STATION PROCEDURE CHANGE REQUEST

CHANGE REQUEST NUMBER 79-242

17-51-2-A

Procedure intent changes require Station Review before using.
Procedure changes with prior Station Review do not need SRO approval.

PROCEDURE TITLE Loss of Reactor Coolant NUMBER EOP-9

Request Change

TEMPORARY UNTIL:
DATE ———
OR
PERMANENT ISSUED ✓

PERMANENT CHANGE NEEDED ☑ YES ☐ NO

Include Appendix J - "Subcooling Temperature Indication"

Reason for change NRC recommendation for core temperature control following ≈ 2" RC break

Frank Fleck 7/24/79
REQUESTOR & DATE

ORIGINATOR: Perform safety analysis on reverse for permanent changes

SHIFT ENGINEER: Issue and log change request. Distribute pink copies as labeled. Send green copy to Station Review, remove expired temporary changes from books and discard. [If there is not a copy of the procedure in the labeled locations distribute pink copies as needed.]

936204

TWO INDIVIDUALS HOLDING SENIOR REACTOR OPERATOR LICENSES

FORM 17-51-2-A: PROCEDURE GROUP 1

7909180 439

Is a change to the Technical Specifications needed? Yes___ No X

Is the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the SAR increased? Yes___ No X Because: THE Change helps monitoring the core conditions after the accident and helps in minimizing the post accident effects.

Is the possibility for an accident or malfunction of a different type than any previously evaluated in the SAR created? Yes___ No X Because:

Same as above

Is the margin of safety, as defined in the basis for any Technical Specification, reduced? Yes___ No X Because: THE addition of the appendix I adds in evaluating of the core condition after the primary break and helps to protect the core from boiling.

Requested By: Frank J Fleche 7/24/79 Date

Approved by Station Review: [X]

Not Approved by Station Review: [ ]

	TEMP	PERM
	TEMP	PERM
	7/24/79	8/29/79
Date		
	TEMP	PERM
	7-27-79	9-5-79
Date		
	TEMP	PERM
	7-27-79	9-5-79
Date		

336205

Authorized for use:

	TEMP	PERM
	TEMP	PERM
	7/27/79	

for Station Superintendent Date

EOP-9

Appendix J

Subcooling Temperature Indication

Purpose: This describes the indication available, how it is to be used, and interpreted in the event of a primary leak when Charging and SI pumps are needed to maintain pressure.

Caution

Computer Points U-0916 - indicator 8
U-0917 - indicator 9
U-0918 - indicator 10

are not to be removed from their respective indicators

Indicator no. 8. The indication is the average temperature of the ten highest incore thermocouples which are in scan.
This is T hot or the Reactor Exit Plenum temperature.

Indicator No 9 The calculated saturation temperature based on primary pressure

I indicator no 10 The degrees of subcooling, that is, the number of degrees the Reactor Exit Plenum is below that temperature at which boiling will occur in the core.

The temperature spans are presently:
550°-650°, 600°-700°, 0-100° respectively
These are Calculated Values and the spans may be changed by the standard program format.

Use and Interpretation-

The most important indication is indicator no. 10. Should a small break occur, high pressure injection shall continue until such time as 50 °F subcooling is achieved and maintained.

The temperature spans listed above are only to be changed when the plant is in a stable condition and a controlled cooldown is in progress.

STATION PROCEDURE CHANGE REQUEST

CHANGE REQUEST NUMBER 79-249

17-51-2-A

Procedure intent changes require Station Review before using.
Procedure changes with prior Station Review do not need SRO approval.

PROCEDURE TITLE LOSS OF REACTOR COOLANT NUMBER EOP-9

Request Change

TEMPORARY UNTIL:
DATE ____
OR
PERMANENT ISSUED ✓

PERMANENT CHANGE NEEDED
☑ YES
☐ NO

Change Step 5.1.3 IN IMMEDIATE ACTIONS TO INCLUDE TRIPPING RCP's ON LOW PRESS. PRESSURE

Reason for change IE BULLETIN NOS. 79-05C & 79-06C

FRANK STECHA 8/3/79
REQUESTOR & DATE

ORIGINATOR: Perform safety analysis on reverse for permanent changes

SHIFT ENGINEER: Issue and log change request. Distribute pink copies as labeled. Send green copy to Station Review, remove expired temporary changes from books and discard. (If there is not a copy of the procedure in the labeled locations distribute pink copies as needed.)

