

PERFORM A MANUAL CEA SUBGROUP SELECTION



RO ADMIN 1

Site W3 Job RO System/Duty Area RXC Mode NORM Number 8

Revision 0 08/24/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 20 Min

Time Critical No Critical Time N/A Alternate Path No

References

OP-004-015, Reactor Power Cutback System
Plant Data Book

NRC KA Number

2.1.23. RO: 3.9; SRO: 4.0

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is holding at 81% (PMC Point C24107) power at Woodlands' request.
Regulating Group 6 CEAs are selected for Reactor Power Cutback.
Core Burnup is 271 EFPD (PMC Point C24110).
Steam Bypass Control Valve, MS-320B, has been removed from service due to erratic behavior.

INITIATING CUE

The Control Room Supervisor directs you to perform a Manual CEA Subgroup Selection calculation to determine if the current alignment is acceptable for the current power level.

TERMINATING CUE

Candidate determines the correct CEA Subgroup Selection for the current condition.

STANDARD

Candidate determines that Subgroups 5 and 11 (Reg Groups 5 and 6) should be selected for Reactor Power Cutback.

TOOLS

1. Copy of OP-004-015, Reactor Power Cutback System
2. Copy of the Plant Data Book
3. Copy of Plant Data Book Figure 1.7.2.1, Power Level After Drop of Bank 6 (or 6 + 5) From Indicated Power Level (for candidate to mark up)
4. Calculator

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Reactor power will be above SBCS capabilities if a Reactor Power Cutback were to occur.

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

This task is normally performed while raising power to 100%. OP-010-004 directs placing Cutback in service above 65% power, and then it directs re-evaluation of the subgroups selected to drop prior to exceeding 90% power. When one SBCS valve became inoperable at 81% power, it became necessary to re-evaluate at that time.

Waterford 3 Job Performance Measure

Note that CEA Subgroup 5 is the same as Regulating Group 6, and CEA Subgroup 11 is the same as Regulating Group 5.

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-004-015 Attachment 11.1. Critical steps are denoted by **CRIT**.

START TIME_____

-
1. Fill in current reactor power.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: Examinee records 81% from Initial Conditions

SAT_____ **UNSAT**_____

-
2. Fill in current EFPD.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: Examinee records 271 from Initial Conditions

SAT_____ **UNSAT**_____

-
3. Fill in number of Operable SBCS Valves

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: 1. Examinee records 5 from Initial Conditions
2. 6 total SBCS valves minus 1 that is inoperable

SAT_____ **UNSAT**_____

-
4. Determine maximum allowed reactor power after Reactor Cutback

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: Examinee records 49.4%

SAT_____ **UNSAT**_____

-
5. Using result from Step 11.1.4 and Figure 1.7.2.1, determine the Subgroups that should be selected for Reactor Power Cutback.

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Refer to PDB Figure 1.7.2.1
2. Check "Subgroups 5 & 11"

Note: Subgroup 5 alone would place the final power level above 49.4% (approx 52-54%). Subgroups 5 and 11 would place the final power level above 20% (approx 25-27%).

SAT_____ **UNSAT**_____

-
6. End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The plant is holding at 81% (PMC Point C24107) power at Woodlands' request.
Regulating Group 6 CEAs are selected for Reactor Power Cutback.
Core Burnup is 271 EFPD (PMC Point C24110).
Steam Bypass Control Valve, MS-320B, has been removed from service due to erratic behavior.

INITIATING CUE

The Control Room Supervisor directs you to perform a Manual CEA Subgroup Selection calculation to determine if the current alignment is acceptable for the current power level.

PERFORM A SHUTDOWN MARGIN CALCULATION



RO ADMIN 2

Site W3 Job RO System/Duty Area CED Mode SURV Number 4

Revision 5 09/16/2006

Approval _____ 09/16/2006
Arvel J. Hall

Estimated Time 20 Min

Time Critical No Critical Time N/A Alternate Path No

References

OP-903-090, Shutdown Margin
Plant Data Book

NRC KA Number

2.1.20 (RO: 4.3; SRO: 4.2)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The Plant tripped 12 hours ago, the conditions prior to the trip were:

- 100% Xenon equilibrium conditions
- 250 EFPD
- RCS Boron Concentration 1000 ppm

Current Plant conditions:

- Mode 3
- Tave 541°F
- RCS Boron Concentration 1000 ppm
- All CEAs are inserted
- Reactivity Bias factor 0.001

INITIATING CUE

The Control Room Supervisor directs you to perform a Shutdown Margin Calculation. Shutdown Margin Verification for the next 24 hours is not required for this task.

TERMINATING CUE

RCS Boron Concentration meets Shutdown Margin requirement.

STANDARD

Candidate determines Shutdown margin is acceptable.

TOOLS

OP-903-090, Shutdown Margin, Section 7.1

OP-903-090, Shutdown Margin, Attachment 10.1

Plant Data Book Figures

- 1.3.4.1, SDM Boron Concentration vs. Burnup
- 1.3.4.2, SDM Boron Concentration vs. Burnup
- 1.4.1, HZP Inverse Boron Worth vs. Burnup
- 1.4.2, Boron Worth vs. Tmod, Normalized to 541 Deg. F
- 1.6.3.1, Xenon Worth After Trip From Indicated Power Level at BOC
- 1.6.3.2, Xenon Worth After Trip From Indicated Power Level at MOC
- 1.6.3.3, Xenon Worth After Trip From Indicated Power Level at EOC

Straight Edge

Calculator

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Loss of Shutdown Margin

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

Waterford 3 Job Performance Measure

None

INSTRUCTOR NOTES

None

Waterford 3 Job Performance Measure

Perform OP-903-090 Shutdown Margin attachment 10.1.

Critical steps are denoted by **CRIT.**

START TIME_____

1. Document current Plant Data.

CUES: Cues required for this step are contained in the initial conditions.

STANDARDS: Candidate Records the following Data in:

1. Current Date and Time
2. Mode 3.
3. 250 EFPD
4. RCS Boron 1000 ppm
5. Tave 541°F
6. Duration of shutdown 12 hours
7. CEA position, all CEAs inserted

SAT_____ **UNSAT**_____

2. Determine current Xenon Free Shutdown Margin Boron Concentration for plant conditions.

CUES: None.

STANDARDS: Examinee determines 1200 (1190 to 1210) ppm from Figure 1.3.4.2, SDM concentration vs Burnup and records in step 7.1.3.1.1 on attachment 10.1

SAT_____ **UNSAT**_____

3. Enter Reactivity Bias factor from Reactor Engineering Book.

CUES: Cues required for this step are contained in the initial conditions.

STANDARDS: Examinee records 0.001 in step 7.1.3.1.2 attachment 10.1

SAT_____ **UNSAT**_____

4. Determine HZP Inverse Boron Worth.

CUES: None.

STANDARDS: Examinee determines HZP inverse Boron worth 127 (126.5 to 127.5) from curve 1.4.1 and records in step 7.1.3.1.3 attachment 10.1:

SAT_____ **UNSAT**_____

5. Determine current normalized Boron worth.

CUES: None.

STANDARDS: Examinee determines normalized boron worth 1.00 from curve 1.4.2 and records in step 7.1.3.4 on attachment 10.1:

SAT_____ **UNSAT**_____

Waterford 3 Job Performance Measure

6. Calculate current Xenon Free Shutdown Margin Boron Concentration.

CRIT

CUES: Initial conditions stated trip from xenon equilibrium conditions.

STANDARDS: Examinee determines current Xenon Free Boron Concentration to be 1200 (1190 to 1210) ppm and records in step 7.1.3.1.5 of attachment 10.1:

Note: Examinee should determine that initial conditions stated Xenon equilibrium conditions and xenon worth can be determined from figure 1.6.3.

SAT _____ UNSAT _____

7. Determine current Xenon Equivalent Boron Concentration.

CUES: None.

STANDARDS: Examinee determines current xenon reactivity worth for plant conditions to -3.90 (-3.85 to -3.95) % delta rho from figure 1.6.3.2 and records on step 7.1.3.3.1 on attachment 10.1:

SAT _____ UNSAT _____

8. Determine current HZP inverse boron worth.

CUES: None.

STANDARDS: Examinee determines HZP inverse worth 127 (126.5 to 127.5) ppm from figure 1.4.1 and records in step 7.1.3.3.2 on attachment 10.1

SAT _____ UNSAT _____

9. Determine current normalized boron worth.

CUES: None.

STANDARDS: Examinee determines normalized boron worth 1.00 from figure 1.4.2 and records in step 7.1.3.3.3 on attachment 10.1:

SAT _____ UNSAT _____

10. Calculate Xenon Equivalent Boron.

CRIT

CUES: None.

STANDARDS: Examinee determines Xenon Equivalent Boron -495 (-485 to -505) ppm and records in step 7.1.3.3.4:

SAT _____ UNSAT _____

11. Calculate Required Shutdown Margin Boron Concentration.

CRIT

CUES: None.

STANDARDS: Examinee determines Required Shutdown Margin Boron Concentration between 705 (685 to 725) ppm and records in step 7.1.3.4 on attachment 10.1:

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

12. Verify current RCS boron concentration $\geq$ Required Shutdown Margin Concentration.

CRIT

CUES: None.

STANDARDS: Examinee determines current RCS Boron Concentration is greater than Required Shutdown margin Boron Concentration:

SAT _____ UNSAT _____

13. Determine Xenon Equivalent Boron Concentration for 24 hours from present.

CUES: Inform the examinee that further calculation is not necessary for this JPM.

STANDARDS: None

SAT _____ UNSAT _____

14. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The Plant tripped 12 hours ago, the conditions prior to the trip were:

- 100% Xenon equilibrium conditions
- 250 EFPD
- RCS Boron Concentration 1000 ppm

Current Plant conditions:

- Mode 3
- Tave 541°F
- RCS Boron Concentration 1000 ppm
- All CEAs are inserted
- Reactivity Bias factor 0.001

INITIATING CUE

The Control Room Supervisor directs you to perform a Shutdown Margin Calculation. Shutdown Margin Verification for the next 24 hours is not required for this task.

PERFORM A CONTAINMENT PRESSURE CALCULATION



RO ADMIN 3

Site W3 Job RO System/Duty Area CB Mode SURV Number 3

Revision 0 08/28/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 20 Min

Time Critical No Critical Time N/A Alternate Path No

References

OP-903-001, Technical Specification Surveillance Logs
Technical Specification 3/4.6.1.4

NRC KA Number

2.2.12. RO: 3.0; SRO 3.4

Evaluation Methods

PERFORM

Trainee		Evaluator	
Observer		Date	
Satisfactory	☐	Unsatisfactory	☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is 100% power.

Containment Pressure Reduction has just been secured.

You note that Containment Pressure is -5.4 INWC (PMC Point A51000), and you inform the Control Room Supervisor.

The TGB Watch reports that barometric pressure, as measured from the TGB roof, is 29.44 INHG.

INITIATING CUE

The Control Room Supervisor directs you to perform a Containment Pressure Calculation to determine if absolute Containment internal pressure is within the limits of the Technical Specification Logs.

TERMINATING CUE

Candidate determines the correct absolute Containment internal pressure for the current condition.

STANDARD

Candidate determines that absolute Containment internal pressure is 14.290 (14.285 – 14.295) PSIA, which is within the limits of the Technical Specification Logs.

TOOLS

1. Copy of OP-903-001, Technical Specification Logs
2. Copy of Attachment 11.15, Containment Pressure Calculation (for candidate to mark up)
3. Calculator

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Inadvertent entry into a Technical Specification Action.

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

Familiarity with Technical Specification 3/4.6.1.4

INSTRUCTOR NOTES

If candidate does not add 0.05 INHG to the Barometric Pressure, as directed in Note 1, the final outcome will be Absolute Containment Internal Pressure being below the Tech Spec limit, and result in an inadvertent entry into the Action for Tech Spec 3.6.1.4.

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-903-001 Attachment 11.15. Critical steps are denoted by **CRIT**.

START TIME_____

-
- 1.** Fill in current barometric pressure.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: 1. Examinee records 29.49 INHG from Initial Conditions
2. Examinee must add 0.05 INHG to the 29.44 provided to meet requirement from Note 1.

SAT_____ **UNSAT**_____

-
- 2.** Fill in current Containment to Ambient Differential Pressure.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: Examinee records -5.4 INWC from Initial Conditions

SAT_____ **UNSAT**_____

-
- 3.** Calculate Barometric Pressure (BP) to PSIA

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Examinee records 14.485 PSIA (14.485 – 14.486)
2. Value comes from: 29.49×0.4912 (rounded down from 14.485488)

SAT_____ **UNSAT**_____

-
- 4.** Calculate Containment to Ambient D/P (C/A) to PSIA

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Examinee records -0.195 PSIA $[(-0.1949) - (-0.195)]$
2. Value comes from: -5.4×0.0361 (rounded up from -0.19494)

SAT_____ **UNSAT**_____

-
- 5.** Calculate Absolute Containment Internal Pressure (CP)

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Examinee records 14.290 PSIA (14.290 – 14.2911) PSIA, which is within the limits of the Technical Specification Logs.
2. Value comes from: $14.485 - 0.195$

SAT_____ **UNSAT**_____

Waterford 3 Job Performance Measure

-
6. Determines that Absolute Containment Internal Pressure is within the limits of the Technical Specification Logs

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: Compare actual pressure to Tech Spec Log Limit (> 14.275 PSIA) found on Attachment 11.1 (page 1 of 42).

SAT _____ **UNSAT** _____

-
7. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The plant is 100% power.

Containment Pressure Reduction is in progress.

You note that Containment Pressure is -5.4 INWC (PMC Point A51000), and you inform the Control Room Supervisor.

The TGB Watch reports that barometric pressure, as measured from the TGB roof, is 29.44 INHG.

INITIATING CUE

The Control Room Supervisor directs you to perform a Containment Pressure Calculation to determine if absolute Containment internal pressure is within the limits of the Technical Specification Logs.

REVIEW A RADIATION WORK PERMIT



RO ADMIN 1

Site W3 **Job** NAO **System/Duty Area** PPA **Mode** ADMIN **Number** 22

Revision 0 09/08/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 10 Min

Time Critical No **Critical Time** N/A **Alternate Path** No

References

ENS-RP-105, Radiation Work Permits

NRC KA Number

2.3.10 (RO: 2.9; SRO: 3.3)

Evaluation Methods

PERFORM

Trainee		Evaluator	
Observer		Date	
Satisfactory	☐	Unsatisfactory	☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

Low Pressure Safety Injection Pump A is being prepared to replace the pump impeller.
The pump has been isolated and is ready for draining and venting at the following valves:

- SI-114A, LPSI Pump A Suction Drain Valve
- SI-1141A, LPSI Pump A Discharge PX Root Valve

Radwaste has connected and lined up the required hoses.

INITIATING CUE

The Control Room directs you to locally vent and drain LPSI Pump A with the following valves:

- SI-114A, LPSI Pump A Suction Drain Valve
- SI-1141A, LPSI Pump A Discharge PX Root Valve

Show me the radiological preparations you would make prior to entering the RCA.

Describe to me all the radiological instructions that apply to you in the performance of this task.

TERMINATING CUE

Examinee reviews the survey map and the RWP, and describes the applicable Worker Instructions of the RWP.

STANDARD

Examinee locates and reviews the survey map for -35 RAB Safeguards Room "A".

Examinee locates and reviews RWP 2006-0002 for Operations personnel.

Examinee describes all applicable Worker Instructions of the RWP for entering a HRA/HCA.

TOOLS

NONE

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Noncompliance with the Waterford 3 ALARA program.

Personnel contamination.

HUMAN INTERFACES

ATC/BOP

SKILLS / KNOWLEDGES

None

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INFORMATION

Waterford 3 Job Performance Measure

Perform the task in accordance with ENS-RP-105, Radiation Work Permits. Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Review the survey map on the RADS computer screen.

CRIT

CUES: Cues required for this step are contained in the Initiating Cue.

- STANDARDS:**
1. Examinee locates and reviews the survey map for -35 RAB Safeguards Room "A".
 2. Examinee recognizes that the valves to be operated are located in a High Radiation Area/High Contamination Area (at LPSI Pump A).

SAT _____ UNSAT _____

-
2. Locate and review the RWP.

CRIT

CUES: Cues required for this step are contained in the Initiating Cue.

STANDARDS: Examinee locates and reviews RWP 2006-0002 for Operations personnel.

SAT _____ UNSAT _____

-
3. Describe all applicable Worker Instructions of the RWP for entering a HRA/HCA.

CRIT

CUES: Cues required for this step are contained in the Initiating Cue.

STANDARDS: Note: Critical elements are in **BOLD**:

1. **Notify HP prior to filling/venting/draining radioactive systems and components.**
2. Status Board/Area Postings should be reviewed, or HP contacted as appropriate to ensure awareness of radiological conditions in work area.
3. **Conduct a face to face briefing with HP.**
4. Periodically check EAD. Secure from work, inform coworkers, exit area, and notify HP/SCT if a dose alarm is received or dose rate continuously alarms.
5. **Full PCs are required.**
6. HP may require additional PCs.
7. **Peer check that you have EAD & TLD prior to entering HRA.**

SAT _____ UNSAT _____

-
4. End of Task

STOP TIME _____

REVIEW A MANUAL CEA SUBGROUP SELECTION



SRO ADMIN 1

Site W3 Job SRO System/Duty Area RXC Mode NORM Number 1

Revision 0 08/24/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 20 Min

Time Critical No Critical Time N/A Alternate Path No

References

OP-004-015, Reactor Power Cutback System
Plant Data Book

NRC KA Number

2.1.20

2.1.23

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is holding at 78.2% (PMC Point C24107) power at Woodlands' request.
Regulating Group 6 CEAs are selected for Reactor Power Cutback.
Core Burnup is 271 EFPD (PMC Point C24110).
Steam Bypass Control Valve, MS-320B, has been removed from service due to erratic behavior.

INITIATING CUE

The At The Controls Operator requests you to review a Manual CEA Subgroup Selection calculation that you had directed him/her to perform.

TERMINATING CUE

Candidate determines the correct CEA Subgroup Selection for the current condition.

STANDARD

Candidate recognizes errors in the calculation and determines that Subgroups 5 and 11 (Reg Groups 5 and 6) should be selected for Reactor Power Cutback.

TOOLS

1. Copy of OP-004-015, Reactor Power Cutback System
2. Copy of the Plant Data Book
3. Copy of Plant Data Book Figure 1.7.2.1, Power Level After Drop of Bank 6 (or 6 + 5) From Indicated Power Level (for candidate to mark up)
4. Calculator

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Reactor power will be above SBCS capabilities if a Reactor Power Cutback were to occur.

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

This task is normally performed while raising power to 100%. OP-010-004 directs placing Cutback in service above 65% power, and then it directs re-evaluation of the subgroups selected to drop prior to exceeding 90% power. When one SBCS valve became inoperable at 78% power, it became necessary to re-evaluate at that time.

Note that CEA Subgroup 5 is the same as Regulating Group 6, and CEA Subgroup 11 is the same as Regulating Group 5.

Waterford 3 Job Performance Measure

Review the calculation in accordance with OP-004-015 Attachment 11.1. Critical steps are denoted by **CRIT**.

START TIME_____

-
1. Verify current reactor power.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: Candidate verifies that 78.2% is correct
:

SAT_____ **UNSAT**_____

-
2. Verify current EFPD.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: Candidate verifies that 271 is correct

SAT_____ **UNSAT**_____

-
3. Verify number of Operable SBCS Valves

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: 1. Candidate determines that 6 is incorrect
2. 6 total SBCS valves minus 1 that is inoperable should be 5 valves

SAT_____ **UNSAT**_____

-
4. Verify maximum allowed reactor power after Reactor Cutback

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Candidate determines that 59.28% is incorrect
2. Value should be 5×9.88 , which equals 49.4%

SAT_____ **UNSAT**_____

-
5. Using result from Step 11.1.4 and Figure 1.7.2.1, verify the Subgroups that should be selected for Reactor Power Cutback..

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Refer to PDB Figure 1.7.2.1
2. Candidate determines that "Subgroup 5" is incorrect
3. Correct alignment should be "Subgroups 5 & 11"

Note: Subgroup 5 alone would place the final power level above 49.4% (approx 50-52%). Subgroups 5 and 11 would place the final power level above 20% (approx 23-25%).

SAT_____ **UNSAT**_____

-
6. End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Waterford 3 Job Performance Measure

Candidate copy

INITIAL CONDITIONS

The plant is holding at 78.2% (PMC Point C24107) power at Woodlands' request.
Regulating Group 6 CEAs are selected for Reactor Power Cutback.
Core Burnup is 271 EFPD (PMC Point C24110).
Steam Bypass Control Valve, MS-320B, has been removed from service due to erratic behavior.

INITIATING CUE

The At The Controls Operator requests you to review a Manual CEA Subgroup Selection calculation that you had directed him/her to perform.

EVALUATE PROPOSED WORK SCHEDULE AGAINST ESTABLISHED OVERTIME GUIDELINES



RO ADMIN 2

Site W3 Job SRO System/Duty Area PPA Mode ADMIN Number 4

Revision 0 09/15/2006

Approval _____ 09/15/2006
Arvel J. Hall

Estimated Time 20 Min

Time Critical No Critical Time N/A Alternate Path No

References

OM-123, Working Hour Limits
Tech Spec 6.2.2, Unit Staff

NRC KA Number

2.1.4 (RO: 2.3; SRO: 3.4)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is holding at 100% power.

Operations shift manning is being severely affected due to a flu epidemic.

All healthy licensed operators are being scheduled to work rolling overtime hours in order to cover shift vacancies.

Listed below is a proposed Work Schedule for one of your reactor operator, whose schedule starts on the 21st.

NOVEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT
		14 OFF	15 OFF	16 1800-0600	17 1800-0600	18 1800-0600
19 OFF	20 OFF	21 START 0600-2000	22 0600-1400	23 0600-2000	24 0200-1000	25 0000-1400
26 0000-1200	27 0600-1800	28 OFF				

Note: All work hours shown exclude turnover time.

INITIATING CUE

One of your reactor operators brings you this proposed Work Schedule, which begins on November 21st, for review and approval. Review the proposed schedule to determine compliance with the Working Hour Limits.

TERMINATING CUE

Examinee determines that the proposed schedule will require additional authorization.

STANDARD

Examinee determines 4 conditions requiring additional authorization (VP, GM, or designee):

1. Does not meet the 8 hours between shifts. Scheduled for 6 hours off (Friday).
2. Exceeds 16 in 24 hour limit. Scheduled for 18 hours (Friday).
3. Exceeds 24 in 48 hour limit. Scheduled for 26 hours in 48 hours (Sunday).
4. Exceeds 72 hour limit. Scheduled for 84 hours in 7 days (Monday).

TOOLS

OM-123, Working Hour Limits
Calculator

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Fatigue from working excessive hours could reduce the ability of the individual in keeping the reactor in a safe condition during the performance of safety-related functions.

HUMAN INTERFACES

Reactor Operator

SKILLS / KNOWLEDGES

Waterford 3 Job Performance Measure

None

INSTRUCTOR NOTES

Provide the Examinee a copy of OM-123, Working Hour Limits.

Waterford 3 Job Performance Measure

Review the work schedule and compare to the guidelines in OM-123, Working Hour Limits. Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Candidate reviews the Overtime Guidelines and determines that working hour limits are exceeded by this schedule.

CRIT

CUES: Cues required for this step are contained in the policy.

STANDARDS Candidate determines 4 conditions that exceed the working hour limits (step 5.2.2):

:

1. Does not meet the 8 hours between shifts. Scheduled for 6 hours off (Friday).
2. Exceeds 16 in 24 hour limit. Scheduled for 18 hours (Friday).
3. Exceeds 24 in 48 hour limit. Scheduled for 26 hours in 48 hours (Sunday).
4. Exceeds 72 hour limit. Scheduled for 84 hours in 7 days (Monday).

SAT _____ **UNSAT** _____

-
2. Candidate reviews the Authorization Guidelines of OM-123.

CRIT

CUES: Cues required for this step are contained in the policy.

STANDARDS Candidate determines that management approval (VP, GM, or designee) is required prior to exceeding the limits (step 5.3.1.c):

:

SAT _____ **UNSAT** _____

-
3. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The plant is holding at 100% power.

Operations shift manning is being severely affected due to a flu epidemic.

All healthy licensed operators are being scheduled to work rolling overtime hours in order to cover shift vacancies.

