

NRC2007-SIM01

TITLE	Isolate Ruptured Steam Generator
PROGRAM	Initial Licensed Operator (ILT)

REVISION	0
TIME	20 Minutes

SCOPE OF REVISION:

Initial Issue

AUTHOR

Name:

John T Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

TITLE:

NRC2007-SIM01 (*Alternate Path*)
Isolate Ruptured Steam Generator

REVISION: 0**REFERENCES**

02-OHP-4023-E-3 Rev. 10 Steam Generator Tube Rupture

Task: EOP0020501 Isolate Ruptured Steam Generator

K/A: EPE 038 EA1.32 SGTR – Isolation of Ruptured Steam Generator

K/A IMPORTANCE: RO: 4.6 SRO 4.7

EVALUATION SETTING

Unit 2 Simulator

HANDOUTS

Task Briefing
Copy of 02-OHP-4023-E-3, Steam Generator Tube Rupture

ATTACHMENTS

None

SIMULATOR SETUP

1. Initialize simulator to IC 987 OR MODE 1 IC.
2. Place simulator in RUN.
3. Ensure Aux Steam Loads are being supplied by Unit 1
4. **IMF MS22B @ 100** to Fail 2-MRV-220 OPEN
5. **IMF RC23B @ 40** causing a #22 SGTR of 400gpm.
6. Perform actions of E-0 and E-3 through step 2 as appropriate.
7. Verify/override MCM-231 open Light LIT/ON
8. Close SG #22 FMOs if SG Level is >13%
9. Freeze simulator.

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TASK OBJECTIVES/STANDARDS

- Steam Generator #22 is isolated from Intact SGs and secondary systems.

TASK BRIEFING

You are an extra RO

A reactor trip with SI occurred due to a Steam Generator Tube Rupture. 02-OHP-4023-E-0 and 02-OHP-4023-E-3 have been implemented. 02-OHP-4023-E-3 is still in progress. Steam Generator #22 has been identified as the ONLY ruptured SG.

The Unit Supervisor directs you to perform Step 3 of 02-OHP-4023-E-3 "Isolate Flow From Ruptured SG(s)."

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NRC2007-SIM01 (*Alternate Path*)
Isolate Ruptured Steam Generator

REVISION: 0

Number: 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED

CAUTION

- If the TDAPP is the only available source of feed flow, steam supply to the TDAPP must be maintained from at least one SG to prevent loss of heat sink.
- At least one SG must be maintained available for RCS cooldown to prevent loss of heat sink.

3. Isolate Flow From Ruptured SG(s):

a. Adjust ruptured SG(s) PORV controller setpoint to 1040 psig

b. Check ruptured SG(s) PORV - CLOSED

- 2-MRV-213 (SG 21)
- 2-MRV-223 (SG 22)
- 2-MRV-233 (SG 23)
- 2-MRV-243 (SG 24)

b. **WHEN** ruptured SG pressure is less than 1040 psig, **THEN** verify SG PORV closed.

IF PORV can **NOT** be closed, **THEN** locally close PORV or associated isolation valve:

- 2-MSV-101-1 (2-MRV-213)
- 2-MSV-101-2 (2-MRV-223)
- 2-MSV-101-3 (2-MRV-233)
- 2-MSV-101-4 (2-MRV-243)

(Step 3 Continued On Next Page)

CT: Adjusts 2-MRV-223 controller setpoint to 1040 psig

Operator checks 2-MRV-223 CLOSED:

- Annunciator Panel 215 Drop 22 is NOT Lit
- Position meter indicates 0%

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<i>(Step 3 Continued From Previous Page)</i>		
c.	Close steam supply valve from ruptured SG(s) to TDAFP: • 2-MCM-221 (SG 22) • 2-MCM-231 (SG 23)	c. IF at least one MDAFP is running, THEN manually trip TDAFP. IF TDAFP can NOT be manually tripped, THEN locally close and deenergize steam supply valve from ruptured SG(s) to TDAFP: • 2-MCM-221 (2-AM-A-1B) • 2-MCM-231 (2-AM-D-R6C)
d.	Check blowdown isolation valve for ruptured SG(s) - CLOSED • 2-DCR-310 (SG 21) • 2-DCR-320 (SG 22) • 2-DCR-330 (SG 23) • 2-DCR-340 (SG 24)	d. Manually close valve(s). IF valve(s) can NOT be manually closed, THEN locally close associated isolation valve(s): • 2-BD-103-1 (2-DCR-310) • 2-BD-103-2 (2-DCR-320) • 2-BD-103-3 (2-DCR-330) • 2-BD-103-4 (2-DCR-340)
e.	Check blowdown sample valve for ruptured SG(s) - CLOSED • 2-DCR-301 (SG 21) • 2-DCR-302 (SG 22) • 2-DCR-303 (SG 23) • 2-DCR-304 (SG 24)	e. Manually close valve(s). IF valve(s) can NOT be manually closed, THEN locally close associated isolation valve(s): • 2-NS-107 (2-DCR-301) • 2-NS-106 (2-DCR-302) • 2-NS-105 (2-DCR-303) • 2-NS-108 (2-DCR-304)

(Step 3 Continued On Next Page)

CT: Places 2-MCM-221 to CLOSE

Verifies SG Blowdown Isolation Valve 2-DCR-320 is CLOSED

Verifies SG Blowdown Sample Valve 2-DCR-302 is CLOSED

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 3 Continued From Previous Page)		
f.	Place 2-DRV-407, SG stop valves drain valve in CLOSE	
g.	Check 2-DRV-407 - CLOSED	g. Locally close 2-MS-141, main steam leads drain DR-86 to condenser A shutoff valve (591' condenser A drip receiver in overhead).
h.	Check steam line warming valves - CLOSED • 2-MS-148 (SG 21) • 2-MS-147 (SG 24)	h. IF any steam line warming valve is known to be open, THEN locally close valve(s).
i.	Trip ruptured SG(s) stop valve closed: • 2-MRV-210 (SG 21) • 2-MRV-220 (SG 22) • 2-MRV-230 (SG 23) • 2-MRV-240 (SG 24)	i. Perform the following: 1) Trip close all remaining SG stop valves. 2) Place steam dumps in OFF. 3) Implement Attachment A (Page 43) while continuing with this procedure. 4) Use intact SG(s) PORV for steam dump. IF any ruptured SG can NOT be isolated from at least one intact SG, THEN go to BCA-3.1, SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired, Step 1.

(Step 3 Continued On Next Page)

Places SG Stop valve drain Valve 2-DCR-407 to CLOSE

Verifies 2-DRV-407 is CLOSED

Checks Steam Line Warming Valves 2-MS-148 and 2-MS-147 are CLOSED

CUE: If asked, 2-MS-147 and -148 are CLOSED.{**NOTE:** Located in plant above the Unit 2 Lower Airlock}**CT:** Places SG Stop Valve Dump Valve 2-MRV-221 to "Trip" CLOSE position (May also try to Trip 2-MRV-222 Dump Valve)**CT:** Identifies that 2-MRV-220 did NOT CLOSE**CT:** Places 2-MRV-211, 2-MRV-231, and 2-MRV-241 to "Trip" CLOSE position (To Close 2-MRV-210, 2-MRV-230, and 2-MRV-240)**CT:** Places Steam Dumps in "OFF" position**CUE:** When acknowledged, "The US directs you to perform Attachment A. The crew will continue on in this procedure."**NOTE:** The Candidate should then locate and perform Attachment A (Provide Attachment A copy to candidate)

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Attachment A
Ruptured SG Isolation With Failed SG Stop Valve

NOTE

Completion of this Attachment is **NOT** required prior to initiating RCS cooldown and subsequent recovery steps of the main procedure.

1. Verify aux steam loads are supplied from UNIT 1 or the Plant Heating Boiler
2. Verify the following valves - CLOSED
 - Main feed pump main steam isolation valves:
 - 2-ARV-11 (East MFP)
 - 2-ARV-12 (West MFP)
 - SG lead drain pot isolation valve:
 - 2-DRV-407
 - Main feed preheating steam supply valves to HP heaters:
 - 2-MRV-501
 - 2-MRV-502
 - 2-MRV-601
 - 2-MRV-602
 - Unit reheater isolation valves from main steam:
 - 2-MMO-431
 - 2-MMO-432
 - 2-MRV-411
 - 2-MRV-412

(Step 2 Continued On Next Page)

(Attachment A, page 1 of 2)

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Verifies that Aux Steam is supplied by Unit 1.

CUE: "Unit 1 reports that they are supplying Aux steam loads."

Verify Main FW pump Steam Isolations 2-ARV-11 and 2-ARV-12 are CLOSED

Verifies 2-DRV-407 is CLOSED

Verifies Feed Preheating Steam Supply valves – CLOSED

- 2-MRV-501
- 2-MRV-502
- 2-MRV-601
- 2-MRV-602

CUE: If required, "MRV-501, 502, 601, & 602 are locally verified closed."

Verifies Reheater Isolation valves – CLOSED

- 2-MMO-431
- 2-MMO-432

CT: Operator CLOSES 2-MRV-411 and 412.

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Attachment A
Ruptured SG Isolation With Failed SG Stop Valve
(Step 2 Continued From Previous Page)

- Steam dump valves:
 - 2-URV-110
 - 2-URV-120
 - 2-URV-130
 - 2-URV-111
 - 2-URV-112
 - 2-URV-124
 - 2-URV-125
 - 2-URV-135
 - 2-URV-136
- Startup air ejectors steam supply valve:
 - 2-SMO-401
- Main turbine sealing steam supply valves:
 - 2-SRV-26
 - 2-SRV-27
- Main steam lead drain valves:
 - 2-DMO-425
 - 2-DMO-426
 - 2-DMO-427
 - 2-DMO-428
 - 2-DMO-450
 - 2-DMO-451
- Turbine bypass header drain valves:
 - 2-DRV-405
 - 2-DRV-406

-END OF ATTACHMENT-

(Attachment A, page 2 of 2)

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Verifies Steam Dump valves – CLOSED:

- 2-URV-110
- 2-URV-120 2-URV-124
- 2-URV-130 2-URV-125
- 2-URV-111 2-URV-135
- 2-URV-112 2-URV-136

Verifies Startup Air Ejectors Steam supply valve - CLOSED:

- 2-SMO-401

CT: Places Turbine Sealing Steam Supply valves – CLOSED:

- 2-SRV-26
- 2-SRV-27

Verifies Main Steam Lead Drain valves – CLOSED:

- 2-DMO-425 2-DMO-428
- 2-DMO-426 2-DMO-450
- 2-DMO-427 2-DMO-451

Verifies Turbine Bypass Drain valves – CLOSED:

- 2-DRV-405
- 2-DRV-406

EVALUATOR: JPM is COMPLETE

TITLE:

NRC2007-SIM01 (Alternate Path)
Isolate Ruptured Steam Generator

REVISION: 0

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STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED

CAUTION

- If the TDAPP is the only available source of feed flow, steam supply to the TDAPP must be maintained from at least one SG to prevent loss of heat sink.
- At least one SG must be maintained available for RCS cooldown to prevent loss of heat sink.

