Operator in Unit 1.**
- **A large break LOCA has occurred.**
- **The CRS directs you to verify a proper RAS actuation per the Loss of Coolant EOP, step 54.**

CANDIDATE

JS 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1250010301 Respond to a condition requiring emergency boration instructions and contingencies.

TASK STANDARD: Emergency boration of >75 gpm using HPSI pumps has been established.

K/A: 4.2.024.AK3.02 K/A RATING: RO: 4.2 SRO: 4.4

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 15 minutes

REFERENCES: 40AO-9ZZ01, Emergency Boration

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* NO Alternative Path? *(Yes/No)* **YES**

APPROVAL

Developed By: T. Stahler Date: 4/15/03

Revised By: Jordan Johnston Date: 4/18/08

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 55

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

NOTE: The following commands are already in IC 55. If using IC 55, do NOT reload these commands. If IC 55 is not available, use *IC 4* and perform the following:

EVENT	COMMAND	DESCRIPTION
1.	rfCV66A open	Opens air supply to CH-532
2.	cmDPCV06CHAP01_6	CCP A trip. **Place on trigger "CH532".**
3.	crB3CV06CHBP01_2 RACK_OUT	Rack out CCP B
4.	crB3CV06CHEP01_2 RACK_OUT	Rack out CCP E
	Perform the following to set up:	
	Close CHE-HV-532	

C. SPECIAL INSTRUCTIONS:

- **IC 55 is set up to run JS 3 and JS 4 for the 2008 NRC Exam**
- **Reset to IC 55**
- **Go to run, silence alarms, and go to freeze**
- **Go to run when examiners are ready.**

D. REQUIRED CONDITIONS:

- **Hang Caution tags for SI mini-flows**
- **Hang Caution tags on Charging pumps B and E**

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

Appendix F of 40AO-9ZZ01

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **The unit is in Mode 5 with 'B' LPSI on Shutdown cooling.**
- **An "Emergency Boration" due to inadequate shutdown margin is required.**
- **Charging pumps B&E are not available**

The CRS directs you to Emergency Borate per 40AO-9ZZ01, Section 3 Emergency Boration.

- **Inform the CRS when adequate flow is established.**
- **PC Cleanup is NOT on the RWT.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 3.1 : Check that BOTH of the following are available for Emergency Boration: • The RWT • At least one Charging Pump		Examinee determines that the RWT and Charging pump A are both available. **Examiner Note: Examinee will "N/A" the next two steps, 3.2 and 3.3.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Ensure CHN-HS-532 is OPEN (Charging Pump A will trip at this point)	After the examinee reports that the Charging Pump has tripped, cue: **"The CRS has assigned another operator to investigate the Charging Pump Trip. The CRS directs you to establish Emergency Boration to the RCS."** If sent as AO to Charging Pump breaker, **cue:** **"Charging pump A tripped on 86 relay".**	**Examiner Note: The Examinee will determine charging pump flowpath by using either steps 4, 5, or 6. They all have the same first substep. When CHN-HS-532 is placed to "OPEN", Charging pump A will trip, forcing them to use HPSI to complete the boration.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Examinee reevaluates step 1. With no Charging Pumps now available he goes to Section 4, HPSI Pump.	**Inform Cue:** **"CRS directs using 'B' HPSI pump."**	Examinee goes to HPSI Pump, section 4.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Refer to Appendix F, simplified Drawings for a basic flow view.		May refer to Appendix.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 4.2: Check that the HPSI 'B' Pump breaker is racked in.	**If Requested Cue:** **"HPSI 'B' Pump breaker is Racked in."**	Examinee determines that HPSI 'B' Pump breaker is racked in by one of the following: - No white SEIS light - Normal green light on pump HS - Sending AO locally
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 4.3: Check that the HPSI Pump lockout relay is reset.	**If sent as AO, cue:** **"HPSI Pump B 86 relay is reset."**	Examinee determines that the lockout relay is reset by one of the following: - No white SEIS light - Normal green light on pump HS - Sending AO locally
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 4.4 : Check that the HPSI 'B' Pump UC fuses are 'ON'	**If sent as AO, cue:** **"HPSI Pump B UC fuses are on."**	Examinee determines that the UC fuses are on by one of the following: - Normal green light on pump HS - Sending AO locally
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	Step 4.6: If HPSI Pump 'B' will be used for emergency boration. Then perform the following: a) Ensure all of the following valves are closed: • SIB-UV-668, LPSI Pump B Miniflow Recirc. • SIB-UV-665, CS Pump B Miniflow Recirc. • SIB-HV-609, HPSI Pump B Long Term Recirc Isolation. • All Train 'B' HPSI Cold Leg Injection Valves. b) Ensure ALL of the following valves are open: • CHB-HV-530, RWT to Train B Safety Injection. • SIB-UV-667, HPSI Pump B Miniflow recirc. SIB-UV-659, Train B Pumps Combined Recirc.		a) Examinee closes SIB-UV-665. All other valves are verified CLOSED. b) All valves are verified OPEN.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 4.7: Start The appropriate HPSI Pump		Examinee starts HPSI pump 'B'
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10. *	Step 4.8: Throttle open one of the HPSI Cold Leg Injection Valves to obtain 75 gpm or more.	**When flow is established, cue:** **"Another RO will complete the remaining actions."**	Flow of greater than 75 GPM established through a 'B' train HPSI Cold Leg Injection Valve: - SIB-HS-616 - SIB-HS-626 - SIB-HS-636 - SIB-HS-646 **Examiner Note**: Approx. 50% valve position will give flowrate of between 75 - 100 gpm.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	4/18/08	3	

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)

INITIAL CONDITIONS

INITIATING CUE:

- **The unit is in Mode 5 with 'B' LPSI on Shutdown cooling.**
- **An "Emergency Boration" due to inadequate shutdown margin is required.**
- **Charging pumps B&E are not available**

The CRS directs you to Emergency Borate per 40AO-9ZZ01, Section 3 Emergency Boration.

- **Inform the CRS when adequate flow is established.**
- **PC Cleanup is NOT on the RWT.**

CANDIDATE

JS 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1240050201 Implement SGTR instructions and contingencies

TASK STANDARD: Ruptured Steam Generator isolated in accordance with Standard Appendix 248.

K/A: 4.2 037 AK3.06 K/A RATING: RO: 3.6 SRO: 4.1

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 10 minutes

REFERENCES: 40EP-9EO04, Steam Generator Tube Rupture

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* **Yes**

APPROVAL

Developed By: John Dedon Date: 5/15/2007

Revised By: Jordan Johnston Date: 4/22/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 55

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

NOTE: The following commands are already in IC 55. If using IC 55, do NOT reload these commands. If IC 55 is not available, use *IC 4* and perform the following:

EVENT	COMMAND	DESCRIPTION
1.	cmAVFW04SGAUV175_4	Mechanical seizure of SG-175
2.	cmAVFW04SGBUV135_4	Mechanical seizure of SG-135
	Perform the following to set up:	
	Open SG-HS-1144	
	Jog open SG-HS-1145 10%	
	Open SGA-UV-1133	
	Open SGA-UV-1134	
	Open SGB-UV-1135A/B	
	Open SGB-UV-1136A/B	

C. SPECIAL INSTRUCTIONS:

- **IC 55 is set up to run JS 3 and JS 4 for the 2008 NRC Exam**
- **Reset to IC 55**
- **Go to run, silence alarms, and go to freeze**
- **Go to run when examiners are ready.**

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **Unit 1 is in Mode 5.**
- **The Lower Mode Functional Recovery Procedure was entered due to a loss of inventory.**
- **The CRS has determined that SG #2 has a ruptured tube (is the most affected SG)**
- **The CRS directs you to perform Standard Appendix 248 to isolate SG #2.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 1: Ensure MSIVs are closed on the most affected SG.		MSIV's are already closed.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Step 2: Ensure that the Economizer valves are closed on the most affected SG.		Examinee closes Economizer valves using : SGA-HS-177C SGB-HS-137C **Examiner Note: SGA-HS-177A and SGB-HS-137A may also be used but will take much longer.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 3: Ensure that the Downcomer Isolation Valves are closed on the most affected SG.		Examinee attempts to close SGA-HS-175 and SGB-HS-135. **Examiner Note: These valves are failed open.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 3.1 Ensure that BOTH of the following valves are closed on the most affected SG SGN-HV-1144 SGN-HV-1145		**Examiner Note: Alternate path step**. Examinee closes SGN-HS-1144 and SGN-HS-1145.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 4: Ensure that the MSIV Bypass valve on the most affected SG is closed.		Examinee checks that SGE-HS-183 is closed
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 5: Ensure that the ADVs on the most affected SG are closed.		Examinee ensures that SGB-HIC-185 and SGA-HIC-179 have zero output.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 6: Ensure that Aux Feed Pump A Steam Supply Valves are closed.		Examinee ensures SGA-HS-138 is closed.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	Step 7: Ensure Auxiliary Feedwater Isolation Valves to the most affected SG are closed.		Examinee checks closed: AFA-HS-37 AFB-HS-35
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 8: Ensure that the Blowdown Containment Isolation Valves are closed on the most affected SG.		Examinee closes: SGB-HS-500R SGA-HS-500S
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
10. *	Step 9: Ensure that BOTH of the steam trap isolation valves are closed on the most affected SG.	**After this step complete, cue:** **Another operator will continue with the procedure.**	Examinee closes: SGA-HS-1134 SGA-HS-1136A/B
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	4/22/2008	6	Modified for Mode 5 performance

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)

INITIAL CONDITIONS

INITIATING CUE:

- **Unit 1 is in Mode 5.**
- **The Lower Mode Functional Recovery Procedure was entered due to a loss of inventory.**
- **The CRS has determined that SG #2 has a ruptured tube (is the most affected SG)**
- **The CRS directs you to perform Standard Appendix 248 to isolate SG #2.**

CANDIDATE

JS 5

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1250800201 Unload the Turbine Rapidly as Directed By ECC.

TASK STANDARD: 40AO-9ZZ25, Appendix A Steps 1-9 to prepare for unloading are complete.

K/A: 3.4-041-A4.08 K/A RATING: RO: 3.0 SRO: 3.1

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 15 minutes

REFERENCES: 40AO-9ZZ25 ECC Directed Turbine Unloading

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Tom Stahler Date: 4/1/2003

Revised By: Jordan Johnston Date: 4/22/2008

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 5

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 56

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

NOTE: This JPM has no malfunctions associated with it. If IC 56 is not available use *IC 20*, and load the commands for JS-6.

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- **IC 56 is set up to run JS-5 and JS-6 on the 2008 NRC Exam**
- **Reset to IC 56**
- **Go to run, silence alarms, and then to freeze.**
- **Go to run when examiners are ready.**
- **Important Note: JS-6 requires being in freeze until after the cue is given and understood. Start JS-5 after JS-6 has been cued and gone to RUN.**

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

The following plant conditions exist:

- **You are in Unit 1.**
- **Reactor Power is 100%.**
- **ECC just requested that Palo Verde rapidly reduce generator output.**

The CRS directs you to align the unit to prepare for turbine unloading using 40AO-9ZZ25 Appendix A steps 1 through 9.

Peer checking is not required for the purposes of this JPM.

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 5

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 1: Direct operator to perform Appendix D	**Inform cue: "Another RO is performing Appendix D".**	
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 2: Log the required completion time.	**Inform cue: "The required completion time is 15 minutes from now."**	Examinee records completion time.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 3: Record Main Generator Gross MW.		Examinee records Main Generator Gross MW output in Appendix A.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Record position of the Load Limit Potentiometer.		Examinee records current position of Load Limit Potentiometer.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 5: Ensure that CEDMCS is NOT in Auto Sequential.		Examinee places CEDMCS out of Auto Sequential.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Step 6: Lower the Local Auto setpoint on SGN-PIC-1010 to 20 psig above the indicated actual pressure.		Examinee adjusts the black pen to 20 psig above the red pen on SGN-PIC-1010.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 7: Place SBCS Master Controller in Local Auto		Examinee performs the following steps: Pushes “Manual” pushbutton Slides lefthand bar to “Local” Pushes “Auto” pushbutton
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	Step 8: Ensure no Auto Demand signals are present for any SBCVs.		Examinee checks that output on SBCV individual controllers are all zero.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 9: Give BOTH of the following a Manual Permissive: SGN-PV-1001 SGN-PV-1004		Examinee places SGN-HS-1001 and SGN-HS-1004 to "Manual".
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS 5

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	4/22/2008	3	

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)

INITIAL CONDITIONS

INITIATING CUE:

The following plant conditions exist:

- **You are in Unit 1.**
- **Reactor Power is 100%.**
- **ECC just requested that Palo Verde rapidly reduce generator output.**

The CRS directs you to align the unit to prepare for turbine unloading using 40AO-9ZZ25 Appendix A steps 1 through 9.

Peer checking is not required for the purposes of this JPM.

CANDIDATE

JS 6

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 0100010401 Operate the Pressurizer Pressure Control System

TASK STANDARD: Pressurizer pressure restored to 2250 ± 25 psia

K/A: 4.2.027.A1.01 K/A RATING: RO: 4.0 SRO: 3.9

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 10 minutes

REFERENCES: 40AL-9RK4A, Panel B04A Alarm Responses

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* **YES**

APPROVAL

Developed By: Larry Wilhelm Date: 6/18/2002

Revised By: Jordan Johnston Date: 4/23/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 6

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 56

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

NOTE: The following commands are already in IC 56. If using IC 56, do NOT reload these commands. If IC 56 is not available, use *IC 20* and perform the following:

EVENT	COMMAND	DESCRIPTION
1.	IOR ZDRCNHS100 CH-X	Fails PPCS selector switch to the "X" position
2.	cmTRRC03RCNPT100X _1 1500	Fails Pressurizer Pressure Control Channel "X" to 1500 psia
	Allow RCS pressure to reach 2285, then freeze.	

C. SPECIAL INSTRUCTIONS:

- **IC 56 is set up to run JS-5 and JS-6 on the 2008 NRC Exam.**
- **Reset to IC 56**
- **Go to run, silence alarms, and go to freeze**
- **Go to run when examiners are ready.**
- **IMPORTANT!! In this setup, RCS pressure will move rapidly (70 psia in 3 minutes). Make sure cue is given and the Examinee is ready prior to "run".**

D. REQUIRED CONDITIONS:

- RCN-HS-100 in Channel X
- RCS pressure >2285 psia.
- Malfunctions in.

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **Pressurizer Pressure is >2285 psia and increasing.**
- **The CRS directs you to restore Pressurizer pressure to 2250 psia, in accordance with 40AL-9RK4A Window 4A01B for High Pressurizer Pressure.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 6

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1. *	Step 1: Trip reactor if high pressure trip is impending (≥ 2383 psia) and proceed to 40EP-9EO01.		Examinee determines Pressurizer Pressure < 2383 psia. **Examiner Note: TERMINATE JPM, IF REACTOR IS TRIPPED. JPM would be UNSAT.** (Critical not to trip Reactor)
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 2: Verify Pressurizer pressure high alarm by observing RCN-PT-100X and/or RCN-PT-100Y on recorder RCN-PR-100 (B04).		Examinee determines actual high pressure condition exists.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 3: Verify controlling channel transmitter has not failed.		Examinee determines CH "X" is inaccurate.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 3: Switch to unaffected channel using RCN-HS-100.		Examinee selects Channel "Y " **Examiner Note: This will have no affect due to switch failure.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Step 4: Manually initiate Pressurizer spray flow using RCN-PIK-100, Pressurizer Spray Control to reduce pressure to normal band.		Examinee reduces RCS pressure with Main Spray. Pressure should be reduced to around 2250 psia (per the Initiating Cue).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Second Priority Action, Step 2: Deenergize Pressurizer Heaters as required to limit pressure increases.	**After heaters have been de-energized CUE:** **Another RO will take actions to maintain Pressurizer Pressure at approximately 2250 PSIA.**	Examinee may or may not turn off heaters, as Main Spray will more than compensate for full heater input. Pressure must be 2225-2275 psia and Main Spray valve either closed with heaters off or throttled to control pressure in the band.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS 6
PVNGS JOB PERFORMANCE MEASURE
2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
14	10/10/96	6	Format changes per OTG-02
15	06/18/02	3	Procedure revised
16	4/23/2008	6	Eliminated use of Aux Spray, reduced failures for credibility.

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)

JS 6

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

INITIAL CONDITIONS

INITIATING CUE:

- **Pressurizer Pressure is >2285 psia and increasing.**
- **The CRS directs you to restore Pressurizer pressure to 2250 psia, in accordance with 40AL-9RK4A Window 4A01B for High Pressurizer Pressure.**

CANDIDATE

JS 7

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1030011001 Place BOP ESFAS modules in Bypass

TASK STANDARD: FBEVAS 'A' BOP ESFAS module has been bypassed.

K/A: 3.7.016.A4.01 K/A RATING: RO: 2.9 2.8

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 15 minutes

REFERENCES: 40OP-9SA01, BOP ESFAS Modules Operation.

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Tom Stahler Date: 4/1/2003

Revised By: Jordan Johnston Date: 4/23/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 7

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 57

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

NOTE: The following condition is already in IC 57. If IC 57 is not available, use *IC 20* and perform the following:

EVENT	COMMAND	DESCRIPTION
1.	N/A	Place FBEVAS B in bypass at BOP-ESFAS cabinets.
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- **IC 57 is set up to run JS-7 and JS-8 on the 2008 NRC Exam.**
- **Reset to IC 57**
- **Go to run, silence alarms, and go to freeze**
- **Go to run when examiners are ready.**

D. REQUIRED CONDITIONS:

- **FBEVAS B in Bypass**
- **IMPORTANT!! Prior to administration of this JPM, ENSURE that no bulbs are burned out on both BOP-ESFAS panels.**

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

The following plant conditions exist:

*** The CRS has directed you to place BOP ESFAS FBEVAS 'A' in bypass in accordance with 40OP-9SA01 SECTION 4.6, due to RU-31 power supply degradation.**

*** Prerequisites have NOT been performed.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 7

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Prerequisite Step 1: Applicable LCOs and the ODCM compensatory actions have been reviewed.	**If Requested CUE: The CRS and STA have reviewed applicable LCOs and ODCM requirements.**	
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Prerequisite Step 2: CRS has given permission to place 'A' FBEVAS in bypass.	**If Requested CUE: The CRS has directed you to place BOP ESFAS FBEVAS 'A' in bypass.**	Permission given in initiating cue
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Prerequisite Step 3: Checks redundant module in Train 'B' is not in bypass.	**If Requested CUE: CRS directs you to remove Train 'B' FBEVAS from bypass, then continue to bypass FBEVAS 'A'.**	Examinee identifies Train 'B' FBEVAS is in bypass.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Examinee goes to section 4.7		Section 4.7 removing BOP ESFAS Modules From Bypass is entered.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Prerequisites are met.		Examinee determines that the three prerequisites of 4.7.2 are met. **Examiner Note: FBEVAS B is in bypass but NOT tripped.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6.	Step 4.3.7.1: Perform a lamp test on BOP ESFAS 'B'		Lamp test is performed **Examiner Note: This JPM has no intentionally burned out bulbs. If a bulb is discovered to be out, the Examiner may let the Examinee replace the bulb or give a cue that the bulb has been replaced and the lamp check is satisfactory.**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7.	Step 4.3.7.2: Perform the appropriate section below: 4.7.4 Removing FBEVAS, CREFAS and CPIAS Modules from Bypass.		Identifies section 4.7.4 as the appropriate section.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8.	If the BOP ESFAS module(s) is not tripped, then GO TO step 4.7.4.4.		Determines FBEVAS Train 'B' not tripped and goes to step 4.7.4.4.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Remove Train 'B' FBEVAS module from bypass by performing all the following: 1. Check that all lights except the 'BYPASS' light are clear (not lit) for module to be removed from Bypass. 2. Turn Bypass key for the desired module counterclockwise approximately ¼ turn. 3. Remove the key. 4. Check 'BYPASS' light is clear (not lit). 5. Independently verify the module has been removed from bypass. Return bypass key to key storage location	**If Requested CUE: Concurrent Verification has been performed** **If Requested Cue: IV has been performed.**	Only the 'Bypass' light is lit. *Evaluator note: Critical nature of step is that the channel is removed from bypass.* **Turn Bypass key for Train 'B' FBEVAS counterclockwise approximately ¼ turn.** Key is removed. 'BYPASS' light is out. **Key may be used to bypass Train 'A' FBEVAS without returning it to the key locker.**

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
10.	Step 4.6.3.1: Examinee returns to Section 4.6. Ensures that the Sequencer is not in Auto Test.		Examinee determines that the Sequencer is not in Auto Test.

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
11.	Step 4.6.3.2: If Dry Cask or Fuel Handling operations are in progress…	**CUE: No Dry Cask or Fuel Handling operations are in progress.**	Examinee N/As the step.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
12.	Step 4.6.3.3: If a radiation monitor is to be placed in local or bypass due to the transfer of radioactive material….	**If Requested, CUE: The monitor is being bypassed due to an erratic power supply.**	Examinee N/As the step.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
13.	Step 3.6.3.4 through 7: Performs a lamp test on BOP ESFAS train 'A' and replaces burned out bulbs.		Lamp test performed.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
14.	Step 4.6.3.8: Check That the redundant module (FBEVAS Train 'B') is not in bypass.		Addressed previously.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
15.	Step 4.6.3.9: If placing LOP/LS Relay in Bypass…		Examinee N/As the step.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
16.	Step 4.3.6.10: Place a check mark in the column provided for the module(s) to be placed in Bypass.		Examinee places check mark on RU-31/ FBEVAS 'A' row.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
17. *	Step 4.3.6.11: Bypass module(s) checked in step 4.6.3.10 by performing ALL of the following: 1. Place Bypass key in key slot for the selected Module. 2. Turn the key clockwise approximately ¼ turn or until the bypass light comes on.	**If Requested CUE: Independent verification is complete.**	Examinee places FBEVAS 'A' in bypass. Bypass light is lit.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS 7

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	4/23/2008	3	Updated procedure and format change.

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)

INITIAL CONDITIONS

INITIATING CUE:

The following plant conditions exist:

* **The CRS has directed you to place BOP ESFAS FBEVAS 'A' in bypass in accordance with 40OP-9SA01 SECTION 4.6, due to RU-31 power supply degradation.**
* **Prerequisites have NOT been performed.**

CANDIDATE

JS 8

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1250030401, Perform Actions for Loss of NC

TASK STANDARD: RCPs are tripped and Seal Bleedoff Isolated.

K/A: 3.8-008-A4.01 K/A RATING: RO: 3.3 SRO: 3.1

K/A: 3.4.003.A2.02 K/A RATING: RO: 3.7 SRO: 3.9

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 8 minutes

REFERENCES: 40AO-9ZZ03, Loss of Cooling Water

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* **Yes** Alternative Path? *(Yes/No)* **Yes**

APPROVAL

Developed By: Tom Stahler Date: 4/25/2003

Revised By: Jordan Johnston Date: 4/23/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

JS 8

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: 57

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

NOTE: The following commands are already in IC 57. If using IC 57, do NOT reload these commands. If IC 57 is not available, use *IC 20* and perform the following:

EVENT	COMMAND	DESCRIPTION
1.	Close NCB-UV-403 on B07.	
2.	cmMVCC04NCBUV403_6	Mechanically fails NCB-UV403 in the closed position
3.	Acknowledge alarms.	
4.	Go to Freeze.	

C. SPECIAL INSTRUCTIONS:

- **IC 57 is set up to run JS-7 and JS-8 on the 2008 NRC Exam.**
- **Reset to IC 57**
- **Go to run, silence alarms, and go to freeze**
- **Go to run when examiners are ready.**

D. REQUIRED CONDITIONS:

- **NCB-UV403 closed**.