Listed below is a proposed Work Schedule for one of your reactor operator, whose schedule starts on the 21st.

NOVEMBER						
SUN	MON	TUE	WED	THU	FRI	SAT
		14 OFF	15 OFF	16 1800-0600	17 1800-0600	18 1800-0600
19 OFF	20 OFF	21 START 0600-2000	22 0600-1400	23 0600-2000	24 0200-1000	25 0000-1400
26 0000-1200	27 0600-1800	28 OFF				

Note: All work hours shown exclude turnover time.

INITIATING CUE

One of your reactor operators brings you this proposed Work Schedule, which begins on November 21st, for review and approval. Review the proposed schedule to determine compliance with the Working Hour Limits.

PERFORM AN SRO REVIEW OF A CONTAINMENT PRESSURE CALCULATION



SRO ADMIN 3

Site W3 **Job** SRO **System/Duty Area** CB **Mode** SURV **Number** 1

Revision 0 08/28/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 20 Min

Time Critical No **Critical Time** N/A **Alternate Path** No

References

OP-903-001, Technical Specification Surveillance Logs
Technical Specification 3/4.6.1.4

NRC KA Number

2.2.12

2.2.22

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is 100% power.

Containment Pressure Reduction has just been secured.

Containment Pressure is -5.4 INWC (PMC Point A51000), and you direct the ATC to perform a Containment Pressure Calculation to determine if absolute Containment internal pressure is within the limits of the Technical Specification Logs.

Barometric Pressure is 29.44 INHG (PMC Point C48516).

INITIATING CUE

The ATC informs you that absolute Containment internal pressure is within the limits of the Technical Specification Logs. The ATC presents you a completed Attachment 11.15, Containment Pressure Calculation, to review.

TERMINATING CUE

Candidate determines the correct absolute Containment internal pressure for the current condition.

STANDARD

Candidate determines that absolute Containment internal pressure is 14.266 (14.265 – 14.2661) PSIA, which is outside the limits of the Technical Specification Logs.

TOOLS

1. Copy of OP-903-001, Technical Specification Logs
2. Copy of Attachment 11.15, Containment Pressure Calculation (performed by the ATC)
3. Calculator

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Missed Technical Specification Action entry.

Possibility of exceeding design peak clad temperature and oxidation following a LOCA (Basis for TS 3.6.1.4).

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

Familiarity with Technical Specification 3/4.6.1.4

INSTRUCTOR NOTES

Examiner may note that there are no Performance, Verification, or Reviewer signatures on this form. This is because this form becomes part of the Tech Specs Surveillance Logs, which are reviewed on the final page of the logs. All calculations are also verified on the same page of the logs.

Waterford 3 Job Performance Measure

Review OP-903-001 Attachment 11.15 and determine errors in the calculation. Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Step 11.15.1, Barometric Pressure.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: 1. **29.49 INHG is incorrect. Should be 29.44 INHG. (Critical)**

: 2. ATC had incorrectly applied Note 1 and added 0.05 INHG. **(Not Critical)**

SAT _____ UNSAT _____

-
2. Step 11.15.3, Convert Barometric Pressure to PSIA.

CRIT

CUES: Cues required for this step are contained in the Initial Conditions

STANDARDS: 1. **Value should be 14.461 (14.460 to 14.461) (Critical)**

2. Error carried forward from Step 11.15.1. **(Not Critical)**

SAT _____ UNSAT _____

-
3. Step 11.15.4, Convert Containment to Ambient D/P (C/A) to PSIA

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. **Value should be -0.195 (-.01949 to -0.195) (Critical)**

2. ATC transposed 0.0361 to 0.0316 when multiplying. **(Not Critical)**

SAT _____ UNSAT _____

-
4. Step 11.15.5, Calculate Absolute Containment Internal Pressure (CP)

CRIT

CUES: Cues required for this step are contained in the procedure

STANDARDS: 1. Final value should be 14.266 (14.265 to 14.2661) **(Critical)**

2. Error carried forward on CP. Should be 14.461 (14.460 to 14.461) **(Not Critical)**

3. Error carried forward on BP. Should be -0.195 (-.01949 to -0.195). ATC also forgot the (-) sign and added the number instead of subtracted. **(Not Critical)**

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

-
5. ATC had determined that Absolute Containment Internal Pressure is within the limits of the Technical Specification Logs. This is an incorrect assessment.

CRIT

CUES: Cues required for this step are contained in the procedure

- STANDARDS:**
1. Compare actual pressure to Tech Spec Log Limit (> 14.275 PSIA) found on Attachment 11.1 (page 1 of 42) or to Tech Spec 3.6.1.4.
 2. Determine that Tech Spec 3.6.1.4 Action applies: Restore internal pressure to above 14.275 within 1 hour or be in at least Hot Standby within the next 6 hours.

SAT _____ **UNSAT** _____

-
6. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The plant is 100% power.

Containment Pressure Reduction has just been secured.

Containment Pressure is -5.4 INWC (PMC Point A51000), and you direct the ATC to perform a Containment Pressure Calculation to determine if absolute Containment internal pressure is within the limits of the Technical Specification Logs.

Barometric Pressure is 29.44 INHG (PMC Point C48516).

INITIATING CUE

The ATC informs you that absolute Containment internal pressure is within the limits of the Technical Specification Logs. The ATC presents you a completed Attachment 11.15, Containment Pressure Calculation, to review.

REVIEW AND APPROVE A GASEOUS RELEASE PERMIT



SRO ADMIN 4

Site W3 **Job** SRO **System/Duty Area** **RMS** **Mode** NORM **Number** 6

Revision 2 09/16/2006

Approval _____ 09/16/2006
Arvel J. Hall

Estimated Time 20 Min

Time Critical No **Critical Time** N/A **Alternate Path** YES

References

OP-007-003, Gaseous Waste Management
TRM 3.3.3.11, Radioactive Gaseous Effluent

NRC KA Number

2.3.6 (SRO: 3.1)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

1. Gas Decay Tank C (and B) is to be discharged via Batch Release
2. Noble Gas Monitor, PRM -IRE-0648 is INOPERABLE, TRM 3.3.3.11 entered
3. Waste Flow Rate Measurement Device, GWM-IFT-0648 is INOPERABLE, TRM 3.3.3.11 entered
4. Meteorological conditions:
 - Primary Met Tower $\Delta T/50m$ reading is 1.1°C
 - Ten Meter Wind Speed is 2 meters per second
 - Wind Direction 270°
5. RAB Exhaust Fan A is running

INITIATING CUE

One of your reactor operators has completed OP-007-003 Section 6.4, Discharging Gas Decay Tank, steps 6.4.1 to 6.4.4. As CRS, perform the reviews necessary to give your approval to release the GDTs specified on the release permit.

TERMINATING CUE

GDT release is not permitted due to meteorological conditions.

STANDARD

Examinee recognizes the following:

- Chemistry should have independently verified release rate calculations (Action 1.b).
- Operations must perform an independent valve lineup for the discharge (Action 1.b).
- Operations must estimate Waste (Process) flow rate must be estimated at least once every 4 hours during the discharge (Action 5).
- Step 6.4.4 (and Att. 11.5): Meteorological Conditions Requirements are NOT satisfied for release. Meteorological conditions are Pasquill Stability Class F, which will not allow the release.

TOOLS

1. Batch Release permit for GDT C Revised for JPM
2. TRM 3.3.3.11, Radioactive Gaseous Effluent
3. OP-007-003 Section 6.4, Discharging Gas Decay Tank
4. OP-007-003 Attachment 11.5, Meteorological Conditions Requirements

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Exceed Offsite Release Limits.

HUMAN INTERFACES

None

SKILLS / KNOWLEDGES

None

Waterford 3 Job Performance Measure

INSTRUCTOR NOTES

None

Waterford 3 Job Performance Measure

Review the Gaseous Batch Release Permit. Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Review TRM 3.3.3.11, Radioactive Gaseous Effluent for Noble Gas Monitor, PRM IRE-0648, being Inoperable. **CRIT**

CUES: CUE: Provided by the Batch Release Permit and the TRM.

STANDARDS Examinee recognizes that with PRM IRE-0648 Inoperable:

:

- Two independent samples should have been taken by Chemistry was correct (Action 1.a).
- Chemistry should have independently verified release rate calculations (Action 1.b).
- Operations must perform an independent valve lineup for the discharge (Action 1.b)..

SAT ____ UNSAT ____

-
2. Review TRM 3.3.3.11, Radioactive Gaseous Effluent for Waste Flow Rate Measurement Device, GWM-IFT-0648, being Inoperable. **CRIT**

CUES: CUE: Provided by the Batch Release Permit and the TRM.

STANDARDS Examinee recognizes that with GWM-IFT-0648 Inoperable:

:

Operations must estimate Waste (Process) flow rate must be estimated at least once every 4 hours during the discharge (Action 5).

SAT ____ UNSAT ____

-
3. Review meteorological conditions proper for release per step 6.4.4 of OP-007-003. **CRIT**
Review steps 6.4.1 through 6.4.4 as performed by the reactor operator.

CUES: CUE: Provided by the procedure OP-007-003.

STANDARDS Examinee recognizes the following:

:

- Step 6.4.1: Gaseous Release Permit is issued.
- Step 6.4.2: Not discharging all GDT (only B and C); therefore, "N/A" is correct.
- Step 6.4.3: Source Check is not required since PRM IRE-0648 is Inoperable); therefore, "N/A" is correct.
- **Step 6.4.4 (and Att. 11.5): Meteorological Conditions Requirements are NOT satisfied for release. Met conditions are Pasquill Stability Class F, which will not allow the release.**

NOTE: Critical step is **BOLDED**.

SAT ____ UNSAT ____

Waterford 3 Job Performance Measure

4. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee Copy

INITIAL CONDITIONS

1. Gas Decay Tank C (and B) is to be discharged via Batch Release
2. Noble Gas Monitor, PRM -IRE-0648 is INOPERABLE, TRM 3.3.3.11 entered
3. Waste Flow Rate Measurement Device, GWM-IFT-0648 is INOPERABLE, TRM 3.3.3.11 entered
4. Meteorological conditions:
 - Primary Met Tower $\Delta T/50m$ reading is $1.1^{\circ}C$
 - Ten Meter Wind Speed is 2 meters per second
 - Wind Direction 270°
5. RAB Exhaust Fan A is running

INITIATING CUE

One of your reactor operators has completed OP-007-003 Section 6.4, Discharging Gas Decay Tank, steps 6.4.1 to 6.4.4. As CRS, perform the reviews necessary to give your approval to release the GDTs specified on the release permit.

R TYPE K 2.28

Gaseous Waste Batch Release Permit

Permit Number : GB2006-0032

Entergy Operations, Inc. Waterford Steam Electric Station Unit III

Release Point (6) : Gas Decay Tank 'C'

Waste Volume : 1.1669e+04 cuft

Minimum Dilution Flow : 9.3000e+04 cfm

Maximum Waste Flow : 100.0 cfm

** Concurrent with Permit Number GC2005-0027 : (1) Reactor Auxiliary Building Exhaust

** Concurrent with Permit Number GC2005-0028 : (2) Fuel Handling Building Normal Exhaust

Nuclide Data Concentration Est. Release Rate Est. Activity Released

XX

Noble Gases 4.35e-04 uCi/cc 2.05e+01 uCi/sec 1.44e-01 Ci

Radioiodines 0.00e+00 uCi/cc 0.00e+00 uCi/sec 0.00e+00 Ci

Particulates 0.00e+00 uCi/cc 0.00e+00 uCi/sec 0.00e+00 Ci

Estimated Maximum Organ Dose : 0.0000 mrem for the Infant Thyroid

XX

Estimated Doses & Air Gamma Air Beta Infant Thyroid

Percent of Limits mrad %limit mrad %limit mrem %limit

XX

This Release 1.76e-05 n/a 5.34e-05 n/a 0.00e+00 n/a

31 Day 1.82e-05 0.01% 5.47e-05 0.01% 2.05e-03 0.68%

Qtr to Date 4.12e-05 0.00% 1.23e-04 0.00% 4.63e-03 0.06%

Year to Date 4.40e-02 0.44% 1.46e-01 0.73% 2.49e-01 1.66%

Release Setpoint For PRM-IRE-0648 : PRM-IRE-0648 inoperable

Special Conditions : PRM-IRE-0648 inoperable.

Multiple Gas Decay Tank Release. Additional Tank(s) Released: GDT B.

Prepared By (cguy)

Reviewed By :

Approved By (CRS/SS)

Date : 11/15/06

Date : 11/15/06

Date/

PRM-IRE-0648 Radiation Monitor Source Check : N/A (Ops) Channel Check : (Ops)

Meteorological Conditions Satisfied : U (Ops)

Initial Release START Date Time Final Release STOP Date Time

Release Interruptions

Release Restart

Release Stop

Release Period

Gas Decay Tank Pressures

Date	Time	Date	Time	Duration	min	Init Press	Final Press	Net Press	Volume (cuft)
/	/	/	/		min	GDT A			
/	/	/	/		min	GDT B			
/	/	/	/		min	GDT C			
/	/	/	/		min				
/	/	/	/		min				

Total Duration of ALL release periods : min

Total Net Pressure : psi
Total Volume Released : cuft

Remarks :

Release Completed By : Date/Time :

Operations

Release Reviewed By : Date/Time :

CRS/SS

Release Reviewed By : Date/Time :

HP Foreman/Designee

BATCH GASEOUS RADIOACTIVE RELEASE REQUEST

OPERATIONS

☒ GAS DECAY TANK

(Enter All of the Tank Pressures)

(Gas Decay Tank in Service)

☐ A ☒ B ☒ C

49.6 psig 113.1 psig 172.8 psig

☒ A ☐ B ☐ C

☐ Containment Purge With Mechanical Stops Installed (16000 CFM)

☐ Containment Purge Without Mechanical Stops (60000 CFM)

☐ Containment ILRT Depressurization - CTMT Pressure - _____ psia

LCO's Affecting Release *TRM3.3.3.11 (GWM RAD Monitor PRM-IRE-0648 OOS*

TRM3.3.3.11 (Waste Gas Flow Transmitter PRM-IFIT-0648 OOS

Requested By: *Dan Connett* Date/Time: 11/15/06 0708

CHEMISTRY

(For Containment Purge/Depressurization Only)

Tritium Sampled By: *N/A* Date/Time: *N/A*

(Attach Results to Release Request)

Release Permit # GB- 06-032

Gas Decay Tank Volume Calculation (N/A as Appropriate):

GDT A Volume = 40.82 (*N/A*) = *N/A* SCF
PRESS

GDT B Volume = 40.82 (*113.1*) = *4617* SCF
PRESS

GDT C Volume = 40.82 (*172.8*) = *7054* SCF
PRESS

Total Press = 285.9

TOTAL
VOLUME = 11671 SCF

R-Type: C6.69
Sample Type: GDT

Waterford 3 Chemistry Department

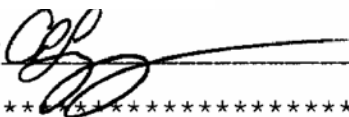
⑤

Sample Description: GDT C Noble Gas Duplicate

Detector: Hot Lab #1
Sample Volume: 1.000E+01 cc
GDT Pressure: 172.50 psig
Spectrum: 01_08903
GDT Volume: 600.00 cft

Sample Start: 15-Nov-2006 15:01
Sample Stop: 15-Nov-2006 15:01

Acquired: 15-Nov-2006 15:02:39
Report Created: 15-Nov-2006 15:36

Performed by 

Reviewed by N/A

Efficiency: Detector #1 33cc Gas Sphere Shelf #1
Library: Noble_Gas.lib

Nuclide	Activity (uCi/cc)	Adjustment Factor	Equivalent Xe-133 (uCi/cc)
Xe-133	4.18E-04 *	1.0000	4.18E-04
Xe-133m	1.67E-05 *	0.8537	1.43E-05
Kr-87	<1.67E-06	---	---
Kr-88	<4.61E-06	---	---
Xe-135	<1.17E-06	---	---
Xe-138	<1.04E-05	---	---
Total	4.35E-04		4.32E-04

Total Equivalent Xe-133 Activity = 9.35E-02 Curies

Unidentified Peak Resolution

661.64 - Cs-137
795.55 - Cs-134

Comments:
None

Sample description
GDT C Noble Gas Duplicate

Spectrum Filename: C:\User\SPC\01_08903.An1

Acquisition information

Start time 15-Nov-2006 15:02:39
Live time 2000
Real time 2019
Dead time .95%
Detector/Geometry IDs 1 & 0

Detector system
Hot Lab #1

Calibration

Filename: 01_33cc Gas Sphere 01.clb
Created: 06-Nov-2002 10:47:58 & 06-Nov-2002 10:47:59
Detector #1 33cc Gas Sphere Shelf #1

Zero offset .190 keV; Gain .500 keV/channel
Quadratic .371E-07 keV/channel^2

Efficiency Calibration

Polynomial Uncertainty = .77%
Coefficients:
-.320824 -5.532561 .741966 -.094283 .005212 -.000122

Library Files

Main analysis library: Noble Gas.lib
Library Match Width: .500
Library based peak stripping used.

Analysis parameters

Start channel 80 for an energy of 40.18keV
Stop channel 4000 for an energy of 2000.14keV
Peak rejection level 35.000%
Peak search sensitivity: 1
Sample Size: 10.000
Activity scaling factor $1.0000E+00 / (1.0000E+00 * 1.0000E+01)$
= 1.0000E-01
Detection limit method:
Nureg 0472 Method
Additional random error: 1.0000000E+00
Additional systematic error: 1.0000000E+00
Fraction Limit: .000%
Background width: best method (based on spectrum).

Corrections	Status	Comments
Decay correct to date	YES	15-Nov-2006 15:01:00
Decay during acquisition	YES	
Decay during collection	NO	
Peaked background correction	YES	01 Background.Pbc
		15-Nov-2006 01:22:49
Absorption (Internal)	NO	
Geometry correction	NO	
Random summing	NO	

Energy calibration normalized difference: 1.0000

***** SUMMARY OF PEAKS IN RANGE *****

PEAK ENERGY	AREA	UNCERT	FWHM	CORRCTN FACTOR	NUCLIDE ENERGY	BRNCH. RATIO	ACT. uCi/cc	NUC
80.99	2567.	2.90	1.10	2.236E-02	81.00	37.100	4.180E-04	Xe131
233.20	29.	31.32	1.05	2.260E-02	233.20	10.300	1.671E-05	Xe135

***** UNIDENTIFIED PEAK SUMMARY *****

PEAK CHANNEL	CENTROID ENERGY	BACKGROUND COUNTS	NET AREA COUNTS	EFFICIENCY * AREA	UNCERT 1 SIGMA %	FWHM keV	SUSPECTED NUCLIDE
1323.19	661.64	0.	62.	7.697E+03	12.70	1.518	- s
1591.06	795.55	0.	18.	2.656E+03	23.57	1.229	- s

s Peak fails shape tests.
 D Peak area deconvoluted.
 L Peak written from unknown list.
 C Area < Critical level.

***** DISCARDED ISOTOPE PEAKS *****

NUCLIDE	CENTROID ENERGY	BACKGROUND COUNTS	NET AREA COUNTS	INTENSITY CTS/SEC	UNCERT 1 SIGMA %	ACTIVITY
P - Peakbackground subtraction						

 This section based on library: Noble_Gas.lib

```
***** I D E N T I F I E D   P E A K   S U M M A R Y *****
NUCLIDE      PEAK CENTROID BACKGROUND NET AREA INTENSITY UNCERT FWHM
CHANNEL      ENERGY COUNTS COUNTS CTS/SEC 1 SIGMA % keV
+-----+-----+-----+-----+-----+-----+-----+-----+
Xe-133      161.64    80.99    397.    2567.    1.283    2.90    1.099s
Xe-133m     465.16   232.70     18.     29.     .014   31.32    1.054s
```

s Peak fails shape tests.
 D Peak area deconvoluted.
 A Derived peak area.

```
***** S U M M A R Y   O F   L I B R A R Y   P E A K   U S A G E   *****
- NUCLIDE - AVERAGE ----- PEAK -----
NAME CODE ACTIVITY ENERGY ACTIVITY CODE MDA VALUE
uCi/cc keV uCi/cc uCi/cc COMMENTS
+-----+-----+-----+-----+-----+-----+-----+-----+
Xe-133      4.1802E-04
              81.00 4.180E-04 @ ( 1.512E-05    2.90 3.71E+01 G
              160.60 0.000E+00 % 1.226E-03 293.26 6.50E-02 G
              302.85 0.000E+00 % 1.300E-02 161.25 5.00E-03 G
Xe-133m     1.6707E-05
              233.20 1.671E-05 * ( 1.163E-05 31.32 1.03E+01
```

(- This peak used in the nuclide activity average.

- * - Peak is too wide, but only one peak in library.
- ! - Peak is part of a multiplet and this area went negative during deconvolution.
- ? - Peak is too narrow.
- @ - Peak is too wide at FW25M, but ok at FWHM.
- % - Peak fails sensitivity test.
- \$ - Peak identified, but first peak of this nuclide failed one or more qualification tests.
- + - Peak activity higher than counting uncertainty range.
- - Peak activity lower than counting uncertainty range.
- = - Peak outside analysis energy range.
- & - Calculated peak centroid is not close enough to the library energy centroid for positive identification.
- P - Peakbackground subtraction
- } - Peak is too close to another for the activity to be found directly.

Nuclide Codes:

- T - Thermal Neutron Activation
- F - Fast Neutron Activation
- I - Fission Product
- N - Naturally Occurring Isotope
- P - Photon Reaction

Spectrum name: 01 08903.An1

C - Charged Particle Reaction

M - No MDA Calculation

Peak Codes:

G - Gamma Ray

X - X-Ray

P - Positron Decay

S - Single-Escape

D - Double-Escape

K - Key Line

A - Not in Average

***** SUMMARY OF NUCLIDES IN SAMPLE *****

TIME OF COUNT TIME CORRECTED UNCERTAINTY 1 SIGMA

NUCLIDE	ACTIVITY uCi/cc	ACTIVITY uCi/cc	COUNTING
---------	--------------------	--------------------	----------

		1	2	3	4
Kr-87	<	1.6420E-06	1.6668E-06	0.000E+00%	0.000E+00%
Kr-88	<	4.5779E-06	4.6088E-06	0.000E+00%	0.000E+00%
Xe-133	#	4.1795E-04	4.1802E-04	2.900E+00%	
Xe-133m	#	1.6701E-05	1.6707E-05	3.132E+01%	
Xe-135	<	1.1626E-06	1.1650E-06	0.000E+00%	0.000E+00%
Xe-138	<	9.5604E-06	1.0366E-05	0.000E+00%	0.000E+00%

All peaks for activity calculation had bad shape.

* Activity omitted from total

& Activity omitted from total and all peaks had bad shape.

```
< MDA value printed.
```

A Activity printed, but activity < MDA.

C Area < Critical level.

S U M M A R Y

TOTAL ACTIVITY (40.2 to 2000.1 keV) 4.3465510E-04 uCi/cc

TOTAL DECAYED ACTIVITY (40.2 to 2000.1 keV) 4.3472370E-04 uCi/cc

R-Type: C6.69
Sample Type: GDT

Waterford 3 Chemistry Department

③

Sample Description: GDT C Noble Gas

Detector: Hot Lab #1
Sample Volume: 1.000E+01 cc
GDT Pressure: 172.50 psig

Spectrum: 01_08902
GDT Volume: 600.00 cft

Sample Start: 15-Nov-2006 4:06
Sample Stop: 15-Nov-2006 4:06

Acquired: 09/07/2005 14:07:50
Report Created: 09/07/2005 14:41

Performed by 

Reviewed by 

Efficiency: Detector #1 33cc Gas Sphere Shelf #1
Library: Noble_Gas.lib

Nuclide	Activity (uCi/cc)	Adjustment Factor	Equivalent Xe-133 (uCi/cc)
Xe-133	2.96E-04	1.0000	2.96E-04
Kr-87	<4.04E-06	---	---
Kr-88	<4.19E-06	---	---
Xe-133m	<1.11E-05	---	---
Xe-135	<1.17E-06	---	---
Xe-138	<9.23E-06	---	---
Total	2.96E-04		2.96E-04

Total Equivalent Xe-133 Activity = 6.40E-02 Curies

Unidentified Peak Resolution

605.14 - Cs-134
661.84 - Cs-137

Comments:
None

Sample description
GDT C Noble Gas

Spectrum Filename: C:\User\SPC\01_08902.An1

Acquisition information

Start time 15-Nov-2006 14:07:50
Live time 2000
Real time 2019
Dead time .92%
Detector/Geometry IDs 1 & 0

Detector system
Hot Lab #1

Calibration

Filename: 01_33cc_Gas_Sphere_01.clb
Created: 06-Nov-2002 10:47:58 & 06-Nov-2002 10:47:59
Detector #1 33cc Gas Sphere Shelf #1

Zero offset .190 keV; Gain .500 keV/channel
Quadratic .371E-07 keV/channel^2

Efficiency Calibration

Polynomial Uncertainty = .77%
Coefficients:
-.320824 -5.532561 .741966 -.094283 .005212 -.000122

Library Files

Main analysis library: Noble_Gas.lib
Library Match Width: .500
Library based peak stripping used.

