

THE BABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

ENCLOSURE

FEB 25 1974

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To: ☒ J. D. PHINNEY - SITE OPERATIONS MANAGER - TMI

From: G. C. SCHECK - TEST PROGRAM SUPERVISOR (2456)

805 883.3

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File No. NSS-5
or Ref. 12X

Subj. REVIEW OF TMI-1 PROCEDURES

Date FEBRUARY 20, 1974

This letter is cover one customer and one subject only.

Enclosed are the following TMI-1 procedures which have been reviewed by Nuclear Service.

EP 1202 06 Loss of RC/RCS Pressure
~~OP 1102 01~~ Plant Heatup to 525°F
EP 1202 02 Station Blackout & Blackout With Loss
of Both Diesel Generators
OP 1103 02 Fill and Vent of RC System
OP 1105 11 Secondary Plant and Auxiliary Systems - NHI
OP 1104 30 Nuclear Service River Water System
OP 1105 02 Reactor Protection System
OP 1105 14 Main Steam System
~~OP 1202 29~~ Pressurizer System Failure
OP 1105 09 Control Rod Drive System
~~OP 1103 11~~ Draining and N₂ Blanketing of RC System
OP 1102 02 Plant Startup

These have been reviewed for interaction with B&W supplied equipment and systems. Comments relative to system protection or preferred method of operation have been included. No comments concerning format, grammar, superfluous information or convenience have been made. These reviews reflect current operating philosophy and requirements, but of course, not any conversations or information passed informally between B&W site personnel and the customer. Where applicable, compliance with B&W draft procedures has been verified.

Chris Delicate

GCS/hh

Enclosures

cc: R. R. Beach
K. E. Suhrke
W. S. Delicate

8307060546 740220
PDR ADOCK 05000289
A HOL

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Comments on Emergency Procedure 1202-29, Pressurizer System Failure

Three Mile Island - Unit 1

29.D.1.2 - This item is not clearly a symptom of an inoperative code relief valve.

29.E-1.1 - The heater setpoints shown are not very clearly stated. These banks should be shown at their actual setpoint values:

Bank	1	2	3	4	5	Units
On	2135	2135	2135	2120	2105	PSIG
Off	2155	2155	2147	2140	2125	PSIG

29.E-1.2 - Loss of pressurizer level will cause lockout of pressurizer heaters, but is not a symptom of heater failure.

29.F.3.2 - It should be noted that computer pressurizer level is not temperature compensated and an appropriate setpoint stated.

Page 8 is missing on the copy reviewed.

Comments by:

of: Jim R. Albright
Babcock & Wilcox Nuclear Service

Date: February 19, 1974

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NY 1201 89
FIREARMER SYS. FAILURE

10011.12

6-PU
Def. Exh. For ID 405
Plf. Exh. In Ev
Charles Shapiro CSR
Doyle Reporting Inc.

1114(82)
CA

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-29
PRESSURIZER SYSTEM FAILURE

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Unit 1 Staff Recommends Approval

Approval [Signature] Date _____
Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval [Signature] Date _____
Cognizant Dept. Head

Unit 1 PORC Recommends Approval

[Signature] Date 5-31-75
Chairman of PORC

PORC comments of _____ included
(date)

By _____ Date _____

Unit 2 PORC Recommends Approval

[Signature] Date _____
Chairman of PORC

PORC comments of _____ included
(date)

By _____ Date _____

Approval [Signature] Date 6-2-75
Station Superintendent/
Unit Superintendent

TMI-56-A 11-74

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REVISION 1
THREE MILE ISLAND NUCLEAR STATION- UNIT 1

Plant Emergency Procedures

EP 1202- 29 Pressurizer System Failure

SECTION A Leaking Pilot Operated (electromatic) Relief Valve RC-RV2

29.A.1 Symptoms

1. Relief valve discharge line temperature exceeding the normal 120 F. Alarms on computer at 200 F.
2. RC drain tank temperature/pressure above normal on the control room radioactive waste panel. (pressure alarm at 1.5-2.0 psig.)
3. RC system makeup flow above normal for the variable let down flow and RC pump seal in leakage conditions.

29.A.2 Immediate Actions

A. Automatic Actions

1. None

B. Manual Actions

1. Close the electromatic relief BLOCK Valve, RC-V2

29.A.3 Follow-Up Action

1. Repair during next shutdown

SECTION B Inoperative Pilot operated (electromatic) Relief Valve, RC-RV2

29.B.1

Symptoms

1. RC System pressure is above 2255 psig and RC-RV2 fails to open
2. RC System pressure is below 2205 psig and valve fails to close
3. RC-RV2 discharge line temperature is above the 200 F alarm.
The RC drain tank temperature/pressure is above ambient as indicated on the control room radioactive waste panel.

29.B.2

Immediate ActionA. Automatic Action

1. For a failed closed RC-RV2:
 - a. Spray valve RC-V1 is open above 2205 psig
 - b. Reactor trip occurs at 2355 psig
 - c. Pressurizer code relief valves open at 2435 psig
2. For a failed open RC-RV-2:
 - a. All pressurizer heater banks on full below 2105 psi
 - b. Reactor trips at 1800 psig
 - c. High Pressure Injection is actuated at 1500 psig

B. Manual Action

1. For a failed closed RC-RV2:
Shift spray valve RC-V1 switch on center console to MANUAL and open further for additional spray flow.
2. For a failed open RC-RV2:
close RC-V2 block valve

29.B.3

Follow-up Action

1. Return system pressure and temperature to normal.

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SECTION C Leaking Code Relief Valve, RC-RVIA or PC-RVIB

29.C.1

Symptoms

1. Code relief valve discharge line temperature (s) exceeding the computer normal 120° F. (Computer alarms at 200 F)
2. RC drain tank temperature/pressure above normal (ambient) on the control room radioactive Waste Panel. (Pressure alarms at 1.5-2.0 psig)
3. RC System increased makeup flow is above normal for the variable letdown flow (45-140 gpm) and PC pump seal in leakage conditions.

29.C.2

Immediate ActionA. Automatic Action

1. None

B. Manual Action

1. Determine RC leakage according to Op 1303-1.1
(daily surveillance checks)

29.C.3

Follow-up Action

1. If RC system identified leakage is in excess of 10 gpm the reactor plant must be shutdown within 24 hours.

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SECTION D Inoperative Code Relief valve, RC-RVIA or RC-RVIB

29.D.1

Symptoms

1. Code relief valve(s) fail to open when above 2435 psig or fails to close when below 2285 psig.
2. Relief valve discharge line temperature is above the 200 F alarm, the RC drain tank temperature/pressure is above ambient and the RC System makeup flow is above normal for the let down (45-140 gpm) and RC pump seal in leakage (approximately 5gpm)

29.D.2

Immediate Action

A. Automatic Action

1. Reactor trip from high or low system pressure.
2. H.P Injection if valve fails to close.

B. Manual Action

1. If code valve(s) fail to open at 2435 psig place spray valve on MANUAL at console center and open. Verify pressurizer heaters are OFF at console right.
2. If code valves fail to close, turn all heaters ON at console right and isolate let down flow at console center by closing MU-V3.
3. Manually initiate H.P Injection if required to maintain pressurizer level.

29.D.3

Follow-up Action

1. Hold pressurizer level if possible at or greater than 220 inches with H.P Injection and begin cooldown.
2. If valve failed to lift, proceed with cooldown.

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SECTION E Inoperative Pressurizer Heaters

29.E.1

Symptoms

1. Heater banks fail to energize or de-energize if RC pressure is at heater bank setpoint.

	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Units
ON	2135	2135	2135	2120	2105	PSIG
OFF	2155	2155	2147	2140	2125	PSIG

NOTE: Banks 1, 2, & 3 are full on at 2135 psig

2. Pressurizer level Lo-Lo alarm at 80 inches.
3. Pressurizer heater power supply ground alarm.
4. Abnormal console indicating lights for the heating groups.
5. High 2255 psig or low 2055 psig pressure alarms.

29.E.2

Immediate Action

A. Automatic Action

1. For energized heaters and rising pressure: Spray valve RC-V1 opens (red and green console jog button lights)
2. For loss of heaters and decreasing pressure: None

B. Manual Action

1. Place heater controller in Manual control if control malfunction is suspected.
2. For energized heaters/rising pressure, attempt to de-energize all heaters (at console right) except group 1 or 2
3. For loss of heaters/decreasing pressure, attempt to energize Backup heaters from console, CL. If unsuccessful, start reducing unit load.

29.E.3

Follow-up Action

1. For energized heaters, open heater breakers in question at the pressurized Heater Control Centers except for group 1 or 2

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SECTION E (CONT'D)

29.E.3

Follow up Action

2. Control RC pressure at normal 2155 psig setpoint with RC-V1 spray valve in MANUAL.
3. For de-energized heaters, determine cause and if a minimum of one heater group is not operable, continue load reduction to shut down and possibly cooldown condition.

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SECTION F Malfunction In Pressurizer Level Indication or Control

29F.1 Symptoms

1. Disagreement between the console recorder level readouts of more than 12 inches.
2. Rapid change in indicated/recorded level due to loss of compensation or loss of power or d/p cell failure or other malfunction.

29F.2 Immediate Action

A. Automatic Action

1. If indication falls low:
Pressurizer heaters trip @ 80 inches, makeup valve MU-V17 opens, and RC pressure increases.
2. If indication falls high:
Makeup valve MU-V17 closes.

B. Manual Action

1. When any two of three console recorder level transmitter readouts disagree by more than 12 inches, take manual control of level and then select the third transmitter for indication.
2. Re-energize heaters if tripped due to malfunction.

29F.3 Follow-up Action

1. If the switching level transmitters has not rectified the condition, switch to the alternate temperature detector.
2. If pressurizer level recorder indication is lost, select another transmitter or use the computer for level indication. If computer level indication is selected be sure to select temperature compensated pressurizer level (Pt. #1720, 1721 & 1722).

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SECTION G Pressurizer Spray Valve Failure

29.G.1 Symptoms

1. RC-V1 spray valve fails to open when the RC system pressure is greater than 2205 psig.
2. RC-V1 spray valve is open when the RC system is less than 2155 psig.

29.G.2 Immediate Action

A. Automatic Action

1. RC system pressure greater than 2255 psig activates RC-RV2 electromatic relief and the high pressure alarm.
2. RC-V1 failing open (in auto) causes RC system pressure to stablize at approximately 2100 psig with all heaters "on".
3. Failure when manually opened beyond the automatic limit position causes continued prassure drop and alarm at 2055.

B. Manual Action

1. Control RC-V1 opening or closing n MANUAL with jogbuttons.
2. If the spray valve has failed open, control pressure by closing the spray block valve RC-V3.

NOTE: If the "Block" valve RC-V3 is closed, it must be periodically cycled to keep the spray line warm. Cycle RC-V3 open as necessary to stay above RC pressurizer spray line temperature alarm of 450°F. (Computer point 520).

CAUTION: Do not exceed a ΔT of 410°F between pressurizer temperature and reactor coolant hot leg temperature.

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3. Reduce rate of ICS load change to less than 1% per minute.

29.6.3 Follow-up Action

1. Continue plant operation with reduced rate of load change.

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GORE Comment Resolution

Procedure Number 1202-29
 Procedure Title Pressurizer System Failures
 Reviewing Organization BGE
 Comment Letter Date 2/26/74
 Comments Resolved (Date) 3/6/74

OP Para	Comment Summary	Comment Incorporated Yes/No	Remarks
23.D.1.2	Item is not clearly a symptom of an inoperative code relief valve.	Yes	Deleted symptom.
23E-1.1	Heater setpoints shown are not clearly stated. These banks should be shown at their actual setpoint values..	Yes	Banks have been shown at their actual setpoint values.
23.E-1.2	Loss of pressurizer level will cause lockout of pressurizer heaters, but is not a symptom of heater failure.	No	We agree with your statement but we are really addressing <u>inoperative</u> pressurizer heaters.
23F.3.2	Computer pressurizer level is not temp. compensated and an appropriate setpoint stated.	Yes	Added words to insure temp compensated pressurizer level is selected. Added computer point #'s 1720, 1721, 1722.
General	Page 8 is missing on copy reviewed	Yes	Has been added to original. Basically covered manual action & Follow Up action for Pressurizer Spray Valve Failure. It

cc: Messrs. J. J. Colitz
 E. A. Greene
 Reviewing Organization ✓

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GORE Comment Resolution

Procedure Number 1202-29

Procedure Title Pressurizer System Failures

Reviewing Organization B&W

Comment Letter Date 2/26/74

Comments Resolved (Date) 3/6/74

OP Para	Comment Summary	Comment Incorporated Yes/No	Remarks
			<p>included: Note: If the Block valve RC-V3 is closed, it must be periodically cycled to keep the spray line warm 3. Reduce rate of ICS load change to less than 1% per minute. <u>Follow Up Action</u></p> <p>29G.3 - Continue plan operation with reduced rate of load change.</p>

cc: Messrs. J. J. Colitz
K. A. Greene
Reviewing Organization ✓

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