NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: DAEC **Revision #:** 0

LMS ID: PDA OPS ESG 1 **LMS Rev. Date:** N/A

SEG TITLE: NRC INITIAL LICENSE EXAM, SCENARIO #1

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: ~90 minutes

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

SIMULATOR EXERCISE GUIDE REQUIREMENTS

Terminal Objective

This Evaluation Scenario Guide evaluates the Operators' ability to: "Given the malfunctions presented in this ESG, the students will protect the public, protect plant personnel, and protect plant equipment, in accordance with plant procedures."

Enabling Objectives:

Evaluation Guide, no tasks are trained.

Prerequisites:

None

Training Resources:

A. Simulator
B. Evaluation team
C. Operations Management Representative
D. Simulator Driver
E. Phone Talker
F. Exam Proctor for custody of the crew between scenarios
G. Simulator Video recording equipment

References:

A. ARP 1C05A Rev. 82
B. ARP 1C08B Rev. 113
C. AOP 410 Rev. 29
D. ARP 1C08A Rev, 90
E. ARP 1C23A Rev. 19
F. ARP 1C23B Rev. 23
G. OI 734 Rev. 59
H. AOP 644, Rev. 17
I. AOP 255.1, Rev. 46
J. AOP 255.2, Rev. 43
K. EOP 2 Rev. 18
L. EOP 1 Rev. 20
M. ED Rev. 11
N. OP-AA-102-1003 Rev. 18
O. IPOI 3 Rev. 152
P. OI 856.1, Rev. 48
Q. OI 304.1, Rev. 84
R. OI 304.2, Rev. 96
S. OI 304.2 QRC 1, Rev. 0

Protected Content:

None

Evaluation Method:

Dynamic Scenario graded in accordance with NUREG 1021 guidance.

Operating Experience:

None

Risk Significant Operator Actions:

TASKS ASSOCIATED WITH SIMULATOR EXERCISE GUIDE	
Task #	**Task Title**
	Reactor Operator
14.16	Remove the Startup Transformer (1X3) from service
15.10	Transfer Essential Bus from Startup to Standby Transformer
45.21	Reset A/B or Startup Feed Regulating Valve Lockup
93.22	Perform the Immediate Operator Responses to a Reactor Scram
94.15	Respond to Loss of River Water Supply
95.21	Perform Defeat 11
95.25	Perform Defeat 15
95.44	Perform actions of RC/L of EOP 1
95.45	Perform initial EOP 1 actions (RC)
95.46	Perform actions of RC/P of EOP 1
95.63	Perform DW/T leg of EOP 2
95.64	Perform PC/P leg of EOP 2
95.74	Perform ALC leg of EOP 1 when Injection Systems are lined up and available
95.76	Perform ALC with 1 Core Spray and 1 other ECCS pump available.
95.80	Perform an Emergency Depressurization Using SRVs.
	Senior Reactor Operator
1.02	Determine operability for TS required components
4.21	Direct Crew Actions to Perform the Immediate Operator Responses to a Reactor Scram
5.04	Direct Crew Responses to Loss of 1A3
5.08	Direct Crew Response to Loss of 4160V Nonessential Power Condition
5.15	Direct Crew Response to Loss of River Water Supply
6.21	Direct Crew Response to Perform EOP Defeat 11
6.25	Direct Crew Response for performance of Defeat 15
6.44	Direct Crew Response for performance of the RC/L leg of EOP 1
6.45	Direct Crew Response for performance of initial EOP 1 actions (RC)
6.46	Direct Crew Response for performance of RC/P leg of EOP 1
6.63	Direct Crew Response for performance of the DW/T leg of EOP 2
6.64	Direct Crew Response for performance of the PC/P leg of EOP 2
6.74	Direct Crew Response to Perform ALC leg of EOP 1 when Injection Systems are lined up
6.76	Direct Crew Response to Perform ALC with 1 core spray and 1 other ECCS pump available
6.78	Direct Crew Response for performance of Emergency Depressurization

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE
Rev. 0	Initial development for 2017 NRC LOIT Examination	Initial development for 2017 NRC LOIT Examination	N/A	See Cover See Cover	

OVERVIEW / SEQUENCE OF EVENTS

Event #	Description
When the crew assumes the shift reactor power is approximately 80% following 'A' feed pump vibration analysis. On the last shift, repairs were made to the 'B' FRV due to internal fault that caused the 'B' FRV to lock. Once the crew takes the shift they will be required to reset the 'B' FRV lockup using ARP 1C05A (F-1) section 4. Following 'A' feed pump vibration analysis, RE will request the crew to raise Reactor Power by 5% and hold prior to continuing raising power to 100%.	
1.	Once the crew has reset the 'B' FRV lockup and raised power to approximately 85%, the crew will respond to 'B' FRV failing downscale. The crew will enter AOP 644 and AOP 255.2 due to the feedwater transient and subsequent power fluctuation.
2.	The crew will then respond to control rod 02-19 drifting in. The crew will be able to stop the rod from drifting using controls on 1C05. AOP 255.1 will be entered to address the drifting rod. The crew will enter **LCO 3.1.3 Condition C.**
3.	Startup Transformer Trouble annunciator will be received and the crew will respond via ARP 1C08A (A-7), "Startup XFMR 1X3 Trouble". In-plant personnel will be dispatched to the S/U Transformer to investigate and upon investigation; it will reveal a Sudden Internal Pressure Trip. The crew will take 1X3 out of service per OI 304.2. The crew then responds to and determines the appropriate Technical Specification actions **(see page 17)** for Startup Transformer OOS.
4.	After the crew removes 1X3 from service, a small steam leak will occur in the Drywell. The crew will implement the actions of and enter EOP 2, Primary Containment Control. The crew will enter AOP 573 to address rising Drywell pressure. The crew will eventually enter EOP 1, Reactor Control and insert a manual scram prior to exceeding 2# in the Drywell.
5.	After the scram is inserted and after Drywell pressure exceeds 2#, HPCI will fail to start due to the HPCI aux oil pump tripping. At the same time a lockout of 1A3 will occur causing the loss of "A" Core Spray pump and "A" and "C" RHR pumps. The leak in the drywell will require the crew to initiate sprays to prevent drywell air temperature from exceeding 280°F. **(CRITICAL)**
6.	After the reactor scram and due to the turbine trip and 1X3 removed from service, Non-Essential Busses will be deenergized causing the crew to control level and pressure via RCIC (HPCI will trip and cannot be restarted) and Steam Line Drains with SRV's.
7.	As RPV water level continues to lower, the crew will enter EOP 1 ALC leg. The crew will ensure the appropriate injection subsystems and systems are available and lined up as RPV level lowers. The crew will enter ED after RPV level reaches 15" and prior to -25" in the RPV. (**CRITICAL**) The crew will recognize that the LPCI inject valve MO-1905 will not automatically open with a 450 psig signal. Operator action at 1C03 will open MO-1905 and RHR will be used to restore and maintain RPV level in the directed control band. (**CRITICAL**)
8.	When RPV level is being restored 170-211" the scenario will be terminated.

SIMULATOR SET UP INSTRUCTIONS

1. Set NRC Exam Security for the Simulator per QF-1071-08 ____
2. Perform simulator set up per TDAP 1839 Attachment 2, Simulator Setup Checklist. ____
3. Load the saved IC (in folder with this ESG) to a SNAPSHOT _____
   a. Reset to that SNAPSHOT. ____
   b. Place the Simulator in **RUN** ____

   OR
4. Reset to IC 23, place the simulator in **RUN** and perform the following:
   a. Raise power to approximately 80%
   b. Insert fw16b and remove to lockup FRV 'B'
   c. Insert event triggers, malfunctions, overrides and remotes per the tables below.
5. RUN Schedule File "ESG_1.sch" and LEAVE IT RUNNING ____
6. Verify Malfunctions ____
7. Verify Remotes (Note that environmental remotes will already be timing) ____
8. Verify Overrides ____
9. Ensure MOL pull sheet is in the 1C05B hanging file. ____
10. Ensure EOOS has the same system status lineup as the start of the simulator scenario.
11. Setup control panel including equipment clearance tags, information tags, caution tags or other site-specific devices used as an aid to the operator.
12. After going to run, to insert the 'B' FRV lockup perform the following:
    a. Insert fw16b to lockup FRV 'B'
    b. Remove fw16b in order to allow for the crew to reset
13. Provide appropriate shift turnover documentation.
    a. Markup ARP 1C05A (F-1) as follows:
       (1) Circle/slash the following sections/steps:
           a) Section 1.0 – Step 1.4
           b) Section 2.0 – Step 2.1
           c) Section 3.0 – Steps 3.1, 3.2 (a), Note, 3.7, 3.8, 3.10
       (2) ONLY circle the following sections/steps:
           a) Section 3.0 – 3.3
       (3) N/A the following sections/steps:
           a) Section 3.0 – 3.4, 3.5, 3.6, 3.8, 3.9

EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
1,7,9,13	Manually Activated	Manually Activated
5	ZLOHPHS2256(2) == 1	HS-2256(2) AUX OIL PUMP 1P-218 LITES (RED) TO ON
11	ZLOCSHS2103(4) == 1	Pump 1P-211A (Red) to Red
15	ZLOPCHS4310(2) == 1	CV-4310 open
17	ZDIRDC11AS3(1) == 1	C11AS3 NOTCH OVRRD EMER IN TO EMER-ROD

MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	AN1C08A(7)	1C08A (A-07) STARTUP XFMR 1X3 TROUBLE	1	1:00		CRYWOLF	ON
Setup	RR15A	RECIRC LOOP RUPT – DESIGN BASES LOCA AT 100% - LOOP A	9		30:00	0	0.05
Setup	ED08C	4.16 KV/480V BUS FAULT – BUS 1A3	11	2 SEC		INACTIVE	ACTIVE
Setup	STRH01	LPCI A INJECT VALVE FAILS TO AUTO OPEN - MO-2003				ACTIVE	ACTIVE
Setup	STRH02	LPCI B INJECT VALVE FAILS TO AUTO OPEN - MO-1905				ACTIVE	ACTIVE
Setup	HP12	HPCI Aux Oil Pump 1P218 Trip	5			INACTIVE	ACTIVE
Setup	FW12B	FW REG VALVE CONTROLLER FAILURE (AUTO)- FWRV B	7		7:00	AS IS	0
Setup	RD060219	CONTROL ROD DRIVES IN- ROD 02-19	13			INACTIVE	ACTIVE

REMOTES:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	DO-HP-032	HS-2256(1) AUX OIL PUMP 1P-218 LITES (GREEN)	5			INACTIVE	ACTIVE
Setup	DO-HP-033	HS-2256(2) AUX OIL PUMP 1P-218 LITES (RED)	5			INACTIVE	ACTIVE

SCHEDULE FILES:

ESG_1			
@Time	Event	Action	Description
Setup	15	Modify rr15a to 1.5 in 900	RECIRC LOOP RUPT – DESIGN BASES LOCA AT 100% - LOOP A
Setup	17	Delete malfunction rd060219	CONTROL ROD DRIVES IN- ROD 02-19

Conduct simulator crew pre-scenario brief using TR-AA-230-1007-F06, Simulator Instructor Pre-Exercise Checklist.

If surrogate operators are to be used, brief them using TR-AA-230-1007-F11, Surrogate Brief Checklist

SHIFT TURNOVER INFORMATION

- Monday, Day Shift
- Warm summer day, 77 degrees F, Severe Weather possibility later today
- Approx. 80% Rx Pwr with corresponding MWe, MWth and core flow.
- Protected train- "A"
- Technical Specification Action statements in effect.
  - DAEC is in compliance with all LCO's
- Plant PRA/PSA Status including CDF/LERF & color
  - **CDF 2.95 E-6, 1 year to Yellow ICDP**
  - **LERF 1.70 E-6, 1 year to yellow ILERP**
- Evolutions in progress or planned for upcoming shift:
  - Repairs to an internal fault of the 'B' FRV controller are complete. Reset of lockup on 'B' FRV is expected upon conclusion of turnover.
  - Power was lowered to perform 'A' feed pump vibration analysis. 'A' feed pump vibration analysis was completed on the last shift. The crew has been instructed to raise power.
  - RE's have requested the crew to raise Reactor Power by 5% and hold prior to continuing raising power to 100%.
- Comments, problems, operator workarounds, etc.
  - One extra NSPEO available in Work Control
  - Radwaste Operator is NSPEO qualified

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
After the crew has assumed the shift:	**Booth Communicator** **Respond as plant personnel and respond as necessary**	Crew • Reset the 'B' FRV lockup CRS • Direct crew to reset the 'B' FRV IAW the ARP RO • Resets the 'B' FRV using ARP 1C05A (F-1) section 4 as follows: o When the cause of the lockout has been corrected, perform the following: ▪ Verify that the controller LED displays for the locked Feed Reg Valve are lit. ▪ Verify the Feedwater Lockout Relay amber light above the associated Lockout Relay is dim. o Reset a locked Feed Reg Valve as follows: ▪ At HC-1621 B FEED REG VALVE MANUAL/AUTO TRANSFER for the locked Feed Reg Valve, perform the following: • Verify or place in MANUAL ('M' is selected on the A/M pushbutton). • Select 'Y' on the display. • Adjust the 'Y' bias setting to zero. ▪ Obtain the current Feed Reg Valve position using ZI-1621 for the locked Feed Reg Valve. ▪ Using Attachment 1, determine the appropriate M/A station controller output signal 'V'. ▪ At HC-1621, perform the following: • Select 'V' on the display to indicate controller output.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Cont.:		RO ▪ Adjust 'V' to the value obtained from Attachment 1. ▪ Reset the lockout using HSS-1621. ▪ Verify the Feedwater Lockout Relay amber light is no longer lit. o Transfer CV-1621 to AUTO as follows: ▪ Verify the B FEED REG VALVE CONTROLLER HC-1621 is in MANUAL. ▪ Select 'V' on the display for B FEED REG VALVE CONTROLLER, HC-1621. ▪ Select 'V' on the display for MASTER FEED REG VALVE CONTROLLER, LC-4577. ▪ Match the Feedwater Reg Valve controller top meter display with the MASTER FEED REG VALVE CONTROLLER top meter display by adjusting the potentiometer on HC-1621. ▪ Verify proper response of the Feedwater Regulating valve by monitoring ZI-1621. ▪ Select AUTO on HC-1621. ▪ Select 'S' on the display for B FEED REG VALVE CONTROLLER, HC1621. ▪ Select 'S' on the display for MASTER FEED REG VALVE CONTROLLER, LC-4577.

Raise power If contacted as organization for assistance:	**Booth Communicator** **Respond as plant personnel and respond as necessary**	CREW • Raise reactor power by 5% RO • Raises reactor power by 5% IAW IPOI 3 and OI 856.1 as follows: o Monitor neutron monitoring instrumentation during control rod movements. o Verifies the following indications: • White backlight on the Rod Select pushbutton turns ON • On the Full Core Display, the white "XX-XX" select light corresponding to the rod selected turns ON • On the Four Rod Group Display, the white SELECT light turns ON denoting the position display for the selected rod. o Momentarily places the ROD MOVEMENT CONTROL in the OUT-NOTCH position and verifies: • The green ROD IN light turns ON momentarily and then turns OFF • The red ROD OUT light turns ON after the green ROD IN light turns OFF. • The red ROD OUT light turns OFF • The amber ROD SETTLE light turns ON and then turns OFF • The rod has been withdrawn as indicated on the Four Rod Group Display CRS • Direct and observe reactivity manipulations to achieve a 5% raise in reactor power

After the crew has reduced power, reset the 'B' FRV, and at the direction of the Floor Instructor: If contacted as organization for assistance: If contacted as operators to inspect the 'B' FRV locally: Two minutes after being sent to investigate 'B' FRV:	**Simulator Operator** **Activate ET 7.** This will activate FW12B for failure of 'B' FRV **Booth Communicator** **Respond as plant personnel and respond as necessary** **Booth Communicator** **Acknowledge communication** **Booth Communicator** **Inform control room that nothing abnormal is seen at the FRV**	Crew • Respond to 'B' FRV failure downscale RO • Assuming manual control of a malfunctioning system • Take manual control of the 'B' Feedwater controller HC-1621 to restore reactor water level • Place one APRM recorder in each trip system to fast speed to monitor for APRM undamped oscillations greater than normal. • Verify proper operation/indication of other systems and/or indications • Verify control rod positions are correct for the established sequence, by using Rod Position Log. • Verify thermal limits on the Official 3D Case. • When power is stabilized, plot location on the Stability Power / Flow Map. CRS • Establish critical parameter monitoring of RPV Water Level • Direct entering AOP 644 • May direct entering AOP 255.2

After the crew has Reactor water level restored and at the direction of the floor instructor:	**Simulator Operator** **Activate ET 13.** This will activate RD060219 with will cause control rod 02-19 to drift in.	Crew • Respond to control rod 02-19 drifting in IAW ARP 1C05A (D-6). RO • Place the C11A-S3 EMERG IN/NOTCH OVERRIDE SELECT switch on 1C05 in the EMERG ROD IN position momentarily to abort the rod sequence timer. • Run an OFFICIAL 3D CASE for abnormal reactor power/control rod distributions. • Verify control rod positions are correct for the established sequence, by using Rod Position Log. • When power is stabilized, plot location on the Stability Power / Flow Map. • When Rod motion has been stopped and/or position indication has been restored clear the alarm by momentarily taking C11A-S7 Rod Drift Alarm Reset/Test switch to RESET. CRS • Direct entering AOP 255.1 • May direct re-entering AOP 255.2 • Notify the Reactor Engineer of the abnormal rod pattern. • Comply with the Technical Specification requirements for Control Rod Operability LCO 3.1.3 Condition C
If contacted as organization for assistance:	**Booth Communicator** **Respond as plant personnel and respond as necessary**	
If contacted as RE in regards to drifting rod:	**Booth Communicator** **Acknowledge communication**	
Two minutes after contacted as RE:	**Booth Communicator** **Inform control room that further analysis is required and inform shortly**	
If sent to HCU to investigate:	**Booth Communicator** **Acknowledge communication**	
Two minutes after sent to HCU:	**Booth Communicator** **Inform control room that nothing abnormal is seen at the HCU**	
When Emergency In/Notch Override Select is taken to EMER ROD IN:	**Simulator Operator** **VERIFY RD060219 IS DELETED** This will stop rod 02-19 from drifting in.	

Loss of 1X3 After investigation of trip of 1A412 and tech spec call and at the direction of the floor instructor: 1 min. after ET 1 goes active: When contacted to investigate 1X3 alarm: 2 min. after told to investigate 1X3 alarm:	**Simulator Operator** **Insert ET1** This inserts AN1C08A(7), S/U Xfmr trouble alarm after 1:00 minute time delay. **Simulator Operator** **Verify 1C08A [A-7] annunciates.** **Booth Communicator** **Acknowledge request.** **Booth Communicator** **Inform Control Room there is a Sudden Internal Pressure Trip Alarm in.**	Crew • Implement actions of ARP 1C08A (A-7) Startup XFMR 1X3 Trouble. RO • Send an Operator locally to 1X3 Alarm Cubicle to determine the cause of the alarm. • With the aid of Table 1, take the appropriate Corrective Action. • Take 1X3 out of service per OI 304.1 and OI 304.2, (or OI 304.2 QRC) CRS • Contact the Electrical Maintenance Supervisor to perform a portable Gas Analysis of the combustible gas. • Direct taking out 1X3 out of service per OI 304.2 (or OI 304.2 QRC)

After crew receives report that 1X3 has hi-combustible gas and rising:
 	
If/when contacted to verify switchgear rooms clear:
 	
If/When contacted as organization:
	Booth Communicator
	Acknowledge request.
	
	Booth Communicator
	Acknowledge information/requests
		Crew
		• Take 1X3 out of service IAW OI 304.2 and OI 304.2 QRC1
		RO
		• Using OI 304.2 QRC1:
		  • Transfer 1A3 to the Standby Transformer by performing the following:
		  • Place BUS 1A3 TRANSFER switch in MANUAL.
		  • Insert the handle in the SYNCHRONIZE switch for 4KV BREAKER 1A301 STANDBY TRANSFORMER TO BUS 1A3, and place in the ON position.
		  • Verify that the synchroscope indicates near 12 o'clock and not moving with both white (differential phase voltage) indicating lights OFF.
		  • Place the control switch 4KV BREAKER 1A301 STNDBY TRANSFORMER TO BUS 1A3 momentarily to the CLOSE position.
		  • Verify BUS 1A3 STANDBY AMPERES greater than zero amps.
		  • Place the control switch 4KV BREAKER 1A302 STARTUP TRANSFORMER TO BUS 1A3 momentarily in the TRIP position.
		  • Place the SYNCHRONIZE switch for 4KV BREAKER 1A301 STANDBY TRANSFORMER TO BUS 1A3 in the OFF position.
		  • Place BUS 1A3 TRANSFER switch in AUTO.

		RO
		• Using OI 304.2 QRC1:
		  • Transfer 1A4 to the Standby Transformer by performing the following:
		  • Place BUS 1A4 TRANSFER switch in MANUAL.
		  • Insert the handle in the SYNCHRONIZE switch for 4KV BREAKER 1A401 STANDBY TRANSFORMER TO BUS 1A4, and place in the ON position.
		  • Verify that the synchroscope indicates near 12 o'clock and not moving with both white (differential phase voltage) indicating lights OFF.
		  • Place the control switch 4KV BREAKER 1A401 STNDBY TRANSFORMER TO BUS 1A4 momentarily to the CLOSE position.
		  • Verify BUS 1A4 STANDBY AMPERES greater than zero amps.
		  • Place the control switch 4KV BREAKER 1A402 STARTUP TRANSFORMER TO BUS 1A4 momentarily in the TRIP position.
		  • Place the SYNCHRONIZE switch for 4KV BREAKER 1A401 STANDBY TRANSFORMER TO BUS 1A4 in the OFF position.
		  • Place BUS 1A4 TRANSFER switch in AUTO.

		RO
		• Using OI 304.2 QRC1:
		  • Remove Startup Transformer 1X3 from service by performing the following:
		  • If required, transfer Bus 1A1 to the Aux Transformer per OI 304.1.
		  • If required, transfer Bus 1A2 to the Aux Transformer per OI 304.1.
		  • Place the STARTUP TRANSFORMER J BREAKER (OCB 5550) control switch momentarily in the TRIP position.
		  • Place the STARTUP TRANSFORMER K BREAKER (OCB 5560) control switch momentarily in the TRIP position.

	Floor Instructor
	Check that CRS is using OI 304.2 section "TRANSFERRING ESSENTIAL BUS 1A3[4] FROM STARTUP TO STANDBY TRANSFORMER" for Tech Spec call.
		CRS
		• Using OI 304.2 section "TRANSFERRING ESSENTIAL BUS 1A3[4] FROM STARTUP TO STANDBY TRANSFORMER":
		  • If in Mode 1,2, or 3, verify the following Tech Spec conditions are entered:
		  • T.S. 3.8.1 Condition A for Standby XFMR Offsite Circuit
		  • T.S. 3.8.1 Condition B for associated SBDG
		  • If the Startup XFMR Offsite Circuit is currently inoperable, then enter the following additional Tech Spec conditions:
		  • T.S. 3.8.1 Condition C for both Offsite Circuits inoperable
		  • T.S. 3.8.1 Condition F (three AC sources inoperable)
		  • T.S. 3.0.3 (per 3.8.1F)

When contacted as ITC Midwest:
 	
If contacted as the organization for assistance:
	Booth Communicator
	Acknowledge notification.
	
	Booth Communicator
	Acknowledge request.
		CREW
		• Using OI 304.1 section "REMOVING THE STARTUP TRANSFORMER (1X3) FROM SERVICE":
		  • Verify Essential Busses 1A3 and 1A4 are transferred to the Standby Transformer or SBDG per OI 304.2.
		  • Verify Non-essential Busses 1A1 and 1A2 are transferred to the Auxiliary Transformer per OI 304.1.
		  • Notify ITC Midwest that the Startup Transformer (1X3) will/has be/been removed from service.
		  • Record the time ITC Midwest was notified that the Startup Transformer was removed from service in the Operating Log.

After 1X3 is taken out of service and Tech Spec has been discussed and at the direction of the floor instructor:
 	
After the crew takes HS-4310 to Auto Open:
	Simulator Operator
	Insert ET 9
	This will start a drywell leak.
	
	Simulator Operator
	Verify ET 15 goes ACTIVE
	This will increase the size of the leak leading to the crew to scram.
		Crew
		• Respond to a coolant leak in containment.
		RO
		• Monitor outside barometric pressure utilizing Computer Point M000 to determine if weather conditions are causing a change in indicated drywell pressure.
		• Verify RIM-9184A and RIM-9184B, NW and South Drywell Area Hi Range Rad Monitors, are reading less than 20R/hr.
		• Start one train of the Standby Gas Treatment System.
		• Depress the DIV 1 Reset and DIV 2 Reset pushbuttons to clear the isolation signals.
		• Position switches at 1C03 as follows:
		  ○ HS-4303 Outbd Drywell Vent Isol CV-4303 Auto Open
		  ○ HS-4310 Inbd DW Vent Bypass Isol CV-4310 Auto Open
		  ○ HS-4302 Inbd Drywell Vent Isol CV-4302 Auto Open
		CRS
		• Directs enter AOP 573

		Crew
		• Implements EOP 1, RPV Control mitigation strategies.
		RO
		• Prior to exceeding 2# Drywell Pressure, insert and perform Immediate Operator Responses to a Reactor Scram
		  • Scrams the reactor and performs IPOI 5, Scram.
		  • Restores and maintains RPV level 170-211" using directed control system.
		  • Installs Defeat 11.
		  • Monitors and controls RC/P 800-1055 psig using directed control system (SRVs and MSL drains).
		  • Commences cool down of the RPV to directed RC/P control band with the directed control system.
		CRS
		• Direct crew response to Off Normal Events/ Accidents
		• Direct Crew Response to manually Insert a Scram Before Any Parameter Reaches Maximum Safe Operating Limits
		  • Directs scramming the reactor and performing IPOI 5, Scram.
		  • Directs RC/L band of 170-211" using the directed control system, RCIC.
		  • Directs installation of Defeat 11.
		  • Directs RC/P of 800-1055 psig using directed control system (SRVs and MSL drains).
		• Direct Crew Response to Establish a Cooldown of the RPV at a Rate of <100F/hr
		  • Directs cooling down the RPV with Alternate Pressure Control Systems (Table 7).