Analysis parameters

Start channel 80 for an energy of 40.18keV
Stop channel 4000 for an energy of 2000.14keV
Peak rejection level 35.000%
Peak search sensitivity: 1
Sample Size: 10.000
Activity scaling factor $1.0000E+00 / (1.0000E+00 * 1.0000E+01)$
= 1.0000E-01
Detection limit method:
Nureg 0472 Method
Additional random error: 1.0000000E+00
Additional systematic error: 1.0000000E+00
Fraction Limit: .000%
Background width: best method (based on spectrum).

DETERMINE EMERGENCY PLAN CLASSIFICATION



SRO ADMIN 5

Site W3 **Job** SRO **System/Duty Area** **PPE** **Mode** EMERG **Number** 1

Revision 0 09/15/2006

Approval _____ 09/15/2006
Arvel J. Hall

Estimated Time 10 Min

Time Critical No **Critical Time** N/A **Alternate Path** No

References

EP-001-001, Emergency Plan Implementing Document

NRC KA Number

2.4.41 (RO: 2.3, SRO: 4.1)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

Initial Conditions are based upon the scenario chosen. The candidate should refer to the rough logs that were maintained during the scenario and to the indications available on the simulator.

INITIATING CUE

Classify the event for the current scenario and determine the correct Emergency Plan Implementing Procedure to be entered.

TERMINATING CUE

The correct level of emergency has been declared..

STANDARD

☐ Scenario 1:

Candidate classifies event as ALERT (SA1) due to the loss of offsite power and EDG B OOS for > 15 minutes.

☐ Scenario 2:

Candidate classifies event as ALERT (FA1/RCB1) due to the loss of the RCS barrier.

☐ Scenario 3:

Candidate classifies event as ALERT (FA1/RCB2) due to the loss of the RCS barrier.

TOOLS

EP-001-001, Emergency Plan Implementing Document

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Incorrect Emergency Classification.

HUMAN INTERFACES

None

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

This JPM is written to match any of the 3 scenarios prepared for this exam.

Waterford 3 Job Performance Measure

Perform the task in accordance with EP-001-001, Emergency Plan Implementing Document. Critical steps are denoted by **CRIT**.

START TIME _____

☐ Scenario 1: LOOP, Loss of All Feedwater.

1. Declare the highest emergency classification for which an IC has been met or exceeded.

CRIT

CUES: Cues required for this step are contained in the rough log maintained by the crew and the indications available on the simulator.

STANDARDS Candidate classifies event as ALERT (SA1) due to the loss of offsite power and
: EDG B OOS for > 15 minutes.

SAT _____ **UNSAT** _____

2. Perform emergency actions of appropriate emergency plan implementing instruction.

CUES: Cues required for this step are contained in the procedure.

STANDARDS Candidate states EP-001-030 to be entered
:

SAT _____ **UNSAT** _____

3. End of Task

STOP TIME _____

☐ Scenario 2: SB LOCA.

1. Declare the highest emergency classification for which an IC has been met or exceeded.

CRIT

CUES: Cues required for this step are contained in the rough log maintained by the crew and the indications available on the simulator.

STANDARDS Candidate classifies event as ALERT (FA1/RCB1) due to either:
:

- potential loss of the RCS barrier (unisolable RCS leak > 44 gpm), or
- loss of the RCS barrier (if RCS subcooling < 28°F).

SAT _____ **UNSAT** _____

2. Perform emergency actions of appropriate emergency plan implementing instruction.

CUES: Cues required for this step are contained in the procedure.

STANDARDS Candidate states EP-001-020 to be entered
:

SAT _____ **UNSAT** _____

3. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

☐ Scenario 3: SGTR.

1. Declare the highest emergency classification for which an IC has been met or exceeded.

CRIT

CUES: Cues required for this step are contained in the rough log maintained by the crew and the indications available on the simulator.

STANDARDS Candidate classifies event as ALERT (FA1/RCB2) due to the loss of the RCS
:
barrier.

SAT_____**UNSAT**_____

2. Perform emergency actions of appropriate emergency plan implementing instruction.

CUES: Cues required for this step are contained in the procedure.

STANDARDS Candidate states EP-001-020 to be entered
:

SAT_____**UNSAT**_____

3. End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

Initial Conditions are based upon the scenario chosen. The candidate should refer to the rough logs that were maintained during the scenario and to the indications available on the simulator.

INITIATING CUE

Classify the event for the current scenario and determine the correct Emergency Plan Implementing Procedure to be entered.

RECOVER DROPPED CEA (CONTINUOUS CEA MOTION)



RO JPM A

Site W3 Job RO System/Duty Area CED Mode OFFNORM Number 35

Revision 4 09/07/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 15 Min

Time Critical No Critical Time Alternate Path Yes

References

OP-901-102, CEA or CEDMCS Malfunction
OP-004-004, Control Element Drive

NRC KA Number

4.2-003-AA1.02 (RO: 3.6; SRO: 3.4)
4.2-001-AA2.05 (RO: 4.4; SRO: 4.6)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

1. Reactor Power is at 68 percent
2. Core age is 250 EFPD
3. CEA 87 has dropped
4. Repairs to CEA 87 have been completed
5. OP-901-102 Subsection E1, is in progress, steps 1-14 have been completed

INITIATING CUE

You are directed by the CRS to withdraw CEA 87 per step 15 of OP-901-102 Subsection E₁ using CEAs in MANUAL INDIVIDUAL mode. The BOP has been directed to add boric acid to the RCS at 10 gallon batches at your request in order to maintain Tc 543-546°F.

TERMINATING CUE

1. CEA 87 is aligned with other CEAs in Shutdown Bank B
2. **(ALT)** Reactor is tripped

STANDARD

1. CEA 87 is aligned within 4 inches of other CEAs in Group P
2. **(ALT)** Reactor manually tripped

TOOLS

NONE

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

REACTIVITY EVENT

HUMAN INTERFACES

1. CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

1. Reset to IC 154
2. Insert RD02A87 to drop rod, **THEN DELETE MALFUNCTION**
3. Insert RD12A87 during CEA withdrawal, preferably 2nd or 3rd pull
4. Adjust RCS temperature

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-102, Section E.1. STEP 15. All components to be operated are located on CP-2. Critical steps are denoted by **CRIT**.

Note: Examinee may initiate Boration at beginning of Task

START TIME _____

-
1. Candidate may refer to OP-004-004, Control Element Drive section, 6.6 OPERATION OF CEAS IN MANUAL INDIVIDUAL (MI) MODE (C) **CRIT**

Position INDIVIDUAL CEA selection switches to CEA 87

CUES: The simulator will provide the required cues

STANDARDS 1. Examinee positions individual CEA selection switch tens to 8
: 2. Examinee positions individual CEA selection switch units to 7
.

SAT _____ UNSAT _____

-
2. Position GROUP SELECT switch to group B **CRIT**

CUES: The simulator will provide the required cues

STANDARDS: Examinee positions GROUP SELECT switch to group B

SAT _____ UNSAT _____

-
3. Place mode select switch to MI **CRIT**

CUES: The simulator will provide the required cues

STANDARDS: Examinee positions MODE SELECT switch to MI

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

4. Verify:

- MI light illuminates.
- white lights on GROUP SELECTION MATRIX for Shutdown Bank B illuminates.
- white selection light for CEA 87 illuminates.

CUES: The simulator will provide the required cues.

STANDARDS:

- Examinee verifies MI light illuminates.
- Examinee verifies white lights on GROUP SELECTION MATRIX for Shutdown Bank B illuminates.
- Examinee verifies white selection light for CEA 87 illuminates.

SAT _____ UNSAT _____

5. Place CEA MANUAL SHIM switch to WITHDRAW.

CRIT

CUES: The simulator will provide the required cues.

STANDARDS: Examinee places CEA MANUAL SHIM switch to WITHDRAW.

SAT _____ UNSAT _____

6. Monitor CEA 87 position indicator moving outward.

CUES: The simulator will provide the required cues.

STANDARDS: Examinee moves CEA 87 at less than 15 in/min.

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

7. Monitor:

- Reactor Power
- RCS temperature
- Axial Shape Index

CUES: The simulator will provide the required cues.

STANDARDS:

- Examinee monitors to meters on CP-2 or PMC indications for:
- Power
- Temperature
- ASI

SAT_____ **UNSAT**_____

8. **(ALT) NOTE:** On the 3rd withdrawal, continuous outward CEA motion will begin when OUT SHIM switch released

CRIT

Attempt to stop outward CEA rod motion

CUES: The simulator will provide the required cues

STANDARDS:

- Examinee recognizes continuous CEA withdrawal
- Examinee places MODE SELECTOR switch to OFF

STOP TIME_____

Waterford 3 Job Performance Measure

9. (ALT) Manually trip Reactor

CRIT

CUES:

- The simulator will provide the required cues
- NOTE: Examinee may refer to Subsection E₃, Continuous Movement of CEA Group
- If Examinee suggests tripping the Reactor, then direct Reactor Trip as CRS

STANDARDS:

- **Examinee recognizes continuous CEA withdrawal and recommends tripping the Reactor to CRS. (Critical)**
- **Examinee Depresses both REACTOR TRIP pushbuttons on CP-2 (Critical)**
- Check reactor power dropping on CP-2 or CP-7
- Check startup rate is negative on CP-2 or CP-7
- Check less than 2 CEAS not fully inserted using
 - o CEAC CRT on CP-2
 - o CEDMCS LEL Lights illuminated on CP-2
 - o CEA Rod Bottom Lights illuminated on CP-2

SAT _____ UNSAT _____

10. END OF TASK.

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

1. Reactor Power is at 68 percent
2. Core age is 250 EFPD
3. CEA 87 has dropped
4. Repairs to CEA 87 have been completed
5. OP-901-102 Subsection E1, is in progress, steps 1-14 have been completed

INITIATING CUE

You are directed by the CRS to withdraw CEA 87 per step 15 of OP-901-102 Subsection E₁ using CEAs in MANUAL INDIVIDUAL mode. The BOP has been directed to add boric acid to the RCS at 10 gallon batches at your request in order to maintain Tc 543-546°F.

PERFORM ACTIONS ON A RECIRCULATION ACTUATION (LEAK ON SUCTION LINE)



RO JPM B

Site W3 Job RO System/Duty Area PPE Mode EMERG Number 1

Revision 9 09/07/2006

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 20 Min

Time Critical Critical Time YES Alternate Path YES

References

OP-902-002, Loss of Coolant Accident Recovery
OP-902-009, Standard Appendices

NRC KA Number

4.1-E11-EA1.11 (RO: 4.2; SRO: 4.2)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

1. The Reactor has tripped
2. A Loss of Coolant Accident inside Containment is in progress
3. OP-902-002, Loss of Coolant Accident, has been implemented:
4. RWSP level is approaching 10% and a Recirculation Actuation Signal (RAS) is imminent
5. Pretrips for RWSP level actuated

INITIATING CUE

The CRS directs you to take the actions for a Recirculation Actuation Signal per step 42 of OP-902-002 after the RAS occurs.

TERMINATING CUE

1. All Safety Injection Pump Recirc Valves are closed
2. Both ESF Pump Suction Valves from the RWSP are closed
3. All Charging Pumps are in OFF and CVC 209 is shut.
4. (ALT) SI-602B is overridden closed.

STANDARD

1. All Safety Injection Pump Recirc Valves are closed within 2 minutes of RAS actuation
2. Both ESF Pump Suction Valves from the RWSP are closed
3. All Charging Pumps are in OFF and CVC 209 is shut.
4. (ALT) SI-602B is overridden closed.

TOOLS

NONE

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Release of Radioactivity through the RWSP Vent

HUMAN INTERFACES

1. SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Reset to IC 155

Set up Remote SIR44B to OVERRIDE SI-602B on Event Trigger 1.

IC will have RAS signal actuate approximately 1 min after going to run

Examiner will need stopwatch for time critical task

- Start timing when RAS actuates (step 1)
- Stop timing when SI-120A(B) & SI-121A(B) are all Closed (step 4)
- Should be within 2 minutes of RAS actuation

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-902-002 and OP-902-009. Critical steps are denoted by **CRIT**.

START TIME _____

1. Verify that an RAS occurs.

CRIT

CUES: Simulator will provide cues

STANDARDS :

- Examinee observes RWSP level is approximately 10% (CP-7 or CP-8)
- Examinee verifies RAS annunciators on CP-2
 - o RAS TRAIN A LOGIC INITIATED (Cabinet K, K-19)
 - o RAS TRAIN B LOGIC INITIATED (Cabinet K, K-20)
- Examinee verifies RAS trip path indicators extinguished on all 4 PPS ROMs (CP-7)

NOTE: Examiner should start timing at this point. Critical Time Start _____

SAT _____ UNSAT _____

2. Verify that BOTH LPSI Pumps are stopped.

CRIT

CUES: Simulator will provide cues

STANDARDS :

- Examinee verifies LPSI Pump A stopped, green OFF light lit, red START light out
- Examinee verifies LPSI Pump B stopped, green OFF light lit, red START light out

SAT _____ UNSAT _____

3. Verify that ESF PUMPS SUCTION SI valves are open.

CRIT

- SI 602A
- SI 602B

CUES: Simulator will provide cues

STANDARDS:

1. Examinee verifies SI 602A, green CLOSED light out, red OPEN light lit on CP-8
2. Examinee verifies SI 602B, green CLOSED light out, red OPEN light lit on CP-8.

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

-
4. Close the SI PUMPS RECIRC ISOL VALVES **WITHIN TWO MINUTES** of receipt of RAS: **CRIT**
- SI 120A
 - SI 120B
 - SI 121A
 - SI 121B.

CUES: Simulator will provide cues

- STANDARDS:**
1. Examinee takes control switch for SI 120A to CLOSE verifies green CLOSED light lit red OPEN light out
 2. Examinee takes control switch for SI 120B to CLOSE verifies green CLOSED light lit red OPEN light out
 3. Examinee takes control switch for SI 121A to CLOSE verifies green CLOSED light lit red OPEN light out
 4. Examinee takes control switch for SI 121B to CLOSE verifies green CLOSED light lit red OPEN light out

Note: Critical Time Stop_____. Should be < 2 minutes.

SAT_____UNSAT_____

-
5. Close the ESF PUMPS SUCTION RWSP: **CRIT**
- SI 106A
 - SI 106B.

CUES: Simulator will provide cues

- STANDARDS:**
1. Examinee takes control switch for SI 106A to CLOSE verifies green CLOSED light lit red OPEN light out on CP-8
 2. Examinee takes control switch for SI 106B to CLOSE verifies green CLOSED light lit red OPEN light out on CP-8

SAT_____UNSAT_____

-
6. Place all charging pumps to "OFF". **CRIT**

CUES: Simulator will provide cues

STANDARDS: Charging Pumps selected to OFF.

SAT_____UNSAT_____

Waterford 3 Job Performance Measure

7. Close CVC-209 CHARGING HEADER ISOLATION.

CRIT

- CUES:**
- **Simulator will provide cues**
 - **(ALT) Local Operator reports large leak in wing area between SI-602B and SI-604B**
 - **(ALT) CRS orders you to secure HPSI Pump B and Containment Spray Pump B and implement OP-902-009, Attachment 29 Override SI-602B.**
 - **(ALT) If examinee asks, Emergency Coordinator's permission has been provided.**

STANDARDS: Close CVC-209 CHARGING HEADER ISOLATION closed.

SAT_____UNSAT_____

8. **(ALT)** Place keyswitch for SI-602B, ESF PUMP SUCTION SI PUMP, located on side of Auxiliary Panel 1, to OVERRIDE

CRIT

- CUES:** **Simulator will provide cues**
- STANDARDS:** Examinee orders NAO to obtain key for SI-602B keyswitch and place in OVERRIDE on Auxiliary Panel 1

(Note to Booth operator) insert SIR44B remote verify Annunciator N-M14 alarms

SAT_____UNSAT_____

9. Close SI-602B, ESF PUMP SUCTION SI PUMP, by placing on CP-8 to CLOSE

CRIT

- CUES:**
- NAO reports SI-602B is in override on Auxiliary panel 1.
 - **Simulator will provide cues**
- STANDARDS:** Examinee rotates control switch for SI-602B to CLOSE, verifies green CLOSE light lit, red OPEN light out

SAT_____UNSAT_____

10. End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

1. The Reactor has tripped
2. A Loss of Coolant Accident inside Containment is in progress
3. OP-902-002, Loss of Coolant Accident, has been implemented:
4. RWSP level is approaching 10% and a Recirculation Actuation Signal (RAS) is imminent
5. Pretrips for RWSP level actuated

INITIATING CUE

The CRS directs you to take the actions for a Recirculation Actuation Signal per step 42 of OP-902-002 after the RAS occurs.

Perform ATC Immediate Actions on CR Evacuation (Fire in Control Room)



RO JPM C

Site W3 Job RO System / Duty Area PPO Mode OFFNORM Number 4

Revision 4 04/03/2000

Approval rfletch 04/05/2000

Estimated Time 5 Min

Time Critical No Critical Time No Alternate Path YES

References

OP-901-502, Evacuation of Control Room & Subsequent Plant Shutdown

NRC KA Number

4.2-A68-AK3.12, RO: 4.1; SRO: 4.5

Evaluation Methods

METHOD

SIMULATE

Trainee		Evaluator	
Observer		Date	
Satisfactory	☐	Unsatisfactory	☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

1. A fire has occurred in Control Room Panel CP-7
2. Control Room Evacuation has been ordered

INITIATING CUE

Perform IMMEDIATE OPERATOR ACTIONS as ATC for Control Room Evacuation per OP-901-502, Evacuation of Control Room & Subsequent Plant Shutdown

TERMINATING CUE

1. IMMEDIATE OPERATOR ACTIONS are taken
2. Exiting Control Room for + 21 RAB

STANDARD

1. All IMMEDIATE OPERATOR ACTIONS for ATC are taken within 15 minutes

TOOLS

NONE

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

1. Reactor not tripped-potential for Fuel Damage

HUMAN INTERFACES

1. SM/CRS

SKILLS / KNOWLEDGES

NONE

INSTRUCTOR NOTES

Reset to IC-30

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-502 Section D. 1.1-1.5. Critical steps are denoted by **CRIT**.

START TIME _____

1. Trip the Reactor.

CUES: ▪ **Simulator provides Cues**

CRIT

STANDARDS: ▪ Examinee depresses REACTOR TRIP pushbuttons on CP-2
:

SAT _____ UNSAT _____

2. Verify ALL CEAs fully inserted.

CUES: ▪ **Simulator provides Cues**

CRIT

STANDARDS: ▪ The examinee verifies ALL CEAs fully inserted by verifying at least one of the following: All Rod Bottom lights LIT, All CEA lower Electrical Limit lights green, CEAC CRT shows all CEAs inserted on CP-2

SAT _____ UNSAT _____

3. Verify Spray Valves selector switch in BOTH.

CUES: ▪ **Simulator provides Cues**

CRIT

STANDARDS: ▪ The examinee verifies Spray Valves Selector switch in BOTH on CP-2

SAT _____ UNSAT _____

4. (ALT) Trip ALL Reactor Coolant Pumps.

CUES: ▪ **Simulator provides Cues**

CRIT

STANDARDS: ▪ The examinee rotates control switch for one Oil Lift Pump for each RCP to START, verifies red START light lit, green TRIP light out. (**NOTE: Performance of this step is NOT Critical**)
▪ The examinee places control switches for 1A, 1B, 2A and 2B Reactor Coolant Pumps to TRIP. Verifies green STOP lights lit red START lights out.

SAT _____ UNSAT _____

5. (ALT) Secure Charging AND Letdown by performing the following: Close CVC-101, Letdown Stop Valve.

CRIT

NOTE: Examinee may simultaneously close CVC-101 and 103

CUES: ▪ **Simulator provides CUES**

STANDARDS: ▪ The examinee rotates control switch for CVC-101, Letdown Stop Valve to CLOSE, verifies green CLOSED light lit and red OPEN light off on CP-4.

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

-
6. (ALT) Secure Charging AND Letdown by performing the following: Close CVC-103, Letdown Inside Containment Isolation.

CUES: ▪ **Simulator provides Cues**

CRIT

STANDARDS: ▪ The examinee rotates control switch for CVC-103, Letdown Inside Containment Isolation to CLOSE, verifies green CLOSED light lit and red OPEN light off on CP-4

SAT_____UNSAT_____

-
7. (ALT) Secure Charging AND Letdown by performing the following: Place ALL Charging Pumps in OFF.

CRIT

CUES: ▪ **Simulator provides Cues**

STANDARDS ▪ The examinee places control switches for all Charging Pumps to OFF, verifies
: green OFF light lit and red START light off on CP-4

SAT_____UNSAT_____

-
8. Obtain Operations Security Key Ring AND proceed to LCP-43.

CRIT

CUES: ▪ **Security Keys obtained**

STANDARDS: ▪ Examinee locates Security Keys from Shift Managers office and states he/she will enter the LCP-43 ROOM on +21 RAB.
▪ (NOTE; JPM may be terminated when examinee has located keys and states he/she will go to LCP-43)

SAT_____UNSAT_____

-
9. End of Task.

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

1. A fire has occurred in Control Room Panel CP-7
2. Control Room Evacuation has been ordered

INITIATING CUE

Perform IMMEDIATE OPERATOR ACTIONS as ATC for Control Room Evacuation per OP-901-502, Evacuation of Control Room & Subsequent Plant Shutdown

START A REACTOR COOLANT PUMP (ALTERNATE PATH)



RO JPM D

Site W3 Job RO System/Duty Area RCP Mode NORM Number 1

Revision 4 08/10/2004

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 20 Min

Time Critical No Critical Time N/A Alternate Path YES

References

OP-001-002, Reactor Coolant Pump Operation

NRC KA Number

4.2-015/17-AA1.23, RO: 3.1; SRO 3.1

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is in mode 3, RCS press is 2250 psia, Tave is 545°F
RCP 1A, 1B, 2B are running

INITIATING CUE

The Control Room Supervisor directs you to start 2A RCP IAW with OP-001-002.

TERMINATING CUE

1. Desired RCP running
2. **(ALT)** RCP tripped.

STANDARD

1. Desired RCP running
2. **(ALT)** RCP tripped.

TOOLS

OP-001-002 Att. 11.3 printout

SAFETY CONSIDERATIONS

Rotating Equipment

PERFORMANCE CONSEQUENCES

Damage to Reactor Coolant Pump.

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

IC 157 with 3 RCPs running
Setup: ensure Annunciators cleared to clear RCP 2A vibration HA8 alarm, HC8 is expected
Print out att 11.3 OP-001-002.

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-001-002 section 6.1.

Critical steps are denoted by **CRIT**.

START TIME _____

1. Review Precautions and Limitations.

CUES: None

STANDARDS: Examinee reviews Precautions and limitations OP-001-002
:

SAT _____ **UNSAT** _____

2. Verify Controlled Bleed Off (CBO) 1.2- 1.8gpm.

CUES: Simulator provides cues

STANDARDS: Examinee verifies CBO 1.2-1.8gpm on RCP mimic or PMC point IAW Attachment 11.2

SAT _____ **UNSAT** _____

3. Verify proper upper and lower oil reservoir level 65%

CUES: Simulator provides cues

STANDARDS: 1. Examinee verifies RCP oil reservoir level on RCP mimic or PMC point IAW Attachment 11.2

SAT _____ **UNSAT** _____

4. Verify CCW flow at CP-2 to 2A RCP seal water cooler flow by checking inlet and outlet valves indicate open.

CUES: Simulator provides cues

NOTE: If Examinee asks if SM/CRS desires CCW flow checked on local indicators inform Examinee SM does not require local verification

STANDARDS: 1. CC-666A, RCP 2A SEAL COOLER CCW INLET ISOLATION Open,
2. CC-680A, RCP 2A SEAL COOLER CCW OUTLET ISOLATION Open,

SAT _____ **UNSAT** _____

5. Test all annunciators on CP-2 and CP-18 and verify all RCP alarms indicate.

CUES: Simulator provides cues

STANDARDS: 1. CP-2 and CP-18 annunciators tested satisfactorily.

