Form 3.3-1 Scenario Outline

Facility:	Davis Besse	Scenario #:	1
Scenario Source:		Op. Test #:	January 2024
Examiners:		Applicants/ Operators:	
Initial Conditions:	100% Power, EFW OOS, MOC		
Turnover:	Swap Main Feed Pump Turbine Main Oil Pumps per the Monthly Activity Log per DB-OP-06224, MAIN FEED PUMP AND TURBINE, Sections 3.23 and 3.24		
Critical Tasks:	1. Bypass Emergency Core Cooling System Actuation 2. Maintain Feedwater Flow Control Avoiding SFRCS Actuation		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	(N) BOP (N) SRO	Swap MFPT Main Oil Pumps
2		(I) BOP (I/TS) SRO	Safety Features Actuation System Borated Water Storage Tank Level Fails High – Channel 1 (TS)
3		(I/MC) ATC (I) SRO	RCP Seal Injection Flow Transmitter Fails Low
4		(C) BOP (R) ATC (C) SRO	Main Condensate Pump 3 High Bearing Temperature Reduce Power due to Stopping Condensate Pump 3
5		(C) ATC (C/TS) SRO	Steam Generator Tube Leak in Steam Generator 1 (TS)
6		(M) CREW	Steam Generator Tube Rupture in Steam Generator 1
7		(C/MC) BOP (C) SRO	Steam Generator 1 Startup Valve Fails Closed
Termination Criteria:			• Critical Tasks have been evaluated • RCS Cooldown in progress • At the discretion of the Lead Evaluator

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

CT1: Bypass Emergency Core Cooling System Actuation

- **Initiating Cue:** Both of the following:
  - 5-2-C, SFAS RC PRESS LO BLK PERM in alarm
  - RCS pressure is being manually reduced and under control
  - SFAS Low Pressure Block Permit lights are lit on HIS 7528 through 7531
- **Performance Feedback:**
  - RCS pressure reduced below the SFAS Low Pressure Trip setpoint without an SFAS actuation
- **Success Path:** 3 SFAS Channels are blocked prior to reaching the SFAS RC Pressure Lo Trip Setpoint
- **Measurable Performance Standard:**
  - On Panel C5705, in the RCS DEPRESSURIZATION SFAS BLOCK section, check which SFAS Channel(s) BLOCK PERMIT INDICATION light is ON
  - Depress the PUSH TO BLOCK switch for the SFAS Channel(s) noted in Step 3.2.b
  - Verify the BLOCKED INDICATION light is ON
- **Safety Significance:** During SGTR mitigation with adequate Subcooling Margin, RCS pressure is reduced to minimize tube stress and control primary to secondary side leakage. With RCS pressure under control SFAS actuation should be bypassed to prevent unwanted and unnecessary equipment actuation.

CT2: Maintain Feedwater Flow Control Avoiding SFRCS Actuation

- **Initiating Cue:** Both of the following:
  - No indicated FW flow to SG 1 on FI SP3B
  - 12-4-A, SG 1 LVL LO in alarm
- **Performance Feedback:** All of the following:
  - Indicated flow on FI SP3B
  - Rising level on Plant Process Computer Screen
- **Success Path:** Manually controlling SG1 level at approximately 40 inches to avoid a low SG level SFRCS actuation using FIC ICS33B.
- **Measurable Performance Standard:** Take manual control of SP7B and maintain SG 1 level on low level limits.
- **Safety Significance:** Restoring Feedwater to SG 1 prevents a release to the environment from a possible SFRCS actuation on Low Level. An SFRCS actuation will result in off-site release which will result in a Site Area Emergency classification.

Scenario Executive Summary

Initial Conditions / Turnover:

The crew will take the watch with the plant at 100% power.

Direction(s) for the Shift:

Swap Main Feed Pump Turbine Main Oil Pumps per the Monthly Activity Log per DB-OP-06224, MAIN FEED PUMP AND TURBINE, Sections 3.23 and 3.24. Auxiliary Operators have been briefed and standing by to complete the evolution.

EVENT 1: Swap MFPT Main Oil Pumps

The BOP will swap the running MFPT Main Oil Pumps per DB-OP-06224, MAIN FEED PUMP AND TURBINE, Sections 3.23 and 3.24.

EVENT 2: Channel 1 BWST level instrument fails High

The BOP will manually trip the associated Safety Features Actuation System (SFAS) BWST level bistable to allow a transfer to the Emergency Sump if conditions require that transfer ability (TS). LCO 3.3.5 is not met.

EVENT 3: Reactor Coolant Pump Seal Injection Flow Transmitter Fails Low

Actual Seal Injection Flow will increase to all 4 Reactor Coolant Pumps due to the flow transmitter failing low. ATC is expected to place MU 19 flow controller in Hand and MANUALLY control seal injection flow.

EVENT 4: Condensate Pump 3 High Bearing Temperature / Reduce Power

Condensate pump 3 bearing temperature will rise to the alarm setpoint of T186 and continue past the trip criteria of 212^{o}F. The ATC is expected to reduce power to within the capacity of 2 Condensate pumps. 7 MPPH is the expected maximum flow with 2 Condensate Pumps. During a normal power reduction, the first Condensate pump will be removed from service by the BOP when condensate flow is less than 7 MPPH.

EVENT 5: SG 1 Steam Generator Tube leak

After power is stabilized with 2 Condensate pumps, the steam generator tube leak (SGTL) is inserted. The crew will enter DB-OP-02531 and begin a power reduction to take the plant off-line. LCOs 3.4.13 and 3.4.17 are not met.

EVENT 6: Major – SG 1 Tube Rupture (CT)

When the manual plant runback has been completed or when directed by the lead evaluator, the steam generator tube rupture (SGTR) can be inserted. The crew will reduce power to Low Level Limits (approximately 30%), transfer steam loads from the main turbine to the turbine bypass valves, then trip the reactor. The crew will lower RCS Pressure to isolate the faulted SG. SFAS RCS Low Pressure trip will be blocked as pressure is lowered.

EVENT 7: SG 1 Startup Valve Fails Closed (CT)

After a programmed time delay after the reactor trip, SG 1 startup level valve will fail closed. The BOP will be required to place SP7B in Hand and MANUALLY control level prior to reaching the SG Low Level SFRCS Actuation.

Scenario Termination

The scenario is terminated when the Critical Tasks have been evaluated, the crew has performed the RCS pressure reduction and commenced the RCS Cooldown, and at the discretion of the Lead Evaluator.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 1	Page 1 of 2

Event Description: Swap Main Feed Pump Main Oil Pumps per the Monthly Activity Log for Main Feed Pumps 1 and 2 per DB-OP-06224. Main Feed Pump and Turbine, Sections 3.23 and 3.24.

Symptoms/Cues:

- Brief the activity after assuming the watch. An Equipment Operator is standing by MFPT 1
- Perform DB-OP-06224 Sections 3.23 and 3.24.

Time	Position	Applicant's Actions or Behavior
	BOP	MAIN FEED PUMP 1 • Start MFPT 1 Main Oil Pump 1, using HIS1195, MAIN FEED PUMP 1 Main Oil Pump 1 – Check MFPT 1 Main Oil Pump 1 is running • Stop MFPT 1 Main Oil Pump 2, using HIS1198, MAIN FEED PUMP 1 Main Oil Pump 2 Local Operator reports post start checks are SAT along with the following indications for Step 3.23.3.d – *"PI 1194, HYDRAULIC OIL PRESSURE, is 235 PSIG"* – *"PI 1216, TURBINE BEARING OIL PRESSURE, is 15 PSIG"* – *"PI 1207, PUMP BEARING OIL PRESSURE, is 15 PSIG"* – *"PI 2650, CONTROL OIL PRESSURE, is 58 PSIG"* – PI 1206, LUBE OIL SYSTEM HDR PRESSURE (CTRM), is between 10.0 and 16.0 PSIG Verify the available MFPT 1 Main Oil Pumps are in AUTO START – HIS1195, MAIN FEED PUMP 1 MAIN PUMP 1 – HIS1198, MAIN FEED PUMP 1 MAIN PUMP 2
	BOOTH CUES	

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 1	Page 2 of 2

Event Description: Swap Main Feed Pump Main Oil Pumps per the Monthly Activity Log for Main Feed Pumps 1 and 2 per DB-OP-06224. Main Feed Pump and Turbine, Sections 3.23 and 3.24

Symptoms/Cues:

- Brief the activity after assuming the watch. An Equipment Operator is standing by MFPT 1
- Perform DB-OP-06224 Sections 3.23 and 3.24.

Time	Position	Applicant's Actions or Behavior
	BOP BOOTH CUES	MAIN FEED PUMP 2 • Start MFPT 2 Main Oil Pump 2, using HIS1247, MAIN FEED PUMP 2 Main Oil Pump 2 – Check MFPT 2 Main Oil Pump 2 is running • Stop MFPT 2 Main Oil Pump 1, using HIS1236, MAIN FEED PUMP 2 Main Oil Pump 1 Local Operator reports post start checks are SAT along with the following indications for Step 3.23.4.d – *"PI 1246, HYDRAULIC OIL PRESSURE, is 237 PSIG"* – *"PI 1259, TURBINE BEARING OIL PRESSURE, is 15 PSIG"* – *"PI 1257, PUMP BEARING OIL PRESSURE, is 15 PSIG"* – *"PI 2630, CONTROL OIL PRESSURE, is 56 PSIG"* – PI 1256, LUBE OIL SYSTEM HDR PRESSURE (CTRM), is between 10.0 and 16.0 PSIG Verify the available MFPT 2 Main Oil Pumps are in AUTO START – HIS1236, MAIN FEED PUMP 1 MAIN PUMP 1 – HIS1247, MAIN FEED PUMP 1 MAIN PUMP 2

Insert Event 2 after the main oil pumps for BOTH main feed pumps have been swapped

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 2	Page 1 of 1

Event description: Safety Features Actuation System Borated Water Storage Tank Level Fails High – Channel 1 (TS)

Symptoms/Cues:

- Annunciator 5-4-D BWST LVL HI FAIL
- Panel C5716 LI 1525A CH 1

	SRO	– Refer to DB-OP-02005 ALARM PANEL 5 ANNUNCIATORS – Determine if the channel is OPERABLE by performing a channel check. REFER TO DB-OP-03006, Miscellaneous Instrument Shift Checks. – Compare the maximum indicated level difference to the tolerance limit of 2.0 Feet – Refer to TS 3.3.5, Safety Features Actuation System Instrumentation. – Declare the Affected Instrument Inoperable 3.3.5 Safety Features Actuation System (SFAS) Instrumentation LCO 3.3.5 Four channels of SFAS instrumentation for each Parameter in Table 3.3.5-1 shall be OPERABLE. APPLICABILITY: According to Table 3.3.5-1 – Condition A. One or more Parameters with one channel inoperable (Parameter 5) – Required Action A.1 Place channel in trip – Completion Time: 1 hour If Instrument and Controls is contacted to investigate, acknowledge the request. *"I'll send an I & C Tech to investigate the failure and report back to the Work Support Center"*
	BOP	Manually Trip SFAS Bistable BA112 in SFAS Channel 1 IAW DB-OP-06405 SFAS Procedure Section 4.1 Annunciator 5-5-F SFAS, RPS, ARTS, OR SFRCS DOOR ALARM EXPECTED • Depress the TEST pushbutton on trip bistable BA112 AND verify the TRIP light is ON – Verify the associated 1/5 lights on the output modules for all four SFAS Channels are ON.

Form 3.3-2 Required Operator Actions

Insert Event 3 when directed by the Lead Evaluator			
Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 3	Page 1 of 1

Event Description: RCP Seal Injection Flow Transmitter Fails Low

Symptoms/Cues:

- Annunciator 6-6-C SEAL INJ TOTAL FLOW
- Panel C5704 FI MU19 Indicates zero Flow

Time	Position	Applicant's Actions or Behavior
	ATC	Refer to Alarm procedure DB-OP-02006 for Annunciator 6-6-C Identify the following: – Seal Injection Flows to Reactor Coolant Pumps are HIGH on FI MU30A, MU30B, MU30C and MU30D – MU19 is OPEN – Total Flow indicated on FI MU19 is zero • Place MU19, RCP SEAL INJ FLOW CONTROLLER, in MANUAL and reduce flow to approximately 8 GPM per pump The Crew may refer to DB-OP-06006 Makeup and Purification System. No additional procedure actions are required.

If an Equipment Operator is directed to investigate the failure of MU19, call back with the following report:
"I don't see anything wrong with MU19, right now it's about _____% OPEN"

Report the position indicated in the Instructor Facility using INSIGHT label BVAMU19

If Instrument and Controls is contacted to investigate, acknowledge the request.
"I'll send an I & C Tech to investigate the failure and report back to the Work Support Center"

Insert Event 4 after RCP seal injection is restored to approximately 8 GPM per pump
NOTE: T186 will alarm approximately 3 minutes after Event 4 is inserted

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 4	Page 1 of 2

Event Description: Main Condensate Pump 3 High Bearing Temperature

Symptoms/Cues:

- Computer Point T186 HIGH Alarm

	BOP **DRIVER**	Monitor Computer Point T186 to determine if Condensate Pump Trip criteria is met • Stop Condensate Pump 3 Using HIS 591 when T186 reaches 212 Degrees **Reduce the value of the malfunction after the Condensate Pump is stopped**
	SRO	Reduce Power to within the Capacity of 2 Condensate Pumps with Indicated Condensate Flow Less than 7 MPPH on Panel C5714 FI 578 NOTE: Power should be reduced to less than or equal to 92% Enter DB-OP-02504 RAPID SHUTDOWN with ICS in Automatic If contacted, acknowledge any information, and provide the expected response. Load Dispatcher, Field Supervisor, Chemistry
	ATC	Enter DB-OP-02504 Rapid Shutdown Attachment 1 • Set the ICS Unit Load Demand Setpoint to approximately 90% • Set the ICS Unit Load Demand Rate of Change to 3 – 5% per minute – Monitor Reactor Power to confirm power is being reduced at approximately the expected rate (NI vs. HBP). – Monitor Regulating Rod Insertion Limits during the Shutdown per Technical Specification 3.2.1 using current Reactor Operator Guidance (ROG) provided by Nuclear Engineering (NOT Expected to Exceed Limits).

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 4	Page 1 of 2

Event Description: Main Condensate Pump 3 High Bearing Temperature

Symptoms/Cues:
Computer Point T186 HIGH Alarm

	BOP	NOTE: The BOP may decide to place LIC 420 and LIC 421 in Hand to manually reduce Condensate flow below 7 MPPH If an Equipment Operator is directed to check Condensate Pump 3, acknowledge the request, and call back with the following report, *"The Upper Pump bearing oil level is out of sight low"*
	BOP	Perform DB-OP-02504 Rapid Shutdown Attachment 6 At approximately 90 percent power, notify an Equipment Operator to remove the Auxiliary Feed Pump Turbine Main Steam Minimum flow lines from service. Refer to DB-OP-06233, Auxiliary Feedwater System.

Insert Event 5 when directed by the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 5	Page 1 of 3

Event Description: Steam Generator Tube Leak in SG 1 (Approximately 10 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Rising Indication on the Station Summary Computer Screen for MSL 1

	CREW	Recognize Indications of a Steam Generator Tube Leak in SG 1
	SRO	Enter DB-OP-02531 – Periodically calculate the RCS Leakrate using the computer calculation for RCS Leakage. (5 minute average preferred) – Determine which SG is leaking. – Compare RE609 (SG 1) and RE600 (SG 2) readings and trend. – Radiation Protection local surveys of Main Steam Lines. . Notify the Shift Manager to: – Have Offsite Dose assessed. REFER TO NOP-LP-5022, Davis-Besse Unified RASCAL Interface (URI) Dose Assessment Software. – Complete required notifications for Abnormal Procedure Entry. REFER TO NOP-OP-1015, Event Notifications, AND NOBP-OP-1015, Event Notifications

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 5	Page 2 of 3

Event Description: Steam Generator Tube Leak in SG 1 (Approximately 10 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Rising Indication on the Station Summary Computer Screen for MSL 1

	SRO	REFER TO Technical Specifications: 3.4.13, RCS Leakage LCO 3.4.13 RCS operational LEAKAGE shall be limited to: a. No pressure boundary LEAKAGE; b. 1 gpm unidentified LEAKAGE; c. 10 gpm identified LEAKAGE; and d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG). LCO 3.4.13 is NOT met for Primary to secondary leakage in Modes 1, 2, 3 and 4 Enter Condition C primary to secondary Leakage not within limit Required Action C.1 Be in Mode 3 in 6 hours C.2 Be in Mode 5 in 36 hours 3.4.17, SG Tube Integrity LCO 3.4.17 SG Tube integrity shall be maintained LCO 3.4.17 is NOT met for SG Tube Integrity in Modes 1, 2, 3 and 4 Enter Condition B for SG Tube Integrity not maintained Required Action B.1 Be in Mode 3 in 6 hours B.2 Be in Mode 5 in 36 hours

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 5	Page 3 of 3

Event Description: Steam Generator Tube Leak in SG 1 (Approximately 10 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Rising Indication on the Station Summary Computer Screen for MSL 1

	SRO	Determine a shutdown rate to achieve at a minimum less than 50% power within one hour AND be in mode 3 within the next 2 hours. Expected Rate is 1% to 3% per minute with a Target Load of 20% for Low Level Limits Rate determined _____ Target Load_____
	SRO	Start a Plant Shutdown. REFER TO DB-OP-02504, Rapid Shutdown (shutdown MFPT supplied by affected SG).
	ATC	• Set the Unit Load Demand to a Target Load of 20% • Set the Unit Load Demand Rate of Change to 1 -3 % per Minute – Monitor Reactor Power to confirm power is being reduced at approximately the expected rate (NI vs. HBP).
	Shift Manager	If the selected rate of change is LESS than 3% per minute, the Lead Evaluator, acting as the Shift Manager will direct the rate of change to be 3% per minute

Insert Event 6 after Technical Specifications have been evaluated, an acceptable power reduction has been performed and at direction from the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 1 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

	CREW	Recognize the SG Tube Leak Has Increased to Greater Than 50 GPM
	SRO	Enter DB-OP-02000 Section 8 for a Steam Generator Tube Rupture Notify the Shift Manager to perform Event Classification
	BOP	Verify MU, HPI, AND LPI are in service. REFER TO Attachment 8, Place HPI/LPI/MU in service Verify both CCW Trains are in service • CCW Train 1 – CCW Train 2 Verify both HPI Pumps are running. • HPI Pump 1 • HPI Pump 2 Verify all HPI Injection valves are open. • HP2C • HP2D • HP2A • HP2B
	BOP	Verify both LPI Pumps are running. • LPI Pump 1 • LPI Pump 2

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 2 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

	BOP	• Open DH 63 • Open DH64 Transfer MU Pump suctions to the BWST AND press OFF for each switch • MU6405 • MU3971
	ATC	IF AT ANY TIME Pressurizer Level is less than 200 inches, THEN • Isolate Letdown using MU2B IF AT ANY TIME two Makeup Pumps are in service AND Pressurizer level is lowering, THEN place the Makeup Alternate Injection Line in service. REFER TO Attachment 13, Controlling the Makeup System. Placing the Alternate Injection Line in service is NOT Expected due to the size of the Rupture Perform a plant shutdown as follows: • Place the SG/RX Demand H/A Station in HAND • Use the toggle switch to insert Control Rods without causing a cross limit OR a Reactor Trip.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 3 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

	SRO	Notify applicable groups to perform Attachments of DB-OP-02531, SG Tube Leak: – Attachment 2, Chemistry Responsibilities, – Attachment 3. Radiation Protection Responsibilities – Attachment 4, Control of Secondary Contamination and Off Site Release
	TEAM	Determine which SG has the tube rupture by comparing RE 609 (MS Line 1) AND RE 600 (MS Line 2)
	SRO	Direct an Equipment operator to Startup the Auxiliary Boiler on Demineralized water AND transfer Auxiliary Steam to the Auxiliary Boiler
	BOP	– At approximately 500 MWe, verify MSR 2nd Stage Reheat High Load Valves have closed • At approximately 450 MWe, remove the MFPT from service on the side with the SGTR. REFER TO Attachment 15, Main Feedwater Pump Shutdown • WHEN Condensate flow is less than 3.5 MPPH, THEN establish one Condensate Pump in operation

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 4 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

	ATC	WHEN the SGs go on Low Level Limits (approximately 28% power), THEN perform the following • Verify SG/RX Demand at zero demand. • Place BOTH SG Feedwater Demands ICS stations in HAND AND reduce the demands to zero
	BOP	Transfer steam flow from the Turbine to the TBVs until Generator load is less than 50 MWe, as follows • Place BOTH TBV H/A stations in Manual (Hand) – Verify the DEHC is in AUTO • Transfer steam load from the Turbine, at a rate that will maintain header pressure with DEHC in AUTO, to the TBVs by manually opening the TBVs.
	SRO	Establish Hot Zero Power as follows: Direct a Reactor Operator to perform the following – Operate TBVs as necessary to control individual SG pressures in the band of 980 to 1000 PSIG – Return the TBV H/A Stations to AUTO when SG pressures are in the established band following the Reactor Trip

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 5 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

	ATC	• Trip the Reactor • Depress Both Main Turbine Trip Pushbuttons
	SRO	GO TO Immediate Actions Step 3.2 – VERIFY Reactor Power is lowering on the Intermediate Range. Trip the Turbine – VERIFY all Turbine Stop Valves OR Control Valves are closed. Implement any necessary Specific Rules Actions – ACTIONS FOR LOSS OF SUBCOOLING MARGIN – STEAM GENERATOR CONTROL – POWER FOR C1 AND D1 BUSES OR EDG START Implement any necessary Symptom Mitigation Sections – LACK OF ADEQUATE SUBCOOLING MARGIN – LACK OF HEAT TRANSFER – OVERCOOLING – STEAM GENERATOR TUBE RUPTURE Return to Section 8 for a Steam generator Tube Rupture

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 6 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

** CRITICAL TASK

	ATC	Begin to depressurize the RCS with RCPs as follows: • Turn off all PZR heaters • Use PZR Spray to reduce RCS Pressure to maintain minimum adequate Subcooling Margin NOTE: Close the following HPI Valves. Valves were opened earlier with Attachment 8 and should be closed to prevent overfilling the Pressurizer as RCS pressure is reduced • HP 2A • HP 2B • HP2C • HP2D IF SFAS has NOT actuated on Low RCS Pressure AND if the RCS pressure decrease is being manually controlled with adequate SCM, THEN block the SFAS Low RCS Pressure trips when the BLOCK PERMITs come in ** Depress at least three of the following pushbuttons to Block the SFAS Low RCS Pressure Trips when the Block Permit Lights come on • ** CH 1 HIS 7528 1600 # TRIP BLK • ** CH 2 HIS 7529 1600 # TRIP BLK • ** CH 3 HIS 7530 1600 # TRIP BLK • ** CH 4 HIS 7531 1600 # TRIP BLK • WHEN RCS pressure is approximately 1000 PSIG, THEN maintain RCS pressure between 980 and 1020 PSIG

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 6	Page 7 of 7

Event Description: Steam Generator Tube Rupture in SG 1 (Approximately 100 GPM)

Symptoms/Cues:

- Annunciator 9-4-A VAC SYS DISCH RAD HI
- Annunciator 12-1-A MN STM LINE 1 RAD HI
- Calculated RCS Leak Rate Greater than 50 GPM (NOT Accurate when Makeup Pump Suctions are on the BWST)

	BOP	IF PZR Level is on scale, THEN it is acceptable to initiate a cooldown while monitoring Subcooling Margin. • Begin an RCS cooldown AND depressurization at 100°F/hr, using both SGs to a Th of 500°F AND RCS pressure of 1000 PSIG using TBVs – WHEN the BLOCK PERMIT lamps come on, THEN block the SFRCS Low Main Steam Line Pressure AND HIGH SG Level Trips (May not reach the Block Permit Setpoints Prior to Scenario Termination)

Event 7 will be inserted automatically with a time delay when the Reactor is Tripped. SG level is expected to rise immediately after the trip with the time delay resulting in SG level continuing to lower after level returns to 40 inches.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 1	Event No.: 7	Page 1 of 1

Event Description: Steam Generator 1 Startup Valve (SP7B) Fails Closed

Symptoms/Cues:

- Indicated SG 1 Level on the Plant Summary Computer Screen is Less Than 40 inches and Lowering
- Annunciator 12-4-A SG 1 LVL LO

** CRITICAL TASK

	CREW	• Identify SG 1 Level is Lowering below 40 inches • Identify SG 1 Low Level is due to SP7B being closed
	BOP	** Take Manual Control of SP 7B AND Prevent actuation of the SFRCS Low Level Trip • Place ICS SP7B in HAND • Open SP7B and restore SG 1 Level to 40 inches

Termination Criteria:

- Critical Tasks Evaluated
- RCS Pressure Reduction in Progress
- RCS Cooldown in Progress
- Lead Evaluator's Direction

Form 3.3-1 Scenario Outline

Facility:	Davis Besse	Scenario #:	2
Scenario Source:		Op. Test #:	January 2024
Examiners:		Applicants/ Operators:	
Initial Conditions:	5% Power, Startup in Progress, MUP #2 OOS and non-functional		
Turnover:	Raise reactor power to 10% RTP per DB-OP-06901, PLANT STARTUP, Step 3.42 and then place Main Feed Reg Valves in service per Step 3.43.		
Critical Tasks:	1. Start High Pressure Injection Pump 2. Start Standby CCW Pump		

Event No.	Mal. No.	Event Type*	Event Description
1		(R) ATC	Continue Reactor startup from 5% to 10%.
2	N/A	(N) BOP (N) SRO	Place Main Feed Reg Valves in service (Open Block Valves)
3		(TS) SRO	Broken High Pressure Injection Pump 2 Oil Flow Sight Glass (TS)
4		(I/MC) BOP (I) SRO	Condensate Deaerator Level Control Transmitter Failure
5		(I) ATC (I) BOP (I/TS) SRO	Power Range Nuclear Instrument 5 Fails High (TS)
6		(M) CREW	TPCW Service Water Supply pipe rupture Trip the Reactor / Initiate and Isolate the Steam and Feedwater Rupture Control System / ABDC1 fails open
7		(C/MC) BOP (C) SRO	Auxiliary Feedwater Pump 2 Fails to Automatically Start
8		(C/MC) ATC (C) SRO	C2 Lockout – EDG 1 Auto Starts – Start STBY CCW Pump
9		(M) CREW	Loss of Coolant Accident / Loss of Subcooling Margin
10		(C/MC) ATC (C) SRO	Start High Pressure Injection Pump 1
Termination Criteria:			• Critical Tasks have been evaluated • At the discretion of the Lead Evaluator

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

CT1: Start Standby CCW Pump

- **Initiating Cue:** Both of the following:
  - CCW Pump 1 panel indications
  - 1-3-B, EDG 1 CCW FLOW LO in alarm

- **Performance Feedback:**
  - Annunciator 1-3-B is Clear
  - CCW Pump 1 Red Light Lit

- **Success Path:** Manually start CCW Pump 1.

- **Measurable Performance Standard:** Start CCW Pump 1 within 11 minutes of the C2 Lockout.

- **Safety Significance:** When the Loss of Subcooling Margin occurs with HPI Pump 2 unavailable, HPI Pump 1 will be needed to increase the total flow reaching the RCS. With C2 locked out and Breaker ABDC1 out of service, EDG 1 is the only available power source for C1. Starting CCW Pump 1 is necessary to maintain EDG available.

  Operation without CCW or SW will lead to EDG overheating and failure. The EDG is shutdown if SW or CCW is not available. PCAQ 98-1883 reviewed the time available to perform the EDG Shutdown. Based on discussions with EDG vender (documented in the PCAQ), in a loaded condition, the EDG Jacket Water would reach the high temperature shutdown setpoint in approximately 3 minutes. If the EDG continued to run, the cylinder head would likely crack in approximately 6 minutes, and the EDG would likely seize in 11 to 14 minutes. The critical task time of 11 minutes will prevent diesel failure.

CT2: Start High Pressure Injection Pump 1

- **Initiating Cue:** All of the following:
  - Only a single HPI pump is available
  - HPI Flowmeters FYI HP3C and FYI HP3D
  - DB-OP-02000 Specific Rule 3 and Attachment 11, HPI Flow Balancing applicable

- **Performance Feedback:** All of the following:
  - HPI Flowmeters FYI HP3C and FYI HP3D
  - HPI Pump running indication

- **Success Path:** Start HPI Pump 1.

- **Measurable Performance Standard:** HPI Pump started and providing core cooling vice entry into Attachment 24, RCS Cooldown during a Loss of SCM with no Makeup/HPI.

  Safety Significance: Whenever Subcooling Margin is lost, HPI flow is established to provide core heat removal. Use of Attachment 24 exceeds Technical Specification cooldown rate limits.

Scenario Executive Summary

Initial Conditions / Turnover:

The crew will take the watch with the plant at 5% Power with a startup in progress per DB-OP-06901, PLANT STARTUP.

Direction(s) for the Shift:

Raise reactor power to 10% RTP per DB-OP-06901, PLANT STARTUP, Step 3.42 and then place Main Feed Reg Valves in service per Step 3.43.

EVENT 1: Continue Reactor startup from 5% to 10%

The ATC will increase power to 10% and stabilize power for Nuclear Instrument Power to Heat Balance comparison per DB-OP-06901, PLANT STARTUP, Step 3.42.

EVENT 2: Place Main Feed Reg Valves in service (Open Block Valves)

An Equipment Operator will report the steps complete for venting the bonnets of the MFW Block Valves. The BOP will open the MFW Block Valves placing the Main Feedwater Control Valves in service per DB-OP-06901, PLANT STARTUP Step 3.43.

EVENT 3: Broken High Pressure Injection Pump 2 Oil Flow Sight Glass

Equipment Operator reports a broken sight glass for the lube oil system on HPI Pump 2. The crew is expected to Refer to TS 3.5.2 ECCS – Operating for Modes 1,2 and 3 and enter LCO Action B, Restore the train to operable status within 72 hours. The crew should disable the automatic start of HPI Pump 2. If HPI Pump 2 is not disabled it will fail 1 minute after starting.

EVENT 4: Condensate Deaerator Level Control Transmitter Failure

LT421 for Condensate D/A #1 will fail high causing CD421 to close. The BOP is expected to take manual control of LIC421 and MANUALLY control #1 D/A level.

EVENT 5: Power Range Nuclear Instrument 5 Fails High

Power Range Nuclear Instrument NI5 will fail high. The SRO will enter TS 3.3.1 RPS INSTRUMENTATION, Condition A, Functions 1, 7, and 8 on RPS Channel 2. The BOP will place RPS Channel 2 in MANUAL BYPASS and place the Power Range Test Module to TEST OPERATE.

EVENT 6: Major – TPCW Service Water Supply Pipe Rupture

TPCW Service Water pipe rupture indicated by service water tunnel sump alarms and lowering pressure in the service water header. DB-OP-02511, Attachment 15 will direct tripping the reactor and initiating and isolating the SFRCS system.

EVENT 7: Auxiliary Feedwater Pump 2 Fails to Automatically Start

MS5889B does not open when SFRCS is initiated. The BOP is expected to MANUALLY open MS5889B to start AFP 2.

EVENT 8: C2 Lockout – EDG 1 Auto Starts – Start STBY CCW Pump (CT)

The Standby CCW pump (1) does not start automatically. The ATC operator is expected to MANUALLY start CCW Pump 1 to supply cooling water to EDG 1.

EVENT 9: Major - Loss of Coolant Accident / Loss of Subcooling Margin

After the plant is stabilized post-trip, an RCS leak develops causing a loss of subcooling margin (SCM) will be indicated by Annunciator 4-1-B SUBCOOL MARGIN LO and at least one SCM meter on the Post Accident Monitoring Panels indicating less than 20 degrees SCM. The crew is expected to stop all 4 RCPs per Specific Rule 2 of DB-OP-02000.

EVENT 10: Start High Pressure Injection Pump 1 (CT)

The output module for HPI 1 and the associated discharge valves are failed. With a loss of subcooling margin and only a single HPI pump available for makeup, the ATC is expected to establish HPI flow to provide cooling for the reactor.

Scenario Termination

The scenario is terminated when the Critical Tasks have been evaluated and at the discretion of the Lead Evaluator.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 1 and 2	Page 1 of 1

Event Description: Continue Reactor startup from 5% to 10%.
Place Main Feedwater Reg Valves in service (Open Block Valves, FW 779 and FW 780)

Symptoms/Cues:

- Brief evolution after assuming the watch
- Continue actions IAW DB-OP-06901 PLANT STARTUP, SECTION 3.0 STEP 3.42

Time	Position	Applicant's Actions or Behavior
	SRO ATC	NOTE: A Reactivity SRO may be used to provide PEER Checks while raising Power Direct/Monitor ATC actions per DB-OP-06901, PLANT STARTUP, from Step 3.42 • Begin raising Reactor power to 10% RTP using the Reactor Demand Station while controlling heatup rate at less than 35°F/Hr (0.58°F/min). • Slowly raise neutron demand using the toggle switch on the Reactor Demand H/A Station HIC ICS 20 NOTE: As RCS Temperature rises, ATC may elect to Raise Pressurizer Level IAW Curve CC 4.3 Pressurizer Level vs RC Temperature OR Divert Inventory to the Clean Waste System – Position MU11 to Clean Waste using HIS MU11

The Lead Evaluator will direct initiating the following report from the field.
"We've completed venting the bonnets for FW 779 and FW 780"

Form 3.3-2 Required Operator Actions

<table>
<tr><td colspan="2">Op. Test No.: 2024 DB NRC</td><td>Scenario No.: 2</td><td>Event No.: 1 and 2</td><td>Page 1 of 1</td></tr>
<tr><td colspan="5">Event Description: Continue Reactor startup from 5% to 10%.
Place Main Feedwater Reg Valves in service (Open Block Valves, FW 779 and FW 780)
Symptoms/Cues:
• Brief evolution after assuming the watch
Continue actions IAW DB-OP-06901 PLANT STARTUP, SECTION 3.0 STEP 3.42</td></tr>
<tr><td></td><td></td><td colspan="3"></td></tr>
<tr><td colspan="5">If necessary, the Shift Manager will direct the crew to continue with the following activity while raising Power</td></tr>
<tr><td></td><td>BOP</td><td colspan="3">Verify an Equipment Operator reports the steps are complete for venting the bonnets of the MFW Block Valves.

OPEN FW 780 (SG 1)

• Open STEAM GENERATOR 1 FEEDWATER MAIN VALVE, SP 6B, to 5%.

• Close STEAM GENERATOR 1 FEEDWATER MAIN VALVE, SP 6B.

• Open FW 780, S/G 1 MAIN FEEDWATER CONTROL VALVE ISOLATION, using HIS 780.

OPEN FW 779 (SG 2)

• Open STEAM GENERATOR 2 FEEDWATER MAIN VALVE, SP 6A, to 5%.

• Close STEAM GENERATOR 2 FEEDWATER MAIN VALVE, SP 6A.

• Open FW 779, S/G 2 MAIN FEEDWATER CONTROL VALVE ISOLATION, using HIS 779</td></tr>
<tr><td></td><td></td><td colspan="3"></td></tr>
<tr><td></td><td></td><td colspan="3"></td></tr>
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<tr><td></td><td></td><td colspan="3"></td></tr>
<tr><td colspan="5">Initiate call to insert Event 3 when directed by the Lead Evaluator
Insert Event 4 approximately 1 minute after the call for Event 3</td></tr>
</table>

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 3	Page 1 of 1

Event Description: Equipment operator reports a broken sight glass for the lube oil system on HPI Pump 2 (TS)

Symptoms/Cues:

- Report from the field describing the condition of the broken sight glass

Time	Position	Applicant's Actions or Behavior
An Equipment operator reports the following to the control room: *"I'm down in #2 ECCS Room. Station Services was moving scaffolding past #2 HPI Pump and a scaffold pole slid out of the cart and underneath the pump. It destroyed the oil flow sight glass. There's some oil on the pump platform, but nothing on the floor"*		
	SRO	Determine HPI Pump 2 is Inoperable and Refer to TS 3.5.2 ECCS – Operating for Modes 1, 2 and 3 LCO 3.5.2 Two ECCS trains shall be operable is NOT met Enter Condition B. One or more trains inoperable for reasons other than Condition A Required Action: B.1 Restore train to OPERABLE status within 72 hours
NOTE: If HPI Pump 2 is not Disabled, it will trip shortly after starting later in the scenario		
	SRO	Direct an equipment operator to disable the automatic start of HPI Pump 2 by removing the close control power fuses in AD111 After 5 minutes report. *"I've removed the close control power fuses from AD111 for HPI Pump 2*
	BOP	– Turn on the Blue Light for High Pressure Injection
Event 4 will result in annunciator 13-4-C approximately 6 minutes after it is inserted if no operator action is taken. The actual time may vary depending on the power level.		

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 4	Page 1 of 1

Event Description: Condensate Deaerator Level Control Transmitter Failure – Level Control Valve Fails Closed in Automatic

Symptoms/Cues:

- Annunciator 13-4-C DEAR STRG TK 1 LVL
- Lower than expected Condensate Flow indicated on Panel C 5714 FI 578
- LIC 421 Indicated Level is Failed High
- CD 421 Indicated position ZI 421
- Z166 for the Condensate Minimum flow control valve NOT Closed
- L449 for Condenser Hotwell Level High

	BOP	Identify the failure of level control for Condensate Deaerator #1, REFER to DB-OP-02013 if Annunciator 13-4-C DEAR STRG TK 1 LVL Alarms • Take Manual Control of LIC 421 • Open CD421 to restore Deaerator #1 Level to approximate 8 feet on LI 202 • Maintain Total Condensate flow less than 3.5 MPPH on FI 578 with a single Condensate Pump in operation If an Equipment Operator is directed to locally check CD 421. Acknowledge the request and report the following after approximately 1 minute. *"CD 421 looks normal to me and is about _____% Open"* Report the current valve position from Z1 421

Insert Event 5 after LIC 421 is in Hand and Deaerator Level is being recovered

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 5	Page 1 of 4

Event Description: Power Range Nuclear Instrument 5 Fails High (TS)

Symptoms/Cues:

- Annunciator 5-1-H RPS CH 2 TRIP
- Annunciator 5-3-I RPS FLUX-ΔFLUX-FLOW TRIP
- Neutron Error Inserting Control Rods

Time	Position	Applicant's Actions or Behavior
	TEAM SRO	– Identify Nuclear Instrument 5 has Failed High – Yokogawa NR NI6 Indicates the Highest Nuclear Instrument – Enter DB-OP-02505 Nuclear Instrument Failures
	ATC	• Place the Rod Control Panel in MANUAL – Check the Reactor Demand Hand Auto Station in HAND. NOTE: Feedwater is not expected to accept Temperature Control of the RCS with SG levels already being controlled on Low Level Limits – Verify RCS Tave control has transferred to Feedwater, AND proper RCS Tave control by Feed water is indicated NOTE: There is a potential for changing Modes from Mode 1 to Mode 2 if % Rated Thermal Power Drops to < or = 5%. Mode 2 would be determined by the value of either the calculated Power indicated on the Unit Load Demand or Core Delta T indicating less than 2.3 Degrees F Changing Modes from 2 to 1 is NOT allowed with HPI Pump 2 Inoperable

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 5	Page 2 of 4

Event Description: Power Range Nuclear Instrument 5 Fails High (TS)

Symptoms/Cues:

- Annunciator 5-1-H RPS CH 2 TRIP
- Annunciator 5-3-I RPS FLUX-ΔFLUX-FLOW TRIP
- Neutron Error Inserting Control Rods

	SRO	REFER TO Technical Specifications • TS 3.3.1 Reactor Protective System for affected functions • High Flux (1a) • High Flux/Number of Reactor Coolant Pumps On (7) • Flux-ΔFlux-Flow (8) NOTE: Function High Flux (1b) would be applicable if the Crew enters Mode 2 LCO 3.3.1 is not met for RPS Channel 2 Enter Condition A. One channel inoperable Required Action: Place channel in bypass or Trip NOTE: Functions (1a), 2, 3, 4, 5, 6, 7 and 8 are applicable with the channel in Bypass Completion Time: 1 hour – TS 3.3.16, ARTS (Function 1) – LCO 3.3.16 is Met with 3 Channels Operable
	SRO	Notify the Shift Manager to – REFER TO NOP-OP-1004, Reactivity Management – REFER TO NOP-OP-1015, Event Notifications – REFER TO NOBP-OP-0011, Fleet Status Calls.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 5	Page 3 of 4

Event Description: Power Range Nuclear Instrument 5 Fails High (TS)
Symptoms/Cues:

- Annunciator 5-1-H RPS CH 2 TRIP
- Annunciator 5-3-I RPS FLUX-ΔFLUX-FLOW TRIP
- Neutron Error Inserting Control Rods

	SRO	IF any Power Range Nuclear Instrument is failed high, THEN brief contingency actions for the following Note: RFR would not be expected to actuate due to the status of the Main feedwater System with power less than 10% – Rapid Feedwater Reduction will not actuate to limit Feedwater Flow – Turbine Bypass Valve bias (+115 psig) for Reactor Trip will not function. Raising Header Pressure Setpoint to 66 post trip will establish proper control pressure without bias – Main Feedwater Block Valves will not automatically close.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 5	Page 4 of 4

Event Description: Power Range Nuclear Instrument 5 Fails High (TS)
Symptoms/Cues:

- Annunciator 5-1-H RPS CH 2 TRIP
- Annunciator 5-3-I RPS FLUX-ΔFLUX-FLOW TRIP
- Neutron Error Inserting Control Rods

NOTE: ARC Flash requirements should be followed to simulate plant requirements. DO NOT ALLOW the candidate to sign the Key Log		
	BOP	REFER TO DB-OP-06403, Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure, Section 4.5 Perform the following for RPS CH 2 • Rotate the MANUAL BY-PASS KEY SWITCH to actuate the manual bypass relay – Check the MANUAL BY-PASS light on the indicating panel is BRIGHT. – Check the protective SUB-SYSTEM light on the indicating panel in DIM. • Place the Power Range Test Module for RPS CH 2 in TEST OPERATE.
Insert Events 6, 7 and 8 when directed by the Lead Evaluator. Events 7 and 8 with automatically insert when the reactor is tripped and SFRCS has been actuated		

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 1 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

The following report should be initiated 1 minute after an Equipment Operator is sent to investigate the SW Tunnel sump alarm or 3 minutes after the sump alarm is received if no Equipment operator is dispatched to the area.

"There's definitely some kind of rupture in the Service Water Tunnel downstream of SW 1399. The sump pumps are not keeping up and the water is flowing into the Water Treatment Building"

	SRO	Enter DB-OP-02511 Loss of Service Water Pumps/Systems Section 4.4 for a Service Water System Non-Seismic Line Break
	BOP	Isolate the TPCW SW header by closing the following • SW 1399, (HIS1399) SW HDR 1 TO TPCW HX – SW1395, (HIS1395) SW HDR 2 TO TPCW HX – CT2955, (HIS 2955), TPCW HX SUPPLY FROM CIRC WTR – Dispatch an Equipment Operator to Close SW 78, SERVICE WATER HEADER FROM TPCW HEAT EXCHANGER ISOLATION

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 2 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

	BOP	Provide a supply of air to the Instrument Air System as follows • Start the Emergency Instrument Air Compressor (HIS813) . Lock out Station Air Compressors • SAC 1 (HIS 812) • SAC 2 (HIS 1494)
	ATC	• Trip the Reactor • Initiate, AND Isolate SFRCS using MANUAL ACTUATION switches.
	SRO	GO TO DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture Trip the Reactor – VERIFY Reactor Power is lowering on the Intermediate Range. Trip the Turbine – VERIFY all Turbine Stop Valves OR Control Valves are closed.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 3 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

	SRO	Implement any necessary Specific Rules Actions – ACTIONS FOR LOSS OF SUBCOOLING MARGIN – STEAM GENERATOR CONTROL – POWER FOR C1 AND D1 BUSES OR EDG START Implement any necessary Symptom Mitigation Sections – LACK OF ADEQUATE SUBCOOLING MARGIN – LACK OF HEAT TRANSFER – OVERCOOLING – STEAM GENERATOR TUBE RUPTURE
NOTE: The Crew may route to Section 7 OVERCOOLING due to Low Decay Heat and SG Pressures remaining below 960 PSIG. Not Expected.		
	SRO	– Route to DB-OP-02000 Section 7 for an Overcooling with SG Pressures Less than 960 PSIG

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 3 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

	BOP	Perform DB-OP-02000 Attachment 8 if directed by the SRO due to routing to Section 7 Overcooling Verify MU, HPI, AND LPI are in service. REFER TO Attachment 8, Place HPI/LPI/MU in service Verify both CCW Trains are in service • CCW Train 1 – CCW Train 2 Verify both HPI Pumps are running. • HPI Pump 1 • HPI Pump 2 Verify all HPI Injection valves are open. • HP2C • HP2D • HP2A • HP2B Verify both LPI Pumps are running. • LPI Pump 1 • LPI Pump 2 • Open DH 63 • Open DH64 Transfer MU Pump suctions to the BWST AND press OFF for each switch • MU6405 • MU3971

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 3 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

	BOP	– Verify proper SFRCS actuation for a Manual Isolation Trip – Verify SG Pressures are approximately equal • Control Atmospheric Vent Valves to maintain RCS temperature constant or slightly lowering • Maintain both SG levels using Specific Rule 4
	SRO	– Check entry into Pressurized Thermal Shock Criteria per Specific Rule 5 – GO TO Section 4 Supplemental Actions
	BOP	– Identify MS5889B Failed to Open – Identify Lack of Auxiliary Feedwater Flow to SG 2 • Depress HIS 5889B to Open MS 5889B If directed to perform post start checks of both AFPs, acknowledge the request. It's not necessary to provide a response.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 4 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

** CRITICAL TASK

	ATC	– Perform Specific Rule 6 – Identify the Lockout of C2 Bus – Identify EDG 1 is operating and supplying C1 Bus without CCW Pump 1 running • ** Start CCW Pump 1 using HIS 1414 If directed to investigate the loss of C2, acknowledge the request and provide the following response. *"There's no obvious damage to C2, but the lockout relay is tripped, and all Load Breakers are Open"* If directed to perform post start checks on EDG 1, acknowledge the request. It's not necessary to provide a response
	SRO	Continue with DB-OP-02000 Section 4 Supplemental Actions
	ATC	Check for all Group 1-7 Control Rods fully inserted

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 5 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

	ATC	Perform Attachment 1, Primary Inventory Control Actions. Transfer MU Pump suctions to the BWST position AND IF not already locked on the BWST, press OFF for each switch • MU6405 • MU3971 • Set Pressurizer Level Controller to 100 inches IF AT ANY TIME Pressurizer Level is less than 40 inches THEN perform the following • Isolate letdown using MU2B – Check all Pressurizer Heaters are OFF • Manually turn any energized heaters to OFF • IF only one Makeup Pump is running, THEN start the second Makeup Pump . – Verify PZR Heaters AND PZR Spray are maintaining RCS pressure in AUTO.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 6, 7 and 8	Page 6 of 6

Event Description: Turbine Plant Cooling Water (TPCW) Service Water Supply Pipe Rupture – Auxiliary Feedwater Pump 2 Fails to Automatically Start – Bus C2 Lockout, CCW Pump 1 Fails to Auto Start

Symptoms/Cues:

- Service Water Pipe Tunnel Sump Alarm L500
- Report from the Field

	BOP	Perform Attachment 2 Steam Generator Inventory and Pressure Control Actions – Verify Steam Generator Levels are being controlled per Specific Rule 4, Steam Generator Control. – IF SFRCS has actuated AND SA2 has NOT actuated, THEN maintain operable SGs as follows: – 49 inches on the Startup Range using AFW – Verify Steam Generator Pressures are being controlled by Automatic or Manual operation of the AVVs

Insert Events 9 and 10 when directed by the Lead Evaluator. Event 10 is automatically initiated due to an SFAS output module failure for HPI Pump 1

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 9 and 10	Page 1 of 3

Event Description: (9) Large Break Loss of Coolant Accident with a failure of Makeup Pump 1 leading to a Loss of Subcooling Margin – (10) Start HPI Pump 1

Symptoms/Cues:

- Annunciator 4-1-B SUBCOOL MARGIN LO
- Rapidly Lowering RCS Pressure
- Makeup Pump 1 Trip

	TEAM	Recognize indications of a large RCS leak with a loss of Subcooling Margin – SFAS Level 2 Actuation due to Low RCS Pressure Annunciator 4-1-B RCS SUBCOOL MARGIN LO
	SRO BOP ATC	Re-Route to Specific Rules of DB-OP-02000 Implement any necessary Specific Rules Actions – ACTIONS FOR LOSS OF SUBCOOLING MARGIN Stop RCPs • RCP 1-1 • RCP 1-2 • RCP 2-1 • RCP 2-2 – STEAM GENERATOR CONTROL – POWER FOR C1 AND D1 BUSES OR EDG START Implement any necessary Symptom Mitigation Sections – LACK OF ADEQUATE SUBCOOLING MARGIN – LACK OF HEAT TRANSFER – OVERCOOLING – STEAM GENERATOR TUBE RUPTUR

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 9 and 10	Page 2 of 3

Event Description: (9) Large Break Loss of Coolant Accident with a failure of Makeup Pump 1 leading to a Loss of Subcooling Margin – (10) Start HPI Pump 1

Symptoms/Cues:

- Loss of RCS Subcooling Margin
- Rapidly Lowering RCS Pressure
- Makeup Pump 1 Trip

** CRITICAL TASK

	SRO	Route to Section 5 of DB-OP-02000 Verify all Reactor Coolant Pumps are tripped Notify the Shift Manager to perform Event Classification.
	ATC	Place HPI, LPI AND MU are in service. REFER TO Attachment 8, Place HPI/LPI/MU in service. Verify both HPI Trains are in service as follows Verify both CCW Trains are in service – CCW Train 1 – CCW Train 2 – Verify both HPI Pumps are running • **Start HPI Pump 1 IF only one HPI train is available, AND SCM is NOT adequate THEN REFER TO Attachment 11, HPI Flow Balancing Verify HPI Train 1 Injection Valves are fully open – HP2C, HIGH PRESSURE INJECTION LINE 1-1 ISOLATION – HP2D, HIGH PRESSURE INJECTION LINE 1-2 ISOLATION

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 2	Event No.: 9 and 10	Page 3 of 3

Event Description: (9) Large Break Loss of Coolant Accident with a failure of Makeup Pump 1 leading to a Loss of Subcooling Margin – (10) Start HPI Pump 1

Symptoms/Cues:

- Loss of RCS Subcooling Margin
- Rapidly Lowering RCS Pressure
- Makeup Pump 1 Trip

	ATC	REFER TO Figure 3, HPI Balancing to determine if each flow is in the acceptable region or not – FYI HP3C - Acceptable - YES – FYI HP3D - Acceptable - YES HPI Flow Balancing is NOT required – Verify both LPI Trains are in service as follows – Verify both LPI Pumps are running • LPI Pump 1 • LPI Pump 2 Open both piggyback valves • DH64 • DH63
	BOP	Verify proper SFAS actuation for the trip parameters present. Use SAM lights (on DIM) OR REFER TO Table 2.
	BOP	Verify proper SFRCS actuation for the trip parameters present. REFER TO Table 1.

Termination Criteria:
Critical Tasks Evaluated
Direction from the Lead Evaluator

Form 3.3-1 Scenario Outline

Facility:	Davis-Besse	Scenario #:	3
Scenario Source:		Op. Test #:	January 2024
Examiners:		Applicants/ Operators:	
Initial Conditions:	80% Power, MOC, MUP 2 OOS and non-functional		
Turnover:	Complete the Function check of BAF3		
Critical Tasks:	1. Manually trip the Rx 2. Supply C1 or D1 from the SBODG		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	(N) BOP (N) SRO	Complete the functional check of BAF3 alternate source Breaker for substation F3
2		(I/MC) ATC (I/MC) BOP (I) SRO	Loop 1 MFW flow indication fails mid-scale
3		(TS) SRO	Containment Spray Pump (CSP) Oil Leak (TS)
4		(C) ATC (C/TS) SRO	Approximately 10 GPM unidentified RCS leak inside containment (TS)
5		(R) ATC (R) BOP	Rapid Shutdown due to RCS leakage
6		(M) CREW	LOCA inside containment
7		(C/MC) ATC (C) SRO	RPS fails to trip the Rx
8		(C/MC) ATC (C) SRO	Loss of offsite power due to failure of fast bus transfer EDG 1 and 2 both fail to start/lockout
9		(C/MC) BOP (C) SRO	AF6452 fails OPEN due to a SG Level Instrument Failure
Termination Criteria:			• Critical Tasks have been evaluated • Attachment 8 completed • At the discretion of the Lead Evaluator

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

CT1: Manually trip the reactor prior to tripping the Main Turbine

- **Initiating Cue:** ALL of the following:
  - CRs NOT FULLY INSERTED
  - Reactor Power greater than 5%

- **Performance Feedback:** All of the following:
  - CRs fully inserted
  - Reactor power is lowering on the IR NI

- **Success Path:** Entry into DB-OP-02000, RPS, SFAS, SFRCS TRIP, OR SG TUBE RUPTURE and performing a manual reactor trip, this will insert all control rods into the core shutting down the nuclear chain reaction as part of steps 3.2 and 3.3.

- **Measurable Performance Standard:** Insert negative reactivity into the core prior to completing step 3.3 RNO of DB-OP-02000. The reactor trip using the manual Reactor Trip pushbuttons will not be successful. The crew will be successful in tripping the reactor when they insert the Reactor Trip Test key and rotate the key clockwise at the Rod Control Panel.

- **Safety Significance:** If the Main Turbine is tripped prior to the reactor being shutdown, steam generator pressures will rise resulting in excessive cycling of the SG code safeties. A SG safety will fail open resulting in an overcooling event which will exacerbate the ATWS condition.

CT2: Supply C1 or D1 from the SBODG

- **Initiating Cue:** All of the following
  - C1 and D1 are de-energized by observing voltage meters
  - Procedure Direction: DB-OP-02000, Specific Rule 6
  - LOOP - Control Room Lighting off

- **Performance Feedback:**
  - Bus C1 or D1 energized

- **Success Path:** By manually starting the Station Blackout Diesel Generator and aligning it to Bus C1 or D1 within 10 minutes from the time Immediate Actions have been verified.

- **Measurable Performance Standard:** Energize either C1 or D1 by starting and loading the Station Blackout Diesel within 10 minutes. 10 minutes is associated with ELAP Time Sensitive Operator Action.

- **Safety Significance:** Plant electrical power is necessary for the operation of normal and emergency plant equipment. Therefore, it is important that the plant operator provide normal AC power, usually supplied through the station startup transformer(s). If normal AC power cannot be supplied, then actions are necessary to initiate operation of the emergency AC source(s). Both EDGs become unavailable therefore the crew must start the SBODG to supply C1 or D1.

Scenario Executive Summary

Initial Conditions / Turnover:

Davis Besse Unit 1 will be at 100% during the middle of the operating cycle. No Xenon transient is in progress. No equipment is out of service.

Direction(s) for the Shift:

Complete the functional check of BAF3 Alternate Source Breaker for Substation F3 by performing a live bus transfer of unit substation F3 to normal power.

EVENT 1: Complete the functional check of BAF3

Crew will complete the functional check of BAF3 Alternate Source Breaker for Substation F3 by performing a live bus transfer of unit substation F3 to normal power using DB-OP-06317, section 3.6. This event is completed when the live bus transfer is complete and unit substation F3 is on its normal power supply and with the concurrence of the lead evaluator.

EVENT 2: Loop 1 MFW flow indication fails low

An instrument failure will occur on SP2A-1 MFW flow transmitter in such manner that SASS will not auto swap to the redundant instrument. The crew will respond by placing the following ICS stations to manual/hand: Rod Control diamond, BOTH FW stations, Loop 1 MFW Control Valves, and adjusting control rods and FW flow to stabilize RCS temperature and reduce power less than 100%. The crew may also respond per DB-OP-02526, PRIMARY – SECONDARY HEAT TRANSFER UPSET, Immediate Actions if the failure is not immediately recognized. This event is complete when the plant is stabilized below 100%, RCS Pressure and Temperature are stabilized, manual control responsibilities and control bands have been established, and with the concurrence of the Lead Evaluator.

EVENT 3: Containment Spray Pump (CSP) Oil Leak

The Lead Evaluator will then cue event 3. An EO performing normal rounds will call the control room and report the oil has leaked out of the CSP 1 inboard bearing reservoir. The SRO will declare the CSP 1 Inoperable and enter TS LCO 3.6.6 (Containment Spray and Air Cooling Systems), Condition A. The crew will direct disabling CSP 1 from starting.

EVENT 4: Approximately 10 GPM RCS leak in containment resulting in manual downpower

A small reactor coolant leak (approximately 10 gpm) will develop that will result in PZR level lowering (less than max charging capability) and lowering PZR pressure. The crew will enter DB-OP-02522, SMALL RCS LEAKS and determine the RCS leak rate. The ATC will perform leak isolation procedure steps but will not be able to specify the location other than that it is in containment. The crew will determine that based on location and leak rate that a downpower is required per step 4.11. The crew will brief and begin a Reactor shutdown. This event is completed when Reactor power has been lowered to less than 75%, actions have been taken

for a leak in containment, and with the concurrence of the lead evaluator. The SRO will analyze Technical Specifications and determine TS LCO 3.4.13 (RCS Leakage), Condition A and TS LCO 3.4.15 (RCS Leakage Detection Instrumentation), Condition A entry are required.

EVENT 5: Major – Small break Loss of Coolant Accident inside containment

At approximately 70% power, the small coolant leak will propagate quickly into a small break LOCA (exceeding charging pump capacity) such that the crew will attempt to trip the reactor prior to PZR Level reaching 100 inches. The crew will enter DB-OP-02000, RPS, SFAS, SFRCS TRIP or SG TUBE RUPTURE. The manual Reactor Trip Pushbuttons will not be successful in tripping the reactor. The crew will address the failed reactor trip (outlined below).

EVENT 6: Manual Reactor Trip Successful in Inserting Control Rods (CT)

The crew will manually trip the reactor and verify Rx power is lowering in the Intermediate Range when they insert the Reactor Trip Test key and rotate the key clockwise at the Rod Control Panel. The crew will progress through DB-OP-02000 Immediate Actions then implement any necessary Specific Rules Actions. When the reactor is tripped, a loss of offsite power will occur.

EVENT 7: Loss of offsite power due to failure of fast bus transfer, with a failure of both EDG1 and 2 to start automatically (CT)

The loss of offsite power was due to a malfunction of the fast bus transfer system. It results in a loss of RCPs and secondary non-vital loads. The crew will implement SR 2, Actions For Loss Of Subcooling Margin and SR 6, Power for C1 and D1 buses OR EDG start. SR 6 Step 6.2 will direct the crew to perform Attachment 28, Restore Power to C1 or D1 Bus from the SBODG. The crew will then perform symptom checks and route to Section 5 for Loss of SCM.

EVENT 8: AF6452 fails to open on SFRCS initiation signal

A malfunction with SG 1 Level Instrument will cause AF6452 to fail OPEN which will result in SG 1 overfeed. The crew will implement SR 4, Steam Generator Control and Attachment 5 Guidelines for Restoring Feedwater to place LIC6452 in manual and adjust SG 1 level to 124".

Scenario Termination

The scenario is terminated when the Critical Tasks have been evaluated, the crew has completed Attachment 8, and at the discretion of the Lead Evaluator.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 1	Page 1 of 1

Event Description: Complete the Functional check of BAF3 Alternate Source Breaker for Substation F3

Symptoms/Cues:

- Brief Completing the Functional check of BAF3 IAW DB-OP-06317 Section 3.6 Unit Substation F3 Live Bus Transfer

Time	Position	Applicant's Actions or Behavior
	SRO BOP	Brief completing the Functional check of BAF3 IAW DB-OP-06317 Section 3.6 Unit Substation F3 Live Bus Transfer
	BOP	– Verify Transformer BF3 (normal supply) is Energized – Verify the designated supply breaker is racked in and the green indicating light, is ON (C5715) BBF3, using HIS6248 – Verify Buses A and B are in phase • Place HIS6248 in the designated position and release, NORMAL SOURCE (BBF3) – Verify breaker BBF3 is closed – Verify breaker BAF3 is OPEN – Check for normal voltage on Unit Substation F3, using EI6268, 480V BUS F3 – Notify the Shift Manager the Functional check of BAF3 is complete and F3 is being supplied from its normal source

Insert Event 2 after the Live Bus Transfer is Complete

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 2	Page 1 of 3

Event Description: LOOP 1 Main Feedwater Flow Transmitter Fails Mid-Scale

Symptoms/Cues:

- Panel C5712 FI SP2B1 Fails to Mid-Scale
- Annunciator 14-4-E ICS INPUT MISMATCH
- Plant Computer Group 61 Indications for Main Feedwater Flow
- Annunciator 14-4-C ICS RX PWR LILMITED BY FW
- Annunciator 14-6-D ICS IN TRACK

Time	Position	Applicant's Actions or Behavior
	TEAM	Identify the Failed Instrument is an Input to the Integrated Control System Feedwater Sub-System for Main Feedwater Loop 1
	ATC	Place the following control stations in HAND • Rod Control Panel • Reactor Demand H/A Station NOTE: The crew may leave these stations in AUTOMATIC until they are ready to select a good flow instrument
	BOP	Place the following Control Stations in HAND • Main Feedwater Loop 1 Demand H/A Station • Main Feedwater Loop 2 Demand H/A Station • Main Feedwater Loop 1 Main Valve H/A Station • Main Feedwater Loop 1 Startup Valve H/A Station

Note: If Annunciator 4-2-E, PZR LVL LO alarms due to Lowering Tave, the ATC may reduce the Pressurizer level Setpoint using LIC RC14

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 2	Page 2 of 3

Event Description: LOOP 1 Main Feedwater Flow Transmitter Fails Mid-Scale

Symptoms/Cues:

- Panel C5712 FI SP2B1 Fails to Mid-Scale
- Annunciator 14-4-E ICS INPUT MISMATCH
- Plant Computer Group 61 Indications for Main Feedwater Flow
- Annunciator 14-4-C ICS RX PWR LILMITED BY FW
- Annunciator 14-6-D ICS IN TRACK

	SRO	NOTE: Entering DB-OP-02526 is NOT Expected The Crew may also Route to DB-OP-02526 Primary to Secondary Heat Transfer Upset Abnormal Procedure and perform the IMMEDIATE ACTIONS if they are unable to quickly identify the failed instrument
	ATC	NOTE: Entering DB-OP-02526 is NOT Expected • Place the Rod Control diamond station in MANUAL AND INSERT control rods as necessary to reduce power below maximum allowed power.
	BOP	NOTE: Entering DB-OP-02526 is NOT Expected • Place BOTH Feedwater Loop Demand Hand/Auto Stations to Hand AND adjust FW Flow to STABILIZE RCS Tave at the current RCS temperature. • Place FW Valve Hand/Auto Stations to Hand AND adjust stations as necessary to STABILIZE RCS Tave at the current RCS temperature. • Check DEHC Load Control is in Automatic AND controlling Turbine Header Pressure between 830 and 930 psig.
	BOP	– Depress the Reset Pushbutton on the affected SASS Module to Reset Annunciator 14-4-E ICS INPUT MISMATCH

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 2	Page 3 of 3

Event Description: LOOP 1 Main Feedwater Flow Transmitter Fails Mid-Scale

Symptoms/Cues:

- Panel C5712 FI SP2B1 Fails to Mid-Scale
- Annunciator 14-4-E ICS INPUT MISMATCH
- Plant Computer Group 61 Indications for Main Feedwater Flow
- Annunciator 14-4-C ICS RX PWR LILMITED BY FW
- Annunciator 14-6-D ICS IN TRACK

	ATC	NOTE: Entering DB-OP-02526 is NOT Expected Perform DB-OP-02526 Supplementary Actions Check RCS Pressure is between 2105 and 2205 psig Place the following ICS Hand/Auto Stations in Hand: • SG/Rx Demand • Reactor Demand – SG Load Ratio
	Lead Evaluator	NOTE: If the crew did not place the Rod Control Panel and the Reactor Demand H/A Station in HAND, the Shift Manager should direct the crew to select a good instrument. This direction is expected to drive the crew to place those stations in HAND
	SRO	Assign manual control responsibilities and control bands for the following plant parameters: – Insert OR withdraw Control Rods to maintain Reactor Power less than maximum allowed power AND within ±1 % of current reactor power level. – Adjust FW Flow as necessary to maintain RCS Tave within ±2°F of current temperature. – Adjust FW Flow as necessary to maintain RCS cold leg differential temperature within ±2 degrees of zero. – IF the Main Turbine is in manual, THEN maintain Turbine Header Pressure within ±10 psig of current pressure.

Initiate the call for Event 3 when directed by the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 3	Page 1 of 1

Event Description: Containment Spray Pump #1 Inboard bearing Oil Leak

Symptoms/Cues:

- Equipment Operator Report

Time	Position	Applicant's Actions or Behavior
	Equipment Operator Report	*"This is Zone 3, Containment Spray Pump 1 has an oil leak from the pump inboard bearing. From the amount of oil on the floor it looks like the bearing may be empty. I'll get some rags and clean up the oil. No oil made it to the sump"*
	SRO	Declare Containment Spray Pump 1 Inoperable Refer to LCO 3.6.6 Two containment spray trains and two containment air cooling trains shall be OPERABLE. Modes 1, 2, 3, and 4 Enter Condition A. One containment spray train inoperable Required Action. Restore containment spray train to OPERABLE status Completion Time. 7 Days
	SRO	Direct an Equipment Operator to Remove the Close Control Power Fuses or Rack out BE111 to disable Containment Spray pump 1 *After 15 minutes: "BE 111 is racked out"*
	BOP	– Turn on BLUE Light for Containment Spray

Insert Event 4 after TS 3.6.6 Condition A is entered and with concurrence of the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 4	Page 1 of 3

Event Description: Small RCS Leak in Containment (approximately 15 GPM)

Symptoms/Cues:

- Containment to Annulus DP Rising
- Rising Indications on Containment RE 4597
- Rising Normal Sump Level Indication on the Yokogawa recorder L317

	SRO	Enter DB-OP-02522 Small RCS leaks IF AT ANY TIME Pressurizer level is less than 100 inches, THEN perform the following: – Trip the Reactor – GO TO DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture.
	ATC	IF AT ANY TIME Pressurizer level is below set point by more than 20 inches, THEN perform the following – Isolate Letdown using MU2B The following actions are NOT expected to be necessary IF Pressurizer Level continues to lower, THEN – Start the standby MU pump IF Pressurizer Level continues to lower, THEN – Establish maximum Makeup Flow. REFER TO Attachment 1, Establish Maximum Makeup Flow IF Pressurizer Level continues to lower, THEN – Lineup and start piggyback operations. REFER TO Attachment 2, Lineup Piggyback Operations.
	TEAM	Determine the RCS Leak rate using the computer calculation for RCS Leakage. (5-minute average preferred.)

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 4	Page 2 of 3

Event Description: Small RCS Leak in Containment

Symptoms/Cues:

- Containment to Annulus DP Rising
- Rising Indications on Containment RE 4597
- Rising Normal Sump Level Indication on the Yokogawa recorder L317

	SRO	REFER TO Technical Specification 3.4.13, RCS Operational Leakage. LCO 3.4.13 RCS Operational Leakage shall be limited to a. No pressure boundary LEAKAGE b. 1 gpm unidentified LEAKAGE c. 10 gpm identified LEAKAGE; and d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG). Modes 1, 2, 3, and 4 Enter Condition B. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE. Required Action. Reduce Leakage to within limits Completion Time. 4 hours
	SRO	Notify the Shift Manager to perform Event Classification (SU5.1 >10 gpm AND RCS Barrier).
	ATC	IF AT ANY TIME Makeup Tank level is approaching 55 inches THEN maintain Makeup Tank Level 55 to 86 inches by performing ONE of the following • Transferring Makeup Pump Suctions MU3971 and MU6405 between the Makeup Tank and the BWST as necessary OR • Add inventory to the Makeup Tank. Refer to DB-OP-06001, Boron Concentration Control.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 4	Page 3 of 3

Event Description: Small RCS Leak in Containment

Symptoms/Cues:

- Containment to Annulus DP Rising
- Rising Indications on Containment RE 4597
- Rising Normal Sump Level Indication on the Yokogawa recorder L317

	ATC	IF the RCS leak has not been isolated, THEN
		• Close MU2B
		
		IF closing MU2B did NOT isolate the RCS leak, THEN
		• Open MU2B.

Event 5 begins when the crew routes to Rapid Shutdown

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 5	Page 1 of 1

Event Description: Rapid Shutdown due to RCS leakage

Symptoms/Cues:

- Containment to Annulus DP Rising
- Rising Indications on Containment RE 4597
- Rising Normal Sump Level Indication on the Yokogawa recorder L317

	SRO	Enter DB-OP-02504 Rapid Shutdown Select a shutdown rate to complete the shutdown: – Prior to Pressurizer level lowering to 100 inches AND – As required by Technical Specifications AND – Prior to SFAS or RPS High Containment Pressure Trips or Low RCS Pressure Trips If the Field Supervisor is contacted to support the Rapid Shutdown, acknowledge the request, and provide the following response. *"I'll direct equipment operators to perform the required actions of DB-OP-02504 Rapid Shutdown"* If Chemistry or Radiation Protection is contacted to support the Small RCS Leak or Rapid Shutdown Abnormal Procedures, acknowledge the specific request. No further actions are necessary.
	ATC	• Manually Insert Control Rods to reduce power – Monitor Reactor Power to confirm power is being reduced at approximately the expected rate (NI vs. HBP).
	BOP	• Manually control total Feedwater Flow to support the directed power reduction • Establish 2 Condensate Pumps in Operation when Condensate flow is Less than 7 MPPH

Insert Events 6 after power has been reduced to an acceptable level as determined by the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 6 & 7	Page 1 of 4

Event Description:
Event 6: Small Break LOCA in Containment
Event 7: RPS Fails to Trip the Reactor

NOTE: Event 8 (LOOP & EDGs L/O will occur when the reactor is tripped)

Symptoms/Cues:

- RCS Pressure Lowering
- Pressurizer Level Lowering
- Power does not lower when the Trip Pushbuttons are depressed

** CRITICAL TASK

	TEAM	Recognize a large step change in RCS Leakage
	SRO	Direct the ATC to Trip the Reactor prior to Pressurizer Level dropping below 100 inches
	ATC	Trip the Reactor • Depress both Reactor Trip Pushbuttons Recognize the Reactor DID NOT Trip • **Insert and rotate the Reactor Trip Test Key Recognize Power is Lowering on the Intermediate Range and continue with the Immediate Actions of DB-OP-02000 • Depress Both Main Turbine Trip Pushbuttons

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 6 & 7	Page 2 of 4

Event Description: Small Break LOCA in Containment – RPS Fails to Trip the Reactor

Symptoms/Cues:

- RCS Pressure Lowering
- Pressurizer Level Lowering
- Power does not lower when the Trip Pushbuttons are depressed

	SRO	GO TO DB-OP-02000, RPS, SFAS, SFRCS Trip, or SG Tube Rupture Trip the Reactor – VERIFY Reactor Power is lowering on the Intermediate Range. Trip the Turbine – VERIFY all Turbine Stop Valves OR Control Valves are closed. Implement any necessary Specific Rules Actions – ACTIONS FOR LOSS OF SUBCOOLING MARGIN – STEAM GENERATOR CONTROL • POWER FOR C1 AND D1 BUSES OR EDG START Implement any necessary Symptom Mitigation Sections – LACK OF ADEQUATE SUBCOOLING MARGIN – LACK OF HEAT TRANSFER – OVERCOOLING – STEAM GENERATOR TUBE RUPTURE

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 6 & 7	Page 3 of 4

Event Description: Small Break LOCA in Containment – RPS Fails to Trip the Reactor

Symptoms/Cues:

- RCS Pressure Lowering
- Pressurizer Level Lowering
- Power does not lower when the Trip Pushbuttons are depressed

	SRO	Recognize the Loss of Subcooling Margin – Route to Section 5 of DB-OP-02000
	BOP ATC	– Verify all Reactor Coolant Pumps are tripped – Transfer Subcooled Margin Input to Incore Thermocouples: • Post-Accident Monitoring Panel 1 • Post-Accident Monitoring Panel 2 – Verify HPI, LPI AND MU are in service. REFER TO Attachment 8, Place HPI/LPI/MU in service. Verify MU, HPI, AND LPI are in service. REFER TO Attachment 8, Place HPI/LPI/MU in service Verify both CCW Trains are in service • CCW Train 1 – CCW Train 2 Verify both HPI Pumps are running. • HPI Pump 1 • HPI Pump 2 Verify all HPI Injection valves are open. • HP2C • HP2D • HP2A • HP2B

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 6 & 7	Page 4 of 4

Event Description: Small Break LOCA in Containment – RPS Fails to Trip the Reactor

Symptoms/Cues:

- RCS Pressure Lowering
- Pressurizer Level Lowering
- Power does not lower when the Trip Pushbuttons are depressed

	BOP	Verify both LPI Pumps are running. • LPI Pump 1 • LPI Pump 2 • Open DH 63 • Open DH64 Transfer MU Pump suctions to the BWST AND press OFF for each switch • MU6405 • MU3971

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 8	Page 1 of 2

Event Description: Loss of Off-Site Power – Both EDGs Fail to Start

Symptoms/Cues:

- Loss of all On-Site AC Power
- Annunciator 1-1-B EDG 1 FAULT
- Annunciator 1-1-J EDG 2 FAULT

** CRITICAL TASK (Time starts when step 6.2 of Specific Rule 6 is reached)

	ATC	Perform Specific Rule 6 – Recognize Both EDGs are Locked Out – Specific Rule 6 Step 6.2 TIME: _____ If an Equipment Operator is directed to check and locally start both EDGs, Acknowledge the request and report the following. *"Both EDGs look like they are locked out due to overspeed trips"* Perform Step 6.2 to Energize C1 or D1 from the SBODG Reenergization of Bus D2 from SBODG – Check AD213 is closed (breaker closed indicates D2 is NOT Locked Out). • Verify ABDD2, BUS TIE XFMR BD is open. – Verify AD 110 is open. • Start the SBODG by pressing START at the SBODG Control Panel C5740. – Check SBODG speed approximately 900 RPM. • Close AD 301 to energize Bus D2. – Verify Bus D2 energized by checking D2 Bus Voltage. IF power is being restored to D1, THEN restore Power to D1 from the SBODG via D2 as follows: – Verify D1 Sync Switch is OFF OR REMOVED. • **Close AD 110 to energize D1 Bus TIME: _____

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 8	Page 2 of 2

Event Description: Loss of Off-Site Power – Both EDGs Fail to Start

Symptoms/Cues:

- Loss of all On-Site AC Power
- Annunciator 1-1-B EDG 1 FAULT
- Annunciator 1-1-J EDG 2 FAULT

** CRITICAL TASK (Time starts when step 6.2 of Specific Rule 6 is reached)

		NOTE: The SRO may elect to Energize C1 from the SBODG. Critical Task Time Stops when Either C1 or D1 is Energized
	ATC	IF power is being restored to C1 bus, THEN restore Power to C1 from the SBODG via D2 as follows: • Verify C1 Sync Switch is OFF OR REMOVED • Verify HBBD is open • Close ABDD2 • **Close ABDC1 to energize C1 Bus TIME: _____ While monitoring SBODG load (continuous rating 2865 KW), start the required components on C1 Bus
		Insert Event 9 After C1 or D1 is Energized and with direction from the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 3	Event No.: 9	Page 1 of 1

Event Description: SG 1 Level Instrument Failure Results in an Overfeed Condition

Symptoms/Cues:

- SG 1 Level Exceeding 124 inches with Maximum Aux Feedwater Flow on the Plant Summary Computer Screen

	BOP	• Take Manual Control of AF 6452 OR • Take Manual Control of AFP 1 Speed AND Restore SG 1 level to 124 inches
	BOP	– Verify Proper SFRCS using Table 1 of DB-OP-02000 – Verify Proper SFAS checking SAM lights on DIM

Termination Criteria
Critical Task have been Evaluated
DB-OP-02000 Attachment 8 Completed

Form 3.3-1 Scenario Outline

Facility:	Davis-Besse	Scenario #:	4
Scenario Source:	New	Op. Test #:	January 2024
Examiners:		Applicants:	
Initial Conditions:	92% Power, MOC, EFW Pump OOS		
Turnover:	Shift Condensate pumps to a lineup of condensate pumps 2 and 3 running and 1 in standby IAW DB-OP-06221		
Critical Tasks:	1. Initiate and isolate SFRCS when the main turbine fails to trip 2. Initiate HPI/MU cooling		

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	(N) BOP (N) SRO	Start Condensate pump 3, stop Condensate pump 1 per DB-OP-06221
2	N/A	(I/MC) ATC (I) BOP (I/TS) SRO	RCS Press NNI input fails low (TS)
3	N/A	(R) ATC (TS) SRO	A control rod from group 5 drops fully into the core (TS)
4	N/A	(M) CREW	Second control rod drops into the core
5	N/A	(C/MC) ATC (C) SRO	Main Turbine FAILS to trip: • Turbine stop valve #2 fails to close. • All Turbine control valves fail to close.
6	N/A	(C) CREW	Complications on the Reactor Trip • AFW pump #2 fails to start. • AFW pump #1 trips on overspeed with a damaged trip linkage. • MDFP trips immediately on overcurrent • STBY makeup pump fails to start
7	N/A	(C) ATC (C) BOP (C) SRO	Plant is aligned for MU/HPI cooling
Termination Criteria:			• Critical Tasks have been evaluated • PORV opened to initiate HPI/MU cooling • At the discretion of the Lead Evaluator

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

CT1: Manually Initiate and Isolate SFRCS prior to SFAS actuation

- **Initiating Cue:** All of the following
  - TSV #2 not closed
  - TCVs not closed
  - Turbine Header pressure lowering

- **Performance Feedback:** All of the following
  - MSIVs closed
  - Slower rate of change for RCS temperature

- **Success Path:** Entry into DB-OP-02000 and performing a manual SFRCS initiation and actuation, this will close MSIVs, isolating steam to the main turbine.

- **Measurable Performance Standard:** Directing isolation of steam to the Main Turbine prior to SFAS actuation.

- **Safety Significance:** Actuating SFRCS upon a failure of the turbine to trip provides a faster response than other actions such as tripping EHC pumps and will work independent of the EHC system or Turbine control and stop valves. Closing both Main Steam Isolation Valves will secure steam flow to the main turbine and will stop the overcooling event.

CT2: Initiate MU/HPI cooling

- **Initiating Cue:** ALL of the following:
  - A loss of all MFW
  - A loss of all AFW
  - A second MU pump cannot be started

- **Performance Feedback:** All of the following
  - Open indication on MU6419 MU ALTERNATE INJECTION LINE
  - Lock open RC2A PORV
  - Lowering RCS temperature

- **Success Path:** Establishing MU/HPI cooling per Attachment 8 prior to RCS pressure reaching the automatic opening setpoint of the PZR PORV ensures adequate core cooling and an unnecessary loss of RCS inventory.

- **Measurable Performance Standard:** Establish MU/HPI cooling per Attachment 8 prior to exceeding T_{HOT} of 600F for greater than 10 minutes.

- **Safety Significance:** In the event all feedwater is lost, HPI cooling provides backup cooling of the core. If only one MU pump is operational, then MU/HPI cooling must be initiated immediately. If corrected T_{HOT} remains less than 600F, then adequate core cooling is assured. Hot leg temperature is allowed to exceed 600F for a period not to exceed 10 minutes based on the analysis contained in FCR 85-0261.

Scenario Executive Summary

Initial Conditions / Turnover:

Unit is at 92% during the middle of the operating cycle with MU pump 1 running. No Xenon transient is in progress.

The EFW pump is out of service for planned maintenance and is expected back within 12 hours.

Direction(s) for the Shift:

Shift Condensate pumps to a lineup of condensate pumps 2 and 3 running and 1 in standby IAW DB-OP-06221.

Event 1: Shift running condensate pumps

Crew will swap condensate pumps such that Condensate pumps 2 and 3 are running, and Condensate pump 1 is in standby IAW DB-OP-06221. Event is complete when condensate pumps 2 and 3 are running and condensate pump 1 is in standby and/or with the concurrence of the lead evaluator.

Event 2: RCS Press NNI input fails low (TS)

Event 2 will be initiated at Leads Evaluator's direction. RCS pressure instrument selected for NNI fails low. The crew will implement DB-OP-02513, Pressurizer System Abnormal Operation, for Failure of Pressure Input to Heaters, Spray and PORV. Manual control of heaters will be required due to input pressure signal failing low. The pressure input to NNI will be swapped to the non-faulted signal IAW DB-OP-06403, RPS and NNI Operating Procedure. Heater controls will then be returned to automatic control. The Unit Supervisor will enter Technical Specification 3.3.1 Condition A for the pressure instrument failure. The TS required action will be completed since the channel will already be tripped due to the failure. The SRO should direct bypassing RPS CH 1 to obtain 2 out of 3 RPS Trip Logic. When Technical Specification 3.3.1 Condition A has been entered and at Leads Evaluator's direction, proceed to Event 3.

Event 3: A group 5 control rod drops fully into the core (TS)

One group 5 control rod will drop fully into the core. Crew will recognize reactor power lowering and respond to various annunciators (specifically, 5-2-E, CRD ASYMMETRIC ROD). Crew will enter DB-OP-02516 (CRD malfunctions) and diagnose that one group 5 control rod will have dropped fully into the core. Crew will take action per section 4.1.3 and reduce reactor power to < 50% with the unit load demand at 3%/minute. The SRO will refer to LCO 3.1.4 and 3.1.7 and enter determine both are NOT MET and enter 3.1.4 Condition A (Control Rod group alignments, various actions) and 3.1.7 Condition A (API / RPI operable for each control rod, Determine API within 8 hours). Event is completed when the downpower is in progress with reactor power < 80%, and with the concurrence of the lead examiner.

Event 4: Major – Second control rod drops into the core requiring a manual reactor trip

The crew will determine a second control rod has dropped into the core and will be required to manually trip the reactor per If At Any Time (IAAT) step 4.1.1. Event is completed when the reactor is manually tripped. This will automatically continue to event #6 with no additional action steps required.

Event 5: Turbine stop valve #2 and all Turbine control valves will fail to close on the turbine trip (CT)

When the manual reactor trip is inserted, Turbine stop valve #2 and all Turbine control valves will fail to close when the turbine is tripped (auto AND manual trips will FAIL to close these valves). Crew will take the Response not obtained (RNO) action in step 3.5 of DB-OP-02000 and initiate and isolate SFRCS using the manual actuation switches.

Event 6: Complications after Reactor Trip (AFW failure, MDFP trips on overcurrent, STBY M/U pump sheared shaft)

Additionally, when the AFW actuation signal is sent by SFRCS, AFW pump #1 will overspeed and be unavailable due to a damaged trip linkage. AFW pump #2 will fail to start and be unavailable due to bound steam admission valve.

IAW DB-OP-2000 Step 4.1 (Supplemental Actions), crew will transition to Specific Rule (SR) 4 (Steam Generator Control, page 285) and place the MDFP in service.

When the MDFP start is attempted, a malfunction with the MDFP will cause the breaker to trip on overcurrent. Crew will utilize RNO for step 4.1 of SR 4. Crew will identify a total loss of feedwater (EFW is OOS from initial conditions). Crew will be directed to start a standby Makeup Pump.

The standby Makeup pump will start as indicated by a red light but will immediately trip. Crew will determine that two MU pumps are not available and GO TO Attachment 4, Initiate MU/HPI cooling, immediately.

Event #7 – Plant aligned for MU/HPI Cooling (CT)

Crew will take the actions specified in Attachment 4, Initiate MU/HPI cooling to include: tripping all but 2-2 RCP, performing Attachment 8, turning off all PZR heaters, locking M/U suction to the BWST, opening PZR PORV.

Scenario Termination

The scenario is terminated when the Critical Tasks have been evaluated, the crew has opened RC-2A PORV, and at the discretion of the Lead Evaluator.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 1	Page 1 of 1

Event Description: Start Main Condensate Pump 3 and Stop Main Condensate Pump 1

Symptoms/Cues:

- Brief evolution after assuming the watch. An Equipment Operator is standing by Condensate Pump 3

Time	Position	Applicant's Actions or Behavior
	BOP	Brief the Crew for Starting Condensate Pump 3 AND Stopping Condensate Pump 1 IAW DB-OP-06221 CONDENSATE SYSTEM
	BOP	• Start Condensate Pump 3 using HIS591, CONDENSATE PUMP 3. – Direct the local operator to complete the following steps Step 3.7.5 Open CD588, CONDENSATE PUMP 3 OUTLET PRESSURE INDICATOR SOURCE. Step 3.7.6 Close CD15, CONDENSATE PUMP 3 DISCHARGE SUCTION VENT. Step 3.7.7 Monitor Condensate Pump 3 for excess vibration. Step 3.7.8 Monitor Condensate Pump 3 seal for proper leakoff flow. *Equipment Operator Reports "CD588 is OPEN and CD15 is CLOSED, All Post Start Checks are SAT"*
	BOP	• Stop Condensate Pump 1 using HIS558, CONDENSATE PUMP 1. – Direct the local Operator to complete the following steps Step 3.8.3 Open CD13, CONDENSATE PUMP 1 DISCHARGE SUCTION VENT. Step 3.8.4 Close CD576, CONDENSATE PUMP 1 OUTLET PRESSURE INDICATOR SOURCE. *Equipment Operator Reports "CD13 is OPEN and CD576 is CLOSED"*
Insert Event 2 after Main Condensate Pump 1 is Stopped		

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 2	Page 1 of 4

Event Description: RPS CH 1 RCS Pressure Input to Pressurizer heaters, Spray and PORV Fails Low

Symptoms/Cues:

- Annunciator 5-1-G RPS CH 1 TRIP
- All Pressurizer Heaters Energized
- Annunciator 5-3-G RPS RC LO PRESS TRIP

Time	Position	Applicant's Actions or Behavior
	TEAM	Recognize a failure of RPS CH 1 RCS Pressure Input to Heaters, Spray and PORV
	SRO	Enter DB-OP-02513 Pressurizer System Abnormal Operation
	ATC	• Manually control Pressurizer Heaters to maintain required RCS Pressure (2105 to 2205 psig). – Manually control Pressurizer Spray RC 2 to maintain required RCS pressure (2105 to 2205 psig).
	SRO	REFER TO Technical Specifications 3.4.1, RCS Pressure, Temperature and Flow DNB Limits NOTE: No entry is required
	BOP	Exchange RCS pressure input to NNI from RPS, REFER TO DB-OP-06403, Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 2	Page 2 of 4

Event Description: RPS CH 1 RCS Pressure Input to Pressurizer heaters, Spray and PORV Fails Low

Symptoms/Cues:

- Annunciator 5-1-G RPS CH 1 TRIP
- All Pressurizer Heaters Energized
- Annunciator 5-3-G RPS RC LO PRESS TRIP

	ATC	IF Pressurizer Heaters are being used to maintain RCS pressure, THEN perform the following: Place the following Pressurizer Heaters in OFF as directed by the Control Room SRO. • HIS RC2-2, Bank 2 • HIS RC2-3, Bank 3 • HIS RC2-4, Bank 4 • HIS RC2A, Essen Bank 1 • HIS RC2B, Essen Bank 2 • PIC RC2 Bank 1 in MANUAL and maintain RCS pressure by adjusting the output.
NOTE: If necessary the Shift Manager should direct the crew to swap the Amphenol connector in RPS Channel 2 before placing RPS Channel 1 in Bypass		
	BOP	• Remove the cap on the selection panel for the alternate RC PRESSURE NNI receptacle in RPS Channel 2. • Disconnect the Amphenol connector from the RC PRESSURE NNI subassembly and reconnect the Amphenol connector to the alternate RC PRESSURE NNI Receptacle. • Cap the open RC PRESSURE NNI receptacle.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 2	Page 3 of 4

Event Description: RPS CH 1 RCS Pressure Input to Pressurizer heaters, Spray and PORV Fails Low

Symptoms/Cues:

- Annunciator 5-1-G RPS CH 1 TRIP
- All Pressurizer Heaters Energized
- Annunciator 5-3-G RPS RC LO PRESS TRIP

	ATC	Place the following Pressurizer Heaters in the designated position as directed by the Control Room SRO: • HIS RC2-2, Bank 2, in AUTO + BASE • HIS RC2-3, Bank 3, in AUTO • HIS RC2-4, Bank 4, in AUTO • HIS RC2A, Essen Bank 1, in AUTO • HIS RC2B, Essen Bank 2, in AUTO • Place PIC RC2 Bank 1 in AUTO position as directed by the Control Room SRO.
	SRO	REFER TO Technical Specifications: • TS 3.3.1, Reactor Protective System Instrumentation. Place the affected RPS channel in bypass (preferred) or tripped. REFER TO DB-OP-06403, Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure. LCO 3.3.1 Not met for RPS CH 1 Enter Condition A for One Channel Inoperable Required Action: Place Channel in Trip or Bypass within 1 hour

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 2	Page 4 of 4

Event Description: RPS CH 1 RCS Pressure Input to Pressurizer heaters, Spray and PORV Fails Low

Symptoms/Cues:

- Annunciator 5-1-G RPS CH 1 TRIP
- All Pressurizer Heaters Energized
- Annunciator 5-3-G RPS RC LO PRESS TRIP

	SRO	REFER TO Technical Specifications: • TS 3.3.1, Reactor Protective System Instrumentation. Place the affected RPS channel in bypass (preferred) or tripped. REFER TO DB-OP-06403, Reactor Protection System (RPS) and Nuclear Instrumentation (NI) Operating Procedure. LCO 3.3.1 Not met for RPS CH 1 Function 3 Enter Condition A for One Channel Inoperable Required Action: Place Channel in Trip or Bypass within 1 hour

Insert Event 3 after the Tech Spec is discussed, Pressurizer Heaters are in Automatic and when directed by the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 3	Page 1 of 3

Event Description: A Single Dropped Control Rod in Group 5

Symptoms/Cues:

- Annunciator 5-1-E CRD SYSTEM FAULT
- Annunciator 5-2-E CRD ASSYMMETRIC ROD
- Average RCS Temperature Lowering
- Out Command from Neutron Error
- Reactor Power Lowering
- Annunciator 14-6-D ICS IN TRACK
- Annunciator 14-4-D ICS FW LIMITED BY RX PWR

	Team	Recognize a Dropped Control Rod in Group 5
	SRO	Enter DB-OP-02516 CRD Malfunctions for a dropped control rod
	ATC	Set ULD MAX LOAD LIMIT based on number of RCPs in service: • 4 RCPs – 50% RTP - 450 MWE • Set ULD Rate of Change to 3% RTP per minute. IF annunciator (4-2-E) PZR LEVEL LO alarms due to the dropped rod Tave transient, THEN – Reduce MU32 setpoint to approximately 180 inches.
	SRO	Enter DB-OP-02504 Rapid Shutdown Notify the Shift Manager to: – REFER TO NOP-OP-1004, Reactivity Management. – REFER TO NOP-OP-1015, Event Notifications – REFER TO NOBP-OP-1015, Event Notifications. – Notify the Duty Engineering Manager OR the Reactor Engineering Supervisor that a Control Rod has been dropped. REFER TO Attachment 5, Reactor Engineering Guidance For CRD Malfunctions.

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 3	Page 2 of 3

Event Description: A Single Dropped Control Rod in Group 5

Symptoms/Cues:

- Annunciator 5-1-E CRD SYSTEM FAULT
- Annunciator 5-2-E CRD ASSYMMETRIC ROD
- Average RCS Temperature Lowering
- Out Command from Neutron Error
- Reactor Power Lowering
- Annunciator 14-6-D ICS IN TRACK
- Annunciator 14-4-D ICS FW LIMITED BY RX PWR

	SRO	Request I&C to perform the following: REFER TO Attachment 1, Specific Control Rod Recovery Guidelines as necessary to aid in troubleshooting. Reduce High Flux Trip Setpoints Evaluate for continued Mode 1 operation by performing the required actions for the applicable LCO(s). REFER TO Technical Specifications, AND Attachment 3, Tech Spec Condition Tracking Aid to evaluate for continued Mode 1 operation. TS 3.1.4 CONTROL ROD GROUP ALIGNMENT LIMITS Each CONTROL ROD shall be OPERABLE, AND Each CONTROL ROD shall be aligned to within 6.5% of its group average height. Condition A: ONE misaligned CONTROL ROD Action A.1.1 Verify SDM within limit Completion Time 1 Hour OR Action A.1.2 Initiate boration to restore SDM to within limit Completion Time 1 Hour A.2 Reduce THERMAL POWER to less than or equal to 60% of ALLOWABLE THERMAL POWER Completion Time 2 Hours A.3 Reduce High Flux trip setpoint to less than or equal to 70% of ALLOWABLE THERMAL POWER Completion Time 10 Hours

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 3	Page 3 of 3

Event Description: A Single Dropped Control Rod in Group 5

Symptoms/Cues:

- Annunciator 5-1-E CRD SYSTEM FAULT
- Annunciator 5-2-E CRD ASSYMMETRIC ROD
- Average RCS Temperature Lowering
- Out Command from Neutron Error
- Reactor Power Lowering
- Annunciator 14-6-D ICS IN TRACK
- Annunciator 14-4-D ICS FW LIMITED BY RX PWR

	SRO	A.4 Verify SDM within limits once per 12 hours – Repeat periodically to ensure compliance. A.5 Verify potential ejected rod worth is within assumptions of rod ejection analysis Completion Time 72 Hours A.6 IF THERMAL POWER is greater than 20% RTP THEN perform SR 3.2.5.1 Completion Time 72 Hours TS 3.1.7 RPI channel inoperable for one or more rods Condition A: RPI channel inoperable for one or more rods A.1 Determine the absolute position indicator channel for the rod(s) is OPERABLE. Completion Time: 8 hours and once per 8 hours thereafter

If Reactor Engineering is contacted to verify Shutdown Margin is adequate, *a*cknowledge the request and provide the following information:

"I'll verify if adequate shutdown margin exists and get back to you as soon as possible"

	SRO	If pressurizer level Exceeds 228 inches LCO 3.4.9 is Not met Enter Condition A Required Action A.1 Restore level to within limit Completion Time 1 hour

Insert Event 4 after Tech Specs have been evaluated, an acceptable power change is completed and when directed by the Lead Evaluator

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 4 and 5	Page 1 of 1

Event Description: (4) A Second Dropped Control Rod in Group 5 – (5) Main Turbine Fails to Trip

Symptoms/Cues:

- Average RCS Temperature Lowering
- Out Command from Neutron Error
- Reactor Power Lowering

	SRO	DB-OP-02516 CRD Malfunctions **IF AT ANY TIME** more than one Control Rod has dropped, THEN perform the following: • Trip the Reactor. • GO TO DB-OP-02000, RPS, SFAS, SFRCS Trip of SG Tube Rupture.
	ATC	Trip the Reactor • Depress both Reactor Trip Pushbuttons – Verify Power is Lowering in the Intermediate Range • Trip the Main Turbine – Check All Main Stop Valves and All Control Valves are Closed – Recognize the Main Turbine is NOT TRIPPED (1 STOP Valve and 3 CONTROL Valves are OPEN) • Initiate AND Isolate SFRCS using MANUAL ACTUATION switches. Implement any necessary Specific Rules Actions • ACTIONS FOR LOSS OF SUBCOOLING MARGIN • STEAM GENERATOR CONTROL • POWER FOR C1 AND D1 BUSES OR EDG START

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 6 and 7	Page 1 of 6

Event Description: Loss of ALL Feedwater and MU/HPI cooling

Symptoms/Cues:

- AUX Feedwater Pump 1 Trips on Overspeed
- AUX Feedwater Pump 2 Fails to Start
- MDFP Trips immediately after starting
- EFW Pump is out of service

	BOP	Refer to Specific Rule 4 • Start the MDFP – MDFP started, then tripped – Identify the TOTAL loss of Feedwater Notify the Command SRO. • Start the standby Makeup Pump. – Makeup Pump 2 started, then immediately tripped – GO TO Attachment 4, Initiate MU/HPI Cooling (SRO Directed).

The following are some expected requests from the control room:

Investigate the problems with AFPs 1 and 2. Acknowledge the request and provide the follow response.
"AFP 1 is tripped, and I can't get the overspeed mechanism to reset. The steam admission valve for AFP 2 is closed with air pressure reading 0 pounds"

Investigate the problem with the MDFP. Acknowledge the request and provide the following response.
"AD 210 has an overcurrent relay tripped"

Investigate the problem with Makeup Pump 2. Acknowledge the request and provide the following response.
"AD 105 has a ground sensor relay tripped"

Place the Startup Feedwater Pump in service. Acknowledge the request. Any further requests on status will be answered with the following response
"I'm still working on the procedure to start the Startup Feedwater Pump. I'll contact you if I have any issues or when the pump is ready to start"

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 6 and 7	Page 2 of 6

Event Description: Loss of ALL Feedwater and MU/HPI cooling

Symptoms/Cues:

- AUX Feedwater Pump 1 Trips on Overspeed
- AUX Feedwater Pump 2 Fails to Start
- MDFP Trips immediately after starting
- EFW Pump is out of service

	SRO ATC	• Trip all RCPs except RCP 2-2 Verify Attachment 8, Place HPI/LPI/MU in Service, is in progress. • Place all PZR Heaters in OFF. • Lock BOTH Makeup Pump Suctions on the BWST • MU6405 • MU3971

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 6 and 7	Page 3 of 6

Event Description: Loss of ALL Feedwater and MU/HPI cooling

Symptoms/Cues:

- AUX Feedwater Pump 1 Trips on Overspeed
- AUX Feedwater Pump 2 Fails to Start
- MDFP Trips immediately after starting
- EFW Pump is out of service

	BOP	Perform DB-OP-02000 Attachment 8 Verify both CCW Trains are in service. • CCW Train 1 • CCW Train 2 Verify both HPI Pumps are running. • HPI Pump 1 • HPI Pump 2 Verify all HPI Injection valves are open. • HP2C • HP2D • HP2A • HP2B Verify both LPI Trains are in service as follows: Verify both LPI Pumps are running. • LPI Pump 1 • LPI Pump 2 Open both piggyback valves. • DH64 • DH63 • Verify Pressurizer Level Controller is set to 100 inches

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 6 and 7	Page 4 of 6

Event Description: Loss of ALL Feedwater and MU/HPI cooling

Symptoms/Cues:

- AUX Feedwater Pump 1 Trips on Overspeed
- AUX Feedwater Pump 2 Fails to Start
- MDFP Trips immediately after starting
- EFW Pump is out of service

** CRITICAL TASK

Any Indicated Thot reaches 600 Degrees

TI 3B4 or TI3A2 on Panel C5705
TI 3B5, TI 3A5, TI 3B6 or TI 3A6 on the PAM Panels
Computer Points T753 or T782

TIME: _____

	SRO ATC	IF Makeup Pump 1 is the only Makeup Pump running, THEN perform the following: • Close MU6408 MU PUMP CROSS CONNECT HEADER ISOLATION • Verify MU6421, MU ALTERNATE INJECTION LINE CTMT ISOLATION is open. • Open MU6419, MU ALTERNATE INJECTION LINE. • Close MU6407, MU PUMP 1 MINIMUM RECIRC. • Close MU6406, MU PUMP 2 MINIMUM RECIRC. • Verify RC11, PORV BLOCK is open Verify Attachment 8, Place HPI/LPI/MU in Service, is complete. • ** Lock open RC2A, PORV TIME: _____ **An Adequate Injection Source is Required when the PORV is OPEN to Satisfy the Critical Task Time requirement. Any Combination of the following pumps that includes 1 HPI Pump is considered Adequate to Satisfy this Critical Task. • Makeup Pump 1 • HPI Pump 1 • HPI Pump 2

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 6 and 7	Page 5 of 6

Event Description: Loss of ALL Feedwater and MU/HPI cooling

Symptoms/Cues:

- AUX Feedwater Pump 1 Trips on Overspeed
- AUX Feedwater Pump 2 Fails to Start
- MDFP Trips immediately after starting
- EFW Pump is out of service

	SRO ATC	IF AT ANY TIME Adequate Subcooling Margin is lost, THEN perform the following: • Trip RCP 2-2 Transfer Subcooled Margin Inputs to Incore Thermocouples: • Post-Accident Monitoring Panel 1 • Post-Accident Monitoring Panel 2 Open Loop 1 High Point Vents. • RC4608B • RC4608A Open Loop 2 High Point Vents. • RC4610B • RC4610A Open PZR High Point Vents. • RC200 • RC239A Check for entry into PTS Criteria REFER TO Specific Rule 5. Close either of the following to isolate Letdown. • MU2B, LETDOWN ISO • MU3, LETDOWN CLRS OUTLET

Form 3.3-2 Required Operator Actions

Op. Test No.: 2024 DB NRC	Scenario No.: 4	Event No.: 6 and 7	Page 6 of 6

Event Description: Loss of ALL Feedwater and MU/HPI cooling

Symptoms/Cues:

- AUX Feedwater Pump 1 Trips on Overspeed
- AUX Feedwater Pump 2 Fails to Start
- MDFP Trips immediately after starting
- EFW Pump is out of service

	ATC	Prevent transfer of water from CTMT Normal Sump to the Auxiliary Building as follows: • Close DR 2012A, CTMT NORMAL SUMP • Close DR 2012B, CTMT NORMAL SUMP Identify an SFAS Level 3 Actuation on High Containment Pressure • Perform Specific Rule 6

Termination Criteria:
Critical Tasks have been Evaluated
PORV Open with Adequate Injection Flow