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **The plant is operating at 100% power.**
- **A Loss of Nuclear Cooling Water to the RCPs has occurred.**
- **The CRS directs you to perform Section 4 of 40AO-9ZZ03, Loss of Cooling Water.**
- **This is a Time Critical JPM.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

JS 8

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1.	Step 4.1: If seal injection is in service and cooling water is **NOT** restored to any operating RCP within 10 minutes of the initial loss, **THEN** perform **ALL** of the following: Ensure that the Reactor is tripped. Stop all of the RCPs Isolate controlled bleedoff.		Examinee will note time. **Examiner Note: The examinee is only expected to note the time at this point and NOT trip the Reactor.** **START TIME: _____**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 4.2: If seal injection is NOT in service….		Examinee N/As this step since seal injection is in service.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 4.3: **IF no** Nuclear Cooling Water pumps are running, **AND** at least one is available, **THEN** perform **ALL** of the following to start a NC Pump.		Examinee determines that a NCW Pump is operating.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4.	Step 4.4: **IF** at least one Nuclear Cooling Water Pump is running, **AND** "NCWS PMPS DSCH HDR PRESS HI-LO" (7A07B) is in alarm due to low pressure, **THEN** perform **ANY** of the following:		Examinee will determine that operating NCW Pump is operating normally and no low discharge pressure alarm exists. Step is marked N/A
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5.	Step 4.5: **IF ANY** of the NC Containment Isolation Valves have failed closed, **AND** there is **NOT** a valid CSAS signal present, **THEN** perform **Both** of the following: Open **ANY** closed isolation valves.	If Examinee recommends locally operating NCB-UV-403 THEN: **INFORM CUE: The CRS has determined a containment entry can not be performed.**	Examinee will recognize that NCB-UV-403 has failed closed. Examinee will attempt to open NCB-UV-403. It will **not** open.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
6. *	Step 4.5, Contingency Action 1: **IF ANY** of the NC Containment Isolation Valves will **NOT** open, **THEN** perform **ALL** of the following: **1)** Close all NC CTMT isolation valves.		Examinee closes NC Containment Valves NCB-UV-401 and NCA-UV-402.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
7. *	Step 4.5, Contingency Action 2: Ensure that the Reactor is tripped.	**If requested cue**: another RO has verified Reactivity Control Safety function is met. **INFORM CUE: Another operator will perform SPTAs.**	Examinee trips the Reactor.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
8. *	Step 4.5, Contingency Action 3: Stop all of the RCPs.		Examinee stops all of the RCPs.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
9. *	Step 4.5, Contingency Action 4: Isolate seal Bleedoff using: RCN-HS-430 RCN-HS-431 RCN-HS-432 RCN-HS-433	**After Seal Bleedoff isolated, Inform CUE:** **Another RO will complete this procedure.**	Isolate seal bleedoff from all RCPs **STOP TIME: _____** **NOTE:** JPM must be completed within 10 minutes.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

JS 8

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
01	02/08/97	6	New Format
02	11/06/97	6	Updated Steps and Cue's
03	01/28/98	6	Updated Steps and Cue's
04	04/25/03	6	Updated format; simulator commands.
05	4/23/2008	6	Updated format; simulator commands.

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)

INITIAL CONDITIONS

INITIATING CUE:

- **The plant is operating at 100% power.**
- **A Loss of Nuclear Cooling Water to the RCPs has occurred.**
- **The CRS directs you to perform Section 4 of 40AO-9ZZ03, Loss of Cooling Water.**
- **This is a Time Critical JPM.**

Facility: Palo Verde Date of Examination: 11-10-2008
Examination Level: RO [X] SRO [ ] Operating Test Number: 2008 RO

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, D	Knowledge of procedures, guidelines, or limitations associated with reactivity management. (Calculate a dilution for a power ascension) *Scheduled as Admin JPM RA-1.*
Conduct of Operations	R, N	Ability to make accurate, clear and concise logs, records, status boards, and reports. (Determine faults in Reactor Coolant System heatup rate) *Scheduled as Admin JPM RA-2.* ***(NEW)***
Equipment Control	R, N	Knowledge of surveillance procedures. (Perform Inoperable Power Sources ST) *Scheduled as Admin JPM RA-3.* ***(NEW)***
Radiation Control	R, D	Ability to comply with radiation work permit requirements during normal or abnormal conditons. (Determine requirements for RCA entry from a REP) *Scheduled as Admin JPM RA-4.*
Emergency Procedures/Plan		

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

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

RA 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1270057402 Direct Power Ascension Above 20%.

TASK STANDARD: Change in boron for planned power ascension calculated per Appendix O of 40OP-9ZZ05. Boron OAP input data recorded

K/A:	2.1.37	K/A RATING:	RO:	4.3	SRO:	4.6
K/A:	2.1.20	K/A RATING:	RO:	4.6	SRO:	4.6

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 30 minutes

REFERENCES: 40OP-9ZZ05, Power Operations

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]
CLASSROOM [X]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Joe Allison Date: 3/10/99

Revised By: Jordan Johnston Date: 4/25/08

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Core Data Book Unit 1 Cycle 14.
- Clean, current copy of 40OP-9ZZ05, Appendix O.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

ALL JPM's

- You may use any source of information normally available.

Given the following conditions in Unit 1:

- **The reactor is critical at 40% power, BOL, 4 EFPD following a Refueling Outage.**
- **Power ascension to 60% is planned from midnight to noon on 11/11/08. Current time is 2330.**
- **RCS Cold leg temperature for the power ascension is on program and will remain "On Program". (Currently at 561.4 degrees F.)**
- **Assume equilibrium Xenon.**
- **Reactor Engineering has provided the following information:**

Parameter	Initial	Final
[Iodine]	40%	48.65%
[Xenon]	67.7%	66.4%
Reactivity (Xe)	-1791	-1765
Reg CEA Position	150	150
PLCEA Position	150	150
Boron worth	-7.32 pcm/ppm	-7.32 pcm/ppm

- **Tave is 573 degrees F.**
- **RCS pressure 2250 psia.**
- **Pressurizer level is 50%.**
- **VCT Level is 40%.**
- **RCS Boron Concentration is 1200 ppm.**
- **RWT Boron concentration is 4200 ppm.**
- **The Power Change Worksheet program is not available.**

You have been directed to:

1. **Determine the change in boron required for the power ascension using 40OP-9ZZ05 Power Operations, Appendix O, Power Change Worksheet manual version.**

AND

2. **Fill in the parameters needed to calculate the dilution (if using the Boron OAP) on the sheet provided.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

RA 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Enter the requested information on the Appendix O, Manual Power Change Worksheet.		**Examiner Note: Examinee transfers cue sheet information to Appendix O and must also refer to values in the Core Data Book to find the corresponding reactivity value/worth.** Examinee enters initial and final reactivity values for the following: RCS Boron Concentration (Given in initiating cue) • 1200 ppm. Xenon Worth (Given in initiating cue) • -1791 pcm Initial • -1765 pcm Final • **+26 pcm** Delta Xenon. Power Defect • Data obtained from the U1C14 Core Data Book Table 2.1.1 • -508 pcm initial (40%) • -770 pcm final (60%) • **-262 pcm** Delta Temperature Defect • Should be **0 pcm** Delta since RCS Temperature is maintained within the program band. Reg Group Worth • Should be **0 pcm** Delta since Reg Group CEA's are fully withdrawn Part Length Worth • Should be **0 pcm** Delta since Part Length CEA's are fully withdrawn

SAT / UNSAT
Comments (required for UNSAT):

	STEP	CUE	STANDARD
2. *	Determines net pcm (total) and delta rho boron (pcm)		Determines net pcm of **-236 pcm** and delta rho boron of **+236 pcm** Adds +26+(-262) = -236 Delta rho = -(-236) = +236
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Determines delta ppm boron		**-32.2ppm** Delta ppm boron calculated Divides delta rho boron (+236 pcm) by Boron Worth (-7.32pcm/ppm) = **-32.2ppm**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Examinee records data on the BORON OAP input sheet.	**Examiner note- it is acceptable if applicant rounds to 1168 ppm**	Examinee records the following data on the Boron OAP input sheet. Tave - 573 degrees F. RCS pressure - 2250 psia. Pressurizer level - 50%. VCT Level - 40%. Current Boron Conc - 1200 ppm. Target Boron Conc – 1167.8 RWT Boron Conc - 4200 ppm.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
0	3/10/99	6	New Admin Task JPM
1	8/12/99	6	Modified JPM steps to enhance CUE's, more clearly identify critical steps, and enhance required band of required dilution.
2	8/29/99	6	Modified Iodine numbers to represent actual numbers.
3	6/13/01	6	Modified JPM for 2001 Audit to require a Manual Calculation.
4	4/25/08	6	Modified to U1 Cycle 14.
5	10/7/08	6	Modified for NRC

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)

INITIATING CUE:

Given the following conditions in Unit 1:

- **The reactor is critical at 40% power, BOL, 4 EFPD following a Refueling Outage.**
- **Power ascension to 60% is planned from midnight to noon on 11/11/08. Current time is 2330.**
- **RCS Cold leg temperature for the power ascension is on program and will remain "On Program". (Currently at 561.4 degrees F.)**
- **Assume equilibrium Xenon.**
- **Reactor Engineering has provided the following information:**

Parameter	Initial	Final
[Iodine]	40%	48.65%
[Xenon]	67.7%	66.4%
Reactivity (Xe)	-1791	-1765
Reg CEA Position	150	150
PLCEA Position	150	150
Boron worth	-7.32 pcm/ppm	-7.32 pcm/ppm

- **Tave is 573 degrees F.**
- **RCS pressure 2250 psia.**
- **Pressurizer level is 50%.**
- **VCT Level is 40%.**
- **RCS Boron Concentration is 1200 ppm.**
- **RWT Boron concentration is 4200 ppm.**
- **The Power Change Worksheet program is not available.**

You have been directed to:

1. **Determine the change in boron required for the power ascension using 40OP-9ZZ05 Power Operations, Appendix O, Power Change Worksheet manual version.**

AND

2. **Fill in the parameters needed to calculate the dilution (if using the Boron OAP) on the sheet provided.**

CANDIDATE

RA 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1270010401 Operate the plant during a plant heatup from cold shutdown to hot standby.

TASK STANDARD: Evaluate 40ST-9RC01, determine heatup rate exceeded.

K/A: 2.1.18 K/A RATING: RO: 3.6 SRO: 3.8

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 30 minutes

REFERENCES: 40ST-9RC01, RCS and Pressurizer Heatup and Cooldown Rates

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Jordan Johnston Date: 5/1/2008

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- 40ST-9RC01 for reference
- Calculator
- Marked up copy of 40ST-9RC01 Appendix A, page 2.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

You are a Reactor Operator in Unit 1 with the following conditions:

- **The unit was in Mode 3, SDC secured, 3 RCPs operating**
- **Attached is a data sheet from 40ST-9RC01 documenting a heatup that occurred last night.**

You are to review the data in accordance with 40ST-9RC01, Section 8 and determine the following:

1. **List all limits exceeded in 40ST-9RC01.**

2. **If limits were exceeded, list what actions were required and at what time were they required.**

Document all results on this page.

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

RA 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1. *	Were guidelines or limits exceeded?		Procedure step 6.8.1 - Examinee determines that at 0045, the equivalent hourly heat up rate was exceeded in 15 minutes (120 degrees in one hour projected).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Determine what actions should have been taken.		0045- Heat up should have been reduced to avoid exceeding the hourly rate.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: [ ]

NORMAL TERMINATION POINT

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)

Answer Key

List all limits exceeded in 40ST-9RC01.

<u>40ST-9RC02</u>

0045- The limit for 40ST-9RC01, exceeding the equivalent hourly heat up rate limit in a 15 minute period (120 degrees per hour projected).

If limits were exceeded, list what actions were required and at what time were they required.

<u>40ST-9RC02</u>

0045 – Reduce the heat up rate so the hourly limit is not exceeded.

Examiner: Procedure step 6.8.1 – reduce the heatup to a lower rate and maintain that lower rate for the remaining 15 minute intervals in that rolling hour.

INITIATING CUE:

You are a Reactor Operator in Unit 1 with the following conditions:

- **The unit was in Mode 3, SDC secured, 3 RCPs operating**
- **Attached is a data sheet from 40ST-9RC01 documenting a heatup that occurred last night.**

You are to review the data in accordance with 40ST-9RC01, Section 8 and determine the following:

1. **List all limits exceeded in 40ST-9RC01.**

2. **If limits were exceeded, list what actions were required and at what time were they required.**

Document all results on this page.

CANDIDATE

RA-3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1280010801 Perform Surveillance Test

TASK STANDARD: Appendix B of 41ST-1ZZ02 performed, acceptance criteria determined not to be met.

K/A: 2.2.12 K/A RATING: RO: 3.7 SRO: 4.1

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): RO/SRO VALIDATION TIME: 20 minutes

REFERENCES: 41ST-1ZZ02, Inoperable Power Sources Action Statement

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Jordan Johnston Date: 5/15/2008

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Print of Board 1 showing:
  - NBN-S01C closed
  - PBA-S03K closed
  - PBA-S03L open
  - PL-972 open
  - PL-975 open
- Blank copy of 41ST-1ZZ02

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

Given the following conditions:

- **You are a Reactor Operator in Unit 1.**
- **The Unit is at 100% power.**
- **All plant equipment is operable with the exception of RU-30, which is in bypass for maintenance.**
- **Hassayampa-Palo Verde Line number 2 is out for maintenance. ECC has just verified all other lines available and powered up.**

- **5 minutes ago DG A was declared inoperable due to an Engineering Department evaluation of the K-1 relay.**

The CRS has directed you to perform Appendix B of 41ST-1ZZ02, Steps 1.1 through 1.4 ONLY.

Note: the procedure you are being handed is the current revision.

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

RA-3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Appendix B, Step 1.1 – Record breaker positions		Examinee circles "Closed" on all breakers/disconnects EXCEPT: PBA-S03L PBB-S04L NAN-S05D NAN-S06F PL-972 PL-975 The above breakers are marked as "Open". Voltage Indicated on PBA-S03 and PBB-S04 should be marked YES.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Step 1.2 – Obtain information from ECC.		Examinee checks "Yes" on all lines except Hassayampa-Palo Verde #2. Examiner note: Given in initial cue.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3.	Step 1.3 – Determine number of lines available.		Examinee should record "6" in Step 1.3.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Step 1.4 – Acceptance Criteria.		Examinee determines that two acceptance criterion are not met: PBA-S03K not open NBN-S01C not open
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: [ ]

NORMAL TERMINATION POINT

RA-3
PVNGS JOB PERFORMANCE MEASURE
2008 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)

INITIAL CONDITIONS

INITIATING CUE:

Given the following conditions:

- **You are a Reactor Operator in Unit 1.**
- **The Unit is at 100% power.**
- **All plant equipment is operable with the exception of RU-30, which is in bypass for maintenance.**
- **Hassayampa-Palo Verde Line number 2 is out for maintenance. ECC has just verified all other lines available and powered up.**
- **5 minutes ago DG A was declared inoperable due to an Engineering Department evaluation of the K-1 relay.**

The CRS has directed you to perform Appendix B of 41ST-1ZZ02, Steps 1.1 through 1.4 ONLY.

Note: the procedure you are being handed is the current revision.

CANDIDATE

RA 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1290020301 Conduct On Shift Operations IAW Conduct of Shift Operations

TASK STANDARD: Determine proper REP task, determine RCA entry requirements.

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/SRO VALIDATION TIME: 25 minutes

REFERENCES: NGW01, Initial Radiation Worker Practices.

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Tom Stahler Date: 5/3/2003

Revised By: Jordan Johnston Date: 5/6/2008

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- A copy of REP 2-3516H.
- A copy of the Pressurizer Spray Valve galleries RP survey maps.

- A copy of 40TD-9RC01, Section 3.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

ALL JPM's

- You may use any source of information normally available.

INITIATING CUE:
A COPY OF THE FOLLOWING IS ATTACHED:

- **REP # 2-3516H.**
- **Pressurizer Spray Valve galleries RP survey maps.**
- **40TD-9RC01 section 3.**

Given the following initial conditions:

- **Unit 2 is in a refueling outage.**
- **Pressurizer Spray Valve RCE-PV-0100F has been isolated.**
- **You have been directed to drain and depressurize the Loop 1B Pressurizer Spray Valve RCE-PV-100F using 40TD-9RC01 Reactor Coolant System Step 3.2.6.**
- **The drain line is hard piped. No hoses will be used.**

Your tasks are to:

1. **Determine proper task for this evolution.**
2. **Determine if a RP Pre-Job Brief is required prior to entering Pressurizer spray valve RCE-PV-100F valve gallery.**
3. **Determine RP coverage during job performance.**

4. **Determine dress-out requirements.**
5. **Determine required EPD settings.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

RA 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1. *	Examinee reviews REP and survey and determines task he can enter on.		Examinee determines entry on task 2 is required. **Note:** Only one REP was given to the examinee. PVNGS operations have only one REP active for each unit, at a given time.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Examinee determines if RP pre-job Brief is required for entry into Pressurizer Spray valve RCE-PV-100F valve gallery.		Determines that a RP pre-job brief must be performed.
SAT / UNSAT **Comments (required for UNSAT):**			

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

	STEP	CUE	STANDARD
4. *	Examinee determines dress-out requirements.		Clothing/protection requirements are Double set. Note: Full set for containment entry. Second set for valve gallery.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
5. *	Determine the REP Dosimetry requirements.		Examinee determines EPD settings of 25 mRem dose and 500 mREM/hr Dose Rate (as stated on the REP)
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

RA 4
PVNGS JOB PERFORMANCE MEASURE
2008 NRC Exam

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
1	5/6/2008	6	New JPM format, updated to current 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)

ANSWER KEY

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

   Task 2

2. **Determine if a RP Pre-Job Brief is required prior to entering Pressurizer spray valve RCE-PV-100F valve gallery?**

   Yes, RP must provide a brief.

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

   Coverage is to be intermittent.

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

   Double PC's are required for entry into the HCA

5. **Determine required EPD settings.**

   Dose Alarm – 25 mr

   Dose Rate alarm – 500 mr/hr

INITIAL CONDITIONS

INITIATING CUE:

A COPY OF THE FOLLOWING IS ATTACHED:

- **REP # 2-3516H.**
- **Pressurizer Spray Valve galleries RP survey maps.**
- **40TD-9RC01 section 3.**

Given the following initial conditions:

- **Unit 2 is in a refueling outage.**
- **Pressurizer Spray Valve RCE-PV-0100F has been isolated.**
- **You have been directed to drain and depressurize the Loop 1B Pressurizer Spray Valve RCE-PV-100F using 40TD-9RC01 Reactor Coolant System Step 3.2.6.**
- **The drain line is hard piped. No hoses will be used.**

Your tasks are to:

1. **Determine proper task for this evolution.**
2. **Determine if a RP Pre-Job Brief is required prior to entering Pressurizer spray valve RCE-PV-100F valve gallery.**
3. **Determine RP coverage during job performance.**
4. **Determine dress-out requirements.**
5. **Determine required EPD settings.**

CANDIDATE

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

2. **Determine if a RP Pre-Job Brief is required prior to entering Pressurizer spray valve RCE-PV-100F valve gallery.**

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

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

5. **Determine required EPD settings.**

CANDIDATE

Facility: Palo Verde
Date of Examination: 11-10-2008
Examination Level: RO [ ] SRO [X]
Operating Test Number: 2008 SRO

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	Knowledge of procedures, guidelines, or limitations associated with reactivity management. (Candidate will review a dilution calculation) *Schedule as Admin JPM SA-1.* ***(NEW)***
Conduct of Operations	R, P	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc (Candidate will be required to determine that OT limits have been exceeded) *Schedule as Admin JPM SA-2.*
Equipment Control	R, D	Knowledge of surveillance procedures. (Review 40ST-1ZZ02) *Schedule as Admin JPM SA-3.*
Radiation Control	R, N	Ability to comply with radiation work permit requirements during normal or abnormal conditions. (Candidate will be required to evaluate radiological conditions and determine dose limits.) *Schedule as Admin JPM SA-4.* ***(NEW)***
Emergency Procedures/Plan	S (or R), N	Knowledge of the emergency action level thresholds and classifications. (Candidate will determine EAL status and classification.) *Schedule as Admin JPM SA-5.* ***(NEW)***

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

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

SA 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1270057402 Direct Power Ascension Above 20%.

TASK STANDARD: Dilution Calculation reviewed and determined to be inaccurate.

K/A: 2.1.37 K/A RATING: RO: 4.3 SRO: 4.6

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): SRO VALIDATION TIME: 20 minutes

REFERENCES: 40OP-9ZZ05, Power Operations; U1C14 Core Data Book

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Jordan Johnston Date: 4/25/08

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

SA 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- **Important!! When giving this JPM multiple times, the Boron OAP and Xenon OAP must be cleared from the last JPM.**

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Core Data Book Unit 1 Cycle 14.
- Computer with Boron OAP and U1C14 Xerho program.
- Marked up copy of 40OP-9ZZ05, Appendix O, pages 4 and 5.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

ALL JPM's

- You may use any source of information normally available.

INITIATING CUE:

Given the following conditions in Unit 1:

- **The reactor is critical at 40% power, BOL, 4 EFPD following a Refueling Outage.**
- **Power ascension to 60% is planned from midnight to noon on 11/11/08. Current time is 2330.**
- **RCS Cold leg temperature for the power ascension is on program and will remain "On Program". (Currently at 561.4 degrees F.)**
- **Assume equilibrium Xenon.**
- **Reactor Engineering has provided the following information:**

Parameter	Initial	Final
[Iodine]	40%	48.65%
[Xenon]	67.7%	66.4%
Reactivity (Xe)	-1791	-1765
Reg CEA Position	150	150
PLCEA Position	150	150
Boron worth	-7.32 pcm/ppm	-7.32 pcm/ppm

- **Tave is 573 degrees F.**
- **RCS pressure 2250 psia.**
- **Pressurizer level is 50%.**
- **VCT Level is 40%.**
- **RCS Boron Concentration is 1200 ppm.**
- **RWT Boron concentration is 4200 ppm.**
- **The Power Change Worksheet program is not available.**

- **A Reactor Operator has calculated a dilution using the manual method.**
- **Your job is to verify that the Manual Power Change Worksheet (40OP-9ZZ05, Appendix O) has been performed correctly.**

  Annotate any/all mistakes (non-clerical) you find on the cue sheet provided.

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

SA 1

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	First error – simple math error on Xenon Reactivity. Examiner Note: These mistakes may be addressed in any order.		Xenon reactivity should be **+26 pcm**.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Second error – wrong number used for final Power Defect.		Final Power Defect should be **-770 pcm**. (Cue sheet used 80% power from Table 2.1.1 instead of 60%) This makes the net reactivity change **-262 pcm** and the boron reactivity change **+236 ppm**.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	All errors carried forward Note: The correct Boron worth table is 2.3.4 for 50% power and 1200 ppm. This yields the 7.32 on the form		The correct final boron should be **1167.8 ppm**. The correct dilution amount is **2152 gallons. (± 67 gallons)**
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

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)

INITIATING CUE:

Given the following conditions in Unit 1:

- **The reactor is critical at 40% power, BOL, 4 EFPD following a Refueling Outage.**
- **Power ascension to 60% is planned from midnight to noon on 11/11/08. Current time is 2330.**
- **RCS Cold leg temperature for the power ascension is on program and will remain "On Program". (Currently at 561.4 degrees F.)**
- **Assume equilibrium Xenon.**
- **Reactor Engineering has provided the following information:**

Parameter	Initial	Final
[Iodine]	40%	48.65%
[Xenon]	67.7%	66.4%
Reactivity (Xe)	-1791	-1765
Reg CEA Position	150	150
PLCEA Position	150	150
Boron worth	-7.32 pcm/ppm	-7.32 pcm/ppm

- **Tave is 573 degrees F.**
- **RCS pressure 2250 psia.**
- **Pressurizer level is 50%.**
- **VCT Level is 40%.**
- **RCS Boron Concentration is 1200 ppm.**
- **RWT Boron concentration is 4200 ppm.**
- **The Power Change Worksheet program is not available.**
- **A Reactor Operator has calculated a dilution using the manual method.**

Your job is to verify that the Manual Power Change Worksheet (40OP-9ZZ05, Appendix O) has been performed correctly.