SAT _____ **UNSAT** _____

Waterford 3 Job Performance Measure

6. Verify RCP 2A High Vibration alarm is clear.

CUES: Simulator provides cues

STANDARDS: 1. Examinee verifies annunciator RCP 2A VIBRATION HI (Cabinet H, A-8) clear.

SAT_____ **UNSAT**_____

7. Start RCP 2A oil lift pump.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Examinee places RCP 2A oil lift pump A or B to ON.

SAT_____ **UNSAT**_____

8. Verify proper high Pressure Oil Lift System pressure for RCP 2A by observing annunciator clear.

CUES: Simulator provides cues

STANDARDS: 1. Examinee verifies annunciator RCP 2A BRNG LIFT OIL PRESS LO (Cabinet H, D-7) is clear.

SAT_____ **UNSAT**_____

9. Verify RCS pressure and temperature are within limits of attachment 11.1.

CUES: Simulator provides cues

STANDARDS: 1. Examinee verifies RCS pressure and temperature limits are within Attachment 11.1 (Note: examinee may use operator aid on MCB).

SAT_____ **UNSAT**_____

10. Verify <100 °F differential temperature between RCS Cold leg and Steam Generator.

CUES: Simulator provides cues

STANDARDS: 1. This step is not applicable one RCP is already running in each loop.

SAT_____ **UNSAT**_____

11. Refer to attachment 11.3 while performing steps 6.1.16 through 6.1.26.

CUES: Provide Examinee with Attachment 11.3 after located in procedure

STANDARDS: 1. Examinee locates Attachment 11.3.

SAT_____ **UNSAT**_____

Waterford 3 Job Performance Measure

12. Verify associated RCP Oil Lift pump operating at normal pressure for minimum of 2 minutes.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Examinee verifies RCP 2A BRNG LIFT OIL PRESS LO (Cabinet H, D-7) annunciator cleared.

SAT_____ **UNSAT**_____

13. Start RCP 2A.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Examinee places and holds RCP 2A control switch to start
2. Examinee verifies RCP 2A breaker indication light indicates running.

SAT_____ **UNSAT**_____

14. Trip RCP 2A if high vibration occurs.

CRIT

CUES: NOTE: Simulator operator inserts RC07A RCP 2A HI Vib malfunction after RCP 2A stabilizes after start.

CUE: If Examinee recommends securing RCP then direct securing RCP 2A as CRS.

STANDARDS: 1. Examinee recognizes (Cabinet H, A-8) annunciator and takes RCP 2A control switch to STOP.

SAT_____ **UNSAT**_____

End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The plant is in mode 3, RCS press is 2250 psia, Tave is 545°F
RCP 1A, 1B, 2B are running

.

INITIATING CUE

The Control Room Supervisor directs you to start 2A RCP IAW with OP-001-002.

.

PLACE HYDROGEN RECOMBINER IN SERVICE



RO JPM E

Site W3 Job RO System/Duty Area HR Mode NORM Number 2

Revision 2 09/08/1995

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 10 Min

Time Critical No Critical Time N/A Alternate Path NO

References

OP-008-006, Hydrogen Recombiner

NRC KA Number

3.5-028-A2.01 (RO: 3.4; SRO: 3.6)

3.5-028-A4.01 (RO: 4.0; SRO: 4.0)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

Plant is shutdown and depressurized following a LOCA
Containment Hydrogen level is at 3%
Post Loca Containment pressure is 20.7 psia on Containment Atmosphere Pressure indicator
Pre-loc a average containment temperature is 105°F

INITIATING CUE

Directed by the CRS to place Hydrogen Recombiner A in Service

TERMINATING CUE

Hydrogen Recombiner is in service

STANDARD

Hydrogen Recombiner is in service

TOOLS

Calculator

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Excessive H2 concentration

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Reset to IC-155

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-008-006 section 6.1.

Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Record present Post-LOCA containment pressure.

CRIT

CUES: Cues are given by initial conditions

STANDARDS: Examinee records 20.7 psia on Attachment 11.2 step 6.1.1.1
:

SAT _____ **UNSAT** _____

-
2. Record Pre-LOCA Containment Average Temperature on Attachment 11.2.

CRIT

CUES: Cues are given by initial conditions

STANDARDS: Examinee records 105°F on Attachment 11.2 step 6.1.1.2

SAT _____ **UNSAT** _____

-
3. Determine Pressure factor Cp from Attachment 11.4

CRIT

CUES: None

STANDARDS: Examinee determines that Pressure factor is 1.26 – 1.28 and records on Attachment 11.2

SAT _____ **UNSAT** _____

-
4. Determine Hydrogen Recombiner Power Control setting on Attachment 11.2.

CRIT

CUES: None

STANDARDS: Examinee determines that power control setting is 60.48 – 61.44 and records on Attachment 11.2

SAT _____ **UNSAT** _____

-
5. Verify Hydrogen Recombiner A Power Control potentiometer is set at zero.

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee verifies power control potentiometer is set at zero.

SAT _____ **UNSAT** _____

-
6. Place Hydrogen Recombiner power control switch HRA-001A to ON

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee places HRA-001A to ON, verifies power on light lit.

SAT _____ **UNSAT** _____

Waterford 3 Job Performance Measure

-
7. Slowly adjust Hydrogen Recombiner Power Control Potentiometer until 5 KW is indicated on power meter.

CUES: Simulator provides cues

STANDARDS: Examinee adjusts potentiometer until 5KW is indicated on HREM-EM-960.

SAT_____ **UNSAT**_____

8. Hold reading for 10 minutes.

CUES: State that 10 minutes have elapsed

STANDARDS: Examinee states that reading must be held for 10 minutes.

SAT_____ **UNSAT**_____

9. Verify Hydrogen Thermocouple temperatures trend upward when adjusting power control Potentiometer.

CUES: Cue Examinee that temperature indicates upward trend

NOTE; simulator response is slow and Meter scale is such that visual indication will not be possible in a timely fashion

STANDARDS: Examinee verifies upward temperature trend on HRA-0001A

SAT_____ **UNSAT**_____

10. Adjust Hydrogen power control Potentiometer until 10 KW is indicated.

CUES: Simulator provides cues

STANDARDS: Examinee adjusts potentiometer until 10 KW is indicated.

SAT_____ **UNSAT**_____

11. Hold for 10 minutes.

CUES: 10 minutes have elapsed

STANDARDS: Examinee states that reading must be held for 10 minutes.

SAT_____ **UNSAT**_____

12. Adjust Hydrogen power control Potentiometer until 20 KW is indicated.

CUES: Simulator provides cues

STANDARDS: Examinee adjusts potentiometer until 20 KW is indicated.

SAT_____ **UNSAT**_____

Waterford 3 Job Performance Measure

-
- 13.** Adjust power control Potentiometer for Hydrogen Recombiner A to setting calculated on attachment 11.2.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Examinee adjusts potentiometer until 60.48 – 61.44 KW is indicated.

SAT _____ **UNSAT** _____

-
- 14.** Adjust Hydrogen Recombiner Power Control Potentiometer as necessary to maintain heater temperature >1225°F to 1400°F.

CRIT

CUES: Cue temperatures indicate the following when associated thermocouple selected:

TC-1 = 1245

TC-2 = 1250

TC-3 = 1255

STANDARDS: Examinee calculates average temperature to be 1250°F

SAT _____ **UNSAT** _____

-
- 15.** Record Containment Hydrogen concentration, Date and time on attachment 11.3 when hydrogen recombinder heater temperature reaches >1225°F.

CRIT

CUES: Simulator provides cues

NOTE: Examinee may refer to section 6.2 for proper operation

STANDARDS: Examinee records current date/time and hydrogen concentration from initial conditions.

SAT _____ **UNSAT** _____

End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

Plant is shutdown and depressurized following a LOCA

Containment Hydrogen level is at 3%

Post Loca Containment pressure is 20.7 psia on Containment Atmosphere Pressure indicator

Pre-loc a average containment temperature is 105°F

.

INITIATING CUE

Directed by the CRS to place Hydrogen Recombiner A in Service

RESTORE NORMAL POWER TO A 4.16 SAFETY BUSS AND SECURE EMERGENCY DIESEL GENERATOR



RO JPM F

Site W3 Job RO System/Duty Area EDG Mode EMERG Number 100

Revision 1 11/20/2001

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 15 Min

Time Critical No Critical Time N/A Alternate Path YES

References

OP-902-009, Standard Appendices

NRC KA Number

3.6-064-A2.03 RO: 3.1; SRO: 3.1

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

The plant is in mode 3 following a reactor trip
4.16 KV Safety Bus A2 is energized from Offsite Power
4.16 KV Safety Bus A3 is energized from EDG A

INITIATING CUE

CRS directs you to transfer 4.16 KV Safety Bus A3 from EDG to Offsite power IAW OP-902-009 Attachment-12C

TERMINATING CUE

EDG a is secured

STANDARD

4.16 KV Safety Bus is being powered from non-safety 4.16 KV bus A2

TOOLS

Synchronizer key

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Potential loss of ESF power from 4.16KV safety bus A3
Possible damage to EDG A due to loss of lube oil

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

IC-156
Ensure no SIAS present
Insert remote ED10A to trip EDG A if NAO ordered to trip diesel locally

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-902-009 Attachment 12C.

Critical steps are denoted by **CRIT**.

START TIME _____

1. Verify bus A3S to A2 tie breaker OPEN.

CRIT

CUES: Simulator provides cues

STANDARDS: A3S to A2 tie breaker open
:

SAT _____ **UNSAT** _____

2. Close A2 to A3S tie breaker.

CRIT

CUES: Simulator provides cues

STANDARDS: A2 to A3S tie breaker closed

SAT _____ **UNSAT** _____

3. Place synchronizer keyswitch in "BUS TIE"

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Synchronizer keyswitch is in "BUS TIE" position

SAT _____ **UNSAT** _____

4. Adjust EDG A voltage to equal system voltage.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. EDG A voltage approximately equal to system voltage,

SAT _____ **UNSAT** _____

5. Adjust engine speed until Synchroscope rotates slowly clockwise.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Synchroscope rotating slowly in the clockwise direction.

SAT _____ **UNSAT** _____

6. Close A3S to A2 tie breaker at 5 minutes to 12 position on the Synchroscope.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Examinee verifies Synchroscope position at 5 minutes to 12 prior to closing tie breaker.
2. Bus A3S to A2 tie breaker closed

SAT _____ **UNSAT** _____

Waterford 3 Job Performance Measure

7. Place Synchronizer keyswitch to OFF.

CRIT

CUES: Simulator provides cues

STANDARDS: 1. Synchronizer keyswitch OFF.

SAT_____UNSAT_____

8. Reduce load on EDG to 0.1 MW and 0.1 MVARs.

CRIT

CUES: After Examinee begins reducing MW Cue NAO reports a large oil leak on the engine driven lube oil pump discharge and crankcase oil level is dropping

STANDARDS: 1. Examinee locates speed control switch and starts to reduce load.

SAT_____UNSAT_____

9. Examinee depresses EDG A trip pushbutton on CP-1 or orders NAO to pull Manual Fuel Oil overspeed Trip locally.

CRIT

CUES: 1. Simulator provides cues if trip pushbutton is used

2. If Examinee orders NAO to pull overspeed trip insert remote EG10A

STANDARDS: 1. EDG A Tripped

SAT_____UNSAT_____

End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

The plant is in mode 3 following a reactor trip
4.16 KV Safety Bus A2 is energized from Offsite Power
4.16 KV Safety Bus A3 is energized from EDG A
.

INITIATING CUE

CRS directs you to transfer 4.16 KV Safety Bus A3 from EDG to Offsite power IAW OP-902-009
Attachment-12C

REALIGN CONTAINMENT SPRAY FOR AUTOMATIC INITIATION FOLLOWING CSAS



RO JPM G

Site W3 Job RO System/Duty Area CS Mode EMER Number 11

Revision 3 09/12/2006

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 15 Min

Time Critical No Critical Time N/A Alternate Path NO

References

OP-902-009, Standard Appendices

NRC KA Number

3.5-026-A2.08 (RO: 3.2; SRO: 3.7)

3.5-026-A4.01 (RO: 4.5; SRO: 4.3)

3.5-026-A4.05 (RO: 3.5; SRO: 3.5)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

A Loss of Coolant Accident has occurred.
A Containment Spray Actuation has occurred.
Containment pressure has been reduced to < 17.7 psia.

INITIATING CUE

The CRS directs you to reset CSAS per OP-902-009 Appendix 5.

TERMINATING CUE

Containment Spray aligned for Automatic initiation

STANDARD

Containment Spray aligned for Auto Initiation

TOOLS

None

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Thermal shock to RCP seals if CCW valves not taken to CLOSE.
Containment Spray System may not be properly aligned to re-initiate as designed.

HUMAN INTERFACES

CRS
May inform NAO of securing CS pumps

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Reset to IC-158 (or a post-LOCA IC with Containment Pressure restored to < 17.7 psia).

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-902-009 Attachment 5-E. Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Place control switches for RCP CCW supply valves to CLOSE.

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee places control switches for the following valves to CLOSE (CP-8):

:

- CC 641, RCP INLET OUTSIDE ISOL
- CC 710, RCP OUTLET INSIDE ISOL
- CC 713, RCP OUTLET OUTSIDE ISOL

SAT _____ UNSAT _____

-
2. Reset CSAS Initiation Relays on ALL four channels.

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee performs the following on each (4 total) PPS Channel (CP-10):
(NOTE: Critical Elements are in **BOLD**)

- **Place Reset Permissive keyswitch to UNLK.**
- **Press CSAS pushbutton.**
- Verify the initiation relay indicator lit on the ESFAS mimic.
- Place Reset Permissive keyswitch to LK.

SAT _____ UNSAT _____

-
3. Reset CSAS actuation logic on BOTH trains.

CRIT

CUES: Simulator provides cues

STANDARDS:

1. Examinee presses both CSAS Reset pushbuttons (CP-33).
2. Examinee verifies the actuation relay indicator lit on the ESFAS mimic (CP-10)

SAT _____ UNSAT _____

-
3. Stop BOTH CS Pumps (CP-8).

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee places control switches for the following pumps to OFF (CP-8)

- Containment Spray Pump A
- Containment Spray Pump B

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

4. Close the Containment Spray Valves.

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee closes the following valves:

- CS 125A, CNTMT SPRAY HEADER A ISOL
- CS 125B, CNTMT SPRAY HEADER B ISOL

SAT _____ UNSAT _____

5. Place BOTH Containment Spray pump control switches to normal position.

CRIT

CUES: Simulator provides cues

STANDARDS: Examinee places control switches for the following pumps to the mid position (CP-8):

- Containment Spray Pump A
- Containment Spray Pump B

SAT _____ UNSAT _____

6. End of Task

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

A Loss of Coolant Accident has occurred.
A Containment Spray Actuation has occurred.
Containment pressure has been reduced to < 17.7 psia.

INITIATING CUE

The CRS directs you to reset CSAS per OP-902-009 Appendix 5.

PERFORM ACTION IN RESPONSE TO CCW SYSTEM LEAKAGE



RO JPM H

Site W3 Job RO System/Duty Area CC Mode OFFNOR Number 8
M

Revision 2 05/05/1995

Approval _____ 04/03/2000
Arvel J. Hall

Estimated Time 15 Min

Time Critical No Critical Time N/A Alternate Path No

References

OP-901-510, Component Cooling Water System Malfunction

NRC KA Number

4.2-026-A2.01 RO: 2.9; SRO: 3.5

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

CCW leakage is in progress
CCW surge tank level is being maintained by automatic operation.
Steps 1-10 section E1 Op-901-510 have been completed

INITIATING CUE

The Control Room Supervisor directs you to perform actions to locate Header with leakage IAW with OP-901-510.

TERMINATING CUE

Examinee determines CCW leak is located on the Header.

STANDARD

Examinee determines CCW leak is located on the Header.

TOOLS

None

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Loss of CCW.

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Reset to IC-30
Insert Malfunction CC17A, CCW pump A discharge leak 3%.

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-510 Section E1.

Critical steps are denoted by **CRIT**.

START TIME _____

-
- 1.** Determine if leak is in the NNS Loop by performing the following.

CRIT

CUES: Simulator will provide cues

STANDARDS: Examinee closes the following valves:

- CC-501 NNS LOOP SUPPLY ISOL
- CC-562 NNS LOOP RETURN ISOL

SAT _____ **UNSAT** _____

-
- 2.** If CCW surge tank level continues to cycle OR makeup system is operating to maintain level then Open the following valves:

CRIT

CUES: Simulator will provide cues

STANDARDS: Examinee determines leak is not in the NNS header and opens the following valves:

- CC-501 NNS LOOP SUPPLY ISOL
- CC-562 NNS LOOP RETURN ISOL

SAT _____ **UNSAT** _____

-
- 3.** IF leak is in the NNS Loop then perform the following:

CRIT

CUES: Simulator will provide cues

STANDARDS: Examinee identifies that leak is not in the NNS header

SAT _____ **UNSAT** _____

-
- 4.** Split out the CCW Headers by closing the following valves: Train A

CRIT

- CC-126A/CC-114A CCW Suct & Disch HEADER TIE VALVES AB TO A
- CC-126A/CC-115A CCW Suct & Disch HEADER TIE VALVES AB TO A

CUES: Simulator will provide cues

STANDARDS: Examinee Places control switch for the following valves to CLOSE:

CC-126A/CC-114A CCW SUCT & DISCH HEADER TIE VALVES AB TO A
CC-127A/CC-115A CCW SUCT & DISCH HEADER TIE VALVES AB TO A

SAT _____ **UNSAT** _____

Waterford 3 Job Performance Measure

5. Split out the CCW Headers by closing the following valves: Train B

CRIT

- CC-126B/CC-114B CCW Suct & Disch HEADER TIE VALVES AB TO B
- CC-127B/CC-115BA CCW Suct & Disch HEADER TIE VALVES AB TO B

CUES: Simulator will provide cues

STANDARDS: Examinee Places control switch for the following valves to CLOSE:

- CC-126B/CC-114B CCW SUCT & DISCH HEADER TIE VALVES AB TO B
- CC-127B/CC-115B CCW SUCT & DISCH HEADER TIE VALVES AB TO B

SAT _____ UNSAT _____

6. If CCW Pump AB is operating then locally check suction and discharge headers for leaks

CUES: Simulator will provide cues

STANDARDS: Examinee identifies that AB pump is not operating

SAT _____ UNSAT _____

7. Verify CC-200B/CC-563 CCW Suct & Disch HEADER TIE VALVES B TO AB open

CUES: Simulator will provide cues

STANDARDS: Examinee verifies CC-200B/CC-563 CCW Suct & Disch HEADER TIE VALVES B TO AB open

SAT _____ UNSAT _____

8. Close CC-200A/CC-727 CCW Suct & Disch HEADER TIE VALVES A TO AB

CRIT

CUES: Simulator will provide cues

STANDARDS: Examinee Places CC-200A/CC-727 CCW control switch for the following valves to CLOSE:

SAT _____ UNSAT _____

9. Verify the following Pump control Switches are in AUTO

CRIT

CUES: Simulator will provide cues

STANDARDS: Examinee verifies A and B CCW makeup Pump control switches are in AUTO

SAT _____ UNSAT _____

10. If CCW Surge Tank Level A drops < 50% then Leak is confined to CCW Safety Header A

CRIT

CUES: Simulator will provide cues

STANDARDS: Examinee verifies identifies CCW leak is confined to Safety Header A

SAT _____ UNSAT _____

END OF TASK

STOP TIME _____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

CCW leakage is in progress

CCW surge tank level is being maintained by automatic operation.

Steps 1-10 section E1 Op-901-510 have been completed.

INITIATING CUE

The Control Room Supervisor directs you to perform actions to locate Header with leakage IAW with OP-901-510.

OPERATE THE ATMOSHERIC DUMP VALVES LOCALLY (ALTERNATE PATH)



RO JPM I

Site W3 Job NAO System/Duty Area MS Mode OFFNOR Number 8
M

Revision 2 08/30/2006

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 30 Min

Time Critical No Critical Time N/A Alternate Path YES

References

OP-901-502, Evacuation of Control Room and Subsequent Plant Shutdown

NRC KA Number

2.1.20
3.4-039-A4.07
4.2-A68-AA1.01
4.2-A68-AK3.06

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

A fire has occurred in CP-2.

Control Room evacuation has occurred and controls have been transferred to LCP-43.

INITIATING CUE

You have been directed by the ATC to take control of Atmospheric Dump Valve (ADV), MS-116A, and open it approximately 50%.

TERMINATING CUE

ADV, MS-116A, is positioned per Initiating Cue

STANDARD

ADV, MS-116A, is positioned as required using Local Handwheel.

TOOLS

None

SAFETY CONSIDERATIONS

Climbing ladders to platforms.

Trip and bump hazards in and around +46 Wing Area.

Hot piping.

PERFORMANCE CONSEQUENCES

Equipment Damage

Overheating or overcooling of RCS

Cooldown Rate in excess of Technical Specifications

HUMAN INTERFACES

ATC

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Provide OP-901-502, Attachment 15 to Examinee

Waterford 3 Job Performance Measure

Perform the task IAW OP-901-502, Attachment 15. Critical steps are denoted by **CRIT**.

START TIME _____

-
1. Record the pressure at the outlet of the transducer _____psig.

CRIT

CUES: The actual transducer pressure gauge provides the cue.

STANDARDS : Examinee locates proper pressure gauge and records the actual pressure (should be around 3-5 psig)

SAT _____ UNSAT _____

-
2. Adjust the pressure at the air regulator outlet on the front of the panel to the pressure recorded in note 1.

CRIT

CUES: **Alternate Path: the air regulator pressure will not lower.**

STANDARDS: Examinee simulates turning handle on top of the regulator counter clockwise.

SAT _____ UNSAT _____

-
3. Inform Control Room that ADV will not operate in local pneumatic.

CRIT

CUES: **ATC directs Examinee to position ADV A to approx 50% using the local handwheel.**

STANDARDS: Examinee simulates informing Control room Atmospheric Dump will not operate in local pneumatic.

SAT _____ UNSAT _____

-
4. Close local NG/IA isolation to the positioner to MS-116A.

CRIT

CUES: **NG-8271C, NG/IA Isolation to MS-116A, is closed.**

STANDARDS: Examinee simulates closing NG-8271C, NG/IA Isolation to MS-116A.

SAT _____ UNSAT _____

-
5. Open Regulator Petcock Drain and bleed off Air/N2 pressure.

CRIT

CUES: **Regulator is vented.**

STANDARDS: Examinee simulates opening Regulator Petcock Drain.

SAT _____ UNSAT _____

-
6. Open MS-116A SG 1 MA Atm Dump Vlv Local Valve Positioner Equalizing Valve.

CRIT

CUES: **Positioner Equalizing Valve is open.**

STANDARDS: Examinee simulates opening Positioner Equalizing Valve.

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

7. Unscrew Clevis from top of the Manual Override shaft.

CRIT

CUES: Clevis is free.

STANDARDS: Examinee simulates unscrewing clevis from manual override shaft

SAT_____UNSAT_____

8. Turn handwheel to expose actuator shaft above manual override shaft.

CRIT

CUES: Actuator shaft is exposed.

STANDARDS: Examinee simulates turning handwheel to expose actuator shaft above manual override shaft.

SAT_____UNSAT_____

9. Slide Clevis onto actuator shaft.

CRIT

CUES: Clevis is positioned on actuator shaft

STANDARDS: Examinee simulates sliding Clevis onto actuator shaft.

SAT_____UNSAT_____

10. Turn handwheel to Open MS-116A to desired position.

CRIT

CUES: MS-116A is at 50%.

STANDARDS: Examinee simulates turning handwheel counter clockwise.

SAT_____UNSAT_____

11. End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

A fire has occurred in CP-2.

Control Room evacuation has occurred and controls have been transferred to LCP-43.

INITIATING CUE

You have been directed by the ATC to take control of Atmospheric Dump Valve (ADV), MS-116A, and open it approximately 50%.