After Drywell Pressure exceeds 2 psig:
 	
If contacted to investigate 1P-218 breaker:
 	
Two minutes after 1P-218 investigation:
	Simulator Operator
	Verify ET 5 AND 11 goes active
	This will insert HP12 to trip the HPCI Aux Oil Pump and ED08C to Lockout Bus 1A3
	
	Booth Communicator
	Acknowledge request.
	
	Booth Communicator
	Inform control room that breaker for 1P-218 is tripped on ground fault.
		Crew
		• Implements the mitigation strategies of EOP 2, Primary Containment Control
		RO
		• Informs the CRS of containment parameters including parameter name, value and trend.
		• Installs Defeat 4.
		• Utilizes OI 149 QRC to spray the torus.
		• Utilizes OI 149 QRC to spray the drywell.
		• Utilizes OI 149 QRC to establish torus cooling.
		CRS
		• Performs a crew update of entry into EOP 2 due to Drywell Pressure.
		• Obtains containment parameters.
		• Directs installation of Defeat 4.
		• Directs spraying the torus after confirmation that torus pressure is greater than 2 psig.
		• Directs spraying the drywell before drywell temperature reaches 280F. **(CRITICAL)**
		  • Verifies torus water level less than 13.5 ft.
		  • Verifies plot of drywell temperature and drywell pressure on the DWSIL curve allows drywell sprays.
		  • Verifies recirculation pumps are secured.
		• Directs maximizing torus cooling.
		• Placekeeps in EOP 2 to the applicable WAIT UNTIL steps in T/L (T/L-3 and T/L 10), T/T (T/T-6), DW/T (DW/T-6) and PC/P (PC/P-7) legs

ALC		Crew
		• Implements that mitigation strategies of the ALC contingency of EOP 1
		RO
		• Lockouts ADS.
		• Attempts to restore and maintain RPV level above +15"
		  o Maximizes injection with CRD in accordance with AIP 407.
		  o Injects with SBLC in accordance with AIP 406.
		• Verifies injection subsystems can be lined up for injection
		• Verifies at least one injection subsystem lined up with a pump running.
		CRS
		• Directs ADS lockout.
		• Directs RPV level bands as RPV level lowers
		• Directs maximizing injection with CRD in accordance with AIP 407.
		• Directs injection with SBLC in accordance with AIP 406.
		• Ensures injections subsystems can be lined up for injection.
		• Waits for RPV level to drop to +15"
		• Ensures at least one injection subsystem lined up with a pump running.
		• Before RPV level reaches -25" performs an Emergency Depressurization.

Emergency Depress.:		Crew
		• After RPV level reaches +15" enters and implements the mitigation strategies of EOP ED. **(CRITICAL)**
		• Places handswitch of the first SRV to OPEN prior to RPV level reaching -25"
		RO
		• Perform Actions of EOP 1 ALC and ED.
		  • Installs Defeat 11.
		• Perform an Emergency Depressurization Using SRVs.
		  • Open 4 ADS SRVs
		• Recognizes MO-1905 does not automatically open at 450 psig and takes action at 1C03 to open MO-1905. **(CRITICAL)**
		CRS
		• Direct Crew Response for performance of EOP 1 ALC and ED
		  • Directs installation of Defeat 11.
		  • Verifies all control rods inserted to at least position 00.
		  • Verifies torus water level above 4.5 feet
		• Direct Crew Response to Perform an Emergency Depressurization Using SRVs
		  • Directs opening 4 ADS SRVs

EOP 1 Implementation after EOP ED:		Crew
		• Implements mitigation strategies of EOP 1 after EOP ED to restore adequate core cooling
		RO
		• Verifies low pressure ECCS system (B & D RHR Pumps) start and align to inject into the RPV
		• Reports 1 Core Spray pumps are injecting and 1 other ECCS pump is injecting.
		• Throttles RHR injection to restore and maintain RPV 170-211"
		CRS
		• Verifies 1 Core Spray pumps and 1 other ECCS pump available for injection
		• Direct Crew Response to Maximize Injection with Table 2 Systems
		  • Direct to maximize injection with all available Preferred Injection Systems (Table 1A) and Alternate Injection Systems (Table 2A).
		• Determines RPV level can be restored and maintained above +15" and returns to the normal RPV level control leg of EOP 1
		• Directs restoring and maintaining RPV level 170-211" using low pressure ECCS systems
		  • Directs throttling RHR injection to maintain RPV level 170-211"

When RPV level is being restored, the crew is progressing to SDC, and at the direction of the Floor Instructor:	**Simulator Operator** **Place the simulator in FREEZE.** **Floor Instructor** **Announce the scenario is complete; please stand by your stations and do not discuss the scenario with your crew.**	

***** END OF SCENARIO *****

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 'B' FRV fail downscale
2. Control Rod Drift
3. S/U Xfmr Hi Combustible Gas

After EOP Entry:

1. HPCI Trip Upon Startup
2. Loss of 1A3
3. Drywell Steam Leak

Abnormal Events:

1. AOP 644
2. AOP 255.2
3. AOP 255.1

Major Transients:

1. LOCA in DW
2. ALC
3. ED

Critical Tasks:

1. #22: BEFORE drywell temperature reaches 280°F and WHILE in the safe region of the DWSIL, THEN initiate drywell sprays. {BWROG: N/A}
2. #1: IF the reactor is shutdown under all conditions and RPV level drops to +15", THEN perform Emergency RPV Depressurization before RPV level reaches -25". {BWROG: RPV 1.1}
3. #2: IF the reactor is shutdown under all conditions, THEN crew actions must be taken to restore and maintain RPV level for adequate core cooling. {BWROG: RPV 1.2}

CREW GRADING ATTACHMENT

ESG 1 Rev. 0 Date _____

Operator Name	Position	Evaluator
	OSM	
	CRS	
	STA	
	1C05	
	1C03	
	B.O.P.	

Management Representative/Lead Evaluator _____/_____

Crew Critical Tasks

Task Statement	SAT	UNSAT
1. BEFORE drywell temperature reaches 280°F and WHILE in the safe region of the DWSIL, THEN initiate drywell sprays.		
2. IF the reactor is shutdown under all conditions and RPV level drops to +15", THEN perform Emergency RPV Depressurization before RPV level reaches -25".		
3. IF the reactor is shutdown under all conditions, THEN crew actions must be taken to restore and maintain RPV level for adequate core cooling.		

Usage Level
CONTINUOUS

Record the following: Date / Time: _____ / _____ Initials: _____

NOTE: *User shall perform and document a Temp Issue / Rev. Check to ensure revision is current, in accordance with procedure use and adherence requirements.*

Prepared By: _____ / _____ Date: _____
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

PROCEDURE APPROVAL

Approved By _____ / _____ Date: _____
Print Signature

1.0 PURPOSE

1.1 This STP verifies correct breaker alignment and indicated power availability for each offsite circuit capable of supplying the onsite Class 1E AC Electrical Distribution System.

1.2 This STP is routinely performed with both offsite circuits available, or in response to the condition of one offsite circuit or one diesel generator inoperable.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 Section 7.0 of this STP contains two (2) sections that cover the anticipated conditions under which this STP will be performed. The STP is organized as follows:

Sect.	Conditions
7.1	Both Offsite Circuits Available
7.2	One Offsite Circuit Available

Only one of these sections should need to be performed to satisfy the performance requirements associated with this STP. All steps within a particular section are to be performed in sequence and the STP steps carried through to completion, unless stated otherwise.

2.1.2 Personnel recommended to perform this procedure:

1 Operations

2.1.3 Special Test Equipment required:

1 Marking Pen (Do not use light colored hi-lighters or markers. Use only dark colored pens or markers. See General Caution 2.2.1).

2.2 GENERAL CAUTIONS

2.2.1 If utilizing a paper copy of this surveillance, do not use light colored hi-lighters or markers to record data, outline configurations on drawings or to initial steps. Light-colored hi-lighters are not dark enough to reproduce adequately as the QA record. Not applicable when using electronic copies.

2.3 SPECIAL PRECAUTIONS

2.3.1 None

3.0 REFERENCES

3.1 Applicable drawings:

3.1.1 BECH-E001<1>

3.1.2 BECH-E005

3.1.3 BECH-E023

3.2 Supporting documents:

3.2.1 NG-97-2146

4.0 GENERAL INSTRUCTIONS

4.1 Steps marked with a "TS" immediately to the right of the step sign-off line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.

4.2 If any equipment or components are observed to be in a state of disrepair during the performance of this STP, appropriate corrective maintenance shall be initiated.

4.3 An Action Request (AR) should be completed for any problems encountered with "TS" marked steps during the performance of this test.

4.4 The CRS shall be notified immediately and the appropriate Limiting Conditions for Operation section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

5.0 APPENDICES

None

6.0 PREREQUISITES

6.1 Verify Offsite power is supplying essential buses 1A3 and 1A4 via either the startup transformer (normal source) or the standby transformer (alternate source). _____

6.2 Evaluate electrical system status and select the STP section which is to be performed: _____

[ ] Section 7.1 - Both Offsite Circuits Available

[ ] Section 7.2 - One Offsite Circuit Available

7.0 PROCEDURE

7.1 BOTH OFFSITE CIRCUITS AVAILABLE

NOTE

Information from the Load Dispatcher may be needed to complete the following step.

7.1.1 Using the guidance below and Attachment 1, identify two separate circuits available to transmit power from the offsite power sources to the essential buses.

a. Based on equipment/system lineup and operational status, use a dark marking pen to trace an available circuit from an offsite power source to the Startup Transformer supply breakers, 1A302 and 1A402. _____

b. Based on equipment/system lineup and operational status, use a dark marking pen to trace a second circuit from another offsite power source to the Standby Transformer supply breakers, 1A301 and 1A401 such that it does not share any lines, buses, or transformers in common with the circuit to the Startup Transformer supply breakers. _____

c. Based on equipment/system lineup and operational status, complete the electrical lineup by using a dark marking pen to trace the connections from each Essential Bus (1A3 and 1A4) to the Startup or Standby Transformer supply breaker currently feeding the bus. _____

7.1.2 Confirm two (2) independent offsite circuits are available by initialing one of the two sets of statements below and N/A'ing the other:

a. A circuit exists from an offsite power source, through the Startup Transformer and its supply breakers to both 1A3 and 1A4 essential buses; _____ TS

AND

A second independent circuit exists from a different offsite source, through the Standby Transformer to its supply breakers.

b. A circuit exists from an offsite power source, through the Startup Transformer and one of its supply breakers to either the 1A3 or 1A4 essential bus; _____ TS

AND

A second independent circuit exists from a different offsite source, through the Standby Transformer and one of its supply breakers to the other essential bus.

(PRINT / SIGN)

_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	

7.2 ONE OFFSITE CIRCUIT AVAILABLE

NOTE

Information from the Load Dispatcher may be needed to complete the following step.

7.2.1 Using the guidance below and Attachment 1, identify a circuit available to transmit power from an offsite power source to the essential buses.

a. Based on equipment/system lineup and operational status, use a dark marking pen to trace an available circuit from an offsite power source to the Startup Transformer supply breakers, 1A302 and 1A402 or Standby Transformer supply breakers, 1A301 and 1A401. _____

b. Based on equipment/system lineup and operational status, complete the electrical lineup by using a dark marking pen to trace the connections from the required Essential Bus(es) (1A3 and/or 1A4) to the Startup or Standby Transformer supply breakers. _____

7.2.2 **If** in Mode 1, 2 or 3, mark Step 7.2.4 "N/A" and proceed with the performance of Step 7.2.3. _____

OR

If in Mode 4 or 5, or during movement of irradiated fuel assemblies in the Secondary Containment, mark Step 7.2.3 "N/A" and proceed with the performance of Step 7.2.4.

7.2.3 Confirm an offsite circuit exists from an offsite power source, through either the Startup or Standby Transformer and its associated supply breakers to both 1A3 and 1A4 essential buses. _____ TS

7.2.4 Confirm an offsite circuit exists from an offsite power source by initialing one of the two statements below and "N/A'ing" the other:

a. An offsite circuit exists from an offsite power source, through either the Startup or Standby Transformer and its associated supply breakers to both 1A3 and 1A4 essential buses. _____ TS

b. An offsite circuit exists from an offsite power source, through either the Startup or Standby Transformer and one of its associated supply breakers to the required 1A3 or 1A4 essential bus. _____ TS

(PRINT / SIGN)

_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	

8.0 ACCEPTANCE CRITERIA

8.1 Indicate the reason for performing the STP:

[ ] Routine with both offsite circuits available

[ ] Routine with one offsite circuit available while in Mode 4 or 5 or during movement of irradiated fuel assemblies in the secondary containment

[ ] Action in response to one offsite circuit inoperable

[ ] Action in response to one diesel generator inoperable

[ ] Other, explain below:

_____

_____

_____

_____

_____

8.2 All Technical Specification required items, as indicated by "TS", have been performed satisfactorily:

8.2.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified _____

8.2.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified _____

8.3 All other items checked in this test have been performed satisfactorily:

8.3.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified _____

8.3.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified _____

8.4 Indicate any relevant test comments below, otherwise mark this step "N/A":

_____

_____

_____

_____

_____

_____

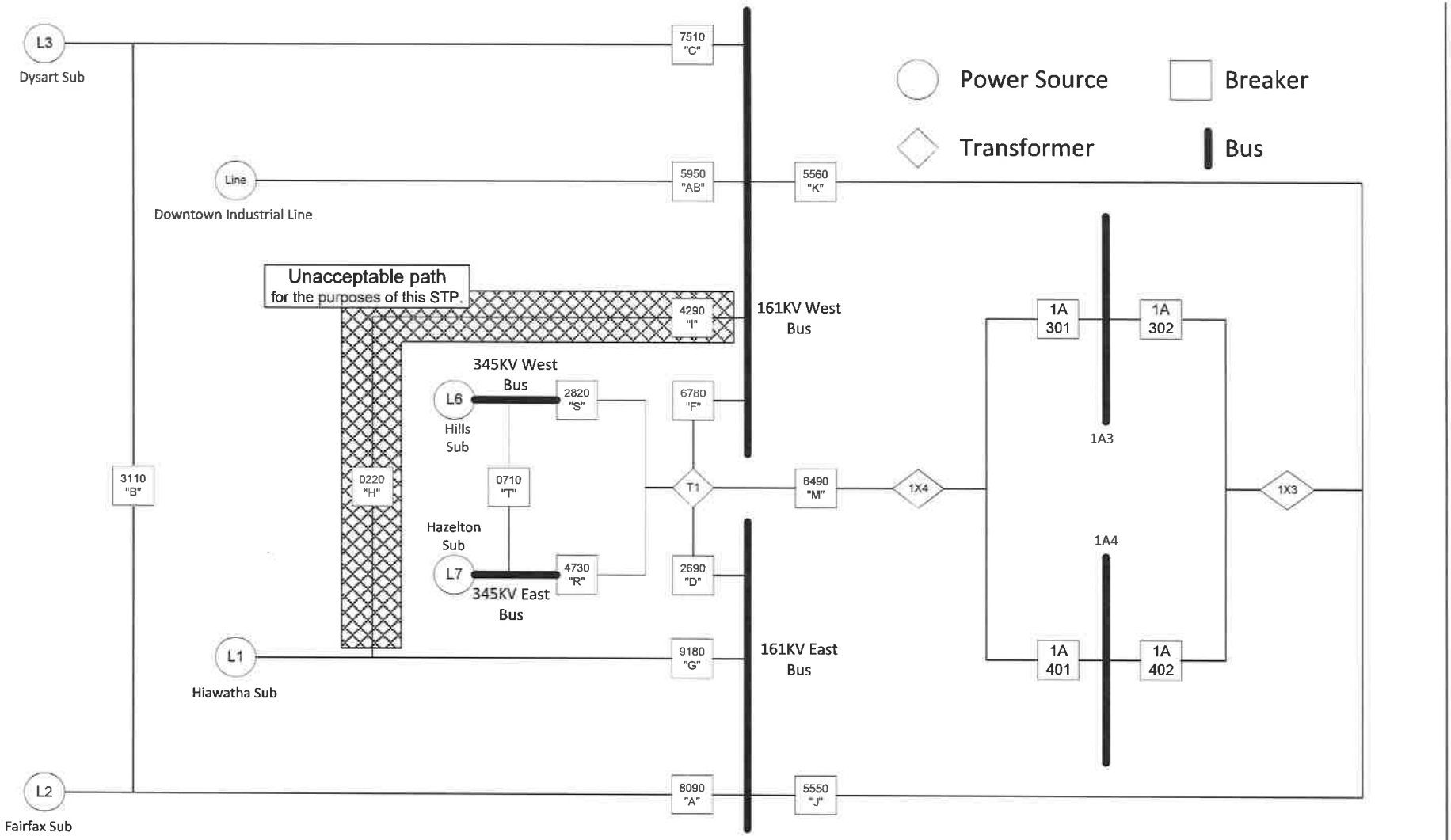
(PRINT / SIGN)

_____ / _____ _____

Operations Date

9.0 ATTACHMENTS

9.1 Attachment 1 - DAEC Offsite Power Circuits Feeding Essential Buses


Power Source
Breaker
Transformer
Bus
L3
Dysart Sub
7510 "C"
Line
Downtown Industrial Line
5950 "AB"
5560 "K"
Unacceptable path
for the purposes of this STP.
4290 "I"
161KV West Bus
345KV West Bus
L6
Hills Sub
2820 "S"
6760 "F"
1A 301
1A 302
1A3
3110 "B"
0220 "H"
0710 "T"
T1
8490 "M"
1X4
1X3
Hazelton Sub
L7
4730 "R"
345KV East Bus
2690 "D"
1A4
L1
Hiawatha Sub
9180 "G"
161KV East Bus
1A 401
1A 402
L2
Fairfax Sub
8090 "A"
5550 "J"

NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: DAEC **Revision #:** 0

LMS ID: PDA OPS ESG 2 **LMS Rev. Date:** N/A

SEG TITLE: NRC INITIAL LICENSE EXAM, SCENARIO #2

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: ~90 minutes

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

SIMULATOR EXERCISE GUIDE REQUIREMENTS

Terminal Objective This Evaluation Scenario Guide evaluates the Operators' ability to: "Given the malfunctions presented in this ESG, the students will protect the public, protect plant personnel, and protect plant equipment, in accordance with plant procedures."

Enabling Objectives: Evaluation Guide, no tasks are trained. Evaluated tasks are listed on page 4.

Prerequisites: None

Training Resources:
A. Simulator
B. Evaluation team
C. Operations Management Representative
D. Simulator Driver
E. Phone Talker
F. Exam Proctor for custody of the crew between scenarios
G. Simulator Video recording equipment

References:
A. OI 644, Rev. 172
B. IPOI 2, Rev. 154
C. OI 264, Rev. 138
D. OI 856.1, Rev. 48
E. OI 856.2, Rev. 9
F. OI 878.8, Rev. 27
G. AOP 255.1, Rev. 46
H. ARP 1C03A, Rev. 58
I. ARP 1C04B, Rev. 81
J. ARP 1C08A, Rev. 92
K. EOP 3, Rev. 22
L. EOP Defeat 15, Rev. 7
M. ARP 1C05B, Rev. 105
N. EOP 1, Rev. 20
O. ATWS, Rev. 23
P. OI 644 QRC 2, Rev. 0
Q. OI 149 QRC 4, Rev. 0
R. OI 734 QRC 1, Rev. 0
S. OI 153 QRC 1, Rev. 4

Protected Content: None

Evaluation Method: Dynamic Scenario graded in accordance with NUREG 1021 guidance.

Operating Experience: None

Risk Significant Operator Actions:

TASKS ASSOCIATED WITH SIMULATOR EXERCISE GUIDE	
Task #	**Task Title**
	Reactor Operator
8.11	Manually Delay or Interrupt ADS Auto Initiation
93.21	Perform a Fast Power Reduction
94.50	Respond to Condenser High Backpressure
95.21	Perform EOP Defeat 11
95.42	Inject into the RPV with SBLC from the Boron Tank
95.45	Perform Initial EOP 1 Actions
95.50	Perform /L to Control RPV Level during an ATWS
95.51	Perform Power/Level Control
95.55	Perform Initial ATWS Actions
95.56	Perform /P to Control RPV Pressure During an ATWS
95.57	Perform /Q to Reduced Reactor Power or SCRAM the Reactor
	Senior Reactor Operator
1.02	Determine Operability for Technical Specification Required Components
5.50	Direct Crew Response to Condenser High Backpressure
6.21	Direct Crew Response to Perform EOP Defeat 11
6.42	Direct Crew Response to Inject into the RPV with SBLC from the Boron Tank
6.45	Direct Crew Response for performance of initial EOP 1 actions (RC)
6.50	Direct Crew Response to Perform /L to Control Level During an ATWS
6.51	Direct Crew Response to Perform Power/Level Control
6.55	Direct Crew Response to Perform Initial ATWS Actions
6.56	Direct Crew Response to perform /Q to reduce power/scram the reactor during ATWS
6.57	Direct Crew Response to perform /P to control RPV pressure during an ATWS

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE
Rev. 0	Initial development for 2017 NRC LOIT Examination	Initial development for 2017 NRC LOIT Examination	N/A	See Cover See Cover	

OVERVIEW / SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
The crew will assume the shift at approximately at 8% Reactor power with applicable portions of IPOI 2 completed. 'A' CRD pump is OOS due to gearbox inspection. The crew will be briefed as to the need to withdraw rods through step 17 (approximately 10% reactor power), transfer from the Startup FRV to the 'A' FRV, and then continue with the power ascension.	
1.	After initial power rise and transfer of the FRVs, the crew will attempt to continue the power rise when a loss of notch indication and an entry into AOP 255.1. The crew will confer with RE and will substitute the rod position IAW OI 878.8 Section 8.2
2.	Following the AOP entry, Annunciator RE-4116B OFFGAS VENT PIPE B DNSC/INOP due to an Electrical Fault. The crew will determine **LCO 3.3.6.1 for Function 2c** - Offgas Vent Stack - High Radiation - Channel B does not need be entered since not in the mode of applicability.
3.	A grid voltage transient causes 'A' SBDG to spuriously start, and the Voltage Regulator fails to maintain voltage. The crew will place the 'A' SBDG handswitch to PTL, declare the 'A' SBDG inoperable, and enter **LCO 3.8.1, Condition B and LCO 3.7.3 Condition A**.
4.	A steam leak in the Steam Tunnel causing an entry into EOP 3. The crew will attempt to insert a manual scram and discover an Electrical ATWS. The 'B' CRD pump will trip shortly after due to high vibrations. Temperatures will continue to rise during the ATWS and cause Group 1 isolation.
5.	The crew will enter EOP 1, determine that an Electrical ATWS is occurring, then transition to ATWS, lock out ADS **(CRITICAL)**, perform the Electrical ATWS RIPs, and attempt to inject with SBLC only to discover that the inject valve is stuck and SBLC injection is not available.
6.	The crew will transition to power level control and Terminate and Prevent injection. **(CRITICAL)** and establish a level band until all rods are inserted. **(CRITICAL)** The crew will notice that RCIC failed to start and start RCIC manually.
7.	Performance of Electrical RIPs (RPS Fuses) will insert rods to shutdown the Reactor. **(CRITICAL)**
8.	After all rods are verified to be fully inserted, the crew will transition from EOP ATWS back to EOP 1 and establish an RPV level band of 170 -211" the scenario will be over.