TWO INDIVIDUALS HOLDING SENIOR REACTOR OPERATOR LICENSES

FORM 17-51-2-A: PROCEDURE GROUP 1

Is a change to the Technical Specifications needed? Yes___ No X

Is the probability of an occurrence or the consequence of an accident or malfunction of equipment important to safety as previously evaluated in the SAR increased? Yes___ No X Because:

THE SEVERITY OF THE ACCIDENT MAY BE DECREASED BY STOPPING THE RCP's ON LOSS ~~OF~~ OF COOLANT WHEN PRESSURIZER PRESSURE CANNOT BE MAINTAINED.

Is the possibility for an accident or malfunction of a different type than any previously evaluated in the SAR created? Yes___ No X Because:

SAME AS ABOVE

Is the margin of safety, as defined in the basis for any Technical Specification, reduced? Yes___ No X Because:

SAME AS ABOVE

Requested By: FRANK STECHA 8/3/79 Date

Approved by Station Review: [X]

Not Approved by Station Review: [ ]

TEMP Arnold 8-9-79 Date

TEMP 8/29/79

R. Mariani 8-9-79 Date 9-5-79

C.E. Schuman 8-10-79 Date 9-5-79

336209

Authorized for use:

TEMP 8-10-79 Date

Station Superintendent

5.0 IMMEDIATE ACTIONS

5.1 Verify reactor trip and turbine trip

5.1.1 All rods fully inserted.

5.1.2 All turbine stop & governor valves closed.

5.1.3 Trip RCP's ~~if~~ ON any of the following.
A. Pressurizer level is Lost - "ZERO" PRESSURIZER LEVEL INDICATION
B. SAFETY INJECTION ACTUATES ON LOW PRESSURIZER PRESSURE
C. PHASE B CONTAINMENT ISOLATION

5.2 Verify safety injection actuation

5.2.1 Appropriate components have started and are operating properly.

5.2.2 Observe monitor lights for equipment failures and proper equipment alignment. Take appropriate action for any malfunctioning equipment.

Group A - At power lineup

Group B - Cold leg recirc. actuation

Group C - Containment spray actuation

Group D - Safety injection actuation

Group E - Phase A containment isolation actuation

Group F - Phase A containment isolation actuation

Group G - Hot leg recirc. actuation

5.2.3 If Phase B - containment isolation actuates, verify automatic actions and dispatch operator to open IVSN valve, per appendix H of this procedure.

5.3 Monitor Tavg, pressurizer pressure and level, containment pressure, temperature and humidity for trends indicating the severity of the accident.

5.4 Verify generator trip approximately 50 seconds after turbine trip.

5.4.1 Generator breakers open.

5.4.2 Main feedwater and heater drain pumps trip.

5.5 Announce casualty as soon as possible.

5.0 IMMEDIATE ACTIONS

5.1 Verify reactor trip and turbine trip

5.1.1 All rods fully inserted.

5.1.2 All turbine stop & governor valves closed.

5.1.3 Trip RCP's if przr. level is lost.
Initiate natural circulation as per EDP-7, App. A as soon as possible.

Move to subsequent actions Section 6.0 Step 6.3

5.2 Verify safety injection actuation

5.2.1 Appropriate components have started and are operating properly.

5.2.2 Observe monitor lights for equipment failures and proper equipment alignment. Take appropriate action for any malfunctioning equipment.

Group A - At power lineup

Group B - Cold leg recirc. actuation

Group C - Containment spray actuation

Group D - Safety injection actuation

Group E - Phase A containment isolation actuation

Group F - Phase A containment isolation actuation

Group G - Hot leg recirc. actuation

5.2.3 If Phase B - containment isolation actuates, verify automatic actions and dispatch operator to open IVSW valve, per appendix H of this procedure.

5.3 Monitor Tavg, pressurizer pressure and level, containment pressure, temperature and humidity for trends indicating the severity of the accident.

5.4 Verify generator trip approximately 50 seconds after turbine trip.

5.4.1 Generator breakers open.

5.4.2 Main feedwater and heater drain pumps trip.

5.5 Announce casualty as soon as possible.

6.0 SUBSEQUENT ACTIONS

6.1 For recovery from a false or inadvertent safety injection, proceed according to Appendix C of this procedure. Follow the subsequent actions of EOP-1 to insure proper secondary plant lineup.

6.2 Initiate emergency plan per E.P.I.P.

NOTE

Steam Generator Level indication will be affected by containment temperature. Refer to appendix I, Steam Generator Level Correction Factors, to determine a more accurate level.

NOTE

At first indication on S/G narrow range level indicator reduce aux. feedwater flow to 50 GPM to preclude an inadvertent safety injection due to water hammer. Aux. feedwater flow may be increased at the discretion of the Shift Supervisor.