PERFORM A SUPS A STARTUP



RO JPM J

Site W3 Job NAO System/Duty Area ID Mode NORM Number 2

Revision 2 8/30/2006

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 15 Min

Time Critical NO Critical Time N/A Alternate Path NO

References

OP-006-005, Inverters and Distribution

NRC KA Number

3.6-062-K4.10

3.6-062-A2.10

3.6-062-A3.04

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

SUPS A has been shutdown for maintenance.
PDP 90A is energized from its Bypass source.
SUPS A is ready to be returned to service.

INITIATING CUE

The ATC directs you to startup SUPS A.

TERMINATING CUE

SUPS A energized and operating.

STANDARD

SUPS A is energized and in operation.

TOOLS

None

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Equipment damage

HUMAN INTERFACES

NPO

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Provide Attachment 11.9, OP-006-005

Waterford 3 Job Performance Measure

Perform the task IAW OP-006-005, section 5.2. Critical steps are denoted by **CRIT**.

START TIME _____

1. Verify the following SUPS A panel breakers OFF:
 - ID-EBKR-A-2, SUPS A AC Input to Rectifier
 - ID-EBKR-A-3, SUPS A Battery Input
 - ID-EBKR-A-6, SUPS A Inverter Output
 - ID-EBKR-A-7, SUPS A Bypass Source AC Input

CUES: After the examinee locates the individual breakers, **cue examinee the breakers are off**

STANDARDS All breakers verified off
:

SAT _____ UNSAT _____

2. Verify Manual Bypass Switch in BYPASS TO LOAD.

CUES: After examinee locates manual bypass switch, **cue examinee the switch is in the 'BYPASS TO LOAD' position.**

STANDARDS: Examinee verifies the manual bypass switch is in 'BYPASS TO LOAD' position

SAT _____ UNSAT _____

3. If PDP-90A is not energized from Bypass Source, then: Refer to Att. 11.10.

CUES: Cue in Initial Conditions states that PDP-90A is energized from Bypass Source.

STANDARDS: Examinee should not perform this step.

SAT _____ UNSAT _____

4. Verify the following SUPS A supply breakers to ON:

- ID-EBKR-312A-2F, SUPS A Normal Supply
- ID-EBKR-311A-3M, SUPS A Bypass Supply
- ID-EBKR-A-35, SUPS A Emergency Supply (DC)

CUES: 1. When examinee locates each SUPS supply breaker, **cue examinee as follows:**

- ID-EBKR-312A-2F, SUPS A Normal Supply - OFF
- ID-EBKR-311A-3M, SUPS A Bypass Supply - ON
- ID-EBKR-A-35, SUPS A Emergency Supply (DC) - OFF

2. After examinee simulates repositioning breakers, **cue examinee the breakers are ON**

STANDARDS: SUPS supply breakers verified on.

SAT _____ UNSAT _____

CRIT

Waterford 3 Job Performance Measure

-
5. Press and hold Precharge pushbutton on SUPS A. When Precharge light (Amber light) is lit, then Close Battery Input (ID-EBKR-A-3). Release Precharge pushbutton.

CRIT

CUES: After examinee locates the DC INPUT METER, and the PRECHARGE PUSHBUTTON, and has simulated depressing the PRECHARGE PUSHBUTTON, **cue examinee the Precharge voltage is approximately 125 VDC on DC INPUT METER and the PRECHARGE LIGHT is lit.**

STANDARDS: 1. Examinee depresses and holds PRECHARGE PUSHBUTTON until PRECHARGE LIGHT is lit.
2. Examinee closes BATTERY INPUT BREAKER (ID-EBKR-A-3), and then releases the PRECHARGE PUSHBUTTON

SAT _____ UNSAT _____

-
6. Verify Closed the following breakers on SUPS A:

CRIT

- AC Input To Rectifier (ID-EBKR-A-2)
- AC Input To Isolimiter (ID-EBKR-A-8)
- Bypass Source AC Input (ID-EBKR-A-7)
- System Output (ID-EBKR-A-4)
- Inverter Output (ID-EBKR-A-6)

CUES: After examinee locates and simulates closing the breakers, **cue the examinee breakers are closed**

STANDARDS: Examinee verifies breakers are closed

SAT _____ UNSAT _____

-
7. If Bypass Source Supplying Load light is Extinguished and Inverter Supplying Load is Illuminated (approximately 30 seconds), then:

CRIT

CUES: 1. After examinee locates BYPASS SOURCE SUPPLYING LOAD light, **cue examinee light is lit.**
2. After examinee locates INVERTER SUPPLYING LOAD light, **cue examinee light is NOT lit.**

STANDARDS: 1. Examinee should recognize that this step (5.2.7) is not required.

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

-
8. If Bypass Source Supplying Load light is not Extinguished and Inverter Supplying Load is not Illuminated (approximately 30 seconds), then:
- Verify unit is In Sync
 - Transfer Manual Bypass Switch to NORMAL OPERATION.
 - Depress INVERTER TO LOAD pushbutton.

CRIT

- CUES:**
1. After examinee locates BYPASS SOURCE SUPPLYING LOAD light, **cue examinee light is lit.**
 2. After examinee locates INVERTER SUPPLYING LOAD light, **cue examinee light is NOT lit.**
 3. After examinee locates IN SYNC light, **cue examinee light is lit.**
 4. After examinee locates and transfers the MANUAL BYPASS switch to NORMAL OPERATION, **cue examinee switch is in the NORMAL OPERATION position.**
 5. After examinee locates and depresses INVERTER TO LOAD pushbutton, **cue examinee:**
 - **INVERTER SUPPLYING LOAD light is lit**
 - **BYPASS SOURCE SUPPLYING LOAD light is NOT lit.**

- STANDARDS:**
1. Examinee verifies BYPASS SOURCE SUPPLYING LOAD light is lit.
 2. Examinee verifies IN SYNC light is lit.
 4. Examinee depresses INVERTER TO LOAD pushbutton.

SAT _____ UNSAT _____

-
9. Close DC Input breaker to SUPS A Annunciator, ID-EBKR-A-5.

CRIT

CUES: After examinee locates and simulates closing the breaker, **cue examinee the breaker is closed.**

STANDARDS: Examinee simulates closing breaker.

SAT _____ UNSAT _____

-
10. Perform Attachment 11.9, SUPS A Breaker Lineup.

CUES: After examinee locates and verifies breaker positions per ATTACHMENT 11.9, **Cue examinee all breakers are properly positioned.**

STANDARDS: All breaker positions verified per ATTACHMENT 11.9

SAT _____ UNSAT _____

-
11. Refer to Attachment 11.10, SUPS A Circuit Loads, and place required SUPS A load breakers to ON at SM/CRS discretion.

CUES: Cue the examinee the **CRS has determined that this step is NOT necessary.**

STANDARDS: Examinee should not perform this step.

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

-
- 12.** Verify SUPS A output frequency when loads are supplied from the inverter is 59.2 to 60.8 Hertz.

CUES: Actual SUPS A indication provides the cue for this step (should be within limits specified).

STANDARDS: Examinee locates indication and verifies inverter is 59.2 to 60.8 Hertz.

SAT_____ **UNSAT**_____

-
- 13. End of Task**

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

SUPS A was completely shutdown for maintenance.
PDP 90A is deenergized.
SUPS A is ready to be returned to service.

INITIATING CUE

The ATC directs you to startup SUPS A.

PLACE GAS DECAY TANK ON DECAY



RO JPM K

Site W3 Job NAO System/Duty Area GWM Mode NORM Number 4

Revision 1 09/07/2006

Approval _____ 04/03/2006
Arvel J. Hall

Estimated Time 25 Min

Time Critical No Critical Time N/A Alternate Path NO

References

OP-007-003, Gaseous Waste Management

NRC KA Number

3.9-071-A4.05 (RO: 2.6; SRO: 2.6)

Evaluation Methods

PERFORM

Trainee

Evaluator

Observer

Date

Satisfactory

☐

Unsatisfactory

☐

Waterford 3 Job Performance Measure

INITIAL CONDITIONS

Gas Decay Tank A is in service.
GDT A and B oxygen and Hydrogen limits are within Technical Specification limits.
Gas Analyzer is operable.

INITIATING CUE

You are directed by the CRS to place Gas Decay Tank B in service and place Gas Decay Tank A on decay in accordance with Section 6.2 and 6.3 of OP-007-003, Gaseous Waste Management

TERMINATING CUE

Gas Decay Tank B in service and Gas Decay Tank A is lined up for decay

STANDARD

Gas Decay Tank B in service and Gas Decay Tank A is lined up for decay

TOOLS

OP-007-003, Gaseous Waste Management

SAFETY CONSIDERATIONS

Radiological considerations for valve located greater than 8 feet above the floor.
Ladder safety considerations for reaching valve located greater than 8 feet above the floor.

PERFORMANCE CONSEQUENCES

Unmonitored release of radioactivity

HUMAN INTERFACES

ATC/BOP

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

None

Waterford 3 Job Performance Measure

Perform the task IAW OP-007-003, Section 6.2 and 6.3. Critical steps are denoted by **CRIT**.

START TIME _____

1. Open Gas Decay tank B Inlet manual Isolation, GWM-2055B

CRIT

CUES: After examinee simulates opening valve, cue that GWM-2055B is open.

STANDARDS Examinee locates GWM-2055B in -35' RAB GDT Room B and locally simulates
: opening GWM-2055B (counter-clockwise direction).

NOTE: This valve is located > 8 feet from the floor; however, a permanent platform is built for the operation of this valve. HP does not need to be informed of this operation, but the examinee may choose to request an HP survey. If so, inform the examinee that it has been surveyed.

SAT _____ UNSAT _____

2. Position the CHARGE/OFF/RELEASE control switch for GDT B to CHARGE position

CRIT

CUES: CHARGE/OFF/RELEASE control switch for GDT B in CHARGE position

STANDARDS At LCP-42, examinee simulates placing CHARGE/OFF/RELEASE control switch
: for GDT B to CHARGE position.

SAT _____ UNSAT _____

3. Verify GDT B Discharge Isolation GWM-305B Closed.

CUES: Green light is ON and Red light is OFF for GDT B Discharge Isolation
GWM-305B Closed

STANDARDS At LCP-42, examinee verifies Green light is ON, and Red light is OFF for
: GWM-305B

SAT _____ UNSAT _____

4. Verify GDT B Inlet Isolation GWM-206B Open

CUES: After examinee simulates depressing button, cue that Red light is ON and
Green light is OFF for GDT B Inlet Isolation GWM-206B.

NOTE: Examinee recognizes requirement to minimize time both GDT inlet valves are open to minimize transfer of Gas.

STANDARDS 1. At LCP-42, examinee simulates depressing Gas Decay Tank B Inlet Isolation,
: GWM-206B, pushbutton.

2. Examinee verifies Red light is ON, and Green light is OFF for GWM-206B.

SAT _____ UNSAT _____

5. Contact Chemistry to transfer Gas Analyzer sample point to GDT B.

CRIT

CUES: Chemistry transfers Gas Analyzer sample point to GDT B.

STANDARDS Examinee notifies Chemistry to transfer Gas Analyzer sample point to GDT B.
:

SAT _____ UNSAT _____

Waterford 3 Job Performance Measure

6. Complete Attachment 11.8, Gas Decay Tank Sample Verification **CRIT**

CUES: 1. **Document GDT lineup on Att. 11.8.**
2. **Examiner circles "B" and dates on step 3 of Att. 11.8.**

STANDARDS 1. Examinee Circles GDT B Placed In Service and initials and dates Step 1
:
2. Examinee ensures that the Chemistry Tech Transfers Gas Analyzer sample point to GDT B and circles "B".

SAT_____UNSAT_____

7. Verify in service GDT pressure is > 10 psig. **CRIT**

CUES: **GDT B pressure is 11 psig.**

STANDARDS: At LCP-42, examinee verifies in service GDT B pressure is > 10 psig.

SAT_____UNSAT_____

8. Place CHARGE/OFF/RELEASE control switch for Gas Decay Tank A to the OFF position **CRIT**

CUES: **CHARGE/OFF/RELEASE control switch for Gas Decay Tank A is in OFF**

STANDARDS At LCP-42, examinee simulates placing CHARGE/OFF/RELEASE control switch
:
for Gas Decay Tank A to OFF.

SAT_____UNSAT_____

9. Verify Gas Decay Tank A Inlet Isolation, GWM-206A, Closed. **CRIT**

CUES: **After examinee simulates depressing button, cue that Red light is ON and Green light is OFF for GDT B Inlet Isolation GWM-206A.**

STANDARDS: 1. At LCP-42, examinee simulates depressing Gas Decay Tank A Inlet Isolation, GWM-206A, pushbutton.
2. Examinee verifies Red light is ON, and Green light is OFF for GWM-206A.

SAT_____UNSAT_____

10. Close Gas Decay Tank A Inlet Manual Isolation, GWM-2055A (B) (C), for GDT being placed on decay. **CRIT**

CUES: **After examinee simulates closing valve, cue that GWM-2055A is closed.**

STANDARDS: Examinee locates GWM-2055A in -35 RAB GDT Room A and simulates closing GWM-2055A (clockwise direction).

NOTE: This valve is located > 8 feet from the floor, the examinee should recognize the following safety/rad precautions prior to operating valve:

1. Must have HP survey valve area.
2. Must use ladder to reach valve. Examinee should locate ladder storage area on the -35 RAB.

SAT_____UNSAT_____

Waterford 3 Job Performance Measure

12. Complete Attachment 11.8, Gas Decay Tank Sample Verification.

CRIT

CUES:

1. **Document GDT lineup on Att. 11.8.**
2. **Examiner signs for receipt of a copy of Att. 11.8.**

STANDARDS:

1. Examinee circles GDT A removed from service and initials and dates step.
2. Examinee ensures that the Chemistry Tech receives a copy of Att. 11.8.

SAT_____ **UNSAT**_____

End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee copy

INITIAL CONDITIONS

Gas Decay Tank A is in service.

GDT A and B oxygen and Hydrogen limits are within Technical Specification limits.

Gas Analyzer is operable.

INITIATING CUE

You are directed by the CRS to place Gas Decay Tank B in service and place Gas Decay Tank A on decay in accordance with Section 6.2 and 6.3 of OP-007-003, Gaseous Waste Management

Facility: Waterford III

Scenario No.: 1

Op-Test No.: 1

 Examiners: _____

 Operators: _____

Initial Conditions: IC-19 70%, MOC

Turnover: EFW Pump A tagged out and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out and is expected to be returned to service within 24 hours. MFW Pump B has recently been returned to service following emergent maintenance. Plant is ready to restore power to 100%.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R(RO) N(BOP/SRO)	Crew performs a brief and commences power escalation toward 100% power.
2	SG07D2	I(BOP/SRO)	SG 2 Channel D low pressure trip setpoint fails high. The crew should enter TS 3.3.1 and 3.3.2 and take required actions to bypass SG Pressure Low and SG ΔP 1 and 2 (EFAS) in PPS Channel D.
3	CV12A2	I(RO/SRO)	After the crew satisfies the reactivity manipulation, the VCT level transmitter fails low causing Charging Pump suction to swap from the VCT to the RWSP. The crew should implement OP-901-113 and secure Charging and Letdown to secure from inadvertent boration. The crew should enter TS 3.1.2.4 due to placing Charging Pump C/S to OFF (may enter 3.0.3 if they take all Pumps to OFF).
4	FW32B	C(SRO)	MFW Pump B lube oil pipe leak, which causes the crew to commence power reduction. During the power reduction brief the oil leak worsens and trips MFW Pump B.
5	PW02	I(RO/SRO)	An automatic reactor power cutback fails to occur, and the crew trips the reactor.
6	RD11A03 RD11A82	C(RO)	CEAs 3 and 82 stick out on the trip, which causes the RO to emergency borate due to two stuck CEAs.
7	ED01A ED01B ED01C ED01D EG09B	C(BOP) M(ALL)	A LOOP occurs 1 minute after the trip, and EDG B Output breaker fails to close and cannot be closed. The crew will implement SPTAs and will be directed to OP-902-003.
8	FW05	C(BOP/SRO)	After the crew performs Step 7 to Protect Main Condenser, the AB EFW Pump trips on overspeed and cannot be restored. The crew will transition to OP-902-008 due to a loss of all feedwater. Once safety function priorities are evaluated, EDG B Output breaker is restored and can be closed. Once closed, the B EFW Pump may be used to feed SGs.

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

**Simulator Scenario
Waterford 3 Nuclear Plant
Simulator Scenario Number: E-NRC06-1**

Author: Kirk Kirkpatrick
Approval: Arvel J. Hall
Revision Number: 0
Estimated Time: 60 Minutes
Initial Conditions: 70%, MOC (IC-151)

Scenario Description:

Power is currently 74 % and rising, MFW Pump B has recently been returned to service following emergent maintenance on the Low Pressure Governor Valve servomotor. ASI control is in progress with Group P and Reg Group 6 CEAs. Subgroup 5 CEAs are selected for both Reactor Power Cutback events. Boron Equalization is in progress. The previous shift has started the power ascent to 100% and has completed all steps in Attachment 9.1 of OP-010-004 up to step 9.1.73.

EFW Pump A tagged out to replace pump impeller and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out due to bearing failure during surveillance run and is expected to be returned to service within 24 hours. DRTS and DEFAS are OOS, AB Bus is aligned to A. RCP 1A middle seal failed 8 hours ago.

Crew will perform a brief and commence power escalation toward 100% power.

After the Up-power has commenced or at the discretion of the lead examiner, SG 2 Channel D low pressure trip setpoint fails high. The crew should enter TS 3.3.1 and 3.3.2 and take required actions to bypass SG Pressure Low and SG ΔP 1 and 2 (EFAS) in PPS Channel D.

After the crew satisfies the reactivity manipulation, VCT level transmitter 227 fails low causing Charging Pump suction to shift from the VCT to the RWSP. The crew should implement OP-901-113 and secure Charging and Letdown to secure from inadvertent boration. The crew should enter TS 3.1.2.4 due to placing Charging Pump C/S to OFF (may enter 3.0.3 if they take all Pumps to OFF).

After Tech Specs have been addressed a lube oil pipe leak on MFW Pump B occurs, which causes the crew to commence power reduction. During the power reduction brief the oil leak worsens and trips MFW Pump B.

An automatic reactor power cutback fails to occur when MFW B trips and the crew trips the reactor, enters OP-902-000, CEAs 3 and 82 stick out on the trip, which will require emergency boration.

A Loss of Offsite Power occurs 1 minute after the trip, and EDG B Output Breaker fails to close and cannot be closed. The crew will implement SPTAs and will be directed to OP-902-003.

After the crew performs Step 7 to Protect Main Condenser, the AB EFW Pump trips on overspeed and cannot be restored. The crew will transition to OP-902-008 due to a loss of all feedwater. Once safety function priorities are evaluated, EDG B Output breaker is restored and can be closed. Once closed, EFW Pump B will fail to auto start and must manually started.

The scenario may be terminated when the crew has taken action to start EFW pump B.

EPLAN classification for this event is SA1

Scenario Notes:

1. Reset Simulator to IC-151.
2. Download bat file: F:\Scenarios\Scenario061 from jump drive.
3. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
 - . Remotes and Overrides are as follows:
 0. FWR74, EFW Pump A breaker racked out
 0. SIR29, HPSI Pump A breaker racked out
 - . Malfunctions
 0. RC09A, RCP 1A middle seal failure (20%) (setup)
 0. FW07B, EFW pump B fail to auto start. (setup)
 0. PW02, Automatic Reactor Cutback fails to occur (Setup)
 0. SG07D2, SG 2 channel D low pressure trip setpoint fails Hi (Trigger 2)
 0. CV12A, VCT level transmitter 227 fails low (Trigger 3)
 0. FW32B, MFW B oil leak 40, 2 min ramp (Trigger 3)
 0. RD11A82, RD11A03, CEAs 3 and 82 stick out on the trip (setup)
 0. ED01A,B,C,D, Loss of Offsite Power (tied to Reactor Trip) (Trigger 5 tie)
 0. EG09B, EDG B Output Breaker fails to close (setup)
 0. FW05, EFW AB Pump mechanical overspeed trips (Trigger 8)
4. Tie Event 7 to Reactor trip
 - . Go to event icon select trigger 7 tie to RX tripped, click add event, click accept new event verify event 7 tied to RX tripped 1 minute delay.
5. Danger Tag and place in OFF:
 - . EFW Pump A
 - . HPSI Pump A
6. Ensure Protected Train B sign is placed in SM office window.
7. Complete the simulator setup checklist.

EVENT 1 – Power Escalation to 100 %

1. On Lead Examiner's cue.
2. If called as woodlands for raising load report ready to receive output
3. If called as TB Watch to monitor equipment during up-power report will monitor equipment.

EVENT 2 – SG 2 channel D low pressure trip setpoint fails Hi

1. On Lead Examiner's cue initiate Event Trigger 2.
2. If Work Week Manager or I&C is called, inform the caller that a work package will be assembled and a team will be sent to the Control Room.

EVENT 3 – VCT level transmitter 227 fails low

1. On Lead Examiner's cue initiate Event Trigger 3.
2. If Work Week Manager or I&C is called, inform the caller that a work package will be assembled and a team will be sent to the Control Room. **(DO NOT ask for priority)**

Event 4 - MFW Pump B lube oil pipe leak,

1. On Lead Examiners cue initiate Event Trigger 4
1. Insert malfunction after 1st annunciator alarms enable modify and raise severity to cause Lo tank level alarm after 1 minute, after crew begins downpower brief modify malfunction to cause Feed pump to trip requiring cutback which will not automatically occur.
3. If called as TB watch to investigate MFW B report large oil leak on pump discharge unisolable and cannot keep up with leak rate

Event 5, 6 and 7- An automatic reactor power cutback fails to occur, and the crew trips the reactor 2 CEAs stick out on trip. LOOP occurs 1 minute later.**NOTE: Mark time breaker failure occurs for classification purposes.**

1. If called as woodlands about restoration of power report power will be restored within 1 hour
2. If called as WWM/PME to investigate EDG B output breaker report team will be dispatched to breaker immediately.
3. If called as RAB watch to investigate EDG B breaker report no obvious reason for failure to close.

Event 8- EFW AB trips on mechanical overspeed

1. If called as RCA watch to investigate EFW AB report EFW AB Mechanical overspeed tripped, linkage broken and cannot be reset.
2. If called as WWM/PMM to repair EFW AB overspeed trip report team will be dispatched immediately
3. When step 7 OP-902-003 to protect main condenser reached call control room as PME at EDG B breaker and report breaker problem repaired and breaker can be safely closed remotely.
4. If asked what the breaker problem was state that the anti-pump device linkage detached.

Note: Ensure call back to close EDG B breaker does not occur until ≥ 15 minutes elapsed. This is to facilitate EPLAN classification of SAI, "AC power capability to essential buses reduced to a single power source for > 15 minutes such that any additional single failure would result in Station Blackout".

Scenario Timeline:

Event	Malfunction	Time (Min)	Severity	Ramp HH:MM:SS	Delay	Trigger
1		1	0	NA	NA	NA
	Power Escalation to 100 %					
2	SG07D2	10	100	N/A	NA	2
	SG 2 channel D low pressure trip setpoint fails Hi					
3	CV12A	15	0	00:01:00	NA	3
	VCT level transmitter 227 fails low					
4	FW32B	25	40	00:03:00	NA	4
	MFW B oil leak					
5	PW02	30	TRUE	NA	NA	NA
	Automatic Reactor Cutback fails to occur					
6	RD11A03	30	TRUE	N/A	NA	NA
	RD11A82					
	CEAs 3 and 82 stick out on the trip					
7	ED01A,B,C, D	31	0	N/A	00:01:00	7
	Loss of Offsite Power (tied to Reactor Trip)					
7	EG09B	31	true	N/A	NA	NA
	EDG B Output Breaker fails to close					
8	FW05	55	true	N/A	NA	8
	EFW AB Pump mechanical overspeed trips					
	RCO9A		40%	N/A	NA	N/A
	RCP 1A middle seal failure					
	FW07B		True	N/A	NA	N/A
	EFW B fail to auto start.					

OP Test 1, Scenario 1, Event 1- Power Escalation to 100 %

Event Description:

Up-power from approximately 74% to 100% power.