Annotate any/all mistakes (non-clerical) you find on the cue sheet provided.

CANDIDATE

SA 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1290020301 Conduct of Shift Operations

TASK STANDARD: Area Operator determined to not be able to stand watch.
SRO determined to be able to stand Dayshift watch.

K/A: 2.1.5 K/A RATING: RO: 2.9 SRO: 3.9

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): SRO VALIDATION TIME: 10 minutes

REFERENCES: 01DP-9EM01, OVERTIME LIMITATIONS

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Phil Capehart Date: 6/8/2005

Revised By: Jordan Johnston Date: 5/2/2008

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- **Blank copy** of 01DP-9EM01, OVERTIME LIMITATIONS, Rev. 6.
- Calculator
- Access to the Operations 72 hour calculator on the intranet is not allowed for this JPM.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

- You may use any source of information normally available with the exception of the Operations 72 hour calculator table on the intranet.

INITIATING CUE:

1. The following Unit 1 outage working hour history is given for you as the CRS and one of your Area Operators.

Date	CRS	Area Operator
11/2 (Day 1)	12 hrs (DS)	12 hrs (NS)
11/3	12 hrs (DS)	OFF
11/4	12 hrs (DS)	OFF
11/5	OFF	12 hrs (DS)
11/6	12 hrs (DS)	12 hrs (DS)
11/7	12 hrs (DS)	12 hrs (DS)
11/8	12 hrs (DS)	12 hrs (DS)
11/9	12 hrs (DS)	12 hrs (DS)
11/10	12 hrs (DS)	12 hrs (DS)

DS=Dayshift NS=Nightshift

2. You and the Area Operator are scheduled to work dayshift today, 11/11

INITIATING CUE:

- **You are to evaluate the working hour history for yourself and the Area Operator to determine whether both of you can work a full dayshift of 12 hours on 11/11. Explain the basis for each of your conclusions.**
- **Access to the Operations 72 hour calculator table on the intranet is not available for this task.**

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

SA 2

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1.	Obtain 01DP-9EM01, Overtime Limitations	**If candidate requests access to the Operations 72 hour calculator, CUE: the calculator is not available.**	Obtains 01DP-9EM01, Overtime Limitations. Note: Access to the Operations 72 hour calculator on the intranet is not allowed for this JPM.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	The number of hours worked shall be controlled in accordance with the limitations set in 01DP-9EM01, Overtime Limitations.		Assess hours worked and conclude the following: The SRO **can** work the entire 12 hour dayshift.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	The number of hours worked shall be controlled in accordance with the limitations set in 01DP-9EM01, Overtime Limitations.		Assess hours worked and conclude the following: The Area Operator can **NOT** take the shift unless an exception is given because the next hour worked will result in him exceeding 72 hours in a 168 hour period.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
0	06/8/05	New	Original
1	7/1/05	NRC	Step 4 add cue that others can perform the ST.
2	5/2/08	3	Procedure now Rev 6.

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)

INITIATING CUE:

1. The following Unit 1 outage working hour history is given for you as the CRS and one of your Area Operators.

Date	CRS	Area Operator
11/2 (Day 1)	12 hrs (DS)	12 hrs (NS)
11/3	12 hrs (DS)	OFF
11/4	12 hrs (DS)	OFF
11/5	OFF	12 hrs (DS)
11/6	12 hrs (DS)	12 hrs (DS)
11/7	12 hrs (DS)	12 hrs (DS)
11/8	12 hrs (DS)	12 hrs (DS)
11/9	12 hrs (DS)	12 hrs (DS)
11/10	12 hrs (DS)	12 hrs (DS)

DS=Dayshift NS=Nightshift

2. You and the Area Operator are scheduled to work dayshift today, 11/11

INITIATING CUE:

- **You are to evaluate the working hour history for yourself and the Area Operator to determine whether both of you can work a full dayshift of 12 hours on 11/11. Explain the basis for each of your conclusions.**
- **Access to the Operations 72 hour calculator table on the intranet is not available for this task.**

CANDIDATE

SA 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1280010202 Review Surveillance Tests

TASK STANDARD: 41ST-1ZZ02 reviewed, 3 errors found.

K/A: 2.2.12 K/A RATING: RO: 3.7 SRO: 4.1

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): SRO VALIDATION TIME: 15 minutes

REFERENCES: 41ST-1ZZ02, Inoperable Sources Action Statement

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Alan Malley Date: 5/25/05

Revised By: Jordan Johnston Date: 5/2/08

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*

PVAR # _____

SA 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Completed copy of 41ST-1ZZ02 with three (3) errors.

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

- **Unit 1 is in mode 1 with Emergency Diesel Generator 'A' inoperable due to a broken fuel line.**
- **41ST-1ZZ02, Inoperable Power Sources Action Statement, Appendix B, has been completed.**
- **The rest of the electric plant is in a normal 100% full power lineup.**

As the CRS your task is to:

- **Review a completed 41ST-1ZZ02, "Inoperable Power Sources Action Statement: Appendix B, One Diesel Generator Inoperable".**

- **Document all technical errors.**
- **Markup procedure as needed to assist in correcting mistakes.**

Page 1 of Appendix B has been verified to be correct by a second RO. There are NO errors on this page.

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

SA 3

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: _____

	STEP	CUE	STANDARD
1. *	Evaluate Appendix B, step 1.3.		There are two errors in this step: 1. Alternate supply breaker PBA-S03K is not open. This acceptance criterion should be marked "NO". (6th one down). 2. NBN-S01C is not open. This acceptance criterion should be marked "NO". (7th one down).
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2.	Evaluate Appendix B, step 1.4.		Examinee notes H2 Recombiners are marked NA but they are required in Modes 1 and 2.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

RECORD OF REVISIONS

REVISION NUMBER	REVISION DATE	REASON REVISED	COMMENTS
001	5/24/05	6	Changed the error on step one to prevent examinees from counting two errors on the same step.
002	5/2/08	6	JPM format change.

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)

INITIAL CONDITIONS

INITIATING CUE:

- **Unit 1 is in mode 1 with Emergency Diesel Generator 'A' inoperable due to a broken fuel line.**
- **41ST-1ZZ02, Inoperable Power Sources Action Statement, Appendix B, has been completed.**
- **The rest of the electric plant is in a normal 100% full power lineup.**

As the CRS your task is to:

- **Review a completed 41ST-1ZZ02, "Inoperable Power Sources Action Statement: Appendix B, One Diesel Generator Inoperable".**
- **Document all technical errors.**
- **Markup procedure as needed to assist in correcting mistakes.**

Page 1 of Appendix B has been verified to be correct by a second RO. There are NO errors on this page.

CANDIDATE

SA 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1290020301 Conduct On Shift Operations IAW Conduct of Shift Operations

TASK STANDARD: Dose limits and hold points determined correctly.

K/A: 2.3.7 K/A RATING: RO: 3.5 SRO: 3.6

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 [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Jordan Johnston Date: 5/7/08

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review N/A Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- Calculator
- Pen and Paper
- 75DP-9RP01 (as well as other RP procedures in a reference book)

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

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 200 mr/hr field. The job will take 45 minutes.

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

2008 Exposure (in mrem)	L. Fine – RW Operator	B. Abbott – Shift AO	M. Howard – FIN Operator
1st Quarter	1627 Most exposure was from Spent resin operations	412	103
2nd Quarter	373	310	62
3rd Quarter	302	192	24
4th Quarter (to date)	52	982 Most exposure was from RCP lineups at outage beginning	1207 Most exposure was from EDT sludge lancing support.

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.

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

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

SA 4

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1. *	Determine dose		Examinee calculates that 150 mrem will be accumulated on this job.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	Determine hold points.		Examinee determines hold points: **L. Fine** – would exceed 2500 mrem for the calendar year. **B. Abbott** – would exceed 2000 mrem for the calendar year. **M. Howard** – would exceed 1500 mrem for the calendar year.
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	Determine whose approval required		L. Fine – Alara committee B. Abbott – RP Director M. Howard – RP Dept. Leader
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
4. *	Ascertain which AO will perform the job based on ALARA criteria.		M. Howard- FIN operator has the lowest year to date exposure.
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: _____

NORMAL TERMINATION POINT

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)

INITIATING CUE:

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 200 mr/hr field. The job will take 45 minutes.

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

2008 Exposure (in mrem)	L. Fine – RW Operator	B. Abbott – Shift AO	M. Howard – FIN Operator
1st Quarter	1627 Most exposure was from Spent resin operations	412	103
2nd Quarter	373	310	62
3rd Quarter	302	192	24
4th Quarter (to date)	52	982 Most exposure was from RCP lineups at outage beginning	1207 Most exposure was from EDT sludge lancing support.

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.

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

CANDIDATE

Candidate Worksheet

2008 Exposure (in mrem)	L. Fine – RW Operator	B. Abbott – Shift AO	M. Howard – FIN Operator
1st Quarter	1627	412	103
2nd Quarter	373	310	62
3rd Quarter	302	192	24
4th Quarter (to date)	52	982	1207

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

L. Fine

B Abbott

M Howard

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

L. Fine

B Abbott

M Howard

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

SA 5

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM BASIS INFORMATION

TASK: 1240100202 Classify events requiring emergency plan implementation

TASK STANDARD: EALs identified and Site Area Emergency classified.

K/A: 2.4.41 K/A RATING: RO: 2.9 SRO: 4.6

K/A: K/A RATING: RO: SRO:

APPLICABLE POSITION(S): SRO VALIDATION TIME: 15 minutes

REFERENCES: EPIP-99

SUGGESTED TESTING ENVIRONMENT: SIMULATOR [X] PLANT [ ]

JPM TYPE

Time Critical? *(Yes/No)* No Alternative Path? *(Yes/No)* No

APPROVAL

Developed By: Jordan Johnston Date: 4/24/2008

Revised By: Date:

Technical Review _____ Operations Approval _____

E-Plan Review _____ Training Approval _____

Only required for Emergency Plan JPMs

TESTING METHOD

ACTUAL TESTING ENVIRONMENT: SIMULATOR [ ] PLANT [ ]

TESTING METHOD: SIMULATE [ ] PERFORM [ ]

EVALUATION

Examinee Name: _____ Date: _____

Evaluator Name: _____

Time to complete: _____ Minutes GRADE *(Circle One)* SAT / UNSAT①

① *For E-Plan JPMs, a grade of UNSAT requires a PVAR to be written, remediation, and re-evaluation.*
PVAR # _____

1. SIMULATOR SETUP:

A. IC#: N/A (May be performed in the simulator or classroom, NO setup required)

B. MALFUNCTIONS, OVERRIDES & REMOTE FUNCTIONS

EVENT	COMMAND	DESCRIPTION
1.	N/A	
2.		
3.		
4.		

C. SPECIAL INSTRUCTIONS:

- NONE

D. REQUIRED CONDITIONS:

- NONE

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.
- ❑ NA if Simulator setup not required

Verified by: _____ Date: _____

2. SPECIAL TOOLS/EQUIPMENT:

- EPIP-99

TASK CONDITIONS

INFORMATION PRESENTED TO EXAMINEE:

SPECIAL CONSIDERATIONS:

IN PLANT JPM's 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 JPM's

- You may use any source of information normally available.

INITIATING CUE:

The following events are occurring in Unit 1:

- **At 0800 the unit experienced a locked rotor on RCP 1A.**
- **The reactor did not automatically trip; L3 and L10 had to be de-energized from B01.**
- **0801- All CEAs inserted.**
- **0802 - Offsite power was lost.**
- **0803 - DG B tripped on overspeed.**
- **0803 - DG A tripped on Generator Differential.**

- **0808 - AFA-P01 tripped on startup. The CRS implemented the Functional Recovery Procedure and operators have recovered (reset) AFA-P01 locally.**
- **It is now 0820.**

Perform the three following tasks:

List ALL Emergency Action Levels that are CURRENTLY MET.

What is the Classification of this event?

List all EALs that are CURRENTLY DRIVING this classification.

INFORMATION FOR EVALUATOR'S USE:

* Denotes 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 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 <u>any</u> valves.

SA 5

PVNGS JOB PERFORMANCE MEASURE

2008 NRC Exam

JPM START TIME: [ ]

	STEP	CUE	STANDARD
1. *	What EALs are met?		**5-4** Failure of RPS to initiate or complete an automatic reactor shutdown and manual shutdown was successful. **2-5** Loss of offsite and onsite AC power >15 minutes. **1-8** LOAF such that minimum feedwater cannot be maintained
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
2. *	What is the classification?		**Site Area Emergency**
SAT / UNSAT **Comments (required for UNSAT):**			

	STEP	CUE	STANDARD
3. *	What EALs are driving the classification?		**2-5**
SAT / UNSAT **Comments (required for UNSAT):**			

JPM STOP TIME: [ ]

NORMAL TERMINATION POINT

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)

INITIAL CONDITIONS

INITIATING CUE:

The following events are occurring in Unit 1:

- **At 0800 the unit experienced a locked rotor on RCP 1A.**
- **The reactor did not automatically trip; L3 and L10 had to be de-energized from B01.**
- **0801- All CEAs inserted.**
- **0802 - Offsite power was lost.**
- **0803 - DG B tripped on overspeed.**
- **0803 - DG A tripped on Generator Differential.**
- **0808 - AFA-P01 tripped on startup. The CRS implemented the Functional Recovery Procedure and operators have recovered (reset) AFA-P01 locally.**
- **It is now 0820.**

Perform the three following tasks:

List ALL Emergency Action Levels that are CURRENTLY MET.

What is the Classification of this event?

List all EALs that are CURRENTLY DRIVING this classification.

Use this as your answer sheet.

CANDIDATE

Facility: PVNGS Scenario No.: 1 Op-Test No: 2008

Examiners: _____ Operators: _____

Initial Conditions: IC #50, 100% power, MOC.

Turnover: Unit 1 has been at 100% power for the past 150 days. The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.

Event No.	Malf. No.	Event Type*	Event Description
1	cmTRRX09RCCPDT125_1	I CO/SRO (TS)	After the crew performs the beginning of shift reactivity brief, SG 2 d/P Transmitter RCC-PDI-125C fails low. CO evaluates Alarm Response 41AL-1RK5A. SRO enters LCO 3.3.1, Condition A. CO will bypass the parameter at the PPS cabinets.
2	mfRC03A f:1	C RO/SRO	RCP 1A Thrust Bearing oil level is low. RO refers to the Alarm Response procedure **40AL-9RJ01**. SRO directs restoring oil level above the alarm setpoint per **40OP-9RC01**.
3	mfRD02A	R CO/RO/SRO (TS)	CEA 14 drops completely into the core. Crew enters 40AO-9ZZ11. Crew begins a 20% downpower. SRO enters LCO 3.1.5 Condition A and LCO 3.2.4 Condition A. **Critical Task – Begin downpower within 15 minutes**
4	cmCPRC02RCEP01A_1 Scenario file "atws"	M- ALL C RO/SRO	RCP 1A motor becomes uncoupled from the pump. The Reactor does NOT automatically trip. The Crew must open supply breakers to Load Centers 3 and 10 to Deenergize CEDMCS. **Critical Task –When reactor trip setpoints are exceeded with no automatic trip, manually trip (including deenergizing CEDMCS bus) the reactor prior to exiting Step 1 of the SPTAs.**
5	mfED02 mfED13A	C CO/RO/SRO	After the SPTAs are complete, Offsite Power is lost. The CRS enters 40EP-9EO07. Instrument bus NNN-D11 is lost, requiring manual operation of ADVs by the CO. The RO will secure RCP Seal Bleedoff. **Critical Task – Use spray and/or control Heat Removal to prevent lifting primary safeties.**
6	mfFW21A (AFN trip) **or** mfFW21B (AFB trip) **or** mfFW22 (AFA trip)	C-CO	The running Auxiliary Feedwater Pump trips. The CO shifts feed source to an unaffected pump.
End point			The scenario is terminated when Auxiliary Feed has been established to the Steam Generators.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Supplemental Turnover

Plant conditions:

Unit 1 has been at 100% power for the past 150 days. MOC 250 EFPD. Normal Chiller A is tagged out for scheduled maintenance. Estimated return to service is 3 days.

Fuel Pool Cleanup is not recirculating the RWT.

Equipment out of service:

The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days.

Risk Management Action Level is GREEN.

Train B is protected equipment.

Planned shift activities:

Normal, shiftly surveillance's are complete.

No other activities are planned.

Note:

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No: _2008_ Scenario No.:__1__ Event No:__1__

Event Description: Failed SG d/P transmitter, RCC-PDI-125C

Time	Position	Applicant's Actions or Behavior
T=0	CO	Evaluates alarm windows 12C and 12D per **41AL-1RK5A**. Determines that SG 2 Differential Pressure Transmitter RCC-PDI-125C has failed low.
	CRS	Evaluates Technical Specifications. Determines that the following parameters must be placed in bypass within 1 hour: • SG-2 Lo Flow, Ch C. The CRS enters LCO 3.3.1, Condition A. The CRS may also evaluate LCOs 3.4.1 and 3.4.4 No actions required.
	CO	Bypasses affected channels at RPS. • Obtains key • Depresses bypass button for SG-2 Lo Flow at "C" PPS cabinets

Op-Test No: _2008_ Scenario No.:__1___ Event No:__2__

Event Description: RCP 1A Thrust Bearing Oil low

Time	Position	Applicant's Actions or Behavior
T=8	RO	Recognizes RJ point in alarm on unit alarm screen. Determines that RCP 1A thrust bearing oil level is low.
	CRS	Directs RO to evaluate per 40AL-9RJ01, PMS Alarm Response.
	RO	*Examiner Note: the crew may enter 40AO-9ZZ04, Reactor Coolant Pump Emergencies, Appendix C to restore oil level. The steps are the same as 40AL-9RJ01.* 40AL-9RJ01 will direct restoring thrust bearing oil level by using 40OP-9RC01. Uses Section 14.3.2 1. Check that the Oil Lift Tank has at least 8% level.(RCL131) 2. Start the RCP Oil Lift Pump using RCN-HS-10 for RCP 1A. 3. Monitor the Upper Thrust Bearing Oil Reservoir level for RCP 1A (RCL107P). 4. **WHEN** the Upper Thrust Bearing Oil Reservoir level is between 64%and 85%, (target level 78%) **THEN** stop the selected RCP Oil Lift Pump: * ____ RCN-HS-10 for RCP 1A *Examiner Note: the tank levels being monitored in this evolution are computer points, not board indications. The crew will monitor these on the Plant Computer or ERFDADS.*

Op-Test No: _2008_ Scenario No.:__1__ Event No:__3__

Event Description: CEA 14 drops into the core

Time	Position	Applicant's Actions or Behavior
T=20	Crew	Responds to alarms on Board 3, determines that CEA 14 has dropped into the core.
	CRS	Implement CEA Malfunction procedure, 40AO-9ZZ11. • Direct CEDMCS to Standby • Directs performance of Appendix E, Initial Actions.
	RO	Place CEDMCS in Standby using the Mode Select switch on the CEDMCS panel.
	CRS	Performs Reactivity Brief with crew on initial power reduction Directs lowering turbine load to raise Tave 3 degrees F greater than Tref within 10 minutes of the CEA slip. **Critical Task – Begin Downpower within 15 minutes**
	CO	Lowers Turbine load to raise Tave greater than Tref by 3 degrees F. **Evaluator note: The Critical Task is met when load is taken off the turbine.**
	CRS	Performs calculations for 20% power reduction Performs Reactivity Brief for lowering power to 80% Directs crew to perform unit downpower May contact ECC to inform them of downpower *Examiner note – boration amount should be around 900 gallons*
	RO	Appendix E actions: Places Pressurizer in boron equalization 1. Override and energize all pressurizer backup heaters: RCA-HS-100-4 RCB-HS-100-5 RCN-HS-100-6 RCN-HS-100-7 RCN-HS-100-8 RCN-HS-100-9 2. Lower the setpoint on RCNPIC-100, Pressurizer Pressure Controller to 2220 psia.

Op-Test No: _2008_ Scenario No.:__1__ Event No:__3__

Event Description: CEA 14 drops into the core

Time	Position	Applicant's Actions or Behavior
	RO	40OP-9CH01 actions: Borates the RCS for downpower. (basic steps the RO will perform) 7.3.6 Set the desired boric acid makeup flow rate on the Foxboro controller, CHN-FIC-210Y. 7.3.7 Select the "Target" makeup volume (gallons) on the boric acid makeup flow totalizer/counter CHN-FQIS-210Y (Micro-Motion) as determined in step 7.3.1 or 7.3.2. 7.3.10 Start the boration as follows: 1. Place CHN-HS-210 in the BORATE position. 2. Depress the "Reset" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion). 3. Depress the "Start" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion).
	CO	Lowers Turbine load to maintain temperature using the Turbine Load Limit potentiometer on Board 6.
	CRS	Enters LCO 3.1.5 Condition A. and LCO 3.2.4 Condition A. *Examiner Note – Page 21 of 40AO-9ZZ11 addresses TS. CRS may not get to address LC.O.s 3.1.5 and 3.2.4 within the timing of the event. This can be followed up after the scenario.*

Op-Test No: _2008_ Scenario No.:__1__ Event No:__4__

Event Description: RCP 1A motor uncouples, ATWS
Loss of NNN-D11

Time	Position	Applicant's Actions or Behavior
T=40	Crew	Recognizes that reactor trip setpoints have been exceeded
	CO	Attempts to trip the reactor using pushbuttons on Board 5. (this will not trip the reactor)
	RO	Opens breakers supplying power to Load Centers 3 and 10 on Board 1. **Critical Task – When reactor trip setpoints are exceed with no automatic trip, manually trip (including de-energizing CEDMCS bus) the reactor prior to exiting Step 1 of the SPTAs.**
	CRS	When the reactor trips, goes to **40EP-9EO01**, Standard Post Trip Actions (SPTAs). 1. Open the placekeeper and enter the EOP Entry Time. 2. Determine that Reactivity Control acceptance criteria are met by the following: a. Check that reactor power is dropping. b. Check that start-up rate is negative. c. Check that **ALL** full strength CEAs are inserted 3. Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following: a. Check that the Main Turbine is tripped. b. Check that the Main Generator output breakers are open. c. Check that station loads have transferred to offsite electrical power such that **BOTH** of the following conditions are met: • All vital and non-vital AC buses are powered • All vital and non-vital DC buses are powered 4. Determine that RCS Inventory Control acceptance criteria are met by the following: a. Check that Pressurizer level meets **BOTH** of the following: • 10 - 65% • Trending as expected to 33 - 53% b. Check that the RCS is 24°F or more subcooled. c. Check that **BOTH** of the following are in service to all RCPs. • Seal injection • Nuclear Cooling Water 5. Determine that RCS Pressure Control acceptance criteria are met by **BOTH** of the following: • Pressurizer pressure is 1837 - 2285 psia • Pressurizer pressure is trending as expected to 2225 - 2275 psia 6. Determine that Core Heat Removal acceptance criteria are met by **ALL** of

Op-Test No: _2008_ Scenario No.:__1__ Event No:__4__

Event Description: RCP 1A motor uncouples, ATWS
Loss of NNN-D11

Time	Position	Applicant's Actions or Behavior
		the following: • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled 7. Determine that RCS Heat Removal acceptance criteria are met by the following: a. Check that at least one Steam Generator meets **BOTH** of the following conditions: • Level is 35% WR or more • Feedwater is restoring or maintaining level 45 - 60% NR b. Check that Tc is 560 - 570°F. c. Check that steam generator pressure is 1140 - 1200 psia. 8. Determine that Containment Isolation acceptance criteria are met by the following: a. Check that Containment pressure is less than 2.5 psig. b. **IF** CIAS has actuated, **THEN** override and open **BOTH** of the following: • HPA-HS-1, Control System A Supply Isolation Valve UV-1 • HPB-HS-2, Control System B Supply Isolation Valve UV-2 c. REFER TO Appendix 7, List of EOP Radiation Monitors and check **BOTH** of the following conditions: • No valid containment area radiation monitor alarms or unexplained rise in activity • No valid steam plant activity monitor alarms or unexplained rise in activity 9. Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following: a. Check that containment temperature is less than 117°F. b. Check that containment pressure is less than 2.5 psig. 10. **IF** all acceptance criteria are met, **AND** no contingency actions were performed, **THEN** GO TO 40EP-9EO02, Reactor Trip. 11. **IF** any acceptance criteria are **NOT** met, **OR ANY** contingency action was taken, **THEN** GO TO Section 4.0, Diagnostic Actions to diagnose the event.
Lead Evaluator – Near the end of SPTAs, cue the next event (LOOP).		