INITIATE NATURAL CIRCULATION AS PER E-0-7, APP. A AS SOON AS POSSIBLE.

6.3 Establish 50 to 150 GPM auxiliary feedwater flow per steam generator and maintain programmed level when levels have been recovered.

6.3.1 If time permits, commence cooldown using steam dump system or atmospheric relief valves to cool steam generators.

6.4 Align control board switches per Appendix A of [illegible]

6.5 Instruct plant operators to investigate equipment not functioning properly as indicated by the control board status lights.

6.6 Cold Leg Injection

6.6.1 When control board alignment has been completed reset safety injection.

6.6.2 When the spray additive tank indicates empty:

A. Push both "containment spray phase "B" isolation reset" pushbuttons.

B. Close spray additive valves MOV-CS-0008, MOV-CS-0009 and MOV-CS-0010.

C. Stop all spray pumps, except 1 motor driven (A or B).

6.6.3 When RWST level reaches the low level alarm (13'-7", approx. 147,000 Gal.), proceed to cold leg recirculation as per Section 6.7 (Two RHR pumps operable) or 6.8 (One RHR pump inoperable).

EOP-9

LOSS OF REACTOR COOLANT

TABLE OF CONTENTS

936213

This procedure contains 25 pages.

APP [signature]
DATE 8/6/79

ZION STATION

EMERGENCY OPERATING PROCEDURE

EOP-9

LOSS OF REACTOR COOLANT

1.0 PURPOSE

This procedure outlines the required actions in the event of a break in the primary pressure boundary exceeding maximum charging capacity.

2.0 REFERENCES

2.1 Zion Technical Specifications

2.2 Zion Emergency Plan, E.P.I.P.

2.3 Zion Operating Instruction, SOI-4

2.4 Zion Operating Instruction, SOI-5

2.5 Zion Operating Instruction, SOI-9

2.6 Zion Operating Instruction, SOI-11

3.0 SYMPTOMS

3.1 High radiation levels in containment:

3.1.1 RO-2 containment area - 560' level

3.1.2 RO-7 incore seal table area

3.1.3 RT-AR01 containment area - 617' level

3.1.4 R-11, containment atmosphere

3.1.5 R-12, containment atmosphere

3.2 Containment humidity, pressure, and/or temperature indicating high.

3.3 Pressurizer pressure/level low and decreasing.

3.4 Pressurizer safety injection press/level low reactor trip.

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4.0 AUTOMATIC ACTIONS

4.1 Charging flow will increase attempting to maintain pressurizer level

4.1.1 Automatic make-up attempts to maintain V.C.T. Level.

4.1.2 Charging pump suction shifts to R.W.S.T. on low-low level in V.C.T.

4.2 Letdown isolates and pressurizer heaters deenergize on low pressurizer level.

4.3 Reactor/turbine trip on low pressurizer pressure.

4.3.1 Steam dumps may actuate.

4.3.2 Atmospheric relief valves may actuate.

4.3.3 Feedwater isolation with low Tavg.

4.3.4 Generator trip approximately 50 seconds after turbine trip.

1. Main feedwater pumps trip
2. Heater drain pumps trip

4.4 Safety injection actuation on low pressurizer pressure.

4.4.1 Auto start

1. Charging pumps A and B
2. Safety injection pumps A and B
3. Residual heat removal pumps A and B
4. Diesel generators 0, A, and B
5. Service water pumps A, B, and C
6. Component cooling pumps A, B, and C (C,D, and E)
7. Auxiliary feedwater pumps A, B, and C

4.4.2 Containment fan coolers shift to slow speed with dampers in accident mode.

4.5 Containment isolation - phase A

4.6 Containment isloation - phase B (If containment pressure is greater than 23 psig)

4.6.1 Containment spray pumps A, B, and C autostart

4.7 Accumulators automatically inject; if RCS pressure falls below ≈ 600 psig.

5.0 IMMEDIATE ACTIONS

5.1 Verify reactor trip and turbine trip

5.1.1 All rods fully inserted.

5.1.2 All turbine stop & governor valves closed.

5.1.3 Trip RCP's if przr. level is lost.
Initiate natural circulation as per EOP-7, App. A as soon as possible.

5.2 Verify safety injection actuation

5.2.1 Appropriate components have started and are operating properly.

5.2.2 Observe monitor lights for equipment failures and proper equipment alignment. Take appropriate action for any malfunctioning equipment.

