Facility: Waterford 3 **Date of Examination:** 11/13/2006
Examination Level: RO ☒ SRO ☐ **Operating Test Number:** 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	Perform OP-004-015 Attachment 11.1 Manual CEA Subgroup Selection.
Conduct of Operations	R, M	Perform OP-903-015 Attachment 10.1 Shutdown Margin Calculation
Equipment Control	R, N	Perform OP-903-001 Attachment 11.15 Containment Pressure calculation.
Radiation Control	R,N	Review RWP.
Emergency Plan		Not selected

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

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

Facility: Waterford 3 **Date of Examination:** 11/13/2006

Examination Level: RO ☐ SRO ☒ **Operating Test Number:** 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	Review OP-004-015 Attachment 11.1, Manual CEA Subgroup Selection.
Conduct of Operations	R,N	Determine if hours worked exceed guidelines Requirements.
Equipment Control	R, N	Perform an SRO review of OP-903-001 Attachment 11.15, Containment Pressure calculation.
Radiation Control	R, N	Review OP-901-131 Attachment 1, Containment Closure checklist.
Emergency Plan	S,M	Determine E-Plan classification and notification requirements based on current simulator scenario.

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

*** Type Codes & Criteria:**

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

Facility: Waterford 3 **Date of Examination: 11/13/2006**
Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ **Operating Test No.: 1**

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

System / JPM Title	Type Code*	Safety Function
a. Recovery Dropped CEA (Continuous CEA Motion)	A, D, P, S	1
b. Perform Actions on a Recirculation Actuation (Leak on Suction Line)	A, D, L, P, S	2
c. Perform ATC immediate Operator Actions on CR evacuation (Fire in Control Room)	D, P, S	3
d. Start Reactor Coolant Pump	A, L, M, S	4
e. Place Hydrogen Recombiner in service	D, C	5
f. Restore Normal Power to a 4.16KV Safety Bus and secure Emergency Diesel Generator	A, D, S	6
g. Realign Containment Spray for Automatic initiation following CSAS	D, S	7
h. Perform actions in response to CCW system leakage	N, S	8
In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Operate the Atmospheric Dump Valves Locally	A, D, E, L	4
j. Perform a SUPS A Startup	D	6
k. Place Gas Decay Tank on Decay	M, R	9

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

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

Facility: Waterford 3	**Date of Examination: 11/13/2006**
Exam Level: RO ☐ SRO-I ☐ SRO-U ☒	**Operating Test No.: 1**

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

System / JPM Title	Type Code*	Safety Function
a.		
b. Perform Actions on a Recirculation Actuation	A, D, L, P, S	2
c.		
d.		
e.		
f. Restore Normal Power to a 4.16KV Safety Bus	A, D, S	6
g.		
h. Perform actions in response to CCW system leakage	N, S	8

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

i. Operate the Atmospheric Dump Valves Locally	A, D, E, L	4
j.		
k. Place GDT on Decay	M, R	9

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

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

Facility: Waterford III Scenario No.: 1 Op-Test No.: 1

Examiners: _____ Operators: _____

_____ _____

_____ _____

Initial Conditions: IC-151 74%, 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 FW05 FW07B	C(BOP) M(ALL) C(BOP/SRO)	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. 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 must be manually started.

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

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

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 & 3.3.3.6 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	EG05	C(BOP)	Main Generator Exciter Field Breaker fails to open.
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

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 _____ 09/16/2006
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**	

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.

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.

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.

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

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

None

INSTRUCTOR NOTES

None

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**_____

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 -3.80 (-3.70 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 –490 (-460 to -520) 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 (680 to 740) ppm and records in step 7.1.3.4 on attachment 10.1:**

SAT_____UNSAT_____

12. Verify current RCS boron concentration ≥ 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 _____ 09/16/2006
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.

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.

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.

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 X 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 X 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**_____

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 4

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

Revision 0 09/08/2006

Approval _____ 09/16/2006
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

THIS PAGE HAS BEEN REMOVED BECAUSE IT CONTAINED SUNSI 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_____

Waterford 3 Job Performance Measure

Examinee copy

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

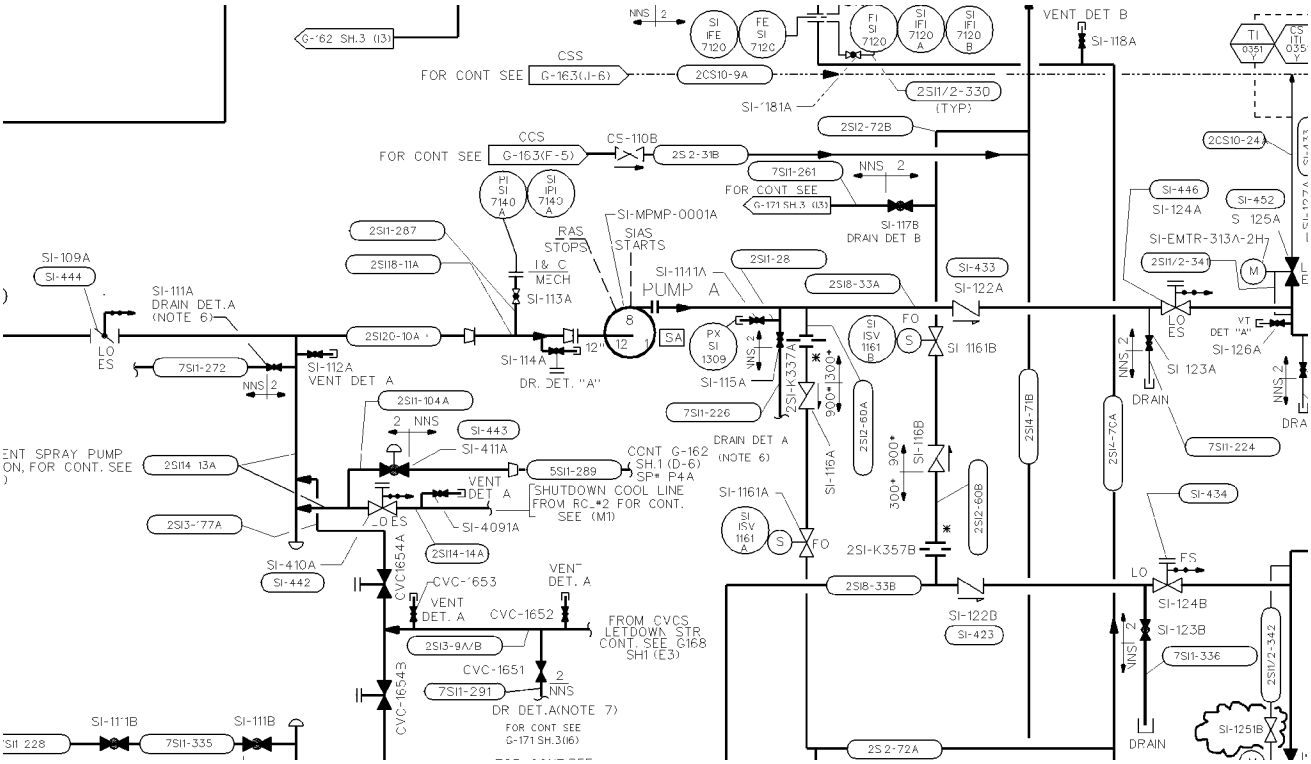
Radwaste has connected and lined up the required hoses.