Op-Test No: _2008_ Scenario No.:__1__ Event No:__5__

Event Description: Loss of Offsite Power

Time	Position	Applicant's Actions or Behavior
T=50	CRS	Diagnoses LOOP, enters **40EP-9EO07.**
	CO	Observes that SBCS is not working and takes contingency actions for heat removal by using ADVs. Opens two permissives for each ADV used (one per SG): ADV 184: SGA-HS-184A, SGC-HS-184B ADV 178: SGB-HS-178A, SGD-HS-178B ADV 185: SGB-HS-185A, SGD-HS-185B ADV 179: SGA-HS-179A, SGC-HS-179B Opens selected ADVs using the appropriate controller: ADV 184: SGA-HIC-184A ADV 178: SGB- HIC-178A ADV 185: SGB- HIC-185A ADV 179: SGA- HIC-179A Determines that power has been lost to support Main Feedwater operations Establishes a feed source using AFN-P01, AFB-P01 or AFA-P01. **AFB** • Starts AFB-P01 on Board 6. (AFB-HS-10) • Opens AFB-HS-34A and AFB-HS-35A on Board 6. • Throttles open AFB-HS-30A and AFB-HS-30A to establish feed both SGs. OR **AFA** • Starts AFA-P01 on Board 6 by opening steam supply valves (Using SGA-HS-134A and SGA-HS-138A) • Opens AFC-HS-36 and AFA-HS-37. • Throttles open AFA-HS-32 and AFC-HS-33 to feed both SGs. OR (continued next page)

Op-Test No: _2008_ Scenario No.:__1__ Event No:__5__

Event Description: Loss of Offsite Power

Time	Position	Applicant's Actions or Behavior
	CO (continued)	**AFN** • Opens AFN-P01 suction valves CT-HS-1 and CT-HS-4 on Board 6. • Starts AFN-P01 on Board 6. (AFA-HS-11) • Opens Downcomer Isolation valves for SG 1, SGA-HS-172 and SGB-HS-130. • Opens Downcomer Isolation valves for SG 2, SGA-HS-175 and SGB-HS-135.
	RO	Evaluates RCP operating criteria. • Determines that NCW and RCPs have been deenergized. • Shuts Containment Control Bleedoff Isolation valves: • CHA-HS-506 • CHB-HS-505 • CHA-HS-507 *Examiner Note: The RO may need to either energize heaters OR spray the Pressurizer depending on how Secondary heat removal is controlled.* **Re-enables automatic operation of heaters (due to NNN-D11 loss)** Takes RCN-HS-100-3 to the "X" position. **Reduce RCS pressure with Auxiliary Spray.** Open CHA-HS-205 and/or CHB-HS-203. **Critical Task – Use spray and/or control Heat Removal to prevent lifting primary safeties.**

Op-Test No: _2008_ Scenario No.:__1__ Event No:__6__

Event Description: The running AFW pump trips.

Time	Position	Applicant's Actions or Behavior
T=55	CO	Establishes feed with another Auxiliary Feed Pump. *Evaluator Note: the CO will lose whichever of the three AFW pumps he initially started. The actions below will cover starting any of the remaining pumps.* **AFB** • Starts AFB-P01 on Board 6. (AFB-HS-10) • Opens AFB-HS-34A and AFB-HS-35A on Board 6. • Throttles open AFB-HS-30A and AFB-HS-30A to establish feed both SGs. OR **AFA** • Starts AFA-P01 on Board 6 by opening steam supply valves (Using SGA-HS-134A and SGA-HS-138A) • Opens AFC-HS-36 and AFA-HS-37. • Throttles open AFA-HS-32 and AFC-HS-33 to feed both SGs. OR **AFN** • Opens AFN-P01 suction valves CT-HS-1 and CT-HS-4 on Board 6. • Starts AFN-P01 on Board 6. (AFA-HS-11) • Opens Downcomer Isolation valves for SG 1, SGA-HS-172 and SGB-HS-130. • Opens Downcomer Isolation valves for SG 2, SGA-HS-175 and SGB-HS-135.
		NORMAL SCENARIO END POINT WHEN AUXILIARY FEED IS ESTABLISHED.

Facility: PVNGS Scenario No.: 2 Op-Test No: 2008

Examiners: _____ Operators: _____

Initial Conditions: IC #50, 100% power, MOC.

Turnover: Unit 1 has been at 100% power for the past 150 days. The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.

Event No.	Malf. No.	Event Type*	Event Description
1	cmCNCV04CHNFIC244_2	C RO/SRO	After the crew performs the beginning of shift reactivity brief, Seal Injection Flow Controller CHN-FIC-244 (RCP 2B) starts controlling high out of the band. The SRO directs the RO to place the controller in manual to stabilize the system.
2	cmTRRX12SGDLT1113D_1	I CO/SRO (TS)	SG 1 Channel D Wide Range Level transmitter fails low. CO evaluates Alarm Response **41AL-1RK5A**. SRO enters LCO 3.3.1 Condition A and LCO 3.3.5 Condition A. CO will bypass parameters 7, 18, and 19 at the D PPS cabinet.
3	cmCPHV17HJNJ01A_2	C RO/SRO	The A Battery Room Normal Exhaust fan trips. RO refers to **41AL-1RK2A**. SRO directs RO to start the A Battery Room Essential Exhaust fan.
4	mfTH06B f:.4	C CO/RO/SRO (TS)	SG 2 develops a 5 gpm leak. SRO enters **40AO-9ZZ02**, Excessive RCS Leakrate. RO sets up for leak rate determination. CO minimizes release to environment. SRO enters LCO 3.4.14 Condition B for SG leakage.
5	mfTH06B f:50	M- ALL	The leaking tube completely fails on SG 2. The crew will recognize the increased leak rate and trip the reactor.
6	mfSI01B cmCPSI01SIAP02A_5	C-RO	HPSI B trips, HPSI A fails to start. RO starts HPSI A to establish Safety Injection flow. **Critical Task – Ensure adequate Safety Injection flow to meet Inventory Control Safety Function prior to exiting the Inventory Control Success Path in use.**
7	mfMS03C	C CO/RO/SRO	SG 2 develops a steam leak in the MSSS. SRO enters the **Functional Recovery Procedure**. CO will be directed to feed SG 2 1360-1600 gpm. RO will secure two RCPs on low RCS pressure. **Critical Task – Feed a rupture and faulted SG 1360-1600 gpm prior to exiting the FRP.**
End point			When 1360-1600 gpm feed has been established to SG 2.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Supplemental Turnover

Plant conditions:

Unit 1 has been at 100% power for the past 150 days. MOC 250 EFPD. Normal Chiller A is tagged out for scheduled maintenance. Estimated return to service is 3 days.

Fuel Pool Cleanup is not recirculating the RWT.

Equipment out of service:

The alarm window on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days.

Risk Management Action Level is GREEN.

Train B is protected equipment.

Planned shift activities:

Normal, shiftly surveillance's are complete.

No other activities are planned.

Note:

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No: _2008_ Scenario No.:__2__ Event No:__1__

Event Description: RCP Seal injection valve fails high.

Time	Position	Applicant's Actions or Behavior
T=0	RO	Evaluates alarm window 3A11B per **40AL-9RK4A**. Determines that Seal Injection Valve Controller CHN-FIC-244 has failed.
	CRS	May enter 40AO-9ZZ04, RCP Emergencies. Directs RO to take manual control of valve controller and restore flow to the normal band per **40AL-9RK4A,** Secondary Priority Action 1.
	RO	Takes manual control of CHN-FIC-244 and returns flow to normal (~6.6 gpm).

Op-Test No: _2008_ Scenario No.:__2__ Event No:__2__

Event Description: SG 1 level SGD-LT-1113D fails low

Time	Position	Applicant's Actions or Behavior
T=7	CO	Evaluates alarm windows 5A9C and 5A9D per **41AL-1RK5A**. Determines that SG 1 Level Transmitter SGD-LT-1113D has failed low.
	CRS	Evaluates Technical Specifications. Determines that the following parameters on Channel D must be placed in bypass within 1 hour: • LO SG-1 Level (PPS) • LO SG-1 Level (ESFAS) • LO SG-2 Level (ESFAS) The CRS enters LCO 3.3.1 Condition A and LCO 3.3.5 Condition A. The CRS may also evaluate LCOs 3.3.2, 3.3.6, 3.3.11, and 3.3.10. No actions required.
	CO	Bypasses affected channels at RPS. Obtains key Depresses bypass buttons on Channel D at PPS cabinets • LO SG-1 Level (PPS) • LO SG-1 Level (ESFAS) • LO SG-2 Level (ESFAS)

Op-Test No: _2008_ Scenario No.:__2__ Event No:__3__

Event Description: Battery Room Normal Fan A fails.

Time	Position	Applicant's Actions or Behavior
T=15	RO	Evaluates alarm window 2A01A per **41AL-1RK2A**.
	CRS	Directs RO to follow the appropriate alarm response procedure. (41AL-1RK2A.
	RO	Starts Battery Room A Essential Exhaust fan using HJA-HS-81.

Op-Test No: _2008_ Scenario No.:__2__ Event No:__4__

Event Description: Steam Generator #2 Tube Leak.

Time	Position	Applicant's Actions or Behavior
T=20	CO	Evaluates alarm on RMS per 74RM-9EF41. Expected alarms are RU's 140, 142, 7, 141.
	CRS	Enters Excessive RCS Leakrate, 40AO-9ZZ02, Section 5. 1. **IF** pressurizer level is lowering, **THEN** ensure all available Charging Pumps are running. 2. **IF** all available Charging Pumps are running, **AND** pressurizer level is lowering, **THEN** isolate letdown. 3. **IF ALL** of the following conditions exist: • All available Charging Pumps are operating • Letdown is isolated • Pressurizer level is lowering **THEN** perform the following: a. Ensure that the Reactor is tripped. b. GO TO **ONE** of the following: • 40EP-9EO01, Standard Post Trip Actions • 40EP-9EO11, Lower Mode Functional Recovery 4. Ensure the event is being classified. 5. **IF** the unit is in Mode 1 - 4, **THEN** ensure compliance with LCO 3.4.14, RCS Operational Leakage. 6. Direct Chemistry to perform 74DP-9ZZ05, Abnormal Occurrence Checklist. 7. Notify Radiation Protection that an RCS leak exists. 8. Determine the leakrate using **ANY** of the following: • Appendix A, 15 Minute Leak Rate Calculation • Appendix B, ERFDADS Leak Rate Determination • 40ST-9RC02, ERFDADS (Preferred) Calculation of RCS Water Inventory • 40ST-9RC05, Manual Calculation of RCS Water Inventory • 40ST-9RC08, OAP (Backup) Calculation of RCS Water Inventory 9. REFER TO Appendix F, Steam Generator Tube Leak Guidelines. 10. **IF** the plant will be shutdown, **THEN** PERFORM 40OP-9ZZ05, Power Operations. 11. PERFORM Appendix C, Minimize Release to the Environment. 12. PERFORM 40DP-9ZZ14, Contaminated Water Management.
	CRS	13. Direct an operator to PERFORM Appendix D, Aligning Turbine

Op-Test No: _2008_ Scenario No.:__2__ Event No:__4__

Event Description: Steam Generator #2 Tube Leak.

Time	Position	Applicant's Actions or Behavior
	(continued)	Building Sumps to LRS. 14. Direct Chemistry to sample the condensate and other connecting systems, including turbine building sumps for activity. 15. **IF** the unit is in Mode 1 - 4, **THEN** ensure compliance with LCO 3.7.16, Secondary Specific Activity.
	RO	*Examiner Note: these are the basic valve manipulations to perform a leakrate test on the RCS, regardless of which method is used.* • Place CHN-FIC-210X, Reactor Makeup Water to VCT, in "MANUAL" with zero output. • Place CHN-FIC-210Y, Boric Acid Makeup to VCT, in "MANUAL" with zero output. • Close CHN-HS-527, Make-up to Charging Pumps (VCT Bypass) Valve. • Place CHN-HS-210, Makeup Mode Select Switch, in "MANUAL".
	CO	*Examiner Note: this is a summary of the actions that the CO is expected to take in Appendix C* Perform Appendix C, Minimize Release to the Environment. 1. Ensure ARN-HS-19, Post FilterMode Select Switch, is in the"THRU FILTER MODE." 3. Select "OFF" on BOTH of the following switches: • SGN-HS-1007, Valve 7 Mode Select • SGN-HS-1008, Valve 8 Mode Select 5. Throttle open CDN-HV-275, Demineralizer Water Feed to Condensate Service Header Valve, to maintain 50 - 100 psig on CDN-PI-201. 7. Ensure that **BOTH** of the following Condensate Pump Overboard Valves are closed: • CDN-HV-29 • CDN-HV-30
	CRS	Determines a downpower is needed per 40AO-9ZZ02
	RO	Starts a boration or inserts CEAs for the downpower.

Op-Test No: _2008_ Scenario No.:__2__ Event No:__4__

Event Description: Steam Generator #2 Tube Leak.

Time	Position	Applicant's Actions or Behavior
		(basic steps the RO will perform) 7.3.6 Set the desired boric acid makeup flow rate on the Foxboro controller, CHN-FIC-210Y. 7.3.7 Select the "Target" makeup volume (gallons) on the boric acid makeup flow totalizer/counter CHN-FQIS-210Y (Micro-Motion) as determined in step 7.3.1 or 7.3.2. 7.3.10 Start the boration as follows: 1. Place CHN-HS-210 in the BORATE position. 2. Depress the "Reset" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion). 3. Depress the "Start" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion).
	CO	Reduces turbine load as necessary to maintain primary temperature as directed by the CRS.

Op-Test No: _2008_ Scenario No.:__2__ Event No:__5__

Event Description: Steam Generator #2 Rupture

Time	Position	Applicant's Actions or Behavior
T=35		*Examiner Note: an Excess Steam Demand will begin on the ruptured Steam Generator (SG 2) 7 minutes after the reactor has tripped and will ramp in over a 5 minute period. Some of the actions associated with the ESD may be performed during the SPTAs.*
	RO	Determines that leak is now greater than makeup capacity. Trips the reactor when directed by the CRS.
	CRS	Determines that trip criteria is met, directs Reactor Trip. When the reactor trips, goes to **40EP-9EO01**, Standard Post Trip Actions (SPTAs). 1. Open the placekeeper and enter the EOP Entry Time. 2. Determine that Reactivity Control acceptance criteria are met by the following: a. Check that reactor power is dropping. b. Check that start-up rate is negative. c. Check that **ALL** full strength CEAs are inserted. 3. Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following: a. Check that the Main Turbine is tripped. b. Check that the Main Generator output breakers are open. c. Check that station loads have transferred to offsite electrical power such that **BOTH** of the following conditions are met: • All vital and non-vital AC buses are powered • All vital and non-vital DC buses are powered 4. Determine that RCS Inventory Control acceptance criteria are met by the following: a. Check that Pressurizer level meets **BOTH** of the following: • 10 - 65% • Trending as expected to 33 - 53% b. Check that the RCS is 24°F or more subcooled. c. Check that **BOTH** of the following are in service to all RCPs. • Seal injection • Nuclear Cooling Water 5. Determine that RCS Pressure Control acceptance criteria are met by

Op-Test No: _2008_ Scenario No.:__2__ Event No:__5__

Event Description: Steam Generator #2 Rupture

	CRS (continued)	**BOTH** of the following: • Pressurizer pressure is 1837 - 2285 psia • Pressurizer pressure is trending as expected to 2225 - 2275 psia 5.2 **IF** pressurizer pressure drops to the SIAS setpoint, **THEN** ensure that SIAS is actuated. 5.3 **IF** pressurizer pressure remains below the SIAS setpoint, **THEN** stop **ONE** RCP in each loop. 6. Determine that Core Heat Removal acceptance criteria are met by **ALL** of the following: • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled 7. Determine that RCS Heat Removal acceptance criteria are met by the following: a. Check that at least one Steam Generator meets **BOTH** of the following conditions: • Level is 35% WR or more • Feedwater is restoring or maintaining level 45 - 60% NR b. Check that Tc is 560 - 570°F. c. Check that steam generator pressure is 1140 - 1200 psia. 8. Determine that Containment Isolation acceptance criteria are met by the following: a. Check that Containment pressure is less than 2.5 psig. b. **IF** CIAS has actuated, **THEN** override and open **BOTH** of the following: • HPA-HS-1, Control System A Supply Isolation Valve UV-1 • HPB-HS-2, Control System B Supply Isolation Valve UV-2 c. REFER TO Appendix 7, List of EOP Radiation Monitors and check **BOTH** of the following conditions: • No valid containment area radiation monitor alarms or unexplained rise in activity • No valid steam plant activity monitor alarms or unexplained rise in activity 9. Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following: a. Check that containment temperature is less than 117°F. b. Check that containment pressure is less than 2.5 psig. 10. **IF** all acceptance criteria are met,

Op-Test No: _2008_ Scenario No.:__2__ Event No:__5__

Event Description: Steam Generator #2 Rupture

	CRS (continued)	**AND** no contingency actions were performed, **THEN** GO TO 40EP-9EO02, Reactor Trip. 11. **IF** any acceptance criteria are **NOT** met, **OR ANY** contingency action was taken, **THEN** GO TO Section 4.0, Diagnostic Actions to diagnose the event.
	CO	Establishes feed when temperature drops below 560 degrees F. **AFB** • Starts AFB-P01 on Board 6. (AFB-HS-10) • Opens AFB-HS-34A and AFB-HS-35A on Board 6. • Throttles open AFB-HS-30A and AFB-HS-30A to establish feed both SGs. OR **AFA** • Starts AFA-P01 on Board 6 by opening steam supply valves (Using SGA-HS-134A and SGA-HS-138A) • Opens AFC-HS-36 and AFA-HS-37. • Throttles open AFA-HS-32 and AFC-HS-33 to feed both SGs. OR **AFN** • Opens AFN-P01 suction valves CT-HS-1 and CT-HS-4 on Board 6. • Starts AFN-P01 on Board 6. (AFA-HS-11) • Opens Downcomer Isolation valves for SG 1, SGA-HS-172 and SGB-HS-130. • Opens Downcomer Isolation valves for SG 2, SGA-HS-175 and SGB-HS-135.
	RO	If RCS pressure drops to <1837 psia, secures 2 RCPs.
	CRS	Diagnoses SGTR with a concurrent ESD from the faulted SG, **enters 40EP-9EO09**, Functional Recovery Procedure.

Op-Test No: _2008_ Scenario No.:__2__ Event No:__6__

Event Description: HPSI fails to start

Time	Position	Applicant's Actions or Behavior
T=48	RO	Determines that neither HPSI is running Checks SESS panel and verifies that HPSI B has tripped. Starts HPSI A to establish Safety Injection flow. (using SIA-HS-1). **Critical Task – Ensure adequate Safety Injection flow to meet Inventory Control Safety Function prior to exiting the Inventory Control Success Path in use.**

Op-Test No: _2008_ Scenario No.:__2__ Event No:__7__

Event Description: ESD from Ruptured Steam Generator

Time	Position	Applicant's Actions or Behavior
T=50	Crew	Diagnoses that SG 2 has ESD.
	RO	Secures 2 RCPs when RCS pressure is less than 1837 psia.
	CRS	Enters Functional Recovery Procedure Performs Section 3. 1. Ensure the event is being classified. 2. Enter the EOP Entry Time: 3. **IF** pressurizer pressure remains below the SIAS setpoint, **THEN** perform the following: a. Ensure **ONE** RCP is stopped in each loop. b. **IF** RCS subcooling is less than 24°F [44°F], **THEN** ensure all RCPs are stopped. 4. **IF** any RCPs are operating, **THEN** PERFORM Appendix 16, RCP Trip Criteria and check the RCP operating limits satisfied. 5. Perform the following: a. Ensure that the Steam Generator Sample Valves are open. b. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist. 6. **IF** CIAS has actuated, **THEN** override and open **BOTH** of the following: • HPA-HS-1, Control System A Supply Isolation Valve UV-1 • HPB-HS-2, Control System B Supply Isolation Valve UV-2 7. Place the Hydrogen Analyzers in service. 8. Identify the success path(s) to be used to satisfy each safety function. REFER TO **BOTH** of the following: • Section 4.0, Safety Function Tracking • Section 6.0, Resource Assessment Trees Determines the Containment Isolation Safety Function is jeopardized. 4. **IF** a SGTR has occurred, **THEN** PERFORM the Heat Removal success path in use and isolate the most affected Steam Generator. Enters Success Path HR-2, Steam Generator with SI

Op-Test No: _2008_ Scenario No.:__2__ Event No:__7__

Event Description: ESD from Ruptured Steam Generator

		Examiner Note: the candidate should go to HR-2 Step 14 (continuously applicable) to commence feeding the faulted SG, although the first 13 steps MAY be performed as well. 14. **IF** the Steam Generator with the tube rupture has **ANY** of the following indications of an ESD: • Abnormal steam generator pressures • Abnormal steam generator levels • Abnormal RCS cold leg temperatures **AND** it is uncontrollably steaming to atmosphere, **THEN** ensure at least **ONE** of the following conditions is met: • The affected Steam Generator has level being restored by feedwater flow 1360 - 1600 gpm (0.8 - 0.92X106 lbm/hr) • The affected Steam Generator has level 45 - 60% [45 - 60%] NR with feedwater available to maintain level *Examiner Note: it will take 2 Auxiliary Feed Pumps to achieve 1360 gpm to the faulted SG.*
	CO	Starts second AFW pump and feeds 1360-1600 gpm **AFB** • Starts AFB-P01 on Board 6. (AFB-HS-10) • Opens AFB-HS-34A and AFB-HS-35A on Board 6. • Throttles open AFB-HS-30A and AFB-HS-30A to establish feed both SGs. OR **AFA** • Starts AFA-P01 on Board 6 by opening steam supply valves (Using SGA-HS-134A and SGA-HS-138A) • Opens AFC-HS-36 and AFA-HS-37. • Throttles open AFA-HS-32 and AFC-HS-33 to feed both SGs. OR (continued next page)
		AFN

Op-Test No: _2008_ Scenario No.:__2__ Event No:__7__ Event Description: ESD from Ruptured Steam Generator		
		• Opens AFN-P01 suction valves CT-HS-1 and CT-HS-4 on Board 6. • Starts AFN-P01 on Board 6. (AFA-HS-11) • Opens Downcomer Isolation valves for SG 1, SGA-HS-172 and SGB-HS-130. • Opens Downcomer Isolation valves for SG 2, SGA-HS-175 and SGB-HS-135. **Critical Task – Feed a ruptured and faulted SG 1360-1600 gpm prior to exiting the FRP.**
		NORMAL SCENARIO END POINT WHEN FEED IS ESTABLISHED TO SG 2 AT 1360-1600 GPM.