Group A - At power lineup

Group B - Cold leg recirc. actuation

Group C - Containment spray actuation

Group D - Safety injection actuation

Group E - Phase A containment isolation actuation

Group F - Phase A containment isolation actuation

Group G - Hot leg recirc. actuation

5.2.3 If Phase B - containment isolation actuates, verify automatic actions and dispatch operator to open IVSW valve, per appendix H of this procedure.

5.3 Monitor Tavg, pressurizer pressure and level, containment pressure, temperature and humidity for trends indicating the severity of the accident.

5.4 Verify generator trip approximately 50 seconds after turbine trip.

5.4.1 Generator breakers open.

5.4.2 Main feedwater and heater drain pumps trip.

5.5 Announce casualty as soon as possible.

6.0 SUBSEQUENT ACTIONS

6.1 For recovery from a false or inadvertent safety injection, proceed according to Appendix C of this procedure. Follow the subsequent actions of EOP-1 to insure proper secondary plant lineup.

6.2 Initiate emergency plan per E.P.I.P.

NOTE

Steam Generator Level indication will be affected by containment temperature. Refer to appendix I, Steam Generator Level Correction Factors, to determine a more accurate level.

NOTE

At first indication on S/G narrow range level indicator reduce aux. feedwater flow to 50 GPM to preclude an inadvertent safety injection due to water hammer. Aux. feedwater flow may be increased at the discretion of the Shift Supervisor.

6.3 Establish 50 to 150 GPM auxiliary feedwater flow per steam generator and maintain programmed level when levels have been recovered.

6.3.1 If time permits, commence cooldown using steam dump system or atmospheric relief valves to cool steam generators.

6.4 Align control board switches per Appendix A of this procedure.

6.5 Instruct plant operators to investigate equipment not functioning properly as indicated by the control board status lights.

6.6 Cold Leg Injection

6.6.1 When control board alignment has been completed reset safety injection.

6.6.2 When the spray additive tank indicates empty:

A. Push both "containment spray phase "B" isolation reset" pushbuttons.

B. Close spray additive valves MOV-CS-0008, MOV-CS-0009 and MOV-CS-0010.

C. Stop all spray pumps, except 1 motor driven (A or B).

6.6.3 When RWST level reaches the low level alarm (13'-7", approx. 147,000 Gal.), proceed to cold leg recirculation as per Section 6.7 (Two RHR pumps operable) or 6.8 (One RHR pump inoperable).

6.7 Cold Leg Recirculation with 2 RHR Pumps Operable

NOTE: If steps 6.7.1 A through L are not completed prior to reaching the Low-Low level alarm (9'-10") on the RWST. Stop all pumps taking suction from the RWST; except the containment spray pumps if the spray additive tank is not empty.

NOTE: If ECCS valves fail to stroke to the position ordered, ensure valve is energized (SVAG) and refer to Appendix "G" for a list of interlocks which must be satisfied for certain valves to function.

6.7.1 When RWST reaches Low level (13'-7") alarm

A. Stop RHR Pump B

1. Open MOV-CC-9412B (CC from RHR heat exch.)
2. Close MOV-RH-8700B (RHR pump B suction)
3. Open MOV-SI-8811B (recirc. sump suction)
4. Close MOV-RH-8716A and B (crosstie isolation)

B. Verify greater than 111" (3 sets of lights lit) in the recirculation sump.

C. Start RHR pump B.

D. Verify cold leg injection flow on FI970A and FI970B.

NOTE: If safety injection pump flow indicators FI-922 and 932 indicate little or no flow, Step "F" must be accomplished immediately after Step "E" is completed, to prevent damage to S.I. pump seals from overheating.

E. Close MOV-SI8814 (SI pump miniflow valve) if valve does not close, isolate MOV-SI8813.

F. Open MOV-SI8804B (crosstie isolation valve).

G. Verify RHR Pump B is supplying the SI Pumps by increased SI Pump disch. press. (PI-923 & 935) and flow (FI-922 & 932).

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H. Stop RHR pump A.

1. Open MOV-CC9412A (CC from RHR heat exch.)

2. Close MOV-RH8700A (RHR pump A suction valve)

3. Open MOV-SI8811A (recirc. sump isolation valve).

I. Start RHR Pump A.

J. Open MOV-SI8804A to align RHR to charging pump suction.

K. Verify that RHR pump A is supplying the centrifugal charging pumps by increased disch. press (PI-947) and flow (FI-934).

L. Close MOV-VC112D and MOV-VC112E (RWST suction isolation valves).

6.7.2 If containment spray actuated.

A. When spray additive tank indicates empty, Reset Phase "B" isolation by depressing both "Cont. Spray. Phase "B" Isolation Reset" pushbuttons.