Event Objectives:

1. Raise reactor power from 74% - 100% power in accordance with all precautions, limitations, and procedural guidance of General Operating Procedure, OP-010-004.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	CRS/ATC/BOP	Commence power ascension by dilution of RCS and raising of Turbine load to match Tave - Tref
	ATC	Initiate RCS Dilution • Performs Dilution lineup in accordance with OP-002-005 at CP-4 per CRS direction. • Estimates ~ 600 gallons of PMU to raise power to 100% and sets up Batch Counter at CP -4 for desired amount of PMU
	BOP	Initiate MT load increase to maintain RCS Tcold 536°F to 549°F. • BOP sets load reference and rate per CRS or BOP instructions and depresses GO pushbutton on DEH Control Panel on CP-1
	CRS/ATC	Maintain ASI within its control band by withdrawal or insertion of reg group 6 or Reg Group P CEA's in accordance with axial shape control • Maintains ASI within ± 0.05 per Attachment 9.4, OP-10-004
	CRS/ATC	At or above 92% power, control Tcold in the following ranges: 0-30 EFPD 545- 548°F, 30-60 EFPD 545-547°F, >60 EFPD 545-546°F
	CRS	At or above 97%, place MSBSCAL in service (SS/CRS discretion).
	BOP	When final power level is attained, adjust DEH valve position limit.
	Termination	When Reactivity manipulation satisfied at discretion of Lead Examiner

OP Test 1, Scenario 1, Event 2 - SG 2 channel D low pressure trip setpoint fails Hi

Event Description:

SG 2 Channel D low pressure trip setpoint fails high. The crew should enter TS 3.3.1 and 3.3.2 and take required actions to bypass SG Pressure Low and SG Δ P 1 and 2 (EFAS) in PPS Channel D.

Event Objectives:

- 1 Recognize failed instrument and verify RPS/CPC bistable functions as expected.
- 2 Bypass affected bistable channel

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC	Recognizes and report indications of failed channel Annunciators : (Cabinet K) • RPS CHANNEL TRIP S/G 2 PRESS LO(E-16, Cabinet K) • RPS CHANNEL D TROUBLE (H-18, Cabinet K) • SG 2 Pressure Lo Pretrip A/C (F-16, Cabinet K) • SG 2Pressure Lo Pretrip B/D (G-16, Cabinet K) Red Trip Light and White Pretrip Light on affected channel of RPS on ROM on CP-6 SG 2 Pressure indication on CP-8
	BOP	Identifies SG2 Pressure SG-IPI-1023D failed High on CP-8
	CRS/ATC	Verify RPS/CPC function bistable respond as expected
	CRS	Review and/or implement actions required by technical specification section 3.3.1 and 3.3.2 (RPS and ESFAS)
	CRS	Direct bistable bypass with 1 hour of failure
	CRS	Note: failure of a second channel will require that channel to be placed in trip condition. To bypass a second channel will remove both channels from bypass

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Expected Annunciators: • B-1 expected opening cabinet (B-1, cabinet L) • B-18 expected while bypassing bistables (B-1, cabinet K)
	BOP	Bypass affected channel in CP-10, Channel D. • Verify desired Trip Channel is not bypassed on another PPS Channel. • Open key-locked portion of BCP in desired PPS Channel. • Depress Bypass push button for desired Trip Channel. • Verify Bypass push button remains in a depressed state.
	ATC	Bypass lights illuminate on BCP and ROM for the desired channel Verify Bypass light Illuminates on BCP and ROM for the desired Trip Channel. • Steam Generator Pressure – Low Pressure • Steam Generator Δ P1 • Steam Generator Δ P2
	TERMINATION	Event can be terminated when Bistables placed in BYPASS or at discretion of Lead examiner.

OP Test 1, Scenario 1, Event 3 - VCT level transmitter 227 fails low

Event Description:

After the crew has bypassed Channel D Bistables and satisfied the reactivity manipulation, VCT level transmitter 227 fails low causing Charging Pump suction to shift from the VCT to the RWSP. The crew should implement OP-901-113 and secure Charging and Letdown to secure from inadvertent boration. The crew should enter TS 3.1.2.4 due to placing Charging Pump C/S to OFF (may enter 3.0.3 if they take all Pumps to OFF).

Event Objectives:

1. Determine cause of VCT makeup malfunction and operate CVCS components in accordance with OP-901-113, VCT Makeup Malfunction.
2. Operate Charging Pumps as necessary to maintain Pressurizer Level above minimum level for operation in accordance with Attachment 1, Pressurizer Level Versus Tave Curve.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC	Recognizes VCT level instrument failed low: • B-3 VCT level Lo-Lo (Cabinet G) • A-3 VCT level Hi/Lo(Cabinet G) • VCT level indication CP-2
	CRS	Directs entry into OP-901-113, Volume Control Tank Makeup control malfunction
	CRS/ATC	If VCT level transmitter 227 fails low (charging pump suction aligned to RWSP): • Simultaneously secure ALL Charging Pumps CP-2 • Close LETDOWN STOP VALVE (CVC 101). CP-2 • Operate Charging Pumps as necessary to maintain Pressurizer Level Above minimum level for operation in accordance with Attachment 1, Pressurizer Level Versus Tave Curve 4.
	CRS/BOP	Match TAVG and TREF by adjusting Turbine Load. • Place Main Turbine on HOLD • BOP sets load reference and rate per CRS or BOP instructions and depresses GO pushbutton on DEH Control Panel on CP-1
	CRS	Initiate corrective action to repair level instrument. • WHEN level instrument CVC-ILT-0227 is repaired, THEN restore Charging and Letdown in accordance with OP-002-005, CHEMICAL AND VOLUME CONTROL

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Enter Tech Spec 3.1.2.4 for Charging Pump Operability
	TERMINATION	This can be terminated once WWM has been contacted and actions have commenced to match Tave to Tref or at discretion of Lead Examiner

OP Test 1, Scenario 1, Event 4 / 5 - MFW Pump B lube oil pipe leak, Reactor Cutback fails to occur
Event Description:

After Charging Pump Tech Specs have been addressed a lube oil pipe leak on MFW Pump B occurs, which causes the crew to commence power reduction. During the power reduction brief the oil leak worsens and trips MFW Pump B. Reactor Cutback will fail to actuate requiring manual Trip.

Event Objectives:

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

Event Critical Tasks:

None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Recognizes MFP B Trouble annunciator R-18 FWPT OIL PUMP TROUBLE (Cabinet F)
	CRS	Dispatch TB watch to investigate B MFP alarm • TB watch will report large oil leak on MFP B oil pump unisolable and unable to keep up with leak
	BOP	Recognizes MFP B low oil tank alarm • S-20 FWPT OIL TANK HI/LO (Cabinet F)
	CREW	MFP B trips Cutback fails to actuate.
	CRS/ATC	Directs tripping Reactor • ATC depresses both Reactor Trip Pushbuttons
	CRS	Direct Entry in OP-902-000 • Perform SPTAs
	TERM	Crew diagnoses a Reactor Trip Event and transitions to OP-902-000 and Directs performance of Standard Post Trip Actions.

OP Test 1, Scenario 1, Event 6/7 – CEAs 3 and 82 stick out on Reactor Trip, Loss of OffSite Power occurs 1 minute after Reactor Trip

Event Description:

An automatic reactor power cutback fails to occur when MFW B trips and the crew trips the reactor enters OP-902-000, CEAs 3 and 82 stick out on the trip, which will require emergency boration

A Loss of Offsite Power occurs 1 minute after the trip, and EDG B Output breaker fails to close and cannot be closed. The crew will implement SPTAs and will be directed to OP-902-003.

Event Objectives:

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure.

Event Critical Tasks

- 1 Establish RCS Reactivity Control

The task is identified by at least one member of the crew. The crew takes action to perform Emergency Boration due to two stuck out CEAs on reactor trip prior to exiting SPTAs.

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
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Time:	Position:	Applicant's Actions or Behavior:
	ATC/CRS	VERIFY REACTIVITY CONTROL - Check Reactor Power dropping on Log Channel indicators and/or recorders on CP-2 and/CP-7 - Check Startup Rate on CP-2 and/or CP-7 Is negative - Emergency Borate from CP-4 by performing the following. <u>CRITICAL</u> - o Place Makeup Mode Selector Switch in MANUAL - o Align borated water source by performing one of the following: ▪ Initiate Emergency Boration using Boric Acid Pump as follows: • Open Emergency Boration Valve, BAM-133. • Start <u>one</u> Boric Acid Pump. • Close recirc valve for Boric Acid Pump started: - o Boric Acid Makeup Pump Recirc Valve A, BAM-126A ▪ <u>OR</u> - o Boric Acid Makeup Pump Recirc Valve B, BAM-126B. ▪ <u>OR</u> ▪ Initiate Emergency Boration using Gravity Feed as follows: • Open Boric Acid Makeup Gravity Feed Valve A, BAM-113A - o <u>And</u> • Open Boric Acid Makeup Gravity Feed Valve B, BAM-113B. - o Close VCT Disch Valve, CVC-183. - o Verify at least <u>one</u> Charging Pump operating <u>and</u> Charging Header flow $\geq$ 40 GPM. Note: Critical Task
	BOP/CRS	Verify Maintenance Of Vital Auxiliaries • Check the main turbine tripped by verifying all throttle and governor valves indicate green at Turbine Mimic on CP-1 • Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1 • Check train A and B station loads are energized from offsite power by: - o Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 - o Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 - o A and B DC bus indicators on CP-1 - o Vital AC Instrument Bus Indicators on CP-7 (4 total)

Time:	Position:	Applicant's Actions or Behavior:
	BOP/CRS	Verify Maintenance Of Vital Auxiliaries • Check the main turbine tripped by verifying all throttle and governor valves indicate green at Turbine Mimic on CP-1 • Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1 • Check train A and B station loads are energized from offsite power by: - o Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 - o Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 - o A and B DC bus indicators on CP-1 - o Vital AC Instrument Bus Indicators on CP-7 (4 total) Recognizes EDG B Breaker did not close: • Attempts to manually close EDG B Output Breaker. • Calls WWM/PME to get assistance to EDG B Breaker.
	ATC/CRS	Verify RCS Inventory Control ▪ Check PZR level 7% to 60% and trending to 33% to 60% on CP-2 ▪ Check Subcooling Margin greater than or equal to 28° on CP-2
	ATC/CRS	Verify RCS Pressure Control • Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2125 and 2275 psia OR • If PZR pressure is less than 1684 psia, the operator verifies that SIAS and CIAS (CP-7) initiate or performs manual initiation (CP-7 or CP-8) NOTE: This was manually performed. • If PZR pressure is less than 1621 psia, the operator verifies no more than two RCPs are operating - o Starts lift oil pumps for RCPs to be secured at CP-2 - o Secures RCP in Loop 1 and Loop 2 at CP-2 • If PZR pressure is less than minimum RCP NPSH of App. 2A (curve located on CP-6) the operator secures all RCPs. - o Starts a lift oil pump for RCPs to be secured on CP-2 - o Secures all RCPs at CP-2 NOTE: CRITICAL TASK BOLDED
	ATC/CRS	Verify Core Heat Removal • Check at least one RCP operating on CP-2, • Operating loop delta-T less than 13°F, and

Time:	Position:	Applicant's Actions or Behavior:
		RCS Subcooling (CP-2) greater than or equal to 28°F.
	BOP/CRS	Verify RCS Heat Removal - Check at least one S/G is both 5-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level OR - Verify EFW is available to restore level in at least one S/G within 50% - 70% NR [60% - 80% NR]. - EFAS-1 or EFAS-2 actuation occurred if < 27.4% NR (PPS ROM lights extinguished CP-7) - EFW pumps operating (CP-8) if EFAS-1 or 2 actuated
	ATC/BOP/CRS	Verify RCS Tc (CP-2 or CP-7) is 530-550°F or - If Tc is > 550°F verify level is being restored to at least one S/G (CP-1 or CP-8) and verify SBCS (CP-1) or ADVS (CP-8) are maintaining RCS temp 530-550°F. - If Tc is < 530°F then verify feed flow (MFW-CP-1 or EFW-CP-8) is not excessive and verify SBCS or ADVs are restoring RCS Tc 530-550°F - If Tc is < 382°F verify no more than 2 RCPs operating on CP-2
	BOP/CRS	Verify S/G pressure 885-1040 psia (CP-1 or CP-7) or - If S/G press < 885 psia verify steam bypass valves and ADVs are closed. - If S/G press less than or equal to 666 psia verify MSIS is initiated. - if S/G press > 1040 psia verify SBCs or ADVs are restoring S/G press to < 1040 psia
	BOP/CRS	Verify FWCS in Reactor Trip Override (CP-1) - Check Main Feed Reg Valves are closed, - Startup Feed Reg Valves are 13-21% open, and - Operating Feed Pumps are 3800 to 4000 rpm or - Manually operate feedwater system to restore level in at least one S/G to 50-70% NR.
	CRS/BOP	Reset Moisture Separator Reheaters - Check the Temp Control Valves closed (Reheat Control Panel CP-1) - Direct TB watch to locally verify MSR TCV reset

Time:	Position:	Applicant's Actions or Behavior:
	BOP/ATC	Verify Containment Temperature And Pressure Control • Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120°F and Containment pressure is < 16.4 psia OR • Verify at least 3 Containment Fan Coolers (CP-18) operating. • If Containment press is greater or equal to 17.1 psia verify ALL available CFCs are operating in emergency mode. ◦ Verifies 4 CFCs operating in slow speed • If Containment pressure is greater than or equal to 17.7 psia, verify ◦ CSAS is initiated ◦ ALL available CS pumps are delivering > 1750 gpm ◦ ALL RCPs are secured NOTE: Due to size of LOCA, 17.7 psia may take some time to attain, so the operator may have to address this again later.
	CRS	Direct Diagnostic Action • If ANY Safety Function Acceptance Criteria are not met OR ANY contingency action was taken perform Diagnostics Flowchart OP-902-009, Appendix 1
	CRS	Diagnoses into OP-902-003, Loss of Offsite power loss of forced circulation recovery.
	CRS	Confirm diagnosis • Direct STA to perform safety function status check list • Direct Chemistry to sample both SGs for activity.
	TERMINATION	The event may be terminated when directed to enter OP-902-003 or at discretion of Lead Examiner

OP Test 1, Scenario 1, Event 8 – EFW pump AB trips on overspeed

Event Description:

After the crew performs step 7 of OP-902-003, to Protect Main Condenser, the AB EFW Pump trips on overspeed and cannot be restored. The crew will transition to OP-902-008 due to a loss of all feedwater. Once safety function priorities are evaluated, EDG B Output breaker is restored and can be closed. Once closed, the B EFW Pump may be used to feed SGs.

The scenario may be terminated when the crew has taken action to start EFW pump B. or at the discretion of the lead examiner.

Event Objectives:

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-008, Functional Recovery.

Event Critical Tasks:

Establish a primary to secondary heat sink.

The task is identified by at least one member of the crew manipulating the controls to establish the desired plant condition. The crew should restore or maintain at least one steam generator available as a heat sink by starting EFW Pump B.

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Directs Entering OP-902-003
	CRS	Confirm Diagnosis • Confirm diagnosis of a Loss of Offsite Power or a Loss of Forced Circulation by checking Safety Function Status Check Acceptance Criteria are satisfied.
	CREW	Announce the Event • Announce a Loss of Offsite Power or a Loss of Forced Circulation is in progress using the plant page.
	CRS	Classify the Event • Advise the Shift Manager to REFER TO EP-001-001, "Recognition & Classification of Emergency Condition" and implement the Emergency Plan.
	CRS	Implement Placekeeping • REFER TO Section 6.0, "Placekeeper" and record the time of the reactor trip.

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Verify Loads Sequence on Vital Bus (CP-1) • IF offsite power has been lost, THEN verify the sequencer has timed out for at least one 4.16KV safety bus.
	BOP	Verify Proper CCW Operation (CP-8) • Check a CCW pump is operating for each energized 4.16KV safety bus.
	BOP	Protect Main Condenser IF offsite power has been lost, THEN : • Verify MSIVs are closed. (CP-8) • Verify following steam generator blowdown isolation valves are closed: • BD-102 A, B (CP-8) • BD-103 A, B (CP-8)
	CRS/BOP	Recognizes EFW AB tripped loss of heat sink • A-10 EFW AB unavailable (Cabinet M) • Dispatches operator to investigate locally • Calls WWM to dispatch repair team to EFW AB to Restore overspeed trip and/or expedite return to service of EFW Pump A. Operator reports Mechanical overspeed tripped linkage damaged and cannot be reset.
	CRS	Directs entry to OP-902-008 for loss of Heat Sink Safety function
	CREW	Announce the Event • Announce that the Functional Recovery Procedure is in progress using the plant page.
	CRS	Classify the Event • Advise the Shift Manager to REFER TO EP-001-001, "Recognition & Classification of Emergency Condition" and implement the Emergency Plan.
	CRS	Implement Placekeeping • REFER TO the "Placekeeper" and record the time of the reactor trip.
	ATC	RCP Trip Strategy • No RCP running following Loss off site power
	CREW	Sample BOTH Steam Generators • Direct Chemistry to sample BOTH steam generators for activity and boron.

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Place Hydrogen Analyzers in Service Train A - Place Train A H2 ANALYZER CNTMT ISOL VALVE keyswitch to "OPEN". (Key 216) - Place H2 ANALYZER A POWER to "ON". - Check H2 ANALYZER A PUMP indicates ON.
	CRS	Identify Success Paths Identify success paths to be used to satisfy each safety function using BOTH of the following: - Resource Assessment Trees - Safety Function Tracking Sheet
	CRS	Directs STA to perform Safety Function Status Checks REFER TO Section 6.0, "Safety Function Status Check", and perform Safety Function Status Checks.
	CRS	Maintain Success Paths Prioritize Safety Functions based on ALL of the following: - Instructions for those Safety Functions which do NOT meet any success path. - Instructions for those Safety Functions for which success path one criteria is NOT met. - Instructions for Safety Functions for which success path one criteria is met. NOTE: RCS and Core Heat Removal identified as number one Priority 2 Reactivity control 4 Maintenance of Aux DC 3 Maintenance of Aux AC 5 Rcs Inventory 6 RCS pressure control 1 RCS/Core Heat Removal 7 Containment Isolation 8 Containment temp and press control
	CRS	Implement Success Paths Implement success paths based on prioritization from previous step. NOTE: Success path will be restoration of EDG B Output breaker Note: Once RCS and Core Heat Removal priority identified report from field that EDG B output Breaker problem has been restored and is ready to close.
	CRS	Directs EDG B output Breaker closed

Time:	Position:	Applicant's Actions or Behavior:
	CRS/BOP	EFW B pump started NOTE: CRITICAL TASK
	TERMINATION	Scenario may be terminated when actions have been taken to manually start EFW pump B or at discretion of Lead Examiner.

NUCLEAR PLANT OPERATOR TURNOVER SHEET AND CHECKLIST

(TYPICAL)

DATE 11/###/06

1. Prior to turnover, review Critical Parameters in allowable limits (Modes 1 and 2):

PRESSURIZER LEVEL	33-56%
PRESSURIZER PRESSURE	2075-2275 psia
STEAM GENERATOR LEVEL	60-70%
STEAM GENERATOR PRESSURE	860-1000 psia
TAVG	544-582°F
REACTOR POWER	≤100% (Mode 2 ≤ 5%)

2. Simulator Specific Information

Reactor Power	<u>74%</u>
EFPD	<u>250</u>
ESI	<u>0.002</u>
RCS Boron	<u>942 ppm</u>
BAMT A	<u>5850 ppm</u>
BAMT B	<u>5725 ppm</u>

3. Complete independent Control Board Walkdown.

LCO/Action Status:

<u>Equip/Sys</u>	<u>TS</u>	<u>Entered</u>	<u>Action</u>	<u>Exited</u>
EFW Pump A	3.7.1.2.d	24 hrs ago	Restore to operable w/in 72 hours or be in HSB w/in 6 hours and HSD w/in next 6 hours.	
HPSI Pump A	3.5.2.b	2 hrs ago	Restore to operable w/in 72 hours or be in HSB w/in 6 hours, and Pzr pressure < 1750 psia and RCS temp < 500°F w/in next 6 hours.	
<u>Equip/Sys</u>	<u>TRM#</u>	<u>Entered</u>	<u>Action</u>	<u>Exited</u>
None				

NUCLEAR PLANT OPERATOR TURNOVER SHEET AND CHECKLIST (Cont'd)

(TYPICAL)

Surveillance Tests in progress:

None

Equipment taken out of service:

EFW Pump A

HPSI Pump A

Equipment returned to service:

None

Maintenance in progress:

EFW Pump A has been OOS for 24 hours to replace the pump impeller. HPSI pump A has been OOS for 2 hours due to bearing failure during a surveillance run.

Significant Events/Additional Items/Remarks/Equipment Out of Service:

Plant Safety Index is 8.6 Yellow. Protected Train is B. SubGroups 5 and 11 are selected for both RXC events. RCP 1A Middle Seal failed 8 hours ago (steps 1 and 2 of OP-901-130 have been taken). Plans are for the oncoming shift to align HPSI Pump AB to replace A.

Facility: Waterford III

Scenario No.: 2

Op-Test No.: 1

Examiners: _____

Operators: _____

_____Initial Conditions: IC-30 100%, EOC

Turnover: RCP 1A Middle Seal failed 8 hours ago (RC09A). EFW Pump A is tagged out and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out and is expected to be returned to service within 24 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	RD02A82	R(RO) C(BOP/SRO)	CEA 82 drops into the core. The crew should implement OP-901-102. To comply with TS 3.1.3.1 the crew implements OP-901-212 for a rapid power reduction within 15 minutes.
2	RC23B (0.01%)	C(SRO)	After the crew satisfies the reactivity manipulation, an RCS leak develops inside Containment. The crew should enter TS 3.4.5.2.
3	CV02A CV02C	I(RO)	Charging Pumps AB and A fail to auto start on lowering Pressurizer level. The RO should start pumps as directed by the SRO.
4	MS09A	I(BOP/SRO)	SG #1 Steam Flow instrument, FW-IFR-1011, fails low. The crew should enter OP-901-201 and manually control feedwater flow. The Ultrasonic Flowmeter goes bad due to the FW flow transient and the crew should enter TRM 3.3.5. Note: the crew has 1 minute 17 seconds to respond to this failure or the plant will trip on low SG level.
5	RC23B (0.1%)	M(ALL)	The leak grows to a SB LOCA over a 10 minute period. The crew should manually trip the reactor and manually initiate SIAS and CIAS.
6	SI02B SI16G	I(BOP)	HPSI Pump B fails to auto start and SI-227B fails to Open. The BOP should manually start HPSI Pump B and open SI-227B. The crew may commence a cooldown with the ADVs.
7	RP05B3 RP05C3 RP05D3	I(RO)	CSAS fails to initiate when containment pressure reaches 17.7 psia. The RO should recognize this and manually initiate CSAS. Once the RO secures RCPs following CSAS, the scenario may be terminated.

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

**Simulator Scenario
Waterford 3 Nuclear Plant
Simulator Scenario Number: E-NRC06-2**

Author: Kirk B. Kirkpatrick
Approval: Arvel J. Hall
Revision Number: 0
Estimated Time: 60 Minutes
Initial Conditions: 100%, EOC (IC-152)

Scenario Description:

The plant is at 100% reactor power. AB electrical buses are aligned to the A side. RCP 1A Middle Seal failed 8 hours ago. EFW Pump A has been OOS for 24 hours to replace the pump impeller. HPSI pump A has been OOS for 2 hours due to bearing failure during a surveillance run.

After the crew takes the shift, CEA 82 drops into the core. The crew should implement OP-901-102. To comply with TS 3.1.3.1 the crew implements OP-901-212 for a rapid power reduction within 15 minutes.

After the crew satisfies the reactivity manipulation, an RCS leak develops inside Containment. The crew should enter op-901-111 and TS 3.4.5.2.

Charging Pumps AB and A fail to auto start on lowering Pressurizer level. The ATC should start pumps as directed by the CRS.

SG #1 Steam Flow instrument, FW-IFR-1011, fails low. The crew should enter OP-901-201 and manually control feedwater flow. Note: the crew has 1 minute 17 seconds to respond to this failure or the plant will trip on low SG level.

The leak grows to a SB LOCA over a 10 minute period. The crew should manually trip the reactor and manually initiate SIAS and CIAS. HPSI Pump B fails to auto start and SI-227B fails to Open. The BOP should manually start HPSI Pump B and open SI-227B. The crew may commence a cooldown with the ADVs. CSAS fails to initiate when containment pressure reaches 17.7 psia. The crew should recognize this and manually initiate CSAS.

Once the RO secures RCPs following CSAS, the scenario may be terminated.