Facility: PVNGS Scenario No.: 3 Op-Test No: 2008

Examiners: _____ Operators: _____

Initial Conditions: IC #50, 100% power, MOC.

Turnover: Unit 1 has been at 100% power for the past 150 days. The alarm on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.

Event No.	Malf. No.	Event Type*	Event Description
1	cmTRRX06RCAPT101A_1 f:2500	I CO/SRO (TS)	After the beginning of shift Reactivity Brief, RCA-PT-101A (Channel A Pressurizer Pressure Narrow Range) fails high. The SRO evaluates LCO 3.3.1. CO evaluates Alarm Response **41AL-1RK5A** and bypasses parameters 3, 4, and 5 on PPS cabinet A.
2	cmBKED05NANS02G_5	C CO/RO/SRO	The main feeder breaker for Cooling Tower 2 trips. The SRO enters **40AO-9ZZ07**, Loss of Condenser Vacuum. The Crew will downpower to maintain vacuum.
3	cmCPTP01CENP01B_6 cmCPTP01CENP01A_5	C CO/SRO	Stator Cooling Pump B trips and the A pump fails to auto start. The SRO will direct starting A pump (Turbine trip occurs in 70 seconds).
4	mfTH01A k:4 f:0.01	C RO/SRO (TS)	A RCS leak develops (16 gpm). SRO will enter **40AO-9ZZ02**, Excessive RCS Leakrate. RO will perform CVCS manipulations to determine leak size. SRO will evaluate LCO 3.4.14.
5	mfTH01B k:5 r:5:00 f:100 Scenario file "NoSICI"	M- ALL C CO/RO/SRO	The leak degrades and the Reactor trips. SIAS fails to initiate automatically. RO will stop RCPs on loss of subcooling. Crew performs **40EP-9EO01,** Standard Post Trip Actions. **Critical Task -When the SIAS setpoint is exceeded, manually initiate SIAS prior to completion of the SPTAs.**
6	cmCPRH02SIAP01_6 cmMVRH06SIBUV615_6 cmMVRH06SIBUV625_1 e:"SIAS CH C"	C RO/SRO	When SIAS is actuated, LPSI A pump will trip. On the LPSI B system, injection valve SIB-UV-625 will blow its control power fuse. SIB-UV-615 will mechanically bind. The SRO will enter **40EP-9EO09,** Functional Recovery Procedure, to line up Containment Spray Pump A to the LPSI header. **Critical Task -When LPSI injections fails, ensure adequate make up to meet Safety Function requirements (per Appendix 2 curves) prior to the completion of the IC success path.**
End point			Containment Spray Pump A lined up to the LPSI header.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Supplemental Turnover

Plant conditions:

Plant conditions:

Unit 1 has been at 100% power for the past 150 days. MOC 250 EFPD. Normal Chiller A is tagged out for scheduled maintenance. Estimated return to service is 3 days.

Fuel Pool Cleanup is not recirculating the RWT.

Equipment out of service:

The alarm on Board 1 is due to Normal Chiller A being tagged out for scheduled maintenance. Estimated return to service is 3 days.

Risk Management Action Level is GREEN.

Train B is protected equipment.

Planned shift activities:

Normal, shiftly surveillance's are complete.

No other activities are planned.

Note:

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No: _2008_ Scenario No.:__3__ Event No:__1__

Event Description: Pressurizer Pressure Narrow Range RCA-PT-101A fails high.

Time	Position	Applicant's Actions or Behavior
T=0	CO	Evaluates alarm window 5A5A per 41AL-1RK5A. Determines that RCA-PT-101A has failed high.
	CRS	Evaluates Technical Specifications. Enters LCO 3.3.1, Condition A. Determines that the following must be bypassed on Channel A PPS in one hour: • High Pressurizer Pressure • Low DNBR • High LPD The CRS may also evaluate LCOs 2.1.2, 2.2.2 and 3.4.1. No actions required.
	CO	Bypasses affected channels at RPS. Obtains key Depresses bypass buttons on Channel A at PPS cabinets • High Pressurizer Pressure • Low DNBR • High LPD

Op-Test No: _2008_ Scenario No.:__3__ Event No:__2__

Event Description: Breaker NANS02G trips, de-energizing Cooling Tower 2 fans.

Time	Position	Applicant's Actions or Behavior
T=9	RO	Evaluates alarm window **1B13B** per **41AL-1RK1A**. (1A10D, 11D, 12D alarm as well)
	Crew	Determines that Cooling Tower 2 fans are de-energized.
	CO	Reports that vacuum is degrading.
	CRS	Implements 40AO-9ZZ07, Loss of Condenser Vacuum, Section 4. (may implement 40AO-9ZZ12, Degraded Electrical first) *Examiner Note: only the pertinent steps for this event are listed.* 2. Ensure that **ALL** available Air Removal Pumps are in operation. 7. Determine **BOTH** of the following: • The magnitude of the power reduction (min 5%) _____ % • The rate to reduce power _____%/time 8. Calculate the reactivity needed using **ANY** of the following (STA Reactivity Worksheet use is acceptable): • Total gallons of boric acid and the boric acid addition rate: _____ gal _____ gpm • CEA insertion _____ inches 9. Perform the following to reduce power: a. **IF** using boration to reduce power, **THEN** commence borating at the desired rate. b. Lower turbine load at the desired rate. c. Maintain Tavg / Tref mismatch 5°F or less by **ANY** of the following: • Boration • CEA insertion *Examiner Note: the CRS may direct placing the Pressurizer into boron equalization per 40OP-9ZZ05.*
	CRS	10. **IF** Tave/Tref can **NOT** be maintained 5°F or less,

Op-Test No: _2008_ Scenario No.:__3__ Event No:__2__

Event Description: Breaker NANS02G trips, de-energizing Cooling Tower 2 fans.

Time	Position	Applicant's Actions or Behavior
	(continued)	**THEN** perform the following: a. Ensure CEDMCS is **NOT** in Auto Sequential "AS". b. **IF** it desired to use SGN-PV-1007/1008, SBCS Valves, **THEN** perform the following: 1). Place the Mode Select switch for SGN-PV-1007 or 1008 to the "MANUAL" position (permissive). 2). Transfer the SBCS to Local/Auto. c. Operate SBCS Valves or the ADVs as needed to maintain **BOTH** of the following: • Steam generator pressure less than the SBCS automatic setpoint • RCS temperature + 3°F (REFER TO Appendix D, Temperature Control Program)
		Examiner Note: a 8% downpower should be enough to stabilize vacuum below 5 inches. The CRS may brief a larger reduction and stop when vacuum is under control.
	RO	*May* place the Pressurizer in boron equalization if so directed. 1. Override and energize all pressurizer backup heaters: RCA-HS-100-4 RCB-HS-100-5 RCN-HS-100-6 RCN-HS-100-7 RCN-HS-100-8 RCN-HS-100-9 2. Lower the setpoint on RCNPIC-100, Pressurizer Pressure Controller to 2220 psia. Operates CEAs or starts a boration as directed by the CRS. (basic steps the RO will perform) 7.3.6 Set the desired boric acid makeup flow rate on the Foxboro controller, CHN-FIC-210Y. 7.3.7 Select the "Target" makeup volume (gallons) on the boric acid makeup flow totalizer/counter CHN-FQIS-210Y (Micro-Motion) as determined in step 7.3.1 or 7.3.2. 7.3.10 Start the boration as follows: 1. Place CHN-HS-210 in the BORATE position. 2. Depress the "Reset" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion). 3. Depress the "Start" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion).
	CO	Lowers Turbine load using the Load Limit Pot. (Board 6).

Op-Test No: _2008_ Scenario No.:__3__ Event No:__3__

Event Description: Stator Cooling Pump B trips, A pump fails to auto start.

Time	Position	Applicant's Actions or Behavior
T=25	CO	Announces alarms on Board 6 (particularly 7B, "Gen Stator Clg Wtr Lo Press/Hi Temp Trip") Recognizes that the A Stator Cooling pump did not start
	CRS	Directs the CO to start the standby Stator Cooling pump.
		Examiner Note: The next event takes ~6 minutes before alarms come in.

Op-Test No: _2008_ Scenario No.:__3__ Event No:__4__

Event Description: RCS leak into Containment

Time	Position	Applicant's Actions or Behavior
T=35	CO	Evaluates RU-1alarms on RMS per 74RM-9EF41.
	CRS	Enters Excessive RCS Leakrate, 40AO-9ZZ02 Section 3. *Examiner Note: Steps 1-3 will apply at the end of this event when the leak gets bigger.* 1. **IF** pressurizer level is lowering, **THEN** ensure all available Charging Pumps are running. 2. **IF** all available Charging Pumps are running, **AND** pressurizer level is lowering, **THEN** isolate letdown. 3. **IF ALL** of the following conditions exist: • All available Charging Pumps are operating • Letdown is isolated • Pressurizer level is lowering **THEN** perform the following: a. Ensure that the Reactor is tripped. b. GO TO **ONE** of the following: • 40EP-9EO01, Standard Post Trip Actions • 40EP-9EO11, Lower Mode Functional Recovery 4. Ensure the event is being classified. 5. **IF** the unit is in Mode 1 - 4, **THEN** ensure compliance with LCO 3.4.14, RCS Operational Leakage. 6. Direct Chemistry to perform 74DP-9ZZ05, Abnormal Occurrence Checklist. 7. Notify Radiation Protection that an RCS leak exists. 8. Determine the leakrate using **ANY** of the following: • Appendix A, 15 Minute Leak Rate Calculation • Appendix B, ERFDADS Leak Rate Determination • 40ST-9RC02, ERFDADS (**Preferred**) Calculation of RCS Water Inventory • 40ST-9RC05, Manual Calculation of RCS Water Inventory • 40ST-9RC08, OAP (Backup) Calculation of RCS Water Inventory

Op-Test No: _2008_ Scenario No.:__3__ Event No:__4__

Event Description: RCS leak into Containment

Time	Position	Applicant's Actions or Behavior
	RO	*Examiner Note: these are the basic valve manipulations to perform a leakrate test on the RCS, regardless of which method is used.* • Place CHN-FIC-210X, Reactor Makeup Water to VCT, in "MANUAL" with zero output. • Place CHN-FIC-210Y, Boric Acid Makeup to VCT, in "MANUAL" with zero output. • Close CHN-HS-527, Make-up to Charging Pumps (VCT Bypass) Valve. • Place CHN-HS-210, Makeup Mode Select Switch, in "MANUAL".
	CRS	When the leak size is quantified, determines that a shutdown is required.

Op-Test No: _2008_ Scenario No.:__3__ Event No:__5__

Event Description: LOCA into Containment

Time	Position	Applicant's Actions or Behavior
T=55	RO	Determines that leak is now greater than makeup capacity. Trips the reactor when directed.
	CRS	Determines that trip criteria is met, directs Reactor Trip. *Examiner Note: the leak is very large, the reactor may trip automatically.* When the reactor trips, goes to **40EP-9EO01**, Standard Post Trip Actions (SPTAs). 1. Open the placekeeper and enter the EOP Entry Time. 2. Determine that Reactivity Control acceptance criteria are met by the following: a. Check that reactor power is dropping. b. Check that start-up rate is negative. c. Check that **ALL** full strength CEAs are inserted. 3. Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following: a. Check that the Main Turbine is tripped. b. Check that the Main Generator output breakers are open. c. Check that station loads have transferred to offsite electrical power such that **BOTH** of the following conditions are met: • All vital and non-vital AC buses are powered • All vital and non-vital DC buses are powered 4. Determine that RCS Inventory Control acceptance criteria are met by the following: a. Check that Pressurizer level meets **BOTH** of the following: • 10 - 65% • Trending as expected to 33 - 53% b. Check that the RCS is 24°F or more subcooled. c. Check that **BOTH** of the following are in service to all RCPs. • Seal injection • Nuclear Cooling Water 5. Determine that RCS Pressure Control acceptance criteria are met by **BOTH** of the following: • Pressurizer pressure is 1837 - 2285 psia • Pressurizer pressure is trending as expected to 2225 - 2275 psia 6. Determine that Core Heat Removal acceptance criteria are met by **ALL** of

Op-Test No: _2008_ Scenario No.:__3__ Event No:__5__

Event Description: LOCA into Containment

Time	Position	Applicant's Actions or Behavior
		the following: • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled 7. Determine that RCS Heat Removal acceptance criteria are met by the following: a. Check that at least one Steam Generator meets **BOTH** of the following conditions: • Level is 35% WR or more • Feedwater is restoring or maintaining level 45 - 60% NR b. Check that Tc is 560 - 570°F. c. Check that steam generator pressure is 1140 - 1200 psia. 8. Determine that Containment Isolation acceptance criteria are met by the following: a. Check that Containment pressure is less than 2.5 psig. b. **IF** CIAS has actuated, **THEN** override and open **BOTH** of the following: • HPA-HS-1, Control System A Supply Isolation Valve UV-1 • HPB-HS-2, Control System B Supply Isolation Valve UV-2 c. REFER TO Appendix 7, List of EOP Radiation Monitors and check **BOTH** of the following conditions: • No valid containment area radiation monitor alarms or unexplained rise in activity • No valid steam plant activity monitor alarms or unexplained rise in activity 9. Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following: a. Check that containment temperature is less than 117°F. b. Check that containment pressure is less than 2.5 psig. 10. **IF** all acceptance criteria are met, **AND** no contingency actions were performed, **THEN** GO TO 40EP-9EO02, Reactor Trip. 11. **IF** any acceptance criteria are **NOT** met, **OR ANY** contingency action was taken, **THEN** GO TO Section 4.0, Diagnostic Actions to diagnose the event.
	RO	STOPS RCPs on loss of Subcooling.

Op-Test No: _2008_ Scenario No.:__3__ Event No:__5__

Event Description: LOCA into Containment

Time	Position	Applicant's Actions or Behavior
	CO (possibly RO)	Manually initates SIAS and CIAS when setpoints are exceeded. **Critical Task -When the SIAS setpoint is exceeded, manually initiate SIAS prior to completion of the SPTAs.** Manually initiates Auxiliary Feed due to MSIS. **AFB** • Starts AFB-P01 on Board 6. (AFB-HS-10) • Opens AFB-HS-34A and AFB-HS-35A on Board 6. • Throttles open AFB-HS-30A and AFB-HS-30A to establish feed both SGs. OR **AFA** • Starts AFA-P01 on Board 6 by opening steam supply valves (Using SGA-HS-134A and SGA-HS-138A) • Opens AFC-HS-36 and AFA-HS-37. • Throttles open AFA-HS-32 and AFC-HS-33 to feed both SGs. OR **AFN** • Opens AFN-P01 suction valves CT-HS-1 and CT-HS-4 on Board 6. • Starts AFN-P01 on Board 6. (AFA-HS-11) • Opens Downcomer Isolation valves for SG 1, SGA-HS-172 and SGB-HS-130. • Opens Downcomer Isolation valves for SG 2, SGA-HS-175 and SGB-HS-135.

Op-Test No: _2008_ Scenario No.:__3__ Event No:__6__

Event Description: Failure of LPSI system

Time	Position	Applicant's Actions or Behavior
T=65	RO	Determines that LPSI A has tripped and both injection valves on LPSI B have failed to actuate.
	CRS	Enters Functional Recovery Procedure Performs Section 3. 1. Ensure the event is being classified. 2. Enter the EOP Entry Time: 3. **IF** pressurizer pressure remainsbelow the SIAS setpoint, **THEN** perform the following: a. Ensure **ONE** RCP is stopped in each loop. b. **IF** RCS subcooling is less than 24°F [44°F], **THEN** ensure all RCPs are stopped. 4. **IF** any RCPs are operating, **THEN** PERFORM Appendix 16, RCP Trip Criteria and check the RCP operating limits satisfied. 5. Perform the following: a. Ensure that the Steam Generator Sample Valves are open. b. Direct Chemistry to PERFORM 74DP-9ZZ05, Abnormal Occurrence Checklist. 6. **IF** CIAS has actuated, **THEN** override and open **BOTH** of the following: • HPA-HS-1, Control System A Supply Isolation Valve UV-1 • HPB-HS-2, Control System B Supply Isolation Valve UV-2 7. Place the Hydrogen Analyzers in service. 8. Identify the success path(s) to be used to satisfy each safety function. REFER TO **BOTH** of the following: • Section 4.0, Safety Function Tracking • Section 6.0, Resource Assessment Trees *Examiner Note: Step 13 is continuously applicable and the candidate may perform it immediately.*
	CRS	Determines that Success Path IC-2 is jeopardized

Op-Test No: _2008_ Scenario No.:__3__ Event No:__6__

Event Description: Failure of LPSI system

Time	Position	Applicant's Actions or Behavior
		13.1 **IF** pressurizer pressure can **NOT** be maintained above 220 psia [220 psia], **AND ALL** of the following conditions exist: • CS Pump is **NOT** needed to meet the CTPC or CCGC success path • CS Pump is required for Inventory Control • RAS has **NOT** actuated **THEN** PERFORM Appendix 107, Aligning a Containment Spray Pump for Injection
	RO	Places H2 analyzers in service: OPEN HPA-HS-1 and HPB-HS-2 Turn both analyzer control switches to "Analyze". Line up CS A to inject into the RCS: a. Ensure **BOTH** of the following pumps are stopped: • CS Pump A • LPSI Pump A b. Ensure SIA-HV-688, Containment Spray-Shutdown Cooling Heat Exchanger A Bypass Valve, is closed. c. Open SIA-HV-685, LPSI-CS to Shutdown Heat Exchanger A Cross-tie Valve. d. Ensure SIA-HV-686, Shutdown Heat Exchanger A Outlet to RC Loops 1A/1B Valve is closed. e. Close SIA-HV-687, LPSI-CS from Shutdown Heat Exchanger A Cross-tie Valve. f. Ensure SIA-HV-306, LPSI Shutdown Cooling Heat Exchanger A Bypass Valve is open. g. Ensure SIA-UV-672, Train A Containment Spray Header Isolation is closed. h. Ensure SIA-HV-684, SDHX Isolation is open. i. Ensure SIA-HV-678, SDHX Isolation is open. j. Close LPSI A Injection Valves k. Start CS Pump A. l. Throttle LPSI A Injection Valves to establish flow to the RCS. **Critical Task -When LPSI injections fails, ensure adequate make up to meet Safety Function requirements prior to the completion of the IC success path.**
		NORMAL END POINT WHEN CS IS INJECTING TO THE RCS.

Facility: PVNGS Scenario No.: 4 Op-Test No: 2008

Examiners: _____ Operators: _____

Initial Conditions: IC #20, 100% power, MOC.

Turnover: Unit 1 has been at 100% power for the past 150 days. RCS sampling is in progress. Train B is protected equipment. Normal Shiftly Surveillances are complete. Risk Management Action Level is Green.

Event No.	Malf. No.	Event Type*	Event Description
1	diRC_ZDSSAHS204A f:open	C CO/SRO (TS)	After the crew performs the beginning of shift reactivity brief, Chemistry calls to say that the sample lineup can be secured. SSA-UV-204 will not close when operated. SRO enters LCO 3.6.3, Condition A.
2	mfRP06H1	C CO/RO/SRO (TS)	B Train CSAS occurs. SRO enters 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations. RO will override and stop equipment. CO overrides NCW valves to restore flow to RCPs. LCO 3.6.6, Condition A is entered when Containment Spray Pump B is overridden.
3	cmCPFW10EDNP01A_6	C RO/CO/SRO	Heater Drain Pump A trips. SRO/CO lower turbine load to raise Main Feedpump suction pressure to greater than 300#
4	mfTC13	M-ALL	Turbine Trip/ Load Reject/ Reactor Power Cutback. SRO enters 40A0-9ZZ08 (Load Reject).
5	mfRD11B	C RO/SRO	CEAs continue to insert requiring a manual Reactor trip. **Critical Task –When control of CEAs is lost, manually trip the reactor prior to exiting the CEA Malfunction AOP.**
6	cmTRMS02SGNPT1027_4	I CO	Steam Bypass Control System instrument failure, CO takes action to restore heat removal. (SGN-PT-1027 fails low) **Critical Task – Establish secondary heat removal prior to lifting primary safeties.**
7	cmHXCV16RCEE05D_2 e:RPSCHC r:300 f:100.0	C CO/RO/SRO	Inter-system LOCA on the 2B RCP. Crew takes actions to isolate the 2B RCP. **Critical Task -When an intersystem LOCA exists, ensure adequate Containment Isolation to meet Safety Function requirements prior to exiting the LOCA procedure.**
End point			RCP 2B Hi pressure cooler isolation valves are closed

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Supplemental Turnover

Plant conditions:

Unit 1 is MOC 250 EFPD. Reactor power has been at 100% power for the past 150 days. RCS sampling is in progress.

Fuel Pool Cleanup is not on the RWT.

Equipment out of service:

Risk Management Action Level is GREEN.

Train B is protected equipment.

Planned shift activities:

Normal, shiftly surveillance's are complete.

No other activities are planned.

Note:

The crew will walk down the control boards and assume the shift and then perform a reactivity brief prior to the commencement of the evaluation.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No: _2008_ Scenario No.:__4__ Event No:__1____

Event Description: SSA-UV-204 fails to close.

Time	Position	Applicant's Actions or Behavior
T=0	CO	CO is directed to close SSA-UV-204 and SSB-UV-201. Informs CRS that SSA-UV-204 did not close.
	CRS	Enters LCO 3.6.3, Condition A. Requires isolation of penetration within 4 hours.