B. Close MOV-CS0008, 0009 and 0010 (Spray additive tank outlet).

C. Stop A and C containment spray pumps.

D. Close MOV-CS0002 and MOV-CS0006 (Disch. stop valves).

E. When R.W.S.T. has been completely emptied, stop "B" containment spray pump, and

1. Close MOV-CS0004 (disch. stop valve).
2. Have operator energize breaker for MOV-SI8809A at MCC 1393A (2393B) 560' A.B.
3. Close MOV-SI8809A ("A" RHR to cold leg inj.)
4. Open MOV-CS0049 (RHR to cont. spray)

NOTE: Containment spray flow should be maintained for minimum of two (2) hours after initiation.

F. When containment pressure begins to decrease and containment spray flow has been maintained for a minimum of two (2) hours.

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1. Close MOV-CS-0049 ("A" RHR to cont. spray).
2. Open MOV-SI8809A (RHR to cold leg inj.).

G. Proceed to Step 6.9.

6.8 Cold leg recirculation with 1 RHR pump inoperable.

NOTE: If Steps 6.8.1 A through J are not completed prior to reaching the low-low Level alarm (9'10") on the RWST, stop all pumps taking suction from the RWST, except the containment spray pumps if the spray additive tank is not empty.

NOTE: If ECCS valves fail to stroke to the position ordered, ensure valve is energized (SVAG) and refer to Appendix G for a list of interlocks which must be satisfied for certain valves to function.

6.8.1 When R.W.S.T. level reaches the low level alarm (13'-7") stop the running RHR pump and align as follows:

A. "A" RHR pump operable.

1. Open MOV-CC 9412A (CC from "A" RHR heat exch.)

2. Close MOV-RH8700A (RHR pump A suction)

3. Open MOV-SI8811A (recirc. sump isolation valve)

B. "B" RHR pump operable

1. Open MOV-CC9412B (CC from "B" RHR Heat Exch.)

2. Close MOV-RH8700B (RHR pump B suction)

3. Open MOV-SI8811B (recirc. sump isolation valve)

C. Verify greater than 111" (3 sets of lights lit) in the recirc. sump.

D. Close MOV-RH8716A and MOV-RH8716B (crosstie isolation valves).

E. Start the operable RHR Pump.

F. Verify cold leg injection flow by monitoring flow indicators FI-970A & B or FI-971 A & B.

G. Open MOV-SI8807A and MOV-SI8807B (centifugal charging pump/safety injection pump suction crosstie valves).

NOTE: If safety injection pump flow indications FI-922 and 932 indicate little or no flow, Step H.2 or I.2, as appropriate must be accomplished immediately after step H.1 or I.1 is completed, to prevent damage to SI pump seals from overheating.

H. If "A" RHR pump is running

1. Close MOV-SI8814 (S.I. pump mini flow) if valve fails to close, isolate MOV-SI8813.

2. Open MOV-SI8804A ("A" RHR to chg. pump suction)

I. If "B" RHR pump is running

1. Close MOV-SI8814 (SI pump miniflow). If valve fails to close, isolate MOV-SI8813.

2. Open MOV-SI8804B ("B" RHR to SI Pump Suction).

J. Verify operable RHR pump is supplying centrifugal charging pumps and safety injection pumps by increased discharge pressure and flows (PI-947, 923 & 935, FI-934, 922 & 932).

1. Close MOV-VC112D and MOV-VC112E (chg. pump RWST suction).

6.8.2 If containment spray actuated

A. When spray additive tank indicates empty, Reset Phase "B" Isolation by depressing both "Cont. Spray/Phase B Isol. Reset" pushbuttons.

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B. Close MOV-CS0008, 0009 and 0010 (Spray additive tank outlet).

C. Stop A and C containment spray pumps.

D. Close MOV-CS0002 and MOV-CS0006 disch. stop valves

E. When R.W.S.T. has been completely emptied, stop "B" containment spray pump and close MOV-CS0004 (discharge stop valve).

NOTE: With only one RHR pump operable, containment spray will not be supplied from the RHR system.

F. If the second RHR pump becomes operable, refer to Section 6.7 of this procedure for proper valve lineup.

6.9 If pressurizer level begins to increase, control level and pressure by stopping charging pumps and safety injection pumps as necessary.

A. Insure pressurizer heaters are off.

B. If pressurizer goes solid, maintain RCS pressure by stopping additional pumps.

CAUTION: Prior to turning off any charging or safety injection pumps, check all hot and cold leg temperatures and all core exit thermocouple temperatures against steam table saturation temperatures to ensure subcooling in the core.