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.



Excerpt from drawing G-167 Sheet 3

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 _____ 09/16/2006
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**	

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.

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.

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.

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 X 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

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, IAW OM-123.

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

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. End of Task

STOP TIME_____

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, IAW OM-123.

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 _____ 09/16/2006
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**	

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.

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**_____

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 B and C are 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 ΔT/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

Gas Decay Tank B and C release is planned for your shift, the Offgoing CRS has reviewed the release permit and asks you to perform a peer check to determine if all requirements for the release have been met. Review GDT B and C release permit and OP-007-003 section 6.4

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 at least once every 4 hours during the discharge (Action 5).
- Step 6.4.4 (and Att. 11.5): Meterological Conditions Requirements are NOT satisfied for release. Met conditions are Pasquill Stability Class F, which will not allow the release.

TOOLS

1. Batch Release permit for GDT B and 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, Meterological Conditions Requirements

SAFETY CONSIDERATIONS

None

PERFORMANCE CONSEQUENCES

Exceed Offsite Release Limits.

HUMAN INTERFACES

None

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

None

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 theBatch 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 theBatch Release Permit and the TRM.

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

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

SAT____UNSAT____

---

3. Review meterological 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): Meterological Conditions Requirements are NOT satisfied for release. Met conditions are Pasquill Stability Class F, which will not allow the resease.**

NOTE: Critical step is **BOLDED**.

SAT____UNSAT____

4. End of Task

STOP TIME_____

Waterford 3 Job Performance Measure

Examinee Copy

INITIAL CONDITIONS

1. Gas Decay Tank B and C are 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 ΔT/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

Gas Decay Tank B and C release is planned for your shift, the Offgoing CRS has reviewed the release permit and asks you to perform a peer check to determine if all requirements for the release have been met.
Review GDT B and C release permit and OP-007-003 section 6.4

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
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

Estimated Doses & Percent of Limits	Air Gamma mrad	Air Gamma %limit	Air Beta mrad	Air Beta %limit	Infant Thyroid mrem	Infant Thyroid %limit
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.**

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 Contitions Satisfied : _____ (Ops)

Initial Release START Date ___/___/___ Time ___:___ — Final Release STOP Date ___/___/___ Time ___:___

Release Interruptions

Release Restart Date	Release Restart Time	Release Stop Date	Release Stop Time	Release Period Duration
		___/___/___	___:___	_____ min
___/___/___	___:___	___/___/___	___:___	_____ min
___/___/___	___:___	___/___/___	___:___	_____ min
___/___/___	___:___	___/___/___	___:___	_____ min
___/___/___	___:___	___/___/___	___:___	_____ min
___/___/___	___:___	___/___/___	___:___	_____ min

Gas Decay Tank Pressures

Tank	Init Press	Final Press	Net Press	Volume (cuft) (net x 40.8)
GDT A	_____	_____	_____	_____
GDT B	_____	_____	_____	_____
GDT C	_____	_____	_____	_____

Total Net Pressure : _____ psi

Total Duration of ALL release periods : _____ min — 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 ☐ A ☒ B ☒ C
(Enter All of the Tank Pressures) ___ 113.1 psig 172.8 psig
(Gas Decay Tank in Service) ☒ 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 Releas *TRM3.3.3.11 (GWM RAD Monitor PRM-IRE-0648 OOS*
TRM3.3.3.11 (Waste Gas Flow Tranmsitter PRM-IFIT-0648 OOS

Requested By: _____ 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) = 4615 SCF
PRESS

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

Total Press = 285.9

TOTAL
VOLUME = 11669 SCF

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**	

INITIAL CONDITIONS

Initial Conditions are based upon the scenario just completed.

INITIATING CUE

Classify the event for the scenario just completed 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-001-020 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_____

¨ 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_____

Examinee copy

INITIAL CONDITIONS

Initial Conditions are based upon the scenario just completed.