Op-Test No: _2008_ Scenario No.:__4__ Event No:__2__

Event Description: Inadvertent B train CSAS

Time	Position	Applicant's Actions or Behavior
T=5	CO	Evaluates Alarm Window 5B2B per 40AL-9RK5B.
	CRS	Enters 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations. 1. Record the time of the CSAS Actuation. 2. **IF ANY** Containment Spray Pump is running, **AND BOTH** of the following conditions exist: • Containment Spray Pump is **NOT** being used for SDC • SIAS has actuated **THEN** override and stop the Containment Spray Pump. *Examiner Note: Since SIAS has not actuated, Step 2 is N/A, but is often misread.* 3. **IF ANY** Containment Spray Pump is running, **AND BOTH** of the following conditions exist: • Containment Spray Pump is **NOT** being used for SDC • SIAS has **NOT** actuated **THEN** place the Containment Spray Pump hand switch in "STOP" to anti-pump the CS Pump. 4. Override and close all open Containment Spray Header Isolation Valves. 5. **IF** seal injection is in service, **AND** cooling water is **NOT** restored to **ANY** operating RCP within **10 minutes** of the initial loss, **THEN** perform the following: a. Ensure the reactor is tripped. b. Stop all of the RCPs. c. Isolate controlled bleedoff. 6. Open **ANY** of the following as needed to restore Nuclear Cooling Water to Containment: • NCA-UV-402, NCW Containment Downstream Return Isolation Valve • NCB-UV-403, NCW Containment Upstream Return Isolation Valve • NCB-UV-401, NCW Containment Upstream Supply Isolation Valve 10. **IF ANY** Control Room Essential AHUs started, **THEN** override and stop the running fans. 11. **IF** RCP Seal Bleedoff isolated to the VCT, **THEN** override and open the closed RCP Seal Bleedoff Isolation Valves.
		14. Perform the following:

Op-Test No: _2008_ Scenario No.:__4__ Event No:__2__

Event Description: Inadvertent B train CSAS

Time	Position	Applicant's Actions or Behavior
		a. PERFORM Appendix C, PPS-ESFAS Check, steps 1 and 2 to check that equipment actuated as expected. b. Document components that failed to actuate in the Control Room Log. c. Ensure compliance with Technical Specifications for components that failed to actuate or were overridden. LCO 3.6.6 Condition A (when CS pump is stopped) LCO 3.7.12 Condition A (if CR Ess AHU stopped) LCO 3.6.3 Condition A (when NCW valves or Seal bleed off valves are re-opened)
	RO	Stops Containment Spray Pump B by using SIB-HS-6 Restores Control Bleedoff for RCPs using CHB-HS-505
	CO	Restores NCW to Containment by using: • NCB-HS-401 • NCB-HS-403

Op-Test No: _2008_ Scenario No.:__4_ Event No:__3__

Event Description: Heater Drain Pump A trips

Time	Position	Applicant's Actions or Behavior
T=15	CO	Responds to alarms on Board 6, recognizes that HDP A has tripped.
	CRS	*Examiner Note: if the CRS elects to trip the reactor instead of downpowering, immediately insert the next malfunction (Turbine Trip)* Recognizes that power must be reduced to clear FWP suction alarms. May open CDN-HV-195, Demin Bypass, to initially restore suction pressure. Calculates downpower. Examiner Note: This calculation may be done several ways: • Using information at beginning of shift brief for reactivity • Using a maneuvering box gameplan. Directs RO to borate or use CEAs during the downpower Directs CO to reduce turbine load during the downpower.
	RO	Uses either CEAs or boration to control RCS temperature. (basic steps the RO will perform) 7.3.6 Set the desired boric acid makeup flow rate on the Foxboro controller, CHN-FIC-210Y. 7.3.7 Select the "Target" makeup volume (gallons) on the boric acid makeup flow totalizer/counter CHN-FQIS-210Y (Micro-Motion) as determined in step 7.3.1 or 7.3.2. 7.3.10 Start the boration as follows: 1. Place CHN-HS-210 in the BORATE position. 2. Depress the "Reset" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion). 3. Depress the "Start" pushbutton - the left pushbutton on the totalizer/counter module (Micro-Motion).
	CO	May be directed to open CDN-HV-195 (Board 5) to restore suction pressure. Uses Turbine Potentiometer to reduce Reactor Power.

Op-Test No: _2008_ Scenario No.:__4__ Event No:__4__ Page _5_ of

Event Description: Main Turbine Trip

Time	Position	Applicant's Actions or Behavior
T=35	CO	Recognizes that Main Turbine has tripped.
	CRS	Enters 40AO-9ZZ09, Load Reject. *Examiner Note: the CRS should not have time to take any actions from this procedure due to the CEAs driving in.*

Op-Test No: _2008_ Scenario No.:__4__ Event No:__5__

Event Description: CEAs continue to drive in, crew trips the reactor.

Time	Position	Applicant's Actions or Behavior
T=37	RO	Determines that CEAs are inserting uncontrollably. Takes CEDMCS to Standby if directed. Recommends reactor trip to the CRS. Trips Reactor by pushing Rx Trip Pushbuttons on Board 5 when directed by the CRS. **Critical Task – When control of CEAs is lost, manually trip the reactor prior to exiting the CEA Malfunction AOP.**
	CRS	*Examiner Note: the CRS may enter 40AO-9ZZ11, CEA Malfunctions, or just direct the action out of it to trip the reactor.* May direct taking CEDMCS to Standby (action from 40AO-9ZZ11, CEA Malfunctions). Directs tripping of the reactor when CEAs are moving uncontrollably. When the reactor trips, goes to **40EP-9EO01**, Standard Post Trip Actions (SPTAs). 1. Open the placekeeper and enter the EOP Entry Time. 2. Determine that Reactivity Control acceptance criteria are met by the following: a. Check that reactor power is dropping. b. Check that start-up rate is negative. c. Check that **ALL** full strength CEAs are inserted. 3. Determine that Maintenance of Vital Auxiliaries acceptance criteria are met by the following: a. Check that the Main Turbine is tripped. b. Check that the Main Generator output breakers are open. c. Check that station loads have transferred to offsite electrical power such that **BOTH** of the following conditions are met: • All vital and non-vital AC buses are powered • All vital and non-vital DC buses are powered 4. Determine that RCS Inventory Control acceptance criteria are met by the following: a. Check that Pressurizer level meets **BOTH** of the following: • 10 - 65% • Trending as expected to 33 - 53% b. Check that the RCS is 24°F or more subcooled. c. Check that **BOTH** of the following are in service to all RCPs. • Seal injection • Nuclear Cooling Water

Op-Test No: _2008_ Scenario No.:__4__ Event No:__5__

Event Description: CEAs continue to drive in, crew trips the reactor.

Time	Position	Applicant's Actions or Behavior
	CRS (continued)	5. Determine that RCS Pressure Control acceptance criteria are met by **BOTH** of the following: • Pressurizer pressure is 1837 - 2285 psia • Pressurizer pressure is trending as expected to 2225 - 2275 psia 6. Determine that Core Heat Removal acceptance criteria are met by **ALL** of the following: • At least one RCP is operating • Loop ΔT is less than 10°F • RCS is 24°F or more subcooled 7. Determine that RCS Heat Removal acceptance criteria are met by the following: a. Check that at least one Steam Generator meets **BOTH** of the following conditions: • Level is 35% WR or more • Feedwater is restoring or maintaining level 45 - 60% NR b. Check that Tc is 560 - 570°F. c. Check that steam generator pressure is 1140 - 1200 psia. 8. Determine that Containment Isolation acceptance criteria are met by the following: a. Check that Containment pressure is less than 2.5 psig. b. **IF** CIAS has actuated, **THEN** override and open **BOTH** of the following: • HPA-HS-1, Control System A Supply Isolation Valve UV-1 • HPB-HS-2, Control System B Supply Isolation Valve UV-2 c. REFER TO Appendix 7, List of EOP Radiation Monitors and check **BOTH** of the following conditions: • No valid containment area radiation monitor alarms or unexplained rise in activity • No valid steam plant activity monitor alarms or unexplained rise in activity 9. Determine that Containment Temperature, Pressure, and Combustible Gas Control acceptance criteria are met by the following: a. Check that containment temperature is less than 117°F. b. Check that containment pressure is less than 2.5 psig. 10. **IF** all acceptance criteria are met, **AND** no contingency actions were performed, **THEN** GO TO 40EP-9EO02, Reactor Trip. 11. **IF** any acceptance criteria are **NOT** met,

Op-Test No: _2008_ Scenario No.:__4__ Event No:__5__

Event Description: CEAs continue to drive in, crew trips the reactor.

Time	Position	Applicant's Actions or Behavior
	CRS (continued)	**OR ANY** contingency action was taken, **THEN** GO TO Section 4.0, Diagnostic Actions to diagnose the event.
	CO	Performs SPTAs. *Examiner Note: Event 6 will happen 5 minutes after reactor trip.* Will establish heat removal, see Event 6.
	RO	Performs SPTAs.

Op-Test No: 2008 Scenario No.: 4 Event No: 6 Page 9 of

Event Description: SGN-PT-1027 fails low

Time	Position	Applicant's Actions or Behavior
T=42	CO	*Examiner Note: there are several ways to establish heat removal in this case.* Establishes Heat Removal with SBCS or ADVs due to failure of SGN-PT-1027. **Insert Manual Permissive to individual valves:** 1. Takes SGN-HS-1001 to "manual" (or other equivalent valves) **SBCS in manual at the Master Controller** 1. Depresses "MAN" pushbutton on SGN-PT-1010 2. Uses slide bar on bottom of controller to operate SBCS **SBCS in Manual/Manual** 1. Takes SGN-HS-1001 to "manual" 2. Moves slide bar on SGN-PIK-1001 down to the "M" position. 3. Rolls thumbwheel on SGN-PIK-1001 up to operate SBCS valve 1001 **ADVs** Opens two permissives for each ADV used (one per SG): ADV 184 / ADV 178 / ADV 185 / ADV 179 SGA-HS-184A / SGB-HS-178A / SGB-HS-185A / SGA-HS-179A SGC-HS-184B / SGD-HS-178B / SGD-HS-185B / SGC-HS-179B Opens selected ADVs using the appropriate controller: ADV 184 / ADV 178 / ADV 185 / ADV 179 SGA-HIC-184A / SGB- HIC-178A / SGB- HIC-185A / SGA- HIC-179A **Critical Task – Establish secondary heat removal prior to lifting primary safeties.**

Op-Test No: _2008_ Scenario No.:__4__ Event No:__7__

Event Description: High Pressure Seal Cooler leak into Nuclear Cooling Water

Time	Position	Applicant's Actions or Behavior
T=47	CRS	Enters 40EP-9EO03, Loss of Coolant Accident. 4. **IF** pressurizer pressure drops to the SIAS setpoint, **THEN** check that SIAS is actuated. 5. **IF** SIAS has actuated, **THEN** perform the following: a. Check that the HPSI and LPSI Pumps have started. b. Check that safety injection flow is adequate. REFER TO Appendix 2, Figures. 6. **IF** SIAS has actuated, **THEN** perform the following: a. **IF** it is determined that RWT level may lower to less than 73% during the event, **OR** it is desired to align Charging Pump suction through an alternate suction path, **THEN** PERFORM **ONE** of the following: • Appendix 10, Charging Pump Alternate Suction to the RWT / Restoration • Appendix 11, Charging Pump Alternate Suction to the SFP / Restoration b. **IF** RWT level is above 73%, **AND** it is desired to align Charging Pump suction through CHE-HV-536 or CHN-UV-514, **THEN** PERFORM Appendix 103, RWT Makeup / Emergency Boration. 7. **IF** pressurizer pressure remains below the SIAS setpoint, **THEN** perform the following: a. Ensure **ONE** RCP is stopped in each loop. b. **IF** RCS subcooling is less than 24°F [44°F], **THEN** ensure all RCPs are stopped. 8. **IF ANY** RCPs are operating, **THEN** PERFORM Appendix 16, RCP Trip Criteria and check the RCP operating limits satisfied. 8.1 Stop RCP(s) which do **NOT** satisfy RCP operating limits. 9. Attempt to isolate the LOCA by performing the following: a. Ensure that the letdown line is isolated. b. Ensure that the RCS sample lines are isolated. 10. **IF ANY** of the following conditions exist:

Op-Test No: _2008_ Scenario No.:__4__ Event No:__7__

Event Description: High Pressure Seal Cooler leak into Nuclear Cooling Water

Time	Position	Applicant's Actions or Behavior
	CRS (continued)	• RU-6, Nuclear Cooling Water Radiation Monitor alarming • An abnormal rise in Nuclear Cooling Water surge tank level **THEN** perform the following: a. Stop all RCPs. b. Close the Nuclear Cooling Water Containment Isolation Valves. c. Isolate controlled bleedoff from the RCPs. d. Energize the RCP HP Cooler Isolation Valves for **ANY** leaking RCP High Pressure Cooler(s). (Appendix 36) e. Close the RCP HP Cooler Isolation Valves for ANY leaking High Pressure Cooler(s). f. Direct Chemistry to sample the Nuclear Cooling Water System for activity.
	RO	Stops RCPs. Closes Bleedoff from RCPs on Board 3 using: • RCN-HS-430 • RCN-HS-431 • RCN-HS-432 • RCN-HS-433 Directs AO to close breakers for 2B RCP HP Seal Cooler Isolation valves per Standard Appendix 36. Closes valves on Board 4 to stop LOCA: • RCN-HS-449, RCP 2B HP Cooler E05D Inlet • RCN-HS-453, RCP 2B HP Cooler E05D Outlet **Critical Task – When an intersystem LOCA exists, ensure adequate Containment Isolation to meet Safety Function requirements prior to exiting the LOCA procedure.**
	CO	Closes NCW to Containment Isolation valves: • NCB-HS-401 • NCA-HS-402 • NCB-HS-403
		NORMAL END POINT HP SEAL COOLER IS ISOLATED.

ES-301 Transient and Event Checklist Form ES-301-5

Facility: Palo Verde | Date of Exam: 11/10/08 | Operating Test Number: 2008

APPLICANT	EVENT TYPE	Scenarios 1 CREW POSITION SRO	1 ATC	1 BOP	2 CREW POSITION SRO	2 ATC	2 BOP	3 CREW POSITION SRO	3 ATC	3 BOP	4 CREW POSITION SRO	4 ATC	4 BOP	TOTAL	MINIMUM(*) R	I	U
RO ☐ SRO-I ☐ SRO-U ☒ U1 U2 U3	RX	3												1	1	1	0
	NOR														1	1	1
	I/C	1, 2, 4, 5			1, 2, 3, 4, 7									9	4	4	2
	MAJ	4			5									2	2	2	1
	TS	1, 3			2, 4									4	0	2	2
RO ☐ SRO-I ☒ SRO-U ☐ I1 I3 I4	RX	3												1	1	1	0
	NOR														1	1	1
	I/C	1, 2, 4, 5				1, 3, 4, 6, 7		1, 2, 3, 4, 5, 6						15	4	4	2
	MAJ	4				5		5						3	2	2	1
	TS	1, 3						1, 4						4	0	2	2
RO ☐ SRO-I ☒ SRO-U ☐ I2	RX		3											1	1	1	0
	NOR													1	1	1	1
	I/C		2, 4, 5		1, 2, 3, 4, 7					1, 2, 3, 5				12	4	4	2
	MAJ		4		5					5				3	2	2	1
	TS				2, 4									2	0	2	2
RO ☒ SRO-I ☐ SRO-U ☐ R2 R8	RX		3											1	1	1	0
	NOR														1	1	1
	I/C		2, 4, 5				2, 4, 7							6	4	4	2
	MAJ		4				5							2	2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

ES-301 Transient and Event Checklist Form ES-301-5

Facility: Palo Verde | Date of Exam: 11/10/08 | Operating Test Number: 2008

APPLICANT	EVENT TYPE	Scenarios 1 CREW POSITION SRO	1 ATC	1 BOP	2 CREW POSITION SRO	2 ATC	2 BOP	3 CREW POSITION SRO	3 ATC	3 BOP	4 CREW POSITION SRO	4 ATC	4 BOP	TOTAL	MINIMUM(*) R	I	U
RO ☒ SRO-I ☐ SRO-U ☐ R5 R6 R7	RX			3										1	1	1	0
	NOR														1	1	1
	I/C			1, 5, 6			2, 4, 7		2, 4, 5, 6					10	4	4	2
	MAJ			4			5		5					3	2	2	1
	TS														0	2	2
RO ☒ SRO-I ☐ SRO-U ☐ R3	RX			3										1	1	1	0
	NOR														1	1	1
	I/C			1, 5, 6		1, 3, 4, 6, 7				1, 2, 3, 5				12	4	4	2
	MAJ			4		5				5				3	2	2	1
	TS														0	2	2
RO ☒ SRO-I ☐ SRO-U ☐ R10	RX														1	1	0
	NOR														1	1	1
	I/C								2, 4, 5, 6				1, 2, 3, 6, 7	9	4	4	2
	MAJ								5				4	2	2	2	1
	TS														0	2	2
RO ☒ SRO-I ☐ SRO-U ☐ R4	RX			3										1	1	1	0
	NOR														1	1	1
	I/C			1, 5, 6		1, 3, 4, 6, 7						2, 3, 5, 7		12	4	4	2
	MAJ			4		5						4		3	2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

ES-301 Transient and Event Checklist Form ES-301-5

Facility: Palo Verde | Date of Exam: 11/10/08 | Operating Test Number: 2008

APPLICANT	EVENT TYPE	Scenarios 1 CREW POSITION SRO	1 ATC	1 BOP	2 CREW POSITION SRO	2 ATC	2 BOP	3 CREW POSITION SRO	3 ATC	3 BOP	4 CREW POSITION SRO	4 ATC	4 BOP	TOTAL	MINIMUM(*) R	I	U
RO ☒ SRO-I ☐ SRO-U ☐ R9	RX			3										1	1	1	0
	NOR														1	1	1
	I/C			1, 5, 6		1, 3, 4, 6, 7				1, 2, 3, 5				12	4	4	2
	MAJ			4		5				5				3	2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐ R1	RX		3											1	1	1	0
	NOR														1	1	1
	I/C		2, 4, 5				2, 4, 7			1, 2, 3, 5				10	4	4	2
	MAJ		4				5			5				3	2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐ I5	RX		3											1	1	1	0
	NOR														1	1	1
	I/C		2, 4, 5		1, 2, 3, 4, 7			1, 2, 3, 4, 5, 6						14	4	4	2
	MAJ		4		5			5						3	2	2	1
	TS				2, 4			1, 4						4	0	2	2
RO ☐ SRO-I ☐ SRO-U ☐ I6	RX		3											1	1	1	0
	NOR														1	1	1
	I/C		2, 4, 5		1, 2, 3, 4, 7						1, 2, 3, 5, 7			13	4	4	2
	MAJ		4		5						4			3	2	2	1
	TS				2, 4						1, 2			4	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Scenario 5- Spare

ES-301 Transient and Event Checklist Form ES-301-5

Facility: Palo Verde | Date of Exam: 11/10/08 | Operating Test Number: 2008

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		5															
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☒ SRO-I ☐ SRO-U ☐	RX	1	1	1											1	1	0
	NOR														1	1	1
	I/C	2, 3, 5, 6, 7, 8	2, 3, 5, 7	5, 6, 7											4	4	2
	MAJ	4	4	4											2	2	1
	TS	2, 3													0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRP *additionally* serves in the BOP position, one I/C Malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: Palo verde Date of Examination: 11/10/08 Operating Test No.: 1

Competencies	APPLICANTS															
	RO ☐ SRO-I ☑ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☐			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	1, 5	4, 5, 6, 7	1, 2, 3													
Comply With and Use Procedures (1)	1, 6	1-7	1, 2, 3, 5													
Operate Control Boards (2)	1, 3, 4, 5, 6		1, 2, 3, 5													
Communicate and Interact	1, 3, 4, 5, 6	1-7	1, 2, 3, 5													
Demonstrate Supervisory Ability (3)		1-7														
Comply With and Use Tech. Specs. (3)		2, 4														

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Facility: _____ Date of Examination: _____

Developed by: Written - Facility ☐ NRC ☐ // Operating - Facility ☐ NRC ☐

Target Date*	Task Description (Reference)	Chief Examiner's Initials
-180	1. Examination administration date confirmed (C.1.a; C.2.a and b)	
-120	2. NRC examiners and facility contact assigned (C.1.d; C.2.e)	
-120	3. Facility contact briefed on security and other requirements (C.2.c)	
-120	4. Corporate notification letter sent (C.2.d)	
[-90]	[5. Reference material due (C.1.e; C.3.c; Attachment 3)]	
{-75}	6. Integrated examination outline(s) due, including Forms ES-201-2, ES-201-3, ES-301-1, ES-301-2, ES-301-5, ES-D-1's, ES-401-1/2, ES-401-3, and ES-401-4, as applicable (C.1.e and f; C.3.d)	
{-70}	{7. Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)}	
{-45}	8. Proposed examinations (including written, walk-through JPMs, and scenarios, as applicable), supporting documentation (including Forms ES-301-3, ES-301-4, ES-301-5, ES-301-6, and ES-401-6, and any Form ES-201-3 updates), and reference materials due (C.1.e, f, g and h; C.3.d)	
-30	9. Preliminary license applications (NRC Form 398's) due (C.1.l; C.2.g; ES-202)	
-14	10. Final license applications due and Form ES-201-4 prepared (C.1.l; C.2.i; ES-202)	
-14	11. Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	
-14	12. Examinations reviewed with facility licensee (C.1.j; C.2.f and h; C.3.g)	
-7	13. Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h)	
-7	14. Final applications reviewed; 1 or 2 (if >10) applications audited to confirm qualifications / eligibility; and examination approval and waiver letters sent (C.2.i; Attachment 5; ES-202, C.2.e; ES-204)	
-7	15. Proctoring/written exam administration guidelines reviewed with facility licensee (C.3.k)	
-7	16. Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i)	

* Target dates are generally based on facility-prepared examinations and are keyed to the examination date identified in the corporate notification letter. They are for planning purposes and may be adjusted on a case-by-case basis in coordination with the facility licensee.
[Applies only] {Does not apply} to examinations prepared by the NRC.

Facility: Date of Examination:

Item	Task Description	Initials a	Initials b*	Initials c#
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. SIMULATOR	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.			
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and that scenarios will not be repeated on subsequent days.			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.			
3. W/T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.			
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) the tasks are distributed among the topics as specified on the form (2) at least one task is new or significantly modified (3) no more than one task is repeated from the last two NRC licensing examinations			
	c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.			
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	d. Check for duplication and overlap among exam sections.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			

	Printed Name/Signature	Date
a. Author		
b. Facility Reviewer (*)		
c. NRC Chief Examiner (#)		
d. NRC Supervisor		

Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.
* Not applicable for NRC-prepared examination outlines

1. Pre-Examination

I acknowledge that I have acquired specialized knowledge about the NRC licensing examinations scheduled for the week(s) of _____ as of the date of my signature. I agree that I will not knowingly divulge any information about these examinations to any persons who have not been authorized by the NRC chief examiner. I understand that I am not to instruct, evaluate, or provide performance feedback to those applicants scheduled to be administered these licensing examinations from this date until completion of examination administration, except as specifically noted below and authorized by the NRC (e.g., acting as a simulator booth operator or communicator is acceptable if the individual does not select the training content or provide direct or indirect feedback). Furthermore, I am aware of the physical security measures and requirements (as documented in the facility licensee's procedures) and understand that violation of the conditions of this agreement may result in cancellation of the examinations and/or an enforcement action against me or the facility licensee. I will immediately report to facility management or the NRC chief examiner any indications or suggestions that examination security may have been compromised.

2. Post-Examination

To the best of my knowledge, I did not divulge to any unauthorized persons any information concerning the NRC licensing examinations administered during the week(s) of _____. From the date that I entered into this security agreement until the completion of examination administration, I did not instruct, evaluate, or provide performance feedback to those applicants who were administered these licensing examinations, except as specifically noted below and authorized by the NRC.

	PRINTED NAME	JOB TITLE / RESPONSIBILITY	SIGNATURE (1)	DATE	SIGNATURE (2)	DATE	NOTE
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

NOTES:

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Facility:	Written Examination Date: Operating Test Dates:

Applicant Name	Docket No.	Exam Level	Written		Operating Test		
			RO	SRO	Adm.	Sys.	Sim.

Instructions: For each approved applicant, enter the exam level (RO, SRO-I, or SRO-U) and an "X" or "W" to indicate whether each portion of the examination is to be administered or waived.

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Facility: _____ Date of Examination: _____

Examination Level: RO ☐ SRO ☐ Operating Test Number: _____

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations		
Conduct of Operations		
Equipment Control		
Radiation Control		
Emergency Procedures/Plan		

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

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

Facility: _____ Date of Examination: _____
Exam Level: RO ☐ SRO-I ☐ SRO-U ☐ Operating Test No.: _____

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.		
j.		
k.		