SIMULATOR SET UP INSTRUCTIONS

1. Set NRC Exam Security for the Simulator per QF-1071-08 ____
2. Perform simulator set up per TDAP 1839 Attachment 2, Simulator Setup Checklist. ____
3. Load the saved IC (in folder with this ESG) to a SNAPSHOT _____ reset to that SNAPSHOT and place the Simulator in RUN,

   OR ____
4. Reset to IC 184, place the simulator in RUN and perform the following: ____
   a. Insert Event Triggers, Malfunctions, Overrides, and Remotes per the tables below
   b. Using MOL pull sheets insert control rods to achieve approximately 8% reactor power
   c. Using InSight bring up ypfastxen and set to -1.0000 three times to burn out Xenon
   d. Pull rods as necessary to achieve approximately 8% reactor power after the Xenon burn.
   e. Substitute final feedwater temperatures (computer points B030, B031, B032, B033)
   f. Place Mode Selector switch to the RUN position. ____
5. RUN Schedule File "Actions.sch" and LEAVE IT RUNNING. ____
6. Verify Malfunctions. ____
7. Verify Remotes (Note that environmental remotes will already be timing) ____
8. Verify Overrides. ____
9. Ensure MOL pull sheet is in the 1C05B hanging file.
10. Establish EOOS conditions for OOS components and plant conditions ____
11. Setup control panel including equipment clearance tags, information tags, caution tags or other site-specific devices used as an aid to the operator.
    a. Substitute final feedwater temperatures (computer points B030, B031, B032, B033)
    b. Place Guarded system tags on 'A' CRD pump
12. Plant procedures being worked at time of scenario initiation including what steps are completed.
    a. Remove CRAM group sheets from 1C05
    b. Place OI 264 on desk open to Appendix 2
    c. OI 856.1 Section 4.1.5
       (1) Place keep the following steps as complete:
           a) All Notes and Steps 1-7
       (2) Place keep the following steps as in progress:
           a) Steps 8-9
    d. Place OI 856.2 on desk open to Section 4.1
    e. IPOI 2 section 4.3
       (1) Place keep the following steps as complete:
           a) All Notes, CRSs, and Cautions up to step 20
           b) Steps 1-11a, 12-17, 19-20

(2) Place keep the following steps as in progress:

a) Steps 11b & c

f. Rod sequence sheets

(1) Place keep rods as out up to and including Step 15.

g. Mark Power/Flow Map as necessary

EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
1, 3,5,17	MANUALLY ACTIVATED	MANUALLY ACTIVATED
7	ZDIDGDG1(1) == 1	'A' SBDG control HS in PTL
9	ZDIHVHS6514 == 1	HS-6514 RX BLDG SUPPLY FAN 1V-SF-10C to START
11	RPDIS1RUN(1) != 1	Reactor Mode Switch out of RUN

MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	MS18A	VALVE CV1158A/B FAILURE – CV1158A				100	100
Setup	MS18B	VALVE CV1158A/B FAILURE – CV1158B				100	100
Setup	RP05A	RPS SCRAM CIRCUIT FAILURE (ATWS)- AUTO SCRAM FAILURE				ACTIVE	ACTIVE
Setup	RP05B	RPS SCRAM CIRCUIT FAILURE (ATWS)- MANUAL SCRAM FAILURE				ACTIVE	ACTIVE
Setup	RP05C	RPS SCRAM CIRCUIT FAILURE (ATWS)- ARI FAILURE				ACTIVE	ACTIVE
Setup	STRC01	TRIP OVRD- RCIC FAILS TO AUTO START				ACTIVE	ACTIVE
Setup	RM03RE4116B	RE-4116B OFFGAS VENT PIPE B	1	3 SEC		INACTIVE	ACTIVE
Setup	AN1C03A(13)	1C03A (B-04) OFFGAS VENT PIPE RM-4116 A/B HI RAD	1	3 SEC		CRYWOLF	CRYWOLF
Setup	DG03A	1G31 'A' DIESEL GENERATOR TRIP- DG A	3	06:00		INACTIVE	ACTIVE
Setup	DG05A	1G31 'A' DIESEL GENERATOR V/R OSCILLATES IN AUTO- DG A	3	5 SEC	30 SEC	0	100
Setup	DG07A	1G31 'A' DIESEL GENERATOR SPURIOUS START- DG A	3			INACTIVE	ACTIVE
Setup	ED02	POWER GRID FREQUENCY DISTURBANCE (DELETE in 1 SEC)	3			0	45
Setup	ED03	POWER GRID VOLTAGE TRANSIENT (DELETE in 1 SEC)	3			50	45
Setup	RD04A1827	CR RPIS REED SW FAILURE OPEN- ROD 18-27				ACTIVE	ACTIVE
Setup	MS08A	STEAM LEAKAGE IN STEAM TUNNEL LINE A	5		6:00	0	0.35
Setup	RP05E	ALL INDIVIDUAL ROD SCRAM SWITCHES FAIL				ACTIVE	ACTIVE
Setup	RD11A	CRD HYDRAULIC PUMP TRIP – PUMP A				ACTIVE	ACTIVE
Setup	RD26B	CRD PUMP 'B' HIGH VIBRATION	11	1:00		INACTIVE	ACTIVE
Setup	RD11B	CRD HYDRAULIC PUMP TRIP – PUMP B	11	1:30		INACTIVE	ACTIVE
Setup	SL04	SBLC INJECT VALVE V-26-9 STUCK				0	0

REMOTES:

Time	Remote No.	Remote Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	MC01	MN COND 1E-7A VACUUM BREAKER V-03-73	17	02:00		CLOSED	OPEN
Setup	MC02	MN COND 1E-7B VACUUM BREAKER V-03-67	17	02:30		CLOSED	OPEN
Setup	DO-RD-615	HS-1807A(1) CRD PUMP 1807 BREAKER TRIPPED (GREEN)				ACTIVE	ACTIVE
Setup	DO-RD-616	HS-1807A(2) CRD PUMP 1807 BREAKER TRIPPED (WHITE)				ACTIVE	ACTIVE
Setup	DO-RD-617	HS-1807A(3) CRD PUMP 1807 BREAKER TRIPPED (RED)				ACTIVE	ACTIVE

SCHEDULE FILES:

Actions.sch			
@ Time	**Event**	**Action**	**Description**
Setup	7	Delete malfunction dg03a	1G31 'A' DIESEL GENERATOR TRIP- DG A
	9	Modify malfunction ms08a to 0.6 in 300	

Conduct simulator crew pre-scenario brief using TR-AA--230-1007-F06, Simulator Instructor Pre-Exercise Checklist.

If surrogate operators are to be used, brief them using TR-AA-230-1007-F11, Surrogate Brief Checklist

SHIFT TURNOVER INFORMATION

- Today, Day Shift
- Warm summer afternoon temperatures in the mid 70's
- Plant power - ~8% with the corresponding MWe, MWth, and core flow.
- Protected Train – "A"
- Procedures or major maintenance in progress:
  - IPOI 2 startup in progress
  - 'A' CRD Pump OOS, gearbox open for inspection
    - Approximate time for restoration is 4 hours
- Technical Specification Action statements in effect:
  - DAEC is in compliance with all LCO's
- Plant PRA Status
  - **CDF: 1.29 x 10^{-6}, GREEN, 1 year to Yellow ICDP**
  - **LERF 3.05 x 10^{-7}, GREEN, 1 year to Yellow ILERP**
- Evolutions in progress or planned for upcoming shift:
  - Continue to raise power IAW with IPOI 2 to approximately 10% this will coincide with the completion of step 17
  - Transfer feed control from the Startup FRV to the 'A' FRV IAW OI 644 Section 3.6
  - Continue to raise power IAW with IPOI 2
- Comments, problems, operator workarounds, etc.
  - One extra NSPEO available in Work Control
  - Radwaste Operator is NSPEO qualified

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
IPOI 2		CREW • Withdraw control rods IAW IPOI 2 and OI 856.1 to complete step 17 RO • When reactor power reaches approximately 10% power on APRMs or as desired by the CRS/OSM • Continue to raise power with control rod withdrawal until one bypass valve is open and the second bypass valve is approximately 25% open. o Monitor neutron monitoring instrumentation during control rod movements. o Verifies the following indications: • White backlight on the Rod Select pushbutton turns ON • On the Full Core Display, the white "XX-XX" select light corresponding to the rod selected turns ON • On the Four Rod Group Display, the white SELECT light turns ON denoting the position display for the selected rod.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Raise Power Cont.		RO ○ Momentarily places the ROD MOVEMENT CONTROL in the OUT-NOTCH position and verifies: • The green ROD IN light turns ON momentarily and then turns OFF • The red ROD OUT light turns ON after the green ROD IN light turns OFF. • The red ROD OUT light turns OFF • The amber ROD SETTLE light turns ON and then turns OFF • The rod has been withdrawn as indicated on the Four Rod Group Display CRS • Direct and observe reactivity manipulations to achieve step 17 complete

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Shift FRV from S/U to 'A' OI 644	**Booth Communicator** **Acknowledge coordination**	CREW • Shift FRV from the S/U FRV to the 'A' FRV RO • Shift feed flow control from the STARTUP FEED REG VALVE to A FEED REG VALVE as follows: o Verify the MASTER FEED REG VALVE CONTROLLER, LC-4577, is in AUTO and select 'V' with the D pushbutton on the display. o Verify the STARTUP FEED REG VALVE CONTROLLER, HC-1622, is in AUTO. o Verify the A FEED REG VALVE CONTROLLER HC-1579 is in MANUAL. o Select 'V' on the display for the A FEED REG VALVE CONTROLLER, HC-1579. o Slowly open A FEED REG VALVE CV-1579 using the potentiometer on HC-1579. o Monitor reactor water level closely and confirm auto operation of FEEDWATER STARTUP FEED REG VALVE CV-1622. o When the display on CV-1579 is matching the display on LC-4577, select AUTO on HC-1579. o Select MANUAL on STARTUP FEED REG VALVE CONTROLLER HC-1622. o Slowly close STARTUP FEED REG VALVE CV-1622 using the potentiometer on HC-1622. o Monitor reactor water level closely and verify auto operation of A FEED REG VALVE CV-1579. o Close MO-1631, Startup Feedline Block. CRS • Coordinate shifting feed flow control from the STARTUP FEED REG VALVE to A FEED REG VALVE.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Control Rod Position Lost AOP 255.1		CREW • Perform the Follow Up Actions of AOP 255.1 for Abnormal Rod Control and Position Indications RO • For rod position indication lost at one notch: o Attempt to move the affected rod, as allowed by rod sequence, to an adjacent notch to check for reed switch failure o Consult with CRS/OSM and Reactor Engineer to modify rod pattern if necessary to avoid leaving the control rod at the notch with no position indication
IF called as any DAEC support personnel:	**Booth Communicator** **Acknowledge coordination**	
If contacted as RE for substituting position for rod 18-27:	**Booth Communicator** **Acknowledge communication**	CRS • Direct the performance of AOP 255.1 for Abnormal Rod Control and Position Indications • Consult with Reactor Engineer to enter Substitute Rod Position into 3D Monicore per REDP7 Section 3.7, Substituting Rod Positions In 3D Monicore.
Two minutes after contacted as RE:	**Booth Communicator** **Report to the control room that you concur with substituting rod position for rod 18-27 and to continue with startup.**	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Position Substitution 878.8		CREW • Substitute notch position IAW OI 878.8 Section 8.2 RO • At 1C28, verify the Rod Worth Minimizer (RWM-CC) keylock MODE switch in the OPER position. • At 1C05, verify the Rod Worth Minimizer (RWM-OD) keylock mode switch is in the OPERATE position. • At 1C05 (RWM-OD), press the ETC soft-key until the SUBSTITUTE OPTIONS menu choice becomes available. • Press the appropriate soft-key. • Press the INCREMENT POSITION soft-key to select the desired position. • Independently verify desired position on RWM Display • Press the ENTER SUBSTITUTE soft-key. • Verify screen display. • Press the EXIT soft-key • Insert rod 18-27 to position 06 CRS • Direct substituting notch position for rod 18-27 • Direct rod 18-27 insertion to position 06

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Offgas Vent Pipe RM Downscale After crew has inserted rod 18-27 to position 06 and/or when directed by the Floor Instructor: If contacted to investigate 1D60: IF called as any DAEC support personnel:	**Simulator Operator:** **ACTIVATE ET 1** This causes RE-4116B OFFGAS VENT PIPE B to fail. **Booth Communicator:** **After 2 minutes, inform control room that Breaker 03 for 1D60 is closed in with no noticeable problems.** **Booth Communicator:** **Acknowledge Request**	CREW • Respond to annunciators per ARP 1C03A (C-4) RO • At 1C10, monitor OFFGAS STACK VENT PIPE B RAD MONITOR RM-4116B to determine if DOWNSCALE or INOPERATIVE.\ • Send an Operator to the following panels to verify the breakers closed/reset: o RM4116B – 1D60 Breaker 03 CRS • Determine affected Tech Spec • LCO 3.3.6.1 • Function 2c Offgas Vent Stack - High Radiation - Channel B • Determine not in mode of applicability

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
When directed by the Floor Instructor:	**Simulator Operator:** **ACTIVATE ET 3** This causes a momentary grid disturbance. 'A' SBDG will spuriously start and its voltage regulator fail.	CREW • Respond to annunciators per ARP 1C08A (A-10) RO • Verify that EMERG SERV WATER PUMP 1P-99A is running. • Verify 1V-SF-20 Diesel Generator Supply Fan is running. • If "A" SBDG 1G-31 was not started for testing and is no longer required for operation, shut down "A" SBDG 1G-31 per OI 324 (Standby Diesel Generator System). CRS • If SBDG 1G-31 is determined to be inoperative, comply with the Technical Specification requirements for AC Sources-Operating and AC Sources-Shutdown.
IF called as any DAEC support personnel:	**Booth Communicator:** **Acknowledge Request**	
If contacted to investigate 'A' SBDG:	**Booth Communicator:** **Acknowledge Request**	
Three minutes after requested to investigate 'A' SBDG:	**Booth Communicator:** **Inform control room that 'A' SBDG appears to be normal and all alarms at 1C93 are as expected.**	
If contacted to verify operation of 'A' ESW:	**Booth Communicator:** **Acknowledge Request**	
Two minutes after requested to verify operation 'A' ESW:	**Booth Communicator:** **Inform control room that 'A' ESW is operating SAT.**	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

When the crew places the 'A' SBDG in PTL:
 	
If the crew requests a copy of STP 3.8.1-01 and/or STP 3.8.1-02:
	Simulator Operator:
	VERIFY ET 7 ACTIVATES
	This deletes malfunction dg03a.
	
	Simulator Operator:
	If the crew does not take the 'A' SBDG to PTL prior to the auto trip:
	
	Pause "Delete malfunction dg03a" in Actions.sch
	
	AND
	
	INSERT ET 7
	
	Evaluator Note:
	If the crew does not place 'A' SBDG in PTL in 6 minutes, it will trip on generator lockout.
	
	Floor Evaluator:
	Give the crew the requested copy of STP 3.8.1-01 and/or STP 3.8.1-02
		CREW
		• Determine that 'A' SBDG is not operating correctly and secure it by placing the handswitch HS-3231A in PTL.
		RO
		• Place 'A' SBDG handswitch HS-3231A in PTL
		CRS
		• Determine that the 'A' SBDG is INOPERABLE and enter appropriate Tech Specs
		• LCO 3.8.1, Condition B
		  • B.1, Perform SR 3.8.1.1 for Operable offsite circuits within 1 hour AND once per 12 hours thereafter.
		  • B.2 Declare required features, supported by the inoperable DG inoperable when the redundant required features are inoperable within 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s).
		  • B.3 Determine OPERABLE DG is not inoperable due to common cause failure within 24 hrs.
		  • B.4 Perform SR 3.8.1.2 for OPERABLE DG once per 72 hrs.
		  • B.5 Restore DG to OPERABLE Status within 7 days.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
EOP 3 Steam Leak in Steam Tunnel After SBDG has TS has been declared and at the direction of the Floor Instructor:	**Simulator Operator:** **ACTIVATE ET 5** This will insert MS08A to start the Steam Tunnel steam leak. **(NOTE: Bring up EOPSLD and monitor Steam Tunnel Temperature)**	CREW • Respond to annunciators per ARP 1C04B (B-4), STEAM LEAK DET AMBIENT HI TEMP/EOP 3. RO • Send an Operator to 1C21 to determine which area has the high temperature condition. • Start 1V-EF-1, 1V-EF-2, and 1V-EF-3 MAIN PLANT EXHAUST FANS by positioning the following handswitches to START and verify their respective dampers indicate OPEN: o Fan Handswitch Panel Damper o 1V-EF-1 HS-7613 1C23A 1V-AD-16U o 1V-EF-2 HS-7614 1C23B 1V-AD-16V o 1V-EF-3 HS-7615 1C23C 1V-AD-16W o Start the Reactor Building Exhaust Fans by positioning the following handswitches to START: o Fan Handswitch Panel o 1V-EF-11A HS-7611A 1C23A o 1V-EF-11B HS-7611B 1C23B o Start the Reactor Building Supply Fans by positioning the following handswitches to START: o Fan Handswitch Panel o 1V-SF-10A HS-6512 1C23A o 1V-SF-10B HS-6513 1C23B o 1V-SF-10C HS-6514 1C23C • Insert manual reactor scram

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
EOP 3 Cont.:		CRS • Direct Crew Response for performance of EOP 3 for high area temperatures level including EOP 1 o Direct Main Plant Supply and Exhaust Fans in a 3-2-3 lineup o Determines RPV pressure reduction will lessen the leakage rate. o Before steam tunnel temperature reaches the Group 1 setpoint enter EOP 1 and direct inserting manual reactor scram.
EOP 1 Transition to ATWS		CREW • Implements the mitigation strategies of EOP 1 and EOP ATWS RO • Inserts a manual reactor scram. • Reports the 'B' CRD pump high vibes and trip • Recognizes an electrical ATWS has occurred and reports the type of ATWS and reactor power. • Places the master Feedwater level controller to 158.5" in AUTO. CRS • Enters EOP 1, RPV Control based on reactor power is above 5% or unknown after a scram signal is received. • Determines that a reactor scram has been initiated • Validates isolations, initiations and SBDG initiations that should have occurred but did not. • Recognizes and implements the CRS "IF any rod is withdrawn past position AND it has NOT been determined that the reactor will remain shutdown under all conditions without boron THEN exit this procedure and enter ATWS".

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
ATWS If directed to vent the scram air header: Three (3) minutes after being directed to vent the scram air header:	**Booth Communicator:** **Acknowledge the request.** **Booth Communicator:** **Inform the control room that you cannot vent the scram air header due to the valve being bound.**	Crew • Implements the mitigation strategies of EOP 1 and EOP ATWS RO • Locks out ADS **(CRITICAL)** • Performs the ATWS QRC. • Reports completion of the ATWS QRC. Determines that ARI was unsuccessful. Reports RPV level and reactor power. • Announces failure to scram. • Reports SBLC inject pressure high and no flow. • Installs Defeat 11. CRS • Directs locking out ADS. • Verifies at least one set of inboard and outboard MSIVs are not open. • Directs performance of the ATWS QRC. • Directs initiation of SBLC. • Directs electrical ATWS rod insertion procedures • Exits the ATWS "Q" leg flowpath and enters "L" leg actions

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
ATWS	**Evaluator Note:** Ensure that while level is lowering that the RO acknowledges RCIC failure to auto start and recommends starting RCIC.	Crew • Implements AOP ATWS power level control actions. RO • Verifies or trip/lockout HPCI. • Terminates injection: o Condensate and Feed: ▪ Close Feedwater Regulating Valves CV-1579, CV-1621, CV-1622 as follows: • Take MANUAL control of Master Fed Reg Valve Auto/Man Control LC-4577 and dial the controller down until all Feedwater Regulating Valves indicate closed as indicated on: ▪ HC-1579, A Feed Reg Valve Manual/Auto Transfer ▪ HC-1621, B Feed Reg Valve Manual/Auto Transfer ▪ HC-1622, Startup Feed Reg Valve Manual/Auto Transfer • RHR: o Place MO-2004 and/or MO-1904 LPCI OPEN INTLK OVERRIDE HS-2004C and/or HS-1904C to OVERRIDE o When 1C03B (B-5) RHR RX LO PRESSURE PERMISSIVE AT 450 PSIG is activated, close MO-2004[MO-1904] by taking HS-2004[HS-1904] to CLOSE • Recognizes that RCIC did not start automatically • Starts RCIC manually. • Reports reactor power when RPV level reaches 87" and lowering. CRS • Directs terminating and preventing injection from CS, RHR and Condensate and Feedwater. **(CRITICAL)** • Directs starting RCIC manually • Directs reporting reactor power at 87" and lowering. • Directs continuing to lower RPV level until conditions allow for reinjection.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
ATWS		Crew • When all rods are in, transition from ATWS to EOP 1 RO • Reports rod insertion working by drifting rods, and/or removing RPS Fuses. **(CRITICAL)** • Controls level 170"-211" using Condensate and Feedwater **(CRITICAL)** CRS • Directs transition back to EOP 1 • Directs RPV level 170"-211" using Condensate and Feedwater.
When all rods are full in: IF directed to break Main Condenser Vacuum:	**Simulator Operator:** **Acknowledge the direction, then** **ACTIVATE ET 17** This inserts remote functions mc01 and mc02.	

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
When the crew has inserted all control rods and is restoring RPV Water Level to >170" and.at the direction of the Floor Instructor:	**Booth Instructor** **Place the simulator in FREEZE.** **Floor Instructor** **Perform a crew update and announce to the crew the simulator is in freeze and the scenario is complete.**	

***** END OF SCENARIO *****

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Loss of notch indication
2. RE-4116B Offgas Vent Pipe "B" Failed Downscale
3. "A" SBDG 1G-21 Spurious Start and failure to maintain Voltage Regulation

After EOP Entry:

1. RCIC Fails to Auto Start

Abnormal Events:

1. AOP 255.1
2. ARP 1C08A

Major Transients:

1. EOP 3 Steam Tunnel Leak
2. Electrical ATWS

Critical Task

1. #4: IF a scram is required and reactor power is above 5%, THEN reduce power below 5% using one or more of the following methods: {BWROG RPV 4.1, 5.1, 6.1}

   Inserting control rods using RIPs
2. #6: IF a reactor scram is required and the reactor is not shutdown under all conditions, THEN lockout ADS before automatic actuation. {BWROG RPV 4.2, 5.2, 6.2}
3. #10: IF a reactor scram is required, and reactor power is >5%, and Power/Level Control is required, THEN terminate and prevent injection until conditions allow reinjection. {BWROG RPV 6.3}
4. #7: IF performing ATWS Power/Level Control and Conditions are met to allow reinjection, THEN crew actions are taken to maintain RPV level above -25" by injecting using Table 1B systems. {BWROG RPV 5.5}

CREW GRADING ATTACHMENT

ESG 2 Rev. 0 Date _____

Operator Name	Position	Evaluator
	OSM	
	CRS	
	STA	
	1C05	
	1C03	
	B.O.P.	

Management Representative/Lead Evaluator _____/_____

Crew Critical Tasks

Task Statement	SAT	UNSAT
1. IF a scram is required and reactor power is above 5%, THEN reduce power below 5% using one or more of the following methods: • Inserting control rods using RIPs		
2. IF a reactor scram is required and the reactor is not shutdown under all conditions, THEN lockout ADS before automatic actuation. (Potential)		
3. IF a reactor scram is required, and reactor power is >5%, and Power/Level Control is required, THEN terminate and prevent injection until conditions allow reinjection.		
4. IF performing ATWS Power/Level Control and Conditions are met to allow reinjection, THEN crew actions are taken to maintain RPV level above -25" by injecting using Table 1B systems.		

DAEC DUANE ARNOLD ENERGY CENTER	SURVEILLANCE TEST PROCEDURE TITLE: **OFFSITE POWER SOURCES**	STP 3.8.1-01 Page 1 of 11 Rev. 5

Usage Level
CONTINUOUS

Record the following: Date / Time: _____ / _____ Initials: _____

NOTE: *User shall perform and document a Temp Issue / Rev. Check to ensure revision is current, in accordance with procedure use and adherence requirements.*

Prepared By: _____ / _____ Date: _____
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

PROCEDURE APPROVAL

Approved By _____ / _____ Date: _____
Print Signature

1.0 PURPOSE

1.1 This STP verifies correct breaker alignment and indicated power availability for each offsite circuit capable of supplying the onsite Class 1E AC Electrical Distribution System.

1.2 This STP is routinely performed with both offsite circuits available, or in response to the condition of one offsite circuit or one diesel generator inoperable.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 Section 7.0 of this STP contains two (2) sections that cover the anticipated conditions under which this STP will be performed. The STP is organized as follows:

Sect.	Conditions
7.1	Both Offsite Circuits Available
7.2	One Offsite Circuit Available

Only one of these sections should need to be performed to satisfy the performance requirements associated with this STP. All steps within a particular section are to be performed in sequence and the STP steps carried through to completion, unless stated otherwise.

2.1.2 Personnel recommended to perform this procedure:

1 Operations

2.1.3 Special Test Equipment required:

1 Marking Pen (Do not use light colored hi-lighters or markers. Use only dark colored pens or markers. See General Caution 2.2.1).

2.2 GENERAL CAUTIONS

2.2.1 If utilizing a paper copy of this surveillance, do not use light colored hi-lighters or markers to record data, outline configurations on drawings or to initial steps. Light-colored hi-lighters are not dark enough to reproduce adequately as the QA record. Not applicable when using electronic copies.

2.3 SPECIAL PRECAUTIONS

2.3.1 None

3.0 REFERENCES

3.1 Applicable drawings:

3.1.1 BECH-E001<1>

3.1.2 BECH-E005

3.1.3 BECH-E023

3.2 Supporting documents:

3.2.1 NG-97-2146

4.0 GENERAL INSTRUCTIONS

4.1 Steps marked with a "TS" immediately to the right of the step sign-off line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.

4.2 If any equipment or components are observed to be in a state of disrepair during the performance of this STP, appropriate corrective maintenance shall be initiated.

4.3 An Action Request (AR) should be completed for any problems encountered with "TS" marked steps during the performance of this test.

4.4 The CRS shall be notified immediately and the appropriate Limiting Conditions for Operation section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

5.0 APPENDICES

None

6.0 PREREQUISITES

6.1 Verify Offsite power is supplying essential buses 1A3 and 1A4 via either the startup transformer (normal source) or the standby transformer (alternate source). _____

6.2 Evaluate electrical system status and select the STP section which is to be performed: _____

[ ] Section 7.1 - Both Offsite Circuits Available

[ ] Section 7.2 - One Offsite Circuit Available

7.0 PROCEDURE

7.1 BOTH OFFSITE CIRCUITS AVAILABLE

NOTE

Information from the Load Dispatcher may be needed to complete the following step.

7.1.1 Using the guidance below and Attachment 1, identify two separate circuits available to transmit power from the offsite power sources to the essential buses.

a. Based on equipment/system lineup and operational status, use a dark marking pen to trace an available circuit from an offsite power source to the Startup Transformer supply breakers, 1A302 and 1A402. _____

b. Based on equipment/system lineup and operational status, use a dark marking pen to trace a second circuit from another offsite power source to the Standby Transformer supply breakers, 1A301 and 1A401 such that it does not share any lines, buses, or transformers in common with the circuit to the Startup Transformer supply breakers. _____

c. Based on equipment/system lineup and operational status, complete the electrical lineup by using a dark marking pen to trace the connections from each Essential Bus (1A3 and 1A4) to the Startup or Standby Transformer supply breaker currently feeding the bus. _____

7.1.2 Confirm two (2) independent offsite circuits are available by initialing one of the two sets of statements below and N/A'ing the other:

a. A circuit exists from an offsite power source, through the Startup Transformer and its supply breakers to both 1A3 and 1A4 essential buses; _____ TS

AND

A second independent circuit exists from a different offsite source, through the Standby Transformer to its supply breakers.

b. A circuit exists from an offsite power source, through the Startup Transformer and one of its supply breakers to either the 1A3 or 1A4 essential bus; _____ TS

AND

A second independent circuit exists from a different offsite source, through the Standby Transformer and one of its supply breakers to the other essential bus.

(PRINT / SIGN)

_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	

7.2 ONE OFFSITE CIRCUIT AVAILABLE

NOTE

Information from the Load Dispatcher may be needed to complete the following step.

7.2.1 Using the guidance below and Attachment 1, identify a circuit available to transmit power from an offsite power source to the essential buses.

a. Based on equipment/system lineup and operational status, use a dark marking pen to trace an available circuit from an offsite power source to the Startup Transformer supply breakers, 1A302 and 1A402 or Standby Transformer supply breakers, 1A301 and 1A401. _____

b. Based on equipment/system lineup and operational status, complete the electrical lineup by using a dark marking pen to trace the connections from the required Essential Bus(es) (1A3 and/or 1A4) to the Startup or Standby Transformer supply breakers. _____

7.2.2 **If** in Mode 1, 2 or 3, mark Step 7.2.4 "N/A" and proceed with the performance of Step 7.2.3. _____

OR

If in Mode 4 or 5, or during movement of irradiated fuel assemblies in the Secondary Containment, mark Step 7.2.3 "N/A" and proceed with the performance of Step 7.2.4.

7.2.3 Confirm an offsite circuit exists from an offsite power source, through either the Startup or Standby Transformer and its associated supply breakers to both 1A3 and 1A4 essential buses. _____ TS

7.2.4 Confirm an offsite circuit exists from an offsite power source by initialing one of the two statements below and "N/A'ing" the other:

a. An offsite circuit exists from an offsite power source, through either the Startup or Standby Transformer and its associated supply breakers to both 1A3 and 1A4 essential buses. _____ TS

b. An offsite circuit exists from an offsite power source, through either the Startup or Standby Transformer and one of its associated supply breakers to the required 1A3 or 1A4 essential bus. _____ TS

(PRINT / SIGN)

_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	

8.0 ACCEPTANCE CRITERIA

8.1 Indicate the reason for performing the STP:

[ ] Routine with both offsite circuits available

[ ] Routine with one offsite circuit available while in Mode 4 or 5 or during movement of irradiated fuel assemblies in the secondary containment

[ ] Action in response to one offsite circuit inoperable

[ ] Action in response to one diesel generator inoperable

[ ] Other, explain below:

_____

_____

_____

_____

_____

8.2 All Technical Specification required items, as indicated by "TS", have been performed satisfactorily:

8.2.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified _____

8.2.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified _____

8.3 All other items checked in this test have been performed satisfactorily:

8.3.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified _____

8.3.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified _____

8.4 Indicate any relevant test comments below, otherwise mark this step "N/A":

_____

_____

_____

_____

_____

_____

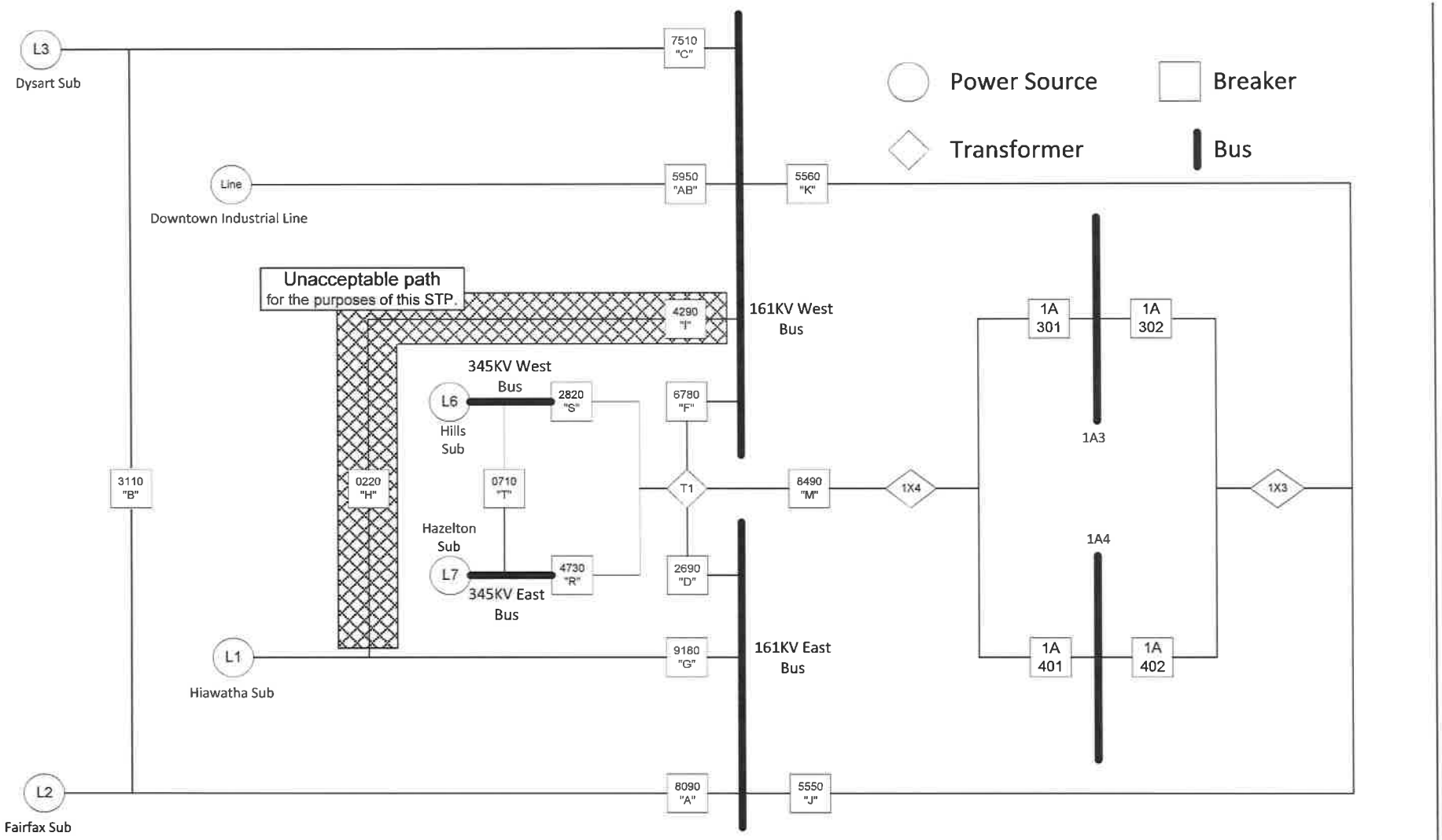
(PRINT / SIGN)

_____ / _____ _____

Operations Date

9.0 ATTACHMENTS

9.1 Attachment 1 - DAEC Offsite Power Circuits Feeding Essential Buses


Power Source
Breaker
Transformer
Bus
L3
Dysart Sub
7510 "C"
Line
Downtown Industrial Line
5950 "AB"
5560 "K"
Unacceptable path
for the purposes of this STP.
4290 "I"
161KV West Bus
345KV West Bus
L6
Hills Sub
2820 "S"
6780 "F"
3110 "B"
0220 "H"
0710 "T"
T1
8490 "M"
1X4
1X3
Hazelton Sub
L7
4730 "R"
2690 "D"
345KV East Bus
L1
Hiawatha Sub
9180 "G"
161KV East Bus
1A 301
1A 302
1A3
1A4
1A 401
1A 402
L2
Fairfax Sub
8090 "A"
5550 "J"

DAEC DUANE ARNOLD ENERGY CENTER	SURVEILLANCE TEST PROCEDURE TITLE ONE STANDBY DIESEL GENERATOR INOPERABLE	STP 3.8.1-02 Page 1 of 7 Rev. 6

Usage Level
CONTINUOUS

Approved for **'Point-of-Use'** printing **IF NO Temporary Changes** are in effect for this procedure.

Record the following: Date / Time: _____ / _____ Initials: ____

NOTE: *A check to ensure current revision and no temporary changes shall be performed and documented every 24 hours if active document use exceeds a 24 hour period as determined from the date and time recorded above.*

Prepared By: _____ / _____ Date: _____
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

PROCEDURE APPROVAL BY QUALIFIED REVIEWER

Approved By _____ / _____ Date: _____
Print Signature

1.0 PURPOSE

1.1 The purpose of this test is to implement the REQUIRED ACTIONS of LCO 3.8.1 when one Diesel Generator is inoperable.

1.2 This procedure also provides instructions for scheduling and performance of SR 3.8.1.1 and SR 3.8.1.2 in accordance with LCO 3.8.1 Action B.1 and Action B.4, respectively.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 Testing is organized as follows:

STP Sections	Evolution
7.1	Required Actions For LCO 3.8.1, Condition B
7.2	Other Actions For One SBDG Inoperable

2.1.2 Personnel recommended to perform this STP:

1 Operations

2.1.3 Special Test Equipment required:

None

2.2 GENERAL CAUTIONS

2.2.1 None

2.3 SPECIAL PRECAUTIONS

2.3.1 None

3.0 REFERENCES

3.1 Associated STPs:

3.1.1 STP 3.8.1-01

3.1.2 STP 3.8.1-03

3.2 ODI-8, LCO Surveillance Log and Flag

4.0 GENERAL INSTRUCTIONS

4.1 The Control Room Supervisor (CRS) shall be notified immediately and the appropriate Limiting Conditions for Operations section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

5.0 APPENDICES

5.1 None

6.0 PREREQUISITES

6.1 None

7.0 PROCEDURE

7.1 REQUIRED ACTIONS FOR LCO 3.8.1, CONDITION B

7.1.1 Enter the appropriate component designator in space provided below (N/A any non-applicable condition): _____

Diesel Generator _____ is INOPERABLE

AND/OR

ESW Subsystem _____ is INOPERABLE

NOTE

Step 7.1.2 must be performed within one (1) hour of determining that one diesel generator has become inoperable. _____

7.1.2 Perform STP 3.8.1-01. _____

7.1.3 Schedule performance of STP 3.8.1-01 within 12 hours of the completion of Step 7.1.2 in accordance with ODI-8. _____

NOTE _____

In reference to the following step, initial diesel generator operability testing must be performed within seventy-two (72) hours of declaring a diesel generator inoperable and once every 72 hours thereafter. Not required to be performed when the cause of the inoperable DG is preplanned, preventive maintenance and testing.

7.1.4 Prepare and place LCO Surveillance Due Flags (Green Cards), requiring the performance of STP 3.8.1-03 on the operable diesel generator. Mark this step N/A if the cause of the inoperable DG is preplanned, preventive maintenance and testing. _____

NOTE _____

Step 7.1.5 must be performed within four (4) hours of discovery that one diesel generator is inoperable concurrent with inoperability of redundant required feature(s).

7.1.5 Declare required feature(s), supported by the inoperable DG, inoperable when the redundant required feature(s) are inoperable. _____

NOTE

Step 7.1.6 must be performed within twenty-four (24) hours of determining that one diesel generator has become inoperable. Step 7.1.6 performs an evaluation to demonstrate that the remaining diesel is not susceptible to the same condition(s) that rendered the first diesel inoperable.

_____

7.1.6 Perform an evaluation on the remaining diesel, verifying that the remaining diesel is not susceptible to the same condition(s) that rendered the first diesel inoperable. List and describe any analysis and/or inspection(s) performed to prove continued operability of the remaining diesel in the spaces provided below (attach additional sheets if necessary): _____

_____

_____

_____

_____

_____

_____

_____

_____

(Attach copy[ies] of supporting documents to the back of this STP).

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

Performed by: Date: Time:

7.2 OTHER ACTIONS FOR ONE SBDG INOPERABLE

7.2.1 IF the associated SBDG or ESW support subsystem are/will be unavailable, THEN verify the 1K-1 Backup Instrument Air Compressor is aligned to be powered from the operable SBDG per OI 518.1. _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

Performed by: Date: Time:

8.0 ACCEPTANCE CRITERIA

8.1 If this STP is performed for any reason other than for satisfying the PURPOSE as stated in Section 1.0, indicate below (otherwise mark this step "N/A"):

_____

_____

_____

_____

8.2 All steps of this STP have been performed satisfactorily: _____

( ) YES ( ) NO ⇒ CRS notified

8.3 Indicate any relevant test comments below, otherwise mark this step "N/A":

_____

_____

_____

_____

_____

_____ _____
Operations Date

_____ _____
Surveillance Coordinator Date

9.0 ATTACHMENTS

9.1 None

NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: DAEC **Revision #:** 0

LMS ID: PDA OPS ESG 3 **LMS Rev. Date:** N/A

SEG TITLE: NRC INITIAL LICENSE EXAM, SCENARIO #3

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: ~90 minutes

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

SIMULATOR EXERCISE GUIDE REQUIREMENTS

Terminal Objective This Evaluation Scenario Guide evaluates the Operators' ability to: "Given the malfunctions presented in this ESG, the students will protect the public, protect plant personnel, and protect plant equipment, in accordance with plant procedures."

Enabling Objectives: Evaluation Guide, no tasks are trained. Evaluated tasks are listed on page 4.

Prerequisites: None

Training Resources:

A. Simulator
B. Evaluation team
C. Operations Management Representative
D. Simulator Driver
E. Phone Talker
F. Exam Proctor for custody of the crew between scenarios
G. Simulator Video recording equipment

References:

A. AOP 255.1, Rev. 46
B. AOP 672.2, rev. 37
C. AOP 901, Rev. 29
D. ARP 1C03A, Rev. 54
E. ARP 1C03B, rev 41
F. ARP 1C03C, rev 43
G. ARP 1C04B, Rev. 80
H. ARP 1C05A, Rev. 81
I. ARP 1C05B, Rev. 104
J. ARP 1C06A, rev 70
K. ARP 1C07B, rev 89
L. ED, Rev. 10
M. EOP 1, Rev. 19
N. EOP 3 EOP 4, Rev. 21
O. OI 255, Rev. 89
P. OI 414. Rev. 40

Protected Content: None

Evaluation Method: Dynamic Scenario graded in accordance with NUREG 1021 guidance.

Operating Experience: N/A

Risk Significant Operator Actions:

TASKS ASSOCIATED WITH SIMULATOR EXERCISE GUIDE	
Task #	**Task Title**
	Reactor Operator
95.71	Perform Actions of EOP 4
95.72	Reduce Offsite Radioactivity Release Rate with a Primary System Discharging Outside of Containment
95.45	Perform initial EOP 1 actions (RC)
95.44	Perform actions of RC/L of EOP 1
95.46	Perform actions of RC/P of EOP 1
95.20	Perform Defeat 11
95.80	Perform an Emergency Depressurization Using SRVs.
95.68	Perform Actions of EOP3 for High Area Temp, Rad, Water Level Including EOP 1 and ED
95.69	Manually Insert A Scram Before Any Area Parameter Reaches Maximum Safe Operating Limits
95.70	Perform actions of EOP 3 for hi area temp, rad, and water level including commencement of plant S/D.
93.21	Perform a Fast Power Reduction
94.22	Respond to Earthquake Condition
94.02	Respond to Abnormal Control rod Movement/Indication
	Senior Reactor Operator
6.72	Direct Crew Response for Performance of EOP 4
6.21	Direct Crew Response for performance of Defeat 11
6.45	Direct Crew Response for performance of initial EOP 1 actions (RC)
6.44	Direct Crew Response for performance of the RC/L leg of EOP 1
6.46	Direct Crew Response for performance of RC/P leg of EOP 1
6.78	Direct Crew Response for performance of Emergency Depressurization
6.68	Direct Crew Response for performance of EOP 3 for high area temperatures/radiation /water level including commencement of a plant shutdown.
6.67	Direct Crew Response for performance of EOP3 for high area temperature/radiation/water level including EOP 1 and ED
5.22	Direct Crew Response to Earthquake Condition
5.02	Direct Crew Response to Abnormal Control rod Movement/Indication
4.07	Recommend Mitigation Strategies for Accidents (EOPs)
4.08	Verify EAL determination
4.09	Perform internal and external notifications

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE
Rev. 0	Initial development for 2017 NRC LOIT Examination	Initial development for 2017 NRC LOIT Examination	N/A	See Cover See Cover	

OVERVIEW / SEQUENCE OF EVENTS

SEQUENCE OF EVENTS	
Event #	**Description**
Eastern Iowa has the potential for severe weather. Several strong storms are forming in the Dakota's and Western Minnesota. "A" Core Spray is out of service for replacement of the breaker overcurrent relay. Work expected to finish tomorrow morning with operability run on days tomorrow. LCO 3.5.1 Condition B, day 2 of 7. The crew will be briefed as to the need to switch running RBCCW pumps and lower 5% to assist in PPC Maintenance and HPCI testing.	
1.	After alternating RBCCW pumps and power reduction an OBE Earthquake occurs and the crew enters AOP 901.
2.	Due to the OBE, PS4549, RPS Channel A Hi Vessel Pressure Scram and LLS Arming switch fails resulting in a half scram. The Crew will recognize that C71A-K5A Relay is not energized due to a failure of PS-4549, High Reactor Pressure, relay causing an "A" RPS AUTO SCRAM signal. The crew will enter Tech Spec **LCO 3.3.1.1 RPS Instrumentation Condition A – Function 3**.
3.	A single Control Rod scrams in during the half scram. The crew will enter AOP 255.1 and 255.2 to respond to the control rod abnormal. The crew will enter Tech Spec **LCO 3.1.3 Control Rod OPERABILITY Condition C**.
4.	The crew will respond to a steam leak from RCIC, Enter EOP 3, and attempt to isolate the leak. The Inboard RCIC Steam Line Isolation MO-2400 will develop a thermal overload and RCIC Outboard Steam Line Isolation MO-2401 will not close; this will cause RCIC room temperature will exceed max normal and will approach max safe. The crew will insert a manual reactor scram prior to temperatures exceeding max safe. **(CRITICAL)** After the scram, the thermal overload for MO-2400 will reset.
5.	The Crew will recognize a fuel leak and enter AOP 672.2.
6.	A steam leak develops in the RWCU room. Group 5 automatic actions fail to occur, however, the leak can be isolated by closing the valves from the control room. **(CRITICAL)**
7.	A steam leak will be reported from the Turbine Building. The crew will attempt to shut the MSIVs but will discover that 'A' MSIVs fail to close. This results in the crew to take action IAW EOP 4 and perform an ED prior to reaching a GE Release Rate**. (CRITICAL)**
8.	After the ED, when the crew has depressurized the RPV and is recovering RPV Water level to the directed band, the scenario is complete.

SIMULATOR SET UP INSTRUCTIONS

1. Set NRC Exam Security for the Simulator per QF-1071-08 ____
2. Perform simulator set up per TDAP 1839 Attachment 2, Simulator Setup Checklist. ____
3. Load the saved IC (in folder with this ESG) to a SNAPSHOT _____ reset to that SNAPSHOT and place the Simulator in RUN, OR ____
4. Reset to IC 20, place the simulator in RUN and perform the following: ____
   a. Insert Event Triggers, Malfunctions, Overrides, and Remotes per the tables below ____
5. COPY the Schedule Files listed below from the folder with this ESG to the S:\TRex_Duane\Lightning\Schedule directory. ____
6. RUN Schedule File "ILT3Actions.sch" and LEAVE IT RUNNING. ____
7. Verify Malfunctions. ____
8. Verify Remotes (Note that environmental remotes will already be timing) ____
9. Verify Overrides. ____
10. Startup Thundersound in Earthquake mode ____
    a. At the right side instructor station computer in the booth, select THUNDERSOUND from the Toolbar.
    b. Select EARTHQUAKE from the popup window.
    c. Toggle the red stop square to the green arrow.
    d. Verify the computer volume is turned up to at least 35.

11. Ensure MOL pull sheet is in the 1C05B hanging file.
12. Establish EOOS conditions for OOS components and plant conditions ____
13. Place clearance tags on 1C03 "A" Core Spray system mimic as follows:
    a. Place MIP tag on HS2103, CORE SPRAY PUMP 1P211A handswitch ____
    b. Place a maintenance/testing border on 1C03A (A-9) ____
    c. Make 'A' Core Spray Loop UNAVAILABLE in EOOS. ____
    d. Hang Guarded Equipment tags on:
       (1) RHR Pumps 'B' & 'D' ____
       (2) Core Spray Loop 'B' ____
       (3) 'B' ESW ____
       (4) 'B' SBDG ____
       (5) 1A4 ____
       (6) 1B4 ____
       (7) 1B44 ____
       (8) 1V-AC-11 ____

EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
1,3,5,7,9, 12,14,16	MANUALLY ACTIVATED	MANUALLY ACTIVATED
18	yp_mms24c == 1	RX BLDG SUPPLY FNA 1V-SF-10C
20	msvpcv4413 <= .95	21040 OUTBOARD MSIV STM LINE A
22	RPDIS1RUN(1) != 1	Reactor Mode Switch out of RUN
24	RRPRV < 880	RPV Pressure < 880
26	YCASL55 >= 30	RWCU HX Room Temperature > 130F
28	cuvpmo2700 <= .05 | cuvpmo2701 <= .05	RWCU ISOLATION
30	ZAORMRI4448A >= .490000	A STEAM LINE RAD MONITOR

MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	CS01A	CORE SPRAY PUMP TRIP- CORE SPRAY PUMP A TRIP				ACTIVE	ACTIVE
Setup	CS05A	CORE SPRAY PUMP A - FAILURE TO AUTO-INITIATE				ACTIVE	ACTIVE
Setup	AN1C03A(9)	1C03A (A-09) 'A' CORE SPRAY PUMP 1P-211A TRIP OR MOTOR OVERLOAD				ON	ON
Setup	MS05A	MSIV DISC FAILURE- INBD MSIV A				100	100
Setup	MS28A	GROUP 5 ISOLATION VALVE(S) FAIL(S) TO CLOSE-MO2700				ACTIVE	ACTIVE
Setup	MS28B	GROUP 5 ISOLATION VALVE(S) FAIL(S) TO CLOSE-MO2701				ACTIVE	ACTIVE
Setup	MS28C	GROUP 5 ISOLATION VALVE(S) FAIL(S) TO CLOSE-MO2740				ACTIVE	ACTIVE
Setup	MS31B	GROUP 6 ISOLATION VALVE(S) FAIL(S) TO CLOSE-MO2401				ACTIVE	ACTIVE
Setup	RC10A	MO2400 THERMAL OVERLOAD BREAKER TRIP				ACTIVE	ACTIVE
Setup	SW14A	RCIC ROOM COOLER ESW FLOW BLOCKAGE- 1V-AC-15A	3		5 SEC	0	100
Setup	SW14B	RCIC ROOM COOLER ESW FLOW BLOCKAGE- 1V-AC-15B	3		5 SEC	0	100
Setup	RC06	RCIC STEAM SUPPLY LINE BREAK (RCIC ROOM)	3	10 SEC	07:00	0	25
Setup	RC06	RCIC STEAM SUPPLY LINE BREAK (RCIC ROOM) NEW	18	10 SEC	07:00	0	75
Setup	ED22B	BREAKER TRIP 1D1401 FOR MO2401	14			INACTIVE	ACTIVE
Setup	CU10	COOLANT LEAKAGE OUTSIDE THE PRIMARY CONTAIMENT	22	2:00	07:00	0	1.5
Setup	MS04A	MSL RUPTURE OUTSIDE PRIMARY CONTAINMENT-STM LINE A	28	04:00	02:00	0	0.5
Setup	RX01	FUEL CLADDING FAILURE	30	05:30	20:00	0	0.01
Setup	TC06A	TURBINE BYPASS VALVE FAILURE- BV-1	24			0	0
Setup	TC06B	TURBINE BYPASS VALVE FAILURE- BV-2	24			0	0
Setup	MS05B	MSIV DISC FAILURE- OTBD MSIV A				100	100
Setup	RM09RM5945	RM5945 KAMAN 2 TB NORM MONITOR FAILURE	28	4:00	30 SEC	AS IS	0.005
Setup	RM09RM5945	RM5945 KAMAN 2 TB NORM MONITOR FAILURE (NEW)	28	4:30	2:30	AS IS	0.031
Setup	RM09RM5945	RM5945 KAMAN 2 TB NORM MONITOR FAILURE (NEW)	28	7:00	5:00	AS IS	0.061
Setup	RM09RM5945	RM5945 KAMAN 2 TB NORM MONITOR FAILURE (NEW)	28	12:00	10:00	AS IS	0.62
Setup	AN1C05B(40)	1C05B (E-08) PCIS GROUP '5' ISOLATION INITIATED	26			CRYWOLF	ON

REMOTES:

Time	Remote No.	Remote Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	HV09	TURBINE BUILDING EXHAUST FAN 1V-EF-21A - HS-5945	1			MAN	MAN
Setup	FP08	RCIC DELUGE MAN ISOLATION VALVE V-33-84	1			OPEN	CLOSE

OVERRIDES:

Time	Override No.	Override Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	AO-CS-002	E21R700A CORE SPRAY PUMP 1P-211A (0-150 AMPS)				0	0
Setup	DI-CS-008	HS-2103 PUMP 1P-211A				STOP	STOP
Setup	DO-CS-003	HS-2103(1) PUMP 1P-211A (WHITE)				OFF	OFF
Setup	DO-CS-004	HS-2103(2) PUMP 1P-211A (GREEN)				OFF	OFF
Setup	DO-CS-006	HS-2103(4) PUMP 1P-211A (RED)				OFF	OFF
Setup	DO-CS-005	HS-2103(3) PUMP 1P-211A (AMBER)				OFF	OFF
Setup	DI-HV-006	HS-5928 TURB BLDG ROOF EXH FANS 1V-REF-20/27				AUTO	AUTO
Setup	DI-HV-007	HS-5948 TB EXH FAN LEAD SEL (A&B-FAN,B&C-FAN,C&A-FAN)				AB	AB
Setup	DI-HV-033	HS-6516 TURB BLD SPLY FAN 1V-SF-22A				START	START
Setup	DI-HV-034	HS-6517 TURB BLD SPLY FAN 1V-SF-22B				START	START
Setup	DI-RC-008	HS-2401 OUTBD STM LINE ISOL. VLV				AUTO	AUTO
Setup	AO-FW-015	FI-4408 STEAM FLOW A - FI-4408	20		02:00	As-Is	8
Setup	DO-MS-192	PCIS-LAIRWCU PCIS GROUP 5 A LOGIC ISOLATION SIGNAL RWCU	26			OFF	ON
Setup	DO-MS-212	PCIS-LBIRWCU PCIS GROUP 5 B LOGIC ISOLATION SIGNAL RWCU	26			OFF	ON

SCHEDULE FILES:

ILT3Actions.sch			
@ Time	**Event**	**Action**	**Description**
Setup	1	Insert malfunction zz01 delete in 20	0.01G Recorders Operating
Setup	1	Insert malfunction zz01 delete in 30 after 30	0.01G Recorders Operating
Setup	1	Insert malfunction zz02 delete in 50 after 30	Operating Basis Earthquake Event
Setup	1	Insert malfunction RR38A after 40	RPV PRESS SWITCH PS4549 FAILURE
Setup	1	Insert malfunction rd081807 after 40	CONTROL ROD SCRAMS- ROD 18-07
Setup	28	Insert malfunction rm02re4448a to 49.00000 in 120 after 180	RE-4448A MAIN STEAM LINE A
Setup	28	Insert malfunction rm02re4448c to 45.00000 in 120 after 180	RE-4448C MAIN STEAM LINE C
Setup	28	Insert malfunction rm02re4448b to 44.00000 in 120 after 180	RE-4448B MAIN STEAM LINE B
Setup	28	Insert malfunction rm02re4448d to 45.00000 in 120 after 180	RE-4448D MAIN STEAM LINE D
Setup	28	Insert malfunction rm01re9158 to 55.00000 in 600 after 180	RE-9158 CONDENSATE PUMP AREA
Setup	28	Insert malfunction rm01re9159 to 59.00000 in 600 after 180	RE-9159 REACTOR FEED PUMP AREA
Setup	28	Insert malfunction rm01re9160 to 61.00000 in 600 after 180	RE-9160 TURBINE LUBE OIL AREA
Setup	28	Insert malfunction rm01re9179 to 57.00000 in 600 after 180	RE-9179 TURBINE FRONT STANDARD
Setup	22	Delete malfunction RC10A	MO2400 THERMAL OVERLOAD BREAKER TRIP
	30	Modify malfunction rm02re4448a to 55 in 300	RE-4448A MAIN STEAM LINE A

Conduct simulator crew pre-scenario brief using TR-AA-230-1007-F06, Simulator Instructor Pre-Exercise Checklist

If surrogate operators are to be used, brief them using TR-AA-230-1007-F11, Surrogate Brief Checklist

SHIFT TURNOVER INFORMATION

- Today, Night Shift
- Temperatures in the 80's. Eastern Iowa has the potential for severe weather. Several strong storms are forming in the Dakota's and Western Minnesota.
- Plant power ~100%, with corresponding MWe, MWth, and core flow
- Protected Train – "B"
- Procedures or major maintenance in progress:
  - "A" Core Spray is out of service for replacement of the breaker overcurrent relay. Work expected to finish tomorrow morning with operability run on days tomorrow.
    - The spare breaker field test failed and has been sent offsite for overhaul.
- Technical Specification Action statements in effect:
  - DAEC is in compliance with all LCO's
  - A" Core Spray is out of service for replacement of the breaker overcurrent relay. Work expected to finish tomorrow morning with operability run on days tomorrow. LCO 3.5.1 Condition B, day 2 of 7.
- Plant PRA Status
  - **CDF: 1.34×10^{-6}, GREEN, 1 year to Yellow ICDP**
  - **LERF 3.27×10^{-7}, GREEN, 1 year to Yellow ILERP**
- Evolutions in progress or planned for upcoming shift:
  - Alternate running RBCCW pumps from 'B' & 'C' running to 'A' & 'C' running for motor inspections on 'B' RBCCW pump IAW OI 414 Section 7.1.
  - Lower power by 5% IAW IPOI 3, Power Operations (35%-100% Rated Power) to assist in PPC Maintenance and HPCI testing
    - RE recommends only lowering Rx Recirc by 1Mlbm/hr due to load line concerns
- Comments, problems, operator workarounds, etc.
  - One extra NSPEO available in Work Control
  - Radwaste Operator is NSPEO qualified

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Switch running RBCCW pumps When contacted as any dept. in organization:	**Booth Communicator:** **Acknowledge the request.**	CREW • Switch running RBCCW pumps IAW OI 414 section 7.1 RO • Place the Standby RBCCW pump handswitch on 1C06 in the START position • Verify that the Standby RBCCW pump starts • Place the handswitch for the RBCCW pump that is to be secured in the STOP position • Verify that RBCCW Pump Disch Header LO Pressure (1C06B, D-3) is reset • Place the handswitch for the secured RBCCW Pump in AUTO CRS • The CRS will direct switching running RBCCW Pumps

IPOI 3		CREW
		• Lower reactor power by 5% to assist in PPC Maintenance and HPCI testing
		RO
		• Lower reactor power by 5% IAW IPOI 3 as follows:
		  • At 1C04, reduce RECIRC MG SET A and B SPEED CONTROL in small equal increments to lower core flow by approximately 1Mlb/hr, maintaining balanced Recirc lop flow, while closely monitoring the Power to Flow Map, so as not to exceed MELLLA, as directed by the CRS/OSM.
		  • Insert control rods per the current Control Rod Withdrawal Sequence Sheets to lower power by approximately 40 MWth or as directed by the CRS/OSM.
		CRS
		• Direct and observe reactivity manipulations to achieve a 5% reduction in reactor power

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Earthquake After the crew reduces power by ~5% and at the direction of the floor instructor: The following scripts are on the following pages: When contacted as any dept. in organization:	**Simulator Operator** **ACTIVATE ET 1** This will cause the 0.01G recorder alarm to run; and then, 30 seconds later, an OBE with additional malfunctions. **Booth Communicator:** HPCI Suction Swap/Torus Level Alarms – Pg. 15 PS-4549/Half Scram Pg. 16 HCU 18-07 – Pg. 17/18 **Booth Communicator:** **Acknowledge the request.**	CREW • Enter and carry out the actions of AOP 901, Earthquake. CRS • Direct Crew Response to an Earthquake Condition. • IF the amber DESIGN BASIS EARTHQUAKE, or amber OPERATING BASIS EARTHQUAKE lights are ON, and not a malfunction, THEN commence shutting down the reactor to be in cold shutdown within 24 hours. • Enter EOP 2 T/L on High/Low Torus Water Level (may be administratively exited). • Direct Health Physics to perform radiation surveys of the normally accessible areas inside DAEC Buildings, and the site grounds including the Independent Spent Fuel Storage Installation. • Direct chemist to review KAMAN data and perform sensor checks. • Direct control room operators monitor the control room panels for changes in some of the following critical plant parameters

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

If contacted as Duty Station Manager:
 	
If contacted as HP or Chemistry:
 	
If contacted as an in-plant operator:
	Booth Communicator:
	Acknowledge the request.
	
	Booth Communicator:
	Acknowledge the request.
	
	Booth Communicator:
	Acknowledge the request to perfrom inside and outside plant walkdowns.
	Keep track of which operator has been sent to what location in the plant.
		CREW
		• Enter and carry out the actions of AOP 901, Earthquake.
		
		RO
		• Respond to an Earthquake Condition.
		• Monitor reactor power, pressure, and level on 1C05.
		• Monitor for any Control Rod out of position.
		• At 1C06, verify River Water Supply system integrity by:
		  • Verify all available RWS pumps will start and deliver >6000 gpm flow.
		  • Using HS 4918, RIVER WATER SUPPLY LOOP SELECT switch, select A CV4915 and B CV4914, one at a time, to verify RWS makeup flow can be established with each loop ensuring RWS piping is intact.
		• Monitor Process and Area Radiation Monitoring System channels on Panels 1C10 and 1C11.
		• Send operators, with portable radiation monitors, to perform a quick walk through of the plant to determine the general condition of the plant structure and system's integrity, and immediately report back any damage to the Control Room.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Earthquake HPCI Suction Swap		CREW • Respond to the HPCI Suction Transfer annunciator 1C03C D-4 RO • Confirm the Torus high level condition at 1C03 on LI-4397A / B WR TORUS LEVEL indicators, or at 1C09 on LR-4396A / B TORUS LEVEL. • Verify the AUTOMATIC ACTIONS have occurred. • If HI TORUS LEVEL is confirmed, then enter EOP-2 (Primary Containment Control). CRS • Enter EOP 2 on T/L (may be administratively exited)
Earthquake Torus Level Alarms		CREW • Respond to the Torus Level annunciator 1C03B (D-9) RO • Monitor the Torus level on URS 4384 (Channel 3) and UR 4385 (Channel 2) at 1C29 or LR-4396A/B at 1C09. • Verify the AUTOMATIC ACTIONS have occurred. CRS • Enter EOP 2 on T/L (may be administratively exited)

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Segment 1 Earthquake PS-4549	**Evaluator Note:** IF the crew checks the condition of C71A-K5A inform the operator that the relay fingers are toward the cover. (De-energized position, but do not directly say it is de-energized) All other relays are as seen. **Evaluator Note:** The crew will determine that PS4549 has failed. The crew will not be able to correct the cause of the half scram, or reset it.	CREW • Respond to the REACTOR VESSEL HIGH PRESSURE TRIP annunciator 1C05B C-4 • Respond to the "A" RPS AUTO SCRAM annunciator 1C05A A-2 RO • At 1C05, confirm Reactor pressure high on PR-4563/4564, REACTOR PRESSURE/REACTOR WATER LEVEL. • Verify Scram Group A 1 2 3 4 indicating lights are off. • Identify the cause of the A RPS Auto Scram. CRS • Enter the applicable Tech Specs: • **LCO 3.3.1.1 RPS Instrumentation Function 3** is not OPERABLE - Condition A; required action A.1 Place channel in trip in 12 hours or A.2 Place associated trip system in trip in 12 hours.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Earthquake		CREW • Respond to the ROD DRIFT annunciator 1C05A D-6

If sent to investigate HCU 18-07:	**Booth Communicator:**
	Acknowledge Request
		RO
		• At 1C05, select affected Control Rod, monitor 4 rod display to determine if a control rod is drifting, and if so in what direction.
		• If any control rod has scrammed, perform the following:
		  • Run an OFFICIAL 3D CASE for abnormal reactor power/control rod distributions.
		  • Notify the Reactor Engineer of the abnormal rod pattern.
		• When Rod motion has been stopped and/or position indication has been restored clear the alarm by momentarily taking C11A-S7 Rod Drift Alarm Reset/Test switch to RESET.

Two minutes after sent to investigate HCU 18-07:	**Booth Communicator:** **Inform the control room HCU 18-07 appears to be scrammed; both scram solenoid pilot valves are de-energized and are venting air.**	

If sent to investigate fuses for Rod 18-07 wait one minute and report:	**Booth Communicator:**
	The fuses for Rod 18-07 appear to have blown.
		CRS
		• Enter the applicable Tech Specs:
		  • **LCO 3.1.5 Control Rod Scram Accumulators** OPERABILITY for rod 18-07 Condition A; Required Actions A.2 Declare the associated control rod inoperable in 8 hours.
		  • **LCO 3.1.3 Control Rod OPERABILITY** for rod 18-07 Condition C; Required Actions C.1 Fully insert inoperable control rod (met) and C.2 Disarm the associated CRD in 4 hours.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Earthquake AOP 255.1 If contacted as Reactor Engineer: Two minutes after contacted as RE:	**Booth Communicator:** **Acknowledge Request** **Booth Communicator:** **Report that there is no current issue with leaving 18-07 inserted.**	CREW • Perform actions of AOP 255.1 in the mispositioned control rod section RO • Once power has stabilized, manually initiate an Official 3D Case. • Verify thermal limits on the official 3D Case. CRS • Direct actions or AOP 255.1 • Contact RE and Ops Manager
Earthquake AOP 255.2		CREW • Perform actions of AOP 255.2 for the unplanned power change. RO • Place one APRM recorder in each trip system to fast speed to monitor for APRM undamped oscillations greater than normal. CRS • Direct actions of AOP 255.2

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
RCIC Leak When the TS Declaration is made and at the direction of the Floor Instructor: When ventilation is taken to a 3-2-3 lineup: IF sent to the RCIC room: Four minutes after sent to RCIC room: After sent to reset the thermal overload for MO2400:	**Simulator Operator:** **ACTIVATE ET 3** This starts the unisolable RCIC steam line leak. **Simulator Operator:** **VERIFY ET 18 ACTIVATES** This will increase the leak rate to ensure Max Safe will be reached. **Booth Communicator:** **Acknowledge Request** **Booth Communicator:** **Inform the control room that you are at the RCIC room door and can hear a loud roar from inside the room, but there is no evidence of steam outside the room.** **Booth Communicator:** Communications for this event are located on page 20.	CREW • Respond to the Steam Leak detection alarm, 1C04B B-4 • Determine that the RCIC room temperature is above Max Normal. RO • Send an Operator to 1C21 to determine which area has the high temperature condition. • Verify the AUTOMATIC ACTIONS have occurred. If the specified automatic response has failed to occur, manually initiate the appropriate actions. CRS • Enter EOP 3 (Secondary Containment Control).

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

RCIC Leak
 	
IF sent to open breaker for MO-2401:
 	
If sent to close MO-2401 manually:
 	
After sent to close MO-2401 and at the direction of the Floor Instructor:
	Simulator Operator:
	Acknowledge the direction and brief, wait 2 minutes then
	ACTIVATE ET 14
	THEN
	Booth Communicator
	Contact the Control Room and report the breaker for MO-2401 is open.
	
	Booth Communicator
	Acknowledge Request
	
	Booth Communicator
	Report to the Control Room that you cannot get MO-2401 to move.
		Crew
		• Implement the actions of EOP 3, Secondary Containment Control.
		RO
		• Starts ESW for RCIC Room Coolers
		• Operates available main plant supply and exhaust fans.
		• Start 1V-EF-1, 1V-EF-2, and 1V-EF-3 MAIN PLANT EXHAUST FANS by positioning the following handswitches to START and verify their respective dampers indicate OPEN:
		  • Fan Handswitch Panel Damper
		  • 1V-EF-1 HS-7613 1C23A 1V-AD-16U
		  • 1V-EF-2 HS-7614 1C23B 1V-AD-16V
		  • 1V-EF-3 HS-7615 1C23C 1V-AD-16W
		• Start the Reactor Building Exhaust Fans by positioning the following handswitches to START:
		  • Fan Handswitch Panel
		  • 1V-EF-11A HS-7611A 1C23A
		  • 1V-EF-11B HS-7611B 1C23B
		• Start the Reactor Building Supply Fans by positioning the following handswitches to START:
		  • Fan Handswitch Panel
		  • 1V-SF-10A HS-6512 1C23A
		  • 1V-SF-10B HS-6513 1C23B
		  • 1V-SF-10C HS-6514 1C23C
		• Inserts a manual reactor scram

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
EOP 3 cont.:		CRS • Directs starting ESW for RCIC Room Coolers • Directs operating available main plant supply and exhaust fans. • Properly placekeeps in EOP 3, Secondary Containment Control. • Isolates all systems discharging into the area except systems required to be operated by EOPS OR required to suppress a fire. • Determines that RPV pressure reduction will decrease leakage into secondary containment. • Before any parameter reaches is Max Safe Operating Limit: • Enter EOP 1. **(CRITICAL)**
EOP 1 When the MODE switch is placed in SHUTDOWN: After the scram and when RC10A has been deleted:	**Simulator Operator:** **VERIFY ET 22 ACITVATES** When the RO takes the Mode Switch out of RUN. This begins the RWCU leak (isolable) starts, and isolates the RCIC steam leak. **Booth Communicator** **Contact the Control Room and report that the thermal overload for MO-2400 has reset.**	CREW • Implements the actions of EOP 1, RPV Control. RO • Inserts a manual reactor scram. • Places the MODE switch in SHUTDOWN. CRS • Directs inserting a manual reactor scram. • Directs a RPV level band of 170-211" using condensate and feedwater. • Directs a RPV pressure band of 800-1055 psig using turbine bypass valves. • Directs commencing a cooldown to lessen the driving head on the leak in the RCIC Room.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
RWCU Leak When RWCU HX room temp is > 130F: When MO-2700 or MO-2701 are closed: If sent to the RWCU HX room:	**Simulator Operator:** **VERIFY ET 26 ACTIVATES** This will activate the Group 5 Annunciator – 1C05B (E-08) **Simulator Operator:** **VERIFY ET 28 ACTIVATES** This will start the 'A' steam line TB leak (Pg. 24) and associated leak rad monitor indications on delays. **Evaluator Note:** The crew will re-enter EOP 3 on High Area Temperature; the steam leak can be isolated by the crew. **Booth Communicator:** **Wait 2 minutes and inform the control room that you can hear a loud whistle from inside the room but there is no evidence of steam outside the room.**	CREW • Respond to the Steam Leak detection alarm, 1C04B B-4 • Determine that the RWCU room temperature is above Max Normal. RO • Send an Operator to 1C21 to determine which area has the high temperature condition. • Verify the AUTOMATIC ACTIONS have occurred. If the specified automatic response has failed to occur, manually initiate the appropriate actions. **(CRITICAL)** CRS • Enter EOP 3 (Secondary Containment Control).

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

Segment 3
RWCU Leak
		CREW
		• Respond to the steam leak in RWCU per ARP 1C05B E-8
		RO
		• Check the amber lights on the PCIS status board on 1C04 to determine if a half or a full Group 5 Isolation has occurred.
		• Verify completion of the Group 5 Isolation by one of the following means:
		  • Verify that the individual valves from Section 2.0 AUTOMATIC ACTIONS are closed, **OR**
		  • On the PCIS status board, verify that the green ALL VALVES CLOSED lights are on to coincide with the amber ISOLATION SIGNAL lights that are on, allowing time for the valves to close, **OR**
		  • Check the CIMS Printer PRT-1 which will print out Group 5 valves which fail to close on an isolation signal.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Fuel Failure / Release 4 minutes after the reactor is scrammed:	**Simulator Operator:** **VERIFY the following:** **ms04a and rm09rm5945 have inserted and are ramping** **AND** **Booth Communicator:** **Contact the control room as HP personnel and report that there is loud noise and rapidly getting humid and hot in the turbine building north end. You have left the area.**	CREW • Determine that a steam leak exists in the Turbine Building and attempt to close the MSIVs. • If delay closing the MSIVs, a Group 1 Isolation will occur. • Recognize both "A" MSIVs fail to close.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

Fuel Failure / Release
 	
Reactor Building ARM alarm
		CREW
		• Respond to the REACTOR BLDG ARM HI RAD alarm, 1C04B A-6
		• In addition to EOP 3, the crew will determine that the cause for the radiation rise in the Reactor Building rooms is potentially due to a fuel failure and enter AOP 672.2
		RO
		• Perform the following:
		  • At 1C11, monitor ARM Indicator and Trip Units to determine the affected Area within the Reactor Building.
		  • Check Computer Point B571, REACTOR BLDG RAD HIGH.
		  • At 1C02, confirm the Area High Radiation conditions on RR-9150 AREA RADIATION MONITORING recorder.
		• If an actual high radiation condition exists in the affected area enter EOP 3 (Secondary Containment Control).
		CRS
		• Enter EOP 3 on High Radiation
		• Direct the actions of AOP 672.2

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
Fuel Failure / Release EOP 3 When rm02re4448a is at 49.0000:	**Evaluator Note**: EOP 3 and AOP 672.2 (below) should be performed concurrently. **Simulator Operator:** **Verify ET 30 ACTIVATES** This will cause rm02re4448a to ramp to 55; this will cause a MSL Hi-Hi Rad annunciator. Also, this will insert rx01 on a delay.	Crew • Implements the mitigation strategies of EOP 3, Secondary Containment Control RO • Informs the CRS of Reactor Building ARM readings. • Announces evacuation of the Reactor Building CRS • Appropriately place keeps in EOP 3, Secondary Containment Control. • Answers SC-4 "Will RPV pressure reduction decrease leakage into secondary containment?" NO • Places a line above SC-8 WAIT UNTIL the same parameter exceeds its Max Safe Operating Limit in Two or More Areas • After the same parameter exceeds Max Safe Operating Limit in Two or More Areas places a checkmark in SC-9 "Begin reactor shutdown per IPOI 3, 4, or 5 as appropriate since the plant is already shutdown

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

If contacted as HP:	**Booth Communicator:**
	Acknowledge the information.
		Crew
		• Implements the mitigation strategies of AOP 672.2, Offgas Radiation/ Reactor Coolant High Activity
		RO
		• Respond to Off Gas Radiation /Reactor Coolant High Activity Condition
		• Notify Health Physics of increasing activity levels.
		• Bypass the Main Condenser High Backpressure trip on 1C15 and 1C17.
		• Establish MSIV leakage treatment system flowpath.
		CRS
		• Direct Crew Response to Off-Gas Radiation/Reactor Coolant High Activity Condition
		• Establish critical parameter monitoring of in-plant radiation levels and offsite release rates, as priorities allow.
		• Request chemistry department perform a reactor coolant isotopic analysis and Offgas Pretreat analysis.
		• IF a valid Main Steam Line Hi Rad (1C05B, D-2) is received and the reactor is shutdown THEN cooldown and depressurize the reactor using the suppression pool as a heat sink as follows:
		  • Establish reactor pressure control with SRVs prior to closing the MSIVs.
		  • Cooldown the reactor with the main condenser unavailable per IPOI 4.
		  • Notify HP that rad levels in the torus room and areas of the reactor building may significantly rise.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE

After the TB KAMAN exceeds the ALERT EAL level:
 	
If/when directed to stop fans:
 	
IF the crew lowers RPV pressure prior to ED:
	Booth Communicator:
	Wait 3 minutes and report that the 1V-EF-21 "A" and "B" Fans were running and that you secured the"B" Fan. The "A" Fan's hand-switch, HS-5945, broke off.
	
	Simulator Operator:
	VERIFY ET 24 ACTIVATES
	This will close the bypass valves.
		Crew
		• Implements the mitigation strategies of EOP 4, Radioactivity Release Control
		RO
		• Perform actions of EOP 4
		• IF Group 3 isolation exists AND Reactor Building Kaman Monitors have a HI-HI Alarm THEN
		  • Stop main plant exhaust fans.
		  • Stop turbine building supply fans.
		  • Verify at least one turbine building exhaust fan operating in high speed.
		  • Verify Group 3 isolation complete.
		• Reduce Offsite Radioactivity Release Rate with a Primary System Discharging Outside of Containment
		• Attempts to isolate all primary systems discharging radioactivity outside the primary and secondary containments except for those systems required to be operated by EOPs
		• Attempts to close at least one of the "A" steam line MSIV's using the handswitch and the test switch. (May have already been attempted)
		• Emergency Depressurization is required.

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
After the TB KAMAN exceeds the ALERT EAL level:		CRS • Direct crew response for Performance of EOP 4 • Directs isolating all primary systems discharging radioactivity outside the primary and secondary containments except for those systems required to be operated by EOPs. • WAIT UNTIL any primary system is discharging radioactivity into areas outside the primary and secondary containments • Begins reactor shutdown per IPOI 3, 4, or 5 as appropriate (already completed) • BEFORE offsite radioactivity release rate reaches a General Emergency

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
When the TB KAMAN exceeds the SITE EMERGENCY EAL level and is approaching the GENERAL EMERGENCY level, the crew Emergency Depressurizes : As RPV pressure is lowered past 880#:	**Simulator Operator:** **VERIFY ET 24 ACTIVATES** This will close the bypass valves.	Crew • Implements the mitigation strategies of Emergency Depressurization. RO • Install Defeat 11 (if not done previously). • Maintains RPV level 170-211" using directed control system. • Reports torus water level. • Opens 4 ADS SRVs. • Commences to initiate actions to place shutdown cooling in service. CRS • Directs Defeat 11 installation (if not done previously). • Directs RPV level be maintained 170-211" using directed control system. • Verifies torus level greater than 4.5'. • Directs opening 4 ADS SRVs. • Continues RPV depressurization using SRVs. • WAIT UNTIL shutdown cooling interlock clears and further cooldown is required. • Directs continuing to cold shutdown conditions with shutdown cooling using only RHR pumps NOT required to maintain RPV level above 170".

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
When RPV pressure is lowering to establish depressurized conditions, RPV water level is being controlled, and at the direction of the floor instructor:	**Simulator Operator** **Place the simulator in FREEZE.** **Floor Instructor** **Perform a crew update and announce to the crew the simulator is in freeze and the scenario is complete.**	

***** END OF SCENARIO *****

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. Operational Basis Earthquake
2. RPV Pressure Switch Failure, PS4549 fails high
3. Single rod scrams in
4. RCIC Steam Leak

After EOP Entry:

1. RWCU leak (isolable)
2. Fuel Failure
3. Steam Tunnel Steam Leak
4. Turbine Bypass Valve Failure

Abnormal Events:

1. AOP 901
2. AOP 255.1
3. AOP 255.2

Major Transients:

1. Earthquake
2. Offsite Release
3. ED

Critical Tasks:

1. #28: IF a primary System is discharging into Secondary Containment and any parameter is above the Max Normal Operating Limit, THEN crew actions are taken to isolate all systems discharging into the area except those required by EOPs or to suppress a fire. {BWROG N/A}
2. #29: IF the reactor is at power AND a primary system is discharging into secondary containment, THEN insert a manual scram before any parameter reaches the Max. Safe Operating Limit. {BWROG SC 1.1}
3. #32: IF a primary system is discharging outside secondary containment, THEN perform Emergency RPV Depressurization before offsite release rates reach General Emergency levels. {BWROG RP 1.1}

CREW GRADING ATTACHMENT

ESG 3 Rev. 0 Date _____

Operator Name	Position	Evaluator
	OSM	
	CRS	
	STA	
	1C05	
	1C03	
	B.O.P.	

Management Representative/Lead Evaluator _____/_____

Crew Critical Tasks

Task Statement	SAT	UNSAT
1. IF a primary System is discharging into Secondary Containment and any parameter is above the Max Normal Operating Limit, THEN crew actions are taken to isolate all systems discharging into the area except those required by EOPs or to suppress a fire.		
2. IF the reactor is at power AND a primary system is discharging into secondary containment, THEN insert a manual scram before any parameter reaches the Max. Safe Operating Limit.		
3. IF a primary system is discharging outside secondary containment, THEN perform Emergency RPV Depressurization before offsite release rates reach General Emergency levels.		

NEXTera ENERGY NUCLEAR FLEET	SIMULATOR EXERCISE GUIDE	SEG

SITE: DAEC **Revision #:** 0

LMS ID: ESG Alt **LMS Rev. Date:** N/A

SEG TITLE: NRC INITIAL LICENSE EXAM, SCENARIO #ALT

SEG TYPE: ☐ Training ☒ Evaluation

PROGRAM: ☐ LOCT ☒ LOIT ☐ Other:

DURATION: ~90 minutes

Developed by: _____ _____
Instructor/Developer Date

Reviewed by: _____ _____
Instructor (Instructional Review) Date

Validated by: _____ _____
SME (Technical Review) Date

Approved by: _____ _____
Training Supervision Date

Approved by: _____ _____
Training Program Owner (Line) Date

SIMULATOR EXERCISE GUIDE REQUIREMENTS

Terminal Objective

This Evaluation Scenario Guide evaluates the Operators' ability to: "Given the malfunctions presented in this ESG, the students will protect the public, protect plant personnel, and protect plant equipment, in accordance with plant procedures."

Enabling Objectives:

Evaluation Guide, no tasks are trained.

Prerequisites:

Enrolled in Licensed Operator Continuing Training, License Operator Initial Training, Senior Reactor Operator- Certification Training

Training Resources:

A. Simulator
B. Evaluation team
C. Operations Management Representative
D. Simulator Driver
E. Phone Talker
F. Exam Proctor for custody of the crew between scenarios
G. Simulator Video recording equipment

References:

A. OI 693.2, Rev. 51
B. AOP 646 Rev. 23
C. AOP 255.2 Rev. 43
D. AOP 264 Rev. 14
E. AOP 573 Rev. 6
F. EOP 2 Rev. 18
G. EOP 1 Rev. 20
H. ATWS Rev. 23
I. ED Rev. 11
J. ATWS Rev. 23
K. IPOI 4 Rev. 133
L. IPOI 3 Rev. 152
M. ARP 1C04B Rev. 81
N. ARP 1C04A Rev. 62
O. ARP 1C05A Rev. 82
P. OP-AA-102-1003 Rev. 11
Q. OI 644 QRC 2, Rev. 0
R. OI 149 QRC 4, Rev. 0
S. OI 153 QRC 1, Rev. 4

Protected Content: None

Evaluation Method: Dynamic Scenario graded in accordance with NUREG 1021 guidance.

Operating Experience:

None

Risk Significant Operator Actions:

TASKS ASSOCIATED WITH SIMULATOR EXERCISE GUIDE	
Task #	**Task Title**
	Reactor Operator
1.04	Respond to Annunciators
10.03	Alternate CRD Pumps
72.02	Insert Control Rods using Single Notch
93.22	Perform the Immediate Operator Responses to a Reactor Scram
94.03	Respond to Power/Reactivity Abnormal Change Condition.
94.19	Respond to Loss of Feedwater Heating Condition.
94.53	Respond to Primary Containment Control Abnormal Situation
94.58	Respond to Loss of Reactor Recirculation Pump(s)
95.00	Respond to Emergency Situations
95.21	Perform EOP Defeat 11.
95.25	Perform Defeat 15
95.44	Perform actions of RC/L of EOP 1
95.45	Perform initial EOP 1 actions (RC)
95.46	Perform actions of RC/P of EOP 1
95.50	Perform /L to Control RPV Level during an ATWS.
95.52	Control RPV Injections prior to, during, and subsequent to ED during ATWS.
95.55	Perform initial ATWS actions (/).
95.56	Perform /P to Control RPV Pressure During an ATWS.
95.57	Perform /Q to Reduce Reactor Power or Scram the Reactor.
95.63	Perform DW/T leg of EOP 2
95.64	Perform PC/P leg of EOP 2
	Senior Reactor Operator
1.02	Determine operability for TS required components
4.21	Direct Crew Actions to Perform the Immediate Operator Responses to a Reactor Scram
5.03	Direct Crew Responses to Power/Reactivity Abnormal Change Condition
5.19	Direct Crew Response to Loss of Feedwater Heating Condition
5.53	Direct Crew response to a Primary Containment Control Abnormal Situation
5.58	Direct Crew response to Loss of Reactor Recirculation Pump(s)
6.21	Direct Crew Response to Perform EOP Defeat 11
6.25	Direct Crew Response for performance of Defeat 15
6.44	Direct Crew Response for performance of the RC/L leg of EOP 1
6.45	Direct Crew Response for performance of initial EOP 1 actions (RC)
6.46	Direct Crew Response for performance of RC/P leg of EOP 1
6.50	Direct Crew Response to Perform /L to Control Level During an ATWS
6.52	Direct Crew Response to Control RPV Injection prior to, during and subsequent to Emergency Depressurization during ATWS
6.55	Direct Crew Response to Perform Initial ATWS Actions (/)
6.56	Direct Crew Response to perform /Q to reduce power/scram the reactor during ATWS
6.57	Direct Crew Response to perform /P to control RPV pressure during an ATWS
6.63	Direct Crew Response for performance of the DW/T leg of EOP 2
6.64	Direct Crew Response for performance of the PC/P leg of EOP 2

UPDATE LOG: Indicate in the following table any minor changes or major revisions (as defined in TR-AA-230-1003) made to the material after initial approval. Or use separate Update Log form TR-AA-230-1003-F16.

#	DESCRIPTION OF CHANGE	REASON FOR CHANGE	AR/TWR#	PREPARER REVIEWER	DATE DATE
Rev. 0	Initial development for 2017 NRC LOIT Examination	Initial development for 2017 NRC LOIT Examination	N/A	See Cover See Cover	

OVERVIEW / SEQUENCE OF EVENTS

ALL TIMES IN THIS SCENARIO ARE APPROXIMATE

Event #	Description
When the crew assumes the shift reactor power is approximately 100%. The 'B' RHR Pump is inoperable due to breaker refurbishment; return time is approximately three days. After crew turnover, maintenance has requested immediately swapping running EHC pumps.	
1.	The crew will swap running EHC pumps IAW OI 693.2 Section 6.2
2.	Once the EHC pump swap is completed, the 'B' Recirc Pump will experience a 20% runback, the scoop tube will not be able to be locked until after the 'B' Recirc Pump speed is less than 75%, and the crew will enter **LCO 3.4.1 Condition C**. The 'B' Recirc Pump will experience erratic parameters and will trip. The crew will lower power IAW IPOI 3.
3.	Then the 'A' CRD pump will trip on overcurrent and three CRD accumulators alarm on low pressure. Permission is given to start standby pump IAW OI 255. After the 'B' CRD Pump is returned to service the CRD Accumulators remain in alarm on low pressure. The crew will enter **LCO 3.1.5 Condition B**.
4.	A small leak in the drywell and rising drywell pressure. As temperature rises in the Drywell, the crew will insert a manual scram prior to Drywell temperature reaching 280F (**CRITICAL**).
5.	As Primary Containment pressures and temperatures rise the 'A' side enable containment switch will not function and MO-2000 will not open causing Drywell temperature to rise past 280F. MO-2000 will be able to be opened through manual operations if an individual is sent to open the valve.
6.	The crew will determine that there is a hydraulic ATWS and transition to EOP ATWS. The crew will lockout ADS **(CRITICAL),** perform the ATWS QRC, inject SBLC, Terminate and Prevent injection **(CRITICAL)** and establish a level band until all rods are inserted **(CRITICAL),** and insert the control rods with the RIPS. **(CRITICAL)** Rods will be able to be inserted via Scram-Reset-Scram.
7.	The scenario may be terminated after all rods are in and RPV level is being restored

SIMULATOR SET UP INSTRUCTIONS

1. Set NRC Exam Security for the Simulator per QF-1071-08 ____
2. Perform simulator set up per TDAP 1839 Attachment 2, Simulator Setup Checklist. ____
3. Load the saved IC (in folder with this ESG) to a SNAPSHOT _____
   a. Reset to that SNAPSHOT. ____
   b. Place the Simulator in **RUN** ____

   OR
4. Reset to IC 20, place the simulator in **RUN** and perform the following:
   a. Insert event triggers, malfunctions, overrides and remotes per the tables below.
5. Have a second instructor verify that the auto triggers are setup as indicated below and evaluate to "FALSE" ____
6. Verify Malfunctions ____
7. Verify Remotes (Note that environmental remotes will already be timing) ____
8. Verify Overrides ____
9. Ensure MOL pull sheet is in the 1C05B hanging file. ____
10. Ensure EOOS has the same system status lineup as the start of the simulator scenario.
11. Setup control panel including equipment clearance tags, information tags, caution tags or other site-specific devices used as an aid to the operator.
    a. Place a Testing and Maintenance border on 1C03B (A-8) "B" RHR Pump 1P-229B Trip or Motor Overload
    b. Hang caution tags on the following:
       (1) HS-1915, B RHR PUMP 1P-228B
    c. Hang Guarded System tags on the following:
       (1) "B" ESW
       (2) "B" RHRSW
       (3) "B" DG
       (4) 1A4
       (5) 1B4
       (6) 1B44
11. Provide appropriate shift turnover documentation.
    a. Have STP 3.4.2-01 Jet Pump Operability Test available upon request.
12. RUN Schedule File "ESG_alt.sch" and LEAVE IT RUNNING.

EVENT TRIGGER DEFINITIONS:

Trigger No.	Trigger Logic Statement	Trigger Word Description
1,3,5,7,9,13,15, 21,23	Manually Activated	Manually Activated
11	ZDIRDHS1807B(4) == 1	Deletes RD073819
17	rrl <= 523	RPV water level less than or equal to 170"
19	zaorrr6211b <= 0.75	'B' Recirc Pump speed less than 75%

MALFUNCTIONS:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	RR06B	RECIRC M-G DRIVE MOTOR BREAKER TRIP – M-G B	3	2:00		INACTIVE	ACTIVE
Setup	RD070615	Control Rod Accumulator Trouble - Rod 06-15	5		1 min	Inactive	Active
Setup	RD073435	Control Rod Accumulator Trouble - Rod 34-35	5		1 min 10 sec	Inactive	Active
Setup	RD11A	CRD Hydraulic Pump Trip – Pump A	5			Inactive	Active
Setup	RD073819	Control Rod Accumulator Trouble - Rod 38-19	5		1 min 30 sec	Inactive	Active
Setup	rr15b	RECIRC LOOP RUPT – DESIGN BASES LOCA AT 100% - LOOP B	13		15 min.	0	1.5
Setup	AN1C03B(8)	1C03B (A-08) 'B' RHR Pump 1P-229B Trip Or Motor Overload				ON	ON
Setup	rr05b	RECIRC PUMP SHAFT SEIZURE- PMP B	3		5:00	0	100
Setup	ms32	SPURIOUS GROUP 7 ISOLATION	17			Inactive	Active
Setup	rp05g	HYDRAULIC LOCK SCRAM DISCHARGE VOLUME (VARIABLE)				75	75
Setup	rr36b	Spurious 20% Recirc Runback B Train	1			INACTIVE	ACTIVE
Setup	rr06	'B' RECIRC SCOOP TUBE LOCK UP (LOCK,UNLOCK)				UNLOCK	UNLOCK

OVERRIDES:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	DI-RH-014	HS-1903C CONT SPRAY VLV CTRL				OFF	OFF
Setup	DI-RH-076	HS-2000 CONTAINMENT SPRAY MOV-2000				AUTO	CLOSE
Setup	DO-RH-063	HS-1915(2) RHR PUMP 1P-229B LITES - (WHITE)				On	Off
Setup	DO-RH-064	HS-1915(3) RHR PUMP 1P-229B LITES - (RED)				On	Off
Setup	DO-RH-065	HS-1915(4) RHR PUMP 1P-229B LITES - (AMBER)				On	Off
Setup	DO-RH-062	HS-1915(1) RHR PUMP 1P-229B LITES - (GREEN)				On	Off
Setup	DI-PC-038	HS-4321B GRP 7 CHAN B DW CLG AND FAN OVR				Normal	Normal
Setup	DO-RH-132	HS-2000(1) CONTAINMENT SPRAY MOV-2000 (GREEN)	21	1:00		ON	OFF
Setup	DO-RH-133	HS-2000(2) CONTAINMENT SPRAY MOV-2000 (RED)	21	1:00		ON	OFF

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	DI-RH-076 (NEW)	HS-2000 CONTAINMENT SPRAY MOV-2000	27			CLOSE	OPEN

REMOTES:

Time	Malf. No.	Malfunction Title	ET	Delay	Ramp	Initial Value	Final Value
Setup	RD04	CRD PUMP 1P-209B DISCHARGE VALVE V-17-10 ISOLATION	7		1 MIN	100	50
Setup	RD04 (NEW)	CRD PUMP 1P-209B DISCHARGE VALVE V-17-10 ISOLATION	15		1 MIN	50	100
Setup	RH10	MAN OPER OF 'B' RHR PUMP (1P229B BREAKER)				Norm	Open
Setup	rp02	ATWS TEST SWITCH (AKA DEFEAT 12) HS-1863A	23	2:30		RUN	TEST
Setup	rp03	ATWS TEST SWITCH (AKA DEFEAT 12) HS-1864A (RUN,TEST)	23	2:00		RUN	TEST

SCHEDULE FILES:

ESG_alt			
@Time	Event	Action	Description
Setup	9	Modify rd04 to 100 in 60 after 60	CRD PUMP 1P-209B DISCHARGE VALVE V-17-10 ISOLATION
Setup	11	Delete malfunction rd073819 after 5	CONTROL ROD ACCUMULATOR TROUBLE- ROD 38-19
Setup	19	Delete malfunction rr06	'B' RECIRC SCOOPE TUBE LOCK UP (LOCK,UNLOCK)

Conduct simulator crew pre-scenario brief using TR-AA-230-1007-F06, Simulator Instructor Pre-Exercise Checklist.

If surrogate operators are to be used, brief them using TR-AA-230-1007-F11, Surrogate Brief Checklist

SHIFT TURNOVER INFORMATION

- Today, Dayshift
- Warm, summer day, temperatures in the high 70's. No inclement weather expected.
- Plant power - ~100% Rx Pwr with corresponding MWe, MWth and core flow.
- Protected train – "A"
- Procedures or major maintenance in progress:
  - "B" RHR Pump is inoperable because of a fault in the motor winding. Maintenance expects repairs to be completed in 3 days.
- Technical Specification Action statements in effect
  - TS 3.5.1 Condition A, Day 1 of 30 day LCO, due to "B" RHR Pump inoperative
  - TS 3.6.2.3, Condition A, Residual Heat Removal (RHR) Suppression Pool Cooling, Day 1 of 30 day LCO, due to "B" RHR Pump inoperative
- Plant PRA/PSA Status including CDF/LERF & color
  - **CDF : GREEN 1.35 E-6, 1 YR TO YELLOW LCDP**
  - **LERF: GREEN 3.32E-7, 1YR TO YELLOW ILERP**
- Evolutions in progress or planned for upcoming shift
  - Maintenance has requested swapping running EHC pumps to allow for checks on the running pump.
- Comments, problems, operator workarounds, etc.
  - One extra NSPEO available in Work Control
  - Radwaste Operator is NSPEO qualified

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
After the crew has taken the shift: When contacted as organization personnel:	**Booth Communicator** **Acknowledge Request**	Crew • Switch running EHC pumps RO • At 1C07, start standby EHC pump 1P-97B by momentarily placing handswitch HS-3665B in the START position. • Verify annunciator EHC PUMPS 1P97A/B BOTH RUNNING (1C07A, C-4) is activated • Verify both EHC pump 1P-97A/B amps have stabilized • Stop EHC Pump 1P-97A by momentarily placing handswitch HS-3665A in the STOP position • Verify annunciators EHC PUMPS 1P-97A/B BOTH RUNNING and ECH PUMP 1P-97A/B HS NOT IN AUTO are reset CRS • Direct switching running EHC pumps

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
Recirc Runback After EHC pumps are swapped and at the direction of the floor instructor: When contacted as organization personnel: When contacted as plant personnel to investigate 'B' Recirc Pump:	**Simulator Operator** **Insert ET 1** This will cause 'B' Recirc Pump 20% runback and failure of 'B' Recirc Pump Scoop Tube lock until speed is lower than 75%. **Booth Communicator** **Acknowledge Request** **Booth Communicator** **Wait 2 minutes and inform Control Room that there is nothing abnormal about the 'B' Recirc Pump, but will continue to investigate.**	Crew • Respond to a 'B' Recirc Pump 20% Runback RO • Attempt to lock 'B' Recirc Pump Scoop Tube. (Will lock once pump speed is lower than 75%) • Stabilize Reactor water level. • When power is stabilized, plot location on the Stability Power / Flow Map • Determine Recirc Pump Speed mismatch is outside of acceptable limits CRS • Comply with Tech Specs and OI 264, Appendix 1 • Enter LCO 3.4.1 Condition C

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS

TIME/NOTES	INSTRUCTOR ACTIVITY	EXPECTED STUDENT RESPONSE
AOP 264 After power has been reduced below MELLLA and at the floor instructors direction: When sent to either 1C149 or 1C113B: Two minutes after sent to 1C113B: Two minutes after sent to 1C149:	**Simulator Operator** **Insert ET 3** This will insert "B" Recirc Pump shaft seizure and, after a 2:00 delay, trip the drive motor breaker for the 'B' Recirc pump. **Booth Communicator** **Acknowledge Request** **Booth Communicator** **Inform Control Room that the 'B' Recirc MG Drive Motor breaker is tripped with indication of a ground fault Relay B31-K3B active. No smoke, smell, or fire.** **Booth Communicator** **Inform Control Room that 1V-SF-12 handswitch is in AUTO**	Crew • Respond to 'B' Recirc Pump trip RO • Verify the AUTOMATIC ACTIONS have occurred: o B RECIRC MG SET MOTOR BREAKER 1A204 is OPEN. o B GENERATOR FIELD BREAKER is OPEN. • Send an Operator to 1C113B in the MG Set Room to monitor relays. • Momentarily place B RECIRC MG SET MOTOR BREAKER 1A204 handswitch in the STOP position to achieve GREEN FLAG status. • Stabilize reactor water level between 186" and 195". • Verify open B RECIRC PUMP DISCH BYP valve MO4630. • Close B RECIRC PUMP DISCHARGE valve MO-4628. • Re-perform appropriate steps in AOP 255.2 concurrently. • After 5 minutes, reopen B RECIRC PUMP DISCHARGE valve MO-4628. • Insert control rods per the Control Rod Withdrawal Sequence Sheets to maintain power less than or equal to (≤) 60.0%. • Reduce core flow to less than or equal to (≤) 53% if necessary. • Send operator to 1C149 and verify that Recirculation Pump MG Set Room Supply fan 1V-SF-12 has its respective handswitch HS-6534A in AUTO or START.

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
AOP 264 Cont.: When contacted as support personnel:	**Booth Communicator** **Acknowledge Request**	CRS • Directs entering AOP 264 and reentering AOP 255.2. • Directs and supervises reactivity manipulation to lower power below 60%. • Comply with the Technical Specification requirements for Recirculation Loops Operating (3.4.1 Condition C)

SIMULATOR EXERCISE GUIDE SCENARIO INSTRUCTIONS		
TIME/NOTES	**INSTRUCTOR ACTIVITY**	**EXPECTED STUDENT RESPONSE**
CRD pump trip/accumulator TS After Load Line is below 100%, power has been reduced ~5%, the TS has been entered and at the direction of the floor instructor: When contacted to investigate CRD pump and breaker: Two minutes after request for CRD pump and breaker status: When contacted to investigate the accumulators: Two minutes after request for accumulator pressures:	**Simulator Operator** **Insert ET 5** This will cause the 'A' CRD pump to trip and accumulator lights to illuminate after a time delay **Booth Communicator** **Acknowledge Request** **Booth Communicator** **Inform Control Room that CRD pump is warm to the touch/ CRD breaker has tripped on time delay overcurrent** **Booth Communicator** **Acknowledge Request** **Booth Communicator** **Inform the control room 06-15, 34-35, 38-19 accumulator pressures:** **06-15 – 915 psig, 34-35 – 890 psig, 38-19 – 935 psig**	Crew • Respond to 'A' CRD pump trip and corresponding accumulator lights RO • Send operator to check 1P-209A breaker and to the pump for fault indications. • Start CRD Pump 1P-209B per OI 255 or OI 255 QRC1. o Verify adequate oil level in CRD Pump 1P-209B motor and speed changer. o Close 1P-209B Pump Discharge Isolation V-17-10 to approximately 1/2 turn open. o Adjust CRD SYSTEM FLOW CONTROL FC-1814 to 0 gpm in MANUAL. o Verify MO-1833, INLET TO CRD RETURN LINE, is fully open. o Start CRD PUMP 1P-209B o Slowly open Discharge Isolation V-17-10 to pressurize downstream piping and to prevent CRD pump from tripping on low suction pressure. o Vent both CRD Discharge Filters 1F-201A and B, using the following Vent Valves: o 1F-201A ▪ V-17-15 CRD Pump Disch Filter 1F-201A Vent ▪ V-17-17 1F-201A Combined Vent/ Drain Line Isolation

CRD pump trip/accumulator TS Cont.: When contacted to close V-17-10 ½ turn closed: When contacted to open V-17-10: When contacted to investigate the accumulators after CRD pump is started: One minute after request for accumulator pressures: If contacted as RE to verify slow rods:	**Booth Communicator** **Acknowledge Request** **Simulator Operator** **Wait 1 min and INSERT ET 7** This will insert RD04 to ½ open V-17-10 **Booth Communicator** **Acknowledge Request** **Simulator Operator** **Wait 1 min and INSERT ET 9** This will delete RD04 to fully open V-17-10 **Booth Communicator** **Acknowledge Request** **Booth Communicator** **Inform the control room 06-15, 34-35, 38-19 accumulator pressures:** **06-15 – 925 psig, 34-35 – 900 psig, 38-19 – 1100 psig** **Booth Communicator** **Inform control room that there are currently no slow rods.**	Crew • Respond to 'A' CRD pump trip and corresponding accumulator lights RO • Start CRD Pump 1P-209B per OI 255 or OI 255 QRC1. (Cont.) ○ 1F-201B ▪ V-17-18 CRD Pump Disch Filter 1F-201B Vent ▪ V-17-20 1F-201B Combined Vent/ Drain Line Isolation ○ Verify charging header pressurized > 1200 psig on PI-1816A CHARGING WATER PRESSURE. ○ Slowly adjust CRD SYSTEM FLOW CONTROL FC-1814 to obtain approximately 40 gpm on FI-1814 CRD SYSTEM FLOW. ○ When FC-1814 is properly controlling flow, then shift to AUTO. ○ Slowly adjust DRIVE WATER □P CONTROL MO-1830 to obtain approximately 260 psid on PDI-1825A DRIVE WATER ΔP. CRS • Directs starting the 'B' CRD Pump • Comply with the Technical Specification requirements for Control Rod Scram Accumulators (3.1.5 Condition B)

Coolant Rupture After 'B' CRD is running and the TS has been entered and at the direction of the floor instructor:	**Simulator Operator** **INSERT ET 13** This inserts a leak from the 'B' Recirc Loop.	

EOP 2 After Drywell Pressure exceeds 2 psig: If contacted as plant personnel to deenergize MO-2000: One minute after ET 21 is activated: If contacted to open locally open MO-2000: Four minutes after contacted to locally open MO-2000:	**Booth Communicator** **Acknowledge Request** **Simulator Operator** **ACTIVATE ET 21** This will turn off the lights on 1C03 for MO-2000 after a one minute delay. **Booth Communicator** **Contact the Control Room and inform them that the breaker for MO-2000 is open.** **Booth Communicator** **Acknowledge Request** **Simulator Operator** **ACTIVATE ET 27** **Booth Communicator** **Contact the Control Room and inform them that MO-2000 is open.**	Crew • Implements the mitigation strategies of EOP 2, Primary Containment Control RO • Informs the CRS of containment parameters including parameter name, value and trend. • Installs Defeat 4. • Utilizes OI 149 QRC to spray the torus using 'A' side Torus Sprays. • Realizes that MO-2000 INBD DRYWELL SPRAY valve will not open and HS-1903C ENABLE CONTAINMENT SPRAY VALVES will not function. • Inserts a manual reactor scram **(CRITICAL)** CRS • Enters into EOP 2 due to Drywell Pressure. • Obtains containment parameters. • Directs installation of Defeat 4. • Directs spraying the torus after confirmation that torus pressure is greater than 2 psig. • Directs spraying the drywell before drywell temperature reaches 280F. • Directs inserting a manual reactor scram • Placekeeps in EOP 2 to the applicable WAIT UNTIL steps in the PC/P (PC/P-7) leg

EOP 1 Transition to ATWS		Crew • Implements the mitigation strategies of EOP 1, RPV Control. RO • Recognizes a hydraulic ATWS has occurred and reports the type of ATWS and reactor power. • Places the master feedwater level controller to 158.5" in AUTO. CRS • Enters EOP 1, RPV Control based on reactor power is above 5% or unknown after a scram signal is received. • Recommends refer to EPIP 1.1 for EAL assessment. • Determines that a reactor scram has been initiated • Validates isolations, initiations and SBDG initiations that should have occurred but did not. • Recognizes and implements the CRS "IF any rod is withdrawn past position AND it has NOT been determined that the reactor will remain shutdown under all conditions without boron THEN exit this procedure and enter ATWS".

ATWS Cont.:
 	
When directed to install Defeat 12:
	Simulator Operator
	
	ACTIVATE ET 23
	
	This will place Remote Functions RP02 in TEST after a time delay; to install Defeat 12.
	
	When RP02 is inserted, call the control room and inform them that Defeat 12 is complete.
		Crew
		• Implements the actions of ATWS.
		RO
		• Locks out ADS. **(CRITICAL)**
		• Completes the ATWS QRC. Reports completion and includes SBLC availability, ARI success, reactor power and RPV level.
		• Installs Defeat 11.
		• Injects SBLC. Reports completion and includes reactor power and RPV level.
		• Coordinates performance of the Hydraulic ATWS RIPs. **(CRITICAL)**
		• Installs Defeat 4
		• Verifies or trip/lockout HPCI.
		• Terminates injection:
		  • Condensate and Feed:
		  • Close Feedwater Regulating Valves CV-1579, CV-1621, CV-1622 as follows:
		  • Take MANUAL control of Master Fed Reg Valve Auto/Man Control LC-4577 and dial the controller down until all Feedwater Regulating Valves indicate closed as indicated on:
		  • HC-1579, A Feed Reg Valve Manual/Auto Transfer
		  • HC-1621, B Feed Reg Valve Manual/Auto Transfer
		  • HC-1622, Startup Feed Reg Valve Manual/Auto Transfer
		  • RHR:
		  • Place MO-2004 and/or MO-1904 LPCI OPEN INTLK OVERRIDE HS-2004C and/or HS-1904C to OVERRIDE
		  • When 1C03B (B-5) RHR RX LO PRESSURE PERMISSIVE AT 450 PSIG is activated, close MO-2004[MO-1904] by taking HS-2004[HS-1904] to CLOSE

ATWS Cont.:		CRS • Directs locking out ADS. • Directs the ATWS QRC be completed. • Directs Defeat 11 installation. • Directs injection of SBLC. • Directs performance of Hydraulic RIPS including installation of Defeat 12. • Directs power level control mitigation strategies. • Directs inserting Defeat 4. • Directs Terminate/prevent injection from HPCI, Condensate/Feedwater, Core Spray and RHR. **(CRITICAL)**
ATWS		Crew • Implements the actions of ATWS. RO • Reports reactor power at 87" and lowering. • Reports RPV level when reactor power is less than 5% or when 15" is reached. • Secures RCIC when RPV level is under control. • 1C05 operator assumes the front panel RIPs after RPV level is under control. CRS • Directs reporting reactor power at 87" and lowering. • Directs RPV level continue to be lowered until reactor power is less than 5% or RPV level reaches 15". • Directs RPV level control band of -25" to either 15" or the RPV level when reactor power was 5% with condensate and feedwater. **(CRITICAL)**

ATWS Transition to EOP 1 After all rods have inserted:	**Floor Instructor** **Monitor and ensure that crew monitors pressure during re-flood of the RPV. Crew should limit injection to ensure cooldown limits are not violated.**	Crew • When all rods are in, transition from ATWS to EOP 1 RO • Reports that all rods in after performing Scram-Reset-Scram. • Secures SBLC • Controls level 170"-211" using Condensate and Feedwater CRS • Confers with the SM on the transition to ATWS. • Directs securing SBLC injection • Directs RPV level 170"-211" using Condensate and Feedwater.
When RPV level is being restored, the crew is progressing to SDC, and at the direction of the Floor Instructor:	**Simulator Operator** **Place the simulator in FREEZE.** **Floor Instructor** **Announce the scenario is complete; please stand by your stations and do not discuss the scenario with your crew.**	

QUANTITATIVE ATTRIBUTES

Malfunctions:

Before EOP Entry:

1. 'B' Recirc Pump 20% runback
2. Recirculation pump trip
3. CRD pump trip
4. Accumulator fails to recharge

After EOP Entry:

1. 'A' side containment enable switch fails to operate
2. 'B' side Inboard Drywell Spray valve (MO-2000) fails to open

Abnormal Events:

1. AOP 255.2
2. AOP 264

Major Transients:

1. LOCA
2. ATWS

Critical Tasks:

#21 IF the reactor is operating at power and Drywell temperature is rising, THEN insert a manual scram before drywell temperature reaches 280°F. {BWROG PC 4.1}

#4: IF a scram is required and Reactor power is above 5%, THEN reduce power below 5% using one or more of the following methods: {BWROG RPV 4.1, 5.1, 6.1}

Inserting control rods using RIPs Injection of Boron

#6: IF a reactor scram is required and the reactor is not shutdown under all conditions, THEN lockout ADS before automatic actuation. {BWROG RPV 4.2, 5.2, 6.2}

#10: IF a reactor scram is required, and reactor power is >5%, and Power/level control is required, THEN terminate and prevent injection until conditions allow reinjection. {BWROG RPV 6.3}

#11 IF performing ATWS Power/level control and Conditions are met to allow reinjection, THEN crew actions are taken to maintain RPV level above -25" by injecting using Table 1B systems. {BWROG RPV 6.4}

CREW GRADING ATTACHMENT

ESG __ALT_____ Rev. __0__ Date _____

Operator Name	Position	Evaluator
	OSM	
	CRS	
	STA	
	1C05	
	1C03	
	B.O.P.	

Management Representative/Lead Evaluator _____/_____

Crew Critical Tasks

Task Statement	SAT	UNSAT
1. IF the reactor is operating at power and Drywell temperature is rising, THEN insert a manual scram before drywell temperature reaches 280°F.		
2. IF a scram is required and Reactor power is above 5%, THEN reduce power below 5% using one or more of the following methods: Injection of Boron Inserting control rods using RIPs		
3. IF a reactor scram is required and the reactor is not shutdown under all conditions, THEN lockout ADS before automatic actuation.		
4. IF a reactor scram is required, and reactor power is >5%, and Power/level control is required, THEN terminate and prevent injection until conditions allow reinjection.		
5. IF performing ATWS Power/level control and Conditions are met to allow reinjection, THEN crew actions are taken to maintain RPV level above -25" by injecting using Table 1B systems.		

Usage Level:

CONTINUOUS

Record the following: Date / Time: _____ / _____ Initials: _____

NOTE: *User shall perform and document a Temp Issue / Rev. Check to ensure revision is current, in accordance with procedure use and adherence requirements.*

Prepared By: _____ / _____ Date: _____
Print Signature

CROSS-DISCIPLINE REVIEW (AS REQUIRED)

Reviewed By: _____ / _____ Date: _____
Print Signature

Reviewed By: _____ / _____ Date: _____
Print Signature

PROCEDURE APPROVAL

Approved By _____ / _____ Date: _____
Print Signature

1.0 PURPOSE

1.1 The purpose of this STP is to log Recirc Pump speeds daily to ensure Recirc Pumps are not operating at a significant speed mismatch and to verify Jet Pump operability. Verification of Jet Pump operability shall be made daily, following startup of a Recirculation Pump, and after any unexplained changes in core flow, Jet Pump Loop flow, Recirc Loop flow, or core plate differential pressure.

1.2 When this procedure is performed in its entirety it FULLY SATISFIES Recirculation Loop Operations Recirc Pump speed mismatch surveillance requirements.

1.3 When this procedure is performed in its entirety it FULLY SATISFIES Jet Pumps surveillance requirements.

2.0 BRIEFING INFORMATION

2.1 PERFORMANCE INFORMATION

2.1.1 This STP is organized as follows:

STP Sections	Evolution
7.1	Recirc Pump Speed Mismatch Check
7.2	Jet Pumps 9-16 Operability Check
7.3	Jet Pumps 1-8 Operability Check
7.4	Jet Pump Trending Data

All steps within a section are to be performed in sequence and the STP steps carried through to completion, unless otherwise indicated. The sections may be performed concurrently for ease of recording data.

Sections 7.2 and 7.3 are not required to be performed when reactor power is less than or equal to (≤) 21.7% RTP. If this procedure is being performed when reactor power is less than or equal to (≤) 21.7% RTP, Prerequisite 6.2 and Sections 7.2 and 7.3 are to be marked "N/A".

2.1.2 Personnel recommended to perform this procedure:

1 Operations

2.1.3 Special Test Equipment required:

None

2.1.4 If Recirculation Pump speed is less than 60% of rated, an Engineering evaluation may be performed to determine Jet Pump OPERABILITY.

2.1.5 Collect Jet Pump DP values using the "2 MIN AVE" screen on FR-4501 and FR-4502 in Sections 7.2, 7.3, and 7.4. Any display screen can be used at other times.

2.2 GENERAL CAUTIONS

2.2.1 None

2.3 SPECIAL PRECAUTIONS

2.3.1 None

3.0 REFERENCES

3.1 None

4.0 GENERAL INSTRUCTIONS

4.1 Steps marked with a "TS" immediately to the right of the step sign-off line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.

4.2 The CRS shall be immediately notified and the appropriate Limiting Condition for Operations section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.

4.3 An Action Request (AR) should be completed for any problems encountered with "TS" marked steps during the performance of this test.

5.0 APPENDICES

5.1 Appendix A – JETS Program Instructions

1. If at a workstation desktop with access to PPC, log in to PPC as follows:
   a. Click the Windows icon in the lower left corner of the screen.
   b. Click Computer: OSDisk (C:): Program Files (x86): Reflection: User: PPC.
   c. At Username Prompt, type SSE <Enter>.
   d. At Password Prompt, enter the appropriate password and press <Enter>. Note that the program will not display any characters, nor will the cursor move, while entering the password.
   e. At the $ prompt, type JETS and press <Enter>.
   The Jet Pump Program main menu should come up on the screen.
2. If at a VAX/PPC terminal, log onto SSE as follows:
   a. Log onto the SSE account.
   b. At the PPC1_SSE prompt, type JETS and press <Enter>. The Jet Pump program main menu should come up on the screen.
3. Type 1 to access combined Loop A and Loop B Jet Pump tables. Type 2 to access only the Loop A Jet Pump table (Jet Pumps 9-16). Type 3 to access only the Loop B Jet Pump table (Jet Pumps 1-8).

NOTE

All ΔPs must be a positive value between 0 and 30, but not including 0 ($0<\Delta P\leq 30$). The program will automatically tab forward as each Jet Pump's ΔP is entered. The <Tab> key may be used to move forward to the next Jet Pump, if desired. The <Control> and <H> keys pressed simultaneously may be used to move backward to the previous Jet Pump, if desired. If desired to change a ΔP, use the <Backspace> key to erase all numerals to the left of the decimal point before entering the new numbers.

4. Type in each Jet Pump's ΔP.

NOTE

If all fields are not filled with a positive number between 0 and 30, but not including 0 ($0<\Delta P\leq 30$) when Step 5.0 is performed, the program will not calculate the % deviations and will return to the Jet Pump main menu.

5. Press the <Enter> key to calculate the % deviations. The printout will automatically print on laser printer LTA14 and the program will automatically terminate.

6.0 PREREQUISITES

6.1 The reactor is in two-loop operation. (If the reactor is in single loop operation, perform STP 3.4.2-03 instead.) _____ (OPS)

6.2 For sections 7.2 and 7.3, reactor power is greater than (>) 21.7% RTP. (See Performance Information Step 2.1.1.) _____ (OPS)

7.0 PROCEDURE

7.1 RECIRC PUMP SPEED MISMATCH CHECK

7.1.1 At 1C04, on SIC-9245A, A MG SET SPEED CONTROL, perform the following:

a. Use the "D" button to select "X" - PERCENT SPEED and record the value: _____ TS

A MG SET PERCENT SPEED (SIC-9245A.X) _____ %

b. Use the "D" button to select "S" - SETPOINT. _____

7.1.2 At 1C04, on SIC-9245B, B MG SET SPEED CONTROL, perform the following:

a. Use the "D" button to select "X" - PERCENT SPEED and record the value: _____ TS

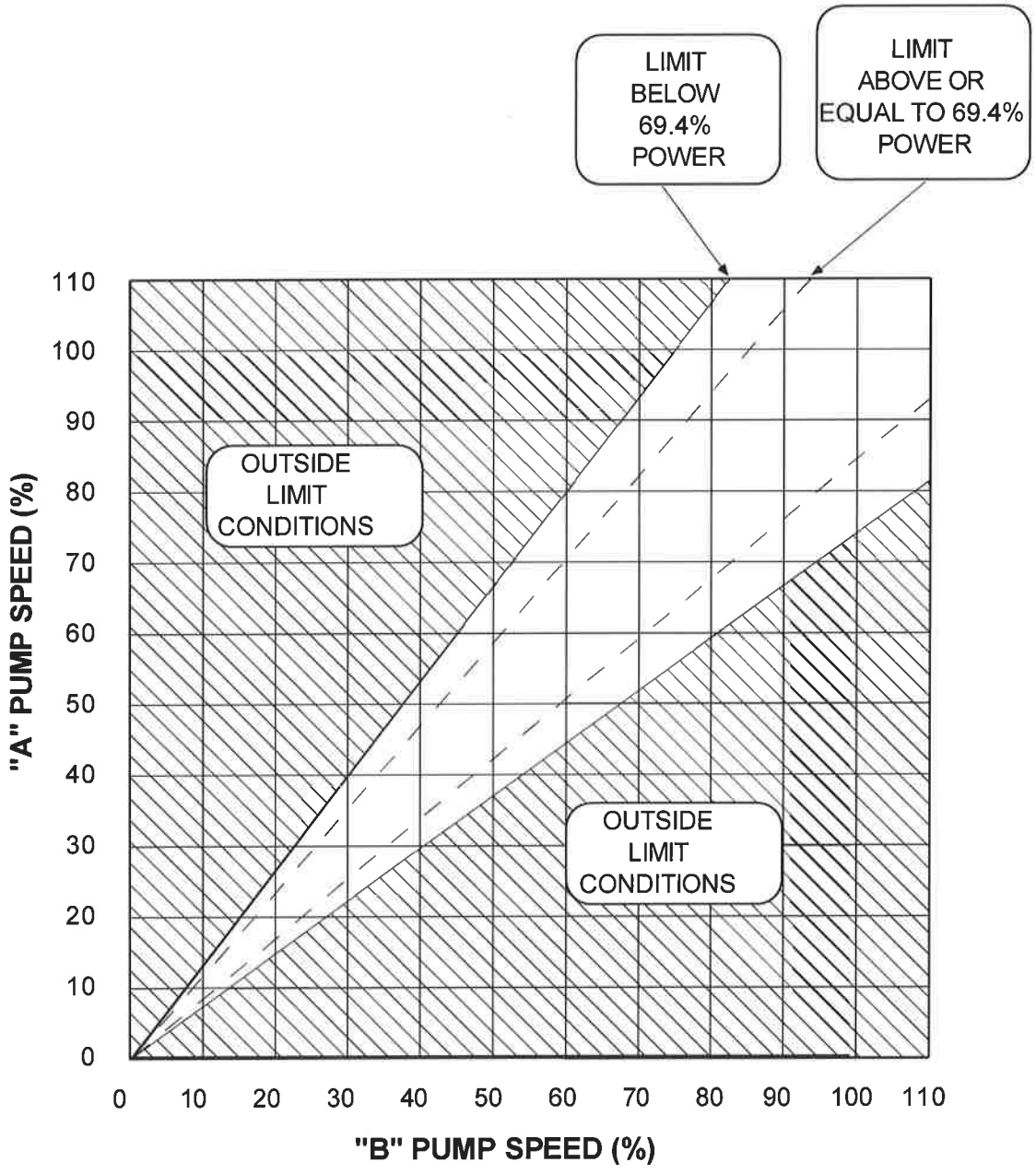
B MG SET PERCENT SPEED (SIC-9245B.X) _____ %

b. Use the "D" button to select "S" – SETPOINT. _____

7.1.3 On Figure 1, plot the intersection of the Recirc Pump speed values using the data recorded in Steps 7.1.1.a and 7.1.2.a. _____

7.1.4 Confirm that the point plotted on Figure 1 is within the appropriate limit for the current core power. If the point is outside the limit, immediately notify the CRS. _____ TS

(PRINT / SIGN)				
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	


LIMIT BELOW 69.4% POWER
LIMIT ABOVE OR EQUAL TO 69.4% POWER
OUTSIDE LIMIT CONDITIONS
OUTSIDE LIMIT CONDITIONS
"A" PUMP SPEED (%)
"B" PUMP SPEED (%)
0
10
20
30
40
50
60
70
80
90
100
110

7.2 JET PUMPS 9-16 OPERABILITY CHECK

7.2.1 At 1C04, record the following data for the "A" Recirc Pump: _____

A MG SET PERCENT SPEED (SIC-9245A.X from Step 7.1.1.a) _____%

DISCHARGE FLOW (FI-4634A) _____ KGPM

LOOP A FLOW (FR-4503, Ch 1) _____ Mlbm/hr

7.2.2 Using the data recorded in Step 7.2.1, plot "A" Recirc MG Set speed vs. "A" Recirc Pump discharge flow on Figure 2. _____ TS

7.2.3 Using the data recorded in Step 7.2.1, plot "A" Recirc MG Set speed vs. Loop "A" Jet Pump flow on Figure 3. _____ TS

NOTE

If Step 7.2.4.a is answered NO, Acceptance Criteria Step 8.2.2 should be answered YES if either Step 7.2.8.a or Step 7.2.8.e is answered YES. _____

7.2.4 Perform the following evaluation:

a. Are all of the points that were plotted on Figure 2 and Figure 3 between or on the sloped lines? _____ TS

(YES/NO) _____

b. If the answer to Step 7.2.4.a was YES, Jet Pumps 9-16 are OPERABLE. "N/A" the remainder of Section 7.2 and Figure 4. _____

c. If the answer to Step 7.2.4.a was NO, immediately notify the CRS. _____

7.2.5 If the JETS program is available, obtain a printout of "A" Recirc Loop ΔP's using the instructions provided in Appendix "A". _____

a. Attach the printout to the STP. _____

7.2.6 If the JETS program is NOT available, perform the following:

a. At 1C38 recorder FR-4501 Jet Pump Flow – Loop A, using the "2 MIN AVE" screen record the indicated RECIRC LOOP A Jet Pump differential pressure value for each Jet Pump in column "A" of Table A (contained in Step 7.2.6.d). _____

b. Calculate the sum of the individual Jet Pump ΔPs and the average Jet Pump ΔP and record those values in the appropriate spaces at the bottom of Table A. _____

c. Calculate the difference between each individual Jet Pump ΔP and the average ΔP and record the results in column "B" of Table A. _____

d. Using the following equation, calculate the percent deviation of each individual Jet Pump ΔP from the average ΔP, and record the result in column "C" of Table A. _____

$$\% \text{ Deviation} = 100 \times \frac{\text{Ind. } \Delta P - \text{Avg. } \Delta P}{\text{Avg. } \Delta P}$$

TABLE A

JET PUMP	A (ΔP)	B (Ind.ΔP - Avg.ΔP)	C (% Deviation)
JP-9			
JP-10			
JP-11			
JP-12			
JP-13			
JP-14			
JP-15			
JP-16			

_____ (Sum of ΔPs) ÷ 8 = _____ (Avg. ΔP)

7.2.7 Plot each individual Recirc Loop "A" Jet Pump % deviation value (from column "C" of Table A or JETS program calculation) on Figure 4. _____

NOTE

If Step 7.2.8.a is answered NO, Acceptance Criteria Step 8.2.2 shall be answered NO also, unless Recirc Pump speed is less than 60% of rated and an Engineering evaluation determines that the Jet Pumps are OPERABLE.

7.2.8 Perform the following evaluation:

a. Are all of the points plotted on Figure 4 on or between the lines of the allowable band? _____ TS

(YES/NO) _____

b. If the answer to Step 7.2.8.a is YES, Jet Pumps 9-16 are OPERABLE. "N/A" Steps 7.2.8.c, 7.2.8.d, and 7.2.8.e. _____

c. If the answer to Step 7.2.8.a is NO and Recirc Pump speed is greater than or equal to (≥) 60% of rated, immediately notify the CRS. Then, "N/A" Steps 7.2.8.b, 7.2.8.d, and 7.2.8.e. _____

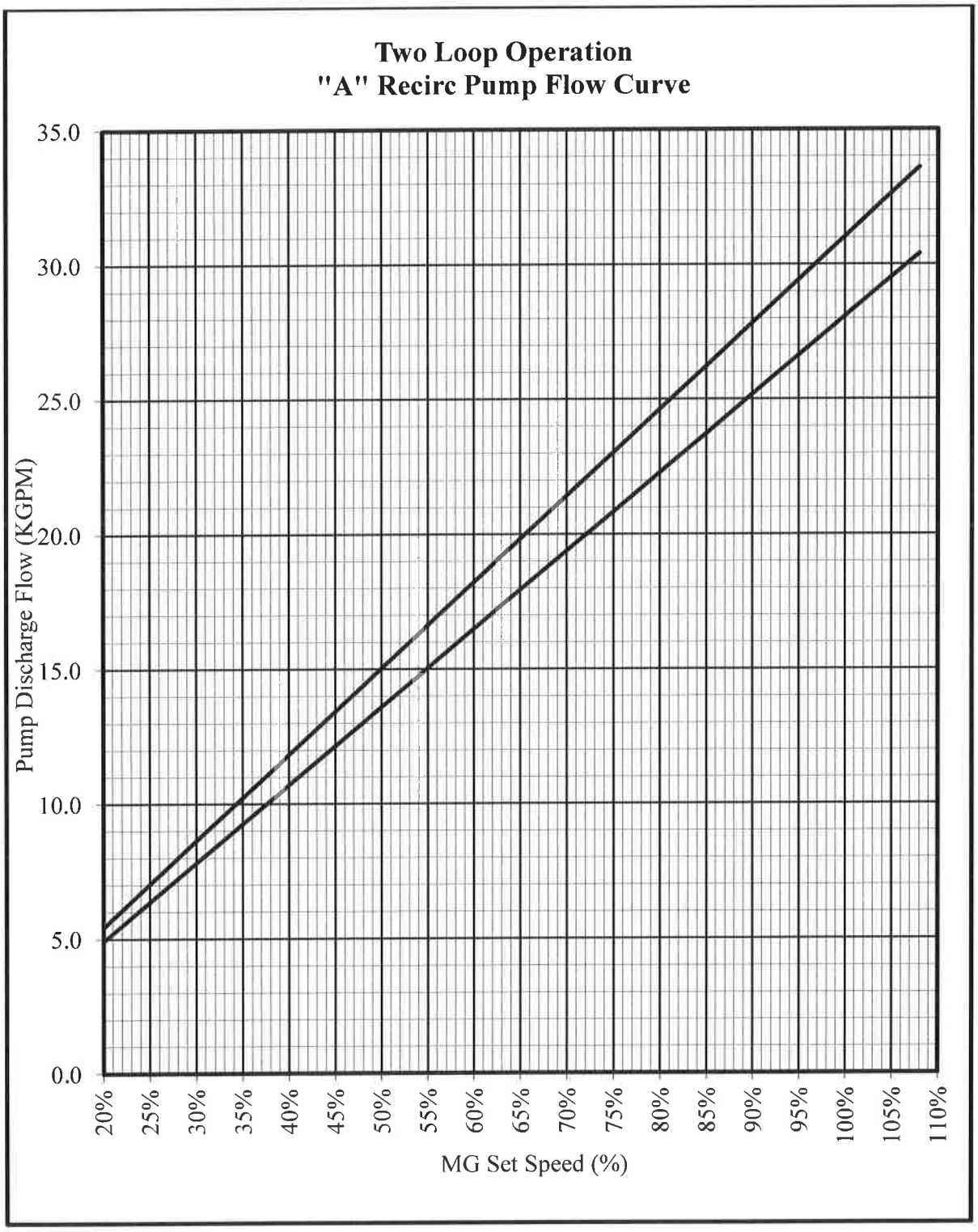
d. If the answer to Step 7.2.8.a is NO and Recirc Pump speed is less than (<) 60% of rated, immediately inform the CRS and then contact Engineering to perform an evaluation of Jet Pump operability. Then, "N/A" Steps 7.2.8.b and 7.2.8.c. _____

e. If an Engineering evaluation was performed, are Jet Pumps 9-16 OPERABLE? ("N/A" if an Engineering evaluation is not required to be performed.) _____ Engineering TS

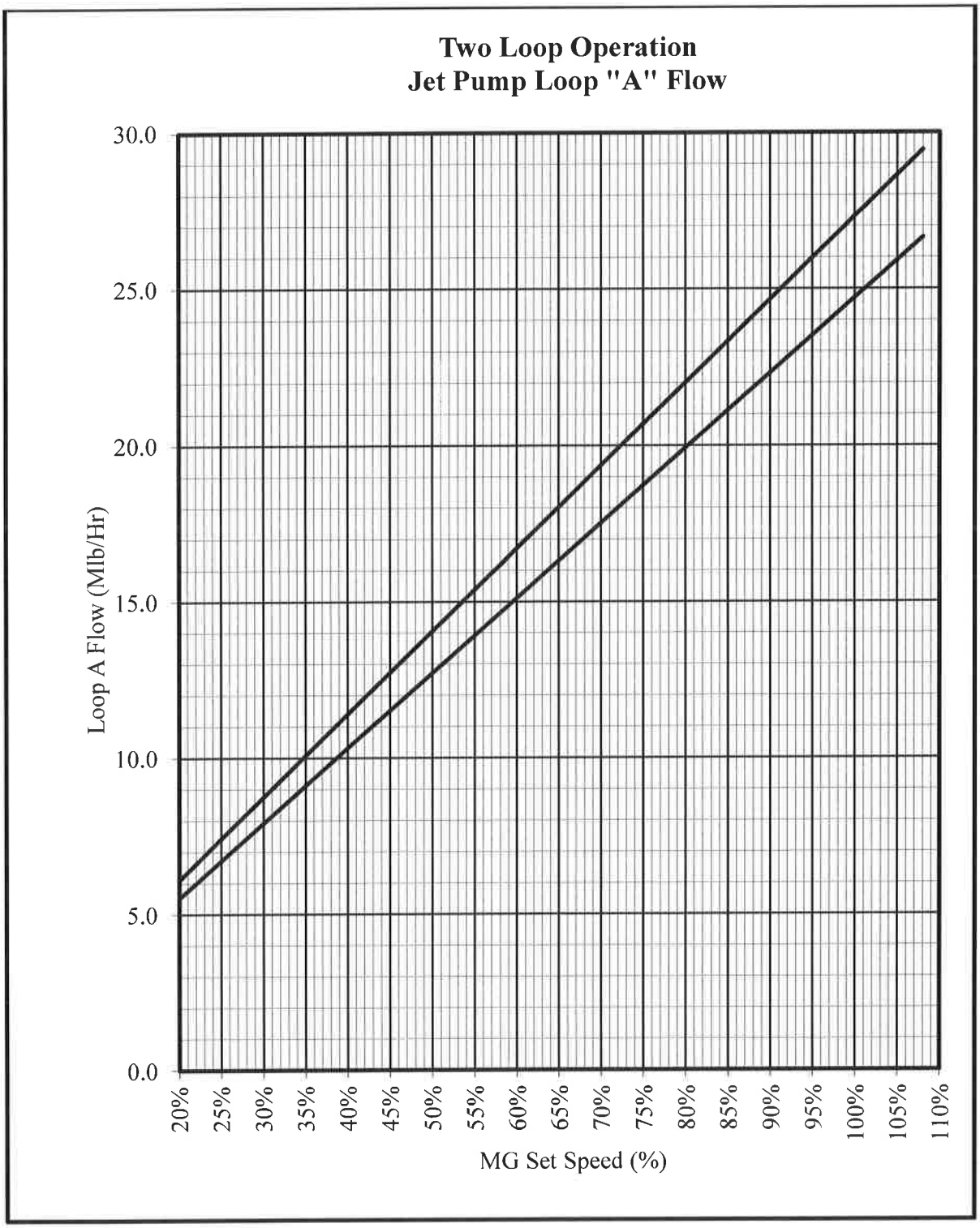
(YES/NO) _____

(PRINT / SIGN)

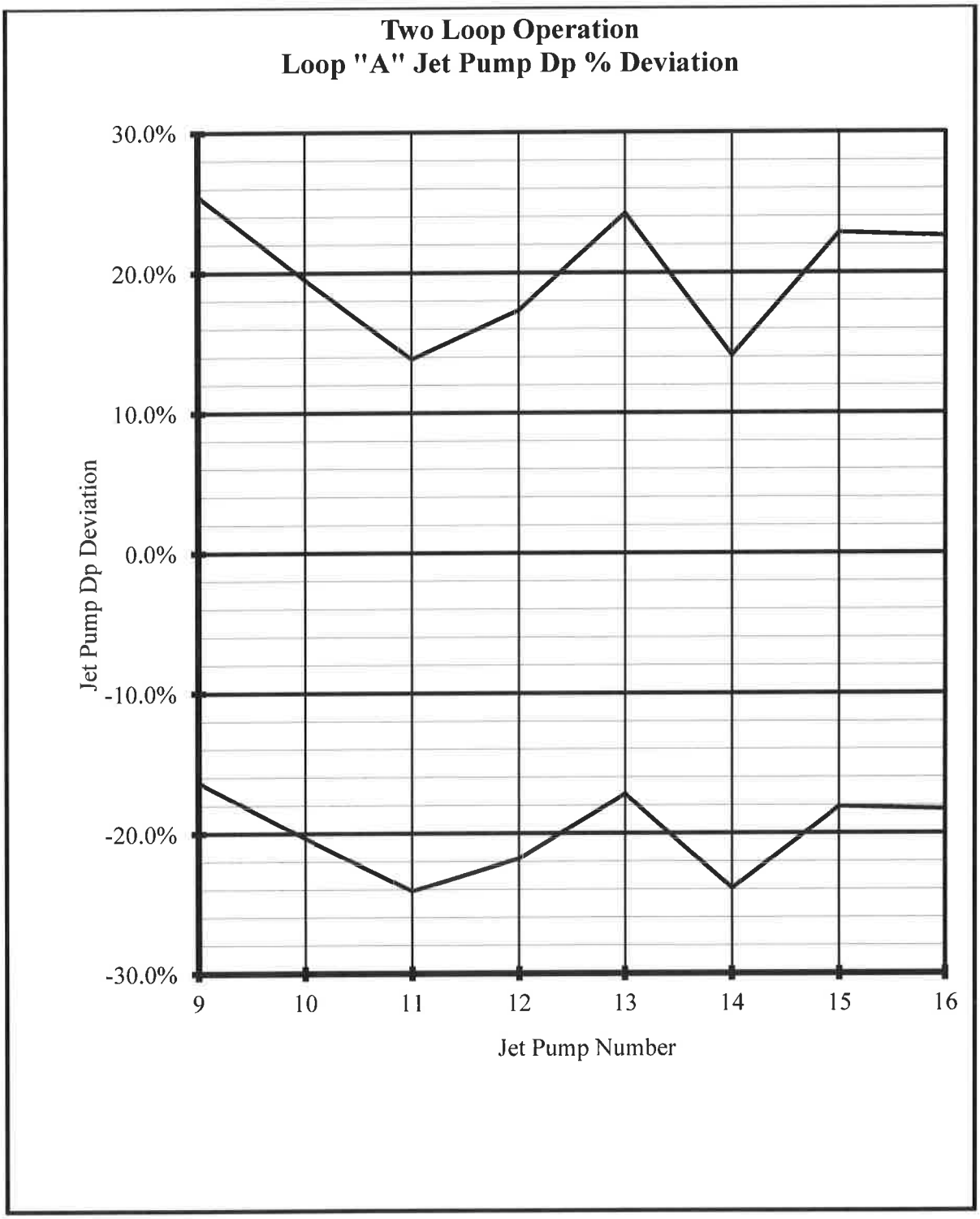
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	



Last updated from data acquired on November 1-4, 2016.



Last updated from data acquired on November 1-4, 2016.



Last updated from data acquired on November 1-4, 2016.

7.3 JET PUMPS 1-8 OPERABILITY CHECK

7.3.1 At 1C04, record the following data for the "B" Recirc Pump: _____

B MG SET PERCENT SPEED (SIC-9245B.X from Step 7.1.2.a) _____%

DISCHARGE FLOW (FI-4634B) _____ KGPM

LOOP B FLOW (FR-4504, Ch 1) _____ Mlbm/hr

7.3.2 Using the data recorded in Step 7.3.1, plot "B" Recirc MG Set speed vs. "B" Recirc Pump discharge flow on Figure 5. _____ TS

7.3.3 Using the data recorded in Step 7.3.1, plot "B" Recirc MG Set speed vs. Loop "B" Jet Pump flow on Figure 6. _____ TS

NOTE

If Step 7.3.4.a is answered NO, Acceptance Criteria Step 8.2.3 should be answered YES if either Step 7.3.8.a or Step 7.3.8.e is answered YES.

_____

7.3.4 Perform the following evaluation:

a. Are all of the points that were plotted on Figure 5 and Figure 6 between or on the sloped lines? _____ TS

(YES/NO) _____

b. If the answer to Step 7.3.4.a was YES, Jet Pumps 1-8 are OPERABLE. "N/A" the remainder of Section 7.3 and Figure 7. _____

c. If the answer to Step 7.3.4.a was NO, immediately notify the CRS. _____

7.3.5 If the JETS program is available, obtain a printout of "B" Recirc Loop ΔP's using the instructions provided in Appendix "A". _____

a. Attach the printout to the STP. _____

7.3.6 If the JETS program is NOT available, perform the following:

a. At 1C38 recorder FR-4502 Jet Pump Flow – Loop B, using the "2 MIN AVE" screen record the indicated RECIRC LOOP B Jet Pump differential pressure value for each Jet Pump in column "A" of Table B (contained in Step 7.3.6.d). _____

b. Calculate the sum of the individual Jet Pump ΔPs and the average Jet Pump ΔP and record the results in the appropriate spaces at the bottom of Table B. _____

c. Calculate the difference between each individual Jet Pump ΔP and the average ΔP and record the result in column "B" of Table B. _____

d. Using the following equation, calculate the percent deviation of each individual Jet Pump ΔP from the average ΔP and then record the result in column "C" of Table B. _____

$$\% \text{ Deviation} = 100 \times \frac{\text{Ind. } \Delta P - \text{Avg. } \Delta P}{\text{Avg. } \Delta P}$$

TABLE B

JET PUMP	A (ΔP)	B (Ind.ΔP - Avg.ΔP)	C (% Deviation)
JP-1	_____	_____	_____
JP-2	_____	_____	_____
JP-3	_____	_____	_____
JP-4	_____	_____	_____
JP-5	_____	_____	_____
JP-6	_____	_____	_____
JP-7	_____	_____	_____
JP-8	_____	_____	_____

_____ ÷ 8 = _____
(Sum of ΔPs) (Avg. ΔP)

7.3.7 Plot each individual Recirc Loop "B" Jet Pump % deviation value (from column "C" of Table B or JETS program calculation) on Figure 7. _____

NOTE

If Step 7.3.8.a is answered NO, Acceptance Criteria Step 8.2.3 shall be answered NO also, unless Recirc Pump speed is less than 60% of rated and an Engineering evaluation determines that Jet Pumps are OPERABLE.

_____

7.3.8 Perform the following evaluation:

a. Are all of the points plotted on Figure 7 on or between the lines of the allowable band? _____ TS

(YES/NO) _____

b. If the answer to Step 7.3.8.a is YES, Jet Pumps 1-8 are OPERABLE. "N/A" Steps 7.3.8.c, 7.3.8.d, and 7.3.8.e. _____

c. If the answer to Step 7.3.8.a is NO and Recirc Pump speed is greater than or equal to (≥) 60% of rated, immediately notify the CRS. Then, "N/A" Steps 7.3.8.b, 7.3.8.d, and 7.3.8.e. _____

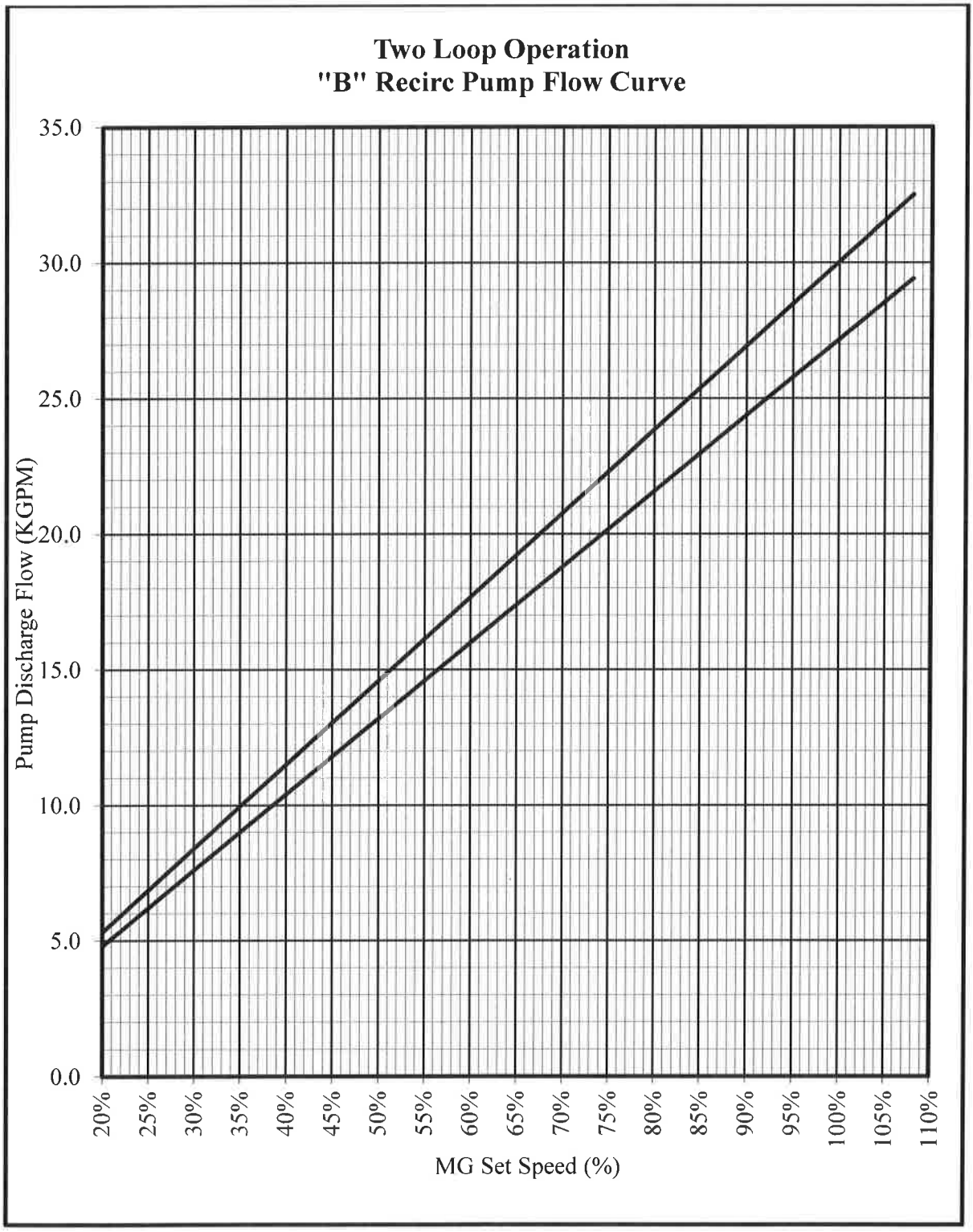
d. If the answer to Step 7.3.8.a is NO and Recirc Pump speed is less than (<) 60% of rated, immediately inform the CRS and then contact Engineering to perform an evaluation of Jet Pump operability. Then, "N/A" Steps 7.3.8.b and 7.3.8.c. _____

e. If an Engineering evaluation was performed, are Jet Pumps 1-8 OPERABLE? ("N/A" if an Engineering evaluation is not required to be performed.) _____ Engineering TS

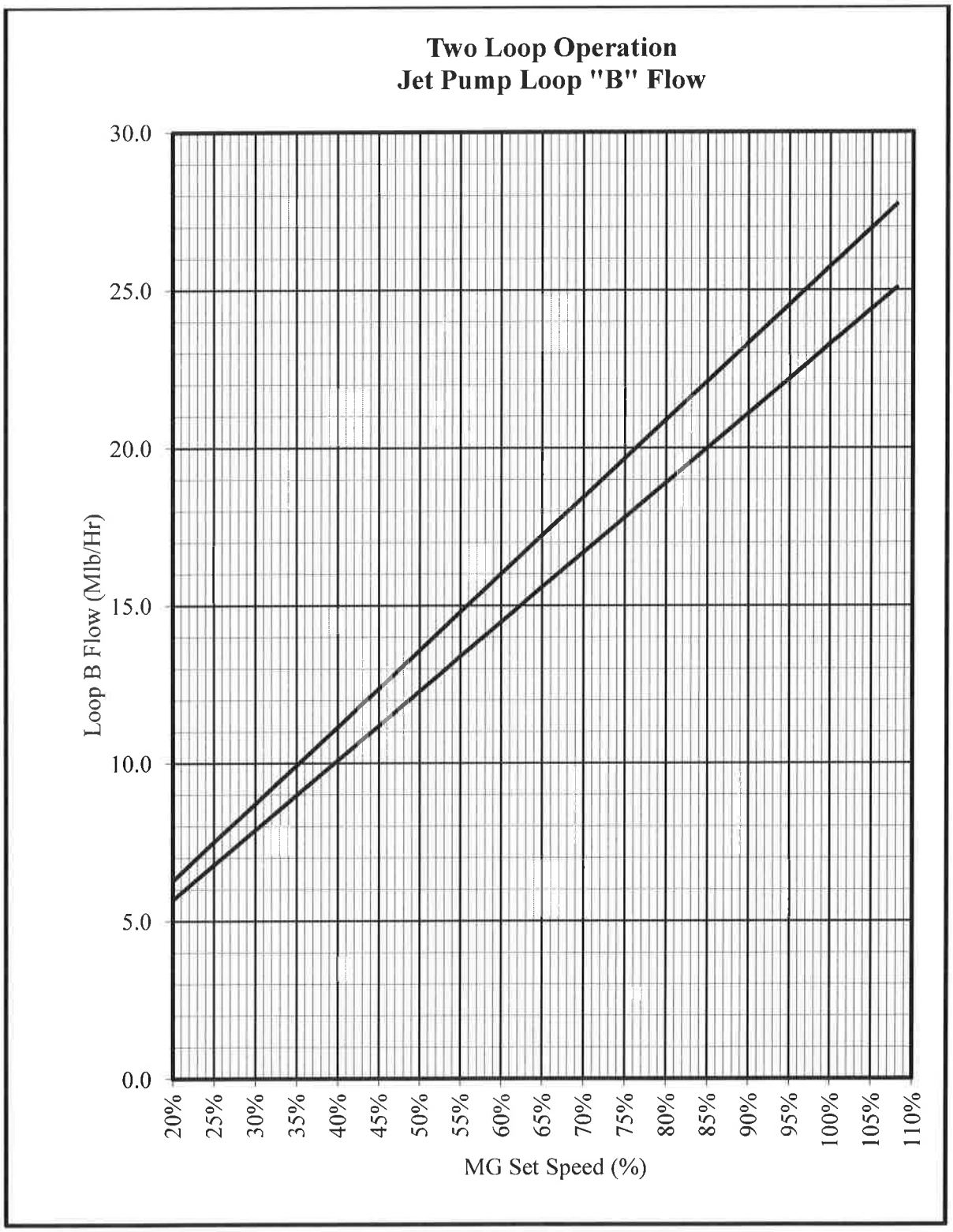
(YES/NO) _____

(PRINT / SIGN)

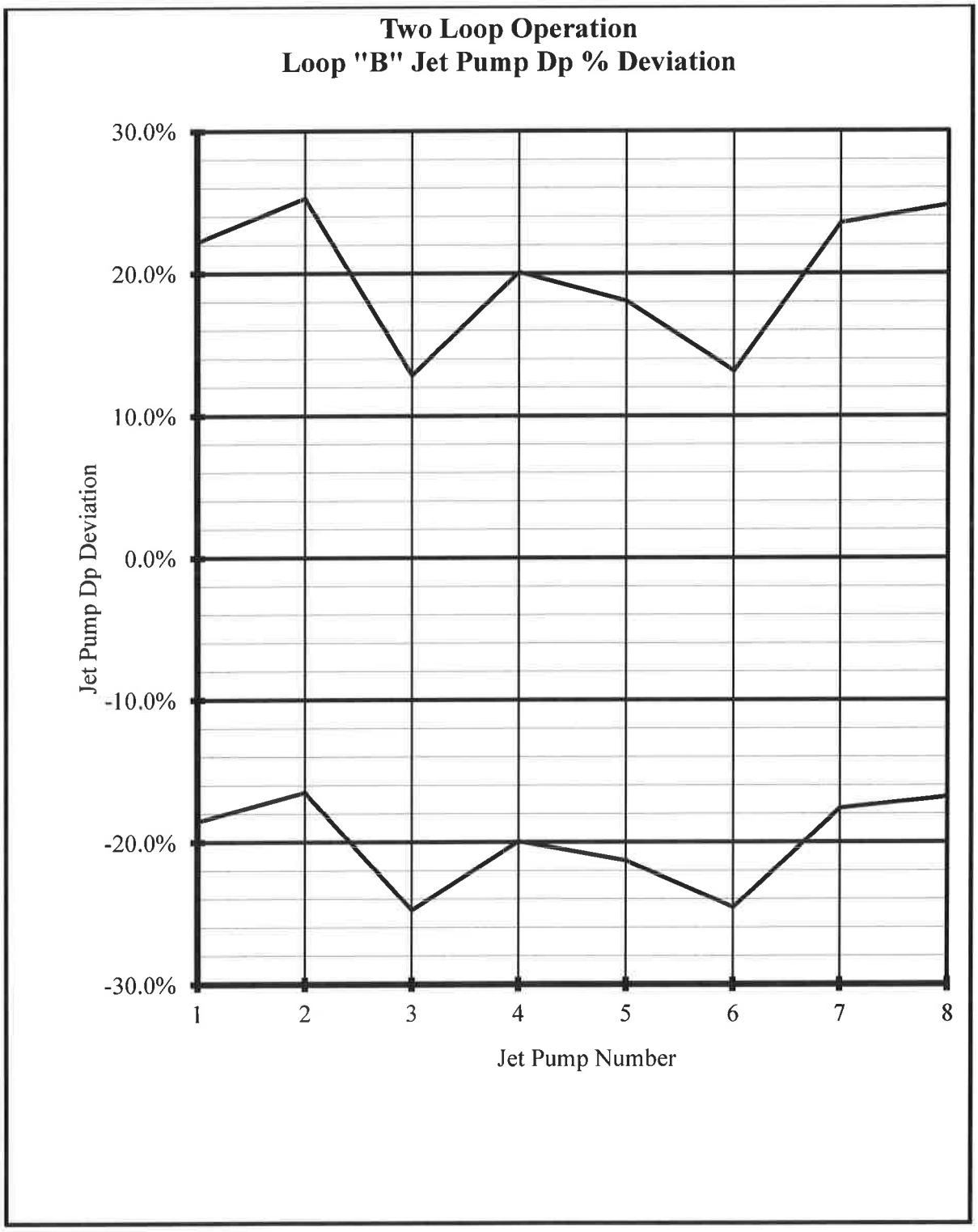
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	



Last updated from data acquired on November 1-4, 2016.



Last updated from data acquired on November 1-4, 2016.



Last updated from data acquired on November 1-4, 2016.

7.4 JET PUMPS TRENDING DATA

7.4.1 At 1C38, record the following Jet Pump D/P (2 Min Ave) from FR-4501 Jet Pump Flow – Loop A. If data was recorded previously in this STP, "N/A" this step: _____

Channel 51, JP-9 _____
Channel 52, JP-10 _____
Channel 53, JP-11 _____
Channel 54, JP-12 _____
Channel 55, JP-13 _____
Channel 56, JP-14 _____
Channel 57, JP-15 _____
Channel 58, JP-16 _____

7.4.2 At 1C38, record the following Jet Pump D/P (2 Min Ave) from FR-4502 Jet Pump Flow – Loop B. If data was recorded previously in this STP, "N/A" this step: _____

Channel 51, JP-1 _____
Channel 52, JP-2 _____
Channel 53, JP-3 _____
Channel 54, JP-4 _____
Channel 55, JP-5 _____
Channel 56, JP-6 _____
Channel 57, JP-7 _____
Channel 58, JP-8 _____

7.4.3 At 1C38, record jet pump total developed head as read on FR-4502: _____

Channel 9, PDT-4567 _____ psid

(PRINT / SIGN)

_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
_____ / _____	_____	_____	_____	
Performed by:	Date:	Time:	Init.	

8.0 ACCEPTANCE CRITERIA

8.1 Check below the reason for performing this STP. If this STP is performed for any reason other than for satisfying the PURPOSE as stated in Section 1.0, indicate below (otherwise mark this step "N/A"):

[ ] Daily Requirement

[ ] Pump Start

[ ] Unexplained changes

[ ] Other

_____

_____

_____

8.2 All Technical-Specification-required items, as indicated by "TS", have been performed satisfactorily.

8.2.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified _____

8.2.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified _____

8.2.3 Section 7.3 ( ) YES ( ) NO ⇒ CRS notified _____

8.3 All other items checked in this test have been performed satisfactorily.

8.3.1 Section 7.1 ( ) YES ( ) NO ⇒ CRS notified _____

8.3.2 Section 7.2 ( ) YES ( ) NO ⇒ CRS notified _____

8.3.3 Section 7.3 ( ) YES ( ) NO ⇒ CRS notified _____

8.3.4 Section 7.4 ( ) YES ( ) NO ⇒ CRS notified _____

8.4 Indicate any relevant test comments below, otherwise mark this step "N/A":

_____

_____

_____

_____

_____

_____

(PRINT / SIGN)

_____ / _____ _____

Operations Date

9.0 ATTACHMENTS

9.1 None