Scenario Notes:

1. Reset Simulator to IC-152.
2. Download bat file: F:\Scenarios\Scenario062 from jump drive.
3. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
 - a. Remotes and Overrides are as follows:
 1. FWR74, EFW Pump A breaker racked out
 2. SIR29, HPSI Pump A breaker racked out
 - b. Malfunctions
 1. RC09A, RCP 1A middle seal failure (20%) (setup)
 2. RD02A82, CEA 82 drops (Trigger 1)
 3. RC23B, RCS leak (0.01%) (Trigger 2)
 4. CV02A/CV02C, Chg Pmps A & AB fail to autostart (setup)
 5. MS09A, SG1 Flow Inst. Fails low (1 min ramp) (Trigger 4)
 6. SI02B, HPSI Pump B fails to auto start on SIAS (setup)
 7. SI16G, SI-227B fails to open on SIAS (setup)
 8. RP05B3/C3/D3, CSAS fails to auto actuate (setup)
4. Place in OFF and Danger Tag:
 - a. EFW Pump A
 - b. HPSI Pump A
5. Ensure Protected Train B sign is placed in SM office window.
6. Complete the simulator setup checklist.

EVENT 1 – CEA 82 Drops into the Core

1. Initiate Event Trigger 1.
2. If Work Week Manager or I&C is called, inform the caller that a team will be sent to the CEDMCS control cabinets.

EVENTS 2 and 3 – RCS Leak Inside Containment/Charging Pumps A & AB Fail to Auto Start

1. Initiate Event Trigger 2.

EVENT 4 – SG1 Steam Flow Instrument, FW-IFR-1011, Fails Low

1. Initiate Event Trigger 4.
2. If Work Week Manager or I&C is called, inform the caller that a work package will be assembled and a team will be sent to the Control Room.

Event 5 – Leak Grows to a SB LOCA

1. Modify RC23B to 0.1% with a 10 minute ramp.

Event 6 – HPSI Pump B Fails to Auto Start and SI-227B Fails to Auto Open

1. Event occurs automatically on SIAS.

Event 7 – CSAS Fails to Auto Actuate

1. Event occurs automatically when containment pressure reaches 17.7 psia.

Scenario Timeline:

Event	Malfunction	Time (Min)	Severity	Ramp HH:MM:SS	Delay	Trigger
1	RD02A82 CEA 82 Drops	1	NA	NA	NA	1
2	RC23B RCS Leak Inside Containment	15	0.01%	NA	NA	2
3	CV02A CV02C Charging Pumps A & AB Fail to Auto Start	20	NA	NA	NA	NA
4	MS09A SG1 Steam Flow Instrument, FW-IFR-1011, Fails Low	30	0%	00:01:00	NA	4
5	RC23B SB LOCA	40	0.1%	00:10:00	NA	2 Modified
6	SI02B SI16G HPSI Pump B Fails to Auto Start and SI-227B Fails to Auto Open	45	NA	NA	NA	NA
7	RP05B3 RP05C3 RP05D3 CSAS Fails to Auto Actuate	55	NA	NA	NA	NA

OP Test 1, Scenario 2, Event 1 - CEA 82 Drops into the Core

Event Description:

CEA 82 drops into the core. The crew should implement OP-901-102. To comply with TS 3.1.3.1 the crew implements OP-901-212 for a rapid power reduction within 15 minutes.

Event Objectives:

1. Stabilize plant conditions by adjusting Turbine load to match Tave-Tref following a dropped CEA.
2. Determine the cause and results of the dropped CEA.
3. Review and enter appropriate Tech Spec 3.1.3.1.c.
4. Reduce reactor power in accordance with COLR and OP-901-212, Rapid Plant Power Reduction.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC/BOP	Recognize and report indications of Dropped CEA • CEA 82 Amber Rod Bottom Light on CEA Rod Bottom Light Mimic on CP-2 • CEA 82 Green Lower Electrical Limit Light illuminated on CEDMCS Control Panel on CP-2 • CEAC CRT on CP-2 indicates CEA 82 inserted in core • RCS Tc, Th, and Tave lowering on indicators and recorders on CP-2, CP-7 and PMC • RCS Pressure slowly lowering on CP-2 and CP-7 indicators and recorders • CEA Disabled, CEA Group Minor Deviation, CEA Group Major Deviation Annunciators on CP-2 • COLSS Master annunciator on CP-36 (BOP) • SG pressure lowering on CP-1 and CP-8 (BOP)
	CRS	Enters OP-901-102, CEA or CEDMCS Malfunction.
	ATC	Verifies CEDMCS Mode Select Switch to OFF on CEDMCS Control Panel on CP-2.
	CRS	Transitions to Section E1, CEA Misalignment Greater Than 7 Inches

Time:	Position:	Applicant's Actions or Behavior:
	Crew	Match TREF and TAVE • CRS directs the BOP and ATC to coordinate to match Tave and Tref • BOP lowers load reference and sets load rate per CRS or ATC instructions and depresses GO pushbutton on DEH Control Panel on CP-1 • ATC instructs BOP to place turbine in Hold when Tave and Tref are matched
	CRS	Informs the SM to notify Duty Plant Manager and Duty Engineering.
	CRS/ATC	Records time of CEA misalignment.
	CRS	• Determines need to commence power reduction below 70% power by boration and implement OP-901-212, Rapid Plant Power Reduction, to comply with Tech Spec 3.1.3.1 • Determines need to start downpower within 15 minutes of CEA deviation • Declares COLSS inoperable and enters OP-901-501, PMC or COLSS Inoperable • Directs STA or board operators to start COLSS Off-Normal 15 minute logs
	ATC	Initiates RCS boration within 15 minutes of CEA deviation • Estimates ~ 660 gallons from BAMT A or ~ 1474 gallons from RWSP to reduce power to 70% • Either direct borate or borate from the RWSP with one Charging Pump per CRS direction
	ATC	Establishes Boron Equalization. • Place all available Pressurizer Backup Heater C/Ss to ON on CP-2. • Lower Potentiometer on Spray Valve Controller on CP-2 until Spray Valves indicate intermediate
	ATC/CRS	Maintain ASI • CRS provides direction on ASI Control - Preferred groups and CEA insertion limits per TS 3.1.3.6 • ATC uses CEAs in Manual Group in accordance with CRS direction and OP-004-004, Control Element Drive
	CRS	Notify Dispatcher of load reduction

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Initiate Main Turbine load reduction to maintain RCS Tc 536°F – 549°F (or within a narrower band if directed by CRS). • BOP lowers load reference and sets load rate per CRS or ATC instructions and depresses GO pushbutton on DEH Control Panel on CP-1
	Termination	Terminate after reactivity manipulation is satisfied.

OP Test 1, Scenario 2, Events 2 and 3 - RCS Leak Inside Containment/Charging Pumps A & AB Fail to Auto Start

Event Description:

After the crew satisfies the reactivity manipulation, an RCS leak develops inside Containment. The crew should implement OP- 901-111, RCS Leak, and evaluate T.S. 3.4.5.2. Charging Pumps AB and A fail to auto start on lowering Pressurizer level. The ATC should start pumps as directed by the SRO.

Event Objectives:

1. Determine approximate RCS leak rate.
2. Take Tech Spec action and make notifications according to Off-Normal Operating Procedure OP-901-111, Reactor Coolant System Leak.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC/BOP	Recognizes an RCS leak exists and checks that automatic actions occur as required • Letdown flow on CP-4 lowers to maintain Pressurizer at setpoint • Containment Water Leakage annunciators on CP-8 • Containment PIG alarms and rising trend indication on RMS CRT at CP-6 • Containment Pressure on CP-8 shows a slow rise over time • Containment Leakage recorder on CP-1 shows rising trend
	CRS	Discusses contingency with crew for inability to maintain Pressurizer Level with available Charging Pumps • Trip Reactor • Manually initiate SIAS/CIAS, • Go to OP-902-000, Standard Post Trip Actions
	ATC	Determines approximate RCS leak rate by either of the following: • calculating the difference between Charging flow (CP-4) and Letdown flow (CP-4) plus RCP Controlled Bleed Off flows (PMC) • obtain value from PMC via Group Display LEAKRATE.
	CRS	Determines that plant is not stable (downpower in progress); therefore, cannot obtain accurate leak rate data from PMC.

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Refers to Tech Spec 3.4.5.2 and determines required actions • Enters TS 3.4.5.2 • Determines to shut the plant down instead of stopping at 70%
	ATC	Recognizes and reports that the backup charging pumps failed to auto start • 1st pump should start when Pzr level is 2.5% below program level • 2nd pump should start when Pzr level is 3.9% below program level • both pumps should receive a start signal when Pzr level is 6.0% below program level
	CRS/ATC	• CRS directs the ATC to start backup charging pumps as necessary to maintain Pzr level. • ATC starts 1 or 2 charging pumps.
	Termination	Terminate after crew stabilizes Pressurizer level.

OP Test 1, Scenario 2, Event 4 - SG1 Steam Flow Instrument, FW-IFR-1011, Fails Low

Event Description:

SG 1 Steam Flow instrument, FW-IFR-1011, fails low. The crew should enter OP-901-201, Steam Generator Level Control System Malfunction, and manually control feedwater flow. Note: the crew has 1 minute 17 seconds to respond to this failure or the plant will trip on low SG level.

Event Objectives:

1. Establish control of SG 1 level with manual control of the Master Controller.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Recognize and report indications of instrument failure: • SG 1 Steam Flow indication lowering (FW-IFR-1011) (CP-1) • SG 1 actual level lowers (CP-1 or CP-8) • Annunciator for SG 1 Level Hi/Lo (Cabinet F, U-14) (CP-1) • Annunciator for SG 1 Steam/FW Flow Signal Dev (Cabinet F, T-17) (CP-1) • SG 1 Master Controller shows deviation between Output and Process inputs (CP-1) • Suggests taking manual control of either of the following to restore SG 1 level: - o SG 1 Master Controller - o SG 1 Main Feedwater Regulating Valve Controller (MFRV)
	CRS/BOP	CRS directs BOP to take manual control of SG 1 Master Controller or MFRV and raise output to restore SG 1 level
	CRS	Enters OP-901-201, Steam Generator Level Control Malfunction
	BOP	BOP may return SG 1 Master Controller to Auto or manually control flow during the plant downpower.
	Termination	Terminate after crew stabilizes Steam Generator level.

OP Test 1, Scenario 2, Event 5, 6, and 7 - Leak Grows to a SB LOCA; HPSI Pump B Fails to Auto Start and SI-227B Fails to Auto Open; and CSAS Fails to Auto Actuate

Event Description:

The leak grows to a SB LOCA over a 10 minute period. The crew should manually trip the reactor, manually initiate SIAS and CIAS, and implement OP-902-000, Standard Post Trip Actions. The crew should diagnose the event and transition to OP-902-002, Loss of Coolant Accident Recovery. HPSI Pump B fails to auto start and SI-227B fails to Open. The BOP should manually start HPSI Pump B and open SI-227B. The crew may commence a cooldown with the ADVs. CSAS fails to initiate when containment pressure reaches 17.7 psia. The BOP should recognize this and manually initiate CSAS.

Event Objectives:

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions.
2. Properly diagnose event in progress and transition to OP-902-002, Loss of Coolant Accident Recovery.
3. Initiate Safety Injection flow when RCS pressure is below SIAS setpoint.
4. Secure Reactor Coolant Pumps when less than minimum NPSH or upon loss of CCW cooling flow.
5. Initiate Containment Spray flow when Containment pressure is above CSAS setpoint.

Event Critical Tasks:

Manually establish the minimum design Safety Injection System flow.	The task is identified by at least one member of the crew. The crew starts HPSI Pump B and opens SI-227B prior to Reactor Vessel Plenum level dropping below 20%.
Trip any RCP not satisfying RCP operating limits.	The task is identified by at least one member of the crew. All RCPs are stopped: • within three (3) minutes on loss of CCW flow. • within three (3) minutes on a loss of Subcooled Margin.
Maintain Containment Temperature and Pressure Control.	The task is identified by at least one member of the crew. The crew will initiate CSAS within three (3) minutes of Containment pressure exceeding 17.7 psia (CRS may direct initiation as pressure approaches 17.7 psia).

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC	Recognize and report indications of inability to maintain Pressurizer Level with available Charging Pumps • All 3 Charging Pumps running (CP-4) • Pressurizer Level continuing to lower (CP-2)

Time:	Position:	Applicant's Actions or Behavior:
	CRS/ATC	At CRS direction, ATC performs the following: • Trip Reactor (CP-2) • Manually initiate SIAS/CIAS (CP-7) • Go to OP-902-000, Standard Post Trip Actions
	ATC/CRS	Verify Reactivity Control • Check reactor power dropping on CP-2 or CP-7 • Check startup rate is negative on CP-2 or CP-7 • Check less than 2 CEAS not fully inserted using - o CEAC CRT on CP-2, or - o CEDMCS LEL Lights illuminated on CP-2, or - o CEA Rod Bottom Lights illuminated on CP-2
	BOP/CRS	Verify Maintenance Of Vital Auxiliaries • Check the main turbine tripped by verifying all throttle and governor valves indicate green at Turbine Mimic on CP-1 • Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1 • Check train A and B station loads are energized from offsite power by: - o Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 - o Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 - o A and B DC bus indicators on CP-1 - o Vital AC Instrument Bus Indicators on CP-7 (4 total)
	ATC/CRS	Verify RCS Inventory Control ▪ Check PZR level 7% to 60% and trending to 33% to 60% on CP-2 ▪ Check Subcooling Margin greater than or equal to 28° on CP-2

Time:	Position:	Applicant's Actions or Behavior:
	ATC/CRS	Verify RCS Pressure Control - Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2125 and 2275 psia OR - If PZR pressure is less than 1684 psia, the operator verifies that SIAS and CIAS (CP-7) initiate or performs manual initiation (CP-7 or CP-8) NOTE: This was manually performed. If PZR pressure is less than 1621 psia, the operator verifies no more than two RCPs are operating - Starts lift oil pumps for RCPs to be secured at CP-2 Secures RCP in Loop 1 and Loop 2 at CP-2 If PZR pressure is less than minimum RCP NPSH of App. 2A (curve located on CP-6) the operator secures all RCPS. - Starts a lift oil pump for RCPs to be secured on CP-2 Secures all RCPs at CP-2 NOTE: CRITICAL TASK BOLDED
	BOP	Recognizes and reports that HPSI Pump B failed to auto start and SI-227B failed to auto open. - Manually start HPSI Pump B - Manually open SI-227B NOTE: CRITICAL TASK (may be performed now or after entering OP-902-002).
	ATC/CRS	Verify Core Heat Removal - Check at least one RCP operating on CP-2, - Operating loop delta-T less than 13°F, and - RCS Subcooling (CP-2) greater than or equal to 28°F.

Time:	Position:	Applicant's Actions or Behavior:
	BOP/CRS	Verify RCS Heat Removal • Check at least one S/G is both 5-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level OR • Verify EFW is available to restore level in at least one S/G within 50% - 70% NR [60% - 80% NR]. - o EFAS-1 or EFAS-2 actuation occurred if < 27.4% NR (PPS ROM lights extinguished CP-7) - o EFW pumps operating (CP-8) if EFAS-1 or 2 actuated
	ATC/BOP/CRS	Verify RCS Tc (CP-2 or CP-7) is 530-550°F or • If Tc is > 550°F verify level is being restored to at least one S/G (CP-1 or CP-8) and verify SBCS (CP-1) or ADVS (CP-8) are maintaining RCS temp 530-550°F. • If Tc is < 530°F then verify feed flow (MFW-CP-1 or EFW-CP-8) is not excessive and verify SBCS or ADVs are restoring RCS Tc 530-550°F • If Tc is < 382°F verify no more than 2 RCPs operating on CP-2
	BOP/CRS	Verify S/G pressure 885-1040 psia (CP-1 or CP-7) or • If S/G press < 885 psia verify steam bypass valves and ADVs are closed. • If S/G press less than or equal to 666 psia verify MSIS is initiated. • if S/G press > 1040 psia verify SBCs or ADVs are restoring S/G press to < 1040 psia
	BOP/CRS	Verify FWCS in Reactor Trip Override (CP-1) • Check Main Feed Reg Valves are closed, • Startup Feed Reg Valves are 13-21% open, and • Operating Feed Pumps are 3800 to 4000 rpm or • Manually operate feedwater system to restore level in at least one S/G to 50-70% NR.
	BOP/CRS	Reset Moisture Separator Reheaters • Check the Temp Control Valves closed (Reheat Control Panel CP-1)

Time:	Position:	Applicant's Actions or Behavior:
	ATC/CRS	Verify Containment Isolation • Check Containment pressure (CP-7 or CP-8) < 16.4 psia, • Check that no Containment Area rad monitors (RMS CRT/CP-14/PMC) are in alarm or show an unexplained rise in activity, and • Check that no steam plant rad monitors (RMS CRT/CP-14/PMC) alarm or show an unexplained rise in activity. • If Containment pressure is greater than or equal to 17.1 psia verify CIAS, SIAS, and MSIS (CP-7) initiated or manually initiate each actuation (CP-7 or CP-8).
	BOP/ATC/C	Verify Containment Temperature And Pressure Control • Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120°F and Containment pressure is < 16.4 psia - OR • Verify at least 3 Containment Fan Coolers (CP-18) operating. • If Containment press is greater or equal to 17.1 psia verify ALL available CFCs are operating in emergency mode. ◦ Verifies 4 CFCs operating in slow speed • If Containment pressure is greater than or equal to 17.7 psia, verify ◦ CSAS is initiated ◦ ALL available CS pumps are delivering > 1750 gpm ◦ ALL RCPs are secured NOTE: Due to size of LOCA, 17.7 psia may take some time to attain, so the operator may have to address this again later.
	CRS	Direct Diagnostic Action • If ANY Safety Function Acceptance Criteria are not met OR ANY contingency action was taken perform Diagnostics Flowchart OP-902-009, Appendix 1
	CRS	Diagnoses into OP-902-002, Loss of Coolant Accident Recovery, procedure.
	CRS	Confirm diagnosis • Direct STA to perform safety function status check list • Direct Chemistry to sample both SGs for activity.
	Crew	Announce the event using plant page
	CRS	Direct SM to refer to Emergency Plan

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Implement Placekeeper and records time of Reactor Trip
	ATC/BOP/CRS	If PZR pressure < 1684 psia verify SIAS initiated, ▪ LPSI and HPSI pumps started, ▪ BOP takes action to manually start HPSI Pump B and open SI-227B NOTE: CRITICAL TASK ▪ Injection flow is acceptable per OP-902-009, Appendix 2-E ▪ available charging pumps (2) are running
	ATC/CRS	If PZR press < 1621 psia and SIAS is actuated verify no more than 2 RCPs operating. If PZR PRESS does not meet Appendix 2A (Curve located on CP-6) secure all RCPs. NOTE: CRITICAL TASK IF CONDITIONS REACHED BEFORE CSAS INITIATES
	ATC/CRS	Verify RCP operating limits • Verify CCW available to RCPs (CP-8 and CP-2) or secure affected RCPs if not restored within 3 minutes. • Secure all RCPs if CSAS is initiated. NOTE: CRITICAL TASK IF NOT PERFORMED IN PREVIOUS STEP • If Tc < 382°F, verify no more than 2 RCPs operating.
	BOP/CRS	Verify CCW operation by checking a CCW pump (CP-8) is operating for each energized 4 KV safety bus (CP-1)
	ATC/BOP/CRS	Isolate the LOCA by: ▪ Verifying letdown Containment isolations (CP-4) are closed. ▪ Verifying RCS sampling isolations (CP-8) are closed. ▪ Checking CCW AB rad monitor not in alarm (RMS CRT on CP-6) and no Abnormal rise in reading or stop all RCPs and close CCW Containment isolations.
	ATC/BOP/CRS	Verify LOCA not outside Containment by checking • RAB rad monitors, • sump levels (CP-8 and PMC), • and waste tank levels (PMC). • If a leak is indicated, locate and isolate the leak and verify CIAS actuated per Appendix 4D.

Time:	Position:	Applicant's Actions or Behavior:
	BOP/CRS	Place Hydrogen Analyzers A and B in service (CP-33) • Open Hydrogen Analyzer Containment Isolation Valves • Start Hydrogen Analyzer sample Pumps
	ATC/BOP/CRS	IF Containment Pressure is > 17.1 psia (CP-7 or CP-8) or Containment area rad monitors are in hi alarm (RMS CRT CP-6 or CP-14), • Verify CIAS is initiated (CP-7 or CP-8) • Verify all available CFCs are in the EMERGENCY MODE (CP-18)
	BOP/CRS	If Containment pressure is > 17.7 psia: • Verify CSAS is initiated (CP-7 or CP-8) • BOP will have to manually initiate CSAS due to initiation failure. • NOTE: Critical Task • Verify all operating CS pumps are delivering > 1750 gpm (CP-8).
	ATC/CRS	If not already performed, ATC will need to secure ALL RCPs • NOTE: Critical Task
	Termination	Terminate after crew initiates CSAS and secures ALL RCPs

NUCLEAR PLANT OPERATOR TURNOVER SHEET AND CHECKLIST

(TYPICAL)

DATE _____

1. Prior to turnover, review Critical Parameters in allowable limits (Modes 1 and 2):

PRESSURIZER LEVEL	33-56%
PRESSURIZER PRESSURE	2075-2275 psia
STEAM GENERATOR LEVEL	60-70%
STEAM GENERATOR PRESSURE	860-1000 psia
TAVG	544-582°F
REACTOR POWER	≤100% (Mode 2 ≤ 5%)

2. Simulator Specific Information

Reactor Power	<u>100%</u>
EFPD	<u>450</u>
ESI	<u>-0.005</u>
RCS Boron	<u>250 ppm</u>
BAMT A	<u>5850 ppm</u>
BAMT B	<u>5725 ppm</u>

3. Complete independent Control Board Walkdown.

LCO/Action Status:

<u>Equip/Sys</u>	<u>TS</u>	<u>Entered</u>	<u>Action</u>	<u>Exited</u>
EFW Pump A	3.7.1.2.d	24 hrs ago	Restore to operable w/in 72 hours or be in HSB w/in 6 hours and HSD w/in next 6 hours.	
HPSI Pump A	3.5.2.b	2 hrs ago	Restore to operable w/in 72 hours or be in HSB w/in 6 hours, and Pzr pressure < 1750 psia and RCS temp < 500°F w/in next 6 hours.	
<u>Equip/Sys</u>	<u>TRM#</u>	<u>Entered</u>	<u>Action</u>	<u>Exited</u>
None				

E-NRC04-1

NUCLEAR PLANT OPERATOR TURNOVER SHEET AND CHECKLIST (Cont'd)

(TYPICAL)

Surveillance Tests in progress:

None

Equipment taken out of service:

EFW Pump A

HPSI Pump A

Equipment returned to service:

None

Maintenance in progress:

EFW Pump A has been OOS for 24 hours to replace the pump impeller. HPSI pump A has been OOS for 2 hours due to bearing failure during a surveillance run.

Significant Events/Additional Items/Remarks/Equipment Out of Service:

Plant Safety Index is 8.6 Yellow. Protected Train is B. SubGroups 5 and 11 are selected for both RXC events. RCP 1A Middle Seal failed 8 hours ago (steps 1 and 2 of OP-901-130 have been taken). Plans are for the oncoming shift to align HPSI Pump AB to replace A.

Facility: Waterford III

Scenario No.: 3

Op-Test No.: 1

 Examiners: _____

 Operators: _____

Initial Conditions: IC-10 100%, BOC

Turnover: RCP 1A Middle Seal failed 8 hours ago (RC09A). EFW Pump A tagged out and is expected to be returned to service by the end of shift. HPSI Pump A is tagged out and is expected to be returned to service within 24 hours.

Event No.	Malf. No.	Event Type*	Event Description
1	NI01G	I(ALL)	After the crew takes the shift ENI Channel C Middle Detector fails low energizing Startup Channel 1. The crew should de-energize SU Channel 1. The crew should enter TS 3.3.1 & 3.3.6 and bypass affected trip bistables.
2	RC21A	I(ALL)	A loop 1 T _{hot} instrument fails low affecting pressurizer level setpoint. This event requires implementation of OP-901-110, Pressurizer Level Malfunction Off-Normal procedure.
3	CC03A	C(BOP/SRO)	CCW Pump A bearing seizes and the pump trips. The BOP will start CCW Pump AB to replace A. Since the AB buses are aligned to the B side, this will require entry into TS 3.7.3 and cascading TS per OP-100-014.
4	RC08A	C(RO/SRO)	The pressure surge on the system causes RCP 1A Lower Seal to fail. The crew should trip the reactor and secure RCP 1A to comply with OP-901-130.
5	RP01A RP01B RP01C	I(RO)	The manual reactor trip will fail and the RO will trip the reactor by alternate means.
6	FW07B	I(BOP)	EFW Pump B will fail to auto start, requiring the BOP to manually start the pump.
7	SG01A (20%)	M(ALL)	After the trip a SGTR occurs in SG #1. The crew will enter OP-902-007. Once the crew isolates SG #1, the scenario may be terminated.