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

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

Facility: Date of Examination: Operating Test Number:

1. General Criteria	Initials a	Initials b*	Initials c#
a. The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).			
b. There is no day-to-day repetition between this and other operating tests to be administered during this examination.			
c. The operating test shall not duplicate items from the applicants' audit test(s). (see Section D.1.a.)			
d. Overlap with the written examination and between different parts of the operating test is within acceptable limits.			
e. It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.			
2. Walk-Through Criteria	--	--	--
a. Each JPM includes the following, as applicable: • initial conditions • initiating cues • references and tools, including associated procedures • reasonable and validated time limits (average time allowed for completion) and specific designation if deemed to be time-critical by the facility licensee • operationally important specific performance criteria that include: – detailed expected actions with exact criteria and nomenclature – system response and other examiner cues – statements describing important observations to be made by the applicant – criteria for successful completion of the task – identification of critical steps and their associated performance standards – restrictions on the sequence of steps, if applicable			
b. Ensure that any changes from the previously approved systems and administrative walk-through outlines (Forms ES-301-1 and 2) have not caused the test to deviate from any of the acceptance criteria (e.g., item distribution, bank use, repetition from the last 2 NRC examinations) specified on those forms and Form ES-201-2.			
3. Simulator Criteria	--	--	--
The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.			

	Printed Name / Signature	Date
a. Author		
b. Facility Reviewer(*)		
c. NRC Chief Examiner (#)		
d. NRC Supervisor		

NOTE: * The facility signature is not applicable for NRC-developed tests.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: Palo verde Date of Exam: 11/10/08 Scenario Numbers: 4 / / Operating Test No.: 1

QUALITATIVE ATTRIBUTES	Initials a	b*	c#
1. The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.			
2. The scenarios consist mostly of related events.			
3. Each event description consists of • the point in the scenario when it is to be initiated • the malfunction(s) that are entered to initiate the event • the symptoms/cues that will be visible to the crew • the expected operator actions (by shift position) • the event termination point (if applicable)			
4. No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.			
5. The events are valid with regard to physics and thermodynamics.			
6. Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.			
7. If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.			
8. The simulator modeling is not altered.			
9. The scenarios have been validated. Pursuant to 10 CFR 55.46(d), any open simulator performance deficiencies or deviations from the referenced plant have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.			
10. Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.5 of ES-301.			
11. All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).			
12. Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).			
13. The level of difficulty is appropriate to support licensing decisions for each crew position.			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes	--	--	--
1. Total malfunctions (5–8)	6 / /			
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)	3 / /			

Facility: Date of Exam: Operating Test No.:

APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1			2			3			4						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO ☐ SRO-I ☐ SRO-U ☐	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the “at-the-controls (ATC)” and “balance-of-plant (BOP)” positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant’s competence count toward the minimum requirements specified for the applicant’s license level in the right-hand columns.

Facility: Palo verde Date of Examination: 11/10/08 Operating Test No.: 1

Competencies	APPLICANTS															
	RO ☑ SRO-I ☐ SRO-U ☐				RO ☑ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☐ SRO-U ☑				RO ☐ SRO-I ☑ SRO-U ☐			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	1, 5	1, 3, 4, 5, 6			2, 3, 4,	2, 4, 7			1, 5	4, 5, 6, 7			1, 5	1, 3, 5, 6	4, 5, 6	
Comply With and Use Procedures (1)	1, 6	1, 3, 4			2, 3, 4, 5	2, 4, 5, 7			1- 6	1-7			1-6	1, 3, 4	1-6	
Operate Control Boards (2)	1, 3, 4, 5, 6	1, 3, 5, 6			2, 3, 4, 5	2, 4, 5, 7								1, 3, 5, 6		
Communicate and Interact	1, 3, 4, 5, 6	1, 3, 4, 6			2, 3, 4, 5	2, 4, 5, 7			1-6	1-7			1-6	1, 3, 4, 6	1-6	
Demonstrate Supervisory Ability (3)									1-6	1-7			1-6		1-6	
Comply With and Use Tech. Specs. (3)									1, 3	2, 4			1, 3		1, 4	

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

U.S. Nuclear Regulatory Commission Individual Examination Report					
Applicant's Name			Docket Number 55-		
I	R	Examination Type (Initial or Retake)	Facility Name		
		Reactor Operator	Facility Description		Hot
		Senior Reactor Operator (SRO) Instant			Cold
		SRO Upgrade			BWR
		SRO Limited to Fuel Handling			PWR

Written Examination Summary	
NRC Author/Reviewer	RO/SRO/Total Exam Points 75 / 25 / 100
NRC Grader/Reviewer	Applicant Points ___ / ___ / 0
Date Administered	Applicant Grade (%) 0.0 / 0.0 / 0.0

Operating Test Summary	
Administered by	Date Administered
Walk-Through (Overall)	
Administrative Topics	
Simulator Operating Test	

Examiner Recommendations					
Check Blocks	Pass	Fail	Waive	Signature	Date
Written Examination					
Operating Test					
Final Recommendation					

License Recommendation			
	Issue License	Supervisor's Signature	Date
	Deny License		

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Walk-Through Grading Details	Evaluation (S or U)	Comment Page Number
Administrative Topics		
a.		
b.		
c.		
d.		
e.		
Systems — Control Room		
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
Systems — In-Plant		
i.		
j.		
k.		

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Reactor Operator Simulator Operating Test Grading Details

Competencies/ Rating Factors (RFs)	RF Weights	RF Scores	RF Grades	Comp. Grades	Comment Page No.
1. Interpretation/Diagnosis a. Recognize & Verify Status b. Interpret & Diagnose Conditions c. Prioritize Response	_____ _____ _____	_____ _____ _____	_____ _____ _____	0.0	_____ _____ _____
2. Procedures/Tech Specs a. Reference b. Procedure Compliance c. Tech Spec Entry	_____ _____ _____	_____ _____ _____	_____ _____ _____	0.0	_____ _____ _____
3. Control Board Operations a. Locate & Manipulate b. Understanding c. Manual Control	_____ _____ _____	_____ _____ _____	_____ _____ _____	0.0	_____ _____ _____
4. Communications a. Provide Information b. Receive Information c. Carry Out Instructions	_____ _____ _____	_____ _____ _____	_____ _____ _____	0.0	_____ _____ _____

[Note: Enter RF Weights (nominal, adjusted, or "0" if not observed (N/O)), RF Scores (1, 2, 3, or N/O), and RF Grades from Form ES-303-3 and sum to obtain Competency Grades.]

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

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Senior Reactor Operator Simulator Operating Test Grading Details

Competencies/ Rating Factors (RFs)	RF Weights	RF Scores	RF Grades	Comp. Grades	Comment Page No.
1. Interpretation/Diagnosis					
a. Recognize & Attend	_____	_____	_____		_____
b. Ensure Accuracy	_____	_____	_____	0.0	_____
c. Understanding	_____	_____	_____		_____
d. Diagnose	_____	_____	_____		_____
2. Procedures					
a. Reference	_____	_____	_____		_____
b. EOP Entry	_____	_____	_____	0.0	_____
c. Correct Use	_____	_____	_____		_____
3. Control Board Operations					
a. Locate & Manipulate	_____	_____	_____		_____
b. Understanding	_____	_____	_____	0.0	_____
c. Manual Control	_____	_____	_____		_____
4. Communications					
a. Clarity	_____	_____	_____		_____
b. Crew & Others Informed	_____	_____	_____	0.0	_____
c. Receive Information	_____	_____	_____		_____
5. Directing Operations					
a. Timely & Decisive Action	_____	_____	_____		_____
b. Oversight	_____	_____	_____	0.0	_____
c. Solicit Crew Feedback	_____	_____	_____		_____
d. Monitor Crew Activities	_____	_____	_____		_____
6. Technical Specifications					
a. Recognize and Locate	_____	_____	_____		_____
b. Compliance	_____	_____	_____	0.0	_____

[Note: Enter RF Weights (nominal, adjusted, or "0" if not observed (N/O)), RF Scores (1, 2, 3, or N/O), and RF Grades from Form ES-303-4 and sum to obtain Competency Grades.]

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Form ES-303-1 Cross-Reference	Comments

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

1. Interpret/Diagnose Events and Conditions Based on Alarms, Signals, and Readings

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant RECOGNIZE and VERIFY off-normal trends and status?	N/O	= 0	3		0.0
	Nominal	**= 0.40**	2		
	(b) or (c) N/O	= 0.57	1		
(b) Did the applicant correctly INTERPRET/DIAGNOSE plant conditions based on control room indications?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(c) N/O	= 0.43	1		
	(a) N/O	= 0.50			
(c) Did the applicant ATTEND TO annunciators, alarm signals, and instrument readings in order of importance and severity?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(b) N/O	= 0.43	1		
	(a) N/O	= 0.50			

2. Comply with and Use Procedures, References, and Technical Specifications

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant REFER TO the appropriate procedure or reference in a timely manner?	N/O	= 0	3		0.0
	Nominal	**= 0.30**	2		
	(c) N/O	= 0.43	1		
	(b) N/O	= 0.50			
(b) Did the applicant COMPLY WITH procedures (including precautions and limitations) and references in an accurate and timely manner?	N/O	= 0	3		
	Nominal	**= 0.40**	2		
	(a) or (c) N/O	= 0.57	1		
(c) Did the applicant RECOGNIZE plant conditions that are addressed in technical specifications?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(a) N/O	= 0.43	1		
	(b) N/O	= 0.50			

3. Operate the Control Boards

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant LOCATE AND MANIPULATE controls in an accurate and timely manner?	N/O	= 0	3		0.0
	Nominal	**= 0.40**	2		
	(b) or (c) N/O	= 0.57	1		
(b) Did the applicant's actions demonstrate UNDERSTANDING OF SYSTEM OPERATION, including set points, interlocks, and automatic actions?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(c) N/O	= 0.43	1		
	(a) N/O	= 0.50			
(c) Did the applicant demonstrate the ability to take MANUAL CONTROL of automatic functions?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(b) N/O	= 0.43	1		
	(a) N/O	= 0.50			

4. Communicate and Interact with Other Crew Members

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant PROVIDE clear and accurate INFORMATION on system status to others for the performance of their jobs?	N/O	= 0	3		0.0
	Nominal	**= 0.34**	2		
	(b) or (c) N/O	= 0.50	1		
(b) Did the applicant effectively RECEIVE INFORMATION from others (including requesting, acknowledging, and attending to information)?	N/O	= 0	3		
	Nominal	**= 0.33**	2		
	(a) or (c) N/O	= 0.50	1		
(c) Did the applicant successfully CARRY OUT THE INSTRUCTIONS of the supervisor?	N/O	= 0	3		
	Nominal	**= 0.33**	2		
	(a) or (b) N/O	= 0.50	1		

1. Interpret/Diagnose Events and Conditions Based on Alarms, Signals, and Readings					
Rating Factors		Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a)	Did the applicant RECOGNIZE AND ATTEND TO off-normal trends and status in order of their importance and severity?	N/O = 0	3		0.0
		Nominal = 0.20	2		
		(b) N/O = 0.25	1		
		(c) or (d) N/O = 0.29			
(b)	Did the applicant ensure the collection of CORRECT, ACCURATE, and COMPLETE information and reference material on which to base diagnoses?	N/O = 0	3		
		Nominal = 0.20	2		
		(a) N/O = 0.25	1		
		(c) or (d) N/O = 0.28			
(c)	Did the applicant's directives and actions demonstrate an UNDERSTANDING of how the PLANT, SYSTEMS, and COMPONENTS OPERATE AND INTERACT (including set points, interlocks, and automatic actions)?	N/O = 0	3		
		Nominal = 0.30	2		
		(a) or (b) N/O = 0.38	1		
		(d) N/O = 0.43			
(d)	Did the applicant correctly INTERPRET/DIAGNOSE plant conditions based on control room indications?	N/O = 0	3		
		Nominal = 0.30	2		
		(a) or (b) N/O = 0.37	1		
		(c) N/O = 0.43			

2. Comply with and Use Procedures and References					
Rating Factors		Weighting Factors	RF Scores	RF Grades	Comp. Grade
(a)	Did the applicant REFER to correct procedures, procedural steps, and references when appropriate?	N/O = 0	3		0.0
		Nominal = 0.30	2		
		(b) N/O = 0.43	1		
		(c) N/O = 0.50			
(b)	Did the applicant RECOGNIZE EOP ENTRY CONDITIONS?	N/O = 0	3		
		Nominal = 0.30	2		
		(a) N/O = 0.43	1		
		(c) N/O = 0.50			
(c)	Did the applicant USE PROCEDURES CORRECTLY, including following procedural steps in correct sequence, abiding by procedural cautions and limitations, selecting correct paths on decisions blocks, and correctly transitioning between procedures?	N/O = 0	3		
		Nominal = 0.40	2		
		(a) or (b) N/O = 0.57	1		

3. Operate the Control Boards
[NOTE: This competency is optional for SRO-upgrade applicants; refer to Section D.2.b.]

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant LOCATE AND MANIPULATE CONTROLS in an accurate and timely manner?	N/O	= 0	3		0.0
	Nominal	**= 0.34**	2		
	(b) or (c) N/O	= 0.5	1		
(b) Did the applicant's control manipulations demonstrate an UNDERSTANDING OF SYSTEM OPERATION, including set points, interlocks, and automatic actions?	N/O	= 0	3		
	Nominal	**= 0.33**	2		
	(a) or (c) N/O	= 0.5	1		
(c) Did the applicant demonstrate the ability to take MANUAL CONTROL of automatic functions?	N/O	= 0	3		
	Nominal	**= 0.33**	2		
	(a) or (b) N/O	= 0.5	1		

4. Communicate and Interact with the Crew and Other Personnel

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant communicate in a clear, easily understood manner?	N/O	= 0	3		0.0
	Nominal	**= 0.4**	2		
	(c) N/O	= 0.5	1		
	(b) N/O	= 0.67			
(b) Did the applicant keep crew members and those outside the control room informed of plant status?	N/O	= 0	3		
	Nominal	**= 0.4**	2		
	(c) N/O	= 0.5	1		
	(a) N/O	= 0.67			
(c) Did the applicant ENSURE RECEIPT of clear, easily-understood communications from crew and others?	N/O	= 0	3		
	Nominal	**= 0.2**	2		
	(a) or (b) N/O	= 0.33	1		

5. Direct Shift Operations

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant take TIMELY AND DECISIVE ACTION that demonstrated appropriate CONCERN for the SAFETY of the plant, staff, and public?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(c) or (d) N/O	= 0.38	1		
	(b) N/O	= 0.43			
(b) Did the applicant remain ATTENTIVE to control room indications, stay in a position of OVERSIGHT, and provide an APPROPRIATE AMOUNT of DIRECTION and GUIDANCE that facilitated CREW PERFORMANCE?	N/O	= 0	3		
	Nominal	**= 0.30**	2		
	(c) or (d) N/O	= 0.37	1		
	(a) N/O	= 0.43			0.0
(c) Did the applicant SOLICIT and INCORPORATE FEEDBACK from the crew to foster an effective, team-oriented approach to problem solving and decision making?	N/O	= 0	3		
	Nominal	**= 0.20**	2		
	(d) N/O	= 0.25	1		
	(a) or (b) N/O	= 0.29			
(d) Did the applicant ensure that CORRECT AND TIMELY ACTIVITIES (including diagnosis, procedural implementation, and control board operations) were carried out BY THE CREW?	N/O	= 0	3		
	Nominal	**= 0.20**	2		
	(c) N/O	= 0.25	1		
	(a) or (b) N/O	= 0.28			

6. Comply with and Use Technical Specifications (TS)

Rating Factors	Weighting Factors		RF Scores	RF Grades	Comp. Grade
(a) Did the applicant RECOGNIZE when conditions were covered by the TS and LOCATE the appropriate TS?	N/O	= 0	3		
	Nominal	**= 0.4**	2		
	(b) N/O	= 1.0	1		0.0
(b) Did the applicant ensure correct COMPLIANCE with TS and LCO action statements?	N/O	= 0	3		
	Nominal	**= 0.6**	2		
	(a) N/O	= 1.0	1		

Facility: Date of Exam:

Tier	Group	RO K/A Category Points												SRO-Only Points		
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1				N/A					N/A			20			7
	2												7			3
	Tier Totals	0	0	0				0	0			0	27	0	0	10
2. Plant Systems	1												26			5
	2												12			3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	38	0	0	8
3. Generic Knowledge and Abilities Categories		1		2		3		4					10	1 2 3 4		7

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

e. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4									
295003 Partial or Complete Loss of AC / 6									
295004 Partial or Total Loss of DC Pwr / 6									
295005 Main Turbine Generator Trip / 3									
295006 SCRAM / 1									
295016 Control Room Abandonment / 7									
295018 Partial or Total Loss of CCW / 8									
295019 Partial or Total Loss of Inst. Air / 8									
295021 Loss of Shutdown Cooling / 4									
295023 Refueling Acc / 8									
295024 High Drywell Pressure / 5									
295025 High Reactor Pressure / 3									
295026 Suppression Pool High Water Temp. / 5									
295027 High Containment Temperature / 5									
295028 High Drywell Temperature / 5									
295030 Low Suppression Pool Wtr Lvl / 5									
295031 Reactor Low Water Level / 2									
295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown / 1									
295038 High Off-site Release Rate / 9									
600000 Plant Fire On Site / 8									
700000 Generator Voltage and Electric Grid Disturbances / 6									
K/A Category Totals:							Group Point Total:		20/7

ES-401 BWR Examination Outline Form ES-401-1
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295002 Loss of Main Condenser Vac / 3									
295007 High Reactor Pressure / 3									
295008 High Reactor Water Level / 2									
295009 Low Reactor Water Level / 2									
295010 High Drywell Pressure / 5									
295011 High Containment Temp / 5									
295012 High Drywell Temperature / 5									
295013 High Suppression Pool Temp. / 5									
295014 Inadvertent Reactivity Addition / 1									
295015 Incomplete SCRAM / 1									
295017 High Off-site Release Rate / 9									
295020 Inadvertent Cont. Isolation / 5 & 7									
295022 Loss of CRD Pumps / 1									
295029 High Suppression Pool Wtr Lvl / 5									
295032 High Secondary Containment Area Temperature / 5									
295033 High Secondary Containment Area Radiation Levels / 9									
295034 Secondary Containment Ventilation High Radiation / 9									
295035 Secondary Containment High Differential Pressure / 5									
295036 Secondary Containment High Sump/Area Water Level / 5									
500000 High CTMT Hydrogen Conc. / 5									
K/A Category Point Totals:							Group Point Total:		7/3

ES-401 BWR Examination Outline Form ES-401-1
Plant Systems - Tier 2/Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
203000 RHR/LPCI: Injection Mode														
205000 Shutdown Cooling														
206000 HPCI														
207000 Isolation (Emergency) Condenser														
209001 LPCS														
209002 HPCS														
211000 SLC														
212000 RPS														
215003 IRM														
215004 Source Range Monitor														
215005 APRM / LPRM														
217000 RCIC														
218000 ADS														
223002 PCIS/Nuclear Steam Supply Shutoff														
239002 SRVs														
259002 Reactor Water Level Control														
261000 SGTS														
262001 AC Electrical Distribution														
262002 UPS (AC/DC)														
263000 DC Electrical Distribution														
264000 EDGs														
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Point Totals:												Group Point Total:		26/5

ES-401 BWR Examination Outline Form ES-401-1
Plant Systems - Tier 2/Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
201001 CRD Hydraulic														
201002 RMCS														
201003 Control Rod and Drive Mechanism														
201004 RSCS														
201005 RCIS														
201006 RWM														
202001 Recirculation														
202002 Recirculation Flow Control														
204000 RWCU														
214000 RPIS														
215001 Traversing In-core Probe														
215002 RBM														
216000 Nuclear Boiler Inst.														
219000 RHR/LPCI: Torus/Pool Cooling Mode														
223001 Primary CTMT and Aux.														
226001 RHR/LPCI: CTMT Spray Mode														
230000 RHR/LPCI: Torus/Pool Spray Mode														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
239001 Main and Reheat Steam														
239003 MSIV Leakage Control														
241000 Reactor/Turbine Pressure Regulator														
245000 Main Turbine Gen. / Aux.														
256000 Reactor Condensate														
259001 Reactor Feedwater														
268000 Radwaste														
271000 Offgas														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
290003 Control Room HVAC														
290002 Reactor Vessel Internals														
K/A Category Point Totals:												Group Point Total:		12/3

Facility: Date of Exam:

Tier	Group	RO K/A Category Points												SRO-Only Points		
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1				N/A					N/A			18			6
	2												9			4
	Tier Totals	0	0	0				0	0			0	27	0	0	10
2. Plant Systems	1												28			5
	2												10			3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	38	0	0	8

3. Generic Knowledge and Abilities Categories	1	2	3	4	10	1	2	3	4	7

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.
3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES-401 PWR Examination Outline Form ES-401-2
Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1									
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3									
000015/17 RCP Malfunctions / 4									
000022 Loss of Rx Coolant Makeup / 2									
000025 Loss of RHR System / 4									
000026 Loss of Component Cooling Water / 8									
000027 Pressurizer Pressure Control System Malfunction / 3									
000029 ATWS / 1									
000038 Steam Gen. Tube Rupture / 3									
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4									
000054 (CE/E06) Loss of Main Feedwater / 4									
000055 Station Blackout / 6									
000056 Loss of Off-site Power / 6									
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									
000062 Loss of Nuclear Svc Water / 4									
000065 Loss of Instrument Air / 8									
W/E04 LOCA Outside Containment / 3									
W/E11 Loss of Emergency Coolant Recirc. / 4									
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4									
000077 Generator Voltage and Electric Grid Disturbances / 6									
K/A Category Totals:							Group Point Total:		18/6

ES-401 PWR Examination Outline Form ES-401-2
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2 (RO / SRO)

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000001 Continuous Rod Withdrawal / 1									
000003 Dropped Control Rod / 1									
000005 Inoperable/Stuck Control Rod / 1									
000024 Emergency Boration / 1									
000028 Pressurizer Level Malfunction / 2									
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000036 (BW/A08) Fuel Handling Accident / 8									
000037 Steam Generator Tube Leak / 3									
000051 Loss of Condenser Vacuum / 4									
000059 Accidental Liquid RadWaste Rel. / 9									
000060 Accidental Gaseous Radwaste Rel. / 9									
000061 ARM System Alarms / 7									
000067 Plant Fire On-site / 8									
000068 (BW/A06) Control Room Evac. / 8									
000069 (W/E14) Loss of CTMT Integrity / 5									
000074 (W/E06&E07) Inad. Core Cooling / 4									
000076 High Reactor Coolant Activity / 9									
W/EO1 & E02 Rediagnosis & SI Termination / 3									
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
W/E16 High Containment Radiation / 9									
BW/A01 Plant Runback / 1									
BW/A02&A03 Loss of NNI-X/Y / 7									
BW/A04 Turbine Trip / 4									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
BW/E03 Inadequate Subcooling Margin / 4									
BW/E08; W/E03 LOCA Cooldown - Depress. / 4									
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4									
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling - PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:							Group Point Total:		9/4

ES-401 PWR Examination Outline Form ES-401-2
Plant Systems - Tier 2/Group 1 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump														
004 Chemical and Volume Control														
005 Residual Heat Removal														
006 Emergency Core Cooling														
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water														
010 Pressurizer Pressure Control														
012 Reactor Protection														
013 Engineered Safety Features Actuation														
022 Containment Cooling														
025 Ice Condenser														
026 Containment Spray														
039 Main and Reheat Steam														
059 Main Feedwater														
061 Auxiliary/Emergency Feedwater														
062 AC Electrical Distribution														
063 DC Electrical Distribution														
064 Emergency Diesel Generator														
073 Process Radiation Monitoring														
076 Service Water														
078 Instrument Air														
103 Containment														
K/A Category Point Totals:												Group Point Total:		28/5

ES-401 PWR Examination Outline Form ES-401-2
Plant Systems - Tier 2/Group 2 (RO / SRO)

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
001 Control Rod Drive														
002 Reactor Coolant														
011 Pressurizer Level Control														
014 Rod Position Indication														
015 Nuclear Instrumentation														
016 Non-nuclear Instrumentation														
017 In-core Temperature Monitor														
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
035 Steam Generator														
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator														
055 Condenser Air Removal														
056 Condensate														
068 Liquid Radwaste														
071 Waste Gas Disposal														
072 Area Radiation Monitoring														
075 Circulating Water														
079 Station Air														
086 Fire Protection														
K/A Category Point Totals:												Group Point Total:		10/3

Facility: Date of Exam:

Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.					
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	2.1.					
	Subtotal					
2. Equipment Control	2.2.					
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	2.2.					
	Subtotal					
3. Radiation Control	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	2.3.					
	Subtotal					
4. Emergency Procedures / Plan	2.4.					
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	2.4.					
	Subtotal					
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection

Examination Outline Cross-Reference:

Level	RO	SRO
Tier #	_____	_____
Group #	_____	_____
K/A #	_____	_____
Importance Rating	_____	_____

Proposed Question:

Proposed Answer: _____

Explanation (Optional):

Technical Reference(s): _____
(Attach if not previously provided) _____
(including version/revision number) _____

Proposed references to be provided to applicants during examination: _____

Learning Objective: _____ (As available)

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____
(Optional: Questions validated at the facility since 10/95 will generally undergo less rigorous review by the NRC; failure to provide the information will necessitate a detailed review of every question.)