INITIATING CUE

Classify the event for the scenario just completed 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 the ATC. You are directed by the CRS to withdraw CEA 87 per step 15 of OP-901-102 Subsection E_1 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. Ensure CEA 87 has been dropped and malfunction RD02A87 is no longer active.
3. Insert RD12A87 during CEA withdrawal, preferably 2nd or 3rd pull
4. Adjust RCS temperature.
5. Group selector sw is in RG 6 and CEA 21 is selected at start of IC

Waterford 3 Job Performance Measure

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

START TIME_____

---

1. Position INDIVIDUAL CEA selection switches to CEA 87. **CRIT**

CUES: The simulator will provide the required cues

STANDARDS: NOTE: Candidate may refer to OP-004-004, Control Element Drive, Section 6.6, OPERATION OF CEAS IN MANUAL INDIVIDUAL (MI) MODE.

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**_____

---

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_____

---

7. Monitor:

- Reactor Power
- RCS temperature
- Axial Shape Index

CUES: The simulator will provide the required cues.

STANDARDS: Examinee monitors CP-2 meters 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**

SAT_____UNSAT_____

9. **(ALT)** Manually trip Reactor **CRIT**

CUES:

- The simulator will provide the required cues
- NOTE: Examinee may refer to Subsection E_3, 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 the ATC. You are directed by the CRS to withdraw CEA 87 per step 15 of OP-901-102 Subsection E_1 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.

RO JPM B

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

Revision 9 09/16/2006

Approval _____ 09/16/2006
Arvel J. Hall

Estimated Time 20 Min

Time Critical YES **Critical Time** 2 Minutes **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 have actuated

INITIATING CUE

NOTE: This JPM is Time Critical.

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
IC will have RAS signal actuate approximately 1 min after going to run
Examiner will need a stopwatch for this 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

Remote SIR44B will be used to OVERRIDE SI-602B.

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-902-002, Loss of Coolant Accident Recovery, Step 42 and OP-902-009.

Critical steps are denoted by **CRIT**.

START TIME_____

---

1. Verify that an RAS occurs.

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
  - RAS TRAIN A LOGIC INITIATED (Cabinet K, K-19)
  - 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.

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.

- 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**_____

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_____

---

7. Close CVC-209 CHARGING HEADER ISOLATION. **CRIT**

CUES: Simulator will provide cues

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:
- (ALT) Local Operator reports large leak in wing area between SI-602B and SI-604B
- (ALT) CRS orders you to secure High Pressure Safety Injection Pump B and Containment Spray Pump B, and override SI-602B closed in accordance with OP-902-009, Attachment 29-B.
- (ALT) NOTE: If examinee asks, TSC concurrence has been provided.
- 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 (Closed) remote verify Annunciator for SI SUMP ISOL VALVE TRAIN B IN RAS OVERRIDE (M14, Cabinet N) alarms

NOTE: Do not use radio for communications, to preclude cueing other candidates. Communications should be made using nearest phone.

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

NOTE: This JPM is Time Critical.

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 09/16/2006

Approval ahall 09/16/2006

Estimated Time 5 Min

Time Critical YES **Critical Time** 15 Minutes **Alternate Path** NO

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

NOTE: This JPM is Time Critical.

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, Evacuation of Control Room and Subsequent Plant Shutdown 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

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

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

SAT_____**UNSAT**_____

---

4. 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. 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**_____

---

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

NOTE: This JPM is Time Critical.

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 5 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-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, Reactor Coolant Pump Operation.

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 RCP 2A vibration HA8 alarm Annunciators cleared, HC8 is expected
Keys:

- HI-SG 165-168.
- CPC Trip B/P 153, 156, 159, 162

Laminate/Sheath OP-001-002
Use RC07C after starting RCP 2A

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-001-002, Reactor Coolant Pump Operation, 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%-90%

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**_____

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: Procedure provides the cues

STANDARDS: 1. Examinee locates Attachment 11.3.

SAT_____**UNSAT**_____

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 RC07C 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, Reactor Coolant Pump Operation.

PLACE HYDROGEN RECOMBINER IN SERVICE

RO JPM E

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

Revision 3 09/16/2006

Approval _____ 09/16/2006
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-LOCA average containment temperature is 105°F

INITIATING CUE

Directed by the CRS to place Hydrogen Recombiner A in Service in accordance with OP-008-006, Section 6.1.

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, Hydrogen Recombiner, section 6.1. Critical steps are denoted by **CRIT**.

START TIME_____

---

1. Record present Post-LOCA containment pressure.

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.

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

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.

CUES: None

STANDARDS: Examine 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.

CUES: Simulator provides cues

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

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**_____

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

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:

- If examinee selects TC-1, TC-2, and/or TC-3, then cue examinee that temperature indicates upward trend.
- If examinee does not select TC-1, TC-2, and/or TC-3 (or review PMC PIDs), then cue examinee that temperature is not changing.

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

STANDARDS: Examinee selects TC-1, TC-2, and/or TC-3 on the Temp Select Switch and verifies upward temperature trend on HRA-0001A

SAT_____UNSAT_____

---

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

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. **CRIT**

CUES: Simulator provides cues

STANDARDS: **Examinee adjusts potentiometer until 20 KW is indicated.**

SAT_____UNSAT_____

13. Hold for 10 minutes.

CUES: 10 minutes have elapsed

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

SAT_____UNSAT_____

---

14. 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 – 62 KW is indicated.**

SAT_____UNSAT_____

---

15. 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, or when PMC PIDs are displayed:

TC-1 = 1250

TC-2 = 1250

TC-3 = 1275

STANDARDS: **Examinee calculates average temperature to be between the required 1225°F and 1400°F.**

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-LOCA average containment temperature is 105°F

INITIATING CUE

Directed by the CRS to place Hydrogen Recombiner A in Service in accordance with OP-008-006, Hydrogen Recombiner, Section 6.1.

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

RO JPM F

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

Revision 2 09/16/2006

Approval _____ 09/16/2006
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**	

INITIAL CONDITIONS

The plant is in mode 3 following a reactor trip
4.16 KV 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 12-C.

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

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.