NOTE: RHR Pumps should remain in operation for decay Heat Removal.

6.10 Simultaneous hot and cold leg recirculation, with two RHR pumps operable.

NOTE: Hot and cold leg recirculation lineup may vary depending on the number of ECCS pumps running. If charging pumps are running, they should remain on cold leg injection along with one RHR pump.

6.10.1 When 19 hours have elapsed since safety injection actuation, realign the RHR system as follows:

A. Instruct operator to energize breaker for MOV-SI8809B at MCC 1383A (2383B).

B. Close MOV-SI8809B ("B" RHR to cold leg inj.)

C. Instruct operator to energize breaker for MOV-RH9000 at MCC 1383B (2383B) 560'AB.

D. Open MOV-RH9000 (RHR to hot leg inj.).

E. Open MOV-RH8716B (RHR crosstie isol.).

F. Verify RHR hot leg injection flow on FI-600.

NOTE: If no flow is indicated after Step F. verify MOV-RH8703 is open.

6.10.2 Realign safety injection system to hot leg recirculation as follows:

A. Stop "A" safety injection pump if not stopped for pressure control.

B. Close MOV-SI9010A ("A" S.I. to cold leg inj.).

C. Instruct operator to energize breaker for MOV-SI9011A at MCC 1372 (2372) 542' A.B.

D. Open MOV-SI9011A ("A" SI to hot leg inj.).

E. Start "A" safety injection pump and verify flow on FI-922.

F. Stop "B" safety injection pump.

G. Close MOV-SI9010B ("B" S.I. to cold leg inj.).

H. Instruct operator to energize breaker for MOV-SI9011B at MCC 1383B (2383B) 560' AB.

I. Open MOV-SI9011B ("B" SI to hot leg inj.).

J. Start "B" safety injection pump and verify flow on FI-932.

6.11 Simultaneous hot and cold leg recirculation with one RHR pump inoperable.

6.11.1 When 19 hours have elapsed since safety injection actuation, realign the one operable RHR system as follows:

A. Instruct operator to energize breaker for MOV-SI8809A at MCC 1393B (2393B) 560' AB.

B. Close MOV-SI8809A ("A" RHR to cold leg inj.).

C. Instruct operator to energize breaker for MOV-SI8809B at MCC 1383A (2383B) 560' AB.

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D. Close MOV-SI8809B ("B" RHR to cold leg inj.).

E. Instruct operator to energize breaker for MOV-RH9000 at MCC 1383B (2383B) 560' AB.

F. Open MOV-RH9000 (RHR to hot leg inj.).

G. Open MOV-RH8716A (If "A" pump operable) or MOV-RH8716B (If "B" pump operable).

H. Verify RHR to hot leg injection flow on FI-600.

NOTE: If no flow is indicated after Step H. verify MOV-RH8703 is open.

I. Insure adequate suction head to safety injection pumps.

6.11.2 Realign safety injection to hot leg recirculation as follows:

NOTE: Safety injection pumps should only be realigned to hot leg recirculation if the charging pumps are operating on cold leg injection, as the other RHR train is inoperable.

A. Stop "A" safety injection pump.

B. Close MOV-SI9010A ("A" SI to cold leg inj.).

C. Instruct operator to energize breaker for MOV-SI9011A at MCC 1372 (2372) 542' AB.

D. Open MOV-SI9011A ("A" SI to hot leg inj.).

E. Start "A" safety injection pump and verify SI flow to hot leg inj. on FI-922.

F. Stop "B" safety injection pump.

G. Close MOV-SI9010B ("B" SI to cold leg inj.).

H. Instruct operator to energize breaker for MOV-SI9011B at MCC 1383B (2383B) 560' AB.

I. Open MOV-SI9011B ("B" SI to hot leg inj.).

J. Start "B" safety injection pump and verify flow on FI-932.

EOP-9

APPENDIX A

SAFETY INJECTION VALVE POSITIONS

1. Control board front

A. Closed

LCV-FW510
LCV-FW510A
LCV-FW520
LCV-FW520A

LCV-FW530
LCV-FW530A
LCV-FW540
LCV-FW540A

OAV-BD0001
OAV-BD0002
OAV-BD0003
OAV-BD0004

OAV-BD0005
OAV-BD0006
OAV-BD0007
OAV-BD0008

2. Control board back

A. Closed

OAV-DT9157
OAV-DT9159A and B
OAV-DT9160A and B

OAV-DT9170
LCV-DT1003

FCV-WD17 A and B

FCV-BD17

FCV-IA01A and B

FCV-RV111
FCV-RV112
FCV-RV113
FCV-RV114

FCV-RV0001
FCV-RV0002
FCV-RV0003
FCV-RV0004

FCV-SS02
FCV-SS03

FCV-SS04
FCV-SS05

B. Open

FCV-IW08
FCV-IW09
FCV-IW10
FCV-IW11
FCV-IW12

FCV-IW13
FCV-IW14
FCV-IW15
FCV-IW16
FCV-IW17

3. See Appendix C, section 1.13 for cont. isol. valves, page 15 and 16 of this procedure, for valves to be realigned before resetting S.I. signal.