Question Cognitive Level: Memory or Fundamental Knowledge ☐
Comprehension or Analysis ☐

10 CFR Part 55 Content: 55.41 _____
55.43 _____

Comments:

Facility: Date of Exam: Exam Level: RO ☐ SRO ☐

	Item Description	Initial a	Initial b*	Initial c#
1.	Questions and answers are technically accurate and applicable to the facility.			
2.	a. NRC K/As are referenced for all questions. b. Facility learning objectives are referenced as available.			
3.	SRO questions are appropriate in accordance with Section D.2.d of ES-401			
4.	The sampling process was random and systematic (If more than 4 RO or 2 SRO questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).			
5.	Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: __ the audit exam was systematically and randomly developed; or __ the audit exam was completed before the license exam was started; or __ the examinations were developed independently; or __ the licensee certifies that there is no duplication; or __ other (explain)			
6.	Bank use meets limits (no more than 75 percent from the bank, at least 10 percent new, and the rest new or modified); enter the actual RO / SRO-only question distribution(s) at right.			
7.	Between 50 and 60 percent of the questions on the RO exam are written at the comprehension/ analysis level; the SRO exam may exceed 60 percent if the randomly selected K/As support the higher cognitive levels; enter the actual RO / SRO question distribution(s) at right.			
8.	References/handouts provided do not give away answers or aid in the elimination of distractors.			
9.	Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the tier to which they are assigned; deviations are justified.			
10.	Question psychometric quality and format meet the guidelines in ES Appendix B.			
11.	The exam contains the required number of one-point, multiple choice items; the total is correct and agrees with the value on the cover sheet.			

Item 6	Bank	Modified	New
	/	/	/

Item 7	Memory	C/A
	/	/

	Printed Name / Signature	Date
a. Author		
b. Facility Reviewer (*)		
c. NRC Chief Examiner (#)		
d. NRC Regional Supervisor		

Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information	
Name:	
Date:	Facility/Unit:
Region: I ☐ II ☐ III ☐ IV ☐	Reactor Type: W☐ CE☐ BW☐ GE☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results		
Examination Value	_____	Points
Applicant's Score	_____	Points
Applicant's Grade	_____	Percent

U.S. Nuclear Regulatory Commission

Site-Specific SRO Written Examination

Applicant Information

Name:	
Date:	Facility/Unit:
Region: I ☐ II ☐ III ☐ IV ☐	Reactor Type: W ☐ CE ☐ BW ☐ GE ☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results

RO/SRO-Only/Total Examination Values	_____ / _____ / _____	Points
Applicant's Scores	_____ / _____ / _____	Points
Applicant's Grade	_____ / _____ / _____	Percent

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6. B/M/N	7. U/E/S	8. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only			

Instructions

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question using a 1 – 5 (easy – difficult) rating scale (questions in the 2 – 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
   - The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
   - The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
   - The answer choices are a collection of unrelated true/false statements.
   - The distractors are not credible; single implausible distractors should be repaired, more than one is unacceptable.
   - One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
   - The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
   - The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).
   - The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - The question requires reverse logic or application compared to the job requirements.
5. Check questions that are sampled for conformance with the approved K/A and those that are *designated SRO-only* (K/A and license level mismatches are unacceptable).
6. Enter question source: (B)ank, (M)odified, or (N)ew. Check that (M)odified questions meet criteria of ES-401 Section D.2.f.
7. Based on the reviewer's judgment, is the question as written (U)nsatisfactory (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
8. At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. Other		6.	7.	8.
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	B/M/N	U/E/S	Explanation

Facility: Date of Exam: Exam Level: RO☐ SRO☐

Item Description	Initials a	Initials b	Initials c
1. Clean answer sheets copied before grading			
2. Answer key changes and question deletions justified and documented			
3. Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)			
4. Grading for all borderline cases (80 ±2% overall and 70 or 80, as applicable, ±4% on the SRO-only) reviewed in detail			
5. All other failing examinations checked to ensure that grades are justified			
6. Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants			

	Printed Name/Signature	Date
a. Grader	_____	_____
b. Facility Reviewer(*)	_____	_____
c. NRC Chief Examiner (*)	_____	_____
d. NRC Supervisor (*)	_____	_____

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

Post-Examination Check Sheet		
Facility:	**Date of Examination:**	
Task Description		**Date Complete**
1.	Facility written exam comments or graded exams received and verified complete	
2.	Facility written exam comments reviewed and incorporated and NRC grading completed, if necessary	
3.	Operating tests graded by NRC examiners	
4.	NRC chief examiner review of operating test and written exam grading completed	
5.	Responsible supervisor review completed	
6.	Management (licensing official) review completed	
7.	License and denial letters mailed	
8.	Facility notified of results	
9.	Examination report issued (refer to NRC MC 0612)	
10.	Reference material returned after final resolution of any appeals	

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Power Plant Examination Results Summary

Facility:	Plant Status: Hot ☐ Cold ☐
Written Examination Date: Prepared by: Facility ☐ NRC ☐	Operating Test Date(s): Prepared by: Facility ☐ NRC ☐
NRC Examiners:	

Overall Results

Applicants:	Total #	# Passed	% Passed	# Failed	% Failed
RO	1		0%		0%
SRO	1		0%		0%

Individual Results

Name	Docket # 55-(_____)	Type (1)	Written Grade	Operating Test(2)		
			RO / SRO / TOT	W-T	ADM	SIM
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			

NOTES:
(1) 1=RO; 2=SRO-I; 3=SRO-U; 4=RO-Retake; 5=SRO-I-Retake; 6=SRO-U-Retake; 7=SRO-Fuel
(2) P=Passed; F=Failed; W=Waived

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Power Plant Examination Results Summary
(Continuation Sheet)

Facility:

Examination Date(s):

Individual Results

Name	Docket # 55-(_____)	Type (1)	Written Grade	Operating Test(2)		
			RO / SRO / TOT	W-T	ADM	SIM
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			
			/ /			

NOTES:
(1) 1=RO; 2=SRO-I; 3=SRO-U; 4=RO-Retake; 5=SRO-I-Retake; 6=SRO-U-Retake; 7=SRO-Fuel
(2) P=Passed; F=Failed; W=Waived

PRIVACY ACT INFORMATION — FOR OFFICIAL USE ONLY

Facility: Date of Exam:

Tier	K/A Category Points											
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G *	Total
1. Emergency & Abnormal Plant Evolutions												10
2. Plant Systems												20
3. Generic Knowledge and Abilities Categories	1			2		3		4		GFE		10

Note:
1. Ensure that at least one topic from every K/A category is sampled within each tier .
2. The point total for each tier in the proposed outline must match that specified in the table. The final point total for each tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 40 points.
3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system (except fuel handling equipment) or evolution (except refueling accident).
4. The shaded areas are not applicable to the category/tier.
5.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
6. If the applicants have not previously taken the GFE, Tier 3 shall include basic reactor theory, component, and thermodynamic topics that apply to fuel handling operations.
7. Systems/evolutions within each tier are identified on the associated outline. Enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the SRO license level, and the point totals (#) for each system and category. Enter the tier totals for each category in the table above.
8. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, importance ratings, and point totals (#) on Form ES-701-3.
9. Refer to ES-401, Section D.1, for guidance regarding the elimination of inappropriate K/A statements. The facility licensee's JTA for fuel handlers should be used as the basis for eliminating or adding testable topics.

ES-701	LSRO BWR Written Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1	Form ES-701-1

	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
295003 Partial or Complete Loss of AC									
295004 Partial or Total Loss of DC									
295014 Inadvertent Reactivity Addition									
295018 Partial or Total Loss of CCW									
295021 Loss of Shutdown Cooling									
295023 Refueling Accidents									
295033 High Secondary Containment Area Radiation Levels									
295034 Secondary Containment Ventilation High Radiation									
295006 SCRAM									
295008 High Reactor Water Level									
295009 / 295031 Reactor Low Water Level									
295017 / 295038 High Offsite Release Rate									
295019 Partial or Total Loss of Inst. Air									
295020 Inadvertent Cont. Isolation									
295030 Low Suppression Pool Wtr Lvl									
295035 Secondary Containment High Differential Pressure									
600000 Plant Fire On Site									
K/A Category Totals:							Tier Point Total:		10

	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
205000 Shutdown Cooling														
215004 Source Range Monitor														
233000 Fuel Pool Cooling/Cleanup														
234000 Fuel Handling Equipment														
262001 AC Electrical Dist.														
263000 DC Electrical Dist.														
290002 Reactor Vessel Internals														
201002 RMCS														
201003 Control Rod and Drive Mechanism														
203000 RHR/LPCI: Injection Mode														
204000 RWCU														
211000 SLC														
212000 RPS														
214000 RPIS														
215001 Traversing In-Core Probe														
215003 IRM														
215005 APRM / LPRM														
223001 Primary CTMT and Aux.														
223002 PCIS/Nuclear Steam Supply Shutoff														
261000 SGTS														
264000 EDGs														
272000 Radiation Monitoring														
286000 Fire Protection														
288000 Plant Ventilation														
290001 Secondary CTMT														
300000 Instrument Air														
400000 Component Cooling Water														
K/A Category Totals:												Tier Point Total:		20

Facility: Date of Exam:

Tier	K/A Category Points											
	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G *	Total
1. Emergency & Abnormal Plant Evolutions												10
2. Plant Systems												20
3. Generic Knowledge and Abilities Categories	1		2		3		4		GFE			10

Note:
1. Ensure that at least one topic from every K/A category is sampled within each tier .
2. The point total for each tier in the proposed outline must match that specified in the table. The final point total for each tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 40 points.
3. Select topics from many systems and evolutions; avoid selecting more than two K/A topics from a given system (except fuel handling equipment) or evolution (except refueling accident).
4. The shaded areas are not applicable to the category/tier.
5.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
6. If the applicants have not previously taken the GFE, Tier 3 shall include basic reactor theory, component, and thermodynamic topics that apply to fuel handling operations.
7. Systems/evolutions within each tier are identified on the associated outline. Enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the SRO license level, and the point totals (#) for each system and category. Enter the tier totals for each category in the table above.
8. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, importance ratings, and point totals (#) on Form ES-701-3.
9. Refer to ES-401, Section D.1, for guidance regarding the elimination of inappropriate K/A statements. The facility licensee's JTA for fuel handlers should be used as the basis for eliminating or adding testable topics.

	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	IR	#
000025 Loss of RHR System									
000026 Loss of Component Cooling Water									
000032 Loss of Source Range NI									
000036 (BW/A08) Fuel Handling Accident									
000061 ARM System Alarms									
000033 Loss of Intermediate Range NI									
000055 Station Blackout									
000056 Loss of Offsite Power									
000057 Loss of Vital AC Inst. Bus									
000058 Loss of DC Power									
000062 Loss of Nuclear Svc Water									
000065 Loss of Instrument Air									
000067 Plant Fire On Site									
000069 (W/E14) Loss of CTMT Integrity									
W/E16 High Containment Radiation									
K/A Category Totals:							Tier Point Total:		10

ES-701	LSRO PWR Written Examination Outline Plant Systems - Tier 2	Form ES-701-2

	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
005 Residual Heat Removal														
015 Nuclear Instrumentation														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
103 Containment														
062 AC Electrical Distribution														
063 DC Electrical Distribution														
002 Reactor Coolant														
004 Chemical and Volume Control														
008 Component Cooling Water														
013 Engineered Safety Features Actuation														
064 Emergency Diesel Generator														
072 Area Radiation Monitoring														
076 Service Water														
078 Instrument Air														
079 Station Air														
086 Fire Protection														
K/A Category Totals:												Tier Point Total:		20

ES-701	LSRO Generic Knowledge and Abilities Outline (Tier 3)	Form ES-701-3

Facility: Date of Exam:

Category	K/A #	Topic	IR	#
1. Conduct of Operations	2.1.			
	2.1.			
	2.1.			
	2.1.			
	Subtotal			
2. Equipment Control	2.2.			
	2.2.			
	2.2.			
	2.2.			
	Subtotal			
3. Radiation Control	2.3.			
	2.3.			
	2.3.			
	2.3.			
	Subtotal			
4. Emergency Procedures / Plan	2.4.			
	2.4.			
	2.4.			
	2.4.			
	Subtotal			
5. Generic Fundamentals				
	Subtotal			
Tier 3 Point Total				10

Applicant Docket Number: 55- Page 2 of
Facility: Date of Examination:

Title / Description of Tasks (JPMs)	Type Codes*	Evaluation (S or U)	Comment Page Number
Administrative			
1.			
2.			
3.			
Systems			
1.			
2.			
3.			
4.			
Emergency/Abnormal Plant Evolutions			
1.			
2.			
3.			

Type Codes & Criteria:
(A)lternative path (2 systems; 1 E/APE))
(C)ontrol room
(D)irect from bank (≤ 7)
(I)n-plant
(N)ew or (M)odified from bank including 1(A) (≥ 1 / section)
(L)ast NRC exam (≤ 1 / section)
(R)efueling accident (1)
(T)echnical specification (≥ 2)

Facility: Date of Examination:

Item	Task Description	Initials a	Initials b*	Initials c#
1. WRITTEN	a. Verify that the outline fits the model in accordance with ES-701.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are sampled at least once.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. OPERATING	a. Verify that the overall operating test: (1) includes at least two tasks that require the use of technical specifications (2) does not duplicate any tasks from the applicants' audit test(s)			
	b. Verify that the administrative tasks: (1) are distributed among the four administrative topics described in ES-301 (2) include no more than one repeat from the last NRC licensing examination (3) include at least one task that is new or significantly modified			
	c. Verify that the systems walk-through includes: (1) two tasks requiring the manipulation of fuel handling equipment (2) two additional tasks related to Tier 2 systems other than fuel handling equipment (3) two tasks requiring implementation of alternative path procedures (4) no more than one repeat from the last NRC licensing examination (5) at least one task that is new or significantly modified			
	d. Verify that the E/APE walk-through includes: (1) three JPMs based on the Tier 1evolutions, including a refueling accident (2) one task requiring implementation of an alternative path procedure (3) no more than one repeat from the last NRC licensing examination (4) at least one task that is new or significantly modified			
	e. Determine whether there are enough different outlines to test the projected number of applicants and ensure that no items are duplicated on subsequent days.			
3. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered inthe appropriate exam section.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Assess whether the sampling process adequately considered plant-specific refueling components, systems, and procedures that are not included in the generic models.			
	d. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	e. Check for duplication and overlap among exam sections.			
	f. Check the entire exam for balance of coverage.			
	g. Assess whether the proposed sample is consistent with the LSRO's job responsibilities.			

	Printed Name / Signature	Date
a. Author		
b. Facility Reviewer (*)		
c. NRC Chief Examiner (#)		
d. NRC Supervisor		

Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: Date of Exam:

	Item Description	Initial a	Initial b*	Initial c#
1.	Questions and answers are technically accurate and applicable to the facility.			
2.	a. NRC K/As are referenced for all questions (as applicable). b. Facility learning objectives are referenced as available.			
3.	Questions are appropriate for LSRO applicants.			
4.	The sampling process was random and systematic (If more than 3 questions were repeated from the last 2 NRC licensing exams, consult the NRR OL program office).			
5.	Question duplication from the license screening/audit exam was controlled as indicated below (check the item that applies) and appears appropriate: __ the audit exam was systematically and randomly developed, or __ the audit exam was completed before the license exam was started, or __ the examinations were developed independently, or __ the licensee certifies that there is no duplication, or __ other (explain)			
6.	Bank use meets limits (no more than 30 questions from the bank, at least 4 new, and the rest modified); enter the actual question distribution at right. — Bank: ___ Modified: ___ New: ___			
7.	Between 50 and 60 percent (20 and 24) of the questions on the exam are written at the comprehension/analysis level; enter the actual question distribution at right. — Memory: ___ C/A: ___			
8.	References/handouts provided do not give away answers or aid in eliminating distractors.			
9.	Question content conforms with specific K/A statements in the previously approved examination outline and is appropriate for the Tier to which they are assigned; deviations are justified.			
10.	Question psychometric quality and format meet guidelines in ES Appendix B.			
11.	The exam contains 40 one-point, multiple choice items; the total is correct and agrees with value on cover sheet.			

	Printed Name / Signature	Date
a. Author	_____	_____
b. Facility Reviewer (*)	_____	_____
c. NRC Chief Examiner (#)	_____	_____
d. NRC Regional Supervisor	_____	_____

Note: * The facility reviewer's initials/signature are not applicable for NRC-developed examinations.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

Facility: Date of Examination: Operating Test Number:

	Item Description	Initials a	Initials b*	Initials c#
1.	The operating test conforms with the LSRO's job responsibilities and the previously approved outline (Form ES-701-4).			
2.	Any changes from the previously approved outline have not caused the test to deviate from any of the acceptance criteria (e.g., item distribution, bank use, repetition from the last two NRC examinations) specified on the outline.			
3.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.			
4.	The operating test does not duplicate items from the applicants' audit test(s). (See Section D.1.a of ES-301).			
5.	Overlap between the written examination and the operating test is within acceptable limits.			
6.	It appears that the operating test will differentiate between competent and less-than-competent applicants.			
7.	Each JPM includes the following, as applicable: • initial conditions • initiating cues • references and tools, including associated procedures • reasonable and validated time limits (average time allowed for completion) and specific designation if deemed to be time-critical by the facility licensee • specific performance criteria that include: – detailed expected actions with exact criteria and nomenclature – system response and other examiner cues – statements describing important observations to be made by the applicant – criteria for successful completion of the task – identification of critical steps and their associated performance standards – restrictions on the sequence of steps, if applicable			

	Printed Name / Signature	Date
a. Author		
b. Facility Reviewer(*)		
c. NRC Chief Examiner (#)		
d. NRC Supervisor		

NOTE: * The facility signature is not applicable for NRC-developed tests.
Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.

U.S. Nuclear Regulatory Commission

LSRO Written Examination

Applicant Information

Name:	
Date:	Region: I ☐ II ☐ III ☐ IV ☐
Facility/Unit:	Reactor Type: W ☐ CE ☐ BW ☐ GE ☐
Start Time:	Stop Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be picked up 4 hours after the examination begins.

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Operator's Signature

Results

Test Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

Facility: _____ Task No: _____

Task Title: _____ Job Performance Measure No: _____

K/A Reference: _____

Examinee: _____ NRC Examiner: _____

Facility Evaluator: _____ Date: _____

Method of testing:

Simulated Performance _____ Actual Performance _____

Classroom _____ Simulator _____ Plant _____

Read to the examinee:

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

Initial Conditions:

Task Standard:

Required Materials:

General References:

Initiating Cue:

Time Critical Task: Yes No

Validation Time:

Performance Information

Denote critical steps with a check mark

_____ ☐ Performance step:

Standard:

Comment:

_____ ☐ Performance step:

Standard:

Comment:

_____ ☐ Performance step:

Standard:

Comment:

Terminating cue:

Verification of Completion

Job Performance Measure No. _____

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:_____
_____
_____

Response:_____
_____
_____
_____

Result: Satisfactory ☐ / Unsatisfactory ☐

Examiner's signature and date: _____ _____

Every JPM should:

1. _____ be supported by the facility licensee's job task analysis.

2. _____ be operationally important (meet the NRC's K/A Catalog threshold criterion of 2.5 (3 for requalification exams) or as determined by the facility and agreed to by the NRC). JPMs shall not test only for simple recall or memorization (refer to ES-602 Attachment 1).

3. _____ be designed as either SRO only, RO/SRO or AO/RO/SRO.

4. include the following, as applicable:

   a. _____ initial conditions

   b. _____ initiating cues

   c. _____ references and tools, including associated procedures

   d. _____ validated time limits (average time allowed for completion) and specific designation of those JPMs that are deemed to be time-critical by the facility operations department

   e. _____ operationally important specific performance criteria that include:

      (1) _____ expected actions with exact control and indication nomenclature and criteria (switch position, meter reading), even if these criteria are not specified in the procedural step

      (2) _____ system response and other cues that are complete and correct so that the examiner can properly cue the examinee, if asked

      (3) _____ statements describing important observations that the examinee should make

      (4) _____ criteria for successful completion of the task

      (5) _____ identification of those steps that are considered critical

      (6) _____ restrictions on the sequence of steps

Facility: _____ Scenario No.: _____ Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: _____

Turnover: _____

Event No.	Malf. No.	Event Type*	Event Description

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: _____ Scenario No.: _____ Event No.: _____ Page ___ of ___

Event Description: _____

Time	Position	Applicant's Actions or Behavior

Facility: Palo verde Date of Examination: 11/10/08 Operating Test No.: 1

Competencies	APPLICANTS															
	RO ☑ SRO-I ☐ SRO-U ☐				RO ☑ SRO-I ☐ SRO-U ☐				RO ☑ SRO-I ☐ SRO-U ☐				RO ☑ SRO-I ☐ SRO-U ☐			
	SCENARIO				SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	1, 5	1, 3, 4, 5, 6			1, 5	2, 4, 7	2, 4, 5, 6		1, 5	1, 3, 4, 5, 6	1, 2, 3,				2, 4, 5, 6	1,4 5, 6, 7
Comply With and Use Procedures (1)	1, 6	1, 3, 4			1, 6	2, 4, 5, 7	2, 4, 5,		1, 6	1, 3, 4	1, 2, 3, 5				2, 4, 5,	1,4 5, 7
Operate Control Boards (2)	1, 3, 4, 5, 6	1, 3, 5, 6			1, 3, 4, 5, 6	2, 4, 5, 7	2, 4, 5, 6		1, 3, 4, 5, 6	1, 3, 5, 6	1, 2, 3, 5				2, 4, 5, 6	1,4 5, 6, 7
Communicate and Interact	1, 3, 4, 5, 6	1, 3, 4, 6			1, 3, 4, 5, 6	2, 4, 5, 7	2, 4, 6		1, 3, 4, 5, 6	1, 3, 4, 6	1, 2, 3, 5				2, 4, 6	1,4 5, 6, 7
Demonstrate Supervisory Ability (3)																
Comply With and Use Tech. Specs. (3)																

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.