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

**Simulator Scenario
Waterford 3 Nuclear Plant
Simulator Scenario Number: E-NRC06-3**

Author: Kirk B. Kirkpatrick
Approval: Arvel J. Hall
Revision Number: 0
Estimated Time: 60 Minutes
Initial Conditions: 100%, BOC (IC-153)

Scenario Description:

The plant is at 100% reactor power. AB electrical buses are aligned to the B side. RCP 1A Middle Seal failed 8 hours ago. EFW Pump A has been OOS for 24 hours to replace the pump impeller. HPSI pump A has been OOS for 2 hours due to bearing failure during a surveillance run. Plans are for the oncoming shift to align HPSI Pump AB to replace A.

After the crew takes the shift ENI Channel C Middle Detector fails low energizing Startup Channel 1. The crew should de-energize SU Channel 1. The crew should enter TS 3.3.1 & 3.3.3.6 and bypass affected trip bistables.

After bistables placed in Bypass a loop 1 T_{hot} instrument fails low affecting pressurizer level setpoint. This event requires implementation of OP-901-110, Pressurizer Level Malfunction Off-Normal procedure.

After actions of OP-901-110 are implemented CCW Pump A bearing seizes and the pump trips. The BOP will start CCW Pump AB to replace A. Since the AB buses are aligned to the B side, this will require entry into TS 3.7.3 and cascading TS per OP-100-014.

The pressure surge on the system causes RCP 1A Lower Seal to fail. The crew should trip the reactor and secure RCP 1A to comply with OP-901-130. The manual reactor trip will fail and the RO will trip the reactor by alternate means.

Exciter Field Breaker fails to auto open on the trip, requiring BOP to open manually.

After the trip a SGTR occurs in SG #1. The crew will enter OP-902-007. Once the crew isolates SG #1, the scenario may be terminated.

Scenario Notes:

1. Reset Simulator to IC-153.
2. Download bat file: F:\Scenarios\Scenario063 from jump drive.
3. Verify Scenario Malfunctions, Remotes, and Overrides are loaded
 - a. Remotes and Overrides are as follows:
 1. FWR74, EFW Pump A breaker racked out
 2. SIR29, HPSI Pump A breaker racked out
 - b. Malfunctions
 1. RC09A, RCP 1A middle seal failure (20%) (setup)
 2. NI01G, ENI Channel C Middle Detector Fails Low (Trigger 1)
 3. RC21A, RCS Hot leg 1 control channel TT 1223C fails Low(Trigger 2)
 4. CC03A, CCW Pmp A Bearing Seizure (Trigger 3)
 5. RC08A, RCP 1A Lower Seal Failure (Trigger 4)
 6. RP01A, B, C, RPS manual pushbutton Ch(setup)
 7. EG05, Main Generator Exciter Field Breaker fails to trip (setup)
 8. SG01A, SG#1 Tube Leak 5% (Trigger 7)
4. Danger Tag and place in OFF:
 - a. EFW Pump A
 - b. HPSI Pump A
5. Ensure Protected Train B sign is placed in SM office window.
6. Complete the simulator setup checklist.

EVENT 1 – ENI Channel C Middle Detector fails low

1. On Lead Examiner's cue initiate Event Trigger 1.
2. If Work Week Manager or I&C is called, inform the caller that a team will be Dispatched in 20 minutes

EVENTS 2– loop 1 T_{hot} instrument fails low affecting pressurizer level setpoint

1. On Lead Examiner's cue initiate Event Trigger 2.
2. If Work Week Manager or I&C is called, inform the caller that a team will be Dispatched in 20 minutes

EVENT 3 – CCW Pump A bearing seizes and the pump trips

1. On Lead Examiner's cue initiate Event Trigger 3.
2. If Work Week Manager or I&C is called, inform the caller that a work package will be assembled and a team will be sent to the Control Room.

Event 4 – RCP 1A Lower Seal to fail requiring Reactor Trip

1. On Lead Examiners cue initiate Event Trigger 4.

Event 5 – Manual Reactor Trip Failure requiring Alternate means

- 1.

Event 6 – EFW Pump B fails to start

1. If Work Week Manager or I&C is called, inform the caller that a team will be Dispatched in 20 minutes

Event 7 – SGTR on S/G# 1 following Reactor Trip

1. On Lead Examiner's cue initiate Event Trigger 7.

Scenario Timeline:

Event	Malfunction	Time (Min)	Severity	Ramp HH:MM:SS	Delay	Trigger
1	N101G ENI Channel C Middle Detector Fails Low	1	0	NA	NA	1
2	RC21A RCS Hot leg 1 control channel TT 1223C fails Low	5	0	NA	NA	2
3	CC03A CCW Pmp A Bearing Seizure	15	NA	NA	NA	3
4	RC08A RCP 1A Lower Seal Failure	25	100%	00:01:00	NA	4
5	RP01A,B,C RPS manual pushbutton Ch Fail	25	NA	NA	NA	NA
6	FW07B EFW Pmp B fail to auto start	25	NA	NA	NA	NA
7	SG01A SG#1 Tube Leak	30	5%	00:02:00	NA	NA
	RC09A RCP 1A middle seal failure		40%	NA	NA	NA

OP Test 1, Scenario 3, Event 1 - ENI Channel C Middle Detector fails low

Event Description:

After the crew takes the shift ENI Channel C Middle Detector fails low energizing Startup Channel 1. The crew should de-energize SU Channel 1. The crew should enter TS 3.3.1 & 3.3.3.6 and bypass affected trip bistables.

Event Objectives:

1. Recognize failed instrument and verify RPS/CPC bistable functions as expected.
2. Bypass affected bistable channel.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC	Recognize and report indications of failed channel - ENI Channel C Log Channel indicator failed low on CP-7 - ENI Channel C Linear Power Recorder on CP-7 reads low on CP-7 - CPC PIDs 011 and 171 read low on CPC Channel C on CP-7 - Startup Channel 1 is energized and indication on CP-2 and CP-4 are reading high - Alarms associated with CPCs, Startup Channel 1 and PPS on CP-2
	ATC/CRS	Verify RPS/CPC bistables respond as expected - Reports trips/pretrips associated with bistables for Low DNBR and High LPD if present
	CRS	Review and/or implement actions required by Technical Specification section 3.3.1 (RPS), 3.3.3.5 (Remote Shutdown), and 3.3.3.6 (Accident Monitoring) - Enters TS 3.3.1 Action 2 - Determines that following trip bistables in PPS Channel must be bypassed within 1 hour of time of failure: - o Linear Power Hi, - o DNBR Lo, - o LPD Hi - o The CRS may decide to bypass PPS Channel A Log Pwr Hi to ensure that on plant shutdown it is not missed, but it is not required in Mode 1 - CRS reviews OP-903-013 and TS 3.3.3.5 and determines that minimum requirements are met - CRS reviews OP-903-013 and TS 3.3.3.6 and determines that minimum requirements are met

	CRS	Directs BOP to bypass the following PPS Channel C trip bistables within 1 hour of failure: - Linear Power Hi, - DNBR Lo, - LPD Hi - The CRS may decide to bypass PPS Channel C Log Pwr Hi to ensure that on plant shutdown it is not missed, but it is not required in Mode 1
	BOP	Bypasses affected bistable in PPS Channel C as follows: - Obtains Key from Key locker on side of BOP Desk - Unlocks and opens front access door at CP-10 Channel C - Unlocks and opens the Bistable Control Panel door in PPS Channel C - Depresses the bistable bypass pushbuttons for the following trip bistables in PPS Channel C and verifies associated bypass lights illuminate on CP-10: - o Linear Power Hi, - o DNBR Lo, - o LPD Hi - o The BOP bypass PPS Channel C Log Pwr Hi per CRS instructions, but it is not required in Mode 1
	Termination	BYPASS lights illuminated on BCP and ROM for the desired bistable channels

OP Test 1, Scenario 3, Events 2 - Loop 1 T_{hot} instrument fails low affecting pressurizer level setpoint

Event Description:

After bistables placed in Bypass a loop 1 T_{hot} instrument fails low affecting pressurizer level setpoint. This event requires implementation of OP-901-110, Pressurizer Level Malfunction Off-Normal procedure.

Event Objectives:

1. Determine faulty temperature channel(s) and take corrective actions to restore pressurizer level control back to normal.
2. Properly perform general subsequent operator actions in accordance with OP-901-110, Pressurizer Level Control Malfunction

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC	Report indications and alarms to CRS. - Pressurizer Level Hi/Lo annunciator on CP-2 - Pressurizer Level Hi-Hi annunciator on CP-2 - All Backup heaters ON at CP-2 - Setpoint Dropped suddenly on RC-ILR-0110 on CP-2 - Letdown Flow rising on CP-4 - Th Loop 1, RC-ITI-0110, instrument reading low on CP-2
	CRS	Determines need to enter and implement OP-901-110, Pressurizer Level Control Malfunction.
	ATC/CRS	Place PZR Level Controller on CP-2 to MANUAL and adjust output slowly to restore Pressurizer Level (CP-2). - Takes manual control of RC-ILIC-0110 by momentarily depressing the MANUAL pushbutton - Lowers output of RC-ILIC-0110 to obtain a letdown flow that results in stable or rising PZR Level on CP-2 indicators and recorders.
	CRS	Diagnose into Subsection, E2, Pressurizer Level Setpoint Malfunction
	ATC/CRS	Verify normal indications on all Safety Measurement Channel Hot Leg And Cold Leg Temperature Indicators on CP-7. - Determines that all Hot and Cold Leg Temperature Indicators on CP-7 are reading normally

	ATC/CRS	Determine affected channel(s) by checking RRS TAVG Recorders (RC-ITR-0111 AND RC-ITR-0121 ON CP-2). - Determines that both RRS Channels are affected.
	ATC/CRS	Cycle Charging Pumps (CP-4) as necessary to maintain Pressurizer Level above minimum level for operation per Attachment 1, PZR Level vs. Tave curve. - Using pre-failure Tave indication and Attachment 1, determines minimum level for operation is 40-45% - CRS gives instructions to ATC to maintain PZR level above minimum level or gives a band to maintain that ensures that minimum level is always met
	ATC/CRS	If PZR Backup Heaters have energized, then place unnecessary Backup Heater banks to OFF on CP-2. (One bank may be left in ON)
	ATC/CRS	Check RRS Hot and Cold Leg Temperature meters on CP-2 for abnormal readings. - Determines that Hot Leg instrument RC-ITI-0110 is failed low
	BOP/CRS	If Hot Leg 1 indicates abnormally high or low, select Loop 2 for Tave Loop Selector in both RRS local cabinets (inside cabinet drawer on side of drawer). - CRS directs performance of this step - Locates RRS system cabinets behind main panels and places both Tave Loop Selector Switches to Loop 2.
	ATC/CRS	Verify setpoint of Pressurizer Level Controller (RC-ILIC-0110 on CP-2) returns to program setpoint per Attachment 1, PZR Level vs. Tave curve and perform the following: - Place PZR Level Controller in AUTO by momentarily depressing AUTO pushbutton and verify PZR level is controlling at setpoint - Place backup Charging Pumps in AUTO as necessary (CP-4) - Place desired Pressurizer Backup Heaters in AUTO; one bank may be left in ON - Reset both Proportional Heater banks by momentarily placing each C/S on CP-2 to ON
	Termination	Termination point for event

OP Test 1, Scenario 3, Event 3 - CCW Pump A bearing seizes and the pump trips

Event Description:

After actions of OP-901-110 are implemented CCW Pump A bearing seizes and the pump trips. The BOP will start CCW Pump AB to replace A. Since the AB buses are aligned to the B side, this will require entry into TS 3.7.3 and cascading TS per OP-100-014.

Event Objectives:

1. Restore and properly align CCW in accordance with off-normal operating procedure OP-901-510, Component Cooling Water System Malfunction.

Event Critical Tasks:

- 1 None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Recognize and report CC Pump A trip. - CCW Pump A Trip/Trouble (CP-8) - Amber light on CC Pump A C/S (CP-8) - Lower CCW Flow and Pressure Indications on CP-8 - PMC alarm for CC Pump A Overload
	CRS	Enter OP-901-510, CCW Malfunction and implement Subsection E2, CCW Pumps.
	BOP/CRS	Align CCW Pump AB Assignment Switch on CP-8 to position A.
	BOP/CRS	Verify Suction and Discharge Cross Connect Valves from Train A are open on CP-8. - CC-126A/CC-114A, CCW Suct & Disch Header Tie Valves AB to A - CC-127A/CC-115A, CCW Suct & Disch Header Tie Valves AB to A
	BOP/CRS	Start CCW Pump AB using C/S on CP-8.
	BOP/CRS	Evaluate AB electrical bus alignment for Technical Specification impact. Enters: - T. S. 3.7.3 - Cascading Tech Specs per OP-100-014 - TRM 3.7.3
	Termination	Termination point for event

OP Test 1, Scenario 3, Event 4, 5 and 6 - RCP 1A Lower Seal failure, Reactor Trip, Manual Trip Failure EFW Pump B fails to Auto Start

Event Description:

The pressure surge on the system causes RCP 1A Lower Seal to fail. The crew should trip the reactor and secure RCP 1A to comply with OP-901-130. The manual reactor trip will fail and the RO will trip the reactor by alternate means.

Event Objectives:

1. Carry out all operator actions, including necessary contingency actions in accordance with OP-902-000, Standard Post Trip Actions, in the event of a Reactor trip.
2. Properly diagnose event in progress and transition to appropriate EOP recovery procedure

Event Critical Tasks:

Establish Reactivity Control

The task is identified by at least one member of the crew. The crew will manually trip the reactor, by opening the 32 bus feeders, within 1 minute of recognizing Manual Trip failed

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC/CRS	Verify Reactivity Control. - Check Reactor power dropping (CP-2 or CP-7) - Check startup rate is negative (CP-2 or CP-7). - Check less than 2 CEAs not fully inserted (CP-2) Open BOTH the following breakers for 5 seconds and close: • SST A32 FEEDER • SST B32 FEEDER NOTE: CRITICAL TASK
	BOP/CRS	Verify Maintenance Of Vital Auxiliaries by: § Checking the main turbine tripped by verifying all valves indicate green at Turbine Mimic on CP-1 § Check the generator tripped by verifying green indication on both Generator Output Breakers and Exciter Field Breaker on CP-1 § Check train A and B station loads are energized from offsite power by: § Voltage available to A1, A2, A3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 § Voltage available to B1, B2, B3 busses (PMC or CP-1) and feeder breakers from Startup Transformer A indicate red on CP-1 § A and B DC bus indicators on CP-1 read > 105 volts § Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts
	ATC/CRS	Verify RCS Inventory Control by: § Checking PZR level 7% to 60% and trending to 33% to 60% on CP-2 § Checks Subcooling Margin greater than or equal to 28 deg. on CP-2

Time:	Position:	Applicant's Actions or Behavior:
	ATC/CRS	Verify RCS Pressure Control by: § Checks PZR pressure between 1750 psia and 2300 psia (CP-2, CP-7, PMC or QSPDS) and trending to between 2025 and 2275 psia
	ATC/CRS	Verify Core Heat Removal by: § Checking at least one RCP operating on CP-2, § Operating loop delta-T less than 13 deg. F (CP-2, CP-7, QSPDS) and § RCS Subcooling (CP-2) greater than or equal to 28 deg. F.
	BOP/CRS	Check RCS Heat Removal by: § Checking at least one S/G is both 15-80% NR (CP-1 or CP-8) and Main Feedwater is available to restore level or § Verify EFW is available to restore level in at least one S/G. - o EFAS-1 or EFAS-2 actuation occurred if < 27.4% NR (PPS ROM lights extinguished CP-7) - o EFW pumps operating (CP-8) if EFAS-1 or 2 actuated Recognizes EFW Pump B failed to auto start: • Manually starts EFW Pump B
	ATC/CRS	Check RCS Tc (CP-2 or CP-7) is 535-555 deg. F
	BOP/CRS	Check S/G pressure 925-1050 psia (CP-1 or CP-7)
	BOP/CRS	Check FWCS in Reactor Trip Override (CP-1) by § Checking Main Feed Reg Valves are closed, § Startup Feed Reg Valves are 13-21% open, and § Operating Feed Pumps are 3800 to 4000 rpm
	BOP/CRS	Reset Moisture Separator Reheaters and § Check the Temp Control Valves closed (Reheat Control Panel CP-1)
	ATC/CRS	Verify Containment Isolation by § Checking Containment pressure (CP-7 or CP-8) < 16.4 psia, § Check that no Containment. Area rad monitors are in alarm or show an unexplained rise in activity, and § Check that no steam plant rad monitors alarm or show an unexplained rise in activity.

Time:	Position:	Applicant's Actions or Behavior:
	BOP/ATC/CRS	Verify Containment Temperature And Pressure Control And Containment Combustible Gas Control by § Verifying Containment Temperature (CP-18 or QSPDS) less than or equal to 120 deg. F § Verify Containment pressure is < 16.4 psia (CP-7 or CP-8)
	CRS	Determines whether all Safety Function Acceptance Criteria were met and no contingencies were taken: § If answer is Yes CRS goes to OP-902-001, Reactor Trip Recovery § If answer is NO then CRS performs diagnostics flowchart OP-902-009, Appendix 1
	Termination	Crew diagnoses a Reactor Trip Event and transitions to OP-902-001

OP Test 1, Scenario 3, Event 7 – Steam Generator Tube Rupture

Event Description:

After the trip a SGTR occurs in SG #1. The crew will enter OP-902-007. Once the crew isolates SG #1, the scenario may be terminated.

Event Objectives:

During implementation of OP-902- 006, a Steam Generator Tube Rupture occurs in S/G 1. The Crew should diagnose to OP-902-007. The scenario may be terminated after the crew takes action to isolate S/G 1 and commence depressurization of the RCS

Event Critical Tasks:

1. Prevent Opening of the SG Safety Valves
The task is identified by at least one member of the crew. The Crew takes action to reduce T-Hot to < 520 degrees F prior to isolating SG 1
2. Isolate the Most Affected SG
The task is identified by at least one member of the crew. The Crew takes action to isolate SG 1 prior to commencing the controlled cooldown to 350°F

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	ATC/BOP	Recognizes SGTR • Pressurizer level changing • Pressurizer pressure dropping rapidly • Activity in steam plant
	CRS	Directs Entry into OP-902-007
	CRS	Confirm diagnosis § CRS directs STA to perform safety function status check list § CRS notifies Chemistry to sample both S/Gs for activity
	CREW	Announce the event using plant page
	CRS	Directs SM to Refer to Emergency Plan
	CRS	Implements Placekeeper and records time of Reactor Trip
	ATC/CRS	If PZR pressure < 1684 psia verify SIAS initiated, § SIAS lights off on PPS ROM on CP-7 § SIAS Initiation Alarms on CP-2

Time:	Position:	Applicant's Actions or Behavior:
	ATC/BOP/CRS	If SIAS initiated, § LPSI and HPSI pumps started, § Injection flow is acceptable per OP-902-009, Appendix 2 § available charging pumps (2) are running
	ATC/CRS	If PZR press < 1621 psia and SIAS is actuated verify no more than 2 RCPs (CP-2) operating. If PZR PRESS does not meet Appendix 2A secure all RCPs.
	ATC/BOP/CRS	Verify RCP operating limits § Verify CCW available to RCPs (CP-2/CP-8) or secure affected RCPs if not restored within 3 minutes. § if Tc < 500 deg. F, verify no more than 2 RCPs operating.
	BOP/CRS	Verify proper CCW operation § Verify a CCW Pump (CP-8) is running for Train A and B
	BOP	Perform Rapid Cooldown of RCS to less than 520°F Th § Places Permissive switch for one Steam Bypass Valve on CP-1 to MANUAL § Places Controller for respective Steam Bypass Valve to Manual on CP-1 and raises output to initiate an RCS cooldown NOTE: CRITICAL TASK
	ATC/CRS	Depressurize the RCS using Main(CP-2) or Aux. Spray (CP-4) to meet all of the following: § RCS pressure less than 950 psia § RCS pressure within Appendix 2-A § If HPSI Throttle Criteria are met control Charging and Letdown flow and throttle HPSI flow
	ATC/BOP	Reset MSIS initiation setpoints § Depress all 4 SG Pressure setpoint Reset pushbutton on PPS ROMs on CP-7 when SG Pressure Lo Pretrip alarms actuate on CP-2 § Verify SG Press Lo Trip Setpoints Lower on all 4 indicators on CP-8 and clear SG pressure Lo Pretrips annunciators by depressing CLEAR pushbutton at CP-2

Time:	Position:	Applicant's Actions or Behavior:
	BOP/CRS	Determine most affected SG § High Rad Monitor readings (RMS CRT on CP-6) § SG level (CP-8) rise in SG 1 when not feeding § SG Activity Samples
	BOP/CRS	When RCS T-hot is less than 520 degrees F isolate the most affected SG 1 by: § Place ADV 1 controller setpoint to 980 psig and verify the controller is in AUTO on CP-8 § Verify MSIV 1 is CLOSED on CP-8 § Verify MFIV 1 Closed on CP-8 § If EFAS 1 is not initiated close EFW-228A and EFW-229A on CP-8 § place the EFW FCV controllers in manual and close EFW-224A and EFW-223A on CP-8 by verifying output of controller is 0% § Close MS-401A on CP-8 § Close the main steam line drains MS-120A and MS-119A on CP-8 § Direct an NAO to check Main Steam Safety Valves closed on SG 1 NOTE: CRITICAL TASK
	Termination	

NUCLEAR PLANT OPERATOR TURNOVER SHEET AND CHECKLIST

(TYPICAL)

DATE 11/15/06

1. Prior to turnover, review Critical Parameters in allowable limits (Modes 1 and 2):

PRESSURIZER LEVEL	33-56%
PRESSURIZER PRESSURE	2075-2275 psia
STEAM GENERATOR LEVEL	60-70%
STEAM GENERATOR PRESSURE	860-1000 psia
TAVG	544-582°F
REACTOR POWER	≤100% (Mode 2 ≤ 5%)

2. Simulator Specific Information

Reactor Power	<u>100%</u>
EFPD	<u>50</u>
ESI	<u>-0.01</u>
RCS Boron	<u>1442 ppm</u>
BAMT A	<u>5850 ppm</u>
BAMT B	<u>5725 ppm</u>

3. Complete independent Control Board Walkdown.

LCO/Action Status:

<u>Equip/Sys</u>	<u>TS</u>	<u>Entered</u>	<u>Action</u>	<u>Exited</u>
EFW Pump A	3.7.1.2.d	24 hrs ago	Restore to operable w/in 72 hours or be in HSB w/in 6 hours and HSD w/in next 6 hours.	

HPSI Pump A	3.5.2.b	2 hrs ago	Restore to operable w/in 72 hours or be in HSB w/in 6 hours, and Pzr pressure < 1750 psia and RCS temp < 500°F w/in next 6 hours.	
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<u>Equip/Sys</u>	<u>TRM#</u>	<u>Entered</u>	<u>Action</u>	<u>Exited</u>
None				

E-NRC04-1

NUCLEAR PLANT OPERATOR TURNOVER SHEET AND CHECKLIST (Cont'd)

(TYPICAL)

Surveillance Tests in progress:

None

Equipment taken out of service:

EFW Pump A

HPSI Pump A

Equipment returned to service:

None

Maintenance in progress:

EFW Pump A has been OOS for 24 hours to replace the pump impeller. HPSI pump A has been OOS for 2 hours due to bearing failure during a surveillance run.

Significant Events/Additional Items/Remarks/Equipment Out of Service:

Plant Safety Index is 8.6 Yellow. Protected Train is B. SubGroups 5 and 11 are selected for both RXC events. RCP 1A Middle Seal failed 8 hours ago (steps 1 and 2 of OP-901-130 have been taken). Plans are for the oncoming shift to align HPSI Pump AB to replace A.