SITE:	**Millstone Power Station**	
PROGRAM:	**Unit 3 ILT**	
COURSE:	**N/A**	
EXAM TITLE:	**Large Break LOCA**	**EXAM #: 2K17 NRC-01**
Total Time	**90 Minutes**	

Prepared by:	W.M. Forrestt	Signature on file	11/21/17
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	Printed Name	Technical Reviewer	Date
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	Printed Name	Facility Reviewer	Date

SEG#_2K17 NRC-01_ Rev ; __2___

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Original issue.	0
10/3/17	The following changes were made following NRC validation: 1. On Exam Overview (pgs 4-5): Removed Event 3 ('A' Charging Pump Trip) and Event 5 (PZR level failure as is). Also, removed reference to specific Tech Specs, added Critical Task for RCP Trip Criteria, and made tripping bistables discretionary in Event 1. 2. On Input Summary (pgs 7-8): Removed associated schedule inputs for Events 3 & 5 (triggers 5, 8, & 9). 3. Changed to IC 18 (certified MOL, 100% power IC) vice IC-29 (older version of same IC). 4. In the scenario time line section, made the following changes: • Corrected Tech Spec / TRM entries. • On page 15, made tripping bistables discretionary for Event 1. • On pages 21-22, changed expected flowpath thru AOP 3571. Also, corrected typo on pg. 22 (move onto event 3 vice 2). • Removed Event 3, 'A' Charging Pump Trip. • On page 24, modified RCP upper seal failure so that it starts to slowly degrade from onset of trigger 7. • On page 29, modified expectant flowpath for AOP 3575 (given a RE Rx Plan exists for power reduction). • Removed Event 5, Controlling PZR Level Fails AS-IS • On page 37, added Critical Task to trip RCP's. • On page 43, removed floor instructor note regarding possible transition to FR-Z.1 (unlikely to have met transition at this point). • On page 44, moved transition to LGBLOCA (Event 8) earlier in E-1. 5. On page 49, Exam Guide Summary, clarified CT-3 description (bounded condition to 520k RWST) and added a fourth critical task (CT-16). 6. On page 50, revised ES-D-1 form to match above changes. 7. Added procedure tracking form (last attachment) to aid in training staff in replacing procedures.	1 / 0
11/21/17	The following changes were made following a second NRC validation: • On page 7, modified severity of CV14C (& ramp) to achieve Rx Trip criterion being met • On page 24, made corresponding change to CV14C in body of guide • On page 31, slightly modified desired MVAR • On page 34 slightly increased severity of CV13C malfunction from 10.5 to 12 (to achieve Rx Trip criterion being met) AND provided a second ARP that may be used to direct Rx Trip • On page 35, corrected typo of SBLOCA severity (100 lbm/sec) • On page 45, provided amplifying instruction on LBLOCA with failure of CDA.	2/0

SEG# 2K17 NRC-01 Rev ; 2

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

SEG# 2K17 NRC-01 Rev ; 2

SECTION 3

EXAM OVERVIEW

Title: **Large Break LOCA**

1. The crew takes the shift with the plant at 100% power and at middle of life. The ‘A’ EDG is out of service for planned maintenance.

   Event 1: The controlling channel of pressurizer pressure (3RCS*PT455) fails high. Pressurizer spray valves will open and RCS pressure will lower. The RO will perform immediate actions of AOP 3581, *Immediate Actions*, to place the master pressure controller in manual and return the output to ≥ 50% to stabilize pressure. The US will enter AOP 3581, confirm immediate actions are complete and transition to AOP 3571, *Instrument Failure Response*. The crew will defeat the failed pressure channel, restore pressurizer pressure to setpoint, and request I&C to trip bistables (discretionary to trip bistables).

   Event 2: Turbine Impulse pressure instrument (3MSS-PT505) fails low. Control rods will automatically insert. The RO should note that no runback is in progress, respond to the rapid inward rod motion by taking immediate actions in accordance with AOP-3581, *Immediate Actions*, to place rod control in manual. The US will enter AOP 3581, confirm immediate actions are complete and transition to AOP 3571, *Instrument Failure Response*. The crew will select the unaffected channel of turbine impulse pressure, place the Steam Dump system in the steam pressure mode and place rod control back in automatic. AMSAC will be placed in ‘Bypass’.

   Event 3: ‘C’ RCP seal degradation. The Lower Seal on the "C" RCP will degrade prompting entry into Annunciator Response Procedures. The leak will be slowly increasing and significant enough to procedurally require the crew to begin a plant shutdown. Station management will direct a downpower at 1% per minute. The crew will enter AOP 3575, *Rapid Downpower*, and perform the downpower.

   Event 4: ‘C’ RCP seal continues to degrade.The crew will return to the Annunciator response for high seal leakoff flow (MB3B 2-10) and based on RCP seal package parameters determine that a reactor trip is required. The US will direct a reactor trip, a trip of the ‘C’ RCP and transition to E-0, *Reactor Trip and Safety Injection*.

   Event 5: Small break LOCA inside CTMT. At the time of the reactor trip a small break LOCA on loop 3 occurs (catastrophic loss of ‘C’ RCP seal package). The crew will carry out the immediate actions of E-0, *Reactor Trip and Safety Injection,* and continue in E-0 to step 16 (Check If RCS Is Intact.) Events 8 and 9 occur at steps 4 and 7 of E-0 respectively. Shortly after the reactor is tripped, RCP trip criteria will be reached (per E-0 foldout page). **[Critical Task]**.

   Event 6: Safety Injection fails to automatically actuate. A Safety Injection is expected to automatically occur from low PZR pressure. Both trains of Safety Injection failed to automatically actuate requiring the RO to manually initiate Safety Injection. **[Critical Task]**.

   Event 7: AFW pumps fail to auto start. The BOP will have to manually start the ‘A’ MDAFW and ‘B’ MDAFW pumps at MB5. Steam supply valves must be opened to start the Turbine Driven AFW pump. **[Critical Task]** – Establish at least 530 gpm AFW flow to the SGs before transition out of E-0.

SEG# 2K17 NRC-01 Rev ; 2

Event 8: Large break LOCA inside CTMT, CDA fails to automatically or manually actuate. At step 16 of E-0, the crew will transition to E-1, *Loss of Reactor or Secondary Coolant.* The crew will stop the RHR pumps when procedurally directed. After the crew stops the RHR pumps, the LOCA will rapidly increase in severity, requiring the crew to restart the RHR pumps. As the break size increases an "Orange" Path will be generated based on CTMT pressure. The crew should respond by transitioning to FR-Z.1, *Response to high CTMT Pressure.* CDA Train "A" & "B" will fail to automatically or manually actuate. This will require the crew to manually manipulate individual components to align CTMT spray **[Critical Task]**. Once FR-Z.1 is complete and the crew transitions back to E-1, the session can be terminated.

2. The SRO candidate (US) should classify this event as an **ALERT Charlie One** based on failure of the RCS barrier.

3. Duration of Exam: 90 minutes

SEG# 2K17 NRC-01 Rev ; 2

SECTION 4

EXAM GUIDE

All Control Room Conduct, Operations and Communications shall be in accordance with OP-AA-100, Conduct of Operations.

"Review the Simulator Operating Limits (design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.06)

INPUT SUMMARY						
RESET SIMULATOR TO IC–18						
Either **INPUT** or **Load** Schedule **NRC–01.sch,** THEN **VERIFY** the following functions:						
ID	Description	Event Trigger	Delay Time	Ramp Time	Delete Time	Severity Or Value
MALFUNCTIONS						
RP07A	‘A’ Train of Safety Injection fails to automatically actuate	initial				
RP07B	‘B’ Train of Safety Injection fails to automatically actuate	initial				
FW20A	‘A’ MDAFW pump fails to automatically start	initial				
FW20B	‘B’ MDAFW pump fails to automatically start	initial				
FW20C	TDAFW pump fails to automatically start	initial				
RP06A	Failure of CDA (train A) to automatically actuate	initial				
RP06B	Failure of CDA (train B) to automatically actuate	initial				
EG07A	EDG A Trip	initial				
MB8B-B01	DG A Local Panel Trouble	initial				OFF
MB8B-A03	DG A Emergency Shutdown	initial				OFF
RX09A	Pzr PT455 Fail (high)	1				2500 psi
RX16A	MSS*PT505 failure	3		60 sec		0.0%
MB4C-F08	AMSAC Trouble/Bypass	4	60s			ON
CV13C	RCP C #1 Seal Failure	6		80s		6.0%
CV14C	RCP C #2 Seal Failure	7		20 min		6.0%

INPUT SUMMARY						
RESET SIMULATOR TO IC–18						
Either **INPUT** or **Load** Schedule **NRC–01.sch,** THEN **VERIFY** the following functions:						
ID	Description	Event Trigger	Delay Time	Ramp Time	Delete Time	Severity Or Value
RC03C	RCS Cold Leg leak (loop 3)	30		60 s		100 lbm/sec
REMOTE FUNCTIONS						
RXR106	Prot Set Door 1 (open)	2				OPEN
RXR40	RX:P455A PB455A Hi Pzr Press Trip	2	20 s			TRIP
RXR120	PZR Press Lo PB-455B (P-11)	2	40 s			TRIP
RXR48	RX:P455C PB455C Lo Pzr Press Trip	2	60 s			TRIP
RXR44	RX:P455D PB455D Lo Pzr Press SI	2	80 s			TRIP
RXR05	OTDT Loop 1 B/S TB411C (Trip)	2	100 s			TRIP
RXR34	OTDT Loop 1 B/S TB411D (C-3)	2	120 s			TRIP
RPR40	PB455H – Hi Press PORV Act (PS455E)	2	140 s			TRIP
RXR106	Prot Set Door 1 (close)	2	160 s			CLOSE
OVERRIDES						
EGLO0001	‘A’ EDG Pre-Lube Pump ‘red’					OFF
EGLO0002	‘A’ EDG Pre-Lube Pump ‘green’					OFF
EGLO0012	‘A’ EDG Output Breaker ‘green’					OFF
EGLO0013	‘A’ EDG Output Breaker ‘red’					OFF

INPUT SUMMARY

RESET SIMULATOR TO IC–18

Either **INPUT** or **Load** Schedule **NRC–01.sch,** THEN **VERIFY** the following functions:

ID	Description	Event Trigger	Delay Time	Ramp Time	Delete Time	Severity Or Value
EGLO0014	‘A’ EDG Output Breaker ‘amber’					OFF
EGLO0083	White D/G A Start Light					OFF
RPDI0004	PB1 CDA Actuate Train ‘A’	initial				NACTUATE
RPDI0005	PB2 CDA Actuate Train ‘A’	initial				NACTUATE
RPDI0006	PB3 CDA Actuate Train ‘B’	initial				NACTUATE
RPDI0007	PB4 CDA Actuate Train ‘B’	initial				NACTUATE

EVENTS

Event Code	Description	Event Number

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
❑ COMPLETE Simulator Setup and Readiness Checklist. ❑ SELECT appropriate IC: **IC-18**, 100% power, MOL. ❑ LOAD and RUN applicable Schedule, **NRC-01.sch**. ❑ LOAD event file **NRC-01.evt**. ❑ As necessary, VERIFY the following Initial Malfunctions / I/Os / Remote Functions, as specified on previous '**Input Summary**' page. ❑ When the simulator is ready, PLACE to Run and VERIFY the simulator reflects the following Initial Conditions for the scenario and is stable. ❑ REMOVE the following Equipment from service and tag accordingly: **1. For "A" EDG: PLACE YCT's on a. Pre Lube Pump b. EDG Start switch c. EDG output breaker** **2. Depress Bypass Annunciator for "A" EDG**		N/A
❑ CONDUCT briefing with evaluators.	**PRE-SCENARIO:** ❑ BRIEF the crew initial plant conditions and provide a shift turnover. ❑ IF this is the first simulator scenario of the week, REVIEW the Plant/Simulator Differences List and Simulator Training Objectives with the crew. ❑ As necessary, REVIEW any scenario specific differences and any planned simulator freeze points.	
		(All) Walk down control boards and conduct shift briefing.
*********** **EVENT 1** ***********		
	Controlling channel of PZR pressure (3RCS*PT455) fails high.	

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	Notes on Event 1: (1) The controlling channel of pressurizer pressure RCS*PT455 will fail high. (2) Pressurizer spray valves will open, variable heaters will go to minimum current and RCS pressure will lower. (1) Returning Master Pressure Controller output to ≥ 50% output will close the spray valves.	
<u>Event 1</u> **T = ≈ 1 min after taking the shift** **Trigger 1** (RX09A) 3RCS*PT455 fails high		
	The RO should recognize spray valves are open and performs Immediate Actions of AOP 3581, Attachment E, from memory	
	AOP 3581 (Rev 004), *Immediate Operator Actions*	**RO:** (E.1)* **TERMINATE Pressurizer Spray** (a.) **CHECK** pressurizer spray valves - BOTH CLOSED • 3RCS*PCV455B • 3RCS*PCV455C

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	The RO should Place Master Pressure Controller in "MAN" and Adjust to >50% output.	(a. RNO) <u>**IF**</u> Pressurizer Pressure is less than 2270 psia, <u>**THEN**</u> **PLACE** Master Pressure Controller in MAN <u>**AND**</u> **ADJUST** to <u>**GREATER THAN OR EQUAL TO**</u> 50% output to maintain Pressurizer Pressure between 2225 psia and 2280 psia. <u>**IF**</u> Spray Valves do <u>**NOT**</u> close, <u>**THEN**</u> Manually **CLOSE** Spray Valves (MB4): • 3RCS*PCV455B • 3RCS*PCV455C
	The RO should focus brief immediate actions are complete.	**RO:** (E.2) **CHECK Pressurizer Spray TERMINATED** (a.) **CHECK** Pressurizer Pressure - STABLE OR INCREASING
	The RO should report a failure of 3RCS*PT455.	**RO:** (E.3) **CHECK Initiating Event - INSTRUMENT FAILURE** • Pressurizer Pressure
	Depending on the speed of the RO, RCS pressure could lower to 2204 psia, in which case the US should enter TS 3.2.5, DNB Parameters.	**US:** (E.4) **GO TO AOP 3571, Instrument Failure Response**

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	AOP 3571 (Rev 013), *Instrument Failure Response*	
	US should e**nter AOP 3571** and reads Note and Caution to crew.	**NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure. **CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback.
		US: (1.) **PROCEED TO the Appropriate Attachment, AND PERFORM Corrective Actions** **Instrument Failure** **Attachment** Pressurizer Pressure Channel Failure B
	AOP 3571 Attachment B	

<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td></td><td>Master Pressure Controller will already be in manual from immediate actions.</td><td>RO:
(B.1) CHECK PZR PRES (3RCS-PK455A) - IN MAN</td></tr>
<tr><td></td><td>RO directed to select Channel 3–4
RO should select a channel other than Ch 1 (likely channel 3).
RO should select a channel other than Ch 1</td><td>RO: using Attachment B
(B.2) DEFEAT The Failed Channel Input
<table>
<tr><th></th><th>Name</th><th>Switch ID</th><th>Position</th></tr>
<tr><td>☐</td><td>PZR PRES SEL - CNTL (MB4)</td><td>3RCS-PS455F</td><td>Select Unaffected Loops</td></tr>
<tr><td>☐</td><td>PZR PRES SEL - RECORD (MB4)</td><td>3RCS-PS455G</td><td>Select Unaffected Loop</td></tr>
<tr><td>☐</td><td>OT/OPΔT Record Select (MB4)</td><td>3RCS-TS411E</td><td>Select Unaffected Loop</td></tr>
</table></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>RO:
(B.3) CHECK PZR Pressure - 2250 psia</td></tr>
<tr><td></td><td></td><td>(B.3 RNO) RESTORE pressurizer pressure to 2250 psia.</td></tr>
</table>

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		US: (B.5) **Trip The Associated Reactor Protection System Bistable(s)** (a.) Using Table B.1, **PLACE** a check mark in the box above the channel required to be tripped
	TS 3.2.5, 2 hr – IF RCS pressure drops below 2204 psia during transient **TS 3.3.1, FU 7, 9, 10, Action 6A**, 72 hr **TS 3.3.2, FU 1.d, Action 20A**, 72 hr **TS 3.3.2, FU 11, Action 20**, 6 hr **TRM 3.3.2.1, FU 11.a, Action 27,** **27.a,** 6 hr **27.b,** see spec **27.c,** 30 day **TRM 7.4.1, Action a.1/a.3**, 14 day/30 day respectively **Note: TS 3.3.2, FU 9.a, Action 21**, NOT applicable because Minimum channels remain operable. **Note: TS 3.3.3.5, Action a**, NOT applicable because Minimum channel remains operable.	(b.) **REFER** to the following Tech Specs for required actions • TS 3.3.1, Reactor Trip System Instrumentation • TS 3.3.2, Engineered Safety Features Actuation System Instrumentation • TS 3.3.3.5, Remote Shutdown Instrumentation
At the discretion of the lead examiner, proceed to Event 2 without tripping bistables.	The RO should do a lamp check to ensure all bistable lights are functional, then verify no coincidence would be met when bistables are tripped.	**RO:** (d.) **CHECK** the existing bistable status to ensure a Reactor trip will **NOT** occur when the failed channel is tripped

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	Bistable status lights are lit and Channel indication is not normal. The US should proceed to next step.	**US:** **CHECK** affected channel indication - **NOT** NORMAL
T = When requested: **Report to the Control Room as I&C.** **T = After I&C brief** INSERT **TRIGGER 2** to trip bistables		**US:** (f.) **REQUEST** I&C use Table B.1 and ATTACHMENT S to perform the following: 1. **PLACE** the selected Master Test switch in TEST 2. **PLACE** the selected Bistable switches in TEST
T = bistables tripped **Move on to Event 2**		**RO:** (g.) **CHECK** the appropriate bistable status light(s) are lit
		US: (B.6) **REQUEST I&C perform corrective maintenance on failed instrument**
*********** **EVENT 2** ***********		
Event 2 **T = Examiner Cue** **Trigger 3** RX16A sev = 0.0% ramp = 060 seconds 3MSS-PT505 fails low		

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	AOP-3581 (Rev 004) **Immediate Operator Actions**	
	The RO should identify uncontrolled rod motion with no turbine runback in progress and perform Immediate Actions of AOP 3581, Attachment A, from memory.	**RO:** (A.1*) **CHECK Turbine Runback In Progress** (a.) **CHECK** the following: • Main Generator MWE - **NOT** AT EXPECTED VALUE • Main Generator MWE - CHANGING
		RO: (a. RNO) **PERFORM** the following: 1. **PLACE** Rod Control SEL switch in MAN. 2. **PROCEED TO** step A.2.
		RO: (A.2*) **CHECK Rod Motion – STOPPED**
	Yes. Turbine Impulse Pressure (PT505) failed.	**BOP:** (A.3) **CHECK Initiating Event - INSTRUMENT FAILURE** • Tavg • Nuclear Instrument • Turbine Impulse Pressure

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		US: (A.4) **GO TO AOP 3571, Instrument Failure Response**
	AOP 3571 Rev 014 **Instrument Failure Response**	
		US: Enters AOP 3571 (Rev-013) and reads Note and Caution to crew: **NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure. **CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback.
	The US should proceed to **Attachment G** for a Turbine Impulse Pressure Channel Failure	**US:** **1. PROCEED TO the Appropriate Attachment, AND PERFORM Corrective Actions** **Instrument Failure Attachment** Turbine Impulse Pressure Channel Failure …**G**
	AOP 3571 Attachment G	

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	Rod Control will already be in manual from the RO's immediate actions.	**RO:** (G.1) **CHECK Control Rods in – MAN**
		BOP: (G.2) **PLACE ONE Steam Dump Interlock Selector Switch – OFF** • INTLK-TR A (MSS-N05) • INTLK-TR B (MSS-N06)
		BOP: (G.3) **SELECT** the unaffected channel on 1st STG STM PRESS CH SEL switch (3MSS-PS505Z) • CHAN 1 (3MSS-PI505) • CHAN 2 (3MSS-PI506)
	MB4D 6-6 "Turbine Load rejection ARM C-7" will not be lit.	**BOP:** (G.4) **CHECK** annunciator TURB LOAD REJECTION ARM C-7 – LIT
		BOP: (G.4 RNO) **<u>PROCEED</u> <u>TO</u>** step G.6.
		BOP: (G.6) **ADJUST** Steam Pressure Controller setpoint to maintain 1092 psig (pot setting of approximately 8.4)

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		BOP: (G.7) **PLACE** the Steam Dump MODE SEL switch (3MSS-N07) in the STM PRESS mode
		BOP: (G.8) **PLACE** Both Steam Dump Interlock Selector Switches – ON • INTLK-TR A (3MSS*N05) • INTLK-TR B (3MSS*N06)
	The Turbine HOLD light will not be lit.	**BOP:** (G.9) **CHECK** Main Turbine HOLD light - NOT LIT
		RO: (G.10) **CHECK** Tavg - Tref error/deviation - LESS THAN +/-1°F
		RO: (G.11) **PLACE** Rod Control SEL switch in AUTO
T = Requested to bypass AMSAC INSERT Trigger 4.		**US:** (G.12) Using OP 3350, ATWS Mitigation System Actuation Circuitry, **PLACE** AMSAC in Bypass

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		US: **NOTE:** If the interlock (permissive annunciator window) is in the required state for the existing plant conditions, **NO** further actions are required (e.g., tripping of bistables).
Once lead evaluator is satisfied that Tech Specs have been addressed, move on to Event 3.	**TS 3.3.1 FU 17.b, Action 8,** 1 hr **TRM 7.2.1, action 1**, see action	**US:** (G.14) Within one hour, **PERFORM** the following: (a.) **DETERMINE** if the interlock is in the required state (b) **REFER** to TS 3.3.1, Action 8 **REFER** to TRM 7.2, Additional Requirement, AMSAC
		NOTE: The following step will distinguish whether the failure is within SSPS or the Protection channel.
	Channel indication is <u>not</u> normal. The US should proceed to next step.	(G.15) **CHECK** affected channel indication - **<u>NOT</u>** NORMAL
		US: (G.16) **REQUEST** I&C perform corrective maintenance on failed instrument

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	*********** **EVENT 3** ***********	
Event 3 **T = Examiner Cue** **Trigger 6** **(CV13C @ 6.0%)**	**'C' RCP Seal Degradation** This will cause mid stage inlet pressure to increase to approximately 2070 psi (normal is 1450 psi). Alarm setpoint is 1875 psi. Hi Range seal leakoff will be 2.9 gpm.	
	MB4B (2-6B) (rev 008) "RCP C MID STG INLET PRES HI"	
	The US should enter ARP MB4B (2-6B) and read the Caution to the crew:	C A U T I O N Gross failure of all seal stages could be indicated by: • Seal return (CBO) flow rate exceeding 4 gpm from a pump • Third stage leakage flow indicating zero or near zero, which may be caused by steam formation in the seal water return (CBO) line
	MB3B (2-10) is not lit.	(1.) IF "RCP HI RANGE LKG FLOW HI" (MB3B 2-10) is lit, Go To 3353.MB3B Window 2-10, "RCP HI RANGE LKG FLOW HI."
	MB3B (2-9) is not lit.	(2.) IF "RCP HI RANGE LKG FLOW LO" (MB3B 2-9) is lit, Go To 3353.MB3B Window 2-9, "RCP HI RANGE LKG FLOW LO."
		(3.) DISPLAY "RCP Status" RCS_2.dis (PPC)

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	US should request current value and assign an owner to monitor these parameters. A complete loss of seal cooling has not occurred.	(4.) IF at any time, any of the following occur: • RCP seal inlet temperature exceeds 190°F • RCP seal outlet temperature exceeds 260°F • DP across any one stage exceeds 1750 psid THEN PERFORM the following: (4.1) TRIP reactor. (4.1.1) STOP RCP C.
		NOTE A complete loss of seal cooling is defined as no seal injection flow, AND no thermal barrier cooling flow.
		(4.1.2) IF a complete loss of seal cooling has occurred, CLOSE CHS-AV8141C, RCP seal return (CBO) isolation valve. (4.1.3) Go To E---0, “Reactor Trip or Safety Injection.”
When called as OMOC acknowledge report and if asked inform SM that: “I will have engineering review data and provide recommendations.”		(5.) NOTIFY OMOC (Duty Officer) of the alarm condition.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
T= Step 6 of ARP MB4B (2-2B) complete **INSERT Trigger 7** (CV14C @ 6.0% on 20 minute ramp). **As Engineering Duty Officer, report:** "Engineering will review data and make recommendations."	This malfunction will allow the crew to determine the seal package is slowly degrading. Later (pg 26 of guide), the OMOC will conservatively instruct the crew to take the unit offline.	(6.) REQUEST Engineering Department evaluate continued pump operation.
	MB4B (2-6A), RCP C UP STG INLET PRES HI will light. Crew to monitor seal inlet temp, outlet temp, and differential pressures. If seal inlet temp > 190°F, OR seal outlet temp > 260°F, OR dp across any stage > 1750#, Trip the reactor and Stop "A" RCP.	(7.) IF RCP removal from service is recommended, PERFORM the following to remove RCP C from service within 8 hours: 7.1 IF reactor power is greater than 25%, Refer To OP 3204, "At Power Operation," and COMMENCE an orderly plant shutdown while continuing with this step.
	Leakage flow for "C" RCP seal will increase to about 3.3 gpm. Alarm setpoint is 3.0 gpm	
	3353.MB3B (2-10) **RCP HI RANGE LKG FLOW HI** **CORRECTIVE ACTIONS** (rev 012)	
		(1.) CHECK the following to confirm alarm and determine affected RCP: • 3CHS-FR158 and 3CHS-FR160, high range seal leak flow recorders (MB3) • CHS-F159*, RCP C seal return (CBO) flow computer point

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(2.) DISPLAY “RCP Status,” RCS_2.dis.
		(3.) ASSESS leakage flow high indication by observing the following indications: • Seal injection flow • Affected RCP seal inlet temperatures • VCT level • Charging header flow • Pressurizer level • 3CHS-PI 124, excess L/D Hx outlet pressure
	CBO flow is > 3 gpm, seal temps are sat and Mid stage inlet pressure high alarm is in. Crew should go to Step 8.	(4.) Using Table 1, EVALUATE plant conditions for the affected RCP, and Go To indicated Step.

Table 1

RCP Seal Return (CBO) Flow	Seal Inlet Temp	Seal Outlet Temp	RCP MID STG INLET PRESS HI Alarm (MB4B)	RCP UP STG INLET PRESS HI Alarm (MB4B)	Go To Step:
≥ 4 gpm			Lit	Lit	6.
≥ 4 gpm			Either Lit		7.
≥ 3 gpm		≥ 260°F			5.
≥ 3 gpm	≥ 190°F				6.
≥ 3 gpm	≤ 190°F	≤ 260°F	Either Lit		8.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
T= Crew reaches Step 8 of ARP 3353.MB3B (2-10), call US as OMOC and report that based on Engineering and Vendor recommendations plant management has decided to take the unit off line. Recommend to SM to use 1% per minute rapid downpower to 30% Reactor Power. OMOC will make DEMI notification.		(8.) PERFORM the following: (8.1) NOTIFY OMOC (Duty Officer) of alarm condition. (8.2) IF "VCT TEMP HI" (MB3A 5---10) is lit, Refer To OP 3353.MB3A 5---10, "VCT TEMP HI." (8.3) REQUEST Engineering Department evaluate continued pump operation. (8.4) IF, at any time, affected RCP seal parameters degrade, IMPLEMENT steps as specified in Table 1, while proceeding to step 9.
		(9.) IF total seal return flow from all four RCPs exceeds 16 gpm, Refer To TRM 7.4.1, "Fire Related Safe Shutdown Components," and PERFORM required ACTIONs.
	AOP 3575, *Rapid Downpower* (Rev 026)	
		US: Receives phone call, briefs crew, and **enters AOP 3575, *Rapid Downpower***
		RO: (1) **CHECK Rod Control - IN AUTO**
		NOTE: For a plant shutdown the preferred reactor power target is 30% Reactor Power

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		NOTE: Reactor Power to MWe correlation is an approximate value and will vary based on seasonal temperatures and equipment performance.
		BOP: (2) **Align EHC Panel** (a.) **CHECK** Load reduction using Load Set – DESIRED
	Desired reactor power for a plant shutdown is 30%. This correlates to a Load Set Indicated MWe Setting of about **375 MWe**.	**BOP:** (b.) Referring to ATTACHMENT H, **DETERMINE** the Load Set Indicated MWe setting for the applicable: • Desired MWE Unit Output **OR** • Equivalent MWE for the Desired final Reactor Power
		BOP: (c.) Using ATTACHMENT E, **ALIGN** EHC Panel for Load Set operation
		NOTE: ISO-NE requested load reductions should be completed within 25 minutes of notification.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	No, OMOC recommended 1% min rate.	**US:** **(3) Determine Power Reduction Rate (% / min)** (a.) **CHECK** power reduction rate - 3%/min or 5%/min
	The US should proceed to step 5.	**US:** (a. RNO) **PERFORM** the following: (1.) **IF** power reduction rate is 1%/min, **THEN PROCEED TO** step 5.
		RO: (5) **Align RCS Makeup System For Boration** (a.) **CHECK** Rod Control - AVAILABLE FOR ROD INSERTION
		US: (b.) **PROCEED TO** step 5.e
	Crew may elect to calculate required boron.	**US:** (b.) **CHECK** use of Rapid Downpower Summary Sheet (RE-H-17) in the RE Curve and Data Book – DESIRED
		US: (c.) **REFER TO** the Rapid Downpower Summary Sheet (RE-H-17), **DETERMINE** the boric acid required

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		US: (d.) **PROCEED TO** step 5.g
		RO: (h) **SET** Boric Acid Batch Counter to the boration amount determined
		(i.) **ADJUST** Boric Acid Blend Flow Controller Pot setting to 6.25 (25 gpm)
		RO: (j.) **SELECT** BORATE on Reactor Coolant Makeup select switch
		RO: (k.) **SELECT** START on Reactor Coolant Makeup START switch
		RO: (l.) **CHECK** boric acid flow – INDICATED
		US: (m.) **PROCEED TO** step 6 **AND WHEN** boration has been performed for the selected amount, **THEN CHECK** Reactor Coolant Makeup boration stops
		NOTE: Delta-T indications are selected as being more accurate than NIS for monitoring power during the rapid downpower.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		NOTE: Perform step 8 if the downpower must be stopped **OR** a lower final power level is required **OR** boron injection alignment must be changed.
	Rapid or gravity boration is not in progress	(6) **Initiate Load Reduction** (a.) **CHECK** rapid or gravity boration - IN PROGRESS
	The US should direct the RO to inform him when either Tavg, power or changes as a result of the boration.	(a. RNO) **PERFORM** the following: (1.) **WHEN** Tavg **OR** Reactor power change due to boration, **THEN** **PROCEED TO** step 6.b.
		(b.) **CHECK** Turbine OPERATING MODE – MANUAL
		(c.) **CHECK** load reduction- USING LOAD SET
	1% minute is desired.	(d.) **SELECT** LOAD RATE LIMIT %/MIN (1%/MIN, 3%/MIN, or 5%/MIN)
		(e.) Refer to ATTACHMENT H **AND** Using the LOAD SELECTOR pushbuttons, **ADJUST** LOAD SET to Load Set Indicated MWe setting recorded in step 2.b
		(f.) **ENERGIZE** ALL PZR Heaters

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(g.) **ADJUST** PZR Spray Valves to 50% setpoint • 3RCS-PK 455B • 3RCS-PK 455C
		NOTE: Adjusting the loading rate (%/min), boration time, boration flow rate, or rod position are acceptable means to control plant parameters during the downpower.
		(h.) **MAINTAIN** plant parameters values as listed in ATTACHMENT C **OR** as directed by Operations Management
		(i.) RNO **CHECK** power reduction - ISO-NE REQUESTED
The US should call ISO-NE and inform the load reduction rate (MWe/min) and final MWe level. When asked about desired MVAR loading band, state "Your target MVAR loading is 100 (+ / – 40) MVAR out."		(i. RNO) **NOTIFY** ISO-NE of load reduction rate (MWe/min) and final MWe level.
		RO: **(7) Check Rod Position Above RIL** (a.) **CHECK** ROD CONTROL BANKS LIMIT LO-LO, (MB4C 4-9) annunciator – LIT
		US: (a. RNO) **PROCEED TO** step 7.k **AND IF** the annunciator is received, **THEN PERFORM** steps 7.b through 7.i.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(k.) **CHECK** ROD CONTROL BANKS LIMIT LO, (MB4C 3-9) annunciator – LIT
		(k. RNO) **PROCEED TO** step 8 **AND IF** the annunciator is received, **THEN PERFORM** steps 7.l through 7.m.
		(8) **Monitor Downpower** (a.) **CHECK** the following- REMAINS UNCHANGED • Final desired MWe load • Final desired target power level • Boron injection path
		US: (b.) **PROCEED TO** step 9
		(9) **Degrade Condenser Backpressure** (a.) **CHECK** final desired Turbine load (MWe) - LESS THAN 907 MWe (apprx 75% reactor power)
As PEO when requested report to Control Room or acknowledge request to degrade vacuum. INSERT and MODIFY MALF FW01 as needed to maintain 2.0 – 4.0 in.		(b.) Using OP 3329, Condenser Air Removal, **PERFORM** SJAE Operation to Increase Condenser Backpressure to between 2.0 in. HgA

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(10) Align One Feedwater Pump For Removal from Service (a.) **CHECK** final desired Reactor power - LESS THAN 50%
		(b.) **CHECK** removing a Feedwater Pump from service during the downpower – DESIRED
		(c.) **CHECK** TD FW Pump Status – • Both OPERATING **AND** • At Least One OPERATING in AUTO
		(d.) Using the applicable Attachment, **REMOVE** ONE TD FW Pump from service: • ATTACHMENT A, Removing A TD FW Pump From Service • ATTACHMENT B, Removing B TD FW Pump From Service
		(11) Check Power Related Interlock Status (a.) **CHECK** Reactor power – LESS THAN THE P-9 SETPOINT (resets at approx. 49% NIS power)

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(a. RNO) **PROCEED TO** step 12 **AND WHEN** Power Less Than P-9, **THEN RETURN** to step 11.
		(12) **Align Plant Systems For Less Than 30% Reactor Power Operation** (a.) **CHECK** final desired Reactor power level - LESS THAN or EQUAL TO 30%
As PEO, acknowledge request to start Aux Boilers. Wait 8 minutes and INSERT MSR01.		(b.) Using OP 3331A, Auxiliary Boiler Steam and Condensate, **START** the Auxiliary Boiler(s)
*********** **EVENT 4** ***********		
T= Lead evaluator satisfied with downpower and Tech Spec review **MODIFY CV13C to 12 on 2 minute ramp.**	**'C' RCP Seal Degradation Requiring a Reactor Trip**	
The above modification will result in Rx Trip Criteria being met (along with stopping 'C' RCP). This condition will be directed by either of the following **ARPs:** 1**. MB3B (2-10)** Table at Step 4 – criterion is **CBO flow will exceed 4.0 gpm** <u>**OR**</u> 2. **MB4B (2-6b)** Step 4 – criterion is **DP across any seal stage exceeding 1750 psid**		

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**

Table 1

RCP Seal Return (CBO) Flow	Seal Inlet Temp	Seal Outlet Temp	RCP MID STG INLET PRESS HI Alarm (MB4B)	RCP UP STG INLET PRESS HI Alarm (MB4B)	Go To Step:
≥ 4 gpm			Lit	Lit	6.
≥ 4 gpm			Either Lit		7.
≥ 3 gpm		≥ 260°F			5.
≥ 3 gpm	≥ 190°F				6.
≥ 3 gpm	≤ 190°F	≤ 260°F	Either Lit		8.

BOOTH INSTRUCTOR	FLOOR INSTRUCTOR	STUDENTS
	The US should direct the RO to trip the reactor, stop the ‘C’ RCP and then transition to E-0.	(6.) PERFORM the following: (6.1) TRIP reactor. (6.2) STOP affected reactor coolant pumps. (6.3) Go To E---0, “Reactor Trip or Safety Injection.”
*********** **EVENT 5** ***********		
	“C” Cold Leg break Inside CTMT	
The small break LOCA will initiate upon the reactor trip. (RC03C, 100 lbm/sec) **Note:** This **leak will be manually increased <u>LATER</u> when the crew reaches E-1 step 3** (see page 45 of guide).		

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	E-0, *REACTOR TRIP OR SAFETY INJECTION* **Rev. 030**	
		NOTE: ADVERSE CTMT is defined as GREATER THAN 180°F or GREATER THAN 105 R/hr in containment. **NOTE:** The reactor can be interpreted as tripped when any two of the actions in step 1 are satisfied. **NOTE:** Attachment D identifies Time Critical Actions.
		RO: (1 *) **Check Reactor Trip** • **CHECK** Reactor Trip and Bypass Breakers – OPEN • **CHECK** Rod Bottom lights – LIT • **CHECK** Neutron Flux – DECREASING
		BOP: (2 *) **Check Turbine Trip** (a.) **CHECK** all Turbine Stop Valves - CLOSED

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(3 *) **Check Power To AC Emergency Busses** (a.) **CHECK** AC Emergency Busses 34C and 34D - BOTH ENERGIZED
	*********** **EVENT 6** ***********	
	EVENT 6: Safety Injection fails to automatically actuate. **Critical Task – Crew should identify that SI did not actuate and it is required. SI should be manually actuated.**	(4 *) **Check If SI Is Actuated** (a.) **CHECK** SAFETY INJECTION ACTUATION annunciators, (MB4D 1-6 or MB2B 5-9) – LIT

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		RO/BOP: (a. RNO) **CHECK** if SI is required: • CTMT pressure GREATER THAN 18 psia **OR** • PZR pressure LESS THAN 1890 psia **OR** • PZR level LESS THAN 9% **OR** • RCS subcooling LESS THAN 32°F **OR** • SG pressure LESS THAN 660 psig
		US: (a. RNO) **IF** SI is required, **THEN INITIATE** SI and **PROCEED TO** step 5.
	Critical Task – Trip RCP's within 5 minutes of reaching foldout page criteria # 1 (will be met once RCS pressure lowers below 1500 psia).	**NOTE:** Foldout page must be open.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	CTMT will not be Adverse.	(5) **DETERMINE IF ADVERSE CTMT CONDITIONS EXIST** • Ctmt temperature - GREATER THAN 180°F **OR** • Ctmt radiation - GREATER THAN 105 R/ hr
		US: (5 RNO) DO **NOT** USE ADVERSE CTMT Parameters
	The US should hand off ATTACHMENT B to the RO	**RO:** (6) **Using** ATTACHMENT B**, Actuation Signal Verification, CHECK Equipment Alignment**
*********** **EVENT 7** ***********		
	EVENT 9: AFW pumps fail to auto – start. **Critical Task –** **The BOP should identify that the AFW pumps failed to automatically start when required. The BOP should manually start ALL AFW pumps.**	**BOP:** (7) **Check AFW Pumps Running** (a.) **CHECK** MD Pumps – RUNNING
		(a. RNO) **START** pump(s).

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(b.) **CHECK** Turbine-Driven Pump - RUNNING IF NECESSARY
		(b. RNO) **OPEN** Steam Supply Valves.
		BOP: (8) **CHECK AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT**
		CAUTION: With TD AFW Pump feeding SG(s): Full travel stroking of any AFW Flow Control Valve should occur one at a time, at a rate GREATER THAN 15 seconds.
		BOP: (9) **Check Adequate Heat Sink** (a.) **CHECK** NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)
		(b.) **CONTROL** feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT)
		US: (c.) **<u>PROCEED</u> <u>TO</u>** step 10
		RO and BOP: (10) **Check RCS Temperature** (a.) Using GA-26, **DUMP** steam to control No-Load RCS Temperature - AT 557°F

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(b.) **CHECK** RCS Temperature – AT NO-LOAD VALUE: • **IF ANY** RCP RUNNING - RCS Tavg - STABLE AT OR TRENDING TO 557°F **OR** • **IF NO** RCP RUNNING – RCS COLD LEG WR TEMPERATURE - STABLE AT OR TRENDING TO 557°F
		US: (c.) **PROCEED TO** step 11
		BOP: (11) **Check Power To SBO Diesel Auxiliaries** (a). **CHECK** any SBO Bus Tie Breaker - CLOSED TO AN ENERGIZED BUS • Bus 34A: 34A1-2 • Bus 34B: 34B1-2 • Bus 24E: A505 (Unit 2)
		US: (b.) **PROCEED TO** Step 12 **AND IF** SBO Diesel Auxiliaries DEENERGIZE, **THEN PERFORM** step 11.a RNO
		RO: (12) **Check PZR Valves** (a.) **CHECK** PORVs - CLOSED

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		(b.) **CHECK** normal PZR Spray Valves - CLOSED
		(c.) **CHECK** PORV Block Valves - AT LEAST ONE ENERGIZED VALVE OPEN
		(d.) **CHECK** PORV Block Valves - ALL ENERGIZED VALVES OPEN
		(e.) **CHECK** PZR Safety Valves - CLOSED
		CAUTION: To prevent seal damage, seal injection flow should be maintained to all RCPs.
	RCP's should have already been tripped.	**RO:** (13) **Check If RCPs Should Be Stopped** (a.) **CHECK** RCPs - ANY RUNNING
		(b.) **CHECK** RCS pressure – LESS THAN 1500 psia (1800 psia ADVERSE CTMT)
		(c.) **CHECK** either of the following: • Charging pumps - AT LEAST ONE RUNNING AND AT LEAST ONE COLD LEG INJECTION VALVE OPEN **OR** • SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF INJECTION
		(d.) **STOP** all RCPs

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	All SG Secondary Boundaries Are Intact	**BOP:** (14) **Check If SG Secondary Boundaries Are Intact** (a.) **CHECK** pressure in all SGs: • **NO** SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • **NO** SG COMPLETELY DEPRESSURIZED
	All SG tubes are intact.	**BOP:** (15) **Check If SG Tubes Are Intact** (a.) **CHECK** Steam Generator levels - **NO** SG LEVEL INCREASING IN AN UNCONTROLLED MANNER
		RO: (b.) **CHECK** trend history and alarm status of radiation monitors • Main Steam Line - NORMAL • Condenser Air Ejector - NORMAL • SG Blowdown - NORMAL

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	CTMT pressure will not be normal.	**RO:** (16) **Check If RCS Is Intact** • **CHECK** Ctmt radiation using 3CMS*RE22 (pre-trip) – NORMAL • **CHECK** Ctmt radiation using radiation monitoring group histogram (CTMT) - NORMAL • **CHECK** Ctmt pressure - NORMAL • **CHECK** Ctmt recirculation sump level - NORMAL
		US: (16 RNO) **INITIATE** monitoring of CSF Status Trees **AND** **GO TO** E-1, Loss of Reactor or Secondary Coolant.
	E-1, *LOSSOF REACTOR OR SECONDARY COOLANT* (Rev. 026)	
		CAUTION To prevent seal damage, seal injection flow should be maintained to all RCPs.
		NOTE Foldout page must be open.
	RCP's should have been stopped in E-0	**RO:** (1.) **Check If RCPs Should Be Stopped** (a.) Verify RCPs - ANY RUNNING

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		US: (a. RNO) Proceed to step 2.
	Secondary Boundaries Are Intact	**BOP:** (2.) **Check If SG Secondary Boundaries Are Intact** (a.) Check pressures in all SGs – • NO SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO SG COMPLETELY DEPRESSURIZED
T = Step 3 or Lead Examiner's cue **Modify RC03C to 100% severity**		**BOP:** (3.) **Check Intact SG Levels** (a.) Verify NR level - GREATER THAN 8% (42% ADVERSE CTMT)
*********** **EVENT 8** ***********		

The above modification to RC03C will result in a Large Break LOCA with failure of CDA. Note the following:

1. A red path will be generated on RCS Integrity (FR-P.1) along with an orange path on Ctmt Integrity (FR-Z.1). As such, FR-P.1 will become the first procedure transition.

2. CDA has failed to actuate and the manual pushbutton will not work. This will require manual system alignments. The crew may implement either of the following procedures:

a.) Transition to FR-Z.1 (after exiting FR-P.1) OR

b.) Implemention of E-0 Att. B Continuous Action Step B.8 (Check if CDA Required) may be used. This guide has the actions listed for FR-Z.1 (E-0 Att. B steps are the same).

3- If stopped, RHR pumps will need to be restarted.

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	NOTE: A red path on RCS Integrity may come in first. If so the crew will perform FR-P.1 first as it has a higher priority	
	FR-P.1 (rev 016) Steps	
		CAUTION • If DWST level decreases to LESS THAN 80,000 gal, Shift AFW pump suction to the CST using GA-4. • If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system.
		RO: (1.) **Check RCS Pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT)**
	RHR Pump flow should be > 1,000 gpm. The appropriate transition will be to FR-Z.1	**US:** (1. RNO) Perform the applicable action: • IF RHR pump flow is LESS THAN OR EQUAL TO 1000 gpm, THEN Proceed to step 2. • IF RHR pump flow is GREATER THAN 1000 gpm, THEN Go to procedure and step in effect.
	FR-Z.1 (rev 017) STEPS	

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
		C A U T I O N If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system.
		RO: (1.) **Check IF CDA Required** (a.) Check Ctmt pressure - GREATER THAN 23 psia
	"CONTAINMENT DEPRESS ACTUATION" will NOT be lit.	(b.) Verify annunciator "CONTAINMENT DEPRES ACTUATION" (MB2B 5-5) - LIT
	The **RO** is expected to attempt to **manually initiate CDA** using the main board pushbuttons **Critical Task –** **The RO must manually start the QSS pumps.**	(b. RNO) Initiate CDA. <u>IF</u> CDA will <u>NOT</u> actuate, <u>THEN</u> 1) START quench spray pumps. 2) OPEN quench spray pump discharge valves.
	The RPCCW pumps will have to be manually stopped.	(c.) Check RPCCW pumps - STOPPED
		(c. RNO) Perform the following: 1) RESET SI and LOP (if required) 2) STOP RPCCW pumps.
		d. STOP all RCPs

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	The BOP will have to manually stop the CAR and CRDM fans.	**BOP:** (e.) Check CAR fans - STOPPED
		(e. RNO) STOP CAR fans.
		(f.) Check CRDM fans – STOPPED
		(f. RNO) STOP CRDM fans.
		<u>C A U T I O N</u> If ECA-1.1, Loss of Emergency Coolant Recirculation, is in progress, Ctmt spray should be operated as directed in ECA-1.1.
	Yes, not lit.	**RO:** (2.) **Verify Quench Spray System Operation** (a.) Check annunciator RWST EMPTY QSS PP OFF (69,331 gal) (MB2A 5-2) - NOT LIT
	QSS pumps were started and their discharge valves opened in step 1.	(b.) Verify quench spray pumps - RUNNING
		(c.) Verify running quench spray pump discharge valve(s) – OPEN • 3QSS*MOV34A • 3QSS*MOV34B

SCENARIO TIME LINE		
BOOTH INSTRUCTOR	**FLOOR INSTRUCTOR**	**STUDENTS**
	Yes, Ctmt pressure will be less than 60 psia.	(3.) **Check Ctmt Status** (a.) Check Ctmt pressure - LESS THAN 60 psia
		US: (b.) Go to procedure and step in effect and, after evaluating step applicability based on plant conditions, Perform the remainder of this procedure as time allows
The scenario may be terminated upon completion of FR-Z.1.		
RESTORE simulator to “training ready” conditions by cleaning/replacing marked up procedures, removing placekeeping tabs or marks from all references and control panel indicators, etc.	**POST-SCENARIO:** a. ENSURE simulator problems encountered during the scenario are documented IAW site specific process.	

SEG#_2K17 NRC-01_ Rev ; __2___

SECTION 5
EXAM GUIDE SUMMARY

Title: Large Break LOCA

Critical Tasks

TASK DESCRIPTION	TASK #	K/A >/= 3.0	BASIS SELECTION
Manually actuate at least one train of SIS-actuated safeguards before transition out of E-0.	CT-2	ESFAS 013-A3.02 (4.1 / 4.2)	Failure to manually actuate SI under the postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent “degraded emergency core cooling system (ECCS)…capacity.”
Establish 530 gpm AFW flow to the SGs before transition out of E-0.	CT-4	AFW 061-A2.05 (3.1 / 3.4)	Failure to establish the minimum required AFW flow rate, under the postulated plant conditions, results in “adverse consequence or a significant degradation in the mitigative capability of the plant.”
Establish at least one train of quench spray flow before reaching 520k gallons in the RWST.	CT-3	CSS 026-A4.01 (4.5 / 4.3) Westinghouse EPE E14–EA1.1 (3.7 / 3.7)	The Quench Spray system reduces containment pressure. Therefore, it is integral post accident in minimizing radiation release to the environment.
Manually trip RCP’s (in accordance with E-0 Foldout Page Criterion 1)	CT-16	EPE 009-EA1.09 (3.6 / 3.6)	Failure to trip RCP’s under postulated conditions leads to core uncovery and excessive fuel clad temperatures.

