

**RIVER BEND STATION
APPROVAL SHEET
STATION OPERATING PROCEDURES**

NO. GOP- 0007

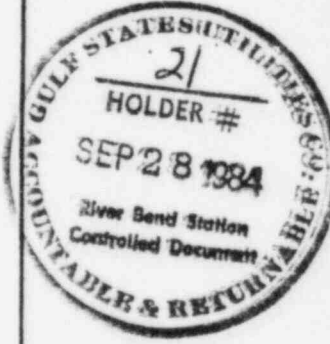
TITLE SCRAM RECOVERY

SAFETY RELATED

YES ☒ NO ☐

TECHNICAL REVIEW REQUIRED

YES ☒ NO ☐

REV. NO.	PAGES ISSUED	INDEP. REVIEW SIGNATURE/DATE	TECH. REVIEW SIGNATURE/DATE	APPROVED BY SIGNATURE/DATE	EFFECT DATE
9	1 THRU 10 LATER'S PAGE	<i>C.D. Byler</i>	<i>P. M. Ruby 9/18/84</i>	<i>B. J. Kellie 9/24/84</i>	09/28/84
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 60%;"> <p align="center">FOR INFORMATION ONLY</p> <p align="right">B</p> </div>					
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<div style="text-align: right; margin-right: 100px;"> <p>RECEIVED</p> <p>SEP 25 1984</p> <p>CFR</p> </div>					
<div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> <p>B507170524 B50709 PDR ADOCK 0500045B A PDR</p> </div> </div>					

(LATER'S)

PROC. NO. GOP-0007 TITLE SCRAM RECOVERY

REV. NO. 0

The following is a list of "missing" and/or "tentative information" -- (LATER'S) -- in this procedure. The responsible Section Supervisor shall update this procedure as the information becomes available.

(LATER) LOCATION

SECTION/STEP	PAGE	BRIEF DESCRIPTION
Attachment 1, 5.0/5.2	4	Manual or Procedure Number for Computer
Attachment 1, 5.0/5.3	4	Differential Temperature Setpoint
Attachment 2, 5.0/5.2	8	Manual or Procedure Number for Computer
Attachment 2, 5.0/5.3	8	Differential Temperature Setpoint

SCRAM RECOVERY

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1.0 PURPOSE

To provide instructions to the Operations Section Personnel for plant recovery following a reactor scram. It is assumed that all applicable sections of AOP-0001 "Reactor Scram" and, if necessary, EOP-0001 "RPV Control" have been completed prior to entry into this procedure.

The actions specified in this procedure are intended to prepare the plant for a subsequent startup (GOP-0005) or Shutdown to HOT SHUTDOWN (GOP-0003) or Cold Shutdown (GOP-0004).

Administrative requirements are contained in ADM-0022 "Conduct of Operations".

2.0 REFERENCES

- 2.1 ANSI N18.7-196 Administration Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants.
- 2.2 "Preparation of Operations Section Procedures", OSP-0007.
- 2.3 River Bend Unit 1 Technical Specifications.
- 2.4 River Bend Station Final Safety Analysis Report.
- 2.5 "Development, Control and Use of Procedures", ADM-0003.
- 2.6 System Operating Procedures:
 - 2.6.1 "Circulating Water", SOP-0006.
 - 2.6.2 "Feedwater", SOP-0009.
 - 2.6.3 "Residual Heat Removal", SOP-0031.
 - 2.6.4 "Reactor Core Isolation Cooling", SOP-0035.
 - 2.6.5 "Reactor Water Cleanup", SOP-0090.
 - 2.6.6 "Off Gas System", SOP-0092.
 - 2.6.7 "Condensate Demineralizer", SOP-0093.
 - 2.6.8 "Main Turbine", SOP-0080.
- 2.7 Abnormal Operating Procedure, "Reactor Scram", AOP-0001.
- 2.8 Emergency Operating Procedures, "RPV Control", EOP-0001.
- 2.9 GSU Operational QA Manual, Section XIV.
- 2.10 Administrative Procedure ADM-0022, "Conduct of Operations".

INITIATED

ON: DATE _____
AT: TIME _____
BY: NCO _____
SS _____

COMPLETED

ON: DATE _____
AT: TIME _____
BY: NCO _____
SS _____

OTHER DOCUMENTS ATTACHED: _____

REMARKS: _____

3.0 PRECAUTIONS

- 3.1 Following a reactor scram from high power levels there is an initial RPV level "Shrink" of 20 to 40 inches followed by a "Swell" of approximately 10 to 20 inches. The Feedwater Level Control System is programmed to "ride out" this shrink and swell without overfilling the RPV. DO NOT attempt to take manual control of the level unless misoperation in automatic is obvious.
- 3.2 If Reactor Recirc Pumps should trip, they should be restarted on LFNG to assure adequate mixing of RPV Coolant and prevent stagnation of Cool Water in the bottom head region. Consult SOP-0003 for pump restart precautions.
- 3.3 If feedwater regulating valves leak excessively, close MOV's [1FWS-MOV27A, 27B and/or 27C] to prevent overfilling the RPV.

4.0 LIMITATIONS AND ACTIONS

- 4.1 RPV level should be maintained between +35" and +45" on the Wide Range Level Recorder, throughout this procedure unless specifically directed otherwise.

- 4.2 Limit the reactor coolant temperature change to less than or equal to 100°F when averaged over any one hour period (Technical Specifications 3.4.6.1).
- 4.3 When heat is being added to the suppression pool, maintain pool temperature per (Technical Specification 3.6.3.1).
- 4.4 Whenever the Condensate/Feedwater System is providing primary makeup to the RPV with the RPV water temperature greater than or equal to 212°F, condenser vacuum should be maintained between 23 Hg and 28 in. Hg to assure deaeration of the feedwater and reduce the possibility of Inter-Granular Stress Corrosion.
- 4.5 The Main Turbine must remain on Turning Gear whenever the Steam Seals are on.
- 4.6 Maintain Condensate Demin inlet temperature less than 130°F.
- 4.7 Complete administrative requirements in reference 2.9 before restarting the reactor.

PROCEDURE NOTES

- 5.1 As feed flow is reduced, reduce on-line condensate demins per SOP-0093 to maintain flow through each demin between 1250 GPM and 2350 GPM.
- 5.2 Block the NSSS Computer P-1 Calculations per (LATER).
- 5.3 If RPV drain temperature to saturated steam temperature differential exceeds 100°F then depressurize the RPV as necessary to maintain this differential temperature less than (LATER).
- 5.4 Anytime steam loads are reduced (such as when steam drains are closed or steam driven equipment is shutdown) maintain RPV pressure control with the Bypass Valves.
- 5.5 Except as specified, primary RPV level control will be with makeup from the Feedwater System with reject as necessary (to control increasing level) from RWCU Blowdown to the main condenser per SOP-0090.
 - 5.5.1 Maintain condenser vacuum between 23" Hg and 28" Hg.
- 5.6 If the circulating water pumps trip and cannot be immediately started, close MSIV's and enter Attachment 2 of this procedure.
- 5.7 The reactor scram must be reset in order to restore normal CRD Hydraulic System operation.

STEP		INITIAL
1.	Verify/establish on-scale neutron monitoring on the SRM's and IRM's	
2.	Maintain RPV pressure at approximately 950 Psig using any of the following: a. Main Turbine Bypass Valves per SOP-0080. 1) On automatic pressure control 2) With bypass valve opening jack b. Normal plant steam loads. 1) SJAE per SOP-0025 2) Steam seals per SOP-0015 3) Radwaste reboiler per SOP-0026 4) Off gas preheater per SOP-0092 5) MSL drains per SOP-0011 c. RCIC per SOP-0035.	
3.	Verify Main Turbine Steam Seals are being maintained at approximately 4 Psig.	
4.	Maintain RPV level using condensate/feedwater as follows: a. Transfer level control to single element as follows; 1) Verify RPV level is stable at the MASTER LEVEL CONTROL [C33-R600] setpoint (will be in "Setdown"). 2) Verify steam flow and feed flow are approximately equal. 3) Select the 1 pushbutton on the ELEMENT 1 OR 3 SELECT. 4) Depress the level "Setdown" reset pushbutton as necessary to restore RPV level setpoint to 35" to 38". b. Shutdown condensate pumps and feedpumps as necessary to have one condensate and one feedwater pump running. c. If necessary, start RCIC per SOP-0035. d. Use RWCU blowdown per SOP-0090 if RPV level increases to +50".	
5.	If tripped, restart reactor recirculation pumps on LFMG per SOP-0003 a. Open flow control valves to the full open position (see Tech Spec 4.4.1.4).	
6.	Verify the HCU scram accumulators have been recharged, by observing the ACCUM FAULT indicating lights on 1H13-P680 are out.	
7.	Shutdown both heater drain pumps per SOP-0010.	
8.	Open/verify open main steam drain valves [1B21-MOVE021 and F068].	

STEP		INITIAL
9.	Shutdown feedwater heaters extraction steam per SOP-0010.	
10.	Consistent with decay heat availability, open the following drain valves to the main condenser; a. Main Stop before Seat [1DTM-MOVSV1, SV3, SV5, SV7] b. SJAE Supply Line [1DTM-MOV175] c. Main Steam Header [1DTM-MOV12A and 12B] d. Main Steam Line [1B21-MOVF066A-D] e. Main Steam Line [1B21-MOVF070] f. Main Steam Line Drain Header [1B21-MOVF015, F016, F085] g. MSIV Before Seat [1B21-MOV068, 1DTM-MOV199] h. Reheater Steam Supply [1DTM-MOV51A and B, 54A and B] i. Crossaround Piping [1DTM-MOVCA1-CA6] j. Extraction Line [1DTM-AOV32A, 32B, 35A, 35B, 41A, 41B]	
11.	Start air removal pumps per SOP-0025, if required (SJAE inadequate) a. Maintain vacuum between 23" Hg and 28" Hg	
12.	Shutdown moisture separator/reheaters and establish steam blanketing per SOP-0010.	
13.	Complete the Scram Report and Post Trip Review Checklist (in reference 2.9).	
14.	If Plant Shutdown is desired, notify System Dispatcher and enter GOP-0003 or GOP-0004.	
15.	If it is desired to startup the Plant, perform the following: a. Verify the cause of the scram is known and no longer exists. b. Verify that the necessary maintenance actions and post-maintenance tests to correct any malfunction that caused or contributed to the scram have been corrected. c. Enter GOP-0005.	
16.	Submit the completed Scram Report, Post Trip Review Checksheet and this attachment to the Operations Supervisor for review.	

INITIATED

ON: DATE _____
AT: TIME _____
BY: NCO _____
SS _____

COMPLETED

ON: DATE _____
AT: TIME _____
BY: NCO _____
SS _____

OTHER DOCUMENTS ATTACHED: _____

REMARKS: _____

3.0 PRECAUTIONS

- 3.1 Following a reactor scram from high power levels there is an initial RPV level "Shrink" of 20 to 40 inches followed by a "Swell" of approximately 10 to 20 inches. The Feedwater Level Control System is programmed to "ride out" this shrink and swell without overfilling the RPV. DO NOT attempt to take manual control of the level unless misoperation in automatic is obvious.
- 3.2 If Reactor Recirc Pumps should trip, they should be restarted on LFMG to assure adequate mixing of RPV Coolant and prevent stagnation of Cool Water in the bottom head region. Consult SOP-0003 for pump restart precautions.
- 3.3 If feedwater regulating valves leak excessively, close MOV's [1FWS-MOV27A, 27B and/or 27C] to prevent overfilling the RPV.
- 3.4 One loop of RHR should be left available for shutdown cooling or suppression pool cooling (B loop is preferred).

4.0 LIMITATIONS AND ACTIONS

- 4.1 RPV level should be maintained between +35" and +45" on the Wide Range Level Recorder, throughout this procedure unless specifically directed otherwise.
- 4.2 Limit the reactor coolant temperature change to less than or equal to 100°F/hr when averaged over any one hour period (Technical Specifications 3.4.6.1).
- 4.3 When heat is being added to the suppression pool, maintain pool temperature per (Technical Specifications 3.6.3.1).
- 4.4 Whenever the Condensate/Feedwater System is providing primary makeup to the RPV with the RPV water temperature greater than or equal to 212°F, condenser vacuum should be maintained between 23 Hg and 28 in. Hg. to assure deaeration of the feedwater and reduce the possibility of Inter-Granular Stress Corrosion.
- 4.5 The Main Turbine must remain on Turning Gear whenever Steam Seals are on.
- 4.6 Maintain Condensate Demin inlet temperature less than 130°F.
- 4.7 Do not shutdown one Decay Heat Removal mode unless a second mode is in service and demonstrated adequate.
- 4.8 Complete administrative requirements in reference 2.9 before restarting the reactor.

5.0 PROCEDURE NOTES

- 5.1 As feed flow is reduced, reduce on-line condensate demins per SOP-0093 to maintain flow through each demin between 1250 GPM and 2350 GPM.
- 5.2 Block the NSSS Computer P-1 Calculations per (LATER).
- 5.3 If RPV drain temperature to saturated steam temperature differential exceeds 100°F, then depressurize the RPV as necessary to maintain this differential temperature less than (LATER).
- 5.4 Except as specified, primary RPV pressure control will be with RCIC initially, with RHR Steam Condensing Mode placed in service as soon as possible. If necessary, SRV's will be used to supplement/augment RCIC/RHR.

5.6 RHR should be operated in Suppression Pool Cooling anytime heat is being added to the suppression pool.

STEP		INITIAL
1.	Verify/establish on scale neutron monitoring on SRM's and IRM's.	
2.	Maintain RPV pressure; use the following systems as needed (listed in order of preference): a. RCIC in CST to CST recirc per SOP-0035. b. Steam condensing mode of RHR SOP-0031. c. SRV's per SOP-0029. Alternate opening SRV's as necessary to equalize suppression pool heating. d. Steam line drains (if condenser is available).	
3.	Maintain RPV level; use the following systems as needed (listed in order of preference): a. Condensate/feedwater; transfer to single element as follows; 1) Verify RPV level is stable at the MASTER LEVEL CONTROL [C33-R600] setpoint (will be in "Setdown"). 2) Verify steam flow and feed flow are approximately equal. 3) Select the 1 pushbutton on the ELEMENT 1 OR 3 SELECT. 4) Depress the level "Setdown" reset pushbutton as necessary to restore RPV level setpoint to 35" to 38". 5) Shutdown condensate pumps and feed pumps as necessary to have one of each running. b. RCIC in normal RPV inject mode per SOP-0035. c. HPCS per SOP-0030.	
4.	If necessary to reduce RPV level, operate RWCU in the blowdown mode per SOP-0090: a. Reject to hotwell is preferred. b. Reject to radwaste if necessary.	
5.	If tripped, restart reactor recirculation pumps on LFMC per GOP-0003 a. Open flow control valves to the full open position.	
6.	Verify Steam Seals are being supplied by auxiliary boiler.	
7.	Start air removal pumps per SOP-0025 a. Maintain condenser vacuum between 23" Hg and 28" Hg.	

STEP		INITIAL		
8.	Verify that the HCU scram accumulators have been recharged by observing the ACCUM FAULT indicating lights on 1H13-P680 are out.			
9.	Shutdown or verify shutdown, the heater drain pumps per SOP-0010: a. Verify #3 feedwater heaters dump valves to the condenser open to control level.			
10.	If all isolation signals are clear, open/verify open Main Steam Drain Valves [1B21-MOVF021 and F068].			
11.	Shutdown feedwater heaters extraction steam per SOP-0010.			
12.	Open the following drain valves to the main condenser: a. Main Stop Before Seat [1DTM-MOVSV1, SV3, SV5 and SV7] b. SJAE Supply Line [1DTM-MOV175] c. Main Steam Header [1DTM-AOV12A, 12B] d. Main Steam Line [1B21-AOVF06... - D] e. Main Steam Line [1B21-AOVF070] f. Main Steam Line Drain Header [1B21-MOVF015, F016, F085] g. MSIV Before Seat [1B21-MOVO68, 1DTM-MOV199] h. Reheater Steam Supply [1DTM-MOV1A and 1B, 54A and B] i. Crossaround Piping [1DTM-MOVCA1-CA6] . j. Extraction Line [1DTM-AOV32A, 32B, 35A, 35B, 41A, 41B]			
13.	Shutdown moisture separator/reheater and establish steam blanketing per SOP-0010.			
14.	Complete the SCRAM report and Post Trip Review Checklist (in reference 2.9).			
15.	If plant shutdown is desired, enter GOP-0003 or GOP-0004.			
16.	If it is desired to start up the plant, perform the following: a. Verify the cause of the scram is known and no longer exists. b. Verify that the necessary maintenance actions and post-maintenance tests to correct any malfunction that caused or contributed to the scram have been completed. c. Enter GOP-0005.			
17.	Submit the completed scram report, Post Trip Review Checklist, and this attachment to the Operations Supervisor for review.			
ATTACHMENT - 2	PAGE 4 OF 4	GOP-0007	REV - 0	PAGE 10 OF 10