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**_____

7. Place Synchronizer keyswitch to OFF.

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 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 12-C.

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 09/16/2006

Approval _____ 09/16/2006
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-E.

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**_____

4. Close the Containment Spray Valves. **CRIT**

CUES: Simulator provides cues

Note: Candidate will have to cycle Cont. Switch OPEN/CLOSE to close valves

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-E.

PERFORM ACTION IN RESPONSE TO CCW SYSTEM LEAKAGE

RO JPM H

Site	W3	**Job**	RO	**System/Duty Area**	CC	**Mode**	OFFNORM	**Number**	8

Revision 3 09/16/2006

Approval _____ 09/16/2006
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**	

INITIAL CONDITIONS

CCW leakage is in progress
CCW surge tank level is being maintained by automatic operation.
OP-901-510, Component Cooling Water System Malfunction, Section E1, Steps 1-10 have been completed

INITIATING CUE

The Control Room Supervisor directs you to perform actions to locate Header with leakage IAW with OP-901-510, Component Cooling Water System Malfunction, Section E1, starting with Step 11.

TERMINATING CUE

Examinee determines the leak location.

STANDARD

Examinee determines that the leak is located on the A CCW Header.

TOOLS

None

SAFETY CONSIDERATIONS

NONE

PERFORMANCE CONSEQUENCES

Loss of CCW.

HUMAN INTERFACES

SM/CRS

SKILLS / KNOWLEDGES

None

INSTRUCTOR NOTES

Reset to IC-156
This IC contains Malfunction CC17A, CCW pump A discharge leak (3%).

Waterford 3 Job Performance Measure

Perform the task in accordance with OP-901-510, Component Cooling Water System Malfunction,Section E1, starting with Step 11.
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-127A/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**_____

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_____

Examinee copy

INITIAL CONDITIONS

CCW leakage is in progress
CCW surge tank level is being maintained by automatic operation.
OP-901-510, Component Cooling Water System Malfunction, Section E1, Steps 1-10 have been completed

INITIATING CUE

The Control Room Supervisor directs you to perform actions to locate Header with leakage IAW with OP-901-510, Component Cooling Water System Malfunction, Section E1, starting with Step 11.

OPERATE THE ATMOSHERIC DUMP VALVES LOCALLY (ALTERNATE PATH)

RO JPM I

Site	W3	**Job**	NAO	**System/Duty Area**	MS	**Mode**	OFFNORM	**Number**	8

Revision 2 08/30/2006

Approval _____ 09/16/2006
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% IAW OP-901-502, Evacuation of Control Room and Susequent Plant Shutdown, Attachment 15.

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

Perform the task IAW OP-901-502, Evacuation of Control Room and Susequent Plant Shutdown, Attachment 15. Critical steps are denoted by **CRIT**.

START TIME_____

---

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

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.

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**_____

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%, IAW OP-901-502, Evacuation of Control Room and Susequent Plant Shutdown, Attachment 15.

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 _____ 09/16/2006
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**	

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, IAW OP-006-005, Inverters and Distribution, section 5.2

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

Perform the task IAW OP-006-005, Inverters and Distribution 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: **CRIT**
- 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**_____

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, if examinee asks, 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:

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_____

8. If Bypass Source Supplying Load light is not Extinguished and Inverter Supplying Load is not Illuminated (approximately 30 seconds), then: **CRIT**

- Verify unit is In Sync
- Transfer Manual Bypass Switch to NORMAL OPERATION.
- Depress INVERTER TO LOAD pushbutton.

CUES: Note to examiner: Cues 1 and 2 are the same as the previous step.

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.

3. 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_____

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_____

Examinee copy

INITIAL CONDITIONS

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

INITIATING CUE

The ATC directs you to startup SUPS A. IAW OP-006-005, Inverters and Distribution, section 5.2

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 _____ 09/16/2006
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**	

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 IAW 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

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_____

---

6. Complete Attachment 11.8, Gas Decay Tank Sample Verification

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.

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_____

---

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

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_____

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 IAW with Section 6.2 and 6.3 of OP-007-003, Gaseous Waste Management

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: 75%, MOC (IC-151)

Scenario Description:

Power is currently 75% 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.

AB electrical buses are aligned to the A side. RCP 1A middle seal has failed 8 hours ago. EFW Pump A is 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.

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 ALERT (SA1).

Scenario Notes:

A. Reset Simulator to IC-151.
B. Verify the following Scenario Malfunctions are loaded:
    1. RC09A: RCP 1A middle seal failure (20%) (setup)
    2. FW07B: EFW Pump B fails to auto start. (setup)
    3. PW02: Automatic Reactor Cutback fails to occur (setup)
    4. RD11A82, RD11A03: CEAs 3 and 82 stick out on the trip (setup)
    5. EG09B: EDG B Output Breaker fails to close (setup)
    6. SG07D2: SG 2 channel D low pressure trip setpoint fails Hi (1200)(Trigger 2)
    7. CV12A2: VCT level transmitter 227 fails low (Trigger 3)
    8. FW32B: MFW B oil leak 40%, 2 min ramp (Trigger 4)
    9. ED01A,B,C,D: Loss of Offsite Power [tied to Reactor Trip (CEDM UV), Event Trigger 6, with a 1 minute TD]
    10. FW05: EFW AB Pump mechanical overspeed trips (Trigger 7)
C. Verify the following Control Board Conditions:
    1. EFW Pump A
        - Breaker racked out (Red & Green lights out)
        - CS in OFF
        - Danger Tag on CS
        - Annunciators D-1 and E-1, Cabinet M, in alarm
    2. HPSI Pump A
        - Breaker racked out (Red & Green lights out)
        - CS in OFF
        - Danger Tag on CS
        - Annunciator A-3, Cabinet M, in alarm
D. Set CP-3 SDS 3 power scales (3) to 70 -80 % pwr
E. Have OP-901-130 open with steps 1 and 2 completed.
F. Ensure Protected Train B sign is placed in SM office window.
G. 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.

Event 4 - MFW Pump B lube oil pipe leak,

1. On Lead Examiners cue, initiate Event Trigger 4.
2. 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 – MFW Pump B trips, the automatic reactor power cutback fails to occur, the crew trips the reactor, and 2 CEAs stick out on trip.

1. After Ann S-20 Cabinet F (FWPT Oil Tank Hi/Lo) alarms, modify malfunction (raise severity to 45%) to cause Feed pump to trip during the crew's downpower brief.

Event 6 - A LOOP occurs 1 minute after the reactor trip, and EDG B output breaker will not close.

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.
4. If called as RAB to check EDGs report EDG A is running loaded EDG B is running unloaded

Event 7 - EFW AB trips on mechanical overspeed

1. After the crew performs step 7 of OP-902-003 (Protect Main Condenser), initiate Event Trigger 7
2. If called as RCA watch to investigate EFW AB, report that the EFW AB Mechanical overspeed trip linkage is broken and cannot be reset.
3. If called as WWM/PMM to repair EFW AB Mechanical overspeed trip linkage, report that a team will be dispatched immediately.
4. After CRS prioritizes Safety Functions (step 10 of OP-902-008 and enters HR-1), call Control Room as PME at EDG B breaker and report that the breaker problem is repaired and the breaker can be safely closed locally.
5. When directed to close EDG B Output Breaker, delete EG09B. Breaker will auto close.
6. If asked what the breaker problem was, state that the anti-pump device linkage is detached.

NOTE: Ensure call back to close EDG B breaker does not occur until $\geq$ 15 minutes elapsed. This will 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	20	100	N/A	NA	2
	SG 2 channel D low pressure trip setpoint fails Hi					
3	CV12A	25	0	00:01:00	NA	3
	VCT level transmitter 227 fails low					
4	FW32B	35	40	00:03:00	NA	4
	MFW B oil leak					
5	PW02	40	TRUE	NA	NA	NA
	Automatic Reactor Cutback fails to occur					
	RD11A03	40	TRUE	N/A	NA	NA
	RD11A82					
	CEAs 3 and 82 stick out on the trip					
6	ED01A,B,C, D	41	0	N/A	00:01:00	7
	Loss of Offsite Power (tied to Reactor Trip)					
	EG09B	41	true	N/A	NA	NA
	EDG B Output Breaker fails to close					
7	FW05	65	true	N/A	NA	8
	EFW AB Pump mechanical overspeed trips					
	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, complete up to step 9.1.73

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 to100% 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
	Termination	When Lead Examiner is satisfied with reactivity manipulation.

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 ΔP 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)
		  • RPS CHANNEL D TROUBLE (H-18)
		  • SG 2 PRESSURE LO PRETRIP B/D (G-16)
		• Red Trip Light and white Pretrip Light on affected channel of RPS on CP-6 ROM.

	BOP	Identifies SG2 Pressure Setpoint (SG-IPI-1023D) has failed High (1200 PSIA) on CP-8
	CRS	Review and/or implement actions required by technical specification section 3.3.1 and 3.3.2 (RPS and ESFAS) Direct bypassing the following bistables within 1 hour of failure: • LO SG-2 PRESS • HI SG-1 Δ P • HI SG-2 Δ P
	BOP	Expected Annunciators: • RPS CABINET CONDITION ABNORMAL (B-1, Cabinet L) expected with cabinet open. • RPS BISTABLE BYPASS (B-1, cabinet K) expected with bistables bypassed.

	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 of PPS Channel D.
		• Depress Bypass push button for bistables 12, 19 and 20:
		  • LO SG-2 PRESS
		  • HI SG-1 Δ P
		  • HI SG-2 Δ P
		• Verify Bypass push button remains in a depressed state.

	ATC	Verify Bypass light Illuminates on BCP and ROM for Trip Channel D. • LO SG-2 PRESS • HI SG-1 Δ P • HI SG-2 Δ P

Time:	Position:	Applicant's Actions or Behavior:
	TERMINATION	Event may 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: • VCT LEVEL LO-LO (B-3, Cabinet G) • CVC-507, RWSP TO CHARGING PUMP SUCTION ISOLATION, OPENS • CVC-183, VCT DISCHARGE VALVE CLOSES
	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 and Close LETDOWN STOP VALVE (CVC 101). (CP-4) • 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	Enter Tech Spec 3.1.2.4 for Charging Pump Operability. NOTE: CRS may elect to realign Chg Pump Selection Switch to A-B or B-AB and place Chg pumps A and B (or AB and B) in AUTO in order to exit TS.
	CRS	Initiate corrective action to repair level instrument.
	TERMINATION	This may be terminated once TS 3.1.2.4 is addressed, or at discretion of Lead Examiner

OP Test 1, Scenario 1, Event 4 - MFW Pump B lube oil pipe leak

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. Recognize conditions for a MFW Pump oil leak and prepare for a plant downpower in order to remove the pump from service.

Event Critical Tasks:

None

Event Action Steps:

Time:	Position:	Applicant's Actions or Behavior:
	BOP	Recognizes FWPT OIL PUMP TROUBLE (R-18, Cabinet F) annunciator
	CRS	Dispatch TB watch to investigate B MFP alarm • TB watch reports a large oil leak on MFP B oil pump. The leak is unisolable.
	BOP	Recognizes FWPT OIL TANK HI/LO (S-20, Cabinet F) annunciator.
	CREW	While the crew briefs a plant downpower, MFP B trips.
	TERMINATION	The event is terminated when MFP B trips.

OP Test 1, Scenario 1, Event 5 – MFW Pump B trips, the automatic reactor power cutback fails to occur, the crew trips the reactor, and 2 CEAs stick out on trip.

Event Description:

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

Event Objectives:

1. Recognize that an automatic reactor power cutback should have occurred on the MFW Pump trip and manually trip the reactor.
2. Commence STPAs in accordance with OP-902-000, Standard Post Trip Actions, and recognize that 2 CEAs did not insert, and commence emergency boration.

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:
	CRS/ATC	A Reactor Power Cutback fails to actuate when the MFP trips, and the CRS Directs tripping Reactor The ATC depresses both Reactor Trip Pushbuttons
	CRS/Crew	CRS directs entering OP-902-000 and performance of SPTAs

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 • Recognize CEAs 3 and 82 NOT inserted • Emergency Borate from CP-4 by performing the following. 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** **<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 <u>≥</u> 40 GPM.** **Note: Critical Task**
	TERMINATION	The event may be terminated once the ATC establishes emergency boration, or at discretion of Lead Examiner.

OP Test 1, Scenario 1, Event 6 - A LOOP occurs 1 minute after the reactor trip, and EDG B output breaker will not close.

Event Description:

An automatic reactor power cutback fails to occur when MFW B trips. The crew trips the reactor and 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 implements SPTAs and is 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, following the reactor trip.
2. Properly diagnose event in progress and transition to OP-902-003, Loss of Offsite Power/Loss of Forced Circulation Recovery Procedure.

Event Critical Tasks

1 None

Event Action Steps:

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) BOP Recognizes LOOP and EDG B Breaker failure to close and attempts to manually close EDG B Output Breaker. CRS Calls RAB watch and 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

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 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
	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.
	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

Time:	Position:	Applicant's Actions or Behavior:
	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
	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. o Verifies 4 CFCs operating in slow speed • If Containment pressure is greater than or equal to 17.7 psia, verify o CSAS is initiated o ALL available CS pumps are delivering > 1750 gpm o ALL RCPs are secured
	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 • 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)
	TERMINATION	The event may be terminated when actions have been taken to protect the main condenser, or at discretion of Lead Examiner.

OP Test 1, Scenario 1, Event 7 – 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/BOP	Recognizes EFW AB tripped loss of heat sink • EFW AB UNAVAILABLE (A-10, 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 trip linkage is damaged and cannot be reset.
	CRS	Directs entry to OP-902-008 for loss of RCS Heat Removal 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

Time:	Position:	Applicant's Actions or Behavior:
	CRS	Sample BOTH Steam Generators • Direct Chemistry to sample BOTH steam generators for activity and boron.
	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: Once RCS and Core Heat Removal priority (HR-1) is entered, report from the field that the EDG B output breaker problem has been restored and can be safely closed locally.
	CRS	Directs EDG B output Breaker closed
	BOP	Recognizes the EFW Pump B did not start when power is restored.
	CRS/BOP	**EFW B pump started** **NOTE: CRITICAL TASK**

Time:	Position:	Applicant's Actions or Behavior:
	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	74%
EFPD	250
ESI	0.002
RCS Boron	935 ppm
BAMT A	5850 ppm
BAMT B	5725 ppm

3. Complete independent Control Board Walkdown.

LCO/Action Status:

Equip/Sys	TS	Entered	Action	Exited
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	1 hr 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.	

Equip/Sys	TRM#	Entered	Action	Exited
None				

Surveillance Tests in progress:

None

Equipment taken out of service:

EFW Pump A

HPSI Pump A

Equipment returned to service:

Main Feedwater Pump B

Maintenance in progress:

EFW Pump A has been OOS for 24 hours to replace the pump impeller. HPSI pump A has been OOS for 1 hour due to bearing failure during a surveillance run.

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

DRTS/DEFAS are OOS.

Plant Safety Index is 8.6 Yellow. Protected Train is B. Subgroup 5 is selected for both RXC events.

RCP 1A Middle Seal failed 8 hours ago (steps 1 and 2 of OP-901-130 have been taken).

Dry Cooling Tower Fans have been placed in Fast to lower CCW temperature to compensate for rising CBO temperature on RCP 1A.

Work Management Center is briefing off-shift NAOs to align HPSI Pump AB to replace A.

Power is currently 75% 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.

Restore plant power to 100%. The previous shift has started the power ascent and has completed all steps in Attachment 9.1 of OP-010-004 up to step 9.1.73.

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 has failed 8 hours ago. EFW Pump A is 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.

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 will 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 will enter OP-901-201 and manually control feedwater flow. Note: the crew has 1 minute 25 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 will enter OP-902-000, implement SPTAs, and will be directed to OP-902-003. 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.

EPLAN classification for this event is ALERT (FA1/RCB1).

Scenario Notes:

A. Reset Simulator to IC-152.
B. Verify the following Scenario Malfunctions are loaded:
    1. RC09A, RCP 1A middle seal failure (20%) (setup)
    2. CV02A/CV02C, Chg Pumps A & AB fail to autostart (setup)
    3. SI02B, HPSI Pump B fails to auto start on SIAS (setup)
    4. SI16G, SI-227B fails to open on SIAS (setup)
    5. RP05B3/C3/D3, CSAS fails to auto actuate (setup)
    6. RD02A82, CEA 82 drops (Trigger 1)
    7. RC23B, RCS leak (0.01%) (Trigger 2)
    8. MS09A, SG1 Flow Inst. Fails low (1 min ramp) (Trigger 4)
C. Verify the following Control Board Conditions:
    1. EFW Pump A
        - Breaker racked out (Red & Green lights out)
        - CS in OFF
        - Danger Tag on CS
        - Annunciators D-1 and E-1, Cabinet M, in alarm
    2. HPSI Pump A
        - Breaker racked out (Red & Green lights out)
        - CS in OFF
        - Danger Tag on CS
        - Annunciator A-3, Cabinet M, in alarm
D. Have OP-901-130 open with steps 1 and 2 completed.
E. Ensure Protected Train B sign is placed in SM office window.
F. 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.
3. If reason for dropped CEA is requested, inform the caller that the disconnect to CEA 82 is in the trip-free condition.

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

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 GROUP MINOR DEVIATION (M-8, Cab H) and CEA GROUP MAJOR DEVIATION (N-8, Cab H) annunciators on CP-2 • Other CEA related annunciators CP-2 and CP-36 • COLSS Master annunciator on CP-36 (BOP) • SG pressure lowers slightly on CP-1 and CP-8 (BOP) • CPC Channel D Hi LPD and Low DNBR Trips
	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 NOTE**:** Should not be required with outer edge CEA.
	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
	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 • CONTAINMENT LEAKAGE HI and HI-HI (L-20 and K-20, Cab N) • 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.
	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%

Time:	Position:	Applicant's Actions or Behavior:
	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 1Steam 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 (U-14, Cabinet F) (CP-1) • Annunciator for SG 1 STEAM/FW FLOW SIGNAL DEV (T-17, Cabinet F) (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)
	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

Time:	Position:	Applicant's Actions or Behavior:
	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
	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**

Time:	Position:	Applicant's Actions or Behavior:
	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.
	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. o Verifies 4 CFCs operating in slow speed • If Containment pressure is greater than or equal to 17.7 psia, verify o CSAS is initiated o ALL available CS pumps are delivering > 1750 gpm o 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
	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

Time:	Position:	Applicant's Actions or Behavior:
	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.
	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).

Time:	Position:	Applicant's Actions or Behavior:
	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	100%
EFPD	450
ESI	-0.005
RCS Boron	250 ppm
BAMT A	5850 ppm
BAMT B	5725 ppm

3. Complete independent Control Board Walkdown.

LCO/Action Status:

Equip/Sys	TS	Entered	Action	Exited
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	1 hr 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.	

Equip/Sys	TRM#	Entered	Action	Exited
None				

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 1 hour due to bearing failure during a surveillance run.

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

DRTS/DEFAS are OOS.

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).

Work Management Center is briefing off-shift NAOs to align HPSI Pump AB to replace A.

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 has failed 8 hours ago. EFW Pump A is 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.

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-902-000, implement SPTAs, and will be directed to OP-902-007. Once the crew isolates SG #1, the scenario may be terminated.

EPLAN classification for this event is ALERT (FA1/RCB2).

Scenario Notes:

A. Reset Simulator to IC-153.
B. Verify the following Scenario Malfunctions are loaded:
    1. RC09A, RCP 1A middle seal failure (20%) (setup)
    2. RP01A, B, C, RPS manual pushbutton Ch(setup)
    3. EG05, Main Generator Exciter Field Breaker fails to trip (setup)
    4. NI01G, ENI Channel C Middle Detector Fails Low (0%) (Trigger 1)
    5. RC21A, RCS Hot leg 1 control channel TT 111X fails Low (0%) (Trigger 2)
    6. CC03A, CCW Pmp A Bearing Seizure (Trigger 3)
    7. RC08A, RCP 1A Lower Seal Failure (100%) (Trigger 4)
    8. SG01A, SG#1 Tube Rupture (5%) [tied to Reactor Trip (CEDM UV), Event Trigger 7, with a 2 minute ramp]
C. Verify the following Control Board Conditions:
    a. EFW Pump A
        - Breaker racked out (Red & Green lights out)
        - CS in OFF
        - Danger Tag on CS
        - Annunciators D-1 and E-1, Cabinet M, in alarm
    b. HPSI Pump A
        - Breaker racked out (Red & Green lights out)
        - CS in OFF
        - Danger Tag on CS
        - Annunciator A-3, Cabinet M, in alarm
D. Have OP-901-130 open with steps 1 and 2 completed.
E. Ensure Protected Train B sign is placed in SM office window.
F. 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 work package will be assembled and a team will be sent to the Control Room.

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 work package will be assembled and a team will be sent to the Control Room.

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 Maintenance is called, inform the caller that a team will be sent to the field to investigate.

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

Event 6 – Exciter Field Breaker fails to open

1. If Work Week Manager or Maintenance is called, inform the caller that a team will be sent to the field to investigate.

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	1	0%	NA	NA	1
	ENI Channel C Middle Detector Fails Low					
2	RC21A	5	0%	NA	NA	2
	RCS Hot leg 1 control channel TT 111X fails Low					
3	CC03A	15	NA	NA	NA	3
	CCW Pmp A Bearing Seizure					
4	RC08A	25	100%	NA	NA	4
	RCP 1A Lower Seal Failure					
5	RP01A,B,C	25	NA	NA	NA	NA
	RPS manual pushbutton Ch Fail					
6	EGO5	25	NA	NA	NA	NA
	Generator Exciter Field Breaker fails to trip					
7	SG01A	30	5%	00:02:00	NA	NA
	SG#1 Tube Leak					

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 o STARTUP CHANNEL 1 NEUTRON FLUX HI (K-3, Cab H) o RPS CHANNEL C TROUBLE (G-18, Cab K)
	ATC/CRS	Verify RPS/CPC bistables respond as expected • Reports trips/pretrips associated with bistables for Low DNBR and High LPD if present
	CRS	Direct BOP to select the non-faulted channel in Startup Channel 1 drawer to deenergize Startup Channel 1.
	BOP	Selects ALTERNATE in Startup Channel 1 drawer and verifies that Startup Channel 1 deenergizes.
	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

Time:	Position:	Applicant's Actions or Behavior:
		• 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 enters TS action 29 restore to operable within 30 days
	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, or at the discretion of the lead examiner.

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

Event Description:

Loop 1 control channel 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 (B-1, Cab H) • PRESSURIZER LEVEL HI-HI annunciator on CP-2 (A-1, Cab H) • 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-0111-X, instrument reading low on CP-2
	CRS	Determines need to enter and implement OP-901-110, Pressurizer Level Control Malfunction.
	CRS/ATC	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 OP-901-110, Subsection E2, Pressurizer Level Setpoint Malfunction.
	CRS/ATC	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
	CRS/ATC	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.

Time:	Position:	Applicant's Actions or Behavior:
	CRS/ATC	Cycle Charging Pumps (CP-4) as necessary to maintain Pressurizer Level above minimum level for operation per Attachment 1, PZR Level vs. Tave curve.
	CRS/ATC	If PZR Backup Heaters have energized, then place unnecessary Backup Heater banks to OFF on CP-2. (One bank may be left in ON)
	CRS/ATC	Check RRS Hot and Cold Leg Temperature meters on CP-2 for abnormal readings. • Determines that Hot Leg instrument RC-ITI-0111-X is failed low
	CRS/BOP	Select Loop 2 for Tave Loop Selector in both RRS local cabinets (inside cabinet drawer on side of drawer). • BOP locates RRS system cabinets behind main panels and places both Tave Loop Selector Switches to Loop 2.
	CRS/ATC	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	ATC returns PZR Level Control System to normal alignment, or at the discretion of the lead examiner.

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:

- 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 (b-2, Cab M) (CP-8) • Amber light on CCW 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.
	CRS/BOP	Align CCW Pump AB Assignment Switch on CP-8 to position A.
	CRS/BOP	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
	CRS/BOP	Start CCW Pump AB using C/S on CP-8.
	CRS	Evaluate AB electrical bus alignment for Technical Specification impact. Enters: • Tech Spec 3.7.3 • Cascading Tech Specs per OP-100-014 • TRM 3.7.3
	Termination	CRS enters Tech Spec 3.7.3, or at the discretion of the lead examiner.

OP Test 1, Scenario 3, Event 4, 5 and 6 - RCP 1A Lower Seal failure (4), Manual Reactor Trip Failure (5), and Exciter Field Breaker fails to open (6).

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	ATC recognizes the 2nd seal failure on RCP 1A • PMC alarms on RCP 1A • Lower and middle seal pressures rise on RCP 1A (CP-2)
	CRS	Directs the ATC to trip the reactor and trip RCP 1A.
	ATC	Depresses the Reactor Trip push buttons, but the reactor does not trip. • **Since DRTS is OOS, the ATC must open BOTH the following breakers for 5 seconds and then re-close:** o **SST A32 FEEDER** o **SST B32 FEEDER** **NOTE: CRITICAL TASK**
	CRS/ATC	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)
	ATC	Starts one oil lift pump and trips RCP 1A.

Time:	Position:	Applicant's Actions or Behavior:
	CRS/BOP	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 • BOP recognizes that the Exciter Field Breaker fails to trip and manually trips the breaker. • 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 read > 105 volts o Vital AC Instrument Bus Indicators on CP-7 read ~ 120 volts
	Termination	BOP recognizes that the Exciter Field Breaker fails to trip and manually trips the breaker.

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, performs a cooldown to < 520°F, and isolates SG #1.

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-902-007, Steam Generator Tube Rupture Recovery.
3. Cooldown and depressurize the RCS to minimize leakage.
4. Isolate SG #1.

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°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:
	CREW	Continues with SPTAs.
	CRS/ATC	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
	CRS/ATC	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
	CRS/ATC	Verify Core Heat Removal by: • Checking at least one RCP operating on CP-2, • Operating loop delta-T less than 13°F (CP-2, CP-7, QSPDS) and • RCS Subcooling (CP-2) greater than or equal to 28°F.
	CRS/BOP	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
	CRS/ATC	Check RCS Tc (CP-2 or CP-7) is 535-555°F
	CRS/BOP	Check S/G pressure 925-1050 psia (CP-1 or CP-7)

Time:	Position:	Applicant's Actions or Behavior:
	CRS/BOP	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
	CRS/BOP	Reset Moisture Separator Reheaters and • Check the Temp Control Valves closed (Reheat Control Panel CP-1)
	CRS/ATC	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. • ATC recognizes and announces rising activity in SG #1.
	CRS/BOP/ATC	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	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-902-007, Steam Generator Tube Rupture, procedure.
	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	Direct SM to Refer to Emergency Plan.
	CRS	Implements Placekeeper and record time of Reactor Trip
	CRS/ATC	If PZR pressure < 1684 psia verify SIAS initiated, • SIAS lights off on PPS ROM on CP-7 • SIAS Initiation Alarms on CP-2
	CRS/ATC/BOP	If SIAS initiated, • LPSI and HPSI pumps started, • Injection flow is acceptable per OP-902-009, Appendix 2 • available charging pumps (2) are running

Time:	Position:	Applicant's Actions or Behavior:
	CRS/ATC	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.
	CREW	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 < 382°F, verify no more than 2 RCPs operating.
	CRS/BOP	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**
	CRS/ATC	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
	CRS/BOP	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

Time:	Position:	Applicant's Actions or Behavior:
	CRS/BOP	When RCS T-hot is less than 520°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	Terminate after BOP isolates SG #1, or at the discretion of the 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	100%
EFPD	50
ESI	-0.01
RCS Boron	1442 ppm
BAMT A	5850 ppm
BAMT B	5725 ppm

3. Complete independent Control Board Walkdown.

LCO/Action Status:

Equip/Sys	TS	Entered	Action	Exited
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	1 hr 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.	

Equip/Sys	TRM	Entered	Action	Exited

None

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 1 hour due to bearing failure during a surveillance run.

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

DRTS/DEFAS

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).

Work Management Center is briefing off-shift NAOs to align HPSI Pump AB to replace A.