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EOP-9

APPENDIX B

SPURIOUS VALVE ACTUATION GROUP

NOTE: These valves are to be energized on an as needed basis to ensure no spurious actuation valve repositioning during the S.I.

1.0 30 minute group (red)

A. MOV-SI8809A (1393B, 2393B)

2.0 19 hour group (yellow)

A. MOV-SI9011A (1372, 2372)

B. MOV-SI9011B (1383B, 2383A)

C. MOV-RH9000 (1383B, 2383B)

D. MOV-SI8809B (1383A, 2383B)

3.0 Non-energized group (green)

A. MOV-RH8703 (1381B, 2381B)

B. MOV-SI8802 (1383A, 2383B)

C. MOV-SI8806 (1383A, 2383A)

D. MOV-SI8812A (1393A, 2393B)

E. MOV-SI8812B (1393A, 2393B)

F. MOV-SI8808A (1371, 2371)

G. MOV-SI8808B (1381B, 2381B)

H. MOV-SI8808C (1391, 2391)

I. MOV-SI8808D (1371,2371)

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APPENDIX C

RECOVERY FROM A FALSE OR INADVERTENT SAFETY INJECTION

1.0 Recovery Actions

1.1 Reset safety injection.

1.2 Stop B.I.T. injection flow.

1. Open charging pump miniflow isolation valves (MOV-VC8110 and 8111)
2. Close B.I.T. inlet valves (MOV-SI8803A and B).
3. Close B.I.T. outlet valves (MOV-SI8801A and B).
4. Stop one centrifugal charging pump.

1.3 Return charging system to normal.

1. Open V.C.T. outlet valves (MOV-VC112B and C).
2. Close CVCS suction from RWST (MOV-VC112D and E).
3. Open charging header isolation valves. (MOV-VC8105 and 8106)
4. Open reactor coolant pump seal return valve. (MOV-VC8100)

1.4 Restore normal letdown.

1. Open letdown containment isolation valves. (AOV-VC8152 and 8153)
2. Open letdown isolation valves (LCV-VC459 and 460).
3. Open PCV-131 in manual control.
4. Open 75 GPM orifice block valve. (OAV-VC8149B or C)
5. Place PCV-131 in automatic.

1.5 Open main steam isolation valves if closed.

1. Verify steam dumps closed.
2. Verfiy M.S.R. steam supply and purge valves closed.
3. Verify S.J.A. ejectors off, aux. steam and turbine gland seals on aux. boiler or opposite unit.
4. Pressurize steam lines using M.S.I.V. bypass valves per GOP-1, Section 3.7.
5. When steam line pressure is within 50 psig of steam generator pressure, open MSIV's.

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APPENDIX C (Continued)

1.6 Return safety injection pumps to standby.

1.7 Restore containment fan coolers to normal operation.

1. Reset containment ventilation isolation.
2. Verify dampers reposition to normal.
3. Start two or three cont. fan coolers in fast speed.

1.8 Auxiliary feedwater system.

1. Stop one motor driven pump.
2. Stop turbine driven pump, if operating.
3. Establish 50 GPM feedflow to each steam generator.

1.9 Restore service water system to normal.

1. Open turbine bldg. isolation valves. (MOV-SW0100 and 0115)
2. Open S.W. boost. pump isol. valves. (MOV-SW0005 and 0006)
3. Start S.W. boost. pumps.
4. Place one service water pump in standby.
5. Place fire pumps in standby.

1.10 Place one component cooling pump in standby.

1.11 Return residual heat removal pumps in standby.

1.12 Return diesel generators to normal.

1. Stop "0" D.G.
2. Stop "A" or "B" diesel generator.
3. Reestablish safety shutdown to operating diesel by depressing "safety shutdown reset" pushbutton on local D.G. panel.