3. Isolate Flow From Ruptured SG(s):

a. Adjust ruptured SG(s)
PORV controller setpoint
to 1040 psig

b. Check ruptured SG(s)
PORV - CLOSED

- 2-MRV-213 (SG 21)
- 2-MRV-223 (SG 22)
- 2-MRV-233 (SG 23)
- 2-MRV-243 (SG 24)

b. **WHEN** ruptured SG pressure is
less than 1040 psig,
THEN verify SG PORV closed.

IF PORV can **NOT** be closed,
THEN locally close PORV or
associated isolation valve:

- 2-MSV-101-1 (2-MRV-213)
- 2-MSV-101-2 (2-MRV-223)
- 2-MSV-101-3 (2-MRV-233)
- 2-MSV-101-4 (2-MRV-243)

(Step 3 Continued On Next Page)

Task Briefing

You are an extra RO

A reactor trip with SI occurred due to a Steam Generator Tube Rupture. 02-OHP-4023-E-0 and 02-OHP-4023-E-3 have been implemented. 02-OHP-4023-E-3 is still in progress. Steam Generator #22 has been identified as the ONLY ruptured SG.

The Unit Supervisor directs you to perform Step 3 of 02-OHP-4023-E-3 "Isolate Flow From Ruptured SG(s)."

NRC2007-SIM02

TITLE

Perform Turbine Driven AFW Pump Run for Maintenance Operation.

REVISION

0

PROGRAM

Initial Licensed Operator (ILT)

TIME

20 Minutes

SCOPE OF REVISION: Initial Issue.

AUTHOR

Name:

John T Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

COURSE NUMBER AND TITLE:	NRC2007-SIM02 Perform Turbine Driven AFW Pump Run for Maintenance Operation	REVISION: 0
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REFERENCES

02-OHP-4021-056-002, Rev. 18, Auxiliary Feed Pump Operation

Task: 0560060101: Operate the Auxiliary Feed Pumps during Plant Start-up and Shutdown

K/A CROSS REFERENCE: SYS 061 2.1.23 Aux FW System - Ability to perform specific system and integrated plant procedures during all modes of plant operation.

K/A IMPORTANCE: RO 3.9 SRO 4.0

EVALUATION SETTING

Simulator

HANDOUTS

Task Briefing

Copy of 02-OHP-4021-056-002, Auxiliary Feed Pump Operation (Body and Attachment 11)

ATTACHMENTS

None

SIMULATOR SETUP

Initialize to IC at 78%power (IC36 or any stable IC @ < 100%)

Verify prerequisites of controlling procedure are met.

Verify Power is < 99.85%

Simulator Booth Operator Action:

MRF FWR37 to 100% - to OPEN 2-FRV-256

MRF FWR37 to 0% - to CLOSE 2-FRV-256

COURSE NUMBER AND TITLE:	NRC2007-SIM02 Perform Turbine Driven AFW Pump Run for Maintenance Operation	REVISION: 0
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TASK OBJECTIVES/STANDARDS

Run the TDAFP for Maintenance Operation in accordance with 2-OHP-4021-056-002, Auxiliary Feed Pump Operation, Attachment 11, TDAFP Maintenance Operation, observing all applicable precautions and limitations, and procedure steps.

TASK BRIEFING

You are the Extra RO in Unit 2.

The Unit 2 TDAFP has been declared inoperable and LCO 3.7.5 has been entered.

Maintenance has just completed minor adjustments to the Trip and Throttle valve and is requesting that the pump be started with flow through the test line to verify it comes up to normal speed. No data collection is required from Operations. Maintenance will monitor speed locally.

The US directs you to run the TDAFP for Maintenance in accordance with 2-OHP-4021-056-002, Auxiliary Feed Pump Operation, Attachment 11, TDAFP Maintenance Operation. No speed adjustments are required.

An AEO has been briefed. The AEO has verified the TDAFP is ready for start and the AEO and Maintenance personnel are standing by.

There is No Identified Primary to Secondary leakage.

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Auxiliary Feed Pump Operation			
Attachment 11	TDAFP Maintenance Operation	Pages: 52 - 59	

1 PURPOSE AND SCOPE

- 1.1 This attachment provides instructions for operating the TDAFP on recirc and/or test line flow path to support maintenance or data gathering activities.

2 PREREQUISITES

- 2.1 The Aux Feedwater System is filled and vented.

INIT

Init

3 PRECAUTIONS AND LIMITATIONS

- 3.1 As detailed in the body, Section 3.
- 3.2 Consider reducing power, if starting the TDAFP could result in exceeding 100% power.
- 3.3 The ELO valve (2-FRV-258) must be open when the flow path is not to the Steam Generators or through the test line.

NOTE: Provide an annotated copy of 02-OHP-4021-056-002 (Body and Attachment 11).

CUE: If asked, AFW system is filled and vented.

Operator reviews applicable Precautions and Limitations from body of procedure (provided during briefing) and specific items in Attachment 11, Section 3.

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4 DETAILS

4.1 Make a Control Room Log entry declaring the TDAFP INOPERABLE.

Shift Manager Signature

Shift Manager/Unit Supervisor

4.2 Verify 2-FRV-256, TDAFP Test Valve, position indicator control power
"ON" light - LIT. (white)

4.3 **IF** desired to connect test cart, **THEN** perform the following:

4.3.1 Connect test cart at 2-FFX-253, Turbine Driven Aux Feed Pump
Test Line Flow Test Point.

NA

4.3.2 Record the following Test Equipment data:

Test Gauge # NA

Calibration Due NA

NA

4.3.3 Verify the following valves - OPEN:

- 2-FFX-253-IH, 2-FFX-253 High Pressure Side
Instrument Shutoff Valve

NA

- 2-FFX-253-IL, 2-FFX-253 Low Pressure Side Instrument
Shutoff Valve

NA

- 2-FFX-253-V1, TDAFP 2-PP-4 Test Line Flow
2-FFX-253 High Pressure Side Root Valve

NA

- 2-FFX-253-V2, TDAFP 2-PP-4 Test Line Flow
2-FFX-253 Low Pressure Side Root Valve

NA

4.3.4 Vent 2-FFX-253 instrument lines.

NA

CUE: (If Asked) Both the East & West AFW pumps are operable and the US has Entered LCO 3.7.5 for the TDAFW

CUE: (If Asked) The Starting team is ready for the TDAFP start.

Operator Verifies 2-FRV-256 White Light is LIT

N/A: No data is being collected.

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- 4.4 Open 2-CA-6530, 50 PSI Control Air to 2-XSO-256 for TDAFP Test Valve 2-FRV-256 Shutoff Valve. _____
- 4.5 Open 2-FW-263 TDAFP Test Valve, 2-FRV-256 Outlet Shutoff Valve. _____
- 4.6 Place 2-FRV-256 TDAFP Test Valve, in- TEST. _____
- 4.7 Verify TDAFP discharge valves to Steam Generator – CLOSED:
- 2-FMO-211, SG 1 Feed from TDAFP _____
 - 2-FMO-221, SG 2 Feed from TDAFP _____
 - 2-FMO-231, SG 3 Feed from TDAFP _____
 - 2-FMO-241, SG 4 Feed from TDAFP _____
- 4.8 IF desired to adjust TDAFP speed, THEN perform the following:
- 4.8.1 Close 2-CA-7165, Turbine Driven Aux Feed Pump 2-PP-4 Governor Speed Control Control Air Vent Valve. NA
- 4.8.2 Place 2-AT-22, TDAFP Speed Control, in CTRL RM position. NA
- 4.8.3 Set 2-AT-22, TDAFP Speed Control, to desired setting. NA
- 4.9 Check TDAFP mechanical and electrical trips – RESET. _____
- 4.10 Open fully 2-FRV-256, TDAFP Test Valve. _____
- 4.11 Start the TDAFP by placing Trip & Throttle Valve 2-QT-506, to – OPEN. _____
- 4.12 Verify all lubricant levels are in the normal range. _____

CT: Operator Directs AEO to OPEN 2-CA-6530, 50 PSI Control Air to 2-XSO-256

CUE: AEO reports 2-CA-6530 is OPEN

CT: Operator Directs AEO to OPEN 2-FW-263 TDAFP Test Valve Outlet Shutoff

CUE: AEO reports 2-FW-263 TDAFP Test Valve Outlet Shutoff is OPEN

CT: Operator places CS for 2-FRV-256 to TEST.

CT: Operator Holds CS in CLOSE and verifies CLOSED for:

2-FMO-211

2-FMO-221

2-FMO-231

2-FMO-241

Annunciator Panel 213 Drop 29 is LIT
Annunciator Panel 213 Drop 39 is LIT
Annunciator Panel 214 Drop 19 is LIT
Annunciator Panel 214 Drop 29 is LIT

Alarms
NOT
Critical

CUE: Speed adjustments are NOT required.

Operator N/A steps in 4.8

Operator verifies that Panel 213 Drop 50 & Panel 214 Drop 10 are NOT LIT

CT: Operator directs AEO to locally open 2-FRV-256

CUE: (**Simulator Booth Operator = MRF FWR37 to 100%**)

CT: Operator opens 2-QT-506 to start the TDAFP.

CUE: AEO reports that all lubricant levels are in the normal range.

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Attachment 11	TDAFP Maintenance Operation	Pages: 52 - 59	

4.13 Monitor TDAFP bearing temperature during pump operation. _____

4.13.1 **IF** TDAFP bearing temperature exceeds 140°F, **THEN** throttle open TDAFP NESW bearing cooler supply valves, as required, to maintain bearing temperature less than 160°F; [Ref. 7.2.1e]

- 2-NSW-537, NESW to TDAFP 2-PP-4 Inboard Pump Bearing Inlet Valve _____
- 2-NSW-536, NESW to TDAFP 2-PP-4 Outboard Pump Bearing Inlet Valve _____

CAUTION: With 2-FW-127 closed, the only pump protection will be through the test line via 2-FRV-256. A minimum of 10 psid as read on 2-FFX-256 is required when using the test line for minimum flow

4.14 **IF** desired, **THEN** Close 2-FW-127, TDAFP 2-PP-4 Emergency Leakoff to CST Shutoff Valve. _____

NA

4.15 Operate the TDAFP as required to support maintenance. _____

4.15.1 Adjust 2-FRV-256, TDAFP Test Valve as required. _____

4.15.2 Adjust TDAFP Speed Control to desired setting. _____

4.16 **WHEN** the TDAFP is no longer required, **THEN** trip the TDAFP. _____

4.16.1 Verify Annunciator 214, Drop 10, TDAFP TRIP & THROT VLV UNLATCHED - LIT. _____

4.16.2 After a minimum of 30 seconds, Close 2-QT-506, TDAFP Trip and Throttle Valve, to relatch TTV. _____

- a. Verify Annunciator 214, Drop 10, TDAFP TRIP & THROT VLV UNLATCHED - NOT LIT. _____

CUE: AEO reports that all TDAFP bearing temperatures are normal.

CUE: Unit Supervisor informs operator that Emergency Leakoff line will NOT be isolated for this pump run.

CUE: Maintenance reports that local speed indications are consistent with previous runs of the TDAFP. No additional data is required and the TDAFP may be shut down.

CT: Operator Depresses the TDAFP TRIP PUSHBUTTON

Operator verifies Ann. 214, Drop 10 is LIT

CT: Operator runs TDAFP Trip & Throttle Valve CLOSED after 30 seconds. (Place 2-QT-506 to CLOSED)

Operator verifies Ann. 214, Drop 10 is NOT LIT

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Attachment 11	TDAFP Maintenance Operation	Pages: 52 - 59	

4.17 Restoring TDAFP to Standby:

- 4.17.1 Place 2-AT-22 in HSD position. NA
- 4.17.2 Open 2-CA-7165, Turbine Driven Aux Feed Pump 2-PP-4 Governor Speed Control Control Air Vent Valve. NA
- 4.17.3 Verify Ann 213 drop 49, TDAFP HSD2 PANEL OVERRIDE - NOT LIT. _____
- 4.17.4 Open TDAFP discharge valves to the Steam Generators: _____
 - 2-FMO-211, SG 1 Feed From TDAFP _____
 - 2-FMO-221, SG 2 Feed From TDAFP _____
 - 2-FMO-231, SG 3 Feed From TDAFP _____
 - 2-FMO-241, SG 4 Feed From TDAFP _____
- 4.17.5 Verify 2-FW-127, TDAFP 2-PP-4 Emergency Leakoff to CST Shutoff Valve - OPEN. _____
- 4.17.6 Verify 2-FRV-258, TDAFP Emer Leakoff - OPEN. _____
- 4.17.7 Verify 2-FRV-258, TDAFP Emer Leakoff, control switch in - AUTO. _____
- 4.17.8 Re-align 2-FRV-256, TDAFP Test Valve, for normal plant operation as follows: _____
 - a. Close 2-FRV-256, TDAFP Test Valve, by positioning local controller to 0%. _____
 - b. Place 2-FRV-256, TDAFP Test Valve, in - NORMAL. _____
 - c. Close 2-CA-6530, 50 PSI Control Air to 2-XSO-256 for TDAFP Test Valve 2-FRV-256 Shutoff Valve. _____
 - d. Close 2-FW-263, TDAFP Test Valve 2-FRV-256 Outlet Shutoff Valve. _____

CUE: Since no speed adjustments were performed, 2-AT-22 is still in the HSD position and 2-CA-7165 is NOT open.

Operator verifies Ann. 213. Drop 49 is NOT LIT.

CT: Operator Holds CS in OPEN and verifies OPEN for:

2-FMO-211	Annunciator Panel 213 Drop 29 is NOT LIT Annunciator Panel 213 Drop 39 is NOT LIT Annunciator Panel 214 Drop 19 is NOT LIT Annunciator Panel 214 Drop 29 is NOT LIT	} Alarms NOT Critical
2-FMO-221		
2-FMO-231		
2-FMO-241		

CUE: AEO reports that 2-FW-127 is open.

Operator Verifies 2-FRV-258 is in OPEN and in AUTO

CT: Operator Directs AEO to CLOSE 2-FRV-256, TDAFP Test Valve.

CUE: (Simulator Booth Operator = MRF FWR37 to 0%)

CUE: AEO reports TDAFP Test Valve 2-FRV-256 is CLOSED.

CT: Operator places CS for 2-FRV-256 to NORMAL.

CT: Operator Directs AEO to CLOSE 2-CA-6530, 50 PSI Control Air to 2-XSO-256.

CUE: AEO reports 2-CA-6530 is CLOSED

CT: Operator Directs AEO to CLOSE 2-FW-263 TDAFP Test Valve Outlet Shutoff

CUE: AEO reports 2-FW-263 is CLOSED.

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- e. Independently verify 2-CA-6530, 50 PSI Control Air to 2-XSO-256 for TDAFP Test Valve 2-FRV-256 Shutoff Valve — CLOSED

-AND-

install seal.

IV

- f. Independently verify 2-FW-263, TDAFP Test Valve 2-FRV-256 Outlet Shutoff Valve — CLOSED.

IV

- 4.17.9 Locally verify 2-QT-506, TDAFP Trip and Throttle Valve - LATCHED.

- 4.17.10 **IF** NESW Bearing Cooler Supply Valves were opened, **THEN** close NESW Bearing Cooler Supply Valves:

- 2-NSW-536, NESW To TDAFP 2-PP-4 Outboard Pump Bearing Inlet Valve
- 2-NSW-537, NESW To TDAFP 2-PP-4 Inboard Pump Bearing Inlet Valve

- 4.17.11 **IF** test instrumentation was used, **THEN** restore as follows:

- a. Close test isolation valves:

- 2-FFX-253-IH, 2-FFX-253 High Pressure Side Instrument Shutoff Valve
- 2-FFX-253-IL, 2-FFX-253 Low Pressure Side Instrument Shutoff Valve

- b. Disconnect test cart from 2-FFX-253, Turbine Driven Aux Feed Pump Test Line Flow Test Point.

- c. Store test cart as appropriate.

CUE: AEO reports that Independent Verification of positions for 2-CA-6530 and 2-FW-263 are complete.

CUE: AEO reports 2-QT-506 is latched.

EVALUATOR: "JPM is COMPLETE"

Task Briefing

You are the Extra RO in Unit 2.

The Unit 2 TDAFP has been declared inoperable and LCO 3.7.5 has been entered.

Maintenance has just completed minor adjustments to the Trip and Throttle valve and is requesting that the pump be started with flow through the test line to verify it comes up to normal speed. No data collection is required from Operations. Maintenance will monitor speed locally.

The US directs you to run the TDAFP for Maintenance in accordance with 2-OHP-4021-056-002, Auxiliary Feed Pump Operation, Attachment 11, TDAFP Maintenance Operation. No speed adjustments are required.

An AEO has been briefed. The AEO has verified the TDAFP is ready for start and the AEO and Maintenance personnel are standing by.

There is No Identified Primary to Secondary leakage.

NRC2007-SIM03

TITLE

RCCA Operability Checks

PROGRAM

Initial Licensed Operator (ILT)

REVISION

0

TIME

15 Minutes

SCOPE OF REVISION: Derived from 2002 NRC Exam Simulator JPM N02-01

AUTHOR

Name:

John T Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

COURSE NUMBER AND TITLE:	NRC2007-SIM03 RCCA OPERABILITY CHECKS	REVISION: 0
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REFERENCES

02-OHP-4030-212-015, Full Length Control Rod Operability Test

Task: 0120130201 Perform Full Length Control Rod Operability Test

K/A REFERENCE: SYS 014 A4.02
K/A IMPORTANCE: RO 3.4 SRO 3.2

EVALUATION SETTING

Simulator

HANDOUTS

Task Briefing
Copy of 02-OHP-4030-212-015 annotated to perform selected Control Rod Bank

ATTACHMENTS

None

SIMULATOR SETUP

Initialize the Simulator to any MOL at-power IC.
Reset Control Rods, check Step Counters and verify Rod Bank Update is complete

COURSE NUMBER AND TITLE:	NRC2007-SIM03 RCCA OPERABILITY CHECKS	REVISION: 0
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TASK OBJECTIVES/STANDARDS

Operator performs a Full Length Operability Test on Control Rod Bank ‘A’ in accordance with 02-OHP-4030-212-015, Attachment 1, while observing all applicable precautions and limitations and procedural steps.

TASK BRIEFING

MTI has completed maintenance on the step counters for Control Bank A.

The Unit Supervisor directs you to perform a Full Length Operability test on Control Bank A in accordance with procedure 02-OHP-4030-212-015, Attachment 1, Step 4.8.

PPC turn on code for Rod Position Screen is “RSVANN.”

Continuous	02-OHP-4030-212-015	Rev. 0	Page 18 of 38
Full Length Control Rod Operability Test			
Attachment 1	Control Rod Testing in Modes 1 and 2	Pages: 6 - 28	

4.8 Test Control Bank A positions as follows:

4.8.1 Record initial position of rods (PPC preferred):

Group 1 Demand	H6	H10
Group 2 Demand	F8	K8

4.8.2 Place Full Length Bank Selector switch in the CONTROL BANK A position.

4.8.3 Monitor reactor power and RCS temperature during rod movement.

NOTE: Annunciator 210 Drop 31, 'ROD BANK A LOW' can be expected if Control Bank A rods are inserted to less than 10 steps above minimum program value.

4.8.4 Insert Control Bank A while performing the following:

a. Verify the "Rods Inserting" lamp - LIT.

b. Verify rod movement.

c. **WHEN** all Control Bank A rods have moved at least 8 steps by PPC or IRPI indication, **THEN** stop rod movement **AND** record position:

Group 1 Demand	H6	H10
Group 2 Demand	F8	K8

4.8.5 Return rods to original demand position.

General CUES:

1. Provide candidate annotated copies of:
02-OHP-4030-212-015

Correctly records position using step counters on Flux panel

CT: Places selector switch in correct position

CUE: Another RO will monitor reactor power and RCS temperature.

CT: Inserts all rods in the group at least 8 steps
Monitors indications to verify expected results

NOTE: Drop 31 "Rod Bank A low" on Panel 210 will alarm as Bank A rods are inserted. (Drop 29 "Rod Sequence Violation" may alarm depending on the amount of steps rods are inserted.)

Ensures each rod in group has moved a minimum of 8 steps

Correctly records position using step counters on Flux panel

CT: Withdraws all rods in the group at least to original position
NOTE: Drop 31 "Rod Bank A low" on panel 210 should clear

Continuous	02-OHP-4030-212-015	Rev. 0	Page 19 of 38
Full Length Control Rod Operability Test			
Attachment 1	Control Rod Testing in Modes 1 and 2	Pages: 6 - 28	

4.8.6 [Current TS]
IF rods are inadvertently withdrawn past 231 steps, THEN perform Step 4.12 AND take appropriate actions specified in TS 3.1.3.2.b.

[Improved TS]
IF rods are inadvertently withdrawn past 231 steps, THEN perform Step 4.12 AND take appropriate actions specified in TS 3.1.7, Action C.

4.8.7 Record final position of rods:

Group 1 Demand	H6	H10
Group 2 Demand	F8	K8

4.8.8 Verify all rod positions are within the ARM of group demand.

4.8.9 Verify Annunciator 210, Drop 29, ROD SEQUENCE VIOLATION, is clear.

4.8.10 Acceptance Criteria:

Verify all Control Bank A rods have moved at least 8 steps in any one direction by PPC indication (see Precaution 3.4 for inoperable PPC indication).

Does not exceed 231 steps for any rod in group

Correctly records position using step counters on the Flux Panel

Uses the Tech Data Book 2 Figure 13.1 or Operator Aid on Flux Panel to verify Allowed Rod Misalignment (ARM)

Verifies alarm clear

Verifies test results are met

Candidate reports Control Rod Bank A test is complete

Evaluator: "JPM IS COMPLETE"

Task Briefing

MTI has completed maintenance on the step counters for Control Bank A.

The Unit Supervisor directs you to perform a Full Length Operability test on Control Bank A in accordance with procedure 02-OHP-4030-212-015, Attachment 1, Step 4.8.

PPC turn on code for Rod Position Screen is "RSVANN."

NRC2007-SIM04

TITLE

Establish Letdown In Accordance With 02-OHP-4023-SUP-015 (ALT)

REVISION

0

PROGRAM

Initial Licensed Operator (ILT)

TIME

15 Minutes

SCOPE OF REVISION:

Initial Issue.

AUTHOR

Name:

John T Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

COURSE NUMBER AND TITLE:	NRC2007-SIM04 Establish Letdown IAW 02-OHP-4023-SUP-015 (Alternate Path to Excess Letdown)	REVISION: 0
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REFERENCES

01-OHP-4023-SUP-015, OPERATION OF NORMAL AND EXCESS LETDOWN

TASK ID: 0030020101 Place Letdown in Service
0030240101 Place Excess Letdown in Service

K/A Statement: SYS 014 A4.02
K/A Importance: 3.4/3.2

K/A Statement: 2.1.32 Ability to explain and apply all system limits and precautions.
K/A Importance: RO: 3.4 SRO: 3.8

EVALUATION SETTING

Simulator

HANDOUTS

01-OHP-4023-SUP-015, OPERATION OF NORMAL AND EXCESS LETDOWN
Task Briefing

ATTACHMENTS

None

SIMULATOR SETUP

Reset to **IC 992** (IC 38 with SGTR steps performed through E-3 Step 26)
Verify **ZGI101QRV111** override to **CLOSE**

COURSE NUMBER AND TITLE:	NRC2007-SIM04 Establish Letdown IAW 02-OHP-4023-SUP-015 (Alternate Path to Excess Letdown)	REVISION: 0
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TASK OBJECTIVES/STANDARDS

Place CVCS letdown in service in accordance with 2-OHP-4023-SUP-015. Recognize that normal letdown cannot be established and place Excess Letdown in service (Alternate Path).

EVALUATOR INSTRUCTIONS

Provide the operator with a completed copy of 02-OHP-4023-SUP-015, OPERATION OF NORMAL AND EXCESS LETDOWN

TASK BREIFING

You are the RO on Unit 2.

Unit 2 is responding to a SG Tube Rupture in accordance with 02-OHP-4023-E-3, Steam Generator Tube Rupture. The Unit Supervisor has requested that you place letdown in service in accordance with the 02-OHP-4023-SUP-015, OPERATION OF NORMAL AND EXCESS LETDOWN, per current procedure directions.

Number: 02 OHP 4023 SUP.015	Title: OPERATION OF NORMAL AND EXCESS LETDOWN	Revision Number: 0
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**1. Check Control Air To
Containment Established:**

WHEN control air to containment
is established,
THEN do Step 2.

a. Control air to
containment valves - OPEN

Continue with procedure and step
in effect.

- 2-XCR-100
- 2-XCR-101
- 2-XCR-102
- 2-XCR-103

2. Establish Normal Letdown:

IF excess letdown is available,
THEN go to Attachment A (Page 5).

a. Place 2-QRV-302, cold
letdown path select in
DIVERT (RC FILTER)

IF excess letdown is **NOT**
available,
THEN return to procedure and
step in effect.

b. Verify letdown orifice
valves - CLOSED

- 2-QRV-160
- 2-QRV-161
- 2-QRV-162

c. Open CVCS letdown
containment isolation
valves:

- 2-QCR-300
- 2-QCR-301

d. Reset **AND** open 2-CRV-470,
letdown HX temperature
control valve

e. Open RC letdown to regen
HX valves:

- 2-QRV-111
- 2-QRV-112

f. Adjust 2-QRV-301, letdown
pressure control to 50%
demand

(Step 2 Continued On Next Page)

Operator verifies air is available to containment

Operator places QRV-302 in the DIVERT position.

Operator verifies orifice isolation valves are closed (may give
switches a 'green target' is desired)

Operator verifies QCR-300/301 open.

Operator resets and opens 2-CRV-470.

CT: Operator attempts to open QRV-111.

NOTE: QRV-111 will not open.

CUE: If asked inform operator that Excess Letdown is desired.

Operator goes to Attachment A in accordance with Step 2 RNO
due to failure of QRV-111 to open.

Number: 02 OHP 4023 SUP.015	Title: OPERATION OF NORMAL AND EXCESS LETDOWN	Revision Number: 0
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Attachment A Placing Excess Letdown In Service		
1.	Check If RCP Seal Return Flow Should Be Established: a. CCP suction - ALIGNED TO RWST OR VCT b. Establish CCW to seal water heat exchanger if necessary c. Open RCP seal water return valves: • 2-QCM-250 • 2-QCM-350	Return to procedure and step in effect.

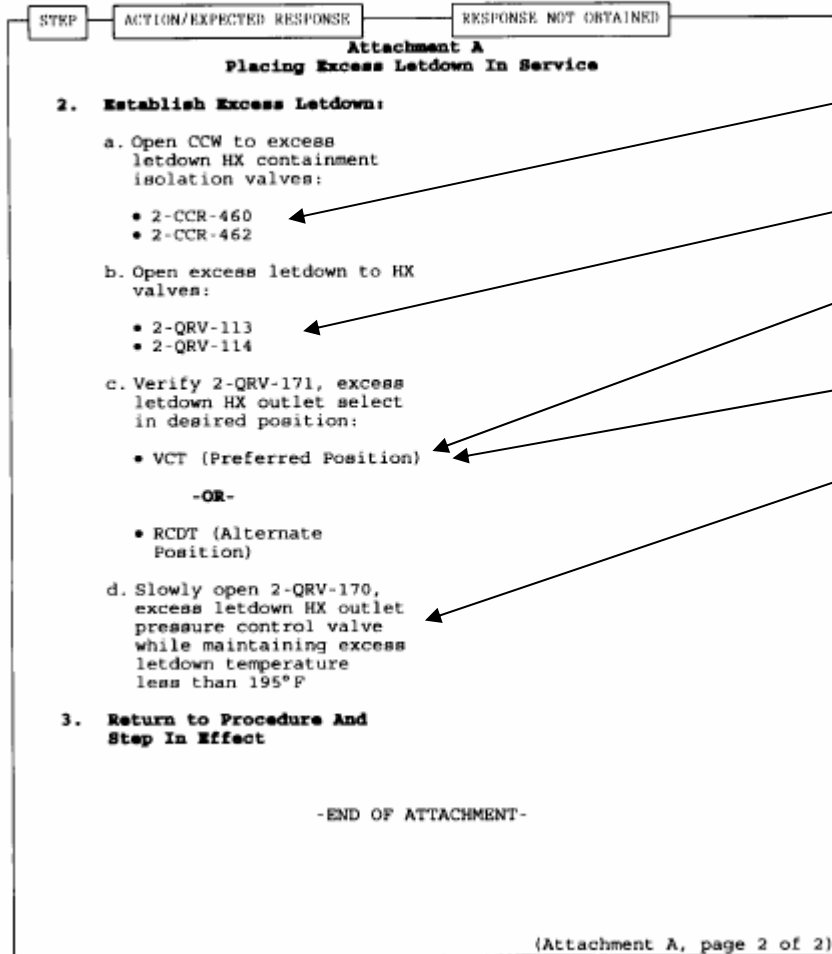
(Attachment A, page 1 of 2)

Operator verifies CCP suction is aligned as required.

CUE: CCW flow has been established to seal water heat exchanger.

CT: Operator opens QCM-250/350.

Number: 02 OHP 4023 SUP.015	Title: OPERATION OF NORMAL AND EXCESS LETDOWN	Revision Number: 0
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CT: Operator opens 2-CCR-460/462

CT: Operator Opens QRV-113/114.

CUE: If asked, inform operator that excess letdown return will be aligned to the preferred flowpath.

Operator places QRV-171 in the VCT position

CT: Operator opens QVR-170 while maintaining excess letdown temperature less than 195°F.

EVALUATOR: "This Completes the JPM"

Task Briefing

You are the RO on Unit 2.

Unit 2 is responding to a SG Tube Rupture in accordance with 02-OHP-4023-E-3, Steam Generator Tube Rupture. The Unit Supervisor has requested that you place letdown in service in accordance with the 02-OHP-4023-SUP-015, OPERATION OF NORMAL AND EXCESS LETDOWN, per current procedure directions.

NRC2007-SIM05

TITLE	Restore DG Power to T21D
PROGRAM	Initial Licensed Operator (ILT)

REVISION	0
TIME	15 Minutes

SCOPE OF REVISION:

Initial Issue: Derived from Audit02-Sim09

DATE:

AUTHOR

Name: John T Conrad

Signature:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

COURSE NUMBER AND TITLE:	NRC2007-SIM05 (Alternate Path) Restore DG Power to T21D	REVISION: 2
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REFERENCES

02-OHP-4023-SUP-012, Rev. 2 Restoring DG Power

K/A Cross Reference: 062-A4.01

K/A Importance: SRO 3.1 RO 3.3

K/A Cross Reference: 062-A2.05

K/A Importance SRO 3.3 RO 2.9

EVALUATION SETTING

Simulator

HANDOUTS

Task Briefing Sheet

02-OHP-4023-SUP-012 Attachment D

SIMULATOR SETUP

1. Reset to IC 987 with SGTR E-3 and Power Lost to T21D
2. IC created with:
 - Malfunctions
 - a. EG12C DG2CD Output Breaker T21C3 Fail to Close
 - b. EG12D DG2CD Output Breaker T21D8 Fail to Close
 - c. EG16B Prevent Blackout DG Start
 - d. RP19C Prevent DG SI start
 - e. Global Malfunction 101TD12 to lose T21D power
3. VERIFY T21D Pumps in PTL

<ol style="list-style-type: none"> a. East MDAFW PP b. East CCP c. East RHR PP d. North SI PP 	<ol style="list-style-type: none"> e. East CTS PP f. East CCW PP g. North NESW PP
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COURSE NUMBER AND TITLE:	NRC2007-SIM05 (Alternate Path) Restore DG Power to T21D	REVISION: 2
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TASK OBJECTIVES/STANDARDS

Electrical Power is restored to Bus T21D using 02-OHP-4023-SUP-012 Attachment D

TASK BRIEFING

You are an Extra Operator.

The US directs you to restore power to Bus T21D from DG2CD using Attachment D of 02-OHP-4023-SUP-012.

<small>Number:</small> 02-OHP-4023 SUP-012	<small>Title:</small> RESTORING DG POWER	<small>Revision Number:</small> 2
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Attachment D Restoring DG Power To T21D		
1.	Check Bus T21D - NOT LOCKED OUT <ul style="list-style-type: none">• "4KV Bus T21D CB T21D12 Trip" annunciator (Panel 220, Drop 96) - CLEAR	<p>Perform the following:</p> <ul style="list-style-type: none">a. Inform Unit Supervisor that Bus T21D can NOT be energized.b. Return to Supplement Body, Step 1 (Page 2).
2.	Verify Bus T21D Breakers - OPEN WITH GREEN TARGETS <ul style="list-style-type: none">• T21D12, Bus 2D Supply Breaker to Bus T21D• T21D9, 4KV Supply To TR21PHC• T21D1, 4KV EP Supply To Bus T21D	
3.	Place Bus T21D Load Control Switches In PULL TO LOCKOUT: <ul style="list-style-type: none">• East MDAFW pump• East CCP• East RHR pump• North SI pump• East CTS pump• East CCW pump	
4.	Check Bus T21C - ENERGIZED	Place north NESW pump in PULL TO LOCKOUT.
5.	Check DG2CD - NOT RUNNING	Go to Step 10 (Page 25).

(Attachment D, page 1 of 6)

Checks Panel 220 Drop 96 is Not Lit

Places C/S to Trip to get Green Target

Places C/S to Trip to get Green Target

Verifies Green Target

CUE: The required Pumps are placed in PTL (Step has already been performed)

Determines Bus T21C is NOT energized and N NESW should be in PTL

CUE: North NESW Pump is in PTL

Verifies DG2CD is NOT Running

Number: 02-OHP-4023 SUP-012	Title: RESTORING DG POWER	Revision Number: 2
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Attachment D Restoring DG Power To T21D		
6.	Check DG2CD Differential Lockout Relay - NOT TRIPPED	IF the DG was emergency tripped due to lack of cooling, THEN perform the following: a. Reset the HEA trip. b. IF the DG starts, THEN go to Step 10 (Page 25). IF the HEA trip was NOT due to an emergency trip, THEN perform the following: a. Inform Unit Supervisor that DG2CD has an HEA trip. b. Return to Supplement Body, Step 1 (Page 2).
7.	Check "DG2CD Incomplete Start" Annunciator - CLEAR • Panel 220, Drop 41	Perform the following: a. Locally attempt to determine and correct cause for DG2CD failure to start. b. Press DG2CD Incomplete Start Reset. c. IF DG2CD starts, THEN go to Step 10 (Page 25).

(Step 7 Continued On Next Page)

(Attachment D, page 2 of 6)

Verifies HEA Relay (87X-DGCD) was NOT Tripped

Verifies Panel 220 Drop 41 is NOT lit.

Number: 02-OHP-4023 SUP-012	Title: RESTORING DG POWER	Revision Number: 2
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p align="center">Attachment D Restoring DG Power To T21D</p> <p><i>(Step 7 Continued From Previous Page)</i></p>		
	<p>d. IF "DG Incomplete Start" annunciator (Panel 220, Drop 41) remains lit, THEN perform the following:</p> <ol style="list-style-type: none"> 1) Inform the Unit Supervisor that DG2CD has an incomplete start. 2) Return to Supplement Body, Step 1 (Page 2). 	
8.	<p>Momentarily Place DG2CD Stop-Run Control Switch In RUN</p>	
9.	<p>Check DG2CD - RUNNING</p> <p>Perform the following:</p> <ol style="list-style-type: none"> a. Inform the Unit Supervisor that DG2CD can NOT be started from the control room. b. Return to Supplement Body, Step 1 (Page 2). 	

(Attachment D, page 3 of 6)

CT: Places DG2CD C/S to Run

Cue: If Required, An AEO is currently at the DG2CD and is monitoring it for proper operation.

Verifies DG2CD Started

Number: 02-OHP-4023 SUP-012	Title: RESTORING DG POWER	Revision Number: 2
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Attachment D Restoring DG Power To T21D		
10.	Check Bus T21D - ENERGIZED Energize Bus T21D from DG2CD: a. Place T21D8 synch selector in MANUAL. b. Place T21D8, DG2CD Supply To Bus T21D, control switch in CLOSE. c. Place master synch switch in CLOSE. d. Place T21D8 synch selector in OFF.	
11.	Check ESW Flowpath To DG2CD - ESTABLISHED Manually start pump(s) and align valve(s) as necessary. • East ESW header pressurized: • 2-WMO-726, normal supply to DG2CD - OPEN -OR- • West ESW header pressurized: • 2-WMO-728, ALT supply to DG2CD - OPEN	

Determines Bus T21D is NOT Energized

CT: Places T21D8 Synch Selector to MANUAL

CT: Places T21D8 Control Switch to CLOSE

CT: Places Master Synch Switch to CLOSE and verifies T21D8 Closes.

Places T21D8 Synch selector in Off

Verifies ESW Valve WMO-726 is Open

Number: 02-OHP-4023 SUP-012	Title: RESTORING DG POWER	Revision Number: 2
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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Attachment D
Restoring DG Power To T21D

**12. Check 600 Volt Bus 21D
ENERGIZED**

Perform the following:

a. **IF** T21D is energized,
THEN perform the following:

1) Check Bus 21D **NOT** faulted by
the following annunciators
clear:

- "TR21D Differential
Operated" (Panel 220,
Drop 98)
- "TR21A 600V CB 21D1 Trip"
(Panel 220, Drop 99)
- "600V Bus 21D Ground"
(Panel 220, Drop 100)

2) **IF** Bus 21D is **NOT** faulted,
THEN close the following
breakers:

- a) T21D2, 4KV Supply To TR21D
- b) 21D1, Incoming Feed From
Transformer TR21D

(Step 12 Continued On Next Page)

(Attachment D, page 5 of 6)

Verifies 600V Bus 21D ENERGIZED

Evaluator: "JPM IS COMPLETE"

Task Briefing

You are an Extra Operator.

The US directs you to restore power to Bus T21D from DG2CD using Attachment D of 02-OHP-4023.SUP.012.

NRC2007-SIM06

TITLE

Switching CCW Pumps

PROGRAM

Initial Licensed Operator (ILT)

REVISION

0

TIME

20 Minutes

SCOPE OF REVISION:

Initial Issue: Derived from Audit06-Sim04

AUTHOR

Name:

John T Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

COURSE NUMBER AND TITLE:	NRC2007-Sim06 Switching CCW Pumps	REVISION: 0
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REFERENCES

02-OHP-4021-016-003 Rev. 15, Operation of the CCW System during System Startup and Power Operation

Task: 0160140101: Switch operating CCW pumps

K/A CROSS REFERENCE: 008 A4.01

K/A IMPORTANCE: RO 3.3 SRO 3.1

EVALUATION SETTING

Simulator

HANDOUTS

Task Briefing

Copy of 02-OHP-4021-016-003 Attachment 2

ATTACHMENTS

None

SIMULATOR SETUP

Initialize any IC with CCW in normal operation aligned as follows:

- East CCW Pump – In Service
- West CCW Pump – In Standby)

Verify prerequisites of controlling procedure are met

COURSE NUMBER AND TITLE:	NRC2007-Sim06 Switching CCW Pumps	REVISION: 0
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TASK OBJECTIVES/STANDARDS

Performs switching of the CCW pumps, observing all applicable precautions and limitations and procedure steps.

TASK BRIEFING

You are an Extra Operator

The US directs you to switch the running CCW pumps per 02-OHP-4021-016-003, Operation of the CCW System Startup and Power Operation.

Reference	2-OHP-4021-016-003	Rev. 18	Page 17 of 74
Component Cooling Water System Operation			
Attachment 2	Switching CCW Pumps	Pages: 14 - 21	

- 4.1.14 IF desired, **THEN** place 2-PP-10W, West CCW Pump control switch to - AUTO. _____
- 4.1.15 Verify CCW Pump flow requirements are met. _____
- 4.1.16 IF step 4.1.1 was performed, **THEN** null 2-CRV-470, Letdown HX Temp Ctrl controller **AND** place in - AUTO. _____
- 4.1.17 IF step 4.1.2 was performed **AND** Letdown temperature is stable, **THEN** place 2-QRV-302, Cold Letdown Path Select, in NORMAL (DEMIN) position. _____
- 4.2 To transfer from East to West CCW Pump **AND** Heat Exchangers: _____

NOTE: Changing CCW and Letdown temperatures can directly affect RCS Boron concentration and RCS temperature.

- 4.2.1 IF desired, **THEN** place 2-CRV-470, Letdown HX Temp Ctrl controller in - MAN. _____
- 4.2.2 IF desired, **THEN** place 2-QRV-302, Cold Letdown Path Select, in DIVERT (RC FILTER) position to bypass the RCS Demineralizers. _____
- 4.2.3 Align ESW flow to the West CCW Hx as necessary.
- 2-WMO-736, ESW Thru CCW HXs to West Hx - OPEN. _____
 - 2-WMO-738, ESW Thru CCW HXs From West Hx - THROTTLED as necessary. _____
- 4.2.4 Verify the following valves - OPEN:
- 2-CMO-415, East CCW to Misc Service Supply. _____
 - 2-CMO-416, West CCW to Misc Service Supply. _____
 - 2-CMO-411, East CCW Suct Hdr Xtie. _____
 - 2-CMO-413, West CCW Suct Hdr Xtie. _____
- 4.2.5 Verify 2-CMO-420, West CCW Hx Outlet - CLOSED. _____

General CUES:

1. Provide an annotated copy of 02-OHP-4021-016-003
2. Inform candidate the West CCW pump is operable

Operator determines this is the correct step to begin

CUE: Unit Supervisor determines that steps 4.2.1, and 4.2.2 are not required. The RO is monitoring RCP and Letdown temperature affects of this evolution.

Verifies 2-WMO-736 is open (red light lit)

CT: Throttles valve open (no specific initial intermediate position)
Evaluator Note: Initial (throttled) position of 2-WMO-738 is not critical however, this valve should be positioned in response to the high/low CCW temperature alarm (Annunciator #204, Drop 95 will alarm until load is placed on the HX).

Operator verifies each valve is OPEN in any order

Operator verifies valve is CLOSED

Reference	2-OHP-4021-016-003	Rev. 18	Page 18 of 74
Component Cooling Water System Operation			
Attachment 2	Switching CCW Pumps	Pages: 14 - 21	

- 4.2.6 Start 2-PP-10W, West CCW Pump. _____
- 4.2.7 Open 2-CMO-420, West CCW Hx Outlet. _____
- 4.2.8 Verify proper operation of 2-PP-10W, West CCW Pump. _____
- 4.2.9 IF the West CCW Pump is OPERABLE OR in Mode 5, 6, or Defueled, THEN verify at least one of the following valves – CLOSED: [Ref. 6.2.2c]
- 2-CMO-412, East CCW Disch Hdr Xtie. _____
 - OR-
 - 2-CMO-414, West CCW Disch Hdr Xtie. _____
- 4.2.10 IF the West CCW Pump is Inoperable AND in Mode 1-4, THEN verify the following valves – OPEN:
- 2-CMO-412, East CCW Disch Hdr Xtie. _____
 - 2-CMO-414, West CCW Disch Hdr Xtie. _____
- 4.2.11 Close 2-CMO-410, East CCW Hx Outlet _____
- 4.2.12 Stop 2-PP-10E, East CCW Pump. _____
- 4.2.13 Verify the following valves - OPEN:
- 2-CMO-412, East CCW Disch Hdr Xtie. _____
 - 2-CMO-414, West CCW Disch Hdr Xtie. _____
- 4.2.14 IF desired, THEN place 2-PP-10E, East CCW Pump control switch to - AUTO. _____
- 4.2.15 Verify CCW Pump flow requirements are met. _____
- 4.2.16 IF step 4.2.1 was performed, THEN null 2-CRV-470, Letdown HX Temp Ctrl controller AND place in - AUTO. _____
- 4.2.17 IF step 4.2.2 was performed AND Letdown temperature is stable, THEN place 2-QRV-302, Cold Letdown Path Select, in NORMAL (DEMIN) position. _____

CUE: "Starting Team has verified West CCW pump is ready for start"

CT: Operator starts West CCW pump

CT: Operator opens 2-CMO-420

Operator verifies pump flow and amps have stabilized.
CUE: "Starting Team reports normal pump running parameters"

CT: Operator closes at least one valve.

Operator determines step - N/A (West CCW Pump is OPERABLE)

CT: Operator closes valve 2-CMO-410

Note: Operator may declare East CCW Train Inoperable based on Step 3.4 (Step 4.2.9 & 4.2.11 meet action Level)

CT: Operator stops East CCW pump

CT: Operator verifies valves OPEN

Note: whichever valve(s) was/were closed in step 4.2.9, must be manually reopened

Operator places control switch to AUTO

Operator verifies flow meets Precaution 3.3
Reports task completed.

CUE: US determines these steps are NOT desired

EVALUATOR: "THIS JPM IS COMPLETE"

East CCW HX Low temp alarm will light due to no heat load.

Task Briefing

You are an Extra Operator

The US directs you to switch the running CCW pumps per 02-OHP-4021-016-003, Operation of the CCW System Startup and Power Operation.

NRC2007-SIM07

TITLE

Verify Containment Isolation Phase A IAW OHP-4023-E-0 Att. A (Alternate Path with OHP-4023-SUP-03)

REVISION

0

PROGRAM

Initial Licensed Operator (ILT)

TIME

15 Minutes

SCOPE OF REVISION:

Initial Issue

AUTHOR

Name:

John T Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

Facility Supervisor / Manager

**COURSE NUMBER
AND TITLE:****NRC2007-SIM07****REVISION: 1****REFERENCES**

02-OHP-4023-E-0 Reactor Trip or Safety Injection
02_OHP-4023-SUP-003 Phase A Isolation Checklist

TASK ID: ADM0370302 Verify Limiting Conditions for Operations are met in
accordance with Technical Specifications

K/A Statement: SYS 103 A2.03 Ability to (a) predict the impacts of a Phase A and B isolation
on the containment system and (b) based on those predictions, use procedures
to correct, control, or mitigate the consequences of those malfunctions or
operations

K/A Importance: RO: 3.5 SRO: 3.8

EVALUATION SETTING

Simulator – Cover PPC Screen With NRC2007-Sim07 Screen.

HANDOUTS

02-OHP-4023-E-0 Reactor Trip or Safety Injection
02_OHP-4023-SUP-003 Phase A Isolation Checklist

ATTACHMENTS

None

SIMULATOR SETUP

Reset to IC 987 with SGTR E-3 and Power Lost to T21D

Insert Malfunctions **RP13B & RP14B** to cause a failure of Train B Auto/Manual Phase A Isolation

- Modify Remote Function **IAR11** to **OPEN** to Cause XCR100 to stick open &
ZLO101XCR100[GRN] OFF

Insert Global Malfunction **101QCM250** to keep power off the valve.

Override Lights to Simulate QCR301 & DCR600 open.

- ZLO101DCR600[RED] ON
- ZLO101DCR600[GRN] OFF
- ZLO101QCR301[RED] ON
- ZLO101QCR301[GRN] OFF

**COURSE NUMBER
AND TITLE:**

NRC2007-SIM07

REVISION: 1

TASK OBJECTIVES/STANDARDS

Verify completion of Containment Isolation Phase A/Containment Vent Isolation/

EVALUATOR INSTRUCTIONS

Provide the operator with a completed copy of Attachment 1 of 01-OHP-4020-001-012 and Tech Data Book Figures

TASK BREIFING

You are the BOP on Unit 2.

The Unit Supervisor has requested that you verify Containment Isolation Phase A/Containment Vent Isolation in accordance with E-0, Attachment A.

Number: 2-OHP-4023 E-0	Title: REACTOR TRIP OR SAFETY INJECTION	Revision Number: 32
-------------------------------------	---	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
Attachment A Verification Of Balance Of Plant		
8. Check Containment Vent And Phase A Isolation:		
a. Containment isolation signal:		
<ul style="list-style-type: none"> • Ventilation - ACTUATED ON BOTH TRAINS • Phase A - ACTUATED ON BOTH TRAINS 		
b. Containment isolation status:		
<ul style="list-style-type: none"> • Ventilation - COMPLETED ON BOTH TRAINS • Phase A - COMPLETED ON BOTH TRAINS 		
	a. Manually actuate containment vent and Phase A isolation(s) as necessary.	
	b. Manually close valve(s) as necessary:	
	<ul style="list-style-type: none"> • Implement SUP-003, Phase A Isolation Checklist. 	
	-OR-	
	<ul style="list-style-type: none"> • Use the plant computer to determine valve(s) required to be closed. 	
	IF at least one valve in the following flowpath can NOT be manually closed, THEN locally close 2-QCM-350:	
	<ul style="list-style-type: none"> • RCP seal water return valves: • 2-QCM-250 • 2-QCM-350 	

(Attachment A, page 6 of 13)

CT: Operator recognizes that Containment Isolation Phase A, Train B did not actuate, and manually initiates

CT: Operator determines that Containment Isolation Phase A, Train B did not manually actuate.

CT: Operator recognizes that Containment Isolation Phase A, Train B valves are still open and

Note: Four valves (DCR-600, QCR-301, XCR-100, QCM-250) for Containment Isolation Phase A, Train A are also still open and will need to be closed in SUP-003.

CUE: The PPC Containment Isolation Screen function is NOT available.

CT: Operator Implements SUP-003.

Number: 02-OHP-4023 SUP-003	Title: PHASE A ISOLATION CHECKLIST	Revision Number: 1b
--	--	-------------------------------

STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED

NOTE

- Some penetrations may be open in accordance with EOP directions and are **NOT** required to be closed.
- Valves denoted by asterisks (*) may **NOT** remain fully closed due to pressure binding. Containment isolation is satisfied if at least one valve in each penetration is closed.

1. Check Containment Isolation Phase A Valves - **CLOSED** Manually close valves **NOT** in required position.

Train A	Train B	Flowpath Description
IV Panel		
2-VCR-103	2-VCR-203	Lower CNMT Purge Supply Air
2-VCR-10	2-VCR-11	Glycol to Air HDLG Units
2-XCR-100	2-XCR-101	Ctrl Air Supply Header No. 2
2-DCR-600	2-DCR-601	CNMT Sumps to Dirty WST HLD TK
2-DCR-201	2-DCR-203	RC Drain Tank to Vent Header
2-CCR-455		CCW to RX Support CLRS
2-VCR-104	2-VCR-204	Lower CNMT Purge Exhaust Air
2-VCR-20	2-VCR-21	Glycol from Air HDLG Units
2-XCR-102	2-XCR-103	Ctrl Air Supply Header No. 1
2-DCR-610	2-DCR-611	ICR Fan CLR Units Drain to WDS
2-DCR-202	2-DCR-204	RC Drain Tank to Gas Analyzer
2-CCR-456	2-CCR-457	CCW from RX Support CLRS

(Step 1 Continued On Next Page)

Operator closes all Containment Isolation Phase A, Train B valves on the IV panel.

Operator attempts to close XCR-100 and DCR-600.

NOTE: Only four valves are Critical Tasks associated with isolating containment due to Train A valves failing to close and Train B failure to actuate.

CT: Operator closes XCR-101

CT: Operator closes DCR-601

Number: 02-OHP-4023 SUP-003	Title: PHASE A ISOLATION CHECKLIST	Revision Number: 1b
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 1 Continued From Previous Page)

Train A	Train B	Flowpath Description
IV Panel (Continued)		
___ 2-VCR-105	___ 2-VCR-205	Upper CNTMT Purge Supply Air
___ 2-VCR-101	___ 2-VCR-201	INSTN Room Purge Supply Air
___ 2-DCR-620	___ 2-DCR-621	CNTMT Vent DRNS to WDS
___ *2-DCR-205	___ 2-DCR-206	RC Drain TK Pumps Suction
___ 2-CCR-462	___ 2-CCR-460	CCW to Excess Letdown HX
___ 2-QCR-301	___ 2-QCR-300	CVCS Letdown CNTMT Isolation
___ 2-VCR-106	___ 2-VCR-206	Upper CNTMT Purge Exhaust Air
___ 2-VCR-102	___ 2-VCR-202	INSTN Room Purge Exhaust Air
___ 2-RCR-100	___ 2-RCR-101	PRZ Relief TK to Auto Gas Anal.
___ 2-DCR-310		Steam Gen 1 Blowdown
___ 2-DCR-340		Steam Gen 4 Blowdown
___ 2-DCR-207		Nitrogen to RC Drain Tank
	___ 2-DCR-320	Steam Gen 2 Blowdown
	___ 2-DCR-330	Steam Gen 3 Blowdown
	___ 2-PCR-40	Plant Air to Containment
___ 2-NCR-252		Primary Water to Containment
___ 2-GCR-301		Nitrogen to PRZ Relief TK
___ 2-QCR-919	___ *2-QCR-920	Demin Water to Containment

(Step 1 Continued On Next Page)

Operator closes all Containment Isolation Phase A, Train B valves on the IV panel.

Operator attempts to close QCR-301.

NOTE: Only four valves are Critical Tasks associated with isolating containment due to Train A valves failing to close and Train B failure to actuate.

CT: Operator closes QCR-300

Number: 02-OHP-4023 SUP-003	Title: PHASE A ISOLATION CHECKLIST	Revision Number: 1b
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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(Step 1 Continued From Previous Page)

IV Panel Status Light Panels		
Indicating Lights	Status Lights	Panel Description
SML-1	SML-4	H₂ Sampling Isol Valves
— 2-ECR-11 and 21		H ₂ SMPL FM E UP CNTMT
— 2-ECR-12 and 22		CNTMT Air (E RECOMB)
— 2-ECR-13 and 23		H ₂ SMPL FM E LWR CNTMT
— 2-ECR-15 and 25	— 2-ECR-14 and 24	H ₂ SMPL FM W LWR CNTMT
		H ₂ SMPL FM E CNTMT DOME
	— 2-ECR-16 and 26	H ₂ SMPL FM W CNTMT DOME
	— 2-ECR-17 and 27	H ₂ SMPL FM W UP CNTMT
	— 2-ECR-18 and 28	CNTMT Air (W RECOMB)
	— 2-ECR-19 and 29	H ₂ SMPL FM Dome Top
— 2-ECR-10	— 2-ECR-20	H ₂ SMPL RET To CNTMT
SML-2	SML-5	Nuclear SMPLG Isol Vlvs
— 2-ECR-416	— 2-ECR-417	Lwr CNTMT Sump To PASS
— 2-ECR-535	— 2-ECR-536	Lwr CNTMT Air To PASS
— 2-ECR-496	— 2-ECR-497	Waste TK RET To CNTMT
SML-3	SML-6	Nuclear SMPLG CIVs
— 2-DCR-301		SG1 BLDN Sample
— 2-DCR-302		SG2 BLDN Sample
— 2-DCR-303		SG3 BLDN Sample
— 2-DCR-304		SG4 BLDN Sample
— 2-MCR-251		SG1 Steam Lead Sample
— 2-MCR-252		SG2 Steam Lead Sample
— 2-MCR-253		SG3 Steam Lead Sample
— 2-MCR-254		SG4 Steam Lead Sample
— 2-NCR-109	— 2-NCR-110	PZR Steam Space Sample
— 2-NCR-107	— 2-NCR-108	PZR Liquid Space SMPL
— 2-NCR-105	— 2-NCR-106	Loop 1 & 3 Hot Leg SMPL
— 2-ICR-5	— 2-ICR-6	Accumulator Sample

(Step 1 Continued On Next Page)

Page 4 of 6

Operator verifies all Containment Isolation Phase A, Train A and B valves on SML-1 and SML-4 indicate closed.

NOTE: Only four valves are Critical Tasks associated with isolating containment due to Train A valves failing to close and Train B failure to actuate.

Number: 02-OHP-4023 SUP-003	Title: PHASE A ISOLATION CHECKLIST	Revision Number: 1b
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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(Step 1 Continued From Previous Page)

Train A	Train B	Flowpath Description
CCW Panel		
	2-CRV-485	CCW to South Boric Acid Evap
	2-CRV-445	CCW from South Spent Fuel Pit HX
Containment Spray & Relief Panel		
2-VCR-107	2-VCR-207	Relief Valve IC Relief Valve OC
Safety Injection/Accumulators Panel		
2-GCR-314		Accumulators N ₂ Supply
CVCS Charging & Letdown Panel		
2-QCM-250	2-QCM-350	RCP Seal Water Return
2-QRV-161		75 GPM Letdown Orifice
2-QRV-162		75 GPM Letdown Orifice
2-QRV-160		45 GPM Letdown Orifice

2. Check At Least One RCP Seal Water Return Isolation Valve - CLOSED

- 2-QCM-250
- 2-QCM-350

IF RCP seal water return is required to be isolated, THEN locally close 2-QCM-350, RCP seal water return isolation valve.

Operator closes all remaining Containment Isolation Phase A, Train B.

Operator closes 2-CRV-445, CCW from South SFP Hx

NOTE: Only four valves are Critical Tasks associated with isolating containment due to Train A valves failing to close and Train B failure to actuate.

Operator recognized no power to 2-QCM-250

CT: Operator closes QCM-350

EVALUATOR: "JPM IS COMPLETE."

Task Briefing

You are the BOP on Unit 2.

The Unit Supervisor has requested that you verify Containment Isolation Phase A/Containment Vent Isolation in accordance with E-0, Attachment A.

NRC2007-Sim08

TITLE

**Depressurize the RCS to Minimize Backflow/Refill
the Pressurizer during SGTR**

REVISION

1

PROGRAM

Initial Licensed Operator (ILT)

TIME

20 Minutes

SCOPE OF REVISION: New Issue

AUTHOR

Name:

Ted Conrad

Signature:

DATE:

**FACILITY
REVIEWER**

Name:

Signature:

TITLE:	NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR	REVISION: 1
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REFERENCES

2-OHP-4023-E-3, Steam Generator Tube Rupture

TASK

TASK ID: EOP0070501, Control RCS Pressure and Inventory following a SGTR.

K/A Statement: EPE 038 EA1.04, Ability to operate and monitor the PZR spray, to reduce coolant system pressure as it applies to a SGTR:

K/A Importance: RO: 4.3 SRO: 4.1

EVALUATION SETTING

Simulator

HANDOUTS

2-OHP-4023-E-3, Steam Generator Tube Rupture

Handout 1, 2-OHP-4023-E-3, Attachment B.

ATTACHMENTS

None

TITLE:	NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR	REVISION: 1
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SIMULATOR SETUP

Reset to an IC 988 with:

- Globals on QMO-200, IMO 255 (Valves that have lost power from T21D)
- A SGTR in progress and ready to depressurize RCS
- Bus T21D de-energized
- Trigger NRV-163/164 to 5% open when Red Light is lit.
 - **TRG 2 PZR Spray Open (ZLONRV163(2) == -1), MF RC15A & RC15B to 5%**
- Close PRZ PORV Block Valves **NMO151 & NMO153, PORV NRV-151**, Caution Tag NRV 153 & Block Closed for Leakage, Clearance Tag NRV-151 & NMO151
- Insert Global Malfunctions **101NRV151, 101NRV152, 101NRV 153 & 101NMO151**
- Override Lights **OFF** on **ZLO101NRV152[GRN] & ZLO101NRV153[GRN]**
- **Trg 1 – NMO153 to Open (ZGI101NMO153 == 2), MF 101NMO153**
- **OOS Tag NRV & NMO 151, Caution Tag NMO 153**
-

TASK OBJECTIVES/STANDARDS

Perform RCS Depressurization to Minimize Break Flow and Refill the Pressurizer using Aux Spray.

EVALUATOR INSTRUCTIONS

Provide the operator with 2-OHP-4023-E-3, Steps 18, 19, and 20, and Attachment B (Handout)

TASK BRIEFING

You are the RO in Unit 2.

Unit 2 is responding to a SG Tube Rupture on SG 22. The cooldown is complete. The Unit Supervisor has requested that you implement Step 17 of 2-OHP-4023-E-3 to Depressurize the RCS to Minimize Break Flow and Refill the Pressurizer.

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 14 Continued From Previous Page)		
	c. Maintain core exit TCs - LESS THAN REQUIRED TEMPERATURE	
15.	Check Ruptured SG(s) Pressure - STABLE OR RISING	Perform the following: a. Attempt to maintain a minimum ΔP of 250 psid between the ruptured and intact SGs. b. Initiate RCS cooldown at less than 100°F/hr if necessary. c. IF the minimum ΔP of 250 psid can NOT be maintained, THEN go to ECA-3.1, SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired, Step 1.
16.	Check RCS Subcooling Based On Core Exit TCs - GREATER THAN 60°F	Go to ECA-3.1, SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired, Step 1.
17.	Depressurize RCS To Minimize Break Flow And Refill PRZ:	
	a. Normal PRZ spray - AVAILABLE	a. Go to Step 18 (Page 18). OBSERVE CAUTIONS AND NOTE PRIOR TO Step 18.
(Step 17 Continued On Next Page)		

Page 16 of 46

Operator determines that Normal Spray is available (Air to containment and RCP3/4 running)

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number: 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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CT: Operator opens NRV-163 and NRV-164 full open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
(Step 17 Continued From Previous Page)						
	<p>b. Spray PRZ with maximum available spray until ANY of the following conditions - SATISFIED</p> <ul style="list-style-type: none">• Use Attachment B, RCS Depressurization Termination Handout (Page 45) as desired	<p>b. IF normal spray is NOT effective, THEN go to Step 18 (Page 18). OBSERVE CAUTIONS AND NOTE PRIOR TO Step 18.</p>				
<table border="1"><thead><tr><th>Conditions For Terminating RCS Depressurization</th></tr></thead><tbody><tr><td>BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]</td></tr><tr><td>PRZ level - GREATER THAN 70% [65% ADVERSE]</td></tr><tr><td>RCS subcooling based on core exit TCs - LESS THAN 40°F</td></tr></tbody></table>			Conditions For Terminating RCS Depressurization	BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]	PRZ level - GREATER THAN 70% [65% ADVERSE]	RCS subcooling based on core exit TCs - LESS THAN 40°F
Conditions For Terminating RCS Depressurization						
BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]						
PRZ level - GREATER THAN 70% [65% ADVERSE]						
RCS subcooling based on core exit TCs - LESS THAN 40°F						
	<p>c. Close PRZ spray valve(s):</p> <ul style="list-style-type: none">• 2-NRV-163• 2-NRV-164	<p>c. Stop RCP 3 AND RCP 4 to stop PRZ spray flow.</p> <p>IF PRZ pressure continues to lower, THEN stop one additional RCP to stop PRZ spray flow.</p>				
	<p>d. Go to Step 20 (Page 23) OBSERVE CAUTION PRIOR TO Step 20</p>					

CT: Operator determines that spray valves are not being effective in reducing RCS pressure, THEN goes to Step 18.

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number: 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP ACTION/EXPECTED RESPONSE RESPONSE NOT OBTAINED

CAUTION

- PRT rupture may cause abnormal containment conditions.
- Excessive cycling of a PRZ PORV may result in failure of the PORV.

NOTE

If RCPs are **NOT** running, the upper head region may void during RCS depressurization. This will result in a rapidly rising PRZ level requiring prompt action to stop the depressurization if PRZ level criteria are met.

18. Depressurize RCS Using PRZ PORV To Minimize Break Flow And Refill PRZ:

a. PRZ PORV - AT LEAST ONE AVAILABLE

a. **IF** normal PRZ spray is available,
THEN return to Step 17.b.

IF normal PRZ spray is **NOT** available,
THEN perform the following:

1) Verify the following running:

- At least one SI pump
- At least one CCP

IF less than the required pumps are running,
THEN go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.

(Step 18 Continued On Next Page)

Operator determines that NO PORVs are available

Operator May try to Open NMO 153, But the Breaker for the Valve will Trip

Operator determines that Normal Spray is NOT available.

Operator verifies that at least one SI and one CCP are in operation.

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number: 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
(Step 18 Continued From Previous Page)						
	2) Go to Step 19 (Page 20).					
	b. Open one PRZ PORV until ANY of the following conditions - SATISFIED					
	• Use Attachment B, RCS Depressurization Termination Handout (Page 45) as desired					
	<table border="1"><thead><tr><th>Conditions For Terminating RCS Depressurization</th></tr></thead><tbody><tr><td>BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]</td></tr><tr><td>PRZ level - GREATER THAN 70% [65% ADVERSE]</td></tr><tr><td>RCS subcooling based on core exit TCs - LESS THAN 40°F</td></tr></tbody></table>		Conditions For Terminating RCS Depressurization	BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]	PRZ level - GREATER THAN 70% [65% ADVERSE]	RCS subcooling based on core exit TCs - LESS THAN 40°F
Conditions For Terminating RCS Depressurization						
BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]						
PRZ level - GREATER THAN 70% [65% ADVERSE]						
RCS subcooling based on core exit TCs - LESS THAN 40°F						
c. Close PRZ PORV	c. Close PORV block valve.					
d. Verify normal PRZ spray valves - CLOSED	d. Stop RCP 3 AND RCP 4 to stop PRZ spray flow.					
• 2-NRV-163 • 2-NRV-164	IF PRZ pressure continues to lower, THEN stop one additional RCP to stop PRZ spray flow.					
(Step 18 Continued On Next Page)						

CT: Operator transitions to Step 19.

If Operator tries to Open PORVs & discovers not available, Direct as US to perform Step 18 a RNO.

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 18 Continued From Previous Page)	
	e. Check RCS Pressure - RISING	e. Close PRZ PORV block valve. IF pressure continues to lower, THEN go to ECA-3.1, SGTR With Loss Of Reactor Coolant - Subcooled Recovery Desired, Step 1.
	f. Go to Step 20 (Page 23) OBSERVE CAUTION PRIOR TO Step 20	
19. Depressurize RCS Using Auxiliary Spray:		
	a. Reset and open both CCP leakoff valves: <ul style="list-style-type: none">• 2-QMO-225• 2-QMO-226	
	b. Close BIT inlet valves: <ul style="list-style-type: none">• 2-IMO-255• 2-IMO-256	b. Close BIT outlet valves: <ul style="list-style-type: none">• 2-ICM-250• 2-ICM-251 IF the BIT outlet valves can NOT be closed, THEN go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.
	(Step 19 Continued On Next Page)	

CT: Operator resets and opens QMO-225/226.

CT: Operator closes BIT Inlet Valves.

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number: 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 19 Continued From Previous Page)		
	c. Open the following valves: <ul style="list-style-type: none">• 2-QRV-251, CCP discharge flow control valve• 2-QRV-200, charging header pressure control valve• 2-QMO-200, charging flow to regen heat exchanger valve• 2-QMO-201, charging to regen heat exchanger valve	c. Go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.
	d. Close PRZ spray valves: <ul style="list-style-type: none">• 2-NRV-163• 2-NRV-164	d. Go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.
	e. Open 2-QRV-51, aux spray valve	e. Go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.
	f. Close charging line to cold leg valves: <ul style="list-style-type: none">• 2-QRV-61• 2-QRV-62	f. Perform the following: 1) Open charging line to cold leg valves: <ul style="list-style-type: none">• 2-QRV-61• 2-QRV-62 2) Close 2-QRV-51, aux spray valve.
(Step 19 Continued On Next Page)		

CT: Operator opens the following valves:

- 2-QRV-251
- 2-QRV-200
- 2-QMO-200
- 2-QMO-201

Operator closes normal spray valves.

CT: Operator opens QRV-51.

CT: Operator closes QRV-61/62.

TITLE:

NRC2007-Sim08 - Depressurize the RCS to Minimize Backflow/Refill the Pressurizer during SGTR

REVISION: 1

Number 02-OHP-4023 E-3	Title: STEAM GENERATOR TUBE RUPTURE	Revision Number: 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
(Step 19 Continued From Previous Page)						
	<p>g. Depressurize RCS until ANY of the following conditions - SATISFIED</p> <ul style="list-style-type: none">• Use Attachment B, RCS Depressurization Termination Handout (Page 45) as desired	<p>3) Go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.</p> <p>g. IF aux spray is NOT effective, THEN perform the following:</p> <ol style="list-style-type: none">1) Open charging line to cold leg valves:<ul style="list-style-type: none">• 2-QRV-61• 2-QRV-622) Close 2-QRV-51, aux spray valve.3) Go to ECA-3.3, SGTR Without Pressurizer Pressure Control, Step 1.				
<table border="1"><thead><tr><th>Conditions For Terminating RCS Depressurization</th></tr></thead><tbody><tr><td>BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]</td></tr><tr><td>PRZ level - GREATER THAN 70% [65% ADVERSE]</td></tr><tr><td>RCS subcooling based on core exit TCs - LESS THAN 40°F</td></tr></tbody></table>			Conditions For Terminating RCS Depressurization	BOTH: • RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE • PRZ level - GREATER THAN 20% [24% ADVERSE]	PRZ level - GREATER THAN 70% [65% ADVERSE]	RCS subcooling based on core exit TCs - LESS THAN 40°F
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RCS subcooling based on core exit TCs - LESS THAN 40°F						
	<p>h. Open charging line to cold leg valves:</p> <ul style="list-style-type: none">• 2-QRV-61• 2-QRV-62					
	<p>i. Close 2-QRV-51, aux spray valve</p>					

CT: Operator depressurizes RCS until the conditions for Attachment B are met. (See Handout)

Operator opens QRV-61/62

CT: Operator stops spray flow when conditions of Attachment B are complete.

EVALUATOR: "This JPM is complete."

Task Briefing

You are the RO in Unit 2.

Unit 2 is responding to a SG Tube Rupture on SG 22. The cooldown is complete. The Unit Supervisor has requested that you implement Step 17 of 2-OHP-4023-E-3 to Depressurize the RCS to Minimize Break Flow and Refill the Pressurizer.