SEG#_2K17 NRC-01_ Rev ; __2___

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Millstone 3 Scenario No.: 2K17 NRC-01(Rev 1) Op-Test No.: 2K17
Examiners:________________ Operators:________________

Initial Conditions: IC-18, 100% Power, Middle of life, Equilibrium Xe

Turnover: The plant is at 100% power and at middle of life. The 'A' EDG is out of service for planned maintenance.

Critical Tasks:

1. Manually actuate at least one train of SIS-actuated safeguards before transition out of E-0. (CT-2)
2. Establish 530 Gpm AFW flow to the SGs before transition out of E-0. (CT-4)
3. Establish at least one train of quench spray flow prior to RWST reaching 520k gallons (CT-3)
4. Manually trip RCP's (CT-16).

Event No.	Malf. No	Event Type*	Event Description
1	RX09A	I (RO)	Controlling channel of PZR pressure (3RCS*PT455) fails high. (AOP 3571) *(Tech Spec entry)*
2	RX16A	I (RO) I (BOP)	Turbine Impulse pressure instrument (3MSS-PT505) fails low. (AOP 3571) *(Tech Spec entry)*
3	CV13C CV14C	R (SRO) R (RO) N (BOP)	'C' RCP seal degradation. Rapid Downpower (1%/min) to take the unit offline. (Annunciator Response, AOP 3575)
4	CV13C CV14C		'C' RCP seal continues to degrade, resulting in high seal leakoff and a procedurally required reactor trip. (Annunciator Response)
5	RC03C	M (All)	Small break LOCA inside CTMT (catastrophic loss of 'C' RCP seal package).
6	RP07A/B	C (RO)	Safety Injection fails to automatically actuate.
7	FW20	C (BOP)	AFW pumps fail to auto start.
8	RP06A/B RPDI0004 RPDI0006	C (RO) C (BOP)	Large break LOCA inside CTMT. CDA fails to automatically or manually actuate. (FR-Z.1)

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

SEG#_2K17 NRC-01_ Rev ; __2___

SHIFT TURNOVER REPORT

DATE-TIME	PREPARED BY	SHIFT
Today 0515	Unit Supervisor /"NIGHT" Shift	18:00 - 06:00

PLANT STATUS:

Mode:	1	Rx Power:	100 %
Megawatts:	Thermal: 3645 MWTH	PZR Pressure:	2250 psia
	Electric: 1285 MWe	RCS T-AVE:	587 deg F
RCS Leakage:	Identified: 0.015 gpm	Core Burnup:	10000 MWD/MTU
	Unidentified: 0.036 gpm	Protected Train/Facility:	B (Purple)
Date/Time:	Today 0015	Intake:	Green

Active Tracking Records and Action Statements

Equipment/Reason

LCO	Action	Date	Time in LCO	Action Requirement	Time Left
"A" EDG OOS for Planned Maintenance					
3.8.1.1	**b.1, b.2, b.3, b.4, b.5**	**yesterday**	**18 hours**	**SR 4.8.1.1.1.a due in 3 hours**	**13 days**
7.4.1	**a.1, a.3**	**yesterday**	**18 hours**		**13 days**

OD Compensatory Actions / Temp Logs

Open Date	Class Reason	Reason	Watch Position

PLANT SYSTEMS APC

System	Notes
EDG	'A' EDG is out of service for planned maintenance on it's lube oil system.

CROSS UNIT SYSTEM STATUS

U3 Power to 24E	**34A aligned to 24E**

SURVEILLANCES / EVOLUTIONS IN PROGRESS

	Steady State Operation

REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)

Current Rod Height	218	
Xenon Trend	Stable	
Current Boron	1035	
Boron Pot Setting / Blend Ratio	2.95 / 11.8 gpm	
Plant Risk	LERF 1.06 ACT: 1 year	CDF 4.15 ACT: 46.9 days

SEG#_2K17 NRC-01_ Rev ; __2___

REFERENCE MATERIAL REQUEST & TRACKING		
Session No.: NRC-01		
Reference No.	**Revision**	**# Copies**
ARP's – RO Station		
MB3A-4-9, 5-9	**Current**	**3**
MB3B-2-10, 5-10	**Current**	**3**
MB4A-3-4, 4-1, 4-3, 4-4, 5-3, 5-4	**Current**	**3**
MB4B-2-6a, 2-6b	**Current**	**3**
MB4C-1-6, 4-6, 4-7, 6-5	**Current**	**3**
ARP's – BOP Station		
MB8B-3-3	**Current**	**3**
US Desk Procedures		
AOP 3581	**Rev. 4**	**3**
AOP 3571	**Rev. 14**	**3**
AOP 3575	**Rev. 26**	**3**
E-0	**Rev. 30**	**3**
E-1	**Rev. 26**	**3**
FR-Z.1	**Rev. 17**	**3**
FR-P.1	**Rev. 16**	**3**

SITE:	**Millstone Power Station**	
PROGRAM:	**Unit 3 ILT**	
COURSE:	**N/A**	
EXAM TITLE:	**Faulted, Ruptured Steam Generator**	**EXAM #: 2K17 NRC-02**
Total Time	**90 Minutes**	

Rev. 1 Ch.1: WMF 11/21/17

Prepared by:	William M. Forrestt	Signature on file	10/4/17
	Printed Name	Developer	Date
Reviewed by:	Robert Royce	Signature on file	11/6/17
	Printed Name	Technical Reviewer	Date
Reviewed by:	E. Brodeur	Signature on file	11/8/17
	Printed Name	Technical Reviewer	Date
Approved by:	M. J. Cote	Signature on file	11/8/17
	Printed Name	Facility Reviewer	Date

SEG#_2K17 NRC-02_ Rev : __1 Ch. 1___

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Original issue.	0
9/6/17	Updated to Revision 025 of E-3, revision 022 of ECA-3.1and revision 011 to AOP 3560. Procedure revisions made effective subsequent to the Operating Test submission to the NRC. DLM	0 / 1
10/4/17	The following changes were made following NRC validation: 1. On Exam Overview (pg 4): Changed plant starting conditions from start-up following a refueling to "a mid cycle spurious Reactor Trip". This matches IC conditions. Also, removed Event 2 ('B' Service Water Pump trip). 2. On Input Summary (pg 7): Removed Triggers 3, 4, & 5 (associated with deleted 'B' Service Water Pump trip) 3. In the scenario time line section, made the following changes: • Corrected Tech Spec / TRM entries. • On pages 21-22, changed EAL & C OP prompts to US from examiner to booth (SM). • On page 27, completed calculation for expectant boration length (was incomplete). • On page 34, removed reference to stopping 'B' / 'C' RCP's and the 'B' EDG (as Service Water Pump event was removed). Added expectation that RCP trip criteria would be met (based on E-0 foldout page). • On page 36, moved up booth instructor cue to initiate SGTR (Trigger 10) at 10% WR level (based on validation, expect to reach this SG inventory earlier in scenario). • On page 45, changed expectant plant response (based on validation). 4. On page 62, changed ES-D-1 form to match changes noted above. 5. On page 63, changed power level from 74% to 79%. Also, changed turnover to plant is being restored to service following "a mid cycle spurious Reactor Trip". This matches IC conditions. 6. On page 64, added procedure tracking form (last attachment) to aid in training staff in replacing procedures.	1
11/21/17	The following changes were made following a second NRC validation: • SG Tube Leak changed from 460 to 432 gpd (pgs 7, 18, & 62) • On page 4, editorial changes in first paragraph on power level and reason for hold. Corrected typo in Event 2 to "N16". • On page 29, clarified ISO-NE instructions on MVAR loading. • On page 35, provided note to alert Floor that RCP trip criterion will not be met without first correcting component failures. • On page 43, removed 3MSS*MOV17C (typo). • On page 63, provided reason for holding power.	1 / 1

SEG# 2K17 NRC-02 Rev : 1 Ch. 1

TABLE OF CONTENTS

SECTIONS LISTED IN ORDER

SEG# 2K17 NRC-02 Rev : 1 Ch. 1

SECTION 3
EXAM OVERVIEW

Title: **Faulted, Ruptured Steam Generator**

1. The crew will take the shift with reactor power at 79%. The plant is being returned to service following a mid cycle spurious Reactor Trip and has been holding power due to a flux map issue (Xenon is stable). The crew is to maintain reactor power at 79% while Reactor Engineering performs EN 31015 "Power Ascension Testing of Millstone Unit 3". The 'C' CCP heat exchanger is out of service for tube leak repair. The 'D' SWP is out of service for corrective maintenance.

   Event 1: 'A' steam generator level transmitter (3FWS-LT551) fails low. The BOP will perform immediate actions of AOP 3581, *Immediate Actions*, which include taking manual control the 'A' Feed Reg Valve and matching feed flow to steam flow to stop the level increase. The US will enter AOP 3581, confirm immediate actions are complete and transition to AOP 3571, *Instrument Failure Response,* to address the failed channel. The BOP will restore narrow range level to 50% and defeat the failed level channel.

   Event 2: 'C' SG Tube Leak, and subsequent procedurally required rapid downpower. A tube leak will develop on the 'C' SG. First indication will be the N16 Monitoring System going into alarm and increasing radiation levels on radiation monitor 3ARC-RE21. The crew will mitigate the tube leak using AOP 3576, *SG Tube Leak*. The severity of the leak will be such that a Tech Spec power reduction is required to be in MODE 3 within 6 hours. Plant management will direct the crew to conduct a downpower at 3%/minute. The crew will enter AOP 3575, *Rapid Downpower*, and perform the downpower.

   Event 3: 'C' main steamline break in CTMT. A major steam line break will occur in CTMT ('C' SG). The break will be severe enough to require a Reactor Trip and Safety Injection. The crew should diagnose the presence of the steam break and the SRO should direct a reactor trip and main steamline isolation.

   Event 4: Automatic and MB7 manual reactor trip switch fail. The steamline break will be severe enough to require a Reactor Trip and Safety Injection, and a Reactor Trip 'First Out' will be received prior to the crew taking action. Automatic and the MB7 manual reactor trip switch are failed requiring the RO to manually trip the reactor from MB4 **[Critical Task]**. The crew will carry out the actions of E-0, *Reactor Trip Or Safety Injection* and transition to E-2, *Faulted Steam Generator Isolation*, to isolate the faulted SG **[Critical Task]**. After isolation the 'C' steam generator will continue to blow down into CTMT and completely depressurize. CTMT will go 'ADVERSE' and CTMT pressure will ultimately reach the CDA setpoint (22.7 psia).

   Event 5: Multiple HPSI components fail to automatically actuate. The RO should manually start the SI pumps. In addition, 3SIH*MV8801A and B (Charging Cold Leg Injection valves) will need to be opened.

   Event 6: CTMT Isolation Phase 'A' fails to automatically actuate. Containment Isolation Phase 'A' fails to automatically actuate, requiring the RO to manually actuate CI'A' from the main board.

   Event 7: Hot, dry 'C' SG results in a SGTR. When the "C" SG tubes become hot and dry, a SG Tube Rupture will occur. The 'C' SG will be faulted and ruptured. The crew will ultimately identify wide range levels and/or pressure going up in 'C' SG and transition to E-3, *Steam Generator Tube Rupture*, from E-2. Once in E-3, the crew will determine that ruptured SG pressure is not sufficient to support the cooldown and depressurization method specified in E-3, and transition to ECA-3.1, *SGTR With Loss of Reactor Coolant - Subcooled Recovery Desired.* The crew will initiate an RCS cooldown as specified in ECA-3.1. Once the crew has shown that the cooldown rate is controlled, the session will end.

SEG# 2K17 NRC-02 Rev : 1 Ch. 1

2. The SRO candidate (US) should classify this event as an **ALERT- Charlie One**, Barrier Failure, BA1, or an **ALERT- Charlie One**, Equipment Failure, EA1.

3. Duration of Exam: 90 minutes

SECTION 4

EXAM GUIDE

All Control Room Conduct, Operations and Communications shall be in accordance with OP-AA-100, Conduct of Operations.

"Review the Simulator Operating Limits (design limits of plant) and the Simulator Modeling Limitations and Anomalous Response List prior to performing this exam scenario on the simulator. The evaluators should be aware if any of these limitations may be exceeded." (NSEM 6.06)

INPUT SUMMARY						
RESET SIMULATOR TO IC–160						
Either **INPUT** or **Load** Schedule **NRC–02.sch** AND Event file **NRC-02.evt,** THEN **VERIFY** the following functions:						
ID	Description	Event Trigger	Delay Time	Ramp Time	Delete Time	Severity Or Value
MALFUNCTIONS						
RP09B	Manual Reactor Trip failure (MB7)	initial				
RP10A	Auto Reactor Trip failure Train A	initial				
RP10B	Auto Reactor Trip failure Train B	initial				
RP11K	CTMT Isolation Phase 'A' fails to automatically actuate.	initial				
RP11E	Multiple HPSI components fail to re-align	initial				
MB4C-F12	LEFM Accuracy Trouble (part of IC-160)	Initial				Off
RX12M	SG Level LT551 Fail	1		30 sec		0
SG03C	'C' SG Tube Leak	6		60 sec		432 gpd
MS01C	Steamline break in CTMT from the 'C' SG	9		60 sec		1.5E6 lbm/hr
SG01C	'C' SG Tube Rupture	10				1000 gpm
REMOTE FUNCTIONS						
RXR106	Protection set 1 door	2				open
RXR131	SG1 HI-HI Level Trip	2	60s			Trip
RXR78	SG1 LO-LO Level Trip	2	120s			Trip

INPUT SUMMARY						
RESET SIMULATOR TO IC–160						
Either **INPUT** or **Load** Schedule **NRC–02.sch** AND Event file **NRC-02.evt,** THEN **VERIFY** the following functions:						
ID	Description	Event Trigger	Delay Time	Ramp Time	Delete Time	Severity Or Value
RXR106	Protection set 1 door	2	130s			Closed
MSR01	Start Aux Boiler	7	5 min	0		START
FWR33	Close 3CNS-V11	8	5 min	0		CLOSE
FWR62	Close 3CNS-V9	8	5 min	0		CLOSE
OVERRIDES						

<table>
<tr><th colspan="3">SCENARIO TIME LINE</th></tr>
<tr><th>BOOTH INSTRUCTOR</th><th>FLOOR INSTRUCTOR</th><th>STUDENTS</th></tr>
<tr><td colspan="2">❑ COMPLETE Simulator Setup and Readiness Checklist.
❑ SELECT appropriate IC: IC-160, 77% power, MOL.
❑ LOAD and RUN applicable Schedule, NRC-02.sch.
❑ LOAD event file NRC-02.evt.
❑ As necessary, VERIFY the following Initial Malfunctions / I/Os / Remote Functions, as specified on previous ‘Input Summary’ page.
❑ Place the SG pressure/cooldown computer points (CPCDSG(A)(B)(C)(D)HR) ‘in scan’.
❑ When the simulator is ready, PLACE to Run and VERIFY the simulator reflects the following Initial Conditions for the scenario and is stable:
▪ ‘A’ CHS Pump running
▪ ‘B’ SWP in lead (SWR02)
❑ As necessary, REMOVE the following Equipment from service and tag accordingly:
▪ The ‘C’ CCP heat exchanger is out of service for tube leak repair. PLACE YCT on ‘C’ CCP pump control switches (both trains)
▪ The ‘D’ SWP is out of service for planned maintenance. PLACE YCT on ‘D’ SWP pump control switch.
❑</td><td>N/A</td></tr>
<tr><td>❑ CONDUCT briefing with evaluators.</td><td colspan="2">PRE-SCENARIO:
❑ BRIEF the crew initial plant conditions and provide a shift turnover.
❑ <u>IF</u> this is the first simulator scenario of the week, REVIEW the Plant/Simulator Differences List and Simulator Training Objectives with the crew.
❑ As necessary, REVIEW any scenario specific differences and any planned simulator freeze points.</td></tr>
<tr><td></td><td></td><td>(All) Walk down control boards and conduct shift briefing.</td></tr>
<tr><td colspan="3"></td></tr>
</table>

************ **EVENT 1** ************		
<u>Event 1</u> **T = Examiner Cue** **Trigger 1** RX12M sev = 0.0%	**'A' SG controlling level channel (3FWS-LT551) fails low.** Notes on Event 1: (1) This failure will cause the 'A' feed reg valve to modulate open; SG level will increase. (2) The BOP needs to take manual control of the 'A' Feed Reg Valve controller (3FWS-FK510) and match feed flow to steam flow to stop the level increase.	
	The BOP should recognize the **Abnormal Steam Generator Level** and perform the immediate actions of AOP 3581, Attachment B, from memory:	
	AOP 3581, *Immediate Actions* (Rev 04)	
	No	**BOP:** (B.1)* **CHECK Steam Generator Narrow Range Level - STABLE AT 50%**

		BOP: (B.1* RNO) **<u>IF</u>** SG Level is changing in an uncontrolled manner, **<u>THEN</u> PERFORM** the following: (a.) As necessary, **SHIFT** affected SG Feedwater Flow Control to **MAN** and **THROTTLE** affected SG Feedwater Flow Control Valve to maintain SG narrow range level stable between 45% and 55%: • 3FWS-FK510 for SG A
	It should not be necessary to take manual control of Master Feed Pump Speed Controller.	**BOP:** (b.) As necessary, **PERFORM** any of the following to control Feed Pump differential pressure in normal operating band (program: 40-175 psid): • **PLACE** FW PP MASTER SPEED CNTL (3FWS-SK509A) in manual **AND ADJUST** to maintain D/P.
		US: (B.2) **Check Main Feedwater Pump Status:** (a.) **CHECK** Reactor Power - GREATER THAN 50%
	Yes	**BOP:** (b.) **CHECK** two Main Feedwater Pumps: • RUNNING **<u>AND</u>** • OPERATING PROPERLY

	Yes	**BOP:** (c.) **CHECK ALL** Running Feedwater Pumps- OPERATING PROPERLY
		NOTE: If suction pressure is LESS THAN 250 psig, following a 30 second time delay, the operating feed pump trips.
	Yes	**BOP:** (B.3) **Check Main Feedwater Pump Suction Pressure:** • **CHECK** the Following Annunciators- NOT LIT • MOTOR FW PP SUCTION PRESSURE LO (MB5A 3-2) • TDFW PP A SUCTION PRESSURE LO (MB5A 3-6) • TDFW PP B SUCTION PRESSURE LO (MB5C 3-4) **AND** • Suction Pressure- STABLE OR INCREASING
	No	**BOP:** (B.4) **CHECK COND DEMIN DP HI (MB6A 2-7) - LIT**
		US: (B.4 RNO) **PROCEED TO** step B.6.

		BOP: (B.6) **CHECK** Initiating Event - ANY LISTED INSTRUMENT FAILURE • SG Narrow Range Level
		US: (B.7) **GO TO AOP 3571, Instrument Failure Response**
	AOP 3571 (Rev 014) **Instrument Failure Response**	
	The US should enter AOP 3571 and read the Note and Caution to crew.	**NOTE:** It is desired that I&C personnel trip the bistables specified in this procedure. If, during off-hours, I&C personnel are **NOT** able to trip the necessary bistables within the time limitations required by the Technical Specifications, Operations personnel may trip the bistables, using the guidance provided within this procedure. **CAUTION:** The rod selector switch shall **NOT** be left in AUTO while diagnosing a related instrument failure, unless the reason for rod movement is a turbine runback.
	The US should proceed to **Attachment N** for a Narrow Range SG Level Channel Failure. The US should assign an appropriate level band to the BOP.	**US:** **1. PROCEED TO the Appropriate Attachment, AND PERFORM Corrective Actions**
	AOP 3571 Attachment N	

	Yes, 3FWS-LT551 is the controlling level channel for ‘A’ SG.	**BOP:** (N.1) **CHECK** failed NR level channel is selected as input to SG level control
	“A” FRV controller should already be in manual.	**BOP:** (N.2) **CHECK Affected, In-Service, Steam Generator Feed Controller in – MAN** • SG Feed Reg Valve Controller
	BOP should restore level to 50%	**BOP:** (N.3) **THROTTLE** affected, in-service, SG Feed Flow Valve **OR** Feed Bypass Level Control Valve to maintain SG Narrow Range level stable between 45% and 55% (target 50%)
	When directed, the BOP should select channel 2 on the level selector for ‘A’ SG. (Switch ID 3FWS-LS519C) ‘SG A LEVEL LO’ and ‘SG A LEVEL DEVIATION’ annunciators will clear.	**BOP:** (N.4) **DEFEAT** the failed channel input by selecting the alternate channel on the Level Selector
		BOP: (N.5) **CHECK** affected SG NR level - STABLE AT 50%
		BOP: (N.6) **PLACE** affected in-service SG Feed Flow Controller **OR** Feed Bypass Level Controller in – AUTO • STM GEN 1 FW FLOW CONTROL (3FWS-FK510)

<table>
<tr>
<td>At the discretion of the lead examiner, proceed to Event 2.</td>
<td></td>
<td>US:
(N.7) Trip the associated Reactor Protection System bistable(s)

(a.) Using Table N.1, PLACE a check mark in the box above the channel required to be tripped</td>
</tr>
<tr>
<td>T= Requested to Trip bistables

Trigger 2</td>
<td>This will open Protection Set I door channel 1 and trip the 2 associated B/Ss for SG Level HI-HI and Level LO-LO. Then the trigger will close the protection set door.</td>
<td>
<table>
<tr><td colspan="4">☐ Trip this channel</td></tr>
<tr><td colspan="4">LT-551 Protection Set I (Red)</td></tr>
<tr><td>Parameter</td><td>Designator</td><td>Location</td><td>Switch</td></tr>
<tr><td>Master Test Card</td><td>UY/761U</td><td>C1-771</td><td>SW-1</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>Parameter</td><td>Designator</td><td>Location</td><td>Bistable</td></tr>
<tr><td>SG A LEVEL HI-HI [P-14]</td><td>LS/551B</td><td>C1-736</td><td>BS-2</td></tr>
<tr><td>STM GEN A LEVEL LO LO</td><td>LS/551A</td><td>C1-736</td><td>BS-1</td></tr>
</table>
</td>
</tr>
</table>

	TS 3.3.1, FU 13, Action 6A 72 hrs **TS 3.3.2, FU 5.b, 6.c, Action 20A** 72 hrs **Note: Action 21** is for < minimum channels, which is <u>not</u> the case **Note: 3.3.3.5 Action a,** <u>NOT</u> applicable. 3FWS*LT551 is not one of the credited Remote Shutdown Monitoring S/G level channels listed in SP 3673.5-001 **Note: TS 3.3.3.6 Action a,** <u>NOT</u> applicable. 3FWS*LT551 is not one of the credited Accident Monitoring S/G level channels listed in SP 3673.6-001 **Note: TRM 7.2.1 AMSAC Action 1 (and 2),** <u>NOT</u> applicable as noted in 3571 guidance.	**US:** (b.) **REFER** to the following Tech Specs for required actions • TS 3.3.1, Reactor Trip System Instrumentation • TS 3.3.2, Engineered Safety Features Actuation System Instrumentation • TS 3.3.3.5, Remote Shutdown Instrumentation • TS 3.3.3.6, Accident Monitoring Instrumentation
	The RO should do a lamp check to ensure all bistable lights are functional, then verify no coincidence would be met when bistables are tripped.	**RO:** (c.) **CHECK** the existing bistable status to ensure a Reactor trip will <u>**NOT**</u> occur when the failed channel is tripped
	Bistable status lights are lit and Channel indication is <u>not</u> normal. The US should proceed to next step.	**US:** (d.) **CHECK the** Affected channel indication - <u>**NOT**</u> NORMAL

	Annunciator "SG LEVEL HI HI" comes in during the tripping of B/Ss.	**US:** (e.) **REQUEST** I&C use Table N.1 and ATTACHMENT S to perform the following: 1. **PLACE** the selected Master Test switch in TEST 2. **PLACE** the selected Bistable switches in TEST
		BOP: (f.) **CHECK** the appropriate bistable status light(s) - LIT
	No, only one.	**US:** (N.8) **CHECK** any TWO of the following NR level channels, which serve as inputs to AMSAC, are failed: • 3FWS*LT551 **<u>OR</u>** • 3FWS*LT552 **<u>OR</u>** • 3FWS*LT538 **<u>OR</u>** • 3FWS*LT547
	No.	**BOP:** (N.11) **CHECK** EITHER of the following STEAM GEN LVL indicators failed: • 2 - NR, 3FWS*LI529A • 4 - NR, 3FWS*LI548A
		US: (N.11 RNO) **PROCEED TO** step N.13.

		US: **(N.13) REQUEST** I&C perform corrective maintenance on failed instrument
	*********** **EVENT 2** ***********	
	'C' SG Tube Leak, and subsequent procedurally required rapid downpower.	
T = Examiner Cue **Insert Trigger 6** SG03C	This will insert a 'C' SG tube leak at ~432 gpd. 'N-16 ALERT' and 'N-16 HI' will alarm. ARC-21 will show an increasing rad level.	
	AOP 3576 (Rev 008), *Steam Generator Tube Leak*	
		CAUTION: With TD AFW Pump feeding SG(s): Full travel stroking of any AFW flow control valve should occur one at a time, at a rate GREATER THAN 15 seconds.
		NOTE: Foldout page must be open.
	PZR level will not be decreasing	**RO:** (1) **Check PZR Level** (a.) **CHECK** PZR Level – DECREASING
		US: (a. RNO) **PROCEED TO** step 2.

		NOTE: If the N-16 radiation monitors are **NOT** available, then Chemistry sampling and leak rate determination should be completed as quickly as possible, as there are EPRI requirements to reduce power and shut down if the leak rate is 75 gpd or more.
	US should call Chemistry	**US:** (2) **Notify Chemistry** (a.) **REQUEST** Chemistry perform SP 3861, Primary to Secondary Leak Rate Determination, to: • Determine the presence of primary to secondary leakage • Determine the leak rate • Identify the leaking SG
	N16 Monitoring System is in service	**RO:** (3) **Check Primary To Secondary Leakage** (a.) **CHECK** N16 monitors in service **AND** trend history **OR** alarm status - **NOT** NORMAL
		US: (b.) **PROCEED TO** step 4

		RO/BOP: (4) **Perform Monitoring Of N16 Monitor Trends** (a.) **IF** N16 monitors are in service, **THEN MONITOR** trend history **AND** leak rate at least once every 15 minutes
	The crew will satisfy this step by meeting multiple bullets (likely all satisfied except Chemistry grab sample is not completed yet).	**RO/BOP:** (5) **Check SG Blowdown Status** (a.) **CHECK** if Blowdown should be isolated • Steam Generator Blowdown radiation monitor - IN ALARM **OR** • Chemistry grab sample indicates Primary to Secondary leakage - GREATER THAN OR EQUAL TO 75 gpd **OR** • Annunciator N-16 HIGH (MB2B 3-6A) – LIT
		RO: (b.) **CHECK** SG Blowdown Isolation Valves - CLOSED: • 3BDG-CTV22A • 3BDG-CTV22B • 3BDG-CTV22C • 3BDG-CTV22D
	Blowdown will need to be isolated.	**RO:** (b. RNO) **CLOSE** valves.
		US: (c.) **PROCEED TO** step 6.

	Yes	**BOP:** (6) **Limit Effects Of Secondary Contamination** (a.) **CHECK** Auxiliary Steam -SUPPLIED FROM MAIN STEAM
T = When Requested **INSERT TRIGGER 7**	This will start the Aux Boilers	(b.) Using OP 3331A, Auxiliary Boiler, Steam and Condensate, **PERFORM** the following: 1. Startup of Auxiliary Boiler A(B) 2. Shift Auxiliary Steam from Main Steam to Auxiliary Boiler System
T = When Requested **INSERT TRIGGER 8**	This will locally close 3CNS-V9, V11	(c.) Locally **CLOSE** Condensate Recirculation to Condensate Surge Tank Isolation Valves: • Cond Drawoff VV Inlet Isol, (3CNS-V9) • Cond Drawoff VV Bypass, (3CNS-V11)
Acknowledge request as HP.		**US:** (d.) **REQUEST** HP determine if personnel should be evacuated from affected areas: • North end of Turbine Bldg • Secondary Sample Sink • Condensate Polishing Enclosure (CPE) • Main Steam Valve Building
	Based upon above HP request, the US would make necessary evacuations. However, the HP surveys will not be completed yet.	**US:** (e.) **EVACUATE** personnel from affected areas as determined in step 6.d
When called as SM, REPORT "SM will Refer to C OP 200.11."		**US:** (f.) Using C OP 200.11, Operation of a Cross Contaminated System, **PERFORM** any required actions

	Yes, N-16 HIGH will be LIT	**US:** (7) **Check If Unit Shutdown Should Be Initiated** (a.) **CHECK** either of the following conditions exist: • Chemistry grab sample indicates primary to secondary leakage in any SG - GREATER THAN OR EQUAL TO 75 gpd **OR** • Annunciator N-16 HIGH (MB2B 3-6A) – LIT
When called as SM, REPORT "SM will evaluate the event for classification."		**US:** (b.) Using MP-26-EPI-FAP06-003, Unit 3 Emergency Action Levels (Barrier Failure), **EVALUATE** the event for classification
		US: (c.) **CHECK** plant status - MODE 1 **OR** 2
	A plant shutdown will be required based on N-16 HIGH in alarm. The US should proceed to the 'Perform Unit Shutdown' step 9.	**US:** (d.) **PROCEED TO** step 9.
		NOTE: If a unit shutdown is initiated based on a N-16 MB annunciator HIGH condition and subsequent Chemistry calculations indicate actual leakage does **NOT** meet a shutdown criterion, then the shutdown may be suspended.
		NOTE: The rate of leakage increase limit does **NOT** apply to initial leak rate increase followed by stable or decreasing leak rates.

		NOTE: Plant shutdown may be accomplished using AOP 3575, Rapid Downpower, or appropriate General Operating Procedures as determined necessary.
T = brief for plant shutdown occurs **Report as chemistry "C" S/G sample results indicate the presence of primary to secondary leakage.**		**US:** (9) **Perform Unit Shutdown** (a.) **CHECK** leakage increased in any SG by - GREATER THAN OR EQUAL TO 15 gpd IN A 30 min PERIOD AFTER THE INITIAL SPIKE
		US: (a. RNO) **PROCEED TO** step 9.c.
	Rate of Increase limit NOT met, but leakage > 150 gpd	**RO or BOP:** (c.) **CHECK** N16 SG Leak Detection Status (PPC) HIGH RATE (75 GPD & 15 GPD RISE IN 30 MIN) - IN ALARM
		US: (c. RNO) **PROCEED TO** step 9.e.
	N16 Monitors are AVAILABLE	**RO:** (e.) **CHECK** N16 Monitors – **NOT** AVAILABLE
		US: (e.) **PROCEED TO** step 9.g.
		RO: (g.) **CHECK** Charging Pumps - TWO REQUIRED TO MAINTAIN PZR LEVEL
	Yes	**US:** (g. RNO) **PROCEED TO** step 9.m.

	TS 3.4.6.2, Action a 6 hr	**RO or BOP:** (m.) **CHECK** SG leakage: • Chemistry grab sample indicates any SG leakage – GREATER THAN OR EQUAL TO 150 gpd **OR** • N16 SG Leak Detection Status (PPC) any SG HIGH HIGH (GREATER THAN 150 GPD) - IN ALARM
T = Calls the OMOC **Direct as OMOC to commence a rapid load reduction in accordance with AOP 3575, *Rapid Downpower,* at 3%/min.**		**US:** (n.) **INITIATE** power reduction to be in MODE 3 within 6 hours.
		US: (o.) **CHECK** plant status - MODE 3
		US: (o. RNO) **RETURN TO** Note prior to step 9.
	AOP 3575, *Rapid Downpower* (Rev 026)	
	After receiving the phone call, the US should brief the crew, and enter AOP 3575, *Rapid Downpower*	**US:**
	Yes	**RO:** (1) **CHECK Rod Control - IN AUTO**
		NOTE: For a plant shutdown the preferred reactor power target is 30% Reactor Power

		NOTE: Reactor Power to MWe correlation is an approximate value and will vary based on seasonal temperatures and equipment performance.
		BOP: (2) **Align EHC Panel** (a.) **CHECK** Load reduction using Load Set – DESIRED
	Desired reactor power is 30%. This correlates to a Load Set Indicated MWe Setting of about **375 MWe**.	**BOP:** (b.) Referring to ATTACHMENT H, **DETERMINE** the Load Set Indicated MWe setting for the applicable: • Desired MWE Unit Output **OR** • Equivalent MWE for the Desired final Reactor Power
		BOP: (c.) Using ATTACHMENT E, **ALIGN** EHC Panel for Load Set operation
	The NOTE does not apply.	**NOTE:** ISO-NE requested load reductions should be completed within 25 minutes of notification.
	OMOC recommended 3% min rate.	**US:** (3) **Determine Power Reduction Rate (% / min)** (a.) **CHECK** power reduction rate - 3%/min or 5%/min

		CAUTION: If SI actuation occurs, restoration from Rapid Boration lineup must be completed.
		RO: (4) **Initiate Rapid Boration** (a.) **CHECK** RCS Makeup System in – AUTO
		(b.) **START** ONE Boric Acid Transfer Pump • BA PP A • BA PP B
		(c.) **OPEN** Emergency Boration Valve, (3CHS*MV8104)
		(d.) **CHECK** direct Boric Acid flow (3CHS-FI183A) – INDICATED
		(e.) **OPEN** Charging Line Flow Control Valve, to match indicated boric acid flow (3CHS-FI183A)
		(f.) **RECORD** time boration started Time: ________________
		(g.) **CHECK** Rod Control – AVAILABLE FOR ROD INSERTION
	No.	**US:** (h.) **CHECK** use of Rapid Downpower Summary Sheet (RE-H-17) in the RE Curve and Data Book – DESIRED
		US: (h. RNO) **PROCEED TO** step 4.k.

	Target power level is 30%. 31.56 gal / % power	**US:** (k.) **REFER TO** the Monthly Reactivity Data Sheet in the RE Curve and Data Book to **DETERMINE** the Gallons of Boric Acid/%Power Reduction
		NOTE: 1/2 the value of Gallons of Boric Acid/%Power reduction is used to obtain an approximate 50/50 ratio of boron and rod movement during the downpower.
	31.56 / 2 = 15.78	**US:** (l.) **USE** 1/2 the value of Gallons of Boric Acid/%Power from the Data Sheet in step 4.m
		US: (m.) Using the formula below, **DETERMINE** boration time • **IF** rapid borating, **THEN USE** 3CHS-FI183A for BA flow rate
	$\frac{[\text{Total power change } (\Delta\%) \times (\_\_\_ \text{ gals BA/\% pwr}) - (\_\_\_ \text{ BA amount recorded in step 4.a RNO})]}{\text{BA Flow Rate}} = \text{Boration Time in minutes}$	
	49% x 15.78 -0 / 75 = 10.3 min	**US:** (n.) **PROCEED TO** step 6 **AND WHEN** boration has been performed for the calculated time, **THEN** using ATTACHMENT G, **STOP** boration
		NOTE: Delta-T indications are selected as being more accurate than NIS for monitoring power during the rapid downpower.

		NOTE: Perform step 8 if the downpower must be stopped **OR** a lower final power level is required **OR** boron injection alignment must be changed.
	Rapid boration is in progress.	(6) **Initiate Load Reduction** (a.) **CHECK** rapid or gravity boration - IN PROGRESS
		(b.) **CHECK** Turbine OPERATING MODE – MANUAL
		(c.) **CHECK** load reduction- USING LOAD SET
	3% minute is desired.	(d.) **SELECT** LOAD RATE LIMIT %/MIN (1%/MIN, 3%/MIN, or 5%/MIN)
	375 MWe (desired is 300 MWe)	(e.) Refer to ATTACHMENT H **AND** Using the LOAD SELECTOR pushbuttons, **ADJUST** LOAD SET to Load Set Indicated MWe setting recorded in step 2.b
		(f.) **ENERGIZE** ALL PZR Heaters
		(g.) **ADJUST** PZR Spray Valves to 50% setpoint ▪ 3RCS-PK 455B ▪ 3RCS-PK 455C
		(h.) **MAINTAIN** plant parameters values as listed in ATTACHMENT C **OR** as directed by Operations Management

		(i.) **CHECK** power reduction - ISO-NE REQUESTED
The US should call ISO-NE and inform the load reduction rate (MWe/min) and final MWe level. When asked about desired MVAR loading band, state "Your MVAR loading target is 100 (+ / – 40) MVAR out."		(i. RNO) **NOTIFY** ISO-NE of load reduction rate (MWe/min) and final MWe level.
		RO: (7) **Check Rod Position Above RIL** (a.) **CHECK** ROD CONTROL BANKS LIMIT LO-LO, (MB4C 4-9) annunciator – LIT
		US: (a. RNO) <u>**PROCEED**</u> <u>**TO**</u> step 7.k <u>**AND**</u> <u>**IF**</u> the annunciator is received, <u>**THEN**</u> **PERFORM** steps 7.b through 7.i.
		RO: (k.) **CHECK** ROD CONTROL BANKS LIMIT LO, (MB4C 3-9) annunciator – LIT
		US: (k. RNO) <u>**PROCEED**</u> <u>**TO**</u> step 8 <u>**AND**</u> <u>**IF**</u> the annunciator is received, <u>**THEN**</u> **PERFORM** steps 7.l through 7.m.

		US: (8) **Monitor Downpower** (a.) **CHECK** the following- REMAINS UNCHANGED • Final desired MWe load • Final desired target power level • Boron injection path
		US: (b.) **PROCEED TO** step 9
As PEO when requested report to Control Room or acknowledge request to degrade vacuum. INSERT and MODIFY MALF FW01 as needed to maintain 2.0 – 4.0 in.		**US:** (9) **Degrade Condenser Backpressure** (a.) **CHECK** final desired Turbine load (MWe) - LESS THAN 907 MWe
		BOP: (b.) Using OP 3329, Condenser Air Removal, **PERFORM** SJAE Operation to Increase Condenser Backpressure to between 2.0 in. HgA and 4.0 in. HgA
		BOP: (10) **Align One Feedwater Pump For Removal from Service** (a.) **CHECK** final desired Reactor power - LESS THAN 50%
		(b.) **CHECK** removing a Feedwater Pump from service during the downpower - DESIRED

		(c.) **CHECK** TD FW Pump Status – • Both OPERATING **AND** • At Least One OPERATING in AUTO
		(d.) Using the applicable Attachment, **REMOVE** ONE TD FW Pump from service: • ATTACHMENT A, Removing A TD FW Pump From Service • ATTACHMENT B, Removing B TD FW Pump From Service
		(11) **Check Power Related Interlock Status** **RO:** (a.) **CHECK** Reactor power – LESS THAN THE P-9 SETPOINT (resets at approx. 49% NIS power)
		US: (a. RNO) **PROCEED TO** step 12 **AND WHEN** Power Less Than P-9, **THEN RETURN** to step 11.
		BOP: (12) **Align Plant Systems For Less Than 30% Reactor Power Operation** (a.) **CHECK** final desired Reactor power level - LESS THAN or EQUAL TO 30%
When lead evaluator is satisfied with downpower move on to Event 3.		(b.) Using OP 3331A, Auxiliary Boiler Steam and Condensate, **START** the Auxiliary Boiler(s)

*********** **EVENT 3** ***********		
	'C' main steamline break in CTMT.	
Event 3 **T = Examiner Cue** **Trigger 9** MS01C (1.5E6 lbm/hr over 60 sec)	The break will be severe enough to require a Reactor Trip and Safety Injection, and a Reactor Trip 'First Out' will be received prior to the crew taking action. Automatic and the MB7 manual reactor trip switch are failed requiring the RO to manually trip the reactor from MB4 **[Critical Task]**	
	The US should direct the RO to trip the reactor	
	E-0, *REACTOR TRIP OR SAFETY INJECTION* (Rev. 030)	
	CTMT will ultimately go ADVERSE.	**NOTE:** ADVERSE CTMT is defined as GREATER THAN 180°F or GREATER THAN 105 R/hr in containment. **NOTE:** The reactor can be interpreted as tripped when any two of the actions in step 1 are satisfied. **NOTE:** Attachment D identifies Time Critical Actions.
*********** **EVENT 4** ***********		
	Automatic and the MB7 manual reactor trip switch are failed requiring the **RO to manually trip the reactor from MB4 [Critical Task]**.	**RO:** (1 *) **Check Reactor Trip** • **CHECK** Reactor Trip and Bypass Breakers - OPEN • **CHECK** Rod Bottom lights - LIT • **CHECK** Neutron Flux – DECREASING

	The RO should trip the reactor using the manual trip switch at MB4.	**RO and BOP:** (1 RNO) **TRIP** the Reactor. **IF** reactor will **NOT** trip, **THEN**: a. **TRIP** Bus 32B and 32N.
		BOP: (2 *) **Check Turbine Trip** a. **CHECK** all Turbine Stop Valves - CLOSED
		BOP: (3 *) **Check Power To AC Emergency Busses** (a.) **CHECK** AC Emergency Busses 34C and 34D - BOTH ENERGIZED
		RO/BOP: (4 *) **Check If SI Is Actuated** (a.) **CHECK** SAFETY INJECTION ACTUATION annunciators, (MB4D 1-6 or MB2B 5-9) – LIT

		(a. RNO) **CHECK** if SI is required: • CTMT pressure GREATER THAN 18 psia **OR** • PZR pressure LESS THAN 1890 psia **OR** • PZR level LESS THAN 9% **OR** • RCS subcooling LESS THAN 32°F **OR** • SG pressure LESS THAN 660 psig **US:** **IF** SI is required, **THEN INITIATE** SI and **PROCEED TO** step 5.\
	While in E-0, RCP Trip criteria will be met based on lowering RCS pressure.	**NOTE:** Foldout page must be open.
	The BOP should isolate feed to the faulted SG ('C') as soon as identified.	**RO:** (5) **DETERMINE IF ADVERSE CTMT CONDITIONS EXIST** • Ctmt temperature - GREATER THAN 180°F OR • Ctmt radiation - GREATER THAN 105 R/ hr
		(5 RNO) DO **NOT** USE ADVERSE CTMT parameters

		RO: (6) **Using** ATTACHMENT B**, Actuation Signal Verification, CHECK Equipment Alignment**
	*********** **EVENT 5** ***********	
	The following step is in **Attachment B of E-0** which has been handed off to the RO.	
	Multiple HPSI components fail to automatically actuate.	
	RO should manually start the 'A'SI pump. The 'A'CCI pump (SI pump cooling) should start when the SI pumps are started. In addition, 3SIH*MV8801A and B (Charging Cold Leg Injection valves) will need to be OPENED. **Note: A suitable (as defined in F.O. Page) injection path needs to be established prior to tripping RCP's.**	**RO:** (B.5) **Check ECCS Pumps Running** • **CHECK** SI Pumps – RUNNING • **CHECK** RHR Pumps – RUNNING • **CHECK** two Charging Pumps – RUNNING
		RO: (B.5 RNO) **START** pumps.
	*********** **EVENT 6** ***********	
	The following step is in **Attachment B of E-0** which has been handed off to the RO.	
	CTMT Isolation Phase 'A' fails to automatically actuate.	

		RO: (B.10) **Check CIA** (a.) **CHECK** ESF Group 2, columns 2 through 10 – LIT
	RO should manually actuate CIA from MB2.	**RO:** (a. RNO) **INITIATE** CIA
	Back to the main body of **E-0, step 7**	
		BOP: (7) **Check AFW Pumps Running** (a.) **CHECK** MD Pumps – RUNNING (b.) **CHECK** Turbine-Driven Pump - RUNNING IF NECESSARY
		BOP: (8) **CHECK AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT**
		CAUTION: With TD AFW Pump feeding SG(s): Full travel stroking of any AFW Flow Control Valve should occur one at a time, at a rate GREATER THAN 15 seconds.
T = "C" SG WR level reaches 10% **Trigger 10*** SG01C, sev=1000 gpm * This will begin Event 7	**The BOP should isolate feed to the faulted SG ('C') as soon as identified.**	**BOP:** (9) **Check Adequate Heat Sink** (a.) **CHECK** NR level in at least one SG - GREATER THAN 8% (42% ADVERSE CTMT)

		BOP: (b.) **CONTROL** feed flow to maintain NR level - BETWEEN 8% and 50% (42% and 50% ADVERSE CTMT)
		US: (c.) **PROCEED TO** step 10
	CDA will occur when CTMT pressure reaches 22.7 psia.	**BOP:** (10) **Check RCS Temperature** (a.) Using GA-26, **DUMP** steam to control No-Load RCS Temperature - AT 557°F
	RCS cold leg WR temperature will be less than 550°F	**RO:** (b.) **CHECK** RCS Temperature – AT NO-LOAD VALUE: • **IF ANY** RCP RUNNING - RCS Tavg - STABLE AT OR TRENDING TO 557°F **OR** • **IF NO** RCP RUNNING – RCS COLD LEG WR TEMPERATURE - STABLE AT OR TRENDING TO 557°F
		US: (b. RNO) **PERFORM** the applicable: • **IF** RCS Temperature is LESS THAN 557°F **THEN PROCEED TO** step 10.d

		BOP: (d.) **MAINTAIN** total feed flow BETWEEN 530 to 600 gpm until NR level is GREATER THAN 8% (42% ADVERSE CTMT) in at least one SG
		BOP: (e.) **CLOSE** SG Atmospheric Relief and Relief Bypass Valves
		BOP: (f.) **CHECK** the following valves – CLOSED • MSIVs • MSIV Bypass Valves
*********** **EVENT 7** ***********		
	Hot, dry ‘C’ SG results in a SGTR. Faulted, ruptured SG.	
T = “C” SG WR level reaches 10% **Trigger 10 (if not previously done)** SG01C, sev=1000 gpm	At 10% WR level, the ’C’ SG will be hot and dry. Malfunction insertion will rupture the ‘C’ SG.	

	Yes, Bus 34A: 34A1-2	**BOP:** (11) **Check Power To SBO Diesel Auxiliaries** (a.) **CHECK** any SBO Bus Tie Breaker - CLOSED TO AN ENERGIZED BUS • Bus 34A: 34A1-2 • Bus 34B: 34B1-2 • Bus 24E: A505 (Unit 2)
		US: (b.) **PROCEED TO** Step 12 **AND IF** SBO Diesel Auxiliaries DEENERGIZE, **THEN PERFORM** step 11.a RNO
		RO: (12) **Check PZR Valves** (a.) **CHECK** PORVs – CLOSED
		(b.) **CHECK** normal PZR Spray Valves – CLOSED
		(c.) **CHECK** PORV Block Valves - AT LEAST ONE ENERGIZED VALVE OPEN
		(d.) **CHECK** PORV Block Valves - ALL ENERGIZED VALVES OPEN
		(e.) **CHECK** PZR Safety Valves - CLOSED
		CAUTION: To prevent seal damage, seal injection flow should be maintained to all RCPs.

	Yes	**RO:** (13) **Check If RCPs Should Be Stopped** (a.) **CHECK** RCPs - ANY RUNNING
	RCS pressure will eventually lower to < 1500 psia. Crew should identify this and trip all RCPs	(b.) **CHECK** RCS pressure – LESS THAN 1500 psia (1800 psia ADVERSE CTMT)
		US: (b.) **PROCEED TO** step 14.
		RO: (c.) **CHECK** either of the following: • Charging pumps - AT LEAST ONE RUNNING AND AT LEAST ONE COLD LEG INJECTION VALVE OPEN **OR** • SI pumps - AT LEAST ONE RUNNING AND CAPABLE OF INJECTION
		RO: (d.) **STOP** all RCPs

	The ‘C’ SG will be depressurized.	**BOP:** (14) **Check If SG Secondary Boundaries Are Intact** (a.) **CHECK** pressure in all SGs: • **NO** SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER • **NO** SG COMPLETELY DEPRESSURIZED
	The US should announce and make the transition to E-2.	**US:** (a. RNO) **INITIATE** monitoring of CSF Status Trees **AND GO TO** E-2, Faulted Steam Generator Isolation.
	E-2 (Rev 012), ***Faulted Steam Generator Isolation***	
		<u>CAUTION</u> • At least one SG must be maintained available for RCS cooldown. • Any faulted SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown or sampling is required. • If RWST level decreases to LESS THAN 520,000 gal, Go to ES-1.3, Transfer to Cold Leg Recirculation, to align the ECCS system.

		BOP: (1.) **Check Main Steam Isolation And Bypass Valves – CLOSED**
		BOP: (2.) **Check At Least One SG Secondary Boundary Is Intact** (a.) Check pressures in all SGs - AT LEAST ONE STABLE OR INCREASING
	Yes, the 'C' SG will be depressurized.	**BOP:** (3.) **Identify Faulted SG(s)** (a.) Check pressure in all SGs – • ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER <u>OR</u> • ANY SG COMPLETELY DEPRESSURIZED
		<u>CAUTION</u> If the TD AFW pump is the only available source of feed flow, a steam supply to the TD AFW pump must be maintained from at least one SG.

	[Critical Task] Isolate the faulted S/G before transition out of E-2. **For proper isolation the BOP will need to close:** **3FWA*HIC31C, HIC32C, HIC36C and FWA*MOV35C (AFW Valves)** **3DTM*AOV29C, 61C (Upstream Traps)** The 'C' SG blowdown sample isolation valve (3SSR*CTV19C) could be open for sampling and should be closed. The 'C' main feed line valves, 'C' MSIV and its bypass valve, 'C' atmospheric relief and bypass valves should already be closed due to the Main Steamline and Feedwater Isolation signals. The 'C' SG Blowdown Isolation and Chemical Feed Isolation valves should already be closed due to the CI'A'.	**BOP/RO:** (4.) **Isolate Each Faulted SG** • Verify main feed line – ISOLATED • TRIP TD FW pumps • Place MD FW pump in PULL-TO-LOCK • Isolate AFW flow path • CLOSE steam supply isolation valve to TD AFW pump • Verify SG atmospheric relief and bypass valves – CLOSED • Verify SG blowdown isolation valve – CLOSED • Verify SG blowdown sample isolation valve – CLOSED • Verify SG chemical feed isolation valve – CLOSED • Using table, Verify main steam line drains upstream of MSIVs and TD AFW pump – CLOSED

		SG C 3DTM*AOV29C 3DTM*AOV61C
		CAUTION Main steam safety valve flow indication (derived from differential temperature switches) may erroneously indicate flow if the common drain header is warmed by previous steam releases. Flow indication should be verified by local observation and other plant responses.
T = 3 minutes after being dispatched **Report no observable steam from the MSVB Roof**		**BOP/PEO:** (5.) **Check SG Code Safety Valves Closed** • Flow switches (MB5) - NOT LIT • Local observation of safety valves (MSVB Roof) - NO STEAM OBSERVED
	No	**BOP:** (6.) **Check AFW Suction Source** (a.) Check DWST level - LESSTHAN 80,000 gal

		US: (a. RNO) Proceed to step 7. and, IF DWST level decreases to LESS THAN 80,000 gal, THEN Perform step 6.b.
	NO: 'C' SG is ruptured CDA has occurred, so presently RPCCW cannot be aligned.	(7.) **Check If SG Tubes Are Intact** **RO:** (a.) Using GA-30, Align RPCCW for RCS and SG sampling
Verify 'C' SG WR level is rising.	It takes approximately 4 - 5 minutes after the SGTR for wide range level to start rising. The crew can identify the ruptured SG by any of the following means: 'C' SG wide range level is slowly increasing Observable steam flow from 'C' SG. RCS remaining depressurized when the expectation for a major steam break would be RCS pressure ultimately increasing.	**BOP:** (b.) Check steam generator levels - NO SG LEVEL INCREASING IN AN UNCONTROLLED MANNER
	The rupture will not show on the rad monitor, since it occurred post trip.	**RO/BOP:** (c.) Verify trend history and alarm status of radiation monitors: • Main steam line – NORMAL • Condenser air ejector – NORMAL • SG blowdown – NORMAL

		US: (d.) Verify SG chemistry activity sample results – AVAILABLE
		US: (d.) Proceed to step 8. and, WHEN SG sample results are available, THEN Perform step 7.e.
	The US should announce and make the **transition to E-3**.	**US:** (7.b. RNO) Go to E-3, Steam Generator Tube Rupture.
	E-3 (Rev 025), *Steam Generator Tube Rupture*	
		NOTE: Foldout page must be open. Continuous Actions Steps are listed on the last page of the procedure. **NOTE:** The RCP trip criteria is only applicable until a controlled cooldown is initiated in step 6.
		CAUTION: To prevent seal damage, seal injection flow should be maintained to all RCPs.

	RCPs should have already been stopped.	**RO:** (1.) **Check If RCPs Should Be Stopped** (a.) Check RCPs - ANY RUNNING
		US: (a. RNO) Proceed to step 2.
		RO/BOP: (2.) **Identify Ruptured SGs** • Unexpected increase in any SG level OR • High radiation from any SG steam line as indicated by the trend history or alarm status OR • High radiation from any SG sample
		CAUTION: If the TD AFW pump is the only available source of feed flow, a steam supply to the TD AFW pump must be maintained from at least one SG. **CAUTION:** At least one SG must be maintained available for RCS cooldown.

	The ruptured SG has already been isolated in E-2.	**BOP:** (3.) **Isolate Flow From Each Ruptured SG** (a.) **CHECK** each ruptured SG atmospheric relief valve controller - IN AUTO AT 1125 psig • 3MSS*PV20A • 3MSS*PV20B • 3MSS*PV20C • 3MSS*PV20D
		(b.) **CHECK** each ruptured SG atmospheric relief valve – CLOSED • 3MSS*PV20A • 3MSS*PV20B • 3MSS*PV20C • 3MSS*PV20D
		(c.) **CHECK** each ruptured SG atmospheric relief bypass valve – CLOSED • 3MSS*MOV 74A • 3MSS*MOV 74B • 3MSS*MOV 74C • 3MSS*MOV 74D
		(d.) **CLOSE** each ruptured SG steam supply isolation valve to TD AFW pump • 3MSS*MOV17A • 3MSS*MOV17B • 3MSS*MOV17D

		RO: (e.) **CHECK** each ruptured SG blowdown isolation valve – CLOSED • 3BDG*CTV22A • 3BDG*CTV22B • 3BDG*CTV22C • 3BDG*CTV22D
		RO: (f.) **CLOSE** each ruptured SG blowdown sample isolation valve • 3SSR*CTV19A • 3SSR*CTV19B • 3SSR*CTV19C • 3SSR*CTV19D
		RO: (g.) **CHECK** each ruptured SG chemical feed isolation valve – CLOSED • 3SGF*AOV24A • 3SGF*AOV24B • 3SGF*AOV24C • 3SGF*AOV24D
		BOP: (h.) Using the table below, **CLOSE** the Main Steam Line Drains Upstream of MSIVs and TD AFW Pump for the ruptured SG(s)

		SG C ☐ 3DTM*AOV29C ☐ 3DTM*AOV61C
		BOP: (i.) CLOSE each ruptured SG MSIV and MSIV bypass valve • 3MSS*CTV27A • 3MSS*CTV27B • 3MSS*CTV27C • 3MSS*CTV27D **AND** • 3MSS-HIC28A • 3MSS-HIC28B • 3MSS-HIC28C • 3MSS-HIC28D
	This caution applies. Feed flow should remain isolated to the "C" SG. The other SGs are available for cooldown.	**CAUTION** : If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless the SG is needed for RCS cooldown.

	Level will not be > 67% WR or > 8% NR. However, **feed flow** to the 'C' SG **should remain isolated**.	**BOP:** (4.) **Check Ruptured SG Level** (a.) **CHECK** one of the following is satisfied: • Ruptured SG WR level - GREATER THAN 67% (75% ADVERSE CTMT) OR • Ruptured SG NR level - GREATER THAN 8% (42% ADVERSE CTMT)
		BOP: (b.) **STOP** feed flow to ruptured SG(s)
		CAUTION : Major steam flow paths from the ruptured SG(s) must be isolated prior to RCS cooldown. Major flow paths include the main steam line, TD AFW pump steam supply, and SG atmospheric relief and bypass lines.
	'C' SG pressure will NOT be greater than 530 psig.	**BOP:** (5.) **CHECK Ruptured SGs Pressure - GREATER THAN 530 psig**
	The US should announce and make the **transition to ECA-3.1.**	**US:** (5. RNO) **GO TO** ECA-3.1, SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.
	ECA-3.1 (Rev 022), ***SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.***	

		NOTE: Foldout page must be open. Continuous Actions Steps are listed on the last page of the procedure.
		CAUTION: If SI is required and after SI reset, manual operator action is required to: • Open the Charging Pump Cold Leg Injection Valves if RCS pressure lowers to LESS THAN 1900 psia. • Restart Safeguards Equipment if offsite power is lost.
		RO: (1.) **Reset Actuated ESF Actuation Signals** (a.) **RESET** SI
		(b.) **RESET** the following: • CDA • LOP • CIA • CIB
		RO: (2.) **Establish Instrument Air To Ctmt** (a.) **CHECK** instrument air compressors - AT LEAST ONE RUNNING
		(a. RNO) **START** one instrument air compressor.

		(b.) **OPEN** instrument air Ctmt isolation valves • 3IAS*MOV72 • 3IAS*PV15
	Yes	**BOP:** (3.) **Check Electrical Alignment** (a.) **CHECK** AC emergency busses - BOTH ENERGIZED BY OFFSITE POWER
		US: (b.) **<u>PROCEED</u> <u>TO</u>** step 3.g.
	Yes	**BOP:** (g.) **PERFORM** the following to energize MCC 32-3T: (1) **CHECK** emergency bus 34C-ENERGIZED
	GA-1 will not allow a reset and an energization of 32-3T with a CDA present and bus 34C energized by offsite power.	(2) Using GA-1, **ENERGIZE** MCC 32-3T
	Yes	**BOP:** (h.) **CHECK** Busses 34A and 34B - BOTH ENERGIZED BY OFFSITE POWER
		US: (i.) **<u>PROCEED</u> <u>TO</u>** step 3.l.

		RO: (I.) **CHECK** RCPs - ANY RUNNING
	RCPs have been tripped.	**US:** (I. RNO) **PROCEED TO** step 4.
		(4.) **Deenergize PZR Heaters** **RO:** (a.) **TURN** OFF all Pzr heaters
T = When Called **REPORT as ADTS to use 22% as the level that covers PZR Heaters.**		**US:** (b.) **CONSULT** ADTS for a recommended minimum indicated PZR water level to ensure heaters are covered
	Yes, quench spray pumps are running.	**RO:** (5.) **Check If Containment Spray Should Be Stopped** (a.) **CHECK** quench spray pumps – RUNNING
	No, CTMT pressure will be about 24 psia.	(b.) **CHECK** Ctmt pressure - LESS THAN 17.5 psia
		(b.) **PROCEED TO** CAUTION prior to step 6. **AND**, **WHEN** Ctmt pressure is LESS THAN 17.5 psia, **THEN** Using GA-8, **STOP** Ctmt Spray.

		CAUTION: If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless the SG is needed for RCS cooldown.
	Since the 'C' SG is faulted, feed flow should remain isolated, per the CAUTION.	**BOP:** (6.) **Check Ruptured SG Level** (a.) **CHECK** one of the following is satisfied: • Ruptured SG WR level - GREATER THAN 67% (75% ADVERSE CTMT) <u>OR</u> • Ruptured SG NR level - GREATER THAN 8% (42% ADVERSE CTMT)
		(b.) **STOP** feed flow to ruptured SG(s)
		CAUTION : RCS pressure should be monitored and RHR pumps manually restarted if RCS pressure lowers in an uncontrolled manner to LESS THAN 300 psia (500 psia ADVERSE CTMT).
		RO: (7.) **Check Stopping RHR Pumps** (a.) **CHECK** RHR Pumps - ANY RUNNING IN SI MODE

	RCS pressure may or may not be stable, depending on the timing of the crew.	(b.) **CHECK** RCS pressure: • RCS pressure - GREATER THAN 300 psia (500 psia ADVERSE CTMT) • RCS pressure – STABLE OR INCREASING
		US: (b. RNO) **<u>PROCEED</u>** TO step 8 **<u>AND</u> <u>IF</u>** conditions for stopping RHR pumps are met, **<u>THEN</u> STOP** RHR pumps **<u>AND</u> PLACE** in AUTO.
		RO: (c.) **STOP** RHR pumps **<u>AND</u> PLACE** in AUTO
	Radiation in the Auxiliary Building and ESF Building will be normal.	(8.) **Initiate Evaluation Of Plant Status** **RO:** (a.) **CHECK** Auxiliary Building and ESF Building radiation (DRMS GROUP trend history and alarm status) • Auxiliary Building (AUX) – NORMAL • ESF Building (ESF) – NORMAL
	Examiner: **Inform the US that the Tech Support Center will carry out ECA-3.1 steps 8.b, c and d.**	(b.) Using GA-30, **ALIGN** RPCCW for RCS and SG sampling to obtain the following:
		(c.) **EVALUATE** plant equipment for continued usage capabilities

		(d.) **START** additional plant equipment as needed for plant recovery
		BOP: (9.) **Check SG Secondary Boundaries Intact** (a.) **CHECK** pressures in all SGs – • **NO** SG PRESSURE LOWERING IN AN UNCONTROLLED MANNER • **NO** SG COMPLETELY DEPRESSURIZED
	The ‘C’ SG will already be isolated.	(a. RNO) For each faulted SG **NOT** required for cooldown, **CONFIRM** isolation of the SG by checking the following closed ….
		BOP: (10.) **Check Intact SG Levels** (a.) **CHECK** NR level - GREATER THAN 8% (42% ADVERSE CTMT)
		(b.) **CONTROL** feed flow to maintain NR level - BETWEEN 30% and 50% (42% and 50% ADVERSE CTMT)

		NOTE: Shutdown margin must be monitored during RCS cooldown using GA-15, Establishing RCS Boron Concentration For Shutdown Margin. **NOTE:** Low Steam Line Pressure SI shall be blocked when PZR pressure is LESS THAN 2000 psia.
	NOTE: A cooldown may already be in progress as a result of ECCS flow, and the BOP may not need to immediately initiate an operator controlled cooldown.	**BOP:** (11.) **Initiate RCS Cooldown To COLD SHUTDOWN** (a.) Using GA-30, **ALIGN** RPCCW for RCS sampling for the following: • RCS boron concentration
		(b.) **REQUEST** Chemistry sample RCS for boron concentration
		(c.) Using GA-15, **ESTABLISH** RCS boron concentration for shutdown margin
		(d.) **MAINTAIN** cooldown in RCS cold legs - AT A MAXIMUM RATE **NOT** TO EXCEED 80°F/hr
		(e.) **IF** in service, **THEN USE** RHR System
	The BOP should use GA-26 to commence the cooldown (if required), using the atmospheric relief bypass valves.	(f.) Using GA-26, **DUMP** steam from intact SGs

	Depending on the timing of the crew, RWST level may or may not be less than 920,000 gal.	**US:** **(12.) Check Whether Saturated Recovery Should Be Performed** (a.) **CHECK** RWST level - LESS THAN 920,000 gal
		(a. RNO) **PROCEED TO** step 12.d.
		(b.) **REFERING TO** Attachment A **CHECK** Ctmt WR Sump Level – IN UNACCEPTABLE LEAKAGE REGION
		(b. RNO) **PROCEED TO** step 12.d.
		(c.) **GO TO** ECA-3.2, SGTR With Loss of Reactor Coolant - Saturated Recovery Desired
		(d.) **CHECK** ruptured SG NR level - GREATER THAN OR EQUAL TO 87% (68% ADVERSE CTMT)
		(d. RNO) **PROCEED TO** step 13.
		(e.) **CHECK** ADTS determines recovery using ECA-3.2, SGTR With Loss Of Reactor Coolant – Saturated Recovery Desired - TO BE PERFORMED
		(e. RNO) **PROCEED TO** step 13.
		(f.) **GO TO** ECA-3.2, SGTR With Loss of Reactor Coolant - Saturated Recovery Desired

The scenario may be terminated once the RCS cooldown is shown to be controlled and the US makes the decision to transition ECA-3.2, or remain in ECA-3.1.		
RESTORE simulator to “training ready” conditions by cleaning/replacing marked up procedures, removing placekeeping tabs or marks from all references and control panel indicators, etc.	**POST-SCENARIO:** a. ENSURE simulator problems encountered during the scenario are documented IAW site specific process.	

SEG#_2K17 NRC-02_ Rev : __1_Ch. 1__

SECTION 5

EXAM GUIDE SUMMARY

Title: Faulted, Ruptured Steam Generator

Critical Tasks

TASK DESCRIPTION	TASK #	K/A >/= 3.0	BASIS SELECTION
Manually trip the reactor from the control room with either the main board trip switch or opening the load center supply breakers before completing step 1 of E-0.	CT-1	EPE 029-EA1.08 (4.5 / 4.5)	Failure to manually trip the reactor causes a challenge to the subcriticality CSF beyond that irreparably introduced by the postulated conditions. Additionally, it constitutes an incorrect performance that "necessitates the crew taking compensating action that would complicate the event mitigation strategy" and demonstrates the inability of the crew to "recognize a failure or an incorrect automatic actuation of an ESF system or component."
Isolate the faulted SG before transition out of E-2.	CT-17	APE 040-AA1.04 (4.3 / 4.3)	Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Also, depending upon the plant conditions, it could constitute a failure by the crew to "demonstrate the ability to recognize a failure or an incorrect automatic actuation of an ESF system or component."

SEG# 2K17 NRC-02 Rev : 1 Ch. 1

Appendix D **Scenario Outline** **Form ES-D-1**

Facility: Millstone 3 Scenario No.: 2K17 NRC-02 (Rev 1) Op-Test No.: 2K17
Examiners:__________ Operators:__________

Initial Conditions: IC-160, 79% Power, Middle of life, Equilibrium Xe
Turnover: The crew will take the shift with reactor power at 79%. The plant is being returned to service following a refueling outage. The crew is to stabilize reactor power at 79% while Reactor Engineering performs EN 31015 "Power Ascension Testing of Millstone Unit 3". The 'C' CCP heat exchanger is out of service for tube leak repair. The 'D' SWP is out of service for corrective maintenance.

Critical Tasks:

1. Manually trip the reactor from the control room with either Main board trip switch or by opening 32B and 32N supply breakers before completing Step 1 of E-0. (CT-1)
2. Isolate the faulted SG(s) before transition out of E-2. (CT-17)

Event No.	Malf. No	Event Type*	Event Description
1	RX12M	I (BOP)	'A' steam generator level transmitter (3FWS-LT551) fails low (AOP 3581 / AOP 3571). *(Tech Spec entry)*
2	SG03C	R (SRO) R (RO) N (BOP)	"C' SG Tube Leak (432 gpd), and subsequent procedurally required rapid downpower. (3%/min). (AOP 3576, AOP 3575) *(Tech Spec entry)*
3	MS01C	M (ALL)	'C' main steamline break in CTMT. Requires reactor trip and safety injection.
4	RP10A/B RP09B	C (RO)	Automatic and MB7 manual reactor trip switch fail. Successful manual reactor trip MB4.
5	RP11E	C (RO)	Multiple HPSI components fail to automatically actuate.
6	RP11K	C (RO)	CTMT Isolation Phase 'A' fails to automatically actuate.
7	SG01C	M (ALL)	Hot, dry 'C' SG results in a SGTR. Faulted, ruptured SG. (ECA-3.1)

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

SEG#_2K17 NRC-02_ Rev : __1_Ch. 1__

SHIFT TURNOVER REPORT		
DATE-TIME	**PREPARED BY**	**SHIFT**
Today 0515	Unit Supervisor /"NIGHT" Shift	18:00 - 06:00

PLANT STATUS:

Mode:	1	Rx Power:	79 %
Megawatts:	Thermal: 2726 MWTH	PZR Pressure:	2250 psia
	Electric: 863 MWe	RCS T-AVE:	577 deg F
RCS Leakage:	Identified: 0.015 gpm	Core Burnup:	10000 MWD/MTU
	Unidentified: 0.036 gpm	Protected Train/Facility:	A (Orange)
Date/Time:	Today 0015	Intake:	Green

Active Tracking Records and Action Statements

Equipment/Reason

LCO	Action	Date	Time in LCO	Action Requirement	Time Left
'D' SWP is out of service for planned maintenance.					
TR 3.7.4	**a**	**yesterday**	**18 hours**	**SFP heat load eval SAT.**	**29 days**

OD Compensatory Actions / Temp Logs

Open Date	Class Reason	Reason	Watch Position

PLANT SYSTEMS APC

System	Notes
CCP	'C' CCP HX is tagged out / drained to repair a tube leak. Both trains of 'C' CCP pump control switches are tagged out of service.
SWP	'D' SWP is out of service for corrective maintenance due to excessive packing leakage severe enough to challenge the Service Water Cubicle sump.

CROSS UNIT SYSTEM STATUS

U3 Power to 24E	**34A aligned to 24E**

SURVEILLANCES / EVOLUTIONS IN PROGRESS

OP 3204	Plant is being returned to service following a mid cycle spurious Reactor Trip. On up-power, a flux mapping issue was discovered. HOLD POWER at 78 - 80% to support while Reactor Engineering performs EN 31015 "Power Ascension Testing of Millstone Unit 3" (test to be completed shortly).

REACTIVITY BRIEFING (SEE REACTIVITY THUMBRULES / SPREAD SHEET FOR ADDITIONAL INFO)

Current Rod Height	185 steps	
Xenon Trend	equilibrium	
Current Boron	1514	
Boron Pot Setting / Blend Ratio	4.41 / 17.7 gpm	
Plant Risk	LERF 1.06 ACT: 1 year	CDF 4.15 ACT: 46.9 days

SEG# 2K17 NRC-02 Rev : 1 Ch. 1

REFERENCE MATERIAL REQUEST & TRACKING		
Session No.: NRC-02		
Reference No.	**Revision**	**# Copies**
ARP's – RO Station		
MB2B-3-6a, 3-6b	**Current**	**3**
MB2C-2-9	**Current**	**3**
ARP's – BOP Station		
MB5B-2-1, 3-1, 4-1	**Current**	**3**
MB6B-3-4, 3-6, 4-2	**Current**	**3**
US Desk Procedures		
AOP 3571	**Rev. 14**	**3**
AOP 3581	**Rev. 4**	**3**
AOP 3575	**Rev. 26**	**3**
AOP 3576	**Rev. 8**	**3**
E-0	**Rev. 30**	**3**
E-2	**Rev. 12**	**3**
E-3	**Rev. 25**	**3**
ECA-3.1	**Rev. 22**	**3**

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Establishing Charging Pump Cooling

JPM Number: 2017 NRC P.1 Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Original issue from Bank (JPM P093)	0
9/9/17	Verified up to date with revision 011 to AOP 3560. Changed applicable revision number to AOP 3560 from Rev 010 to Rev 011 in the references section.	0 / 1
10/17/17	Minor changes following NRC validation. Changed description of valve manipulations in STEPS 4 & 6 to reflect ball valve (vice gate valve).	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ____________________

JPM Number: 2017 NRC P.1 Revision: 0 / 2

Task Title: Establishing Charging Pump Cooling

System: 076 Service Water System

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 21

Task Number(s): 344-05-002, 344-05-153

Applicable To: SRO **X** RO **X**

K/A Number: 076.A2.01 K/A Rating: 3.5 / 3.7

Method of Testing: Simulated Performance: X Actual Performance: ______

Location: Classroom: ______ Simulator: ______ In-Plant: X

Task Standards: Satisfactorily complete establishing alternate charging pump cooling following a loss of service water, using AOP 3560, Attachment B.

Required Materials: (procedures, equipment, etc.) Depending on plant conditions, a high radiation area key may be required. Check status and obtain key if required.

General References: AOP 3560, *Loss of Service Water*, Rev. 011

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC P.1 Revision : 0 / 2

Initial Conditions: A complete loss of service water occurred and a service water pump cannot be started.

- The reactor has tripped and the crew has entered E-0, *Reactor Trip or Safety Injection*.
- The crew is performing steps in AOP 3560, *Loss of Service Water*, in parallel with E-0.
- The “A” Charging Pump is running.

Initiating Cues: The US directs you to perform AOP 3560, Attachment B, steps B.1 through B.4 to establish alternate charging pump cooling.

Simulator Requirements: NONE

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC P.1 Revision: 0 / 2

Task Title: Establishing Charging Pump Cooling

START TIME: ____________

STEP #1 AOP3560 Att B step B.1	Performance: **DETERMINE Affected Charging Pump** **CHECK** a Train A Charging pump - RUNNING	Standard: Realizes from Initial Conditions that Charging Pump A is running. Examinee may also simulate checking which pump is running locally, or call Control Room to determine which pump is running. After determining the "A" Charging pump is running, proceeds to to the Note prior to step 2 of procedure (versus step 3 for "B" charging pump).	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:	If the Examinee checks which Charging Pump is running locally, or asks the Control Room which pump is running, state "The "A" Charging Pump is running."			
Comments:				
STEP #2 AOP3560 Att B step B.2 NOTE	Performance: **NOTE:** Fire Water System pressure is higher than the CCE Heat Exchanger Service Water Outlet Relief Valve (3SWP*RV96A) setpoint pressure.	Standard: Examinee reviews the Note	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:				
Comments:				

STEP #3 AOP3560 Att B step B.2.a	Performance: **Locally ALIGN Fire Water Supply to CCE Heat Exchanger A** **CONNECT** a hose from Fire Header Hose Station 52 Supply Valve (3FPW-V812) to CCE HX A Service Water Inlet Drain Valve (3SWP*V196)	Standard: Locates valve 3FPW-V812 in AB 24' west side near the "B" RPCCW HX; Locates valve 3SWP*V196 in CCE HX area, about waist high, west corner; Simulates obtaining hose, fittings and tools as necessary from EOP/AOP locker 43' AB outside boron evaporator cubicle and simulates connecting.	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:				
Comments:	Obtaining equipment will be simulated, but the Examinee must go to the locker to locate the hose as well as appropriate tools and fittings			
STEP #4 AOP3560 Att B Step B.2.b	Performance: **CLOSE** CCE HX A Service Water Supply Valve (3SWP*V31)	Standard: Locates valve 3SWP*V31 in CCE HX area about neck level, near west corner; and rotates handle 90 degrees (such that valve operator is in-line with valve body).	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:	"The valve handle rotates 90 degrees, comes to a hard stop, and is now in-line with the valve body."			
Comments:				
STEP #5 AOP3560 Att B step B.2.c	Performance: **THROTTLE** Open Fire Header Hose Station 52 Supply Valve (3FPW-V812) **One** turn	Standard: Locates valve 3FPW-V812 in AB 24' west side outboard of "B" RPCCW HX; rotates hand wheel in the COUNTER-clockwise direction to throttle open the valve one turn.	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:	"The valve hand wheel rotates one turn in the counter-clockwise direction." "The hose begins to pressurize"			
Comments:				

STEP #6 AOP3560 Att B step B.2.d	Performance: **THROTTLE** Open CCE HX A Service Water Inlet Drain Valve (3SWP*V196) to establish between 30 and 40 gpm flow (3SWP*FI 160A)	Standard: Locates valve 3SWP*V196 in CCE HX area, about waist high, west corner; rotates handle slightly towards the in-line (open position) to establish flow. Locates flow indicator 3SWP*FI 160A in CCE HX area entrance, east side, floor level; and verifies and adjusts flow as necessary.	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:	"The valve handle rotates toward the in-line position. "Water begins to flow through the hose." When the examinee looks at the indicator, state, "Flow indicates 18 gpm." If the examinee checks flow intermittently as 3SWP*V196 is throttled open, provide flow indication between 18 and 24 gpm. Eventually state that "the valve handle rotates 90 degrees, comes to a hard stop, and is now in-line with the valve body." Then, when flow is checked on 3SWP*FI 160A, state, "Flow indicates 25 gpm."			
Comments:	This requires the Examinee to go to the RNO to adjust 3FPW-V812.			
STEP #7 AOP3560 Att B step B.2.d RNO	Performance: **ADJUST** Fire Hose Station 52 Supply Valve (3FPW-V812) to establish between 30 and 40 gpm flow (3SWP*FI 160A)	Standard: Locates valve 3FPW-V812 in AB 24' west side outboard of "B" RPCCW HX; rotates hand wheel in the COUNTER-clockwise direction to throttle open, to obtain 30 to 40 gpm. Locates flow indicator 3SWP*FI 160A in CCE HX area entrance, east side, floor level; and verifies and adjusts flow to obtain between 30 and 40 gpm.	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:	"The valve hand wheel rotates in the COUNTER-clockwise direction." When the checks the flow indicator, state, "Flow indicates 35 gpm."			
Comments:				

STEP #8 AOP3560 Att B step B.2.e	Performance: **CHECK** CCE HX SW Outlet Relief (3SWP*RV96A) **- NOT** LIFTING	Standard: Locates valve 3SWP*RV96A in CCE HX area, middle of west wall, and checks for flow through valve.	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:	"No flow through the valve is indicated."			
Comments:				
STEP #9 AOP3560 Att B step B.2.f	Performance: PROCEED TO step B.4	Standard: Proceeds to step B.4	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:				
Comments:				
STEP #10 AOP3560 Att B step B.4.a	Performance: **Locally MONITOR CCE System** **CHECK** operating Charging pump oil temperature - BETWEEN 55 AND 131°F • For pump A, 3CHS-TI 1022A	Standard: Locates temperature indicator 3CHS-TI 1022A in the "A" charging pump cubicle (indicator on east side, approximately waist-high on "A" charging pump)	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:	When the temperature indicator is checked, state, "Temperature indicates 95°F and steady."			
Comments:				

STEP #11	Performance: Notify the Control Room that steps B.1 through B.4 of AOP 3560, Attachment B are complete	Standard: Reports to the US that alternate charging pump cooling is established for the “A” charging pump in accordance with AOP 3560, Attachment B.	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:				
Comments:				

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ___________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC P.1 Revision: 0 / 2

Task Title: Establishing Charging Pump Cooling

Date Performed: ______________

Examinee: ______________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**21**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC P.1 Revision: 0 / 2

Initial Conditions: A complete loss of service water occurred and a service water pump cannot be started.

- The reactor has tripped and the crew has entered E-0, *Reactor Trip or Safety Injection*.
- The crew is performing steps in AOP 3560, *Loss of Service Water*, in parallel with E-0.
- The “A” Charging Pump is running.

Initiating Cues: The US directs you to perform AOP 3560, Attachment B, steps B.1 through B.4 to establish alternate charging pump cooling.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Energizing MCC 32-3T following CDA

JPM Number: 2017 NRC P.2 Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Modified from Bank (JPM P007A)	0
9/7/17	Modified JPM to start with step 2 of GA-1, as specified in initial cue. The body of the JPM started at step 1 of GA-1. This necessitated the renumbering of JPM steps. Old JPM steps 1 and 2 were deleted. The comments and cues associated with the deleted steps were incorporated in new JPM step 2. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1
10/17/17	Minor changes following NRC validation. • STEPS 9 and 13: Enhanced cues for expectant tripped open breakers • Corrected typo on STEP 11 (“breake” to “breaker”).	0 / 2

JPM WORKSHEET

Facility: **MP3** Examinee: ____________________

JPM Number: 2017 NRC P.2 Revision: 0 / 2

Task Title: Energizing MCC 32-3T following CDA

System: 062

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 20

Applicable To: SRO **X** RO **X**

K/A Number: 062.A2.01 K/A Rating: 3.4 / 3.9

Method of Testing: Simulated Performance: X Actual Performance: ____

Location: Classroom: ____ Simulator: ____ In-Plant: X

Task Standards: Energize MCC 32-3T and verify the MCC is supplying inverter 6

Required Materials: (procedures, equipment, etc.) EOP 35 GA-1, *Energizing MCC 32-3T*, Rev. 004

General References: None

*** READ TO THE EXAMINEE ***
I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC P.2 Revision : 0 / 2

Initial Conditions: **A large-break LOCA occurred 15 minutes ago, resulting in the following sequence of events:**

1. **SIS, LOP, and CDA all actuate.**
2. **Both Emergency Buses energize from the Emergency Diesels.**
3. **The crew enters E-1, *Loss of Reactor or Secondary Coolant*.**
4. **The crew resets SIS and LOP.**

Initiating Cues: **The US directs you to energize MCC 32-3T using GA-1, *Energizing MCC 32-3T,* starting with Step 2.**

Simulator Requirements: N/A

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC P.2 Revision: 0 / 2

Title: Energizing MCC 32-3T following CDA

START TIME: ________

Step	Performance	Standard	Critical	Grade
STEP #1 GA-1, Caution prior to Step 2	Performance: **CAUTION:** MCC 32-3T feeder breaker trip should **NOT** be overridden without BOTH a CDA and LOP (Sequencer signal) present.	Standard: Reviews Caution.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue:			
	Comment:			
STEP #2 GA-1 Step 2.a	Performance: **Check if MCC32-3T Feeder Breaker Trip Should Be Overridden** a. Check annunciator CONTAINMENT DEPRES ACTUATION (MB2B 5-5)- LIT	Standard: Determines from Initial Conditions or call to Control Room that CDA annunciator is lit. Proceeds to GA-1, step 2.b	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: If examinee requests status of CDA annunciator, state: "The CDA annunciator at MB2B 5-5 is lit." If examinee contacts Control Room to determine status of SI and LOP signals, state "SI and LOP have been reset." If examinee questions how long it has been since offsite power was lost, state, "it has been 15 minutes since offsite power was lost."			
	Comment: Initial Condition specified that CDA actuated, that SI and LOP signals are reset and that it has been 15 minutes since offsite power was lost.			

STEP #3 GA-1 Step 2.b	Performance: b. CHECK emergency bus 34C - ENERGIZED BY EDG A	Standard: Determines from Initial Conditions or call to Control Room that bus 34C is energized by EDG A. Proceeds to GA-1, step 3	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: If examinee requests status of bus 34C, state: "Bus 34C is energized from the 'A' Emergency Diesel."			
	Comment: Initial Condition specified that bus 34C is energized by its EDG.			
STEP #4 GA-1 Step 3.a	Performance: **At Bus 32T, Override MCC 32-3T Feeder Breaker** a. On cubicle 32T10-2, **PRESS** SIS/CDA/LOP OVERRIDE MCC 32-3T pushbutton	Standard: At cubicle 32T10-2 (top right cubicle), locates the override pushbutton and depresses it.	Critical: **Y** ☒ N ☐	Grade S ☐ U ☐
	Cue: If examinee looks at or requests the status of the red "Override" indicating light <u>prior to</u> pressing the override pushbutton, state, "The red indicating light is lit." If examinee looks at or requests the status of the red "Override" indicating light <u>after</u> pressing the override pushbutton, state, "The red indicating light NOT lit."			
	Comments:			
STEP #5 GA-1 Step 3.b	Performance: b. **CHECK** associated red indicating light - **<u>NOT</u>** LIT	Standard: Locates red "Override" light on Bus 32T to determine status. Proceeds to GA-1, step 4	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: State, "The Red indicating light is not lit."			
	Comments:			

<table>
<tr><td rowspan="3">STEP #6
GA-1
Step 4</td><td>Performance:
At inverter 6, check DC input Ammeter Indicating - ZERO AMPS</td><td>Standard:
Checks DC ammeter reading on inverter 6 (turbine bldg. 38’ elev.)
Proceeds to step 4.a RNO</td><td>Critical:
Y ☐ N ☒</td><td>Grade
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
The DC Input Ammeter indicates 5 amps.</td></tr>
<tr><td colspan="4">Comments:
This check for amps determines the recovery method, since it is expected that the DC input Ammeter will indicate some amps less than 30 minutes after the SIS, and Zero Amps ≥30 minutes after the SIS.
Indicated Amps means it has been less than 30 minutes after the SIS, since the DC Bus is still supplying the Instrument Bus.
The strategy is to restore the AC Input path from MCC 32-3T while the Instrument Bus is still being supplied from the DC Bus.</td></tr>
<tr><td rowspan="3">STEP #7
GA-1
Step 4.
RNO.a</td><td>Performance:
Locally, PERFORM the following:
a. At Inverter 6, OPEN The AC INPUT Breaker (CB-43).</td><td>Standard:
Locates AC Input Breaker (CB-43) and positions it to the OPEN position.</td><td>Critical:
Y ☒ N ☐</td><td>Grade
S ☐ U ☐</td></tr>
<tr><td colspan="4">Comments:
As found position of the breaker is in CLOSED position.</td></tr>
<tr><td colspan="4">Cue:
When the examinee initially observes the AC Input Breaker, state, “The AC Input Breaker is in the CLOSED position.”
As examinee simulates opening breaker, state: “A clunk sound is heard and breaker aligns to the OPEN position.”</td></tr>
<tr><td rowspan="3">STEP #8
GA-1
Step 4.
RNO.b</td><td>Performance:
b. At Bus 32T, CLOSE the feeder breaker for MCC 32-3T (32T13-2).</td><td>Standard:
Locates feeder breaker for MCC 32-3T on Load Center 32T in the East Switchgear room.
Rotates breaker control switch to CLOSE position and returns control switch to mid position.</td><td>Critical:
Y ☒ N ☐</td><td>Grade
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
When the examinee initially observes the MCC 32-3T Feeder Breaker, state, “The Breaker Green light is ON, and the red light is OFF.”
As the examinee closes the breaker for MCC 32-3T, state, “A clunk sound is heard from the lower right of the switchgear. The Control switch is now in the CLOSE position, and the breaker’s indicating lights are Green OFF, Red ON.”</td></tr>
<tr><td colspan="4">Comments: The as-found position of the breaker for MCC 32-3T is Open.</td></tr>
</table>

STEP	Performance	Standard	Critical	Grade
STEP #9 GA-1 Step 4. RNO.c	Performance: c. **CHECK** Inverter 6 DC INPUT breaker (CB-44) closed.	Standard: Locates Inverter 6 DC INPUT breaker (CB-44) and observes it in the OPEN (tripped) position.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: When the examinee initially observes the DC Input Breaker, state, “The Breaker handle is in the mid position”.			
	Comments: (1) The breaker is found to be in a tripped open condition. In this state, the operating handle will be in the mid position with the handle free to readily move. (2) The expected position of the DC Input Breaker less than 30 minutes after the SIS is CLOSED. Finding the Breaker OPEN starts the “Alternate Path” portion of this JPM.			
STEP #10 GA-1 Step 4. RNO.d	Performance: d. **IF** Inverter 6 DC INPUT breaker is **NOT** closed, **THEN PROCEED TO** step 5.	Standard: Proceeds to step 5.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue:			
	Comments: Finding the DC input breaker NOT closed requires a new strategy. The new strategy is to open all electrical paths into and out of the inverter, then re-energize the inverter. This discovery starts the alternate path portion of this JPM.			
STEP #11 GA-1 Step 5	Performance: **At Inverter 6, OPEN The AC INPUT Breaker (CB-43)**	Standard: Locates the AC Input breaker (CB-43) and observes the breaker (CB-43) already OPEN at Inverter 6.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: When the examinee initially observes the AC Input breaker, state, “The Breaker is aligned to the OPEN position.”			
	Comments:			

STEP #12 GA-1 Step 6	Performance: **At Inverter 6, OPEN The Inverter Output Breaker (CB-45)**	Standard: Locates the Inverter Output breaker (CB-45) and simulates moving the breaker handle to the OPEN position.	Critical: **Y** ☒ N ☐	Grade S ☐ U ☐
	Cue: When the examinee initially observes the Inverter Output Breaker, state, “The Breaker is Aligned to the CLOSED position.” As the examinee opens the Inverter Output breaker, state, “The Breaker aligns to the OPEN position.”			
	Comments:			

STEP #13 GA-1 Step 7	Performance: **At Inverter 6, OPEN The DC INPUT breaker (CB-44)**	Standard: Observes the DC INPUT breaker (CB-44) already OPEN (tripped) at Inverter 6.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: When the examinee initially observes the DC Input Breaker, state, “The Breaker handle is in the mid position”.			
	Comments: The breaker is found to be in a tripped open condition. In this state, the operating handle will be in the mid position with the handle free to readily move.			
STEP #14 GA-1 Step 8	Performance: **At Bus 32T, CLOSE The Feeder Breaker For MCC 32-3T (32T13-2)**	Standard: Examinee recognizes that an earlier step already closed this breaker. Examinee may choose to re-check this breaker closed.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: If the examinee chooses to re-check the breaker, state “The Breaker Red light is lit, and green light is off.”			
	Comments:			

<table>
<tr><td rowspan="3">STEP #15
GA-1 Step 9.a</td><td>Performance:
At Inverter 6, Check If Computer Panels (3VBA-PNL-6A and 6B) Should Be Energized
a. CHECK ALT SOURCE SUPPLYING LOAD light - NOT LIT</td><td>Standard:
Locates Alt Source Supplying Load light at Inverter 6, and observes the Alt Source Supplying Load light is not lit.</td><td>Critical:
Y ☐ N ☒</td><td>Grade
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: When the examinee observes the Alt Source Supplying Load light, state, “The light is OFF.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #16
GA-1 Step 9.b</td><td>Performance:
b. CHECK manual bypass switch (3VBA-SW-6) in NORMAL OPERATION</td><td>Standard:
Checks the manual bypass switch (3VBA-SW-6, located in the Turbine Building, 38’level), and determines it is already aligned to the NORMAL OPERATION position.</td><td>Critical:
Y ☐ N ☒</td><td>Grade
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: When the examinee observes the manual bypass switch, state, “the Manual Bypass Switch is in the NORMAL OPERATION position.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #17
GA-1 Step 9.c</td><td>Performance:
c. PRESS and HOLD PRECHARGE button <u>AND WHEN</u> the PRE-CHARGE light is lit, <u>THEN</u>
1. CLOSE the DC INPUT breaker (CB-44)
2. RELEASE the PRE-CHARGE button</td><td>Standard:
1. Locates the Pre-Charge Pushbutton on Inverter 6,
2. Presses and holds it.
3. When the amber light lights, takes the DC Input Breaker on Inverter 6 to “CLOSE”,
4. And then releases the Pre-Charge Pushbutton.</td><td>Critical:
Y ☒ N ☐</td><td>Grade
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: When the examinee depresses the Pre-Charge Pushbutton, state, “The Pre-Charge light illuminates.
When the examinee simulates taking the DC Input breaker to CLOSE, state, “The DC Input Breaker is aligned to the CLOSE position.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #18 GA-1 Step 9.d	Performance: d. **CLOSE** the AC INPUT breaker (CB-43)	Standard: Locates the AC Input breaker (CB-43) and simulates moving the breaker handle to the CLOSE position.	Critical: **Y** ☒ N ☐	Grade S ☐ U ☐
	Cue: When the examinee initially observes the AC Input breaker, state, “The Breaker is Aligned to the OPEN position.” As the examinee closes the AC Input breaker, state, “The Breaker aligns to the CLOSE position.”			
	Comments:			
STEP #19 GA-1 Step 9.e	Performance: e. **CLOSE** the INVERTER OUPUT breaker (CB-45)	Standard: Locates the Inverter Output breaker (CB-45) and simulates moving the breaker handle to the CLOSE position.	Critical: **Y** ☒ N ☐	Grade S ☐ U ☐
	Cue: When the examinee initially observes the Inverter Output breaker, state, “The Breaker is Aligned to the OPEN position.” As the examinee closes the Inverter Output breaker, state, “The Breaker aligns to the CLOSE position.”			
	Comments:			
STEP #20 GA-1 Step 9.f	Performance: f. **PRESS** the INVERTER TO LOAD STATIC SWITCH button (PB-1)	Standard: Locates the Inverter to Load Static Switch Pushbutton on Inverter 6, and observes the Inverter Supplying Load light is already lit.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: When the examinee initially observes the Inverter to Load Static Switch Pushbutton, state, “the Inverter Supplying Load light is already lit.”			
	Comments:			
STEP #21	Performance: **NOTIFY The Control Room MCC 32-3T Has Been Re-energized**	Standard: Informs Control Room that 32-3T has been re-energized.	Critical: Y ☐ N ☒	Grade S ☐ U ☐
	Cue: “Control Room acknowledges report. A Control Room Operator will complete GA-1 Step 11, “Rearm Turbine Lift Oil Pumps” and Step 12, “Restore Plant Process Computer”.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ____________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC P.2 Revision: 0 / 2

Task Title: Energizing MCC 32-3T following CDA

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**20**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC P.2 Revision: 0 / 2

Initial Conditions: A large-break LOCA occurred 15 minutes ago, resulting in the following sequence of events:

1. SIS, LOP, and CDA all actuate.
2. Both Emergency Buses energize from the Emergency Diesels.
3. The crew enters E-1, *Loss of Reactor or Secondary Coolant*.
4. The crew resets SIS and LOP.

Initiating Cues: The US directs you to energize MCC 32-3T using GA-1, *Energizing MCC 32-3T,* starting with Step 2.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Align “C” CCW Pump and Heat Exchanger to the “A” Train

JPM Number: 2017 NRC P.3 Revision: 0

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Original issue direct from Bank (JPM P113)	0

JPM WORKSHEET

Facility: Millstone Unit 3 Examinee: ______________________

JPM Number: 2017 NRC P.3 Revision: 0

Task Title: Align “C” CCW Pump and Heat Exchanger to the “A” Train

System: CCW

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 25

Task Number(s): 344-05-024

Applicable To: SRO **X** RO **X**

K/A Number: 008.A2.01 K/A Rating: 3.3 / 3.6

Method of Testing: Simulated Performance: X Actual Performance: ______

Location: Classroom: ______ Simulator: ______ In-Plant: X

Task Standards: Satisfactorily align the “C” RPCCW pump and heat exchanger to the “A” train of RPCCW using OP 3330A Section 4.9.

Required Materials: (procedures, equipment, etc.) OP 3330A (Rev. 24-0), Section 4.9 **(handout)**

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC P.3 Revision : 0

Initial Conditions:

- Train "A" RPCCW Pump has tripped.
- The crew has entered AOP 3561, *Loss of Reactor Plant Component Cooling Water*.
- The RPCCW CTMT Headers have been cross-connected.

Initiating Cue: The US directs you to align the "C" RPCCW Pump and Heat Exchanger to the "A" Train of RPCCW using OP 3330A, *Reactor Plant Component Cooling Water*, Section 4.9.

- Both RPCCW Pump "C" Control Switches are in the PULL-TO-LOCK position (Step 4.9.3).
- Another PEO will complete steps 4.9.10 through 4.9.14 in OP 3330A and will provide you with the appropriate Kirk key when these steps are completed.
- The vents on the "C" RPCCW Heat Exchanger have been closed to allow opening either 3SWP*V37, RPCCW HX C SW A Service Water Supply Valve or 3SWP*V69, RPCCW HX C SW B Service Water Supply Valve (due to valve leak by of 3SWP*V38).

Simulator Requirements: NA

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC P.3 Revision: 0

Task Title: Align “C” CCW Pump and Heat Exchanger to the “A” Train

START TIME: ____________

STEP #1	Performance:	Standard:	Critical:	Grade
3330A Note prior to Step 4.9.1	NOTE Breaker realignment may be performed concurrently with mechanical realignment.	Examinee reads the NOTE.	Y [ ] N [**X**]	S [ ] U [ ]
Cue:				
Comments:	The position indicators for several of the valves that are manipulated cannot be observed without a ladder. For the purposes of this JPM, it is not required that a ladder be obtained to check the position. However, the examinee should point (light pointer or flashlight) to each specific valve that would be operated. The location for Performance Steps 2 through 9 is Aux. Bldg. 24’6”, near HX and pumps.			

<table>
<tr><td>STEP #2
3330A Step 4.9.1</td><td>Performance:
CLOSE the following RPCCW heat exchanger C Train B service water return valves:
• 3SWP*V70, RPCCW HX C SW B rtn isol
• 3SWP*V71, RPCCW HX C SW B rtn stop</td><td>Standard:
Rotates the handwheel for 3SWP*V70 in the clockwise direction to close the valve.

Rotates the handwheel for 3SWP*V71 in the clockwise direction to close the valve.</td><td>Critical:
Y [X] N [ ]</td><td>Grade
S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">“It is not required to obtain a ladder to check the position of valves that cannot be reached from the floor. However, you should point (light pointer or flashlight) to each specific valve that would be operated. ”

For each valve, state
1. “The valve handwheel rotates in the clockwise direction and the position indicator starts moving toward the close position. Eventually some resistance is met and the valve handwheel comes to a hard stop.”
2. “The position indicator points to the “closed” position.”</td></tr>
<tr><td>Comments:</td><td colspan="4">Closing EITHER V70 or V71 meets the critical nature of this step.</td></tr>
</table>

<table>
<tr><td>STEP #3
OP 3330A Step 4.9.2</td><td>Performance:
OPEN the following RPCCW heat exchanger C Train A service water return valves:
• 3SWP*V40, RPCCW Hx C SW A rtn stop
• 3SWP*V41, RPCCW HX C SW A rtn isol</td><td>Standard:
Rotates the handwheel for 3SWP*V40 in the counter-clockwise direction to open the valve. Rotates the handwheel ¼ turn in the close direction.
Rotates the handwheel for 3SWP*V41 in the counter-clockwise direction to open the valve.
Rotates the handwheel ¼ turn in the close direction.</td><td>Critical:
Y [X] N [ ]</td><td>Grade
S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">For each valve, state
1. “The valve handwheel rotates in the counter-clockwise direction and the position indicator starts moving toward the open position. Eventually some resistance is met and the valve handwheel comes to a hard stop.”
2. “The valve has been taken one-quarter turn in the closed direction.”
3. “The position indicator points to the “open” position.”</td></tr>
<tr><td>Comments:</td><td colspan="4">The critical nature of this step does not require taking the valves off their backseat.</td></tr>
<tr><td>STEP #4
OP 3330A Step 4.9.3</td><td>Performance:
PLACE the following in “PULL-TO-LOCK” (MB1):
• 3SWP*P1C, “PP C” (Train A)
• 3SWP*P1C, “PP C” (Train B)</td><td>Standard:
Recalls from initial conditions that these switches are already in Pull-To-Lock.
May ask examiner to confirm the switches are in Pull-To-Lock.</td><td>Critical:
Y [ ] N [X]</td><td>Grade
S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">If asked, state, “Both Main Board Switches for 3SWP*P1C are in Pull-To-Lock.”</td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

STEP #5 OP 3330A Note prior to Step 4.9.4	Performance: **NOTE** The following valve manipulation sequence will prevent cross-tying the RPCCW Trains.	Standard: Examinee reads the NOTE.	Critical: Y [ ] N [**X**]	Grade S [ ] U [ ]
Cue:	Cue:			
Comments:				

STEP #6 OP 3330A Step 4.9.4	Performance: CLOSE the following Train B RPCCW discharge cross-connects: • 3CCP*V8, train B RPCCW secondary discharge cross connect • 3CCP*V10, train B RPCCW primary discharge cross connect	Standard: Rotates the handwheel for 3CCP*V8 in the clockwise direction to close the valve. Rotates the handwheel for 3CCP*V10 in the clockwise direction to close the valve.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	For each valve: "The valve handwheel rotates in the clockwise direction. Eventually some resistance Is met and the valve comes to a hard stop."			
Comments:	The initial positions of 3CCP*V8 and 3CCP*V10 are OPEN. Closing either valve meets the critical nature of this step.			

STEP #7 OP 3330A Step 4.9.5	Performance: CLOSE the following Train B RPCCW suction cross-connects: • 3CCP*V94, train B RPCCW secondary suction cross connect to P1C • 3CCP*V95, train B RPCCW primary suction cross connect to P1C	Standard: Rotates the handwheel for 3CCP*V94 in the clockwise direction to close the valve. Rotates the handwheel for 3CCP*V95 in the clockwise direction to close the valve.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	For each valve: "The valve handwheel rotates in the clockwise direction. Eventually some resistance Is met and the valve comes to a hard stop."			
Comments:	The initial positions of 3CCP*V94 and 3CCP*V95 are OPEN. Closing either valve meets the critical nature of this step.			

<table>
<tr><td>STEP #8
OP 3330A Step 4.9.6</td><td>Performance:
OPEN the following Train A RPCCW suction cross-connects:
• 3CCP*V092, TR A RPCCW PRIMARY SUCTION X-CONN TO PC1
• 3CCP*V093, TR A RPCCW SECONDARY SUCTION X-CONN TO PC1</td><td>Standard:
Rotates the handwheel for 3CCP*V092 in the counterclockwise direction to open the valve. Rotates the handwheel 1/4 turn in the clockwise (close) direction.
Standard:
Rotates the handwheel for 3CCP*V093 in the counterclockwise direction to open the valve.
Rotates the handwheel 1/4 turn in the clockwise (close) direction.</td><td>Critical:
Y [X] N [ ]</td><td>Grade
S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">For each valve:
1. “The valve handwheel rotates in the counterclockwise direction. Eventually some resistance Is met and the valve handwheel comes to a hard stop. The position indicator points to the “open” position.”
2. “The handwheel has been rotated 1/4 turn in the clockwise direction.”</td></tr>
<tr><td>Comments:</td><td colspan="4">The initial positions of 3CCP*V092 and 3CCP*V093 are CLOSED.
Removing the valves from their backseat is not required to meet the critical nature of this step.</td></tr>
<tr><td>STEP #9
OP 3330A Step 4.9.7</td><td>Performance:
Ensure 3CCP*V96, RPCCW pump C suction isolation, open.</td><td>Standard:
Rotates 3CCP*V96 in the clockwise direction. When the valve handwheel moves, rotates the handwheel in the counterclockwise direction. Rotates the handwheel ¼ turn in the clockwise direction.</td><td>Critical:
Y [ ] N [X]</td><td>Grade
S [ ] U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4">1. When the valve is rotated in the clockwise direction, state, “The valve handwheel rotates in the clockwise direction.”
2. When the valve handwheel is rotated in the counter-clockwise direction, state, “The handwheel rotates in briefly in the counterclockwise direction, then comes to a hard stop.”
3. When the valve is taken off its backseat, state, “The handwheel has been rotated 1/4 turn in the clockwise direction.”</td></tr>
<tr><td>Comments:</td><td colspan="4">Initial position of 3CCP*V96 is OPEN.</td></tr>
</table>

STEP #10 OP 3330A Step 4.9.8	Performance: OPEN the following Train A RPCCW discharge cross-connects: • 3CCP*V007, TR A RPCCW PRIMARY DISCHARGE X-CONN • 3CCP*V009, TR A RPCCW SECONDARY DISCHARGE X-CONN	Standard: Rotates the handwheel for 3CCP*V007 in the counterclockwise direction to open the valve. Rotates the handwheel 1/4 turn in the clockwise (close) direction. Standard: Rotates the handwheel for 3CCP*V009 in the counterclockwise direction to open the valve. Rotates the handwheel 1/4 turn in the clockwise (close) direction.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	For each valve: 1. "The valve handwheel rotates in the counterclockwise direction. Eventually some resistance Is met and the valve handwheel comes to a hard stop. 2. "The handwheel has been rotated 1/4 turn in the clockwise direction."			
Comments:	The initial positions of 3CCP*V007 and 3CCP*V009 are CLOSED. Removing the valves from their backseat is not required to meet the critical nature of this step.			
STEP #11 OP 3330A Step 4.9.9	Performance: Ensure 3CCP*V005, RPCCW PUMP P1C DISCHARGE ISOLATION, open.	Standard: Rotates 3CCP*V005 in the clockwise direction. When the valve handwheel moves, rotates the handwheel in the counterclockwise direction. Rotates the handwheel ¼ turn in the clockwise direction.	Critical: Y [ ] N [**X**]	Grade S [ ] U [ ]
Cue:	1. When the valve is rotated in the clockwise direction, state, "The valve handwheel rotates in the clockwise direction." 2. When the valve handwheel is rotated in the counter-clockwise direction, state, "The handwheel rotates in briefly in the counterclockwise direction, then comes to a hard stop." 3. When the valve is taken off its backseat, state, "The handwheel has been rotated 1/4 turn in the clockwise direction."			
Comments:	Initial position of 3CCP*V005 is OPEN			

STEP #12 OP 3330A Step 4.9.10	Performance: Refer to OP 3370A, “Electrical Breaker Procedure” and RACK DOWN circuit breaker 34D9-2, RPCCW pump C	Standard: Recalls from initial conditions that another PEO will complete steps 4.9.10 through 4.9.14 in OP 3330A and will provide you with the appropriate Kirk key when these steps are completed. Examinee may also ask the examiner to confirm these actions have been completed.	Critical: Y [ ] N [X]	Grade S [ ] U [ ]
Cue:	State, “The PEO who completed steps 4.9.10 through 4.9.14 has provided you with Kirk Key number 3.” If the examinee attempts to confirm steps 4.9.10 through 4-9-14 have been completed, state "Another PEO has completed steps 4.9.10 through 4.9.14 in OP 3330A.			
Comments:				

STEP #13 OP 3330A Step 4.9.15	Performance: At 3CCP*TRS-P1C (east MCC/RCA 46’), INSERT the Kirk Key No. 3 (RE11339) into the lower block at switch 2 and UNLOCK switch 2.	Standard: Inserts Kirk key No. 3 into the lower block and rotates the key to unlock switch 2.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	WHEN the Examinee states / simulates inserting and rotating the key, state: “The Kirk key has been inserted and rotated.”			
Comments:				

STEP #14 OP 3330A Step 4.9.16	Performance: To open switch 2, PULL the lever arm down.	Standard: Pulls the lever arm down	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	WHEN the Examinee states / simulates pulling the lever arm down, state: “The lever arm is in the down position.”			
Comments:				
STEP #15 OP 3330A Step 4.9.17	Performance: LOCK switch 2 open and REMOVE the upper Kirk key No. 2 (RE11337).	Standard: Rotates the Kirk key No. 2 to lock switch 2 and pulls the Kirk key out of the locking block.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	WHEN the Examinee states / simulates rotating and removing the key, state: “The upper Kirk key No. 2 has been rotated, and you have the key in your hand.”			
Comments:				
STEP #16 OP 3330A Step 4.9.18	Performance: INSERT Kirk Key No. 2 (RE11337) into the lower block at switch 1 and UNLOCK switch 1.	Standard: Inserts Kirk key No. 2 into the lower block and rotates the key to unlock switch 1.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	WHEN the Examinee states or indicates inserting and rotating the key, state: “The Kirk key has been inserted and rotated, and switch 1 is unlocked.”			
Comments:				

STEP #17 OP 3330A Step 4.9.19	Performance: To close switch 1, PUSH lever UP.	Standard: Pushes the lever up.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	WHEN the Examinee states / simulating motion in the upward direction, state: “The lever is aligned to the up position.”			
Comments:				
STEP #18 OP 3330A Step 4.9.20	Performance: LOCK switch 1 closed and REMOVE the upper Kirk key No. 1 (RE11336).	Standard: Rotates the Kirk key No. 1 to lock switch 1 and pulls the Kirk key out of the locking block.	Critical: **Y [X]** N [ ]	Grade S [ ] U [ ]
Cue:	WHEN Examinee states or indicates rotating and removing the key, state: “The upper Kirk key No. 1 has been rotated and you have the key in your hand.”			
Comments:				
STEP #19 3330A Note prior to Step 4.9.21	Performance: **NOTE** This interlock is electrical as well as mechanical, therefore the key must be turned as far as it will go clockwise, to ensure the electrical contact is made up.	Standard: Examinee reads the NOTE.	Critical: Y [ ] N [**X**]	Grade S [ ] U [ ]
Cue:	“Another PEO has taken Kirk Key number 1 from you, and has completed the operations at the Switchgear.”			
Comments:				

STEP #20	Performance: Notify the US that the “C” RPCCW pump and heat exchanger are aligned to the Train A RPCCW System.	Standard: Informs the US that Section 4.9 of OP 3330A has been completed and the “C” RPCCW pump and heat exchanger are aligned to the Train A RPCCW System.	Critical: Y [ ] N [**X**]	Grade S [ ] U [ ]
Cue:				
Comments:				

TERMINATION CUE: The evaluation for this JPM is completed.

STOP TIME: _______________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC P.3 Revision: 0

Task Title: Align “C” CCW Pump and Heat Exchanger to the “A” Train

Date Performed: ____________________

Examinee: ____________________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**25**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC P.3 Revision: 0

Initial Conditions:

- Train "A" RPCCW Pump has tripped.
- The crew has entered AOP 3561, *Loss of Reactor Plant Component Cooling Water*.
- The RPCCW CTMT Headers have been cross-connected.

Initiating Cue:

The US directs you to align the "C" RPCCW Pump and Heat Exchanger to the "A" Train of RPCCW using OP 3330A, *Reactor Plant Component Cooling Water*, Section 4.9.

- Both RPCCW Pump "C" Control Switches are in the PULL-TO-LOCK position (Step 4.9.3).
- Another PEO will complete steps 4.9.10 through 4.9.14 in OP 3330A and will provide you with the appropriate Kirk key when these steps are completed.
- The vents on the "C" RPCCW Heat Exchanger have been closed to allow opening either 3SWP*V37, RPCCW HX C SW A Service Water Supply Valve or 3SWP*V69, RPCCW HX C SW B Service Water Supply Valve (due to valve leak by of 3SWP*V38).

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

JPM Number: 2017 NRC RO A.1.1 Revision: 0 chg 2

Initiated:

Robert Royce — 8/17/17

Developer — Date

Reviewed:

Dave Minnich — 8/17/17

Technical Reviewer — Date

Reviewed:

E. Brodeur — 8/18/17

Technical Reviewer — Date

Approved:

M. J. Cote — 8/18/17

Supervisor, Nuclear Training — Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Direct from Bank (JPM A216)	0
9/6/17	Made JPM steps 9, 12 and 19 critical steps. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1
10/17/17	Post NRC Validation change. Deleted reference of Tech Specs (as candidate should be able to determine RCS T/S limits without reference).	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC RO A.1.1 Revision: 0 chg 2

Task Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

Topic: Conduct of Operations

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 40

Applicable To: SRO ______ RO **X**

K/A Number: 2.1.7 K/A Rating: 4.4 / 4.7

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Carry out and correctly disposition the surveillance for RCS Inventory Balance.

Required Materials: (procedures, equipment, etc.)
SP 3601F.6, Rev 007
Completed surveillance Form SP 3601F.6 – 001, Rev 003-02
Calculator

General References: Unit 3 Technical Specifications

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC RO A.1.1 Revision : 0 chg 2

Initial Conditions:

The plant is at 100% power, and current conditions are as follows:

- The PPC RCS Leakage Program is malfunctioning.
- VCT level appears to be dropping at a faster rate than expected.
- The SM has directed a RCS Leakage calculation to be performed in accordance with SP3601F.6, *Reactor Coolant System Water Inventory Measurement*.
- The SM has directed the data be gathered over a two-hour interval.
- Other operators have gathered the required initial and final data over the two-hour interval per SP3601F.6, steps 4.3.1 through 4.3.3.
- Other operators have recorded the data on Surveillance Form SP 3601F.6 – 001, *RCS Inventory Balance*, on the DATA TABLE (page 2 of 7).
- Initial and final RCS specific volume values have been determined using R*Time and are 0.02260 ft^3 /lbm.
- The data gathered by the other operators have been verified to be correct.
- The proper initial conditions were established for the data gathering period.
- All assumptions listed in SP-3601F.6 for a manual RCS leakage calculation are met.
- VCT Divert did not occur during the data gathering period.
- There is no known RCS leakage from other sources inside CTMT.
- There is no known RCS leakage from other sources outside CTMT.

Initiating Cues:

- The US directs you to perform a manual RCS water inventory balance using SP 3601F.6, *Reactor Coolant System Water Inventory Measurement*, section 4.3, “Manual RCS Leakage Calculation”, step 4.3.4.
- You are directed to complete Surveillance Form SP 3601F.6 – 001, using the previously recorded data on the form.
- After completing SP 3601F.6, step 4.3.4, report to the US as to whether or not RCS leakage exceeds Tech Spec limits.

Record any required actions as a result of your leak rate calculations at the bottom / back of this page.

Simulator Requirements: None

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.1.1 Revision: 0 chg 2

Task Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

START TIME: __________

STEP	Performance	Standard	Critical	Grade
STEP #1	Performance: Obtains copy of SP3601.F, and Surveillance form SP3601F.6-001	Standard: Obtains copy of SP 3601F.6 from US. Obtains copy of Surveillance Form SP 3601F.6-001 from US.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #2 SP 3601F.6 – 001, Cover sheet	Performance: Reviews prerequisites, and initials “Prerequisites Completed” block on FORM SP 3601F.6 – 001.	Standard: Reviews prerequisites, or verifies “Prerequisites Completed” block has been initialed on FORM SP 3601F.6 – 001.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Examinee was informed prerequisites were met as part of the initial conditions for this JPM.			

STEP# 3 SP 3601F.6 – 001, Cover sheet	Performance: Reviews precautions, and initials “Precautions Noted” block is initialed on FORM SP 3601F.6 – 001	Standard: Reviews Precautions. Verifies “Precautions completed” block has been initialed on FORM SP 3601F.6 – 001.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #4 SP 3601F.6 – 001, Cover sheet	Performance: Verify “Test Authorized By” block is signed on FORM SP 3601F.6 – 001.	Standard: Verifies “Test Authorized By” block is signed on FORM SP 3601F.6 – 001.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #5 **SP 3601F.6 Note prior to step 4.3.4**	Performance: **NOTE** If desired, calculations may be performed after restoration of plant equipment.	Standard: Reads the note	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td rowspan="3">STEP #6
SP 3601F.6 step 4.3.4.a</td><td>Performance:
Refer To SP 3601F.6-001 and PERFORM the following:
a. CALCULATE and RECORD change in volume using initial and final data for the following components in the Calculation Tables listed for each:
• Pressurizer, Calculation Table 1A</td><td>Standard:
Examinee determines the correct Table 1B value for ‘K’ (74.15) for current plant conditions, and enters the following on Table 1A:

(64.2% - 63.6%) x 74.15 gal/% = 44.49 gal</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Rounding allowance accepts range from 44 to 45 gallons on Table 1A.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #7
3601F.6 step 4.3.4.a</td><td>Performance:
• VCT, Calculation Table 2</td><td>Standard:
Examinee enters the following on Table 2:

55.1% - 46.6% x 18.92 gal/% = 160.82 gal</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Rounding allowance accepts range from 160.0 to 161.0 on Table 2.</td></tr>
<tr><td rowspan="3">STEP #8
3601F.6 step 4.3.4.a</td><td>Performance:
• RCS, Calculation Table 3</td><td>Standard:
Examinee refers to Table 3, and records Data Table values for initial PZR pressure (CVPZRP) and initial calculated average temperature.
Using the value given in the initial cue, the Examinee records initial specific volume obtained from R*Time.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: For initial <u>and</u> final specific volume the Examinee should use the value of 0.02260 ft^3 /lbm.</td></tr>
</table>

<table>
<tr><td rowspan="12"></td><td></td><td>Standard:
Using the value recorded for initial specific volume, the Examinee calculates and records initial density.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td></td><td>Standard:
Examinee refers to Table 3 and records Data Table values for final PZR pressure (CVPZRP) and final calculated average temperature.
Using the value given in the initial cue, the Examinee records final specific volume obtained from R*Time.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td></td><td>Standard:
Using the value recorded for final specific volume, the Examinee calculates and records final density.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td></td><td>Standard:
Using the recorded values for initial and final density and the conversion factor 1251.9 gal ft^3 /lbm, the Examinee calculates and records a change in RCS volume of 0.0 gallons.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical portion of this step is determining RCS Calculation = 0 on Table 3. Initial and final specific volume are effectively the same value, thus there is no change in RCS volume.</td></tr>
<tr><td rowspan="3">STEP #9
3601F.6 step 4.3.4.a</td><td>Performance:
• PRT, Calculation Table 4</td><td>Standard:
Examinee enters the following on Table 4:
(68.1% - 68.1%) x 126.57 gal/% = 0.0 gal</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: To be graded as “Satisfactory” on this step, Examinee needs to determine PRT Calculation = 0 on Table 3</td></tr>
</table>

STEP #10 3601F.6 step 4.3.4.a	Performance: • PDTT, Calculation Table 5	Standard: Examinee enters the following on Table 5: (369.6 gal – 354.7gal) = 14.90 gal	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Acceptable to round to 14.9 gal on Table 5			
STEP #11 3601F.6 step 4.3.4.a	Performance: • CDTT, Calculation Table 6	Standard: Examinee enters the following on Table 6: (338.9 gal – 327.3 gal) = 11.60 gal	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Acceptable to round to 11.6 gal on Table 6			
STEP #12 3601F.6 step 4.3.4.b	Performance: CALCULATE and RECORD volume of makeups using initial and final makeup totalizer flow in Calculation Table 7.	Standard: Examinee enters the following on Table 7: (7982372 gal – 7982372 gal) = 0.0 gal	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: To be graded as “Satisfactory” on this step, Examinee needs to determine Makeup Volume = 0 on Table 7			
STEP #13 3601F.6 step 4.3.4.c.1)	Performance: CALCULATE volume diverted by performing the following in Calculation Table 7: 1) CALCULATE total time flow was diverted by summing individual divert times and RECORD as “Total Divert Time.”	Standard: Recognizes this is zero, or N/A, since no divert occurred.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP	Performance	Standard	Critical	Grade
STEP #14 3601F.6 step 4.3.4.C2)	Performance: 2) CALCULATE and RECORD total volume diverted using letdown flow rate and total divert time.	Standard: Recognizes this is N/A, since no divert occurred.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #15 3601F.6 Note prior to step 4.3.4.d	Performance: **NOTE** Quantified leakage is RCS leakage, inside or outside Containment, collected and quantified by measurements using graduated cylinders or containers of known volumes over a test period which satisfy the following conditions: • Leakage is not PRESSURE BOUNDARY LEAKAGE • Leakage does not interfere with Leak Detection System (i.e., over range the detection system)	Standard: Reads the Note	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #16 3601F.6 step 4.3.4.d.1)	Performance: CALCULATE total leakage from other known sources in Calculation Table 8 as follows: 1) IF any leakage is quantified from inside Containment, ENTER quantified value for RCS leakage as “Inside Containment Quantified Leakage.”	Standard: Recognizes this is N/A, as given in JPM initial conditions, or cue.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If Examinee asks US if other sources of leakage exist, state “There is no known RCS leakage from other sources inside CTMT.			
	Comments:			

STEP #17 3601F.6 step 4.3.4.d.2)	Performance: 2) IF any leakage is quantified from outside Containment, ENTER quantified value for RCS leakage as "Outside Containment Quantified Leakage."	Standard: Recognizes this is N/A, as given in JPM initial conditions, or cue.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: Cue: If Examinee asks US if other sources of leakage exist, state "There is no known RCS leakage from other sources outside CTMT.			
	Comments:			
STEP #18 3601F.6 step 4.3.4.d.3)	Performance: 3) CALCULATE and RECORD volume from other sources of leakage by adding inside and outside Containment quantified leakage.	Standard: Enters zero gallons, or N/A, since no other known sources of leakage exist.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #19 3601F.6 step 4.3.4.e	Performance: CALCULATE and RECORD time difference from initial data collection to final data collection in Calculation Table 9.	Standard: Enters 15:00 – 13:00 = 120 minutes on Table 9.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #20 3601F.6 step 4.3.4.f	Performance: CALCULATE and RECORD total RCS leakage using the previously calculated volumes in Calculation Table 9.	Standard: Calculates 44.49 gal + 160.82 gal + 0 + 0 – 0 = 205.31 gal, and enters this on Table 9.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #21 3601F.6 step 4.3.4.g	Performance: CALCULATE and RECORD total RCS leak rate by dividing total RCS leakage by the time difference in Calculation Table 9.	Standard: Calculates 205.31 gal / 120 min = 1.711 gal/min, and enters this on Table 9.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #22 3601F.6 step 4.3.4.h	Performance: CALCULATE and RECORD IDENTIFIED LEAKAGE by dividing the sum of the total collected leakage by the time difference in Calculation Table 10.	Standard: Enters the following on Table 10: (0 gal + 14.90 gal + 11.60 gal + 0 gal) / 120 min = 0.221 gpm	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #23 3601F.6 step 4.3.4.i	Performance: CALCULATE and RECORD UNIDENTIFIED LEAKAGE by subtracting IDENTIFIED LEAKAGE from total RCS leak rate and adding the change in PDTT volume in Calculation Table 11.	Standard: Enters the following on Table 11: 1.711 gpm – 0.221 gpm + (14.90 gal / 120 min) = 1.614 gpm	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical portion is this step is met with leakage rate between 1.5 and1.7 gpm, to allow for rounding. Table 12 data (corrected UNIDENTIFIED LEAKAGE) is not required for this JPM, since this calculation occurs later in the procedure, and the Examinee will be cued that those steps will be completed by a SRO.			

<table>
<tr><td rowspan="3">STEP #24
Tech Spec LCO 3.4.6.2</td><td>Performance:
Reactor Coolant System operational LEAKAGE shall be limited to…
b. 1 gpm UNIDENTIFIED LEAKAGE…
d. 10 gpm IDENTIFIED LEAKAGE…</td><td>Standard:
Compares calculated leakage to Tech Spec leakage limits.
Reports that Unidentified Leakage (1.6 gpm) exceeds Tech Spec limit (of 1 gpm).</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: “The US asks you to report whether or not RCS leakage exceeds Tech Spec limits.”
“An SRO will complete the remaining steps in SP3601F.6. “</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

Termination cue: The evaluation for this JPM is concluded. STOP TIME: _________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.1.1 Revision: chg 2

Task Title: Determine RCS Leakrate, and Determine if the Leakrate is within Limits.

Date Performed: ____________________

Examinee: ____

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	40	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC RO A.1.1 Revision: 0 chg 2

Initial Conditions: The plant is at 100% power, and current conditions are as follows:

- The PPC RCS Leakage Program is malfunctioning.
- VCT level appears to be dropping at a faster rate then expected.
- The SM has directed a RCS Leakage calculation to be performed SP3601F.6, *Reactor Coolant System Water Inventory Measurement*.
- The SM has directed the data be gathered over a two-hour interval.
- Other operators have gathered the required initial and final data over the two-hour interval per SP3601F.6, steps 4.3.1 through 4.3.3.
- Other operators have recorded the data on Surveillance Form SP 3601F.6 – 001, *RCS Inventory Balance*.
- Initial and final RCS specific volume values have been determined using R*Time and are 0.02260 ft^3 /lbm.
- The data gathered by the other operators have been verified to be correct.
- The proper initial conditions were established for the data gathering period.
- All assumptions listed in SP-3601F.6 for a manual RCS leakage calculation are met.
- VCT Divert did not occur during the data gathering period.
- There is no known RCS leakage from other sources inside CTMT.
- There is no known RCS leakage from other sources outside CTMT.

Initiating Cues:

- The US directs you to perform a manual RCS water inventory balance using SP 3601F.6, *Reactor Coolant System Water Inventory Measurement*, section 4.3, “Manual RCS Leakage Calculation”, step 4.3.4.
- You are directed to complete Surveillance Form SP 3601F.6 – 001, using the previously recorded data on the form.
- After completing SP 3601F.6, step 4.3.4, report to the US as to whether or not RCS leakage exceeds Tech Spec limits.

Record any required actions as a result of your leak rate calculations at the bottom / back of this page.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Calculate a dilution without the PPC

JPM Number: 2017 NRC RO A.1.2 Revision: 0 chg 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Modified from Bank (JPM A141-02)	0
9/6/17	Deleted the cue from step 11 and 12 to provide the Monthly Reactivity Data Sheet. Removed the Monthly Reactivity Data Sheet from the list of required materials. Added a cue to step 12 to tell the candidate that the Monthly Reactivity Data Sheet shows an auto makeup reactivity correction factor of 1.0, if asked. Added a comment to step 12 that the auto makeup reactivity correction factor was given in the initial conditions. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1

JPM WORKSHEET

Facility: Millstone 3 Examinee: ______

JPM Number: 2017 NRC RO A.1.2 Revision: 0 chg 1

Task Title: Calculate a dilution without the PPC

System: NA

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 12

Applicable To: SRO **X** RO **X**

K/A Number: GEN.2.1.43 K/A Rating: 4.1 / 4.3

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Calculate the required amount of Dilution to lower RCS Boron 200 ppm, and determine new boric acid pot setting.

Required Materials: (procedures, equipment, etc.)
OP3304C, *Primary Makeup and Chemical Addition*, Rev 029
Scientific Calculator

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC RO A.1.2 Revision : 0 chg 1

Initial Conditions: The plant is in MODE 3, HOT STANDBY, and current conditions are as follows:

- Core Burnup: 13,000 MWD/MTU.
- RCS Boron concentration: 1500 ppm.
- RCS Pressure: 2250 psia.
- Tave: 557°F.
- PZR Level: 28%.
- The plant computer is unavailable
- There is no reactivity plan required for this evolution.
- BAST Tank Boron Concentration is 6850 ppm.
- Monthly Reactivity Data Sheet shows an auto makeup reactivity correction factor of 1.0.

Initiating Cues: The Unit Supervisor directs you to calculate the required amount of PGS needed to lower RCS Boron concentration from 1500 ppm to 1300 ppm using OP3304C, *Primary Makeup and Chemical Addition*, step 4.9.1.

You are not required to determine the required dilution rate (GPM).

The US also directs you to determine the required pot setting **for the new 1300 ppm RCS boron concentration** after the dilution is complete using OP3304C, *Primary Makeup and Chemical Addition*, step 4.2.1.

Another operator will perform the dilution and make the actual pot setting adjustment.

Simulator Requirements: NA

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.1.2 Revision: 0 chg 1

Task Title: Calculate a dilution without the PPC

START TIME: ___________________

STEP	Performance:	Standard:	Critical:	Grade:
STEP #1	Obtains copy of OP 3304C	Obtains copy of OP 3304C	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

STEP	Performance:	Standard:	Critical:	Grade:
STEP #2 OP 3304C, NOTE prior to Step 4.9.1	1. The maximum dilution flow rate while in the DILUTE mode is 115 gpm. If a dilution flow rate greater than 115 gpm is required, the makeup system must be aligned for alternate dilution. 2. Main Board components identified in this section are located on MB3.	Reviews the Notes.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

STEP #3 OP 3304C, Step 4.9.1	Performance: DETERMINE the quantity and flow rate of dilution water to be added for the desired boron concentration reduction using one of the following: • Attachment 2, "Determining Boration or Dilution Volume and Rate" • Computer program for Dilution • Approved Reactivity Plan	Standard: Transitions to Attachment 2, "Determining Boration or Dilution Volume and Rate."	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: (If asked) "The plant computer is unavailable, and no reactivity plan is required for this evolution. The US directs you to use Attachment 2 to determine the required dilution volume."			
	Comments:			

STEP #4 OP 3304C, Att. 2, Step 1	Performance: Gallons of boric acid required for a boration = (M/8.33) [ln (7000 – Ci/7000 – Cf)] K	Standard: Does not perform step, since this step is for a boration.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #5 OP 3304C, Att. 2, Step 2	Performance: GPM of boric acid required for a specific boration rate = [(δC/δt) M/500 (7000 – C)] K	Standard: Does not perform step, since this step is for a boration.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #6 OP 3304C, Att. 2, Step 3	Performance: Gallons of PGS required for a dilution = **(M/8.33) [ln (Ci/Cf)] K**	Standard: Gallons of PGS required for a dilution = ([507,127 lbm/8.33] [ln 1500/1300]) x 0.98 = **8538 gallons**	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: <u>Amplifying information for the evaluator for JPM Step 6:</u> M = RCS Mass = 507,127 lbm C = boron concentration Ci = initial boron concentration Cf = final boron concentration ($\delta C/\delta t$) = rate of boron concentration change (ppm/hr) K = Correction Factor (from following procedure table) K is determined to be 0.98 per OP 3304C, Att. 2 Table, which directs the use of 0.98 for "K" at 2250 psia, 557°F, 28% Pressurizer level. Obtaining the exact value of 8538 gallons is not required. Range from 8535 gallons (obtained using 3 significant digits) to 8540 gallons is acceptable due to rounding of numbers. Use of the wrong "K" value of 1.0 will result in a number outside of this acceptable range.			

STEP #7 OP 3304C, NOTE prior to Step 4.2.1	Performance: NOTE Components identified in this section are located on MB3.	Standard: Reviews the Note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td rowspan="3">STEP #8
OP 3304C,
Step 4.2.1</td><td>Performance:
Refer To Attachment 1 and ENSURE 3CHS-FK110, “BORIC ACID BLEND FLOW CONT,” is set to provide required boric acid flow rate.</td><td>Standard:
Transitions to Attachment 1, “3CHS-FK110 Controller Pot Setting"</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: (If Examinee asks about actually adjusting the pot, state, “Another operator will make the actual pot setting adjustment.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #9
OP 3304C,
Att. 1,
NOTE prior to Step 1</td><td>Performance:
NOTE
Although makeup controller is operating within design parameters, operating experience from performing blended makeups at high RCS boron concentrations (>2,500 ppm) and large volumes (>200 gallons) has shown that the difference between setpoint and actual flow may result in a makeup concentration that is up 5 to 7% below the calculated value. Makeup concentration should be set 100 to 150 ppm above the desired value. Consideration should also be given to dividing large blended makeups into parts and sampling the RCS in between the parts of the makeups. This will allow correction of any undesirable results prior to completion of the makeup.</td><td>Standard:
Reads the Note.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Note does not apply, since RCS boron is less than 2500ppm, and is not being set for a large makeup.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #10
OP 3304C, Att. 1
Step 1</td><td>Performance:
DETERMINE required boric acid flow rate, based on current RCS and in-service Boric Acid Storage Tank boron concentrations, by performing one of the following:
• OBTAIN flow rate from Attachment 3, “Boric Acid Flow Rate Based on 80 gpm Blended Makeup”
• CALCULATE flow rate by applying the following formula:
Required boric acid flow rate =
(RCS CB / In–service BAST CB) x (80 gpm)</td><td>Standard:
Determines required boric acid flowrate, either by going to Attachment 3, or by using the formula.
Attachment 3 shows for 1300 ppm RCS boron concentration and 6850 ppm BAST boron concentration, the required boric acid flowrate is 15.18

Calculation method shows (1300 ppm / 6850 ppm) x 80 gpm = 15.18 for the required boric acid flowrate.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Either method may be used to determine the required boric acid flowrate of 15.18 gpm. (Acceptable range is from 15.18 to 15.2 gpm, to allow for rounding.)</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #11
OP 3304C, Att. 1
Step 2</td><td>Performance:
NOTE
During long on-line periods, B-10 depletes more than indicated by regular RCS sampling. Without correction, an auto makeup will over-borate the RCS. The correction factor is to account for B-10 depletion.</td><td>Standard:
Reads the Note.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #12 OP 3304C, Att. 1 Step 2	Performance: Refer To the current Monthly Reactivity Data Sheet in the Reactor Engineering Curve and Data Book and CALCULATE the corrected boric acid flow rate by multiplying the flow rate determined in step 1. by the auto makeup reactivity correction factor.	Standard: Calculates the corrected boric acid flow rate by multiplying the flow rate determined in step 1. by the auto makeup reactivity correction factor. 15.18 gpm x 1.0 = 15.18 gpm	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue: If requested, state, “the Monthly Reactivity Data Sheet shows an auto makeup reactivity correction factor of 1.0.”			
	Comments: The auto makeup reactivity correction factor was given in the initial conditions.			

STEP #13 OP 3304C, Att. 1 Step 3	Performance: CALCULATE 3CHS-FK110 pot setting by applying the following formula: 3CHS–FK110 pot setting = Corrected boric acid flow rate x (10 turns / 40 gpm)	Standard: Calculates the 3CHS-FK110 pot setting: 15.18 gpm x (10/40) = **3.795 turns**	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Acceptable pot setting range is from 3.79 to 3.80 turns.			

STEP #14	Performance: Notify the US.	Standard: Reports to the US that (approximately) 8538 gallons of dilution water is required, and the required pot setting is approximately 3.80 turns.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Acceptable dilution volume range is from 8535 to 8540 gallons. Acceptable pot setting range is from 3.79 to 3.80 turns.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.1.2 Revision: 0 chg 1

Task Title: Calculate a dilution without the PPC

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**12**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC RO A.1.2 Revision: 0 chg 1

Initial Conditions: The plant is in MODE 3, HOT STANDBY, and current conditions are as follows:

- Core Burnup: 13,000 MWD/MTU.
- RCS Boron concentration: 1500 ppm.
- RCS Pressure: 2250 psia.
- Tave: 557°F.
- PZR Level: 28%.
- The plant computer is unavailable
- There is no reactivity plan required for this evolution.
- BAT Tank Boron Concentration is 6850 ppm.
- Monthly Reactivity Data Sheet shows an auto makeup reactivity correction factor of 1.0.

Initiating Cues: The US directs you to calculate the required amount of PGS needed to lower RCS Boron concentration from 1500 ppm to 1300 ppm using OP3304C, *Primary Makeup and Chemical Addition*, step 4.9.1.

You are not required to determine the required dilution rate (GPM).

The US also directs you to determine the required pot setting **for the new 1300 ppm RCS boron concentration** after the dilution is complete using OP3304C, *Primary Makeup and Chemical Addition*, step 4.2.1.

Another operator will make the actual pot setting adjustment.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

JPM Number: 2017 NRC RO A.2

Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Facility Reviewer	Date

JPM Number: 2017 NRC RO A.2 Revision: 0 / 2

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Direct from Bank (JPM A011; 2K15 RO A.1.1)	0
9/7/17	In step 9 standard, removed the reference to the 'turnover sheet'. No turnover sheet is associated with this JPM. Added to initial conditions a bullet specifying that All MOVs listed for the associated equipment check for the 'A' EDG are OPERABLE (the candidate was supposed to refer to the turnover sheet to make this determination). Added a cue to step 9 that, all MOVs listed for the associated equipment check for the 'A' EDG are OPERABLE, if asked by the candidate. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1
10/23/17	Changes made following NRC validation. Revised the following JPM steps to clarify administration: • Referenced revision to form, SP 3646A.7-002, Rev 008. This did not alter JPM content. • JPM Step 6: Removed cue and added clarification on what examinee should observe (under "Standard"). • JPM Step 7: Changed part of cue from "Continue with procedure" to "'A' EDG is operable". • JPM Steps 8 & 10: Changed Cue and Comments to reflect possibility of stopping JPM early.	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ____________________

JPM Number: 2017 NRC RO A.2 Revision: 0 / 2

Task Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

Admin Section: Conduct of Operations

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 8

Applicable To: SRO ______ RO X

K/A Number: 2.2.12 K/A Rating: 3.7 / 4.1

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards:	Correctly complete AC Electrical Source Inoperability Surveillance for one EDG inoperable.
Required Materials: (procedures, equipment, etc.)	SP 3646A.7, "AC Electrical Sources Inoperability" Rev 011 SP 3646A.7-002, Rev 008 "T/S 3.8.1.1 ACTION b – One EDG Inoperable"
General References:	None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC RO A.2 Revision : 0 / 2

Initial Conditions:

The plant is at 100% power, and the following conditions exist:

- 10 minutes ago, the "B" EDG was declared INOPERABLE due to discovery of a significant jacket water leak into the rocker arm lube oil system. The crew disabled the 'B' EDG from starting and has started the tagging process.
- Tech Spec LCO 3.8.1.1, "AC Sources Operating", ACTION b was entered at the time of discovery.
- All MOVs listed for the associated equipment check for the 'A' EDG are OPERABLE (step 4.2.2.c of SP 3646A.7).

Initiating Cues:

The US directs you to complete SP 3646A.7, *AC Electrical Sources Inoperability* for the "B" EDG.

The US provides you with a copy of the procedure and Surveillance Form.

Simulator Requirements:

1. Reset to **IC-356**, 100% steady-state power.
2. Close **3MSS*MOV17A, B, D** for TDAFW pump.
3. Place the simulator in "RUN", check for a stable IC condition, and acknowledge/clear annunciators.

Approximate setup time is 4 minutes.

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the applicant states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question applicant for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the applicant be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.2 Revision: 0 / 2

Task Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

START TIME: ________________

STEP	Performance	Standard	Critical	Grade
STEP # 1	Performance: Obtains copy of SP 3646A.7, *AC Electrical Sources Inoperability* and associated surveillance form SP 3646A.7-002 from the US	Standard: Obtains copy of SP 3646A.7, *AC Electrical Sources Inoperability*. Obtains copy of surveillance form SP 3646A.7-002	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Provide a copy of SP 3646A.7, and associated surveillance form SP 3646A.7-002 to the examinee.			
STEP # 2 SP 3646A.7 Prerequizite 2.1.1	Performance: SM/US has signed the “Test Authorized By” block on the appropriate form.	Standard: Reviews Prerequisites from SP 3646A.7, then reviews cover sheet of SP 3646A.7-002. Confirms “Test Authorized By” has been signed.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 3 SP 3646A.7-002, Cover Sheet	Performance: Initial for “Prerequisites Completed” on cover sheet.	Standard: Verifies all prerequisites met, then initials for “Prerequisites Completed” on cover sheet.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td rowspan="3">STEP #4
SP 3646A.7-002, Cover Sheet</td><td>Performance:
Initial for “Precautions Noted” on cover sheet.</td><td>Standard:
Reviews Precautions from SP 3646A.7, which are listed as “N/A”. Initials for “Precautions Noted” on cover sheet.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #5
SP 3646A.7 Note prior to Step 4.2.1</td><td>Performance:
T/S 3.8.1.1 ACTION b. – One EDG Inoperable
NOTE
Verification of the offsite sources must be performed as follows:
• Within one hour prior to or one hour after entering the ACTION statement
• At least once every eight hours while in the ACTION statement</td><td>Standard:
Reviews the NOTE.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #6
SP 3646A.7 Step 4.2.1</td><td>Performance:
Refer To SP 3646A.7-002 and PERFORM the following:
• CHECK that both RSST A AND NSST A are energized with no valid alarms.
• ENSURE the breaker alignment for supplying the vital 4,160V bus 34C from the credited source (NSST A or RSST A) is OPERABLE.
• ENSURE the breaker alignment for supplying vital 4,160V bus 34D from the credited source (NSST A or RSST A) is OPERABLE.</td><td>Standard:
1. Performs inspection of NSST and RSST on MB8 to include the following:
• Energized / No Alarms (checks NSST / RSST energized via checking MB8 vertical section ‘SPLY VOLTS’ for 34A or B / 34 C or D, respectively. No Alarms verified by absence of associated MB8 annunciators. (For the RSST feeds, the assoc. white lights may be used to verify RSST energized – indicative of >97% supply volts to the associated bus).
• Breaker Racked Up Verified by checking associated MB8 breaker switch lights (either red / green light lit & absence of amber light)
2. Initials each row on SP 3646A.7-002 for Step 4.2.1 in space provided for Bus 34C / 34D (pg 2 / 3).
3. Marks or initials SAT for Bus 34C / 34D capable of being powered from both off-site sources (pg 2 / 3).</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #7
SP 3646A.7 Step 4.2.2.a</td><td>Performance:
Within two hours, Refer To SP 3646A.7-002 and PERFORM the following for the OPERABLE EDG:

a. REVIEW LCO ACTION statements in effect for each OPERABLE system, subsystem, train, component, or device.</td><td>Standard:
1 Request US review applicable LCO ACTION statements.
2 Initials every row of the “EDG A OPERABLE” column for step 4.2.2.a (pg 4).
3 Leaves the “EDG B OPERABLE” column blank or documents all rows N/A for step 4.2.2.a (pg 4).</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: “The US has performed a review of all applicable Tech Specs. ‘A’ EDG is operable.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP # 8
SP 3646A.7 Step 4.2.2.b</td><td>Performance:
b. ENSURE equipment associated with the listed bypass annunciators is OPERABLE.</td><td>Standard:
1 Observes status of Train A bypass annunciator windows at MB1, none are LIT for Train A.
2 Initials each row of the “OPERABLE” column for step 4.2.2.b for “EDG A OPERABLE” (pg 5).
3 Documents N/A for 4.2.2b “EDG B OPERABLE” (pg.7)
4 Documents N/A or leaves blank the Initial box for window MB1E 4-1, TDAFW (pg 7).</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue: If examinee discovers the TDAFW pump is inoperable at this point and reports this to the US, ask “What is the status of the surveillance procedure”. If examinee reports the surveillance is UNSAT, the JPM may be stopped with SAT overall performance.</td></tr>
<tr><td></td><td colspan="4">Comments: Examinee may perform a Lamp Test to confirm annunciator status.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP # 9
SP 3646A.7 Step 4.2.2.c</td><td>Performance:
c. ENSURE associated equipment is OPERABLE.</td><td>Standard:
1 Reviews initial conditions, recognizing that none of the MOVs listed on pg 6 for step 4.2.2.c for “EDG A OPERABLE” are out of service.
2 Initials each row of the “OPERABLE” column for step 4.2.2.c for “EDG A OPERABLE” (pg 6).
3 Documents N/A for the “OPERABLE” column for step 4.2.2.c for “EDG B OPERABLE” (pg 7)</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked about the status of the MOVs on page 6 of SP 3646A.7-002, state, “All MOVs listed for the associated equipment check for the ‘A’ EDG are OPERABLE”.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP # 1 0
SP 3646A.7 Step 4.2.3</td><td>Performance:
<u>IF</u> in MODE 1, 2, or 3, within two hours, ENSURE the turbine driven auxiliary feedwater pump is OPERABLE and DOCUMENT on SP 3646A.7-002.</td><td>Standard:
1. Recognizes from observation that the TDAFW pump is out of service from one or more of the following:
• Either the Bypass Annunciator window is lit for MB1E 4-1
• MOVs 3MSS*MOV17A, B, D are closed at MB5.
2. Marks or initials the “Unsat” column for step 4.2.3 (pg 7).</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If examinee discovers the TDAFW pump is inoperable at this point and reports this to the US, ask “What is the status of the surveillance procedure”. If examinee reports the surveillance is UNSAT, the JPM may be stopped with SAT overall performance.</td></tr>
<tr><td colspan="4">Comments: If examinee doesn’t recognize the TDAFW is inoperable, allow the JPM to continue as written.</td></tr>
<tr><td rowspan="3">STEP # 1 1
SP 3646A.7 Step 4.2.4</td><td>Performance:
Refer To LCO 3.8.1.1, “A.C. Sources – Operating,” ACTION b.3 and DETERMINE if any additional ACTION requirements are applicable based on performance of steps 4.2.2 and 4.2.3.</td><td>Standard:
Requests US to determine if action requirements are applicable.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: “The US will review if there any additional ACTION requirements, continue on with procedure.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP # 1 2
SP 3646A.7 Step 4.2.5</td><td>Performance:
IF the EDG became inoperable due to pre-planned maintenance or testing, PERFORM the following:
a. Refer To SP 3646A.7-002 and DOCUMENT “Pre-planned maintenance or testing.”
b. Go To step 4.2.7.</td><td>Standard:
Recognizes step is not applicable. Proceeds to the NOTE prior to step 4.2.6.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP # 1 3
SP 3646A.7 Note prior to step 4.2.6</td><td>Performance:
NOTE
An independently testable component is one which can be tested without running the EDG. Examples would be I&C loops out of calibration, valves found out of alignment, leaks on piping, breaker failures, and other similar items.</td><td>Standard:
Reviews the NOTE.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr>
<td rowspan="3">STEP
#14
SP
3646A.7
Step 4.2.6</td>
<td>Performance:
<u>IF</u> the EDG became inoperable due to an inoperable support system OR an independently testable component, PERFORM one the following within 24 hours and DOCUMENT on SP 3646A.7-002:
• ENSURE no potential Common Mode Failure exists and Go To step 4.2.7
• Refer To the applicable procedure below and PERFORM actions for starting the OPERABLE EDG from MB8 without loading:
  • SP 3646A.1, “Emergency Diesel Generator A Operability Test”
  • SP 3646A.2, “Emergency Diesel Generator B Operability Test”</td>
<td>Standard:
1. Based on NOTE, examinee determines that the ‘A’ EDG has no symptoms of jacket water leak.
2. Checks the box for “Common Mode Failure Determination” for step 4.2.5/4.2.6 (pg 8).
3. Marks or initials the “Sat” column for step 4.2.5/4.2.6 (pg 8).</td>
<td>Critical:
Y ☐ N ☒</td>
<td>Grade:
S ☐ U ☐</td>
</tr>
<tr>
<td colspan="4">Cue: If requested assistance to assess the status of the ‘A’ EDG for Common Mode Failure, state:
“The System Engineer and PEO have inspected the ‘A’ EDG, no symptoms of a jacket water leak exist.”</td>
</tr>
<tr>
<td colspan="4">Comments:</td>
</tr>
<tr>
<td rowspan="3">STEP
#15
SP
3646A.7
Step 4.2.7</td>
<td>Performance:
<u>IF</u> the EDG may be subject to an extended on–line maintenance window of more than 72 hours, PERFORM the following to ensure Tech Spec 14 day on–line maintenance requirements are met:</td>
<td>Standard:
Recognizes step is not applicable.</td>
<td>Critical:
Y ☐ N ☒</td>
<td>Grade:
S ☐ U ☐</td>
</tr>
<tr>
<td colspan="4">Cue: “The US has determined that Tech Spec 14 day requirements do not apply.”</td>
</tr>
<tr>
<td colspan="4">Comments:</td>
</tr>
</table>

STEP # 1 6 SP 3646A.7 Step 4.2.8	Performance: Refer To LCO 3.8.1.1, “A.C. Sources – Operating,” ACTION b. and DETERMINE if any additional ACTION requirements are applicable.	Standard: Informs US of requirement. Candidate may also attempt to refer to the LCO.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: “The US will perform the LCO review, continue on with SP 3646A.7.”			
	Comments:			
STEP # 1 7 SP 3646A.7 Step 4.2.9	Performance: REPEAT step 4.2.1 through 4.2.4 at least once every eight hours until both EDGs are restored to OPERABLE status.	Standard: Informs the US that surveillance must be repeated at least once every eight hours until both EDGs are restored to OPERABLE status.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: “The US acknowledges that the surveillance must be repeated.” “The US directs you to complete the Surveillance Form Cover Sheet.”			
	Comments:			
STEP # 1 8 SP 3646A.7-002, Cover Sheet	Performance: Review Surveillance Form for Acceptance Criteria and document status on cover sheet.	Standard: 1 Marks the “NO” box on the cover sheet for Acceptance Criteria Satisfied, or leaves both boxes empty. 2 Signs and dates the cover sheet as “Performed By” 3 Informs the US that Acceptance Criteria is NOT satisfied.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: The critical portion of this step is informing the US that Acceptance Criteria is NOT satisfied.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ____________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.2 Revision: 0 / 2

Task Title: Perform AC Electrical Source Inoperability Surveillance Requirements.

Date Performed: ________________

Examinee: ________________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	8	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: **2017 NRC RO A.2** Revision: 0 / 2

Initial Conditions: The plant is at 100% power, and the following conditions exist:

- 10 minutes ago, the "B" EDG was declared INOPERABLE due to discovery of a significant jacket water leak into the rocker arm lube oil system. The crew disabled the 'B' EDG from starting and has started the tagging process.
- Tech Spec LCO 3.8.1.1, "AC Sources Operating", ACTION b was entered at the time of discovery.
- All MOVs listed for the associated equipment check for the 'A' EDG are OPERABLE (step 4.2.2.c of SP 3646A.7).

Initiating Cues: The US directs you to complete SP 3646A.7, *AC Electrical Sources Inoperability* for the "B" EDG.

The US provides you with a copy of the procedure and Surveillance Form.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Determine Dose Limits Under Changing Plant Conditions

JPM Number: 2017 NRC RO A.3

Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Facility Representative	Date

JPM Number: 2017 NRC RO A.3 Revision: 0 / 2

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Original issue (new)	0
9/7/17	Added to initial conditions for the time 1700 event, that it is expected that your dose as a result of this action may exceed 6 REM. This adds clarity to interpreting the Table on Attachment 3 to MP-26-EPI-FAP09, *Radiation Exposure Controls.* These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week. Verified JPM up to date with revision 005 to MP-26-EPI-FAP09.	0 / 1
10/24/17	Changes made following NRC validation. • Initial Condition / Cue section (pgs 4 & 10): Changed initial condition 17:00 statement to remove the sentence "It is expected that your dose as a result of this action may exceed 6 REM". This statement caused confusion during validation. Changed initiating cue to include applicable procedures needed. Added word Maximum to table (far right hand column). • Initiating Cue section (pgs 4 & 10): Removed "Using RP-AA-105… and MP-26-EPI-FAP09…" as it was considered leading. Changed references to allow use of the CR – DSEO Book (would be available in the Control Room and it contains 1 of 2 references – MP-26-EPI-FAP09). • JPM Step 6 & 8: Added cue (2) to clarify current TEDE.	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC RO A.3 Revision: 0 / 2

Task Title: Determine Dose Limits Under Changing Plant Conditions

System: NA

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 12

Applicable To: SRO ______ RO X

K/A Number: GEN.2.3.4 K/A Rating: 3.2 / 3.7

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards:
1) Determine dose limit under normal plant operations
2) Determine dose limit upon declaration of an emergency
3) Determine dose limit needed for protection of large populations

Required Materials: (procedures, equipment, etc.)

1. "CR DSEO" Book – containing the following reference:
- MP-26-EPI-FAP09 (Rev 005), *Radiation Exposure Controls*

2. Access to the Doc Top would allow use of RP-AA-105 (Rev 2), *External Radiation Exposure Control Program*

3. Calculator

General References: 10CFR20, *Standards for Protection Against Radiation*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC RO A.3 Revision : 0 / 2

Initial Conditions: You are the extra licensed operator on shift.

Your annual TEDE dose this year is 400 mr, all received at Millstone 3.

The plant is initially at 100% power when the following sequence of events occurs:

09:00: The US directs you to assist a PEO with a solid waste resin transfer.

11:00: A large break LOCA occurs, resulting in entry into the EOP network and the declaration of an ALERT, Charlie 1.

12:00: The US directs you to assist a PEO in checking a valve lineup in the ESF Building.

17:00: The US obtains Assistant Director of Technical Support (ADTS) approval, and directs you to perform an action in the plant that is deemed necessary to protect large populations.

Initiating Cues: Determine the following:

- Your available TEDE dose (taking your existing annual dose into consideration, if required) prior to reaching the following limits at the following times.
- Provide the allowable dose on the following table:

Time	Allowable dose to prevent exceeding the Admin guideline limit at Millstone 3	Allowable dose to prevent exceeding the Federal Dose Limit	Maximum allowable dose to prevent exceeding the Emergency Dose Limit
09:01			N/A
12:01	N/A	N/A	
17:01	N/A	N/A	

Simulator Requirements: N/A

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC RO A.3 Revision: 0 / 2

Task Title: Determine Dose Limits Under Changing Plant Conditions

START TIME: ____________

<table>
<tr><td rowspan="3">STEP #1</td><td colspan="2">Performance:
Obtain a copy of RP-AA-105, External Radiation Exposure Control Program, Attachment 1, "Federal Limits and Administrative Guidelines for Exposure."</td><td>Standard:
Obtains copy of RP-AA-105 (Electronic or Hard Copy)</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="5">Cue:</td></tr>
<tr><td colspan="5">Comments: It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
<tr><td rowspan="5">STEP #2
RP-AA-105 Att. 1</td><td colspan="2">Performance:
Determine allowable dose at 09:01 to prevent exceeding the Millstone 3 Administrative Guideline.</td><td rowspan="3">Standard:
Calculates allowable dose at 09:01 by determining the proper column is the Dominion Site Specific administrative limit, which is 2000 mr for the year.

Subtracts the 400 mr already received at Millstone, and fills in 1600 mr (1.6 Rem) on the table.</td><td rowspan="3">Critical:
Y ☒ N ☐</td><td rowspan="3">Grade:
S ☐ U ☐</td></tr>
<tr><td>Classification:</td><td>Administrative Guideline at Dominion Site</td></tr>
<tr><td>Radiation Worker and Escorted Radiation Worker (TEDE)</td><td>2000 mrem/year at home Dominion Site</td></tr>
<tr><td colspan="5">Cue:</td></tr>
<tr><td colspan="5">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #3</td><td>Performance:
Determine allowable dose at 09:01 to prevent exceeding the Federal Dose Limit:
Obtain copy of RP-AA-105, External Radiation Exposure Control Program, Attachment 1, "Federal Limits and Administrative Guidelines for Exposure." OR a copy of 10CFR20.1201</td><td>Standard:
Obtains copy of RP-AA-105 (Electronic or Hard Copy)</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
<tr><td rowspan="3">STEP #4
RP-AA-105 Att 1</td><td>Performance:
Determine allowable dose at 09:01 to prevent exceeding the Federal Dose Limit
<table><tr><th>Classification</th><th>Federal Dose Limit</th></tr><tr><td>Radiation Worker and Escorted Radiation Worker (TEDE)</td><td>5000 mrem/year at all licensees (with extension)</td></tr></table></td><td>Standard:
Calculates allowable dose at 09:01 by determining the Federal Limit is 5000 mr for the year, subtracts the 400 mr already received at Millstone, and fills in 4600 mr (4.6 Rem) on the table.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #5</td><td>Performance:
Determine the allowable dose at 12:01 to prevent exceeding the Emergency Dose Limit:
Obtain copy of EPI-FAP09, Radiation Exposure Controls, Attachment 3, "Emergency Exposure Control Guidance."</td><td>Standard:
Obtains copy of EPI-FAP09 (Electronic or Hard Copy)</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #6
EPI-FAP09 Att. 3</td><td>Performance:
Determine allowable dose at 12:01 to prevent exceeding the Emergency Dose Limit:
At Alert and higher classification levels, dose limits are automatically extended to 4.5 Rem and continue to follow 10 CFR 20 criteria (any emergency dose is added to any accumulated annual dose to establish control limits)… The table below assumes an Alert or higher classification has been declared:
<table><tr><td>If the following condition is expected</td><td>The following may be applicable</td></tr><tr><td>Dose (including annual exposure to date) is not expected to reach 4.5 Rem TEDE</td><td>Emergency workers may be dispatched without exposure extension.</td></tr></table></td><td>Standard:
Calculates the allowable dose at 12:01 by determining the proper Emergency Dose Limit is NOT the limit required to protect valuable property or protect large populations, selecting 4500 mr for the year, and determines this dose IS to include the annual exposure to date, so the Examinee subtracts the 400 mr already received at Millstone, and fills in 4100 mr (4.1 Rem) on the table.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: (1) If asked, inform the Examinee that the valve lineup is NOT required to protect valuable property, for lifesaving or protect large populations. (2) If asked what present dose is, inform Examinee that “Your TEDE remains at 400 mr.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #7</td><td>Performance:
Obtain copy of EPI-FAP09, Radiation Exposure Controls, Attachment 3, "Emergency Exposure Control Guidance."</td><td>Standard:
Obtains copy of EPI-FAP09 (Electronic or Hard Copy)</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Reference is being obtained to determine allowable dose at 17:01 to prevent exceeding the Emergency Dose Limit.
It is acceptable if Examinee finds the correct limit in another reference.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #8
EPI-FAP09 Att. 3</td><td>Performance:
Determine allowable dose at 17:01 to prevent exceeding the Emergency Dose Limit:
For situations where exposure may exceed 4.5 Rem, dose accumulated during the emergency follows EPA-400 criteria and is independent of any prior occupational exposure. The table below assumes an Alert or higher classification has been declared:
<table><tr><th>If the following condition is expected</th><th>The following may be applicable</th></tr><tr><td>Dose (accumulated during the emergency) may reach 25 Rem TEDE for actions needed for lifesaving or protection of large populations.</td><td>Assistant Director approval required for exposure > 4.5 Rem and ≤ 25 Rem.</td></tr></table></td><td>Standard:
Calculates 17:01 allowable dose by determining the proper Emergency Dose Limit IS the limit required to protect large populations—which is 25 Rem during the emergency—and determines that since this is the dose accumulated during the emergency, the 400 mr already received at Millstone should NOT be subtracted, and fills in 25 Rem (25,000 mr) on the table.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:
(1) If asked, inform the Examinee that Dose accumulated during the emergency should not exceed 25 Rem.
(2) If asked what present dose is, inform Examinee that “Your TEDE remains at 400 mr.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #9</td><td colspan="2">Performance:
Informs Examiner all required limits have been determined</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ____________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC RO A.3 Revision: 0 / 2

Task Title: Determine Dose Limits Under Changing Plant Conditions

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	12	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC RO A.3 Revision: 0 / 2

Initial Conditions:

You are the extra licensed operator on shift.

Your annual TEDE dose this year is 400 mr, all received at Millstone 3.

The plant is initially at 100% power when the following sequence of events occurs:

09:00: The US directs you to assist a PEO with a solid waste resin transfer.

11:00: A large break LOCA occurs, resulting in entry into the EOP network and the declaration of an ALERT, Charlie 1.

12:00: The US directs you to assist a PEO in checking a valve lineup in the ESF Building.

17:00: The US obtains Assistant Director of Technical Support (ADTS) approval, and directs you to perform an action in the plant that is deemed necessary to protect large populations.

Initiating Cues:

Determine the following:

- Your available TEDE dose (taking your existing annual dose into consideration, if required) prior to reaching the following limits at the following times.
- Provide the allowable dose on the following table:

Time	Allowable dose to prevent exceeding the Admin guideline limit at Millstone 3	Allowable dose to prevent exceeding the Federal Dose Limit	Maximum allowable dose to prevent exceeding the Emergency Dose Limit
09:01			N/A
12:01	N/A	N/A	
17:01	N/A	N/A	

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Initiate Immediate Boration

JPM Number: 2017 NRC S.1 Revision: 0 chg 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Original issue from Bank (JPM S23A-2)	0
8/25/17	Deleted JPM step 7 (AOP 3566 step 1.b.1 RNO). This is an RNO action not required and would not be carried out by current rules of AOP usage. This required a renumbering of JPM steps. Added a comment and cue to new JPM step 6 that the candidate may stop or request to stop the running Boric Acid Transfer Pump. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week. Verified up to date with Revision 029 to ES-0.1.	0 chg 1
10/25/17	Changes made following NRC validation. • In Sim Reqt Section (pg 4): Added note: “Will be run in parallel with 2017 NRC S.8.” • JPM Step 6: Changed comment section to clarify the candidate “should” stop (vice “may”) the Boric Acid Transfer Pump. Added clarification on non-critical nature of this step.	0 chg 2

Job Performance Measure Guide

Facility: Millstone Unit 3 Examinee ____________________

JPM ID Number: 2017 NRC S.1 Revision: 0 chg 2

Task Title: Initiate Immediate Boration

System: 004 CVCS

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 20

Applicable To: SRO X RO X

K/A Number: 004.A2.14 K/A Rating: 3.8 / 3.9

Applicable Methods of Testing:

Simulated Performance: ______ **Actual Performance: X**

Classroom: ______ **Simulator: X** In-Plant: ______

Task Standards: Complete step 6 of ES-0.1, including initiating an immediate boration using AOP 3566

Required Materials: AOP 3566, Rev. 13-0,
EOP 35 ES-0.1, Rev. 029

General References: None

*****READ TO THE EXAMINEE*****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective(s) for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution were actually being performed.

Simulator Requirements:

Will be run in parallel with 2017 NRC S.8.

Reset to IC 44, ES-0.1, step 6 with two stuck rods, or,
Reset to any 100% steady state IC and perform the following:

1. Insert IO override "CVDI0033", "3CHS*MV8104". "CLOSE" to ON (immediate boration valve 3CHS*MV8104 failure).
2. Insert malfunctions RD0406 and RD0416 - Control Rods B4 and C7 stuck.
3. Check remote function CVR79 (B Bat Pump Disch Valve) set at 100% and CVR 83 (BA Pump B Recirc Flow Throttle) set at 0%.
4. Insert malfunctions RP02A and RP02B - Reactor Trip, MS02A at 200,000 severity, steam break outside CTMT and place the simulator in RUN
   a. Carry out the immediate actions of E-0 and first 5 steps of ES 0.1
   b. With the plant stable, acknowledge/clear the annunciators
   c. Check RCS cold leg WR temperature is less than 550°F, but greater than 540°F
   d. Remove malfunction MS02A (Steam Break)
   e. Place the simulator in "Freeze"
5. Place the simulator in "run" just prior to giving the examinee the initial conditions and initiating cues. This will allow the temperature trend recorders to show a downward trend.

Approximate setup time is 10 minutes.

Initial Conditions: A reactor trip has occurred, and current conditions are as follows:

- The crew has transitioned to ES-0.1, *Reactor Trip Response*.
- The crew has completed steps 1 through 5 of ES-0.1.
- RCS boron concentration is 500 ppm.

Initiating Cues: The US directs you to carry out ES-0.1, step 6.

**** **NOTES TO EVALUATOR** ****

1. Critical steps for this JPM are indicated by a check box. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. The Examinees performance is graded by an "S" for satisfactory or a "U" for unsatisfactory on each step.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question the Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.1 Revision: 0 chg 2

Task Title: Initiate Immediate Boration

START TIME: ____________________

STEP #1 ES-0.1, step 6	Performance: **CHECK All Control Rods – FULLY INSERTED**	Standard: Recognizes two rods did not insert on the trip.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	Two rods are not inserted			

STEP #2 ES-0.1, step 6 RNO	Performance: <u>**IF**</u> two or more control rods are NOT fully inserted, <u>**THEN**</u> using AOP 3566, Immediate Boration, **IMMEDIATE BORATE** until one of the following conditions is met: • **INCREASE** of 200 ppm for each control rod <u>**NOT**</u> verified fully inserted <u>**OR**</u> • Increase of 1300 ppm in RCS boron concentration <u>**OR**</u> • Increase of RCS boron concentration to 2600 ppm	Standard: Obtains copy of AOP 3566, *Immediate Boration* in preparation to borate 200 ppm for each stuck rod JPM Initial Conditions state RCS boron concentration is 500 ppm. Examinee determines required increase in RCS boron concentration is 200 ppm x two stuck rods = 400 ppm increase in RCS boron concentration is required (to a total of 900 ppm).	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:	If Examinee does not state how much boron is required to be added, cue "The US directs you to report how much boron is required to be added to the RCS."			
Comments:				

STEP #3 AOP 3566, Caution prior to Step1	Performance: **CAUTION:** If SI actuation occurs, restoration from Rapid Boration lineup must be completed.	Standard: Reads Caution	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	Caution currently does not apply.			

STEP #4 AOP 3566, Step1.a	Performance: **1. Initiate Immediate Boration of RCS** a. CHECK ONE Charging Pump - RUNNING	Standard: Observes one Charging Pump running by observing the Red light is lit on MB3	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #5 AOP 3566, Step 1.b.1	Performance: b. **ALIGN** boration path: 1. **START** ONE Boric Acid Transfer Pump • BA PP A • BA PP B	Standard: Starts one Boric Acid Transfer Pump by depressing the Start pushbutton on MB3. Observes the pump starts (Red light comes on, green light goes off).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #6 AOP 3566, Step 1.b.2	Performance: 2. **OPEN** Emergency Boration Valve (3CHS*MV8104)	Standard: Depresses the OPEN pushbutton for 3CHS*MV8104 on MB3. Observes that 3CHS*MV8104 does NOT open (Green light remains lit, Red light remains off). Moves to the Step 1.b.2 RNO column.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If the candidate asks US whether to stop the running Boric Acid Transfer Pump, state, “Stop the Boric Acid Transfer Pump.			
Comments:	The candidate should stop the running Boric Acid Transfer Pump. However, if they do not stop the pump, this not critical in nature. The failure of 3CHS*MV8104 to open requires the examinee to align a completely different path to route boron from the BAT Tanks to the suction of the Charging Pumps. This is where the alternate path for this JPM commences.			

STEP #7 AOP 3566, Step1, RNOb.2	Performance: 2. **OPEN** a minimum of ONE Gravity Feed Boration Valve. • 3CHS*MV8507A • 3CHS*MV8507B	Standard: Opens at least one Gravity Feed Boration Valve by depressing the OPEN pushbutton on MB3. Observes the valve(s) open (Green light goes off, Red light lights).	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	Critical nature of this step is to open a minimum of one Gravity Feed Boration Valve.			

STEP #8	Performance:	Standard:	Critical:	Grade:
AOP 3566, Step1, RNOb.3	3. **<u>IF</u>** AT LEAST ONE Gravity Feed Boration Valve CANNOT be opened, **<u>THEN</u> OPEN** AT LEAST ONE RWST to Charging Pump Suction Isolation Valve • 3CHS*LCV112D • 3CHS*LCV112E **AND** **<u>WHEN</u>** ONE RWST to Charging Pump Suction Isolation Valve is open, **<u>THEN</u> CLOSE** AT LEAST ONE VCT Outlet Isolation Valve • 3CHS*LCV112B • 3CHS*LCV112C **AND** **<u>PROCEED</u> <u>TO</u>** step 1.c.	Realizes this step does not apply, and proceeds to step 1, RNO.b.4, not step 1.c.	Y ☐ N ☒	S ☐ U ☐
Cue:				
Comments:				

STEP #9	Performance:	Standard:	Critical:	Grade:
AOP 3566, Step1, RNOb.4	4. **LIMIT** net charging flow to the RCS to LESS THAN 85 gpm (Charging + Seal Injection – RCP Seal Return).	Reads Charging flow, Seal Injection flow, and RCP Seal Return flows on MB3. Determines net flow by adding Charging + Seal Injection – RCP Seal Return flow. Adjusts Charging flow through 3CHS*FCV121 by depressing the down arrow on the MB3 pushbutton as necessary to reduce net charging flow to less than 85 gpm.	**Y** ☒ N ☐	S ☐ U ☐
Cue:				
Comments:	Critical nature of this step is to reduce net charging flow to less than 85 gpm, if required.			

STEP #10 AOP 3566, Step1, RNOb.5	Performance: 5. **CLOSE** a minimum of ONE VCT Outlet Isolation Valve. • 3CHS*LCV112B • 3CHS*LCV112C	Standard: Closes either one or both VCT Outlet Isolation Valves 3CHS*LCV112B and / or 3CHS*LCV112C. Observes that 3CHS*LCV112B and / or 3CHS*LCV112C close (Green light lights, Red light goes off) on MB3.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	Critical nature of this step is to close at least one VCT Outlet Valve			

STEP #11 AOP 3566, Step1, RNOb.6	Performance: 6. **VERIFY** BOTH RWST to Charging Pump Suction Isolation Valves – CLOSED • 3CHS*LCV112D • 3CHS*LCV112E	Standard: Observes both 3CHS*LCV112D and 3CHS*LCV112D are closed (Green lights lit, Red lights off) on MB3.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	Valves are already closed.			

STEP #12 AOP 3566, Step1.c	Performance: c. **CHECK** normal Charging Flow Path aligned • **CHECK** Charging Flow Control Valve (3CHS*FCV121) - CAPABLE OF BEING THROTTLED	Standard: May adjust 3CHS*FCV121 by pushing the up and / or down arrows on the controller on MB3, or may just realize this valve has already been throttled while performing steps in this procedure.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	AOP 3566, step 1.c actions can be performed in any order, since the step is bulleted.			

STEP #13 AOP 3566, Step1.c	Performance: • **CHECK** ONE Charging Header Loop Isolation Valve – OPEN • 3CHS*AV8146 **<u>OR</u>** • 3CHS*AV8147	Standard: Observes 3CHS*AV8146 or 3CHS*AV8147 open by observing the Green light off and the Red light lit for only one of the two valves on MB3.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	AOP 3566, step 1.c actions can be performed in any order, since the step is bulleted. These valves should already be in this alignment.			

STEP #14 AOP 3566, Step1.c	Performance: • **CHECK** Charging Header Isolation Valves - OPEN • 3CHS*MV8106 <u>AND</u> • 3CHS*MV8105	Standard: Observes MV8106 and MV8105 open by observing the Green light off and the Red light lit for both valves on MB3.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	AOP 3566, step 1.c actions can be performed in any order, since the step is bulleted. These valves should already be in this alignment.			

STEP #15 AOP 3566, Step 1.d	Performance: d. **<u>PROCEED</u> <u>TO</u>** step 3.	Standard: Proceeds to step 3 of AOP 3566.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #16 AOP 3566, Note prior to Step3	Performance: **NOTE:** Net Charging Flow to the RCS is Charging + Seal Injection - RCP Seal Return. **NOTE:** Thumb rule: With RWST as boration source: 100 gpm ≈ 33 gpm of 4% boric acid	Standard: Reads Notes	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	The second Note does not apply			

STEP #17 AOP 3566, Step3.a	Performance: **Check Boration Flow** a. **CHECK** PZR Pressure - LESS THAN 2350 psia	Standard: Checks RCS pressure less than 2350 psia on meter on MB4, or on PPC.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #18 AOP 3566, Step 3.b	Performance: b. **CHECK** normal Charging Flow Path - ALIGNED	Standard: Verifies flowpath from Charging Pump to the RCS exists by checking 3CHS*FCV121 throttled open at its controller at MB3, and Charging Header Isolation Valves 3CHS*MV8105 and 8106 open (Red light lit, Green light off) on MB3. Also acceptable to state the flowpath is available, since these valves have already been checked while performing earlier procedure steps.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #19
AOP 3566, Step 3.c</td><td>Performance:
c. PLACE Charging Flow Control Valve (3CHS*FCV121) in MANUAL</td><td>Standard:
Verifies 3CHS*FCV121 is already in Manual by observing lit up or down arrow on controller on MB3.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

<table>
<tr><td>STEP #20
AOP 3566, Step 3.d</td><td>Performance:
d. CHECK Boration flow to the RCS – EQUAL TO OR GREATER THAN 33 gpm
• <u>IF</u> Immediate Boration is in service, <u>THEN</u> CHECK Direct BA Flow (3CHS-FI183A)
• <u>IF</u> Gravity Boration is in service, <u>THEN</u> CHECK Net Charging Flow</td><td>Standard:
Checks Net Charging Flow, since Gravity Boration is in service.
Reads Charging flow, Seal Injection flow, and RCP Seal Return flows on MB3.
Determines net flow by calculating Charging + Seal Injection – RCP Seal Return flow.
Also acceptable to state flow is adequate, since these flows have already been checked while performing earlier procedure steps.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">This step is critical only if less than 33 gpm net charging flow exists, after which increasing flow to 33 gpm or more would be required.
Approximate values are 40 gpm Charging flow + 37 gpm Seal Injection flow – 10 gpm seal return flow = 67 gpm</td></tr>
</table>

STEP #21 AOP 3566, Step 4.a	Performance: **Energize PZR Heaters To Equalize Boron Concentration** a. **ENERGIZE** ALL PZR Heaters	Standard: Takes all Pzr Heater Control Switches to ON at MB4. Verifies the Heater Indication Lights are Red on MB4.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	Critical nature of the step is to energize the heaters.			

STEP #22 AOP 3566, Step 4.b	Performance: b. **ADJUST** PZR Spray Valves to 50% setpoint • 3RCS-PK 455B • 3RCS-PK 455C	Standard: Adjusts Pzr Spray Valve Controller knobs for both 3RCS-PK 455B and 3RCS-PK 455C to approximately 50% at MB4.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #23 AOP 3566, Step 5	Performance: **Check Dilution Paths Isolated** • **CHECK** Primary Makeup Water to Blender (3CHS*FCV111A) - CLOSED • Locally **CHECK** Chemical Mix Tank Outlet Isolation Valve (3CHS*V317) - CLOSED • Locally **CHECK** Manual Dilution Valve (3CHS*V305) – CLOSED	Standard: Checks 3CHS*FCV111A at MB3 (Green light lit, Red light off) Calls PEO to check these valves, or requests the US contacts a PEO to check these valves.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	"The US will be tracking the completion of this step."			
Comments:	These valves should already be closed.			

STEP #24 AOP 3566, Step 6.a	Performance: **Check If Immediate Boration is Required Due To Control Rod Bank Height** a. **CHECK** EITHER of the following annunciators - LIT • ROD CONTROL BANKS LIMIT LO (MB4C 3-9) **OR** • ROD CONTROL BANKS LIMIT LO-LO (MB4C4-9)	Standard: Checks annunciators windows MB4C 3-9 and MB4C 4-9 not lit	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	These annunciators are not lit.			

STEP #25 AOP 3566, Step 6.a RNO	Performance: a. **PROCEED TO** step 7.	Standard: Proceeds to AOP 3566, step 7	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #26
AOP 3566, Step 7.a</td><td>Performance:
Check If Immediate Boration Should Be Stopped
a. CHECK EITHER condition satisfied
• The conditions requiring entry into this procedure - NO LONGER EXIST
<u>OR</u>
• The required amount of Boric Acid solution - HAS BEEN ADDED TO THE RCS</td><td>Standard:
400 ppm of boric acid is required.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4">“The STA is checking how long boration is required.”</td></tr>
<tr><td>Comments:</td><td colspan="4">The time may or may not have been met, based on boration rate and the speed at which the Examinee moves through the procedure. Terminate the JPM when the Examinee decides whether or not the boration is required to continue.</td></tr>
</table>

Terminating Cue: The evaluation for this JPM is concluded

Stop Time: ____________

VERIFICATION OF JPM COMPLETION

JPM Number: **2017 NRC S.1** Revision: 0 chg 2

Task Title: Initiate Immediate Boration

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**20**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

Initial Conditions: A reactor trip has occurred, and current conditions are as follows:

- The crew has transitioned to ES-0.1, *Reactor Trip Response*.
- The crew has completed steps 1 through 5 of ES-0.1.
- RCS boron concentration is 500 ppm.

Initiating Cues: The US directs you to carry out ES-0.1, step 6.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Establish Feed and Bleed Cooling of the RCS

JPM Number: 2017 NRC S.2 Revision: 0 / 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

JPM Number: 2017 NRC S.2 Revision: 0 / 1

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Original issue - New	0
10/25/17	Changes made following NRC validation. • In Sim Requirement Section (pg 4): Editorial clean-up on alignment of bullets and bolt type (no content change). • JPM Step 5: Removed the cue saying RO will address ARP (will allow Examinee to review ARP, more realistic). • Multiple JPM Steps: Editorial re-alignment of Critical Step Cell to allow "Yes / No" boxes to be on the same line.	0 / 1

JPM WORKSHEET

Facility: MP3

Examinee: ______

JPM Number: 2017 NRC S.2

Revision: **0**

Task Title: Establish Feed and Bleed Cooling of the RCS

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 12

Applicable To: SRO X RO X

K/A Number: W/E05.EK2.2

K/A Rating: 3.9 / 4.2

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Attempt to establish AFW flow, and correctly implement bleed and feed cooling of the RCS.

Required Materials: (procedures, equipment, etc.) EOP35 FR-H.1, Rev 026

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.2 Revision : **0**

Initial Conditions: A Reactor Trip occurred, resulting in the following sequence of events:

1. The crew entered E-0, *Reactor Trip or Safety Injection*.
2. The crew determined Safety Injection is not required.
3. The crew transitioned from E-0, step 4, to FR-H.1, *Response to Loss of Secondary Heat Sink*.

Initiating Cues: The US directs you to attempt to restore Auxiliary Feedwater flow, starting at FR-H.1, step 1.

Simulator Requirements: Reset to **IC 43**, E-0, steps 1 through 4 complete, **and ENSURE the following:**

- **No AFW Pumps running.**
- **FW18A, "A" MDAFW Pump trip**
- **FW18B, "B" MDAFW Pump trip**
- **FW19, TDAFW Pump trip**
- **CV11A "A" Charging Pump trip, Trigger 1 in snap**
- **CV11B "B" Charging Pump trip, Trigger 1 in snap**

Acknowledge/clear annunciators. Place the simulator in "freeze". Place the simulator in "run" after the examinee has read the initial conditions and initiating cues.

Approximate simulator setup time is 5 minutes.

*** * * * <u>NOTES TO TASK PERFORMANCE EVALUATOR</u> * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.2 Revision: **0**

Task Title: Establish Feed and Bleed Cooling of the RCS

START TIME: ____________

STEP	Performance	Standard	Critical	Grade
STEP # 1	Performance: Obtain copy of FR-H.1, and locates step 1, “Check If Secondary Heat Sink Is Required.”	Standard: Obtains copy of FR-H.1, and turns to step 1.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 2 FR-H.1, Caution prior to step 1	Performance: Caution: • Feed flow must **NOT** be reestablished to any faulted SG if a non- faulted SG is available. • With all steam generators faulted and total feed flow LESS THAN 530 gpm due to operator action, this procedure should **NOT** be performed.	Standard: Reads cautions	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td rowspan="3">STEP #3
FR-H.1, step 1.a</td><td>Performance:
Check If Secondary Heat Sink Is Required
a. CHECK RCS pressure - GREATER THAN ANY NON - FAULTED SG PRESSURE</td><td>Standard:
Checks RCS pressure at MB4, or the PPC (about 2250 psia), and compares it to non-faulted SG pressures at MB5, MB2, or the PPC (about 1100 psig).
Recognizes RCS pressure is greater than SG pressures, and proceeds to FR-H.1, step 1.b.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #4
FR-H.1, step 1.b</td><td>Performance:
b. CHECK RCS hot leg WR temperature - GREATER THAN 350°F</td><td>Standard:
Checks RCS temperature at MB4, or PPC (about 557°F), and determines it is greater than 350°F. Proceeds to FR-H.1, step 1.c</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #5
FR-H.1, step 1.c</td><td>Performance:
c. CHECK a secondary heat sink established
• Check WR level in at least one SG – RISING
• Check Core exit TCs - STABLE OR LOWERING</td><td>Standard:
Checks WR SG levels at MB5 or the PPC (stable or lowering), and determines they are not rising.
Checks Core Exit TCs on the PPC or ICC cabinet (stable).
Determines Secondary Heat Sink is NOT established.
Proceeds to step 1.c RNO.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Sim Booth Operator is to insert malfunctions CV11A and CV11B (Trigger 1) to trip the running Charging Pump when the Examinee is checking Core Exit Thermocouples per step 1.c. The Charging Pump Auto Trip / Overcurrent annunciator will illuminate at MB3.</td></tr>
</table>

STEP	Performance:	Standard:	Critical:	Grade:
STEP # 6 FR-H.1, step 1.c.RNO	Performance: **PROCEED TO** step 2 .	Standard: Proceeds to FR-H.1, step 2	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 7 FR-H.1, step 2	Performance: **CHECK Charging Pump Status - AT LEAST ONE RUNNING**	Standard: Observes no Charging Pumps running by observing green lights lit and red lights off at MB3. Proceeds to FR-H.1, step 2.RNO	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP	Performance	Standard	Critical	Grade
STEP #8 FR-H.1, step 2 RNO	Performance: **START** one charging pump. • **IF** one charging pump **CANNOT** be started, **THEN PROCEED TO** CAUTION prior to step 12.	Standard: Attempts to start the standby Charging Pump by taking the switch to Start on MB3. Observes the pump does not start (Green light stays lit, amber light lights, and red light stays off). Proceeds in FR-H.1 to Caution prior to step 12	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If asked, state, "the US directs you to attempt to start the standby Charging Pump.			
	Comments: Examinee may request US permission before starting the standby pump. The loss of all Charging Pumps requires the examinee to leave the portion of the procedure and initiate bleed and feed. This step commences the alternate path portion of this JPM.			
STEP #9 FR-H.1, Caution prior to step 12	Performance: CAUTION: Steps 12 through 16 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed. CAUTION: During the remainder of the procedure, feed flow to the SGs must be established as specified by step 21.	Standard: Reads the Cautions	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #10 FR-H.1, step 12	Performance: **CHECK All RCPs - STOPPED**	Standard: Observes RCPs red lights lit on MB4. Proceeds to FR-H.1, Step 12 RNO.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td rowspan="3">STEP #11
FR-H.1, step 12.RNO</td><td>Performance:
STOP pump(s).</td><td>Standard:
Stops all four RCPs by taking their switches to “Stop” on MB4, observing the green lights illuminate and the red lights go off.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical portion of this step is to stop all four RCPs.</td></tr>
<tr><td rowspan="3">STEP #12
FR-H.1, step 13</td><td>Performance:
INITIATE SI</td><td>Standard:
Depresses the SIS Actuation pushbuttons on MB2, or turns the SIS Actuation switch to “Actuate” on MB4.
Observes SIS Actuation Annunciator lights on MB4.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: After SIS actuates, state, “The US is going to Master Silence.”</td></tr>
<tr><td colspan="4">Comments: Critical portion of this step is to actuate SIS.
Booth operator is to select “Master Silence” at US desk.</td></tr>
<tr><td rowspan="3">STEP #13
FR-H.1, step 14.a</td><td>Performance:
Check RCS Feed Path
a. CHECK charging pumps - AT LEAST ONE RUNNING</td><td>Standard:
Observes no Charging Pumps running (Green and Amber lights lit) on MB3
Proceeds to FR-H.1, step 14.a.RNO</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP	Performance:	Standard:	Critical:	Grade:
STEP #14 FR-H.1, step 14.a.RNO	**START** a pump. **IF** a charging pump **CANNOT** be started, **THEN** perform the applicable: • **IF** Core Exit TCs are LESS THAN 596 °F **THEN PROCEED TO** step 14.c.	May attempt to restart the tripped Charging Pumps at MB3. Also acceptable to realize attempts to start the pumps have already been taken. Checks Core Exit TCs on the PPC or ICC cabinet are less than 596 °F. Proceeds to step 14.c.	Y ☐ N ☒	S ☐ U ☐
	Cue: If asked, state, “The US directs you NOT to attempt a restart of the tripped Charging Pumps, and to proceed in FR-H.1.”			
	Comments:			

STEP	Performance:	Standard:	Critical:	Grade:
STEP #15 FR-H.1, step 14.c	c. **CHECK** SI pumps - BOTH RUNNING	Observes both SIH Pumps are running (red lights on) at MB2.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

STEP	Performance:	Standard:	Critical:	Grade:
STEP #16 FR-H.1, step 14.d	d. **CHECK** ECCS valve alignment - PROPER EMERGENCY ALIGNMENT	Traces flowpath from RWST through the SIH Pump Suction Valves (Red lights lit), through the SIH Pumps, through the SIH Cold Leg Injection Valves (Red lights lit) on MB2.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

STEP	Performance:	Standard:	Critical:	Grade:
STEP #17 FR-H.1, step 15.a	**Establish RCS Bleed Path** a. **CHECK** PZR PORV block valves - BOTH OPEN	Observes both PORV Block Valves open by observing their red lights lit on MB4.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

STEP #18 FR-H.1, step 15.b	Performance: b. **OPEN** both PZR PORVs	Standard: Opens both PORVs by taking their switches to OPEN on MB4. Observes the red lights light, and the green lights go off.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical nature of this step is to open both PORVs.			
STEP #19 FR-H.1, step 16	Performance: **Check Adequate RCS Bleed Path** • **CHECK** PZR PORVs - BOTH OPEN • **CHECK** PZR PORV block valves - BOTH OPEN	Standard: Observes both PORVs open and both PORV block Valves Open (Red lights lit, green lights off) on MB4	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: The JPM is concluded after the Examinee verifies the bleed path is adequate.			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ______________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.2 Revision: **0**

Task Title: Establish Feed and Bleed Cooling of the RCS

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**12**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC S.2 Revision: **0**

Initial Conditions:

A Reactor Trip occurred, resulting in the following sequence of events:

1. The crew entered E-0, *Reactor Trip or Safety Injection*.
2. The crew determined Safety Injection is not required.
3. The crew transitioned from E-0, step 4, to FR-H.1, *Response to Loss of Secondary Heat Sink*.

Initiating Cues:

The US directs you to attempt to restore Auxiliary Feedwater flow, starting at FR-H.1, step 1.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Depressurize the RCS During a SG Tube Rupture

JPM Number: 2017 NRC S.3 Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Direct from Bank (JPM S052A-2)	0
9/7/17	Moved the step 6 comment, 'This commences the Alternate Path portion of this JPM ….. ' to step 8, which is where the alternate path actually begins. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week. Updated JPM to revision 025 to E-3. Only minor changes were made to this JPM as a result of revision 025.	0 / 1
10/25/17	Changes made following NRC validation. • In Sim Requirement Section (pg 4): Editorial to bold instructor set-up actions.	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC S.3 Revision: 0 / 2

Task Title: Depressurize the RCS During a SG Tube Rupture

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes) 16

Applicable To: SRO X RO X

K/A Number: EPE.038.EA1.04 K/A Rating: 4.3 / 4.1

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Depressurize the RCS to minimize break flow and refill the Pressurizer, using the Auxiliary Spray Valve

Required Materials: (procedures, equipment, etc.) EOP35 E-3, Rev 025
EOP35 GA-28, Rev 000

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.3 Revision : 0 / 2

Initial Conditions: A Steam Generator Tube Rupture has occurred on the “D” Steam Generator, and current conditions are as follows:

- The crew has entered E-3, *Steam Generator Tube Rupture*.
- The crew has completed the RCS cooldown per E-3, step 13, “Check If Cooldown Should Be Stopped.”
- The crew has just verified adequate subcooling exists per E-3, step 15, “Check RCS Subcooling Based on Core Exit TCs - GREATER THAN 52°F (135°F ADVERSE CTMT).”
- The “A” PORV Block Valve is tagged closed with its power removed.

Initiating Cues: The US directs you to Depressurize the RCS using E-3, step 16, “Depressurize RCS To Minimize Break Flow And Refill PZR”.

Inform the US when the depressurization has commenced.

Simulator Requirements:

1. **Reset to IC 121**, E-3, ready for RCS depressurization
   <u>OR</u>
   Reset to any 100% power IC, then
   - Enter SG01D, (300 gpm) SGTR on “D” SG
   - Enter RC08A, “A” PORV (455) failed closed.
   - Enter RC08B, “B” PORV (456) failed closed.
   - Enter IO RCLO0050 to OFF “A” PORV Block Valve green light off.
   - Enter IO RCLO0051 to OFF “A” PORV Block Valve red light off.
   - Place “A” PORV in CLOSE, and close the “A” PORV Block Valve.
   - Trip RCPs,
   - Perform E-0, step 1, through E-3, cooldown complete.
2. **Place Yellow Tags on the “A” PORV and PORV Block Valve**.
3. **Freeze the Simulator, and check**
   - RCPs tripped.
   - “A” PORV Block Valve closed with power removed, and
   - Yellow Tags hung on “A” PORV and “A” PORV Block Valve.

Approximate simulator setup time is 10 minutes.

* * * * <u>NOTES TO TASK PERFORMANCE EVALUATOR</u> * * * *

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **<u>ALL</u>** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **<u>NO</u>** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

JPM Number: 2017 NRC S.3

PERFORMANCE INFORMATION

Revision: 0 / 2

Task Title: Depressurize the RCS During a SG Tube Rupture

START TIME: ____________

STEP	Performance	Standard	Critical	Grade
STEP # 1	Performance: Obtain copy of E-3, and locates step 16, Depressurize RCS To Minimize Break Flow And Refill PZR	Standard: Obtains copy of E-3, and turns to step 16.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 2 E-3, step 16.a	Performance: **Depressurize RCS To Minimize Break Flow And Refill PZR** a. **CHECK** normal PZR spray - AVAILABLE	Standard: Realizes RCPs have been tripped, making spray not available, or attempts to depressurize the RCS using spray valves, and determines spray is ineffective. May attempt to use normal spray, and observe it is ineffective.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 3 E-3, step 16.a.RNO	Performance: a. RNO **PROCEED TO** NOTE prior to step 17.	Standard: Proceeds to E-3, step 17	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP # 4 E-3, Note prior to step 17	Performance: **NOTE** If an RCP is **NOT** running, the upper head region may void during RCS depressurization resulting in a rapidly increasing PZR level.	Standard: Reads Note	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 5 E-3, Caution prior to step 17	Performance: CAUTION • The PRT may rupture if a PZR PORV is used to depressurize the RCS resulting in abnormal containment conditions. • Cycling of the PZR PORVs should be minimized.	Standard: Reads Caution	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 6 E-3, step 17.a	Performance: **Depressurize RCS Using PZR PORV To Minimize Break Flow And Refill PZR** a. **CHECK** PZR PORV – AT LEAST ONE AVAILABLE	Standard: Realizes "B" PORV is available (Block Valve red light lit, green light off, and PORV green light lit) at MB4, and "A" PORV is not available (Tagged) on MB4.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP # 7 E-3, step 17.b	Performance: b. **<u>PROCEED</u> <u>TO</u>** step 17.f.	Standard: Proceeds to E-3, step 17.f	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 8 E-3, step 17.f	Performance: f. **DEPRESSURIZE** RCS using one PZR PORV	Standard: Selects “Open” on the “B” PORV switch on MB4. Observes the PORV does NOT open (Green light still lit, Red light still off). Proceeds to step 17.f RNO.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: This commences the Alternate Path portion of this JPM. Failure of the PORV to OPEN will require the Examinee to enter GA-28 to depressurize the RCS.			
STEP # 9 E-3, step 17.f.RNO	Performance: f. RNO **<u>RETURN</u> <u>TO</u>** step 17.c.	Standard: Returns to E-3, step 17.c	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #10 E-3, step 17.c	Performance: c. **CHECK** at least one SI pump - RUNNING	Standard: Checks at least one SIH Pump running by observing red light(s) lit and green light(s) off at MB2.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Both SIH Pumps are running.			
STEP #11 E-3, step 17.d	Performance: d. Using GA-28, **INITIATE** auxiliary spray to reduce RCS pressure	Standard: Obtains copy of GA-28, *Controlling RCS Pressure Using Auxiliary Spray*.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #12 GA-28, Note prior to step 1	Performance: NOTE With no RCPs running, the upper head region may void during RCS depressurization resulting in a rapidly increasing PZR level.	Standard: Reads note	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td rowspan="3">STEP #13
GA-28, step 1.a</td><td>Performance:
Determine Auxiliary Spray Availability
a. Verify the following:
• Instrument air - AVAILABLE
• At least one charging pump - RUNNING
• RCPs – NONE RUNNING</td><td>Standard:
Verifies Instrument Air pressure exists on Meter on MB1. May also check Air Compressor running (Red light lit) on MB1.
Verifies Charging Pumps are running (Red lights lit, Green lights off) at MB3
Checks no RCPs are running (Green lights lit, red lights off) at MB4</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #14
GA-28, step 2.a</td><td>Performance:
Align Auxiliary Spray For RCS Pressure Control
a. Unlock (key tag #37) and OPEN auxiliary spray valve (3RCS*AV8145)</td><td>Standard:
Obtains key from either key box on the side of the US desk, or from a Main Board component.
Inserts key into Aux Spray Valve controller on MB3, and rotates to the OPEN position.
Observes Red light lights, and green light goes off.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical nature of this step is to open the Aux Spray Valve.</td></tr>
<tr><td rowspan="3">STEP #15
GA-28, step 2.b</td><td>Performance:
b. Check both charging isolation valves - OPEN
• 3CHS*MV8106
• 3CHS*MV8105</td><td>Standard:
Checks both charging isolation valves, observes they are closed (Red lights off, green lights on) at MB3.
Proceeds to Response Not Obtained column.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #16 GA-28, step 2.b. RNO	Performance: b. RNO OPEN valves.	Standard: Depresses the OPEN pushbuttons for both charging isolation valves. Observes they stroke Open (Red lights light, green lights go off) at MB3.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical nature of this step is to open the both Charging Isolation valves.			
STEP #17 GA-28, step2.c	Performance: c. CLOSE charging loop isolation valves • 3CHS*AV8146 • 3CHS*AV8147	Standard: Closes Charging Loop Isolation Valves at MB3 by depressing the Close Pushbuttons. Observes the Charging Loop Isolation Valves are closed (Green lights lit, Red lights off) at MB3.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical portion of this step is to close the Charging Loop Isolation Valves.			
STEP #18 GA-28, step 2.d	Performance: d. Check both charging pump cold leg injection valves - CLOSED • 3SIH*MV8801A • 3SIH*MV8801B	Standard: Checks both charging pump cold leg injection valve position indications. Observes they are open (Red lights on, green lights off) at MB3 Proceeds to RNO column.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #19 GA-28, step 2.d. RNO	Performance: d. RNO CLOSE valves.	Standard: Depresses the CLOSE pushbuttons for both charging pump cold leg injection valves. Observes Red lights go off, green lights light at MB3	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical nature of this step is to close both Charging Isolation valves.			
STEP #20 GA-28, step 3.a	Performance: **Initiate Auxiliary Spray** a. Throttle charging flow controller as necessary to maintain or reduce RCS pressure as specified by the procedure in effect	Standard: Observes the Aux Spray Valve is already open (Red light lit, Green light off) at MB3	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #21 GA-28, step 3.b	Performance: b. Check REGEN HX LETDOWN TEMP HI (395°F) (MB3A 5-4) annunciator - LIT	Standard: Checks annunciator window at MB3A, 5-4. Observes it NOT lit.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: It is likely this annunciator is not lit. If the annunciator is lit, Examinee implements step 3.c to OPEN one charging header loop isolation valve, which increases cooling to the Regenerative Heat Exchanger.			

STEP #22 GA-28, step 3.b RNO	Performance: b. RNO Proceed to step 3.d. and IF at any time, REGEN HX LETDOWN TEMP HI (395°F) (MB3A 5-4) annunciator actuates, THEN OPEN one charging header loop isolation valve.	Standard: Proceeds to step 3.d. If the annunciator illuminates, Examinee OPENs one charging header loop isolation valve	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: This action increases cooling to the Regenerative Heat Exchanger.			
STEP #23 GA-28, step 3.d	Performance: d. Check RCS depressurization as specified by the procedure in effect - IN PROGRESS	Standard: Observes RCS pressure decreasing, either on a meter on MB3, or on the PPC	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #24	Performance: Inform the US when the depressurization has commenced.	Standard: Informs the US that the depressurization has commenced.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: ____________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.3 Revision: 0 / 2

Task Title: Depressurize the RCS During a SG Tube Rupture

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?	☐ Yes ☒ No		
Validated Time (minutes):	**16**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC S.3 Revision: 0 / 2

Initial Conditions:

A Steam Generator Tube Rupture has occurred on the “D” Steam Generator, and current conditions are as follows:

- The crew has entered E-3, *Steam Generator Tube Rupture*.
- The crew has completed the RCS cooldown per E-3, step 13, “Check If Cooldown Should Be Stopped.”
- The crew has just verified adequate subcooling exists per E-3, step 15, “Check RCS Subcooling Based on Core Exit TCs - GREATER THAN 52°F (135°F ADVERSE CTMT).”
- The “A” PORV Block Valve is tagged closed with its power removed.

Initiating Cues:

The US directs you to Depressurize the RCS using E-3, step 16, “Depressurize RCS To Minimize Break Flow And Refill PZR”.

Inform the US when the depressurization has commenced.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shifting the RHR System During Single Loop Operation

JPM Number: 2017 NRC S.4 Revision: 0 / 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

JPM Number: 2017 NRC S.4 Revision: 0 / 1

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Direct from Bank (JPM S136)	0
10/26/17	Changes made following NRC validation. • On page 4: Added NOTE to allow for task preview. In Simulator Requirements Section, added / re-configured detail to ensure stable IC. • JPM Step 5: Added comment on the possibility of a RHR Pp low flow alarm to annunciate. • JPM Steps 10,11 & 16: Bolded instructions for examiner / booth operator.	0 / 1

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC S.4 Revision: **0 / 1**

Task Title: Shifting the RHR System During Single Loop Operation

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes) 22

Applicable To: SRO ______ RO X

K/A Number: 005.A4.01 K/A Rating: 3.6 / 3.4

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Correctly shift the RHR system during single loop operation from Loop A to Loop B using OP 3310A

Required Materials: (procedures, equipment, etc.) OP 3310A, Rev 018

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.4 Revision : 0 / 1

NOTE: Prior to the examinee entering the simulator, distribute the following material to allow for task preview:
1. JPM Handout (Initial Condition / Initiating Cue)
2. OP 3310A precautions / pre-requisites and section 4.8

Initial Conditions: The plant is in MODE 5, and the following conditions exist:

- The crew is in the process of shifting protected trains from “A” Train protected to “B” train protected.
- OP 3310A, *Residual Heat Removal System*, Section 4.4, “Establishing RHR Train B Boron Concentration” is complete,
- OP 3310A, Section 4.6, “Aligning RHR Train B for Plant Cooldown” is complete.
- The “B” RHR Train has been previously operated during this outage.
- Current RCS boron concentration is the same as it was when RHR Train “B” was last in operation.

Initiating Cues: The US directs you to shift the RHR system from Train “A” to Train “B” using OP 3310A, Section 4.8, “Shifting the RHR System During Single Loop Operation From Train A to Train B”.

Simulator Requirements:

1. Reset to **IC 294 and Go To RUN, THEN:**

2. **ENSURE the following** controller settings / parameters:
   - ‘B’ PZR Spray valve is in MAN at 6% output controlling RCS pressure at 330 – 350 psia
   - 3RHS*HCV606 potentiometer set for a valve position of 20% open
   - 3RHS*HCV607 is closed
   - 3CHS*FCV121 is flowing ~92 gpm
   - ‘A’ Train Protected Signs are up
   - PPC Screen ‘T444S’ (3310A A & B RHR) is set-up at the RO workstation
   - **3SWP*AOV39B is OPEN** (required if running 2017 NRC S.7 in parallel)

Approximate simulator setup time is 10 minutes.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking “Y”. For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the applicant states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question applicant for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the applicant be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.4 **Revision:** 0 / 1

Task Title: Shifting the RHR System During Single Loop Operation

START TIME: ____________

<table>
<tr><td rowspan="3">STEP
1
OP 3310A
Step.4.8.1</td><td>Performance:
ENSURE Section 4.6, “Aligning RHR Train B for Plant Cooldown,” completed.</td><td>Standard:
Recollects from (or reviews) JPM initial conditions that section 4.6 has been completed for the “B” Train of RHR. May ask US to confirm that section 4.6 has been completed.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked, state, “Section 4.6, “Aligning RHR Train B for Plant Cooldown,’ has been completed.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP
2
OP 3310A
Step.4.8.2</td><td>Performance:
IF RHR Train B has previously been in operation during this shutdown, PERFORM the following:
a. IF either of the following conditions exist, Go To step 4.8.3:
• Current RCS boron concentration is less than or equal to the RCS boron concentration when RHR Train B was last in operation.
• RHR Train B boron concentration is known to be greater than required to meet the SDM of T/S 3.1.1.1.2 or 3.9.1.1, as applicable, AND T/S ACTION is not in effect prohibiting positive reactivity additions</td><td>Standard:
Recollects from (or reviews) JPM initial conditions that current RCS boron concentration is the same as it was when RHR Train “B” was last in operation. May ask US to confirm that one of these bullets is met.

Goes to step 4.8.3</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked, state, “current RCS boron concentration is the same as it was when RHR Train “B” was last in operation.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #3 OP 3310A Note prior to Step.4.8.3	Performance: Note RPCCW return line temperature from the RHR heat exchanger must not exceed 145F. Initial CCP flow of greater than 1,500 gpm will prevent exceeding this limit. The RPCCW Train B flow rates may be monitored using the computer points for Train B (CCP-F11B*, CCP-F12B*, and CCP-F15B*) or the corresponding MB1 indications.	Standard: Reviews the notes.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #4 OP 3310A, Step 4.8.3	Performance: Slowly THROTTLE open 3CCP-HK66B1, “RPCCW HX FLOW” (MB2), to provide at least 1,500 gpm cooling flow without exceeding the following limits: • RPCCW Train B total flow - 8,100 gpm • RPCCW flow through RHR HX - 7,000 gpm	Standard: Throttles open on controller 3CCP-HK66B1 thumbwheel. Observes RPCCW flow increases, and does not exceed flow limits (total Train B flow limit of 8,100 gpm and “B” RHR Heat Exchanger flow limit of 7,000 gpm) monitoring MB1 and MB3 meters, or PPC computer points.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical nature of this step is to avoid exceeding the flow limits. Momentary exceedance does not violate the critical nature of this step, since these flows are concerned with long term effects such as heat exchanger tube vibration.			
STEP #5 OP 3310A Step.4.8.4	Performance: START 3RHS*P1B, “RHR PP B” (MB2).	Standard: Rotates the “B” RHR Pump Control Switch to the “Start” position on MB2. Observes Red running light comes on, and the Green stopped light goes off on MB2.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: 1.) The critical portion of this step is to start the “B” RHR Pump. Candidate may also check motor amps on MB2. 2.) MB2C 4-9, RHR Pump B Flow Lo, may annunciate if operator doesn’t increase flow w/in 15 sec. This is acceptable.			

STEP # 6 OP 3310A Step.4.8.5	Performance: Slowly OPEN 3RHS-FK619, “RHR HDR FLOW,” to establish 4,000 gpm flow (MB2).	Standard: Depresses the up arrow (↑) pushbutton on 3RHS-FK619 and monitors the flow rate on MB2. Releases the pushbutton when indicated flow is approximately 4,000 gpm.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 7 OP 3310A Step.4.8.6	Performance: ENSURE 3RHS-FK619, “RHR HDR FLOW,” set to 4,000 gpm and PLACE in “AUTO” (MB2).	Standard: Verifies flow indicates approximately 4,000 gpm, and Depresses the 3RHS-FK619 “Auto/Manual” pushbutton and observes that the manual light goes out and the auto light comes on at MB2.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical portion of this step is placing the controller in AUTO, since the candidate has just verified 4.000 gpm flow in the previous step.			

<table>
<tr><td rowspan="3">STEP #8
OP 3310A
Step.4.8.7</td><td>Performance:
To shift RHR cooling from Train A to Train B, PERFORM the following concurrently (MB2):
• OPEN 3RHS-HC607, “HX B FLOW,” as necessary to maintain required RCS temperature
• CLOSE 3RHS-HC606, “HX A FLOW”</td><td>Standard:
Rotates the potentiometer for HCV606 in the close direction and HCV607 in the open direction on MB2.
Observes that the position indicating pointer for HCV607 throttles open toward the 100% (open) position, and the position indicating pointer for HCV606 moves to the 0% (close) position.
Stops rotating the potentiometers when HCV606 is fully closed.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: The critical portion of this step is to throttle open HC607, and close HC606.
Candidate may observe the position of 3RHS*HCV606 when starting to throttle the valves to determine an approximate position to open 3RHS*HCV607.</td></tr>
<tr><td rowspan="3">STEP #9
OP 3310A
Step.4.8.8</td><td>Performance:
ENSURE 3HVQ*ACUS1B, “RHR ACU,” running (VP1).</td><td>Standard:
Candidate goes to VP1 and observes the red light lit and green light out for ACUS1B on VP1C.
Or, acknowledges cue from examiner that HVU1B is running (if two JPMs are being conducted in parallel).</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If this JPM is being conducted in parallel with another JPM in the vicinity of VP1, cue the candidate: “The BOP Operator has verified ACU1B is running at VP1.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #10
OP 3310A
Step.4.8.9</td><td>Performance:
OPEN 3RHS*V37, RHR loop B to CVCS letdown isolation.</td><td>Standard:
Either directly contacts a PEO or requests that the US contact a PEO to locally open 3RHS*V37.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: Simulator Booth Operator calls the control room as a PEO to report “3RHS*V37 is open.”</td></tr>
<tr><td colspan="4">Comments: Simulator Booth Operator uses remote function RHR02 to open V37.
It is acceptable to direct the PEO to open 3RHS*V37 and close 3RHS*V20 with a single phone call.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #11
OP 3310A
Step.4.8.10</td><td>Performance:
CLOSE 3RHS*V20, RHR loop A to CVCS letdown isolation.</td><td>Standard:
Either directly contacts a PEO or requests that the US contact a PEO to locally close 3RHS*V20.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: After closing V20, the Simulator Booth Operator calls the control room as a PEO to report “3RHS*V20 is closed.” Time compression is allowed with NRC Examiner concurrence.</td></tr>
<tr><td colspan="4">Comments: Simulator Booth Operator uses remote function RHR01 to close V20.
It is acceptable to direct the PEO to open 3RHS*V37 and close 3RHS*V20 with a single phone call.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #12
OP 3310A
Step.4.8.11</td><td>Performance:
STOP 3RHS*P1A, “RHR PP A” (MB2).</td><td>Standard:
Rotates the control switch for 3RHS*P1A to “stop” at MB2.

Observes the green “off” light comes on, and the red “on” light goes off.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical nature of this step is stopping the RHR Pump.
Examinee may also check current indication for the motor goes to zero.</td></tr>
</table>

STEP #13 OP 3310A Note prior to Step.4.8.12	Performance: **NOTE** The RPCCW train flow rates may be monitored using the computer points for Train A (CCP-F11A*, CCP-F12A*, and CCP-F15A*), or Train B (CCP-F11B*, CCP-F12B*, and CCP-F15B*), or the corresponding MB1 indications.	Standard: Reviews the note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #14 OP 3310A Step.4.8.12	Performance: THROTTLE 3CCP-HK66A1 and 3CCP-HK66B1, "RPCCW HX FLOW" (MB2), as necessary without exceeding the following limits: • RPCCW Train A total flow - 8,100 gpm • RPCCW Train B total flow - 8,100 gpm • RPCCW flow through RHR HX - 7,000 gpm	Standard: Throttles controllers 3CCP-HK661 and 3CCP-HK66B1 thumbwheel if needed. Observes RPCCW flow changes, and does not exceed flow limits (total Train A flow and Train B flow limit of 8,100 gpm, and "B" RHR Heat Exchanger flow limit of 7,000 gpm) monitoring MB1 and MB3 meters, or PPC computer points.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical nature of this step is to avoid exceeding the flow limits. Momentary exceedance does not violate the critical nature of this step, since these flows are concerned with long term effects such as heat exchanger tube vibration.			

STEP	Performance	Standard	Critical	Grade
STEP #15 OP 3310A Step.4.8.13	Performance: PLACE 3RHS-FK618, “RHR HDR FLOW,” in “MAN” and ADJUST to 100% output (full closed) (MB2).	Standard: Depresses the down arrow (↓) pushbutton on 3RHS-FK618 on MB2. Releases the pushbutton after 100% output is indicated on MB2.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP #16 OP 3310A Step 4.8.14.a	Performance: <u>IF</u> Train A SI and QSS pumps *not* running, PERFORM the following (VP1): a. STOP 3HVQ*ACUS1A, “RHR ACU,” and PLACE in “AUTO.”	Standard: Candidate goes to VP1 and places the control switch for 3HVQ*ACUS1A in “Stop”, and then to “Auto”. Observes the red light is off and green light is lit at VP1. Or, acknowledges cue from examiner that the BOP operator has stopped 3HVQ*ACUS1A (if two JPMs are being conducted in parallel).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If this JPM is being conducted in parallel with another JPM in the vicinity of VP1, **cue the candidate:** “The BOP Operator has stopped 3HVQ*ACUS1A.”			
	Comments:			

<table>
<tr>
<td rowspan="3">STEP #17
OP 3310A Step 4.8.14.b</td>
<td>Performance:
b. IF AFW pumps are not running, PERFORM the following:
1) STOP 3HVQ*FN5A and 3HVQ*FN6A, “AFW AREA EMER SPLY/FANS/DMPRS.”
2) WHEN at least 90 seconds has elapsed, ENSURE 3HVQ*FN5B and 3HVQ*FN6B, “AFW AREA EMER SPLY/FANS/DMPRS,” running.</td>
<td>Standard:
Candidate goes to VP1 and places the control switch for 3HVQ*FN5A 3HVQ*FN6A in “Stop”.
Observes the red light is off and green light is lit at VP1.
After 90 seconds, observes 3HVQ*FN5B and 3HVQ*FN6B red light is lit, and green light is off at VP1.
Or, acknowledges cue from examiner that the BOP operator has stopped 3HVQ*FN5A and 3HVQ*FN6A, and has verified 3HVQ*FN5B and 3HVQ*FN6B have started (if two JPMs are being conducted in parallel).</td>
<td>Critical:
Y ☐ N ☒</td>
<td>Grade:
S ☐ U ☐</td>
</tr>
<tr>
<td colspan="4">Cue: If this JPM is being conducted in parallel with another JPM in the vicinity of VP1, cue the candidate: “The BOP Operator has stopped 3HVQ*FN5A and 3HVQ*FN6A, and has verified 3HVQ*FN5B and 3HVQ*FN6B have started.”</td>
</tr>
<tr>
<td colspan="4">Comments:</td>
</tr>
<tr>
<td rowspan="3">STEP #18
OP 3310A Step.4.8.15</td>
<td>Performance:
TRACK the time that Train A RHR is out of service while aligned to the RCS and IF Train A RHR is out of service for seven days or more AND IF any RCS loop is isolated AND there is fuel in the vessel, NOTIFY Chemistry Department in writing to obtain weekly boron sample of the A RHR loop through the A RHR heat exchanger drain valve.</td>
<td>Standard:
Informs the US that the time that Train A of RHR is out of service must be tracked.</td>
<td>Critical:
Y ☐ N ☒</td>
<td>Grade:
S ☐ U ☐</td>
</tr>
<tr>
<td colspan="4">Cue: “The US is performing step 4.8.15.”</td>
</tr>
<tr>
<td colspan="4">Comments:</td>
</tr>
</table>

STEP	Performance:	Standard:	Critical:	Grade:
STEP #19 OP 3310A Step.4.8.16	IF Train B RHR heat exchanger drain was being sampled on a weekly basis because Train B RHR was out of service while aligned to the RCS and an RCS loop was isolated with fuel in the vessel, NOTIFY Chemistry Department to stop sampling Train B RHR.	Informs the US about possible Chemistry Department notification requirement, Or determines this step is not applicable.	Y ☐ N ☒	S ☐ U ☐
	Cue: “The US is performing step 4.8.16.”			
	Comments:			

STEP	Performance:	Standard:	Critical:	Grade:
STEP #20 OP 3310A Step.4.8.16	Notifies US that RHR Trains have been shifted from Train A to Train B.	Reports to the US that RHR Trains have been shifted from Train A to Train B.	Y ☐ N ☒	S ☐ U ☐
	Cue: “The US acknowledges the trains have been shifted.”			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ______________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.4 Revision: 0 / 1

Task Title: Shifting the RHR System During Single Loop Operation

Date Performed: ____________________

Examinee: ____________________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**22**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

____

APPLICANT HANDOUT

JPM Number: 2017 NRC S.4 Revision: 0 / 1

Initial Conditions: The plant is in MODE 5, and the following conditions exist:

- The crew is in the process of shifting protected trains from “A” Train protected to “B” train protected.
- OP 3310A, *Residual Heat Removal System*, Section 4.4, “Establishing RHR Train B Boron Concentration” is complete,
- OP 3310A, Section 4.6, “Aligning RHR Train B for Plant Cooldown” is complete.
- The “B” RHR Train has been previously operated during this outage.
- Current RCS boron concentration is the same as it was when RHR Train “B” was last in operation.

Initiating Cues: The US directs you to shift the RHR system from Train “A” to Train “B” using OP 3310A, Section 4.8, “Shifting the RHR System During Single Loop Operation From Train A to Train B”.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Shift to SG Feedwater Flow Control Valves

JPM Number: 2017 NRC S.5 Revision: 0 / 2

Initiated:

Robert Royce 8/17/17

Developer Date

Reviewed:

Dave Minnich 8/17/17

Technical Reviewer Date

Reviewed:

E. Brodeur 8/18/17

Technical Reviewer Date

Approved:

M. J. Cote 8/18/17

Supervisor, Nuclear Training Date

JPM Number: 2017 NRC S.5 Revision: 0 / 2

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Original issue - New	0
9/9/17	Verified JPM up to date with revision 023 to OP 3203. Changed OP 3203 to rev 023 in the references section.	0 / 1
10/25/17	Changes made following NRC validation. • On page 3, changed to rev 24 of OP 3203 (no impact on associated procedure steps) • In Sim Requirement Section (pg 4): Listed IC 260 (wasn't listed) and editorial reformat to number & bold sim set-up steps.	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC S.5 Revision: 0 / 2

Task Title: Shift to SG Feedwater Flow Control Valves

Time Critical Task: ☐ YES ☒ NO

Validated Time (minutes): 12

Applicable To: SRO X RO X

K/A Number: 059.A4.03 K/A Rating: 2.9 / 2.9

Method of Testing: Simulated Performance: ____ Actual Performance: X

Location: Classroom: ____ Simulator: X In-Plant: ____

Task Standards: Correctly shift the FWS System from feeding the SGs with the Feed Control Bypass Valves to the Main Feed Control Valves

Required Materials: (procedures, equipment, etc.) OP 3203, Rev 024

General References:

*** READ TO THE EXAMINEE ***
I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. With the exception of the questions at the end, you may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.5 Revision : 0 / 2

Initial Conditions: The plant is at 25% power, and the following conditions exist:

- The crew is performing a plant startup using OP 3203, *Plant Startup*.
- OP 3203, Step 4.3.57, "INCREASE reactor power to approximately 25%" has just been completed.

Initiating Cues: The US directs you to SHIFT to SG feedwater flow control valves using OP 3203, Section 4.3.58, "Shift to SG Feedwater Flow Control Valves".

Simulator Requirements:

1. Reset to IC 260 (on Feed Control Bypass Valves at 25% power)

2. Set up MB4 computer display for "Wide Range Level" on a narrow band (approximately 60 to 70%).

3. Acknowledge/clear annunciators. Place the **simulator in "freeze".** Place the simulator in **"run" after the examinee** has read the initial conditions and initiating cues.

Approximate simulator setup time is 5 minutes.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.5 Revision: 0 / 2

Task Title: Shift to SG Feedwater Flow Control Valves

START TIME: ____________

STEP	Performance	Standard	Critical	Grade
STEP # 1 OP 3203, Note prior to step 4.3.58	Performance: **NOTE** 1. Computer display for "Wide Range Level" on a narrow band (approximately 60 to 70%) may be used as an aid in maintaining steam generator inventory constant. 2. Shifting to SG feedwater flow control valves may be shifted in any order, one SG at a time.	Standard: Reads Note	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			
STEP # 2 OP 3203 Step 4.3.58.a	Performance: SHIFT to SG feedwater flow control valves as follows: a. STATION an additional Operator at the feedwater control station.	Standard: Requests an additional operator at the feed station.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: An additional operator has been stationed.			
	Comments:			

<table>
<tr><td rowspan="3">STEP #3
OP 3203 Step 4.3.58.b</td><td>Performance:
OPEN the following valves:
• OPEN 3FWS-MOV35A, “SG FEEDWATER” “SG 1” “CNTL ISOL.”
• OPEN 3FWS-MOV35B, “SG FEEDWATER” “SG 2” “CNTL ISOL.”
• OPEN 3FWS-MOV35C, “SG FEEDWATER” “SG 3” “CNTL ISOL.”
• OPEN 3FWS-MOV35D, “SG FEEDWATER” “SG 4” “CNTL ISOL.”</td><td>Standard:
Depresses the OPEN pushbutton for 3FWS-MOV35A, B, C, and D.
Observes each of the valves’ Green lights go off, and Red lights illuminate.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: The critical portion of this step is to open the valves.</td></tr>
<tr><td rowspan="3">STEP #4
OP 3203, Step 4.3.58.c.1)</td><td>Performance:
SHIFT SG1 flow control as follows (MB5):
1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following:
• OPEN 3FWS-FK510, “SG FEEDWATER” “SG 1” “CONTROL” “FLOW”
• CLOSE 3FWS-LK550, “SG FEEDWATER” “SG1” “CONTROL” “BYP”</td><td>Standard:
Throttles open on controller 3FWS-FK510 while throttling down on 3FWS-LK550 at MB5 until the Feed Control Bypass valve is fully closed.
Observes Feed Reg Valve throttles open (red light illuminates), and the Bypass Valve is closed (Green light lit, Red light off) on MB5.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Per the note prior to this step, the operator can swap the four feed valves in any order.
The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve.</td></tr>
<tr><td rowspan="3">STEP #5
OP 3203, Step 4.3.58.c.2)</td><td>Performance:
2) WHEN SG 1 NR level is stable at approximately 50%, PLACE 3FWS- K510, “SG FEEDWATER” “SG1” “CONTROL” FLOW,” in “AUTO.”</td><td>Standard:
Depresses the “AUTO” pushbutton for 3FWS-FK510 on MB5.
Observes the AUTO light illuminates.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical portion of this step is to place the controller in Auto.</td></tr>
</table>

STEP #6 OP 3203, Step 4.3.58.d.1)	Performance: SHIFT SG2 flow control as follows (MB5): 1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following: • OPEN 3FWS-FK520, "SG FEEDWATER" "SG 2" "CONTROL" "FLOW" • CLOSE 3FWS-LK560, "SG FEEDWATER" "SG2" "CONTROL" "BYP"	Standard: Throttles open on controller 3FWS-FK520 while throttling down on 3FWS-LK560 at MB5 until the Feed Control Bypass valve is fully closed.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Per the note prior to this step, the operator can swap the four feed valves in any order. The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve.			
STEP #7 OP 3203, Step 4.3.58.d.2)	Performance: 2) WHEN SG 2 NR level is stable at approximately 50%, PLACE 3FWS-FK520, "SG FEEDWATER" "SG2" "CONTROL" "FLOW," in "AUTO."	Standard: Depresses the "AUTO" pushbutton for 3FWS-FK520 on MB5. Observes the AUTO light illuminates.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical portion of this step is to place the controller in Auto.			

<table>
<tr><td rowspan="3">STEP #8
OP 3203, Step 4.3.58.e.1)</td><td>Performance:
SHIFT SG3 flow control as follows (MB5):
1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following:
• OPEN 3FWS-FK530, “SG FEEDWATER” “SG 3” “CONTROL” “FLOW”
• CLOSE 3FWS-LK570, “SG FEEDWATER” “SG 3” “CONTROL” “BYP”</td><td>Standard:
Throttles open on controller 3FWS-FK530 while throttling down on 3FWS-LK570 at MB5 until the Feed Control Bypass valve is fully closed.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Per the note prior to this step, the operator can swap the four feed valves in any order.
The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve.</td></tr>
<tr><td rowspan="3">STEP #9
OP 3203, Step 4.3.58.e.2)</td><td>Performance:
2) WHEN SG 3 NR level is stable at approximately 50%, PLACE 3FWS-FK530, “SG FEEDWATER” “SG 3” “CONTROL” “FLOW,” in “AUTO.”</td><td>Standard:
Depresses the “AUTO” pushbutton for 3FWS-FK530 on MB5.
Observes the AUTO light illuminates.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical portion of this step is to place the controller in Auto.</td></tr>
</table>

STEP #10 OP 3203, Step 4.3.58.f.1)	Performance: SHIFT SG4 flow control as follows (MB5): 1) While maintaining feedwater flow as constant as possible, simultaneously PERFORM the following: • OPEN 3FWS-FK540, "SG FEEDWATER" "SG 4" "CONTROL" "FLOW" • CLOSE 3FWS-LK580, "SG FEEDWATER" "SG 4" "CONTROL" "BYP"	Standard: Throttles open on controller 3FWS-FK540 while throttling down on 3FWS-LK580 at MB5 until the Feed Control Bypass valve is fully closed.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Per the note prior to this step, the operator can swap the four feed valves in any order. The critical portion of this step is to maintain feed from the Feed Reg Valve, and close the Bypass Valve.			
STEP #11 OP 3203, Step 4.3.58.f.2)	Performance: 2) WHEN SG 4 NR level is stable at approximately 50%, PLACE 3FWS-FK540, "SG FEEDWATER" "SG 4" "CONTROL" "FLOW," in "AUTO."	Standard: Depresses the "AUTO" pushbutton for 3FWS-FK540 on MB5. Observes the AUTO light illuminates.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: Critical portion of this step is to place the controller in Auto.			
STEP #12	Performance: Notify US that feedwater has been shifted from the Feed Control Bypass Valves to the Feed Control Valves.	Standard: Report to the US that that feedwater has been shifted from the Feed Control Bypass Valves to the Feed Control Valves.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: The US acknowledges that feedwater has been shifted from the Feed Control Bypass Valves to the Feed Control Valves.			
	Comments:			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ______________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.5 Revision: 0 / 2

Task Title: Shift to SG Feedwater Flow Control Valves

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**12**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC S.5 Revision: 0 / 2

Initial Conditions: The plant is at 25% power, and the following conditions exist:

- The crew is performing a plant startup using OP 3203, *Plant Startup*.
- OP 3203, Step 4.3.57, "INCREASE reactor power to approximately 25%" has just been completed.

Initiating Cues: The US directs you to SHIFT to SG feedwater flow control valves using OP 3203, Section 4.3.58, "Shift to SG Feedwater Flow Control Valves".

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Manual CIA

JPM Number: 2017 NRC S.6 Revision: 0

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Direct from Bank (JPM S076-1)	0

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC S.6 Revision: 0

Task Title: Manual CIA

System: 103 Containment System

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 16

Applicable To: SRO **X** RO **X**

K/A Number: 103.A2.03 K/A Rating: 3.5 / 3.8

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Complete a manual CIA using EOP 35 E-0 and identify minimum safety function criteria.

Required Materials: (procedures, equipment, etc.) E-0, Rev. 32, Attachments "B" and "C"

General References: NA

*** READ TO THE EXAMINEE ***
I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.6 Revision : 0

Initial Conditions: With the plant initially at 100% power, the following sequence of events occurs:

1. The reactor trips, and Safety Injection actuates.
2. The Main Board annunciators are in “Master Silence”.
3. The crew enters E-0, *Reactor Trip or Safety Injection*.
4. E-0, Attachment B, *Actuation Signal Verification*, is complete through step B.9.

Initiating Cues: The US directs you to perform E-0, Attachment B, steps B.10 and B.11.

Simulator Requirements: **Preferred:**
Reset to IC-120

OR

Optional:
1. Reset to any 100% power IC
2. Insert Malfunctions:
   a. MS01A – 1 E 6
   b. RP11K - Failure of “CIA” to actuate
3. Insert I/O overrides for manual CIA:
   a. PB1-3ISC-CIA, RPDI0066 NISOLATE
   b. PB2-3ISC-CIA, RPDI0067 NISOLATE
   c. CHDI0082 “3FPW*CTV48” (open/auto)
   d. CHLO0033 to “off”
   e. CHLO0034 to “on”
   f. ANLO1163 to “off”
   g. ANLO1043 to “off”
   h. CHLO0029 to “off”
   i. CHLO0030 to “on”
4. Take the master silence switch to the SILENCE position
5. Place simulator in “RUN”
6. A reactor trip and safety injection will occur. Allow ESF Status Panel to finish changing state (CIA) components will remain “as is”)
7. Place the simulator in “FREEZE”
8. Place simulator in “RUN”, after the examinee has received the initial conditions and initiating cues

(Approximate simulator setup time is 15 minutes)

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.6 Revision: 0

Task Title: Manual CIA

START TIME: ____________

<table>
<tr><td rowspan="3">STEP #1
E-0
Att. B
Step
B.10</td><td>Performance:
Check CIA

Check ESF Group 2, columns 2 through 10 - LIT</td><td>Standard:
Observes Status Panel indication on MB2 and observes not all lights are lit (Group 2, columns 2 through 10).

Proceeds to step B.10 a. RNO.</td><td>Critical:
Y [ ]
N [X]</td><td>Grade
S [ ]
U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments</td><td colspan="4"></td></tr>
<tr><td rowspan="3">STEP #2
E-0
Att. B
Step
B.10.a
RNO</td><td>Performance:
Initiate CIA

<u>IF</u> ESF Group 2, columns 2 through 10 are <u>NOT</u> lit, <u>THEN</u> Refer to ATTACHMENT C <u>AND</u> REPOSITION valves to establish at least minimum safety function</td><td>Standard:
Initiates CIA by depressing both of the following CIA pushbuttons on MB2:
• TRAIN A CIA
• TRAIN B CIA

Determines CIA did NOT actuate and obtains Attachment C.</td><td>Critical:
Y [ ]
N [X]</td><td>Grade
S [ ]
U [ ]</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments</td><td colspan="4">The failure of CIA to automatically or manually actuate begins the alternate path portion of the JPM.</td></tr>
</table>

STEP #3 E-0 Att. B Step B.10.a RNO	Performance: Using Attachment C, Reposition valves as necessary for minimum safety function.	Standard: Obtains copy of E-0, Attachment C. 1. For each containment penetration isolation valve depresses the close push button or rotates control switch to the "close" position and observes indicating lights shift to green illuminated, red extinguished. 2. Recognizes three valves (in comment 2 below) will not go closed.	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:				
Comments:	In order to improve the examiner's ability to track examinee progress, E-0, Attachment C has been attached to this JPM, rather than separating each set of valves that requires checking into approximately 40 separate JPM steps. The examinee Is expected to attempt to close all valves on Attachment C. • The critical nature of these checks requires only one valve per block to be closed to meet minimum safety function • The failed CDS penetration cannot be isolated from the Main Boards. This is to be reported to the US. • Some penetrations only have single valve isolation. For these penetrations, there is only one valve in a block and it must be closed to meet minimum safety function. All valves will operate as expected with the exceptions of the following valves, which are failed in the OPEN position: • 3FPW*CTV48, Fire Water • 3CDS*CTV39B, Train B Return • 3CDS*CTV40B, Train B Return (both valves).			

STEP #4 E-0 Att. B Step B.11	Performance: Verify Proper ESF Status Panel Indication • **CHECK** ESF Group 1 lights – OFF • **CHECK** ESF Group 2 lights – LIT **RNO**- **ALIGN** component(s) for at least minimum safety function.	Standard: Observes status panel indication on MB2 and makes the following determination / report: 1) All valves are closed with the exception of 3FPW*CTV48, 3CDS*CTV39B, and 3CDS*CTV40B. 2) MINIMUM SAFETY FUNCTION is **NOT MET** as a CDS penetration is not isolated. 3) Reports expected exceptions of GROUP 2; 'A' and 'B' RPCCW Pump lights lit (expected with CDA present, which trips the pumps).	Critical: Y **[X]** N [ ]	Grade S [ ] U [ ]
Cue:	If the Examinee completes the step without making a report to the US, state "The US directs you to report the status of meeting Minimum Safety Function for CIA."			
Comments:	The **ONLY critical aspect** of this step is that the **examinee recognizes** that the **CDS penetration** is not isolated & **does NOT meet minimum safety function**. In order to make this decision, the examinee may reference a P&ID. After successful completion, the MB2 Status Panel should show only the following exceptions: - **GROUP 1: 9-17 & 10-17 LIGHTS LIT** for 'A' & 'B' RPCCW pumps - **GROUP 2: 2-3** (3CDS*V39B), **5-3** (3CDS*V40B), & **6-12** (3FPW*V48) lights **NOT LIT**			

TERMINATION CUE: The evaluation for this JPM is concluded.

STOP TIME: ________________

Attachment C "Containment Isolation Phase A Valves"

NOTE: Components are listed in a box with associated path isolation valve (where available).

Main Board 1 (Vertical)			
Component	**Description**	**Position**	**Train**
3SSP*CTV7	PASS Isolation	Closed	A
3SSP*CTV8	PASS Isolation	Closed	A
3SSR*CTV26 3SSR*CTV27	Rx Hot Leg Rx Hot Leg	Closed Closed	A B
3SSR*CTV29 3SSR*CTV30	Rx Cold Leg Rx Cold Leg	Closed Closed	A B
3SSR*CTV20 3SSR*CTV21	PZR Vapor PZR Vapor	Closed Closed	A B
3SSR*CV8026 3SSR*CV8025	PRT Gas PRT Gas	Closed Closed	A B
3SSR*CTV32 3SSR*CTV33	SI Accumulator SI Accumulator	Closed Closed	A B
3IAS*PV15 3IAS*MOV72	Instrument Air Instrument Air	Closed Closed	A B
3GSN*CTV105 3GSN*CV8033	Nitrogen to PRT Nitrogen to PRT	Closed Closed	A B
3CMS*CTV20 3CMS*CTV21	Ctmt Atmospheric Monitor Ctmt Atmospheric Monitor	Closed Closed	A B
3CMS*CTV23 3CMS*MOV24	Ctmt Atmospheric Monitor Ctmt Atmospheric Monitor	Closed Closed	A B
3VRS*CTV20 3VRS*CTV21	Gas Vent Gas Vent	Closed Closed	A B
3DGS*CTV24 3DGS*CTV25	Reactor Plant Drains Gaseous Reactor Plant Drains Gaseous	Closed Closed	A B
3DAS*CTV24 3DAS*CTV25	Reactor Plant Drains Aerated Reactor Plant Drains Aerated	Closed Closed	A B
3PGS*CV8046 3PGS*CV8028	Primary Water Primary Water	Closed Closed	A B
3FPW*CTV48 3FPW*CTV49	Fire Water Fire Water	Closed Closed	A B
3CVS*CTV20A 3CVS*CTV21A	Ctmt Vacuum Pump Ctmt Vacuum Pump	Closed Closed	A B
3CVS*CTV20B 3CVS*CTV21B	Ctmt Vacuum Pump Ctmt Vacuum Pump	Closed Closed	A B

Main Board 1 (Horizontal)			
Component	**Description**	**Position**	**Train**
3CDS*CTV38A 3CDS*CTV91A	Train A Supply Train A Supply	Closed Closed	A B
3CDS*CTV38B 3CDS*CTV91B	Train B Supply Train B Supply	Closed Closed	A B
3CDS*CTV39A 3CDS*CTV40A	Train A Return Train A Return	Closed Closed	A B
3CDS*CTV39B 3CDS*CTV40B	Train B Return Train B Return	Closed Closed	A B
3CDS*AOV45C/46C	Coil 1A (Train A)	Closed	A
3CDS*AOV45B/46B	Coil 1B (Train B)	Closed	B
3CCP*AOV10A/19A 3CCP*AOV197A/194A	Train A Supply / Return Isol Train A Supply / Return Isol	Closed Closed	A B
3CCP*AOV10B/19B 3CCP*AOV197B/194B	Train B Supply / Return Isol Train B Supply / Return Isol	Closed Closed	B A
3CCP*MV223/225	CDS/CCP Train A cross-connect	Open	A
3CCP*MV222/224	CDS/CCP Train A cross-connect	Open	A
3CCP*MV226/228	CDS/CCP Train B cross-connect	Open	B
3CCP*MV227/229	CDS/CCP Train B cross-connect	Open	B

Main Board 2 (Horizontal)			
Component	**Description**	**Position**	**Train**
3SIH*CV8823	Cold Legs	Closed	A
3SIH*CV8824	1/3 Hot Legs	Closed	A
3SIH*CV8881	2/4 Hot Legs	Closed	A
3SIH*CV8843	Chg Cold Legs	Closed	A
3SIH*CV8888	SI Accumulator Master Fill	Closed	B
3SIH*CV8964 3SIH*CV8871	SI Test Header SI Test Header	Closed Closed	B A
3SIL*CV8890A	1/2 Cold Legs	Closed	A
3SIL*CV8890B	3/4 Cold Legs	Closed	A
3SIL*CV8825	2/4 Hot Legs	Closed	A
3SIL*CV8968 3SIL*CV8880	Nitrogen Supply Nitrogen Supply	Closed Closed	A B

Main Board 3 (Horizontal)			
Component	**Description**	**Position**	**Train**
3CHS*MV8100 3CHS*MV8112	RCP Seal Isolation RCP Seal Isolation	Closed Closed	B A
3CHS*CV8160 3CHS*CV8152	Letdown Hdr Isolation Letdown Hdr Isolation	Closed Closed	A B

VERIFICATION OF JPM COMPLETION

JPM Number: **2017 NRC S.6** Revision: 0

Task Title: Manual CIA

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**16**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC S.6 Revision: 0

Initial Conditions: With the plant initially at 100% power, the following sequence of events occurs:

1. The reactor trips, and Safety Injection actuates.
2. The Main Board annunciators are in “Master Silence”.
3. The crew enters E-0, *Reactor Trip or Safety Injection*.
4. E-0, Attachment B, *Actuation Signal Verification*, is complete through step B.9.

Initiating Cues: The US directs you to perform E-0, Attachment B, steps B.10 and B.11.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Test Start The “B” EDG From MB8

JPM Number: 2017 NRC S.7 Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Direct from Bank (JPM S026)	0
9/7/17	Made JPM step 31 a critical step. Added a step 31 comment that the critical nature of this step is to avoid a reverse power trip. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1
10/26/17	Changes made following NRC validation. • On page 3, revised OP 3346A to current rev. 37 (no change to steps / jpm). • On page 4: In Simulator Requirements Section, added / re-configured detail to allow running JPM in parallel with S.4. Also, provided note to allow task preview. • JPM Step 40: Added clarification in Comment section that examinee should apply note and incrementally adjust EDG loading.	0 / 2

JPM WORKSHEET

Facility: MP 3 Examinee: ____________________

JPM Number: 2017 NRC S.7 Revision: 0 / 2

Task Title: Test Start The “B” EDG From MB8

System: 064 Emergency Diesel

Time Critical Task: ( ) YES (**x**) NO

Validated Time (minutes): 18

Task Number(s): 064-01-016

Applicable To: SRO **x** RO **x**

K/A Number: 064.A4.06 K/A Rating: 3.9 / 3.9

Method of Testing: Simulated Performance: _______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Satisfactorily start and load the “B” Emergency Diesel Generator from MB8 using OP 3346A.

Required Materials: (procedures, equipment, etc.) OP 3346A, Rev 037-00

General References:

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.7 Revision : 0 / 2

NOTE: Prior to the examinee entering the simulator, distribute the following material to allow for task preview:
1. JPM Handout (Initial Condition / Initiating Cue)
2. OP 3346A precautions / pre-requisites and sections 4.27 & 4.31.

Initial Conditions:

The plant is at 100% power.

- The Outside Rounds PEO at the "B" EDG enclosure and has completed the preliminary checks for starting the "B" EDG.
- The prestart portions of the EDG Data Sheet (OP 3346A-013) and Diesel B Operating Log (OP 3346A-015) have been completed.
- The SBO diesel is not running.
- Bus 34B is *not* paralleled to Unit 2 bus 24E.
- The Extra Operator will be filling out all required Ops Forms.
- The RO has just opened 3SWP*AOV39B "DG B OUT" at MB1.

Initiating Cues:

- The US directs you to conduct a test fast-start of the "B" EDG from MB8.
- The EDG is to be paralleled to Bus 34D and loaded to 1000KW, with Reactive Load adjusted to 0.6 MVAR Out.
- You are to use OP 3346A, *Emergency Diesel Generator*, Sections 4.27 and 4.31, performing steps 4.27.5 through 4.31.6.

Simulator Requirements:

IF running in parallel with 2017 NRC S.4, PERFORM the following:

1. Reset to **IC 294**
2. **ENSURE 3SWP*AOV39B is OPEN**
3. **ENSURE 2017 NRC S.4** other set-up requirements are met

IF NOT running in parallel with 2017 NRC S.4, PERFORM the following:

1. Reset to IC 18
2. Open 3SWP*AOV39B "DG B OUT" at MB1.

Approximate simulator setup time is 3-5 minutes.

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.7 Revision: 0 / 2

Task Title: Test Start The “B” EDG From MB8

START TIME: ________________

STEP	Performance:	Standard:	Critical:	Grade:
STEP # 1	Obtains copy of OP 3346A, *Emergency Diesel Generator*.	Obtains copy of OP 3346A, *Emergency Diesel Generator.* Turns to section 4.27, step 4.27.5.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

STEP	Performance:	Standard:	Critical:	Grade:
STEP # 2 OP 3346A Step 4.27.5	ENSURE “EDG B” “VOLT REG SEL” (MB8) in “AUTO” (preferred) or “MANUAL.”	Observes the control switch for the “B” diesel generator voltage regulator aligned to the “AUTO” position.	Y ☐ N ☒	S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td>STEP #3
OP 3346A Note prior to Step 4.27.6</td><td>Performance:
NOTE
The rocker arm prelube pump should not be run more than 30minutes a day.</td><td>Standard:
Reviews Note.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td rowspan="2"></td><td colspan="4">Cue: Inform the Examinee that the rocker arm prelube pump has not been run in the last 24 hours.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #4
OP 3346A Step 4.27.6</td><td>Performance:
START EGO*P1B, “PRELUBE” pump (MB8).</td><td>Standard:
Rotates the control switch for the “B” diesel generator rocker arm prelube pump to the “start” position and observes that the indicating lights shift to green OFF, red ON.
Also notes the time that the prelube pump was started.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td rowspan="2"></td><td colspan="4">Cue: If desired to shorten the JPM run time, the examiner may provide the following cue after ~ 15 seconds, “The prelube pump has run for 2 minutes.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #5 OP 3346A Step 4.27.7	Performance: WHEN two minutes have elapsed, STOP EGO*P1B, “PRELUBE” pump (MB8).	Standard: When at least two minutes have elapsed, or after the examiner has cued the Examinee that the prelube pump has run for 2 minutes, rotates the control switch for the “B” diesel generator rocker arm prelube pump to the “stop” position and observes the indicating lights shift to green ON, red OFF.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #6 OP 3346A Caution prior to Step 4.27.8	Performance: **CAUTION** Due to load sharing instability, parallel operation with station blackout diesel is prohibited.	Standard: Reviews Caution	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If the Examinee asks the US for the status of the SBO Diesel, state, “The SBO diesel is not running.”			
	Comments: As part of the initial conditions, the Examinee was told that the SBO diesel was not running.			

<table>
<tr><td>STEP #7
OP 3346A Step 4.27.8</td><td>Performance:
ENSURE SBO diesel is not paralleled to bus 34D.</td><td>Standard:
As part of the initial conditions, the Examinee was told that the SBO diesel was not running. May check the SBO diesel breaker (3BGS-ACB-BG-A is OPEN) on MB8 as a second check.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue: If the Examinee asks the US for the status of the SBO Diesel, state, “The SBO diesel is not running.”</td></tr>
<tr><td></td><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #8
OP 3346A Caution prior to Step 4.27.9</td><td>Performance:
CAUTION
The emergency diesel generator may be test started to ENSURE OPERABILITY, but should not be paralleled to emergency bus under any of the following conditions:
• Emergency diesel generator A is inoperable
• Emergency diesel generator A is operating in parallel
• During severe weather
• During possible loss of offsite power
• Cross-tie breaker 34D*1T---2 closed while 34B is paralleled to Unit 2 bus 24E.</td><td>Standard:
Reviews the Caution</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue: If asked, state
“The opposite train diesel is operable.”
“Severe weather conditions do not exist.”
“The grid is stable and a loss of offsite power is not anticipated.”
“34B is not paralleled to Unit 2 bus 24E.”</td></tr>
<tr><td></td><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #9
OP 3346A Step 4.27.9</td><td>Performance:
CHECK the following conditions do not exist:
• Emergency diesel generator A is inoperable
• Emergency diesel generator A is operating in parallel Severe weather
• Other possible loss of offsite power (LOP) condition
• 34D*1T-2 closed while 34B paralleled to Unit 2 bus 24E</td><td>Standard:
The Examinee may rely on JPM Initial Conditions to determine that none of these conditions exist. Examinee may also check MB8 indications for the status of the other diesel generator and offsite power, and may ask the US for the status of the other parameters.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: If asked, state
“The opposite train diesel is operable.”
“Severe weather conditions do not exist.”
“The grid is stable and a loss of offsite power is not anticipated.”
“34B is not paralleled to Unit 2 bus 24E.”</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td rowspan="3">STEP #10
OP 3346A Note prior to Step 4.27.10</td><td>Performance:
NOTE
1. Sequence of events computer points EGB-START and EGB-LOAD should be used to determine diesel start time. If the plant computer is unavailable, a stopwatch may be used to determine diesel start time (period between diesel start and the “LOAD” light on).
2. For routine starts, the time between engine start and loading to 20% load (1000 kW) should not be more than 30 minutes.</td><td>Standard:
Reviews the Note</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue: The Extra Operator will be checking and recording the Diesel Start Time.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #11 OP 3346A Step 4.27.10 .a	Performance: <u>IF</u> a fast start of the B EDG is desired, PERFORM the following: a. REVIEW steps 4.27.10b. through 4.27.10g. <u>AND</u> steps 4.31.1 through 4.31.7 prior to continuing with this procedure to minimize time between engine start and loading to 20% load (1000 kW).	Standard: Reviews Note, and reviews steps 4.27.10b. through 4.27.10g. AND steps 4.31.1through 4.31.7 prior to continuing with the procedure.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If the Examinee asks the US to confirm a fast-start is to be performed, state, “A fast-start is to be performed.”			
	Comments: As part of the initial conditions, the Examinee was told a fast start of the diesel is to be performed..			

STEP #12 OP 3346A Step 4.27.10 .b	Performance: ENSURE the “START MODE” switch is in “NORMAL” (3EGS*PNLB).	Standard: Contacts a PEO at the EDG, or requests the US contact the PEO, to ensure the “START MODE” switch is in “NORMAL” (3EGS*PNLB).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: When asked, report, “The START MODE switch at 3EGS*PNLB .is in “NORMAL”			
	Comments:			

STEP #13 OP 3346A Step 4.27.10.c.	Performance: PLACE diesel generator B "START" switch in "START" (MB8).	Standard: Rotates the start switch for the B diesel generator to the "start" position and observes that exciter volts, generator volts and generator frequency meters will move off their bottom pegs as EDG comes up to speed.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: The critical nature of this step is to take the start switch to "START".			

STEP #14 OP 3346A Step 4.27.10.d	Performance: CHECK diesel generator B "LOAD" light, lit (MB8).	Standard: Observes that the white "LOAD" light is lit after the "B" diesel generator frequency meter indicates 60 Hz.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td>STEP #15
OP 3346A Step 4.27.10.e</td><td>Performance:
Refer To OP 3346A-013 “Start” Section and DOCUMENT the following:
• Time diesel started
• Diesel start time</td><td>Standard:</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td rowspan="2"></td><td colspan="4">Cue: If the Examinee asks the US to confirm the start times are being documented, state “”The extra operator is documenting the diesel start times on the “Start” Section of 3346A-013</td></tr>
<tr><td colspan="4">Comments: As part of the initial conditions, the Examinee was told that the Extra Operator will be filling out all required Ops Forms.</td></tr>
</table>

<table>
<tr><td>STEP #16
OP 3346A Note prior to Step 4.27.10.f</td><td>Performance:
NOTE
Step 4.27.10f. can be performed in parallel with the remainder of this Section.</td><td>Standard:
Reviews the Note</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td rowspan="2"></td><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #17
OP 3346A Step 4.27.10.f</td><td>Performance:
COMPLETE “Immediately after diesel started” Section of OP 3346A---015.</td><td>Standard:
Recalls extra operator will be filling out forms, or confirms this by asking the US.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td rowspan="2"></td><td colspan="4">Cue: If the Examinee asks, or attempts to fill out this form, state, “The Extra Operator and the PEO at the Diesel will be filling out all required forms.</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #18
OP 3346A Step 4.27.10.g</td><td>Performance:
IF diesel generator B is to be paralleled to bus 34D, Go To Section 4.31.</td><td>Standard:
Goes to Section 4.31, since the diesel is to be loaded.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td rowspan="2"></td><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #19
OP 3346A Caution prior to Step 4.31.1</td><td>Performance:
CAUTION
1. SBO diesel must not be supplying the bus to which the emergency diesel generator is to be paralleled.
2. When Unit 3 is supplying Unit 2 offsite power through the SBO cross-tie, paralleling a Unit 3 emergency diesel generator to the same bus that is supplying Unit 2 bus 24E will increase the available fault current above the fault duty rating of Unit 2 and Unit 3 equipment, and should not be attempted, except during the performance of the monthly operability test.</td><td>Standard:
Examinee may rely on previous reports that the SBO Diesel is not running, and Unit 3 is not supplying Unit 2 through the SBO cross-tie, or may request this information from the US.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue: If the Examinee asks the US for the status of the SBO Diesel, state, “The SBO diesel is not running.”
If the Examinee asks the US for the status of Unit 3 supplying Unit 2, state,“ Unit 3 is not supplying Unit 2 offsite power through the SBO cross-tie.”</td></tr>
<tr><td></td><td colspan="4">Comments: As part of the initial conditions, the Examinee was told that the SBO diesel was not running.</td></tr>
</table>

<table>
<tr><td>STEP #20
OP 3346A Note prior to Step 4.31.1</td><td>Performance:
NOTE
1. Key # ILCO 999NY1E, “EGS*PNLB Local/Remote/MNTC,” located on the SM key ring or in the Work Control key locker (#6), may be required during the performance of this Section to position the “CONTROL MODE” selector switch on 3EGS*PNLB.
2. For routine starts, the time between engine start and loading to 20% load (1000 kW) should not be more than 30 minutes.</td><td>Standard:
Reviews Notes</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue:</td></tr>
<tr><td></td><td colspan="4">Comments: Note 1 is not applicable, since the Control Mode Switch does not need to be repositioned.</td></tr>
</table>

STEP #21 OP 3346A Step 4.31.1.a	Performance: IF paralleling diesel from Control Room, PERFORM the following (MB8): a. ENSURE "CONTROL MODE" switch in "REMOTE" (EGPB).	Standard: Requests PEO confirm the Control Mode Switch is in Remote at EGPB.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: The PEO reports "the "CONTROL MODE" switch is in "REMOTE" at EGPB."			
	Comments:			

STEP #22 OP 3346A Step 4.31.1 b	Performance: IF, at any time, a loss of offsite power occurs, Refer To Attachment 2 and PERFORM appropriate actions to ensure proper diesel operation or to restore diesel.	Standard: Reads step, but does not currently need to reference Attachment 2, since offsite power is available.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #23 OP 3346A Step 4.31.1 c	Performance: PLACE diesel generator B "MODE SEL" switch in "PARALLEL."	Standard: Rotates the "B" diesel generator mode selector switch to the "parallel" position at MB8.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #24 OP 3346A Step 4.31.1 d	Performance: PLACE diesel generator B to bus 34D "SYNC SEL" switch in "ON."	Standard: Places the "B" train handle into the "B" diesel generator to bus 34D synchronizing selector switch and rotates the handle to the "on" position at MB8.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments: The synchroscope is placed in service by this action, so the synchroscope starts to rotate.			

<table>
<tr><td>STEP #25
OP 3346A Step 4.31.1 e</td><td>Performance:
<u>IF</u> 34D*1T-2, "34B-34D TIE" is closed, CHECK the following:
• Bus 34B is not paralleled to Unit 2 bus 24E.
• SBO D/G not paralleled to bus 34B.</td><td>Standard:
Recognizes that, based on the Initial Conditions given for this JPM, Bus 34B is not paralleled to Unit 2, and the SBO Diesel is not paralleled to bus 34B. It is also acceptable if the Examinee requests the US confirm these conditions.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue: If the Examinee asks the US for the status of the SBO Diesel, state, "The SBO diesel is not running."
If the Examinee asks the US for the status of Unit 3 supplying Unit 2, state," Unit 3 is not supplying Unit 2 bus 24E."</td></tr>
<tr><td></td><td colspan="4">Comments: As part of the initial conditions, the Examinee was told that the SBO diesel was not running, and Bus 3B is not paralleled to Unit 2.</td></tr>
</table>

<table>
<tr><td>STEP #26
OP 3346A Step 4.31.1 f</td><td>Performance:
Refer To the following and ENTER required actions for EDG B inoperable:
• T/S 3.8.1.1, "A.C. Sources, Operating"
• T/S 3.8.1.2, "A.C. Sources, Shutdown"</td><td>Standard:
Requests the US reference these LCOs.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue: The US has referred to these Tech Specs, and has entered the required actions.</td></tr>
<tr><td></td><td colspan="4">Comments:</td></tr>
</table>

STEP #27 OP 3346A Step 4.31.1 g.1)	Performance: SYNCHRONIZE diesel to bus 34D as follows: 1) ADJUST diesel generator B “SPEED/LOAD” switch to obtain slow rotation of synchroscope in fast direction (8 to 20 seconds per revolution).	Standard: Rotates the “B” diesel generator Speed/Load switch to the “raise/lower” positions as necessary on MB8 so the synchroscope is rotating slowly in the fast direction.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #28 OP 3346A Step 4.31.1 g.2)	Performance: 2) Using the selected voltage regulator control, ADJUST “EDG B” voltage regulator to obtain “INCOMING” voltage slightly greater than “RUNNING” voltage.	Standard: Rotates the “B” diesel generator voltage regulator adjust switch to the “raise/lower” positions as necessary until the “INCOMING” voltage is slightly higher than the “RUNNING” voltage.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
	Cue: .			
	Comments: This step is only critical if incoming voltage is initially lower than running voltage.			

<table>
<tr><td rowspan="3">STEP
#29
OP
3346A
Note
prior
to Step
4.31.1
h.</td><td>Performance:
NOTE
As soon as the diesel generator B supply breaker is closed, the diesel load should be increased to 200 kW to prevent a reverse power trip.</td><td>Standard:
Reviews the Note</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: The “Seq B Trouble” Annunciator will come in at MB2. Simulator Instructor is to acknowledge this alarm.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP
#30
OP
3346A
Step
4.31.1
h</td><td>Performance:
<u>WHEN</u> the synchroscope is rotating slowly in fast direction <u>AND</u> is at five minutes before twelve o’ clock position, CLOSE DGB*34D-2, “EDG B SPLY.”</td><td>Standard:
When the synchroscope is approximately five minutes to twelve o’clock position, rotates the control switch for diesel generator “B” supply breaker to the “close” position and observes the indicating lights shift to green OFF, red ON.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Critical nature of this step is to actually close the breaker, which requires the closing interlock to be met. More than one attempt is allowed.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #31
OP 3346A Step 4.31.1 i</td><td>Performance:
Using diesel generator B “SPEED/LOAD” switch, LOAD diesel to a minimum of 200 kW as read on “kW.”</td><td>Standard:
Using the diesel generator B “SPEED/LOAD” switch, LOADs diesel to a minimum of 200kW as read on “KW”. On MB8</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments: Per the Note prior to this step, there should not be a delay in loading the diesel after closing the output breaker, to avoid a reverse power trip.

Critical nature of this step is to avoid a reverse power trip.</td></tr>
</table>

<table>
<tr><td rowspan="3">STEP #32
OP 3346A Step 4.31.1 j</td><td>Performance:
PLACE diesel generator B to bus 34D “SYNC SEL” switch in “OFF.”</td><td>Standard:
Rotates the diesel generator “B” to bus 34D synchronizing selector switch to the “off” position.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td colspan="4">Cue:</td></tr>
<tr><td colspan="4">Comments:</td></tr>
</table>

STEP #33 OP 3346A Step 4.31.1 k	Performance: Go To step 4.31.3	Standard: Goes To step 4.31.3	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #34 OP 3346A Note prior to Step 4.31.3	Performance: **NOTE** Step 4.31.3 can be performed while EDG is being loaded.	Standard: Reads the Note	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #35 OP 3346A Step 4.31.3	Performance: COMPLETE “After EDG Output Breaker is closed” Section of OP 3346A-015.	Standard:	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If the Examinee asks the US to confirm the After EDG Output Breaker is closed” Section of OP 3346A-015 is being completed, state “”The extra operator is completing OP 3346A-015.”			
	Comments: As part of the initial conditions, the Examinee was told that the Extra Operator will be filling out all required Ops Forms.			

STEP #36 OP 3346A Step 4.31.4	Performance: IF EDG B is to be the sole source supplying Bus 34D, Go To Section 4.32.	Standard: Recognizes that EDG B is not the sole source supplying Bus 34D, and does not go to section 4.32.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments: Bus 34D is also being supplied from offsite power via the 34B-34D bus cross-tie breaker.			

STEP #37 OP 3346A Step 4.31.5	Performance: OBSERVE the following load/duration limits and NOTIFY Engineering Department of any operation and duration with load greater than 5,000 kW. **Load** / **Maximum Duration** < 5,000 kW — 8,760 hours 5,000 to 5335 kW — 2000 hours 5,335 to 5,500 kW — 160 hours 5,500 to 6,000 kW — 30 min > 6,000 kW — Prohibited	Standard: As the diesel is loaded, the Examinee does not exceed 6,000 kW on EDG load.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #38 OP 3346A Caution prior to Step 4.31.6	Performance: **CAUTION** Unless during emergency situation or specified by surveillance test, diesel should *not* be loaded immediately to rated capacity.	Standard: Reads the Caution	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

<table>
<tr><td>STEP #39
OP 3346A Note prior to Step 4.31.6</td><td>Performance:
NOTE
Normal loading rate is no more than 200 kW (0.2 MW) per minute and 0.2 MVAR per minute.</td><td>Standard:
Reads the Note</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue:</td></tr>
<tr><td></td><td colspan="4">Comments:</td></tr>
</table>

<table>
<tr><td>STEP #40
OP 3346A Step 4.31.6 bullet #1</td><td>Performance:
<u>IF</u> operating diesel from Control Room, PERFORM the following simultaneously to raise EDG to desired loading: (MB8)

• Using “SPEED/LOAD” switch, ADJUST EDG load as indicated on either of the following:

• PPC Point 15G-15U-W
• “EDG B” “KW” (MB8)</td><td>Standard:
Rotates the “SPEED/LOAD” switch in the “raise/lower” directions as necessary to increase load.

Observes the normal loading limit of no more than 200 kW (0.2 MW) per minute, so the total time to reach 1000KW should be approximately 4 minutes based in initial 200 KW load.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td></td><td colspan="4">Cue:</td></tr>
<tr><td></td><td colspan="4">Comments: Critical portion of this step is to load the diesel to approximately 1000 kW (incrementally per NOTE).</td></tr>
</table>

STEP #41 OP 3346A Step 4.31.6 bullet #2	Performance: • WHEN EDG B is 20% loaded (1000 kW), RECORD time on OP 3346A-013.	Standard: May verify extra operator is logging this time, or may assume it is being done per the initial conditions provided for this JPM.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue: If the Examinee asks the US to confirm the time the diesel is 20% loaded on OP3346A-013, state “”The extra operator is completing OP 3346A-013.”			
	Comments: As part of the initial conditions, the Examinee was told that the Extra Operator will be filling out all required Ops Forms.			

STEP #42 OP 3346A Step 4.31.6 bullet #3	Performance: • Using selected voltage regulator control, ADJUST reactive load (3.0 to 3.2 MVAR OUT at full load, if *not* otherwise directed) as indicated on either of the following: • PPC Point 15G---15U---VR • “EDG B” “MVAR” (MB8)	Standard: Rotates the “B” diesel generator voltage regulator switch to the “raise/lower” positions as necessary to obtain 0.6 MVAR Out as read on either the PPC or on the MB8 meter.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

STEP #43	Performance: Informs US that the B EDG has been loaded to 1,000 kW (1 MWe).	Standard: Reports to the US that the B EDG has been loaded to 1,000 kW (1 MWe).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
	Cue:			
	Comments:			

Termination cue: The evaluation for this JPM is complete.

Stop Time:__________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.7 Revision: 0 / 2

Task Title: Test Start The “B” EDG From MB8

Date Performed: ____________

Examinee: ____________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly. If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**18**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC S.7 Revision: 0 / 2

Initial Conditions: The plant is at 100% power.

- The Outside Rounds PEO at the “B” EDG enclosure and has completed the preliminary checks for starting the “B” EDG.
- The prestart portions of the EDG Data Sheet (OP 3346A-013) and Diesel B Operating Log (OP 3346A-015) have been completed.
- The SBO diesel is not running.
- Bus 34B is *not* paralleled to Unit 2 bus 24E.
- The Extra Operator will be filling out all required Ops Forms.
- The RO has just opened 3SWP*AOV39B “DG B OUT” at MB1.

Initiating Cues:

- The US directs you to conduct a test fast-start of the “B” EDG from MB8.
- The EDG is to be paralleled to Bus 34D and loaded to 1000KW, with Reactive Load adjusted to 0.6 MVAR Out.
- You are to use OP 3346A, *Emergency Diesel Generator*, Sections 4.27 and 4.31, performing steps 4.27.5.through 4.31.6.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Starting Control Building Ventilation on Filtered Outside Air

JPM Number: 2017 NRC S.8 Revision: 0 / 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/15/17	Direct from Bank (JPM S032)	0
10/25/17	Changes made following NRC validation. • On page 3, changed OP 3314F to current rev. 34 (no changes to JPM) • Initial Conditions Section (pgs 4 & 12): Replaced 100% power condition with ES-0.1 (due to running S.1 and S.8 in parallel, no effect on this JPM). • Initiating Cue Section Section (pgs 4 & 12): Added the following cue: “All pre-requisites of OP 3314F have been completed.” • In Sim Requirement Section (pg 4): Added note: “Will be run in parallel with 2017 NRC S.1.” Also, changed IC to match S.1 (IC 44). • On page 10: Added STEP 13 (non-critical procedure step that was missing from previous revision).	0 / 1

JPM WORKSHEET

Facility: MP 3 Examinee: ____________________

JPM Number: 2017 NRC S.8 Revision: 0 / 1

Task Title: Starting Control Building Ventilation on Filtered Outside Air

System: 013

Time Critical Task: ( ) YES (x) NO

Validated Time (minutes): 9

Applicable To: SRO **X** RO **X**

K/A Number: 071.A2.09 K/A Rating: 3.0 / 3.5

Method of Testing: Simulated Performance: _______ Actual Performance: X

Location: Classroom: ______ Simulator: X In-Plant: ______

Task Standards: Satisfactorily complete starting Control Building Ventilation on filtered outside air using Train A in accordance with OP 3314F, *Control Building Heating, Ventilation, Air Conditioning and Chill Water*

Required Materials: (procedures, equipment, etc.) OP 3314F, Rev 034-00

General References: AOP 3573, *Radiation Monitor Alarm Response*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC S.8 Revision: 0 / 1

Initial Conditions: A few minutes ago, the plant tripped and it is presently in Mode 3. The following sequence of events have occurred:

1. A relief valve on the Gaseous Waste System lifts, and sticks open.
2. The RO reports Turbine Building Stack Rad Monitor 3HVR-RE10A shows an increasing trend.
3. The RO reports Control Room Return Air Rad Monitors 3HVC-RE91-1 and 3HVC-RE91-2 show an increasing trend.
4. The crew enters AOP 3573, *Radiation Monitor Alarm Response*.

There are no restrictions (solvents, painting, etc.) involving the use of the Control Building Filter Banks.

Initiating Cues: The US directs you to align the Train A Control Room Emergency Ventilation System to operate with recirculated outside filtered air using the Train "A" filter per OP 3314F, Section 4.10.2. All pre-requisites of OP 3314F have been completed.

Simulator Requirements: **Will be run in parallel with 2017 NRC S.1.**

Reset to IC 44, ES-0.1.

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC S.8 Revision: 0 / 1

Task Title: Starting Control Building Ventilation on Filtered Outside Air

START TIME: ____________

STEP #1 OP 3314F Note prior to Step 4.10.2	Performance: **NOTE** The Control Room will be pressurized in this mode.	Standard: Reads the Note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #2 OP 3314F, Step 4.10.2	Performance: IF desired to operate Train A Control Room Emergency Ventilation System with recirculated outside filtered air, PERFORM the following:	Standard: Uses this section of OP 3314F	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #3
OP 3314F Step 4.10.2.a</td><td>Performance:
<u>IF</u> desired, PERFORM the following:
CLOSE and DOG the following Control Building pressure boundary doors:
CB west 47’6” (C-47-1A)
CB east 64’6” (C-64-1B)
ENSURE the following Control Building pressure boundary doors, closed:
CB west 47’6” (C-47-1)
CB north 64’6” chiller room door, (C-64-4)
CB north 64’6” chiller room door, (C-64-5)
CB east 49’6” (C-49-1)</td><td>Standard:
Requests the US dispatch a PEO to perform step 4.10.2.a</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4">“It is NOT desired to CLOSE and DOG Control Building pressure boundary doors.”</td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #4
OP 3314F, Step 4.10.2.b</td><td>Performance:
CLOSE the following (VP1):
3HVC*AOD27A, “NORM SPLY DMPR”
3HVC*AOD27B, “NORM SPLY DMPR”</td><td>Standard:
Presses “CLOSE” Pushbuttons for 3HVC*AOD27A and HVC*AOD27B.

Observes the indicating lights green ON red light OFF.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">The critical portion of this step is closing the AOVs.</td></tr>
</table>

STEP #5 OP 3314F, Step 4.10.2.c.1)	Performance: PERFORM the following to stop Kitchen Exhaust Fan Ventilation System (VP1): 1) PLACE 3HVC-FN6, "KITCHEN EXH FAN," to "OFF."	Standard: Places 3HVC-FN6, "KITCHEN EXH FAN" control switch to OFF at VP1. Verifies Red light goes off, and Green light lights at VP1.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #6 OP 3314F Step 4.10.2.c.2)	Performance: 2) CLOSE the following: • 3HVC*AOV20, "KITCHEN EXH AIR ISOL" • 3HVC*AOV21, "KITCHEN EXH AIR ISOL"	Standard: Presses "CLOSE" pushbuttons for 3HVC*AOV20 and 3HVC*AOV21 at VP-1. Observes that the indicating lights green ON red OFF.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	The critical portion of this step is closing the AOVs.			
STEP #7 OP 3314F Step 4.10.2.d	Performance: ENSURE the following, open (VP1): • 3HVC*AOV25, "OUTSIDE AIR ISOL" • 3HVC*AOV26, "OUTSIDE AIR ISOL"	Standard: Observes 3HVC*AOV25, "OUTSIDE AIR ISOL" and 3HVC*AOV26, "OUTSIDE AIR ISOL" indicating lights green OFF red ON.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #8 OP 3314F, Step 4.10.2.e	Performance: IF 3HVC*AOV25 cannot be opened OR maintained opened, PERFORM the following (Local):	Standard: Observes 3HVC*AOV25 is already open (Red light ON, Green light OFF) at VP1. Marks step N/A.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	Step is **N/A**. No local action required, as 3HVC*AOV25 is open.			
STEP #9 OP 3314F, Step 4.10.2.f	Performance: IF 3HVC*AOV26 cannot be opened OR maintained opened, PERFORM the following (Local)….	Standard: Observes 3HVC*AOV26 is already open (Red light ON, Green light OFF) at VP1. Marks step N/A.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	Step is **N/A**. No local action is required, since 3HVC*AOV26 is open.			
STEP #10 OP 3314F, Step 4.10.2.g	Performance: ENSURE one of the following, running (VP1): • 3HVC*ACU1A, "CNTL RM ACU" • 3HVC*ACU1B, "CNTL RM ACU"	Standard: Observes indicating lights at VP1: 3HVC***ACU1A** green OFF red ON. 3HVC***ACU1B** green ON red OFF.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #11
OP 3314F Step 4.10.2.h</td><td>Performance:
<u>IF</u> Purge System is in service, Refer To step 4.12.2 and SHUTDOWN Control Building Purge System.</td><td>Standard:
Verifies Purge System is not in service, by observing Purge Off (Red light OFF, Green lights ON) on VP1. May also check Purge Dampers. Marks step N/A.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">This step is N/A. Purge system is not in service.</td></tr>
<tr><td>STEP #12
OP 3314F Step 4.10.2.i</td><td>Performance:
PLACE 3HVC*FN1A, “FLTR UNIT FAN/DMPRS,” to “ON” and OBSERVE the following (VP1):
1) 3HVC*MOD33A, “FLTR UNIT FAN/DMPRS,” opens.
2) 3HVC*FN1A, “FLTR UNIT FAN/DMPRS,” starts.
3) 3HVC*FLT1A, “FLTR BANK HTR,” on.
4) 3HVC*AOD119A. “RECIRC DMPR,” in “EMERGENCY.”</td><td>Standard:
Places 3HVC*FN1A to “ON” and observes the following (VP1):
1) 3HVC*MOD33A, “FLTR UNIT FAN/DMPRS,” opens (Red light ON, Green light OFF).
2) 3HVC*FN1A, “FLTR UNIT FAN/DMPRS,” starts (Red light ON, Green light OFF).
3) 3HVC*FLT1A, “FLTR BANK HTR,” on (Red light ON, Green light OFF).
4) 3HVC*AOD119A. “RECIRC DMPR,” in “EMERGENCY.”</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">Critical nature of the step is to start 3HVC*FN1A</td></tr>
</table>

STEP #13 OP 3314F Step 4.10.2.j	Performance: ENSURE VP1A 4-1, "CONTROL BLDG EMER VENT FAN SYS A TROUBLE" is clear.	Standard: Observes annunciator is clear.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #14	Performance: Notifies the US that Train A Control Building Ventilation has been started on Filtered Outside Air	Standard: Reports to the US that Train A Control Building Ventilation has been started on Filtered Outside Air.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

TERMINATION CUE: **"The evaluation for this JPM is completed".**

Stop Time:_________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC S.8 Revision: **0 / 1**

Task Title: Starting Control Building Ventilation on Filtered Outside Air

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**9**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC S.8 Revision: 0 / 1

Initial Conditions: A few minutes ago, the plant tripped and it is presently in Mode 3. The following sequence of events have occurred:

1. A relief valve on the Gaseous Waste System lifts, and sticks open.
2. The RO reports Turbine Building Stack Rad Monitor 3HVR-RE10A shows an increasing trend.
3. The RO reports Control Room Return Air Rad Monitors 3HVC-RE91-1 and 3HVC-RE91-2 show an increasing trend.
4. The crew enters AOP 3573, *Radiation Monitor Alarm Response*.

There are no restrictions (solvents, painting, etc.) involving the use of the Control Building Filter Banks.

Initiating Cues: The US directs you to align the Train A Control Room Emergency Ventilation System to operate with recirculated outside filtered air using the Train "A" filter per OP 3314F, Section 4.10.2. All pre-requisites of OP 3314F have been completed.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

JPM Number: 2017 NRC SRO A.1.1 Revision: 0 / 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Original issue (new)	0
10/24/17	Changes made following NRC validation. • On page 3, changed reference OP 3204 to Rev. 32. No impact on JPM. • Initiating Cue Section (pgs 4 & 13): Removed 2nd cue for 08:00 & 10:00 which read "Any actions, if any, required to be taken with reactor power prior to taking the instrument out of service." This was found to be confusing during validation. • JPM Step 2: Removed cue "If examinee starts addressing … state "All three 'A' SG pressure channels are indicating the same value". • JPM Step 8: Changed to Non – Critical step.	0 / 1

JPM WORKSHEET

Facility: MP3 Examinee: ______________________

JPM Number: 2017 NRC SRO A.1.1 Revision: 0 / 1

Task Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

Admin Area Conduct of Operations

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 15

Applicable To: SRO **X** RO ______

K/A Number: 2.1.7 K/A Rating: 4.4 / 4.7

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Given a specific set Instruments being removed from service, correctly determine the impact on the Plant Calorimetric Program, and determine required actions to maintain power within the licensed maximum power level.

Required Materials: SP 31002, Rev 018
(procedures, equipment, etc.) OP 3204, Rev 032

General References: Millstone 3 Operating License

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC SRO A.1.1 Revision : 0 / 1

Initial Conditions: The plant is at 100% power, as indicated by the Calorimetric program, which is in the "Steam Calc" mode.

The following sequence of events occurs:

Time:	Event:
08:00:	An I&C Technician reports to the control room, requesting to remove Steam Generator A Steam Pressure instrument 3MSS-PI516 from service.
09:00:	3MSS-PI516 is returned to service.
10:00:	S/G C Steam Flow Instrument 3MSS-F532 fails to zero.
10:00:	The crew enters AOP 3571, *Instrument Failure Response*, to address the failed instrument.

Initiating Cues: At 08:00, the Shift Manager directs you, the extra SRO on shift, to determine:

- The effect, if any, that removing the Steam Generator A Steam Pressure instrument 3MSS-PI516 from service will have on the plant calorimetric.

At 10:00, the Shift Manager directs you to determine:

- The effect, if any, that S/G C Steam Flow Instrument 3MSS-F532 failing to zero had on the plant calorimetric.

Consider each instrument separately.

Simulator Requirements: NONE

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.1.1 Revision: 0 / 1

Task Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

START TIME: ________________

STEP	Performance	Standard	Critical	Grade
STEP #1	Performance: Obtains a copy of SP 31002, *Plant Calorimetric*.	Standard: Obtains SP 31002. May review Prerequisites and Precautions.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #2 SP 31002, Attachment 7, Sheet 2 of 3	Performance: Determine the effect on the plant calorimetric, if any, of removing 3MSS-PI516 from service.	Standard: Locates 3MSS-P516 on Attachment 7 of SP 31002. Determines that it takes 2 or more of the 3 'A' SG pressure channels to cause a Shift to NIs. Notes that removing this instrument may affect CVSGP1, causing the averaged value to change (up or down).	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:	If the examinee starts looking at other actions, such as Tech Specs, state, "Your task is to determine the effect, if any, on the Calorimetric. The SM will be looking at other required actions."			
Comments:	Critical nature of this step includes determining that the Calorimetric will still function when this channel is removed from service. Examinee may consider actions such as directing the crew to monitor power indications when the instrument is removed from service.			

STEP #3 SP 31002, Attachment 7, Sheet 2 of 3	Performance: Determine the effect on the plant calorimetric, if any, of 3MSS-F532 failing low.	Standard: Determines that the Calorimetric will Shift to NIs Calc (since the Calorimetric was in the Steam Flow Calc mode).	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:	**When the SRO candidate states or otherwise indicates the Calorimetric will Shift to NIs, provide the candidate with Handout 2.**			
Comments:	Handout 2 will cue the examinee to determine actions required to maintain reactor power below the licensed maximum power level of 3650 MWth. (CVQRPA is a ten minute average of CVQRPI. This value updates once per second).			
STEP #4	Performance: Obtains a copy of OP 3204, *At Power Operations*.	Standard: References OP 3204, *At Power Operation*, **Section 4.3, "Steady State Operation".**	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	OP 3204 is referenced to determine the actions needed to address CVQRPA indicating 3725 MWth.			

STEP # 5 OP 3204, Note prior to step 4.3.1	Performance: 1. Major steps in this section may be performed in any order. 2. Calorimetric input shifts to the average of the four NI power range instruments when a faulty or invalid input to the calculated calorimetric is detected. The shift is indicated by a Computer Priority Alarm. 3. CVQRPI may experience a short duration (15 to 30 seconds) downward spike of four to six MWth while in steam flow calorimetric mode. This condition is caused by "Lower Plenum Flow Anomaly" and has been evaluated as acceptable by Reactor Engineering. A CR is *not* required for these occurrences. 4. If feedwater flow or steam generator levels are changing due to a transient, the calorimetric may *not* be accurate. Diverse reactor power indications should be used, as identified in SP 31002, "Plant Calorimetric," (Att.) "Characteristics of Various Power Level Indications."	Standard: Reviews the Note.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP	Performance	Standard	Critical	Grade
STEP #6 OP 3204, step 4.3.1.a.1)	Performance: MAINTAIN CVQRPA less than or equal to the licensed maximum power level (3,650 MWth) and PERFORM the following: IF CVQRPA exceeds 102% (3,723 MWth), PERFORM the following: 1) Immediately REDUCE reactor power to less than or equal to the licensed maximum power level (3,650 MWth).	Standard: Recognizes CVQRPA did exceed 102% (3,723 MWth). Examinee directs the crew (or otherwise states) to immediately lower reactor power to less than or equal to the licensed maximum power level (3,650 MWth).	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #7 OP 3204, step 4.3.1.a.2)	Performance: 2) NOTIFY Reactor Engineering.	Standard: Notifies Reactor Engineering that CVQRPA exceeded 102% (3,723 MWth).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	When the examinee requests or calls RE, state "Reactor Engineering has been notified."			
Comments:				
STEP #8 OP 3204, step 4.3.1.a.3)	Performance: IF the increase in indicated thermal power is due to a shift in calculation to feedwater flow OR NI input, Go To step 4.3.1.f.	Standard: Recognizes the reason CVQRPA exceeded 102% was due to a secondary transient and NOT due to a shift in calculation to feedwater flow or NI input. Moves on to step 4.3.1.a.4)	Critical: **Y** ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #9 OP 3204, step 4.3.1.a.4)	Performance: SUBMIT a CR.	Standard: Examinee directs the STA or the extra licensed operator to submit a CR, detailing the event or otherwise states that a CR must be submitted.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If the examinee questions whether it is desired for him to initiate a CR, state, "Another crewmember will initiate the CR."			
Comments:				
STEP #10 OP 3204, step 4.3.1.a.5)	Performance: REQUEST Reactor Engineering determine Reportability.	Standard: Examinee calls Reactor Engineering or otherwise states that RE needs to determine reportability.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #11 OP 3204, step 4.3.1.a.6)	Performance: Go To step 4.3.1.f.	Standard: Examinee proceeds to step 4.3.1.f.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #12
OP 3204, step 4.3.1.f</td><td>Performance:
MAINTAIN CVQRPSHFT less than or equal to the licensed maximum power level (3,650 MWth).</td><td>Standard:
Examinee directs the crew (or otherwise states) to maintain CVQRPSHFT less than or equal to the licensed maximum power level (3,650 MWth).</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">CVQRPSHFT is the average power over the course of the 12 hour shift. The crew is required to monitor CVQRPSHFT to ensure the 12 hour average does not exceed the maximum licensed power level.</td></tr>
<tr><td>STEP #13
OP 3204, step 4.3.1.g</td><td>Performance:
<u>IF</u> CVQRPSHFT exceeds licensed maximum power level (3,650 MWth) at the completion of a computer defined 12 hour shift, PERFORM the following….</td><td>Standard:
Recognizes that there is ample time to ensure CVQRPSHFT can be maintained less than or equal to 3,650 MWth, so there is no urgent action required for this step.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

STEP #15	Performance: Notifies the US that all required actions for this JPM have been completed.	Standard: Reports to the US that all required actions for this JPM have been completed.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: _______________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.1.1 Revision: 0 / 1

Task Title: Determine Effects on Calorimetric of Removing Instruments from Service, and Determine Required Actions

Date Performed: ________________

Examinee: ________________________________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**15**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC SRO A.1.1 Revision: 0 / 1

Initial Conditions: The plant is at 100% power, as indicated by the Calorimetric program, which is in the "Steam Calc" mode.

The following sequence of events occurs:

Time:	Event:
08:00:	An I&C Technician reports to the control room, requesting to remove Steam Generator A Steam Pressure instrument 3MSS-PI516 from service.
09:00:	3MSS-PI516 is returned to service.
10:00:	S/G C Steam Flow Instrument 3MSS-F532 fails to zero.
10:00:	The crew enters AOP 3571, *Instrument Failure Response*, to address the failed instrument.

Initiating Cue: At 08:00, the Shift Manager directs you, the extra SRO on shift, to determine:

- The effect, if any, that removing the Steam Generator A Steam Pressure instrument 3MSS-PI516 from service will have on the plant calorimetric.

At 10:00, the Shift Manager directs you to determine:

- The effect, if any, that S/G C Steam Flow Instrument 3MSS-F532 failing to zero had on the plant calorimetric.

Consider each instrument separately.

EXAMINEE HANDOUT

JPM Number:	2017 NRC SRO A.1.1	Revision:	0 / 1

EXAMINEE HANDOUT 2

DO NOT provide this handout until cued

Initial Conditions:	A secondary transient has occurred which resulted in a reactor power excursion. The secondary plant has been stabilized utilizing the appropriate ARPs. The RO reports that CVQRPA has increased to 3,725 MWth.
Initiating Cue:	The SM directs you to determine the actions needed to address CVQRPA indicating 3725 MWth."

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Check Refueling Admin Requirements

JPM Number: 2017 NRC SRO A.1.2 Revision: 0 / 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

Eric Brodeur	8/22/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/22/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Original issue (new)	0
10/25/17	Changes made following NRC validation. • Referenced revision to OP 3210B and SP 3672.2 (page 3). This did not alter JPM content. • Initiating Cue Section (pgs 4 & 14): Removed the following two bullets: "Which LCO ACTION(S), if any, which is/are required to be entered." "What specific action(s), if any, other than stopping fuel movement is/are required to be taken based on any LCO ACTIONs that have been entered." Re-worked cue to read, in part, "Record any Tech Spec Actions required (if any) or reporting requirements (if any) as a result of your review at the bottom/back of this page."	0 / 1

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC SRO A.1.2 Revision: 0 / 1

Task Title: Check Refueling Admin Requirements

Admin Area Conduct of Operations

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 30

Applicable To: SRO **X** RO ______

K/A Number: 2.1.40 K/A Rating: 2.8 / 3.9

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Given a specific set of plant conditions, correctly determine the status of Refueling Admin Requirements

Required Materials: (procedures, equipment, etc.)
OP 3210A, Rev 14-3
OP 3210B, Rev 11
SP 3613F.3, Rev 05-2
SP 3613F.3-001, Rev 06-1
SP 3672.2, Rev 06
MP3 Technical Specifications, Section 9, Refueling Operations
MP3 Technical Technical Requirements Manual
SP 3670.1-017, MODE 5/6/0 Daily and Shiftly Control Room Rounds

General References: None

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC SRO A.1.2 Revision : 0 / 1

Initial Conditions:

Current Conditions:

- The plant is in MODE 6.
- The Reactor has been subcritical for 200 hours.
- Refueling Cavity level is 49 feet, 10 inches.
- Refueling Cavity Boron concentration is 2800 ppm.
- Fuel Pool Boron concentration is 2800 ppm.
- Westinghouse Source Range Channel N31 is out of service for surveillance testing.
- Both Gammametrics Channels are OPERABLE.
- The status of the Containment Equipment Hatch is as follows:
    - The hatch is open, open under administrative control.
    - It is estimated that the hatch is capable of being closed and bolted in place in 25 minutes.
    - Maintenance has reported the bolts used to bolt the hatch have been spilled, and currently only three bolts are available to bolt the equipment hatch.
    - It is estimated the remaining bolts can be retrieved and bolted in place in 45 minutes, if needed.
- The status of the Containment personnel access hatch is as follows:
    - Both personnel access hatch doors are open for personnel access to Containment, under administrative control.
    - Only one of the two personnel access hatch doors is OPERABLE. and capable of being closed.
- All other Containment penetrations providing direct access from the containment atmosphere to the outside atmosphere are closed by an isolation valve, blind flange, or manual valve.
- The “A”RHR loop is OPERABLE and in operation.
- The “B” RHR Pump has been tagged out for maintenance.
- Five hours ago, RHR flow was suspended for one hour to improve fuel pool visibility.
- Fifteen minutes ago, RHR flow was lowered from 4000 gpm to 2500 gpm to improve fuel pool visibility.
- The refueling team has established communications with the control room
- All other conditions are as expected for fuel movement.

The refueling team requests permission from the Refueling SRO to re-commence moving fuel, moving the next fuel bundle from the fuel building to the core.

Initiating Cues:

As the refueling SRO, determine all conditions that are required to be corrected in order to re-commence moving fuel.

Record any Tech Spec Actions required (if any) or reporting requirements (if any) as a result of your review at the bottom/back of this page.

Simulator Requirements: NONE

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking "Y". For the student to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the student states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question student for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the student be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.1.2 Revision: 0 / 1

Task Title: Check Refueling Admin Requirements

START TIME: ____________

STEP #1	Performance: Obtains references, and determines correct sections to be used.	Standard: Obtains OP 3210B. Obtains Tech Specs and COLR. May also obtain OP 3210A, SP3613F.3 and/or SP 3672.2	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If asked at any time during this JPM about any condition not specified in the initial conditions of this JPM, state, "All other conditions not specified in the Initial Conditions for this JPM are as expected for fuel movement."			
Comments:	The examinee is to assume all admin requirements not specified in the initial conditions for this JPM are met, since the initial conditions also state, "All other conditions are as expected for fuel movement." The steps in this JPM may be performed in any order, and references may be obtained as needed.			
STEP #2 LCO 3.9.1.1 COLR	Performance: An RCS boron concentration of greater than or equal to the limit specified in the CORE OPERATING LIMITS REPORT (COLR).	Standard: Confirms actual RCS Boron concentration (2800 ppm) exceeds the required minimum amount specified in the COLR.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If asked about Keff or CVCS Dilution Valve status, state "RE has confirmed Keff is <0.95, and the CVCS valves of Specification 4.1.1.2.2 are closed and secured in position."			
Comments:	The examinee may assume dilution valves are in the proper position, and that Keff is <0.95, since the initial conditions for this JPM stated that all other conditions are as expected for fuel movement. The COLR is located in the Technical Requirements Manual, Appendix 8.1.			

STEP #3 LCO 3.9.1.2	Performance: The soluble boron concentration of the Spent Fuel Pool shall be greater than or equal to 800 ppm.	Standard: Confirms actual Fuel Pool Boron concentration (2800 ppm) exceeds the required minimum amount of 800 ppm specified in Tech Specs.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #4 LCO 3.9.2 OP 3210B, Step 2.1.18	Performance: Two Source Range Neutron Flux Monitors shall be OPERABLE with continuous visual indication in the control room, and one with audible indication in the containment and control room.	Standard: Determines that even with one Westinghouse SR NIS Channel INOPERABLE, Gammametrics is an acceptable substitute, and either Westinghouse channel is capable of providing audible indication in Containment and in the Control Room.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If asked, "Reactor Engineering has determined that Gamma-Metrics source range channel is coupled to the core."			
Comments:	SP 3670.1-017 (MODE 5/6/0 CR logs) and Tech Spec bases clarifies TS LCO 3.9.2. One Gamma---Metrics source range channel may be used to satisfy the Mode 6 source range neutron flux monitoring requirement provided that the channel is "coupled" to the core.			
STEP #5 LCO 3.9.3.	Performance: The reactor shall be subcritical for at least 100 hours.	Standard: Confirms actual time subcritical (200 hours) exceeds the required minimum time of 100 hours specified in Tech Specs.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #6
LCO 3.9.4.a
SP 3613F.3-001</td><td>Performance:
The containment building penetrations shall be in the following status:
The equipment access hatch shall be either:
1. closed and held in place by a minimum of four bolts, or
2. open under administrative control * and capable of being closed and held in place by a minimum of four bolts,
* Administrative controls shall ensure that appropriate personnel are aware that the equipment access hatch penetration, personnel access hatch doors and/or other containment penetrations are open, and that a specific individual(s) is designated and available to close the equipment access hatch penetration, a personnel access hatch door and/or other containment penetrations within 30 minutes if a fuel handling accident occurs.</td><td>Standard:
Recognizes the Containment Equipment Hatch status will NOT allow movement of fuel in Containment, since, even though other admin controls are in place, having only three bolts that can be bolted in place within 30 minutes does NOT meet the minimum requirement of four bolts.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">Examinee must recognize that a minimum of four bolts are required within 30 minutes to meet this requirement.</td></tr>
<tr><td>STEP #7
LCO 3.9.4.b
SP 3613F.3-001</td><td>Performance:
A personnel access hatch shall be either:
1. closed by one personnel access hatch door, or
2. capable of being closed by an OPERABLE personnel access hatch door, under administrative control*</td><td>Standard:
Determines that even with one personnel Access Door INOPERABLE, and both doors open, the Access Hatch is acceptable, since admin controls are in place, and one door is OPERABLE.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

STEP # 8 LCO 3.9.4.c. SP 3613F.3-001	Performance: Each penetration providing direct access from the containment atmosphere to the outside atmosphere shall be either: 1. Closed by an isolation valve, blind flange, or manual valve, or 2. Be capable of being closed under administrative control.*	Standard: Recalls from JPM initial conditions that each of these penetrations are are closed by an isolation valve, blind flange, or manual valve, or asks the Control Room to confirm the state of these penetrations.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If asked to verify status of these penetrations, state, “Each of these penetrations are closed by an isolation valve, blind flange, or manual valve.”			
Comments:	The examinee may recall from the initial conditions that these paths are isolated.			

STEP	Performance	Standard	Critical	Grade
STEP #9 LCO 3.9.8.1 and 3.9.8.2 OP 3210B, Step 2.1.15 OP 3210A, Att. 2.	Performance: At least one residual heat removal (RHR) loop shall be OPERABLE and in operation.* Applicability: MODE 6, when the water level above the top of the reactor vessel flange is greater than or equal to 23 feet. Two independent residual heat removal (RHR) loops shall be OPERABLE, and at least one RHR loop shall be in operation.* Applicability: MODE 6, when the water level above the top of the reactor vessel flange is less than 23 feet.	Standard: Determines that LCO 3.9.8.1 applies, rather than LCO 3.9.8.2, since water level is above the top of the reactor vessel flange by $\geq$ 23 feet. Determines that it is acceptable to have one RHR Pump INOPERABLE, since adequate refueling cavity level exists, since only one RHR loop is required.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #10 LCO 4.9.8.1.1, plus NOTE for LCO 3.9.8.1 OP 3210B, Step 3.9 and 3.10	Performance: At least one RHR loop shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 2800 gpm at the frequency specified in the Surveillance Frequency Control Program. *The RHR loop may be removed from operation for up to 1 hour per 8-hour period, provided no operations are permitted that could cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1.1.	Standard: Determines that current RHR flowrate (2500 gpm) is **below the minimum flow** required by Surveillance Requirement 4.9.8.1.1 (2800 gpm). This is acceptable per the Note associated with LCO 3.9.8.1, up to a maximum of 1 hour per 8-hour period. Recognizes this 1 hour flow allowance was used up 5 hours ago, so RHR flow is required to be increased before commencing fuel movement.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #11 LCO 3.9.10 OP 3210A, Att. 2.	Performance: At least 23 feet of water shall be maintained over the top of the reactor vessel flange.	Standard: Determines level given in the Initial Conditions (49', 10") is above the top of the reactor vessel flange by $\geq$ 23 feet,	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #12 LCO 3.9.11 through 3.9.14	Performance Water Level - Storage Pool Spent Fuel Pool – Reactivity Spent Fuel Pool - Storage Pattern	Standard: Recognizes from the JPM Initial Conditions that there are no abnormal conditions in the Spent Fuel Pool	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If asked about the status of conditions in the Spent Fuel Pool, state, "All conditions in the Spent Fuel Pool are as expected for fuel movement."			
Comments:	The examinee may assume that all conditions in the Spent Fuel Pool are acceptable, since the initial conditions for this JPM stated that all other conditions are as expected for fuel movement.			

<table>
<tr><td>STEP #13
Required LCO ACTIONS</td><td>Performance:
Determine which LCO ACTION(S), if any, which is/are required to be entered.
Determine what specific action(s), other than stopping fuel movement that is/are required to be taken based on any LCO ACTIONs that have been entered, if any.</td><td>Standard:
Logs into
1. LCO 3.9.4.a ACTION and
2. 3.9.8.1 ACTION,

Actions required beyond stopping fuel movement are from 3.9.8.1 ACTION, which requires the crew to:
1. Suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet the boron concentration of LCO 3.9.1, and
2. Immediately initiate corrective action to return the required RHR loop to OPERABLE and operating status as soon as possible. Also,
3. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #14</td><td>Performance:
Notify the Control Room.</td><td>Standard:
Reports that issues with the Containment Equipment Hatch and RHR flow prevent fuel movement, and reports required ACTIONS per LCO 3.9.4.a and 3.9.8.1, including specific actions required.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: __________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.1.2 Revision: 0 / 1

Task Title: Check Refueling Admin Requirements

Date Performed: ____________

Examinee: ____________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	30	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

STUDENT HANDOUT

JPM Number: 2017 NRC SRO A.1.2 Revision: 0 / 1

Initial Conditions: Current Conditions:

- The plant is in MODE 6.
- The Reactor has been subcritical for 200 hours.
- Refueling Cavity level is 49 feet, 10 inches.
- Refueling Cavity Boron concentration is 2800 ppm.
- Fuel Pool Boron concentration is 2800 ppm.
- Westinghouse Source Range Channel N31 is out of service for surveillance testing.
- Both Gammametrics Channels are OPERABLE.
- The status of the Containment Equipment Hatch is as follows:
  - The hatch is open, open under administrative control.
  - It is estimated that the hatch is capable of being closed and bolted in place in 25 minutes.
  - Maintenance has reported the bolts used to bolt the hatch have been spilled, and currently only three bolts are available to bolt the equipment hatch.
  - It is estimated the remaining bolts can be retrieved and bolted in place in 45 minutes, if needed.
- The status of the Containment personnel access hatch is as follows:
  - Both personnel access hatch doors are open for personnel access to Containment, under administrative control.
  - Only one of the two personnel access hatch doors is OPERABLE. and capable of being closed.
- All other Containment penetrations providing direct access from the containment atmosphere to the outside atmosphere are closed by an isolation valve, blind flange, or manual valve.
- The “A”RHR loop is OPERABLE and in operation.
- The “B” RHR Pump has been tagged out for maintenance.
- Five hours ago, RHR flow was suspended for one hour to improve fuel pool visibility.
- Fifteen minutes ago, RHR flow was lowered from 4000 gpm to 2500 gpm to improve fuel pool visibility.
- The refueling team has established communications with the control room
- All other conditions are as expected for fuel movement.

The refueling team requests permission from the Refueling SRO to re-commence moving fuel, moving the next fuel bundle from the fuel building to the core.

Initiating Cue: As the refueling SRO, determine all conditions that are required to be corrected in order to re-commence moving fuel.

Record any Tech Spec Actions required (if any) or reporting requirements (if any) as a result of your review at the bottom/back of this page.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Complete a Shutdown Safety Assessment Checklist.

JPM Number: 2017 NRC SRO A.2 Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

Eric Brodeur	8/22/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/22/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Direct from Bank (JPM A105)	0
9/7/17	Added to initial conditions that Annunciator MB8A 4-12, *BUS 34C BUS DIFF* is in alarm. This precludes the candidate from questioning whether or not the 'A' EDG is available to power the A" Train normal and emergency buses. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1
10/25/17	Changes made following NRC validation. • Due to OU-M3-201 being revised, made minor changes to step numbers. Also, had to create JPM Step 6 for new step that relates to Security. As such, a bullet was added to the cue stating: "Security requirements for crediting the Terry Turbine as operable are met." • Initial Conditions Section (pgs 4 & 17): Added the following bullet: "Pressurizer Level is 65% with a Pressurizer bubble established • Initiating Cue Section (pg 17): Changed cue to match pg 4 cue sheet.	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ____________

JPM Number: 2017 NRC SRO A.2 Revision: 0 / 2

Task Title: Complete a Shutdown Safety Assessment Checklist.

Admin Area Equipment Control

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 30

Applicable To: SRO **X** RO ______

K/A Number: 2.2.18 K/A Rating: 2.6 / 3.9

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Given a specific set of plant conditions, correctly perform a Shutdown Safety Assessment Checklist.

Required Materials: (procedures, equipment, etc.) OU-M3-201, Rev 25, *Shutdown Safety Assessment Checklist*.

General References: OU-AA-200, *Shutdown Risk Management*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC SRO A.2 Revision : 0 / 2

<u>Initial Conditions</u>:

The plant is in MODE 5, and initial conditions are as follows:

- The plant is in day 28 of a scheduled 30 day refueling outage.
- RCS Boron concentration is 1987 ppm, which is in excess of required Shutdown margin.
- RCS temperature is 160°F
- RCS pressure is 360 psia.
- “A” Train is protected.
- Both RHR trains are aligned for cooldown with the ‘A’ RHR running.
- The ‘A’ Charging pump is running.
- The ‘C’ Charging pump is tagged out with its breaker racked down.
- All four RCS loops have been vacuum filled.
- Pressurizer Level is 65% with a Pressurizer bubble established
- All four SGs are at 50% narrow range level.
- The ‘B’ SI pump is available for inventory control, caution tagged in the Pull-to-Lock position, with its breaker racked up, and its UC fuses removed.
- Containment Closure is set with exceptions tracked and capable of being closed prior to core boiling and prior to 4 hours.
- 3RHS*V43, RHR to RWST recirculation, is tagged and locked closed.
- 1,200,000 gallons in the RWST.
- Both the North and South busses of the 345KV switchyard are energized and considered reliable.
- Dilution flowpaths are tagged closed.
- Spent Fuel Pool level is normal.
- The SBO Diesel is out of service for planned maintenance.
- No other equipment is out of service.
- The BDB AFW Pump is available for RCS injection.
- Security requirements for crediting the Terry Turbine as operable are met

The following sequence of events occurs:

1. A loss of “A” Train normal and emergency buses 34A and 34C occurs. Annunciator MB8A 4-12, *BUS 34C BUS DIFF*, is in alarm.
2. The crew enters EOP 3505, *Loss of Shutdown Cooling and/or Inventory.*
3. The ‘B’ RHR pump is started.
4. The ‘B’ Charging pump is racked up and started.
5. RCS temperature is stabilized.

Initiating Cues:	The Shift Manager directs you to complete a Shutdown Safety Assessment Checklist to address the new current plant conditions for the loss of buses 34A and 34C. OU-M3-201, Section 3.2, “Shutdown Safety Assessment (SSA) Checklist Preparation”, sections 1 and 2 are being completed by the STA. Complete the Shutdown Safety Assessment Checklist, Section 3.2, starting with section 3 (Decay Heat Removal, step 3.2.2), and determine the color condition for each Key Safety Function.
Simulator Requirements:	NONE

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking “Y”. For the examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.2 Revision: 0 / 2

Task Title: Complete a Shutdown Safety Assessment Checklist.

START TIME: ____________

STEP #1	Performance: Obtains materials, locates correct procedure section.	Standard: Examinee is provided with a copy of OU-M3-201, *Shutdown Safety Assessment Checklist*. Reviews front matter, and arrives at section 3.2.2, "Section 3 - Decay Heat Removal (DHR)."	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If the Candidate questions the completion of sections 1 and 2 of the Checklist, state that " Sections 1 and 2 are being completed by the STA and will not be completed by you as part of this JPM."			
Comments:	The examinee is provided with a copy of OU-M3-201 and a copy of Attachment 1 (Millstone Unit 3 Shutdown Assessment (SSA) Checklist.			
STEP #2 OU-M3-201, step 3.2.2.1	Performance: RCS Decay Heat Removal (DHR) • **IF** in MODE 0, **THEN CIRCLE** "NA for MODE "0" and **GO TO** step 3.2.1.3.2.2.2.	Standard: Examinee recognizes that the plant is in MODE 5 and not in MODE 0, and moves on to the next step.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #3 OU-M3-201, step 3.2.2.1	Performance: • **REFER** to ATTACHMENT 2 for background information of each element associated with the Decay Heat Removal KSF.	Standard: Examinee refers to Attachment 2 and reviews background information	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #4
OU-M3-201, step 3.2.2.1</td><td>Performance:
RCS Decay Heat Removal (DHR)
• CHECK appropriate boxes for conditions supporting “Key Safety Function” of RCS decay heat removal.
• IF natural circulation is the only backup for decay heat removal AND NOT in a Bus 34C or 34D outage, THEN CIRCLE additional credited charging pump.
• TOTAL score and ENTER value in RCS DHR Total box.
• CIRCLE Condition color corresponding to point total.</td><td>Standard:
Examinee determines that ‘B’ RHR is in operation in the cooldown mode and checks the following boxes:
• “B” Train RHR
• All conditions met to meet natural circulation in the RCS
Assigns one point each, for a total of two points.
Determines RCS decay heat removal is “Yellow”.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #5
OU-M3-201, step 3.2.2.2</td><td>Performance:
Beyond Design Basis
• CHECK appropriate boxes corresponding to present BDB condition.</td><td>Standard:
Determines all four SGs are available, along with the Terry Turbine and checks the appropriate boxes.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #6
OU-M3-201, step 3.2.2.3</td><td>Performance:
Security
CHECK appropriate box ensuring security commitments are satisfied.</td><td>Standard:
Based on cue of Security crediting the Terry Turbine coupled with conditions that support Natural Circulation, checks “Terry Turbine operable…” box</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

<table>
<tr><td>STEP #7
OU-M3-201, step 3.2.2.4</td><td>Performance:
SFP Decay Heat Removal
• IF in MODE 5 OR core reload or shuffle is complete, THEN CIRCLE “N/A in MODE 5 <u>OR</u> core reload is complete,” and GO TO step 3.2.2.e.5.</td><td>Standard:
Recognizes the plant is in MODE 5, Circles “N/A in MODE 5 <u>OR</u> core reload is complete” and goes to step 3.2.2.e.5.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #8
OU-M3-201, step 3.2.2.5</td><td>Performance:
Fuel Offload Required Equipment
<u>IF</u> the following conditions are met, THEN REFER to ATTACHMENT 2 for Fuel Offload Required Equipment and DOCUMENT available equipment:
• In MODE 6. Core offload has started and core reload has NOT been completed.
• In MODE 0</td><td>Standard:
Recognizes the plant is not in MODE 6, and not in MODE 0.
Proceeds to next step.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

<table>
<tr>
<td>STEP #9
OU-M3-201, step 3.2.2.a.1</td>
<td>Performance:
Section 4 - Inventory Control

RCS Inventory Control

<u>IF</u> in MODE 0, THEN CIRCLE “NA for Mode 0” and GO TO step 3.2.1.g.2.
REFER to ATTACHMENT 3 for background information of each element associated with the RCS Inventory Control KSF.
CHECK appropriate boxes for conditions supporting “Key Safety Function” inventory.
TOTAL score and ENTER value in Inventory Control Total box.
CIRCLE Condition color corresponding to the point total.
ENSURE RWST level is greater than 250,000 gallons and CHECK box.
CHECK 3RHS*V43, RHR to RWST recirculation isolation, is tagged and locked closed by verifying the clearance is active in the tagging computer (Preferred Method) and CHECK box.</td>
<td>Standard:

Recognizes the plant is not in MODE 0, so the step is required to be completed.

Reviews background information for RCS Inventory Control.

Checks boxes for
‘B’ Train CHS with flow path
‘B’ Train SIH aligned to RWST with either hot leg or cold leg injection path capability
RCS Inventory > Decreased Inventory Conditions
Assigns one point each, for a total of three points.

Determines RCS Inventory Control is “Green”.

Checks boxes for adequate RWST level and for 3RHS*V43, locked closed.</td>
<td>Critical:
Y ☒ N ☐</td>
<td>Grade:
S ☐ U ☐</td>
</tr>
<tr>
<td>Cue:</td>
<td colspan="4"></td>
</tr>
<tr>
<td>Comments:</td>
<td colspan="4">Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color

The “B” RHR Pump cannot be credited, even though it is available, since is it required for temperature control.

Minimum defense in depth for this KSF: One CHS pump and one backup pump.

The additional defense of RCS Greater Than Decreased Inventory point value cannot be credited toward meeting the minimum DID criteria (YELLOW).</td>
</tr>
</table>

<table>
<tr><td>STEP
#10
OU-M3-201, step 3.2.2.a.2</td><td>Performance:
Spent Fuel Pool Inventory Control
• REFER to ATTACHMENT 3 for background information of each element associated with the Inventory KSF.
• CHECK appropriate boxes for conditions supporting “Key Safety Function” of SFP Inventory Control.
• TOTAL score and ENTER value in SFP Inventory Control Total box.
• CIRCLE Condition color corresponding to the point total.</td><td>Standard:
Reviews background information for Spent Fuel Pool Inventory Control Inventory Control.
Checks boxes for
• Gravity Makeup from the RWST (Level >800,000 gallons)
• ‘B’ Primary Grade Water System Pump and Makeup Flow Path
• Makeup Available from Fire Protection System (e.g., hose)
Assigns one point each, for a total of three points.
Determines Spent Fuel Pool Inventory Control is “Green”.</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color</td></tr>
</table>

STEP #11 OU-M3-201, step 3.2.2.b	Performance: Section 5 - Reactivity Control 1. **IF** in MODE 0, **THEN CIRCLE** “NA for Mode 0” and **GO TO** step 3.2.1.i. 2. **REFER** to ATTACHMENT 4 for background information of each element associated with the Reactivity KSF. 3. **CHECK** appropriate boxes for conditions supporting “Key Safety Function” of Reactivity. 4. **TOTAL** score and **ENTER** value in the Reactivity Total box. 5. **CIRCLE** Condition color corresponding to point total.	Standard: Recognizes the plant is not in MODE 0, so the step is required to be completed. Reviews background information for Reactivity Control. Checks boxes for • RCS Boron > required SDM* • Inventory flow paths* (2) • In Mode 5, at least one Shutdown Margin Monitor train operable or one channel source range with automatic or manual monitoring of count rate* • Dilution paths tagged using SP 3604C.6 (may be opened under admin control) And assigns one point each, for a total of five points. Determines RCS Inventory Control is “Green”.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color. Inventory flowpaths are determined from RCS Inventory Control Section 4, which is CHS Pump and SIH Pump.			

STEP #12	Performance	Standard:	Critical:	Grade:

OU-M3-201, step 3.2.2.c	Section 6 - Containment
	1. **IF** in MODE 0, **THEN CIRCLE** "NA for Mode 0" and **GO TO** step 3.2.1.j.
	2. **REFER** to ATTACHMENT 5 for background information of each element associated with Containment KSF.
	3. **CHECK** one of the Containment Closure requirements are met.
	4. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Containment.
	5. **TOTAL** score and **ENTER** value in Containment Total box.
	6. **CIRCLE** Condition color corresponding to the point total.
		Recognizes the plant is not in MODE 0, so the step is required to be completed.
		Reviews background information for Containment.
		Checks boxes for
		• Containment Closure Set with exceptions tracked and capable of being closed prior to the lesser of:
		  • Time to Core Boil (2 points) OR
		  • 4 hours (2 points)
		• No significant fuel failures indicated
		• No Core Alterations in progress in Containment
		• RCS Pressure Boundary intact
		• Low Decay Heat (>8 days Shutdown)
		Assigns one point each, and two points for Containment Closure, for a total of six points
		Determines Containment is Green
			Y ☒ N ☐	S ☐ U ☐

Cue:				
Comments:	Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color.			

STEP #13 OU-M3-201, step 3.2.2.d	Performance: Section 7 - Power Availability 1. **REFER** to ATTACHMENT 6 for background information for each element associated with Power Sources KSF. 2. **CHECK** appropriate boxes for conditions supporting "Key Safety Function" of Power Availability. 3. REFER to ATTACHMENT 6 for applicable Off-Site GRID Risk Penalty Factor and **SUBTRACT** from Power Availability subtotal to determine Power Availability Total. 4. **TOTAL** score and **ENTER** value in Power Availability Total box. 5. **CIRCLE** Condition color corresponding to point total.	Standard: Reviews background information for Power Availability. Checks boxes for • "B" EDG • NSST/Main • RSST Assigns one point each, for a total of three points. Determines the grid risk factor is zero. Determines Power Availability is Yellow.	Critical: Y ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	Critical nature of this step is completed by checking the appropriate boxes related to determining color, and determining the correct color			

<table>
<tr><td>STEP #14</td><td>Performance:
To obtain each Key Safety Function Total, SUM the points allotted for each credited component or condition supporting the Key Safety Function and ENTER in box.</td><td>Standard:
Candidate sums the points for each credited component or condition supporting the Key Safety Function
• RCS Decay Heat Removal: 2
• RCS Inventory: 3
• SFC Inventory: 3
• Reactivity: 5
• Containment: 6
• Power Availability: 3</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
<tr><td>STEP #15</td><td>Performance:
Using the Key Safety Function Total, CIRCLE the associated color CONDITION.</td><td>Standard:
Candidate circles the color condition below for each Key Safety Function
RCS Decay Heat Removal
Yellow
RCS Inventory
Green
SFC Inventory
Green
Reactivity
Green
Containment
Green
Power Availability
Yellow</td><td>Critical:
Y ☒ N ☐</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4">“The STA's independent assessment and the review process will be tracked by the US.”</td></tr>
<tr><td>Comments:</td><td colspan="4"></td></tr>
</table>

STEP #16	Performance: Notify the Shift Manager that the Shutdown Safety Assessment Checklist is complete.	Standard: Reports to the Shift Manager that the Shutdown Safety Assessment Checklist is complete.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

TERMINATION CUE: The evaluation for this JPM is complete.

STOP TIME: ____________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.2 Revision: 0 / 2

Task Title: Complete a Shutdown Safety Assessment Checklist.

Date Performed: ____________

Examinee: ____________

For the applicant to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**30**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC SRO A.2 Revision: 0 / 2

Initial Conditions

The plant is in MODE 5, and initial conditions are as follows:

- The plant is in day 28 of a scheduled 30 day refueling outage.
- RCS Boron concentration is 1987 ppm, which is in excess of required Shutdown margin.
- RCS temperature is 160°F
- RCS pressure is 360 psia.
- "A" Train is protected.
- Both RHR trains are aligned for cooldown with the 'A' RHR running.
- The 'A' Charging pump is running.
- The 'C' Charging pump is tagged out with its breaker racked down.
- All four RCS loops have been vacuum filled.
- Pressurizer Level is 65% with a Pressurizer bubble established
- All four SGs are at 50% narrow range level.
- The 'B' SI pump is available for inventory control, caution tagged in the Pull-to-Lock position, with its breaker racked up, and its UC fuses removed.
- Containment Closure is set with exceptions tracked and capable of being closed prior to core boiling and prior to 4 hours.
- 3RHS*V43, RHR to RWST recirculation, is tagged and locked closed.
- 1,200,000 gallons in the RWST.
- Both the North and South busses of the 345KV switchyard are energized and considered reliable.
- Dilution flowpaths are tagged closed.
- Spent Fuel Pool level is normal.
- The SBO Diesel is out of service for planned maintenance.
- No other equipment is out of service.
- The BDB AFW Pump is available for RCS injection.
- Security requirements for crediting the Terry Turbine as operable are met.

The following sequence of events occurs:

1. A loss of "A" Train normal and emergency buses 34A and 34C occurs. Annunciator MB8A 4-12, *BUS 34C BUS DIFF*, is in alarm.
2. The crew enters EOP 3505, *Loss of Shutdown Cooling and/or Inventory.*
3. The 'B' RHR pump is started.
4. The 'B' Charging pump is racked up and started.
5. RCS temperature is stabilized.

Initiating Cues:

The Shift Manager directs you to complete a Shutdown Safety Assessment Checklist to address the new current plant conditions for the loss of buses 34A and 34C.

OU-M3-201, Section 3.2, "Shutdown Safety Assessment (SSA) Checklist Preparation", sections 1 and 2 are being completed by the STA.

Complete the Shutdown Safety Assessment Checklist, Section 3.2, starting with section 3 (Decay Heat Removal, step 3.2.2), and determine the color condition for each Key Safety Function.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Evaluation of an Unplanned Gaseous Release.

JPM Number: 2017 NRC SRO A.3 Revision: 0 / 1

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Direct from Bank (JPM A220; 2K11 SRO A.3).	0
10/25/17	Changes made following NRC validation. • Referenced revision to RAC 14 (page 3). This did not alter JPM content. • Initial Conditions Section (pgs 4 & 21): Changed cue 1. From "About 30 minutes ago…" to "Ten minutes ago…". • Initiating Cues Conditions Section (pgs 4 & 21): Simplified cue statement.	0 / 1

JPM WORKSHEET

Facility: Millstone Unit 3 Examinee: ____________________

JPM Number: 2017 NRC SRO A.3 Revision: 0 / 1

Task Title: Evaluation of an Unplanned Gaseous Release.

System: GENERIC

Time Critical Task: ( ) YES (X) NO

Validated Time (minutes): 30

Applicable To: SRO **X** RO ______

K/A Number: 2.3.11 K/A Rating: 3.8 / 4.3

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Evaluate an unplanned gaseous release and as a result, the proper notifications and event reporting requirements.

Required Materials: (procedures, equipment, etc.) RAC 14, *Non-Emergency Station Events,* Rev 012

General References: RAC 05, *Reportability Determinations and Licensee Event Reports*
AOP 3573*, Radiation Monitor Alarm Response*
MP-26-EPI-FAP06, *Classification and PARs*

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC SRO A.3 Revision : 0 / 1

Initial Conditions:

The plant is at 100% power, and the following sequence of events has occurred:

1. Ten minutes ago MB2B 2-8 “RADIATION ALERT” alarmed.
2. The RO reported that 3HVR*RE10B is in alert.
3. The crew entered AOP 3573, *Radiation Monitor Alarm Response,* and has completed actions for 3HVR*RE10B.
4. The crew has determined that the cause of the release was a Degasifier overpressure event that lifted the degasifier condenser relief valve (3GWS-RV35).
5. The relief valve was found initially stuck open, but it has since closed.

Current conditions are as follows:

- There is no indication that there is an equipment problem associated with 3HVR*RE10B.
- 3HVR*10B has cleared the alert setpoint. It is currently reading 1.0×10^{-5} μCi/cc and slowly lowering. The highest reading during the event was 6.0×10^{-5} μCi/cc. The highest 10 minute average net increase was 3×10^{-5} μCi/cc.
- The SM has already determined that the event is not Classifiable at the Alert level or above.
- The Chemistry Department has determined that Delta-Two Posture Code Limits (for OU1, Unplanned Release) have not been exceeded.
- The Chemistry Department has determined that the release did not exceed 40CFR302 limits (EPA Reportable Releases).
- HP, Chemistry, Environmental, Licensing and other personnel are in the Control Room ready to assist.
- Turbine Building vent stack flowrate is 186,000 cfm.

Initiating Cues:

Using RAC-14, determine if this event is reportable. If reportable, document reportability requirements at the bottom/back of this page.

Simulator Requirements: NONE

*** * * * NOTES TO TASK PERFORMANCE EVALUATOR * * * ***

1. Critical steps for this JPM are indicated by checking “Y”. For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.3 Revision: 0 / 1

Task Title: Evaluation of an Unplanned Gaseous Release.

START TIME: ____________________

STEP	Performance:	Standard:	Critical:	Grade:
STEP #1 RAC 14, Section 3	Obtains a copy of RAC 14, *Non-Emergency Station Events*.	Obtains a copy of RAC 14. Reviews precautions 3.1 through 3.8. Goes to section 4.1	Y ☐ N ☒	S ☐ U ☐
Cue:				
Comments:				
STEP #2 RAC 14, Note prior to step 4.1.1	**NOTE** Attachments 1 through 6 are tools to provide conservative, prompt reportability assessments of events or conditions. Extensive guidance and examples exist in many documents beyond what is contained in Attachments 1 through 6. If time permits (generally for 4, 8, and 24-hour notifications), contacting Licensing should be considered for additional guidance and insights for determining event or condition reportability.	Reviews note	Y ☐ N ☒	S ☐ U ☐
Cue:				
Comments:				

STEP #3 RAC 14, step 4.1.1.a	Performance: **Initial Event Reportability Determination** IF sufficient cause exists for reporting a non-emergency event, PERFORM the following: a. ANALYZE available information and DEVELOP a general understanding of event in progress.	Standard: Determines sufficient cause may exist for reporting this event.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #4 RAC 14, step 4.1.1.b	Performance: ASSIGN staff to collect and track information.	Examinee requests additional staff.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If the Examinee requests additional personnel to track the event, or requests additional assistance, state: “Additional assistance will be available shortly. Continue with your task.”			
Comments:				

STEP # 5 RAC 14, step 4.1.1.c.1)	Performance: IF necessary, PERFORM the following: REQUEST assistance from any of the following, as applicable, to determine reportability and respond to event: • Unit Chemistry Supervision • Environmental Compliance Coordinator • On-Shift Chemistry Technician • On-Shift Health Physics Technician • Security Shift Operations Supervisor (SSOS) • Licensing	Standard: Examinee reviews the step. May request assistance from Chemistry, Health Physics, and Licensing.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If help is requested, state, “The Shift Manager will request assistance from these people.”			
Comments:				

STEP # 6 RAC 14, step 4.1.1.c.2)	Performance: DOCUMENT resulting basis for reportability and Licensing contact who provided input in eSOMS, if applicable.	Standard: Reads step. May request if there is any available input in eSOMS.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If asked, state “Licensing has not provided input in ESOMS for this event.”			
Comments:				

STEP #7 RAC 14, step 4.1.1.d	Performance: As required, REQUEST Station Duty Officer (typically the non-affected unit STA) and Emergency Communicator (typically the non-affected unit WC SRO) report to the Control Room and prepare to send a Non Emergency Event Report.	Standard: Reads step. May request SDO and Emergency Communicator to come to the Control Room.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	When the examinee requests the SDO and Emergency Communicator (maybe later during the performance of this JPM), state "The SM will contact the SDO and Emergency Communicator."			
Comments:	The Examinee may wait to determine if the event is reportable prior to requesting the SDO and EC. This is acceptable.			
STEP #8 RAC 14, step 4.1.1.e NOTE	Performance: **NOTE** Certain reportable environmental events, including those not reportable to the NRC, have reportable time limits listed in Attachments 1 through 7.	Standard: Examinee reviews the NOTE.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #9 RAC 14, step 4.1.1.e	Performance: <u>IF</u> event is *an unplanned or unmonitored radioactive release*, Refer To and PERFORM Section 4.2, "Evaluation of an Unplanned Radioactive Release."	Standard: Examinee recognizes that the event potentially is an unplanned radioactive release, and proceeds to Section 4.2.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #10 RAC 14, step 4.2.1 CAUTION	Performance: Leaks from plant systems, e.g., aux steam, condensate. etc., that have the potential to be radioactive could constitute an unplanned, unmonitored radioactive release and must be evaluated.	Standard: Examinee reviews the CAUTION.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #11 RAC 14, step 4.2.1	Performance: IF an unplanned or unmonitored radioactive release has occurred including any spills and/or leaks of radioactive liquid, NOTIFY the following, as applicable, for assistance in determining reportability requirements: • Health Physics Supervisior • Unit Chemistry • Environmental Compliance Coordinator • Licensing	Standard: Examinee request Health Physics, Environmental and Licensing. Examinee may have already requested help in a previous step..	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If help is requested, state, “The Shift Manager will request assistance from these people.”			
Comments:				

STEP #12 RAC 14, step 4.2.2	Performance: IF release source is not identified, Refer To Attachment 8, Section 6, “Maintenance Operations," and REVIEW current plant operations to identify source of release.	Standard: Examinee recognizes that the release source is already identified.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	The release source (3GWS-RV35) was given in Initial Conditions.			
STEP #13 RAC 14, step 4.2.3	Performance: IF applicable, Refer To and IMPLEMENT C OP 200.4 “Response to Plant Leaks."	Standard: Examinee recognizes that C OP 200.4 does not apply and proceeds to step 4.2.4.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #14 RAC 14, step 4.2.4	Performance: IF applicable, Refer To and IMPLEMENT C OP 200.5, “Oil, Hazardous Material, Hazardous Waste, and Mixed Waste Contingency Plan."	Standard: Examinee recognizes that C OP 200.5 does not apply and proceeds to step 4.2.5.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

<table>
<tr><td>STEP #14
RAC 14, step 4.2.5</td><td>Performance:
IF applicable, Refer To C OP 200.11, “Operation of a Cross Contaminated System," and simultaneously COMPLETE requirements.</td><td>Standard:
Examinee recognizes that C OP 200.11 does not apply and proceeds to step 4.2.6.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">The Degasifier relief valve and associated piping are considered contaminated.</td></tr>
<tr><td>STEP #15
RAC 14, step 4.2.6, and Att 8 Section 2</td><td>Performance:
Refer To Attachment 8, Section 2, “Reportable Releases," and REVIEW for type of release involved.</td><td>Standard:
Refers to Attachment 8, Section 2, and reviews for type of release involved.
Recognizes the following types of release may be involved:
1. Releases Exceeding Gaseous Release Rate Limit
2. Unplanned Gaseous Releases</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4">When the examinee requests the SDO and Emergency Communicator (maybe later during the performance of this JPM), state “The SM will contact the SDO and Emergency Communicator.”</td></tr>
<tr><td>Comments:</td><td colspan="4">Examinee may request SDO and Emergency Communicator, if not requested earlier.</td></tr>
<tr><td>STEP #16
RAC 14, step 4.2.7</td><td>Performance:
Refer To Attachment 8, Section 3, “Release Calculations," and COMPLETE calculations listed for released material, or other method as approved by the Chemistry Department.</td><td>Standard:
Examinee refers to Attachment 8, Section 3, and reviews various the Release Calculations to determine which may apply.</td><td>Critical:
Y ☐ N ☒</td><td>Grade:
S ☐ U ☐</td></tr>
<tr><td>Cue:</td><td colspan="4"></td></tr>
<tr><td>Comments:</td><td colspan="4">The various Release Calculations listed in Section 3 follow in JPM steps 17 through 20.</td></tr>
</table>

STEP #17 RAC 14, Att 8 Section 3	Performance: <u>GASEOUS RELEASE RATE LIMIT</u> If an effluent radiation monitor (HVR-RE10B), exceeds the alarm setpoint request that Chemistry enter SP 823/2823/3823 to determine if the instantaneous release rate limit has been exceeded.	Standard: Examinee recognizes that 3HVR*RE10B did NOT exceed its alarm setpoint, therefore this release calculation does not apply.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #18 RAC 14, Att 8 Section 3	Performance: <u>UNMONITORED GASEOUS RELEASES:</u>	Standard: Examinee recognizes that the release was monitored, therefore this calculation does not apply.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #19 RAC 14, Att 8 Section 3	Performance: <u>UNPLANNED GASEOUS RELEASES</u> <u>Unit 3 Vent</u> Average 10 Minute Net Increase on HVR-RE10B in µci/cc **x** Flow Rate (CFM) **x** 472 cc/sec **x** Pressure Correction = _________ µCi/sec	Standard: Examinee recognizes that the release path was via the Unit 3 Vent (Turbine Building stack); therefore this calculation does apply. Examinee refers to the initial conditions and records values for the average 10 minute net increase on 3HVR*RE10B (3 x 10^{-5} µCi/cc) and Unit 3 Vent stack flowrate (186,000 cfm). Using these recorded values, the conversion factor of 472 cc/sec/cfm, and pressure correction (1.5), the Examinee calculates and records a release rate **3951 µci/sec**.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	If the Examinee requests assistance performing the calculation, provide the following cue: "A second person will be independently performing the calculation. Perform the calculation." If the Examinee requests Chemistry to perform the calculation, provide the following cue: "There is a delay getting the Chemistry Tech to the Control Room. Perform the calculation."			
Comments:				
STEP #20 RAC 14, Att 8 Section 3	Performance: Unit 3 SLCRS Unit 3 ESF Bldg. Unit 3 Total = ______ <1500 µCi/sec	Standard: Examinee recognizes that any contribution from the SLCRS or ESF Building effluent release paths will be negligible compared to Unit 3 Vent path release.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	When the examinee requests the SDO and Emergency Communicator (maybe later during the performance of this JPM), state "The SM will contact the SDO and Emergency Communicator."			
Comments:	Examinee may recognize at this point that 3951 µci/sec is NOT <1500 µCi/sec. Therefore, an unplanned gaseous release has occurred from Unit 3.			

STEP #21 RAC 14, Att 8 Section 3	Performance: <u>UNPLANNED OR UNMONITORED LIQUID RELEASE:</u>	Standard: Examinee recognizes that the release was gaseous, therefore this calculation does not apply.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #22 RAC 14, step 4.2.8	Performance: Refer To the following and DETERMINE if release exceeds limits: a. Attachment 8, Section 2, “Reportable Releases." b. Attachment 8, Section 4, “EPA Reportable Releases."	Standard: Examinee refers to Attachment 8, Section 2, and reviews to determine if the release exceeds a limit.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #23 RAC 14, Att 8 Section 2.C	Performance: <u>Unplanned Gaseous Releases</u> (State Regulation) Any increase in noble gas release rates which, when averaged over 10 minutes, is greater than 1500 microcuries/sec above the normal (existing) release rate and this increase is not due to a planned or expected event as listed in Section 6, “Maintenance Operations."	Standard: Examinee recognizes that **3951 µci/sec** is NOT <1500 µCi/sec. Therefore, an unplanned gaseous release has occurred from Unit 3.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				

Comments:	Critical portion of this step is to determine that a gaseous release has occurred.			
S T E P # 2 4 RAC 14, Att 8 Section 1	Performance: <u>Environmental Protection Agency Reportable Quantity (RQ) Reportable Release</u> - Any release or loss of radioactive material (airborne, liquid, or solid) to the environment which exceeds the levels permitted in 40CFR302, see Section 4, "EPA Reportable Releases."	Standard: Examinee recognizes from initial conditions that the release did NOT exceed 40CFR302 limits (EPA Reportable Releases).	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
S T E P # 2 5 RAC 14, step 4.2.9	Performance: <u>IF</u> release exceeds limits, Refer To appropriate Attachments 1 through 7 and DIRECT Emergency Communicator to perform Section 4.7, "Radiopager Notifications."	Standard: Examinee refers to Attachments 1 through 7 and determines that Attachment 2, **"Radiological Events"**, is the applicable attachment. Examinee directs the Emergency Communicator to perform Section 4.7, 'Radiopager Notifications.'"	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	"The SM will contact the Emergency Communicator to perform Section 4.7, "Radiopager Notifications.'"			

STEP #26 RAC 14, step 4.2.9		Standard: Examinee matches the event in progress with the following event description in attachment 2: "Any unplanned, unmonitored, or unauthorized release of radiological material to the environment." Examinee correctly determines the NRC Reporting Requirement for the event is as follows: **"Within 1 hour via ENS"** (10CFR50.72(b)(2)(xi)	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #27 RAC 14, step 4.2.9		Standard: Examinee correctly determines the State posture code for the event is an **"Foxtrot"** Examinee correctly determines the State Reporting Requirement for the event is as follows: "Within 1 hour of report to NRC" (State Reg. 22a-135-1 / ENV 4.1.6.1)	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #28 RAC 14, step 4.2.9	Performance: Determine additional requirements.	Standard: Examinee correctly determines that NOTEs 1, 17 and 19 in Attachment 2 of RAC 14 apply.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	NOTES are located in Attachment 7 to RAC 14.			
Comments:				
STEP #29 RAC 14, Att 7 NOTE 1	Performance: Refer To Attachment 15 for additional notifications.	Standard: Examinee reviews Attachment 15 and determines that no additional notifications are required.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #30 RAC 14, Att 7 NOTE 17	Performance: When Federal and State reporting requirements overlap, the "Clock" for the State reporting does not start until the report is made to the Federal Authority.	Standard: Examinee reviews the NOTE.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
RAC 14, Att 7 NOTE 19	Performance: The existing CR process is to be used to identify any spills and/or leaks of radioactive liquid. Chemistry, HP and/or Station Licensing personnel will perform any necessary evaluations based on CR information and subsequent investigations as appropriate, and determine if GPI reporting is necessary.	Standard: Examinee recognizes that the release was gaseous, therefore this NOTE does not apply.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #31 RAC 14, step 4.2.10	Performance: IF applicable, Refer To Section 4.8, "NRC Notifications."	Standard: Examinee refers to Section 4.8.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:	Once the Examinee refers to Section 4.8, provide the following cue:"The Emergency Communicator will prepare and send the Non Emergency Event Report and the Station Duty Officer will complete the remaining required notifications. "			

Termination cue: The evaluation for this JPM is complete.

STOP TIME: _______________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.3 Revision: 0 / 1

Task Title: Evaluation of an Unplanned Gaseous Release.

Date Performed: ____________________

Examinee: ____________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☐ Yes ☒ No	
Validated Time (minutes):	**30**	Actual Time to Complete (minutes):	
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:

EXAMINEE HANDOUT

JPM Number: 2017 NRC SRO A.3 Revision: 0 / 1

Initial Conditions: The plant is at 100% power, and the following sequence of events has occurred:

1. Ten minutes ago MB2B 2-8 “RADIATION ALERT” alarmed.
2. The RO reported that 3HVR*RE10B is in alert.
3. The crew entered AOP 3573, *Radiation Monitor Alarm Response,* and has completed actions for 3HVR*RE10B.
4. The crew has determined that the cause of the release was a Degasifier overpressure event that lifted the degasifier condenser relief valve (3GWS-RV35)
5. The relief valve was found initially stuck open, but it has since closed.

Current conditions are as follows:

- There is no indication that there is an equipment problem associated with 3HVR*RE10B.
- 3HVR*10B has cleared the alert setpoint. It is currently reading 1.0×10^{-5} µCi/cc and slowly lowering. The highest reading during the event was 6.0×10^{-5} µCi/cc. The highest 10 minute average net increase was 3×10^{-5} µCi/cc.
- The SM has already determined that the event is not Classifiable at the Alert level or above.
- The Chemistry Department has determined that Delta-Two Posture Code Limits (for OU1, Unplanned Release) have not been exceeded.
- The Chemistry Department has determined that the release did not exceed 40CFR302 limits (EPA Reportable Releases).
- HP, Chemistry, Environmental, Licensing and other personnel are in the Control Room ready to assist.
- Turbine Building vent stack flowrate is 186,000 cfm.

Initiating Cues: Using RAC-14, determine if this event is reportable. If reportable, document reportability requirements at the bottom/back of this page.

JOB PERFORMANCE MEASURE APPROVAL SHEET

JPM Title: Emergency Plan Classification and PAR

JPM Number: 2017 NRC SRO A.4 Revision: 0 / 2

Initiated:

Robert Royce	8/17/17
Developer	Date

Reviewed:

Dave Minnich	8/17/17
Technical Reviewer	Date

Reviewed:

E. Brodeur	8/18/17
Technical Reviewer	Date

Approved:

M. J. Cote	8/18/17
Supervisor, Nuclear Training	Date

SUMMARY OF CHANGES

DATE	DESCRIPTION	REV/CHANGE
8/16/17	Direct from Bank (2K13 SRO A.4)	0
9/7/17	Moved the following cue from the comments section of JPM step 3, to the cue section of step 3: If the Examinee correctly classifies the event as a General Emergency - ALPHA, then CUE the Examinee "Determine Protective Action Recommendations and record recommendation on page 2 of the Examinee handout." Added a comment to JPM step 2.d that shows the major and minor headings of the classification. These changes are a result of NRC Exam comments made on 8/31/17. NRC will review these changes during NRC Validation week.	0 / 1
10/25/17	Changes made following NRC validation. In Reference Section (pg 3): Added the Status Tree Book as a second reference & bolded CR DSEO Book.	0 / 2

JPM WORKSHEET

Facility: MP3 Examinee: ______

JPM Number: 2017 NRC SRO A.4 Revision: 0 / 1

Task Title: Emergency Plan Classification and PAR

System: N/A

Time Critical Task: (X) YES ( ) NO

Validated Time (minutes): 22

Applicable To: SRO **X** RO ______ PEO ______

K/A Number: 2.4.44 K/A Rating: 2.4 / 4.4

Method of Testing: Simulated Performance: ______ Actual Performance: X

Location: Classroom: X Simulator: ______ In-Plant: ______

Task Standards: Determine the EAL and State Posture Code
Determine the minimum required PAR

Required Materials:

1. "CR DSEO" Book – containing all of the following references

- MP-26-EPI-FAP06-003 Rev. 011, MILLSTONE UNIT 3 EMERGENCY ACTION LEVELS
- MP-26-EPI-FAP06 Rev 010, CLASSIFICATION AND PARs
- MP-26-EPI-FAP06-005 Rev. 006, CONTROL ROOM PROTECTIVE ACTION RECOMMENDATIONS
- Incident Report Form (MP-26-EPI-FAP07-001)- Rev. 001-03

2. Status Tree Book

General References: MP-26-EPI-FAP-01-001, CONTROL ROOM DIRECTOR OF STATION EMERGENCY OPERATION, Rev. 014 (CR DSEO)

***** READ TO THE EXAMINEE *****

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this JPM will be satisfied. You may use any approved reference material normally available in the Control Room, including logs. Make all written reports, oral reports, alarm acknowledgements, and log entries as if the evolution was actually being performed.

JPM WORKSHEET

JPM Number: 2017 NRC SRO A.4 Revision : 0 / 1

Initial Conditions: With the plant initially at 100% power, an earthquake occurs, resulting in the following sequence of events:

Time	Event
08:00	A Small Break LOCA occurs.
08:04	The RO reports no Charging Pumps and no High Head Safety Injection Pumps are running, and none can be started from the Main Boards.
08:06	The Core Cooling Status Tree turns yellow based on a loss of RCS subcooling.
08:10	Core Cooling Status Tree turns orange based on low RVLMS plenum level.
08:15	The crew transitions from E-0, *Reactor Trip or Safety Injection*, FR-C.1, *Response to Inadequate Core Cooling*.
08:28	Containment High Range Rad Monitors 3RMS*RE-04A/05A indicate 5.2 R/hr and increasing
08:30	The Core Cooling Status Tree turns red based on CET's reading 1200°F and rising.
08:35	3RMS*RE04A /05A read 230 R/hr and increasing
08:46	CET's are 1450°F and rising.
08:47	3RMS*RE04A/05A read 31,000 R/hr and increasing

- The current wind speed is fifteen (15) miles per hour.
- The current wind direction is from 145°.

Initiating Cues: **Determine the appropriate emergency classification. This is time critical.**

Record the Highest required Classification Level, State Posture Code and the required EAL Major and Minor Heading on the space provided below. **Report to the Examiner when your Classification is made (FOR PROPER TIMING).**

CLASSIFICATION LEVEL: ______________________________

EAL MAJOR HEADING:________________________________

MINOR HEADING: ____________________________________

Simulator Requirements: NONE

* * * * **NOTES TO TASK PERFORMANCE EVALUATOR** * * * *

1. Critical steps for this JPM are indicated by checking "Y". For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
2. When the Examinee states what his/her simulated action/observation would be, read the appropriate "Cue".
3. If necessary, question Examinee for details of simulated actions/observations (i.e. "What are you looking at?" or "What are you observing?").
4. Under **NO** circumstances must the Examinee be allowed to manipulate any devices during the performance of this JPM (in-plant only).

PERFORMANCE INFORMATION

JPM Number: 2017 NRC SRO A.4 Revision: 0 / 1

Task Title: Emergency Plan Classification and PAR

START TIME: __________

For timing purposes, both of the following tasks have time limits:

1. 15 minutes to determine Emergency Action Level and State Posture Code.
2. 15 minutes after classifying the event to determine minimum required PAR (**Examiner Note:** The initial cue does **not** have the Examinee perform a PAR (as this may lead the Examinee into a GE classification). Once the successful GE classification is made, the examiner will ask for the PAR to be made. This direction is contained in the body of this JPM.

The timing for the EAL determination (item 1 above) will begin ONCE the book labeled "CR DSEO" is handed to the Examinee (this will be after the EXAMINEE HANDOUT is read and understood)

Record the JPM start time above.

STEP # 1	Performance: Obtain Proper procedure.	Standard: Examinee obtains or requests copy of MP-26-EPI-FAP06-003, MP3 Emergency Action Levels.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:	After allowing the examinee to read the initial conditions and initiating cue, pass out the CR DSEO book and inform the Examinee that "Timing to complete the Classification has begun."			
Comments:	Provide the Examinee a blank copy of an Incident Report Form and a Control Room PAR Process Flowchart (Handout #1). Examinee may also request copies of: • MP-26-EPI-FAP-01-001, CR-DSEO Checklist • MP-26-EPI-FAP06, Classification and PARs • MP-26-EPI-FAP06-005, CR PARs • MP-26-EPI-FAP07, Notifications & Comms • MP-26-EPI-FAP07-001, Incident Report Form The **CR DSEO Notebook** contains all these procedures.			

STEP #2.a FAP06-003	Performance: Classify the Event	Standard: Examinee recognizes a **LOSS** of the **Fuel Clad Barrier**, based on EITHER one of following: • **FCB1** - Core Cooling RED • **FCB2** - CET > 1200 F • **FCB3** - > 200 R/hr on RE04/05, ≤ 2hrs after shutdown. (FCB3 AND Table 1 values)	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #2.b FAP06-003	Performance: Classify the Event	Standard: Examinee recognizes a **LOSS** of the **RCS Barrier** based on **RCB2** RCS Subcooling < 32°F Due to RCS Leak.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #2.c FAP06-003	Performance: Classify the Event	Standard: Examinee recognizes a **POTENTIAL LOSS** of the **CTMT Barrier** based on EITHER one of the following: • **CNB2** – Entry in FR-C.1 with conditions met • **CNB5** – > 800 R/hr on RE04/05, ≤ 2hrs after shutdown. (FCB3 AND Table 1 values)	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #2.d FAP06-003	Performance: Classify the Event	Standard: Examinee reviews MP-26-EPI-FAP06-003 and determines that a NRC EAL of **GENERAL EMERGENCY** based on EITHER one of the following: • Barrier Table (BG1) described above (BG1 exists. Fuel Clad Barrier (L), RCS Barrier (L) and CTMT Barrier (Potential L)). • IN PLANT RADIATION (RG1), based on sustained RE04A/05A reading > 800 R/hr	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:				
Comments:	Major Heading is BARRIER FAILURE, Minor Heading is BG1 (All Three Barriers) OR Major Heading is IN PLANT RADIATION, Minor Heading is RG1 (Major Fuel Damage).			
STEP #3 FAP06-003	Performance: Determine State Posture Code	Standard: Examinee reviews MP-26-EPI-FAP06-003 and determines that the block for BG1 or RG1 is the same color as **State Posture ALPHA**.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:	**If the Examinee correctly classifies the event as a General Emergency - ALPHA, then CUE the Examinee "Determine Protective Action Recommendations and record recommendation on page 2 of the Examinee handout."**			
Comments:	Tables are color coded to reflect the State Posture. **1. Record the Time Classification is Completed: ________ (must be within 15 minutes of JPM start)** **2. Record start time _________.** **NOTE: If the Examinee unsuccessfully declares another action level (ie not GE Alpha), then end the JPM. The Examinee will have failed the JPM and a PAR is not necessary.**			

STEP #4	Performance: Determine the State Protective Action Recommendation	Standard: Examinee uses MP-26-EPI-FAP06-005, Section B, Control Room PAR Process Flowchart, to determine the PAR.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #5 FAP06-005 Flowchart	Performance: Determine the State Protective Action Recommendation	Standard: Examinee reviews flowchart and progresses based on a General Emergency being declared	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #6 FAP06-005 Flowchart	Performance: Determine the State Protective Action Recommendation	Standard: Examinee reviews flowchart and progresses based on a General Emergency-Alpha being declared	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				
STEP #7 FAP06-005 Flowchart	Performance: Determine the State Protective Action Recommendation	Standard: Examinee reviews flowchart and progresses after determines from Table 3 that this is NOT a rapidly progressing severe incident, since the Containment Barrier is only potentially lost.	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #8 FAP06-005 Flowchart	Performance: Determine the State Protective Action Recommendation	Standard: Examinee reviews Table 1 and determines that 31,000 R/hr exceeds Table 1 Values (Yes). Examinee progresses to the required PAR	Critical: Y ☐ N ☒	Grade: S ☐ U ☐
Cue:				
Comments:				

STEP #9 FAP06-005 Flowchart	Performance: Determine the State Protective Action Recommendation	Standard: Examinee reviews flowchart and makes the determination to: 1. Evacuate 5 mile radius, 2. Evacuate 10 miles downwind, which includes **A** and **B** and **C** and **Lyme** in **D**. 3. All other zones shelter in place.	Critical: **Y** ☒ N ☐	Grade: S ☐ U ☐
Cue:	If asked about a dose assessment from Chemistry state, "Dose assessment results from the Chemistry Technician are not available."			
Comments:	**Record the Time PAR is Completed: ____________________** **The PAR is required to be completed within 15 minutes of completing the Classification**			

The evaluation for this JPM is complete.

STOP TIME: ________________

VERIFICATION OF JPM COMPLETION

JPM Number: 2017 NRC SRO A.4 Revision: 0 / 1

Task Title: Emergency Plan Classification and PAR.

Date Performed: ________________

Examinee: ______________________________

For the Examinee to achieve a satisfactory grade, **ALL** critical steps must be completed correctly.
If task is Time Critical, it **MUST** be completed within the specified time to achieve a satisfactory grade.

EVALUATION SECTION:

Time Critical Task?		☒ **Yes** ☐ No	
Validated Time (minutes):	10 min classify 12 min PAR	Actual Time to Complete (minutes):	Classify:______________. PAR:______________.
Overall Result of JPM:		☐ SAT ☐ UNSAT	

Comments:
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EXAMINEE HANDOUT (page 1 of 2)

Initial Conditions: With the plant initially at 100% power, an earthquake occurs, resulting in the following sequence of events:

Time	Event
08:00	A Small Break LOCA occurs.
08:04	The RO reports no Charging Pumps and no High Head Safety Injection Pumps are running, and none can be started from the Main Boards
08:06	The Core Cooling Status Tree turns yellow based on a loss of RCS subcooling.
08:10	Core Cooling Status Tree turns orange based on low RVLMS plenum level.
08:15	The crew transitions from E-0, *Reactor Trip or Safety Injection*, FR-C.1, *Response to Inadequate Core Cooling*.
08:28	Containment High Range Rad Monitors 3RMS*RE-04A/05A indicate 5.2 R/hr and increasing
08:30	The Core Cooling Status Tree turns red based on CET's reading 1200°F and rising.
08:35	3RMS*RE04A /05A read 230 R/hr and increasing
08:46	CET's are 1450°F and rising.
08:47	3RMS*RE04A/05A read 31,000 R/hr and increasing

- The current wind speed is fifteen (15) miles per hour.
- The current wind direction is from 145°.

EXAMINEE HANDOUT (page 2 of 2)

Initiating Cues:

Determine the appropriate emergency classification. This is time critical.

Record the Highest required Classification Level, State Posture Code and the required EAL Major and Minor Heading on the space provided below. Report to the Examiner when your Classification is made (FOR PROPER TIMING).

CLASSIFICATION LEVEL: ________________________________

EAL MAJOR HEADING:__________________________________

MINOR HEADING: ______________________________________