1.13 Restore containment isolation valves to normal.

1. Open the following valves on back of control board.

   A. FCV-SA01A and B (service air)
   B. FCV-VF01A and B (filtered vent header)
   C. FVC-VN01A and B (stem. line low pt. drain)
   D. FVC-SS9354A and B (przr. stm. sample)
   E. FCV-SS9355A and B (przr. liquid sample)

F. FCV-SS9356A and B (hot leg sample)
G. FCV-SS9357A and B (accum. sample)
H. FCV-PR19A and B through 23A and B (Rx leak detect.)

2. Open the following valves on the front of control board.

A. FCV-PR24A and B (cont. air sample)
B. OAV-RC8028 and 8029 (P.W. to P.R.T.)

3. Open the following valves at the waste gas panel.

A. DT9170 (RCDT pump disch. valve)
B. DT9160A and B (RCDT vent)

1.14 Refer to Appendix-D to flush B.I.T. injection lines to R.C. loops.

1.15 Refer to Appendix-E to restore B.I.T. concentration.

1.16 Refer to Appendix-F for post safety injection containment inspection.

EOP-9

APPENDIX D

FLUSHING B.I.T. INJECTION LINES TO R.C. LOOPS

1.0 Procedure

1.1 Shift from positive displacement charging pump to centrifugal charging pump, if applicable.

1.2 Close MOV SI-8800B, C, and D.

1.3 Throttle open B.I.T. manual bypass valve (SI-8925)

CAUTION: Maintain R.C. pump labyrinth ΔP by adjusting HCV-182.

1.4 Verify flow on FI-924 or V.C.T. level decrease.

1.5 After 5 minutes, open MOV-SI8800B and close MOV-SI8800A.

1.6 Verify flow on FI-925 or V.C.T. level decrease.

1.7 After 5 minutes, open MOV-SI8800C and close MOV-SI8800B.

1.8 Verify flow on FI-926 or V.C.T. level decrease.

1.9 After 5 minutes, open MOV-SI8800D and close MOV-SI8800C

1.10 Verify flow on FI-927 or by V.C.T. level decrease.

1.11 After 5 minutes, close and lock SI8925.

1.12 Open MOV-SI8800A, B, and C and return charging pumps to normal.

EOP-9

APPENDIX E

RESTORING BIT CONCENTRATION

A. Preferred Method (Flush to H.U.T.)

1. Line up standby B.A.T. (normally 0B) to supply affected units make up and B.I.T. manual supply and return valves.

2. Open SI-8913 (B.I.T. outlet to H.U.T.).

3. Open AOV-SI8883 (B.A.T. pump to B.I.T. isol. valve).

4. Shift appropriate B.A. transfer pump to fast speed.

5. Verify flow on FI-949 (B.I.T. flow meter).

6. Flush approximately 1000 gal. through the B.I.T. to the H.U.T.

7. Shut SI-8913 (B.I.T. outlet to H.U.T.).

8. Open AOV-SI-8807A & B (B.I.T. to B.A.T. isol. valves).

9. Verify flow on FI-949 (B.I.T. flow meter)

10. Recirc. for 2 to 3 hours and verify concentration of B.A.T.

11. If necessary batch a high concentration batch to bring B.A.T. and B.I.T. into specs.

12. Return affected unit's normal B.A.T. to supply makeup and B.I.T. recirc. supply and return.

B. Alternate method (Recirc. and Batching)

1. Line up standby B.A.T. (normally 0B) to supply affected units make-up, and B.I.T. recirc. supply and return manual valves.

2. Open AOV SI-8883 (B.A.T. pump to B.I.T. Isol. valve) and AOV SI-8870A & B (B.I.T. to B.A.T. Isol. Valves).

3. Shift appropriate B.A. transfer pump to fast speed.

4. Verify flow on FI-949 (B.I.T. flow meter).

5. Recirc. B.I.T. for 2 to 3 hours.

6. Periodically sample and batch high concentration batches to bring B.A.T. and B.I.T. into specs.

7. Return affected units normal B.A.T. to supply make-up and B.I.T. recirc. supply and return.

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APPENDIX F

CONTAINMENT POST SAFETY INJECTION INSPECTION

Purpose:

To specify a visual inspection to be performed after any actuation of the safety injection systems. This inspection will satisfy the technical specification requirement (3.3.2.F) for verifying integrity of the reactor coolant system.

Procedure:

Inspect the areas listed below for any signs of leakage, hydraulic snubber actuation, hanger deformation, structural deformation or any other visual indication of change:

AREA OF INSPECTION		INSPECTORS INITIALS
1. Boron injection nozzles:	Loop A	_____
	Loop B	_____
	Loop C	_____
	Loop D	_____
2. Mechanical pipe penetration Area (inside containment):	Upper Level	_____
	Lower Level	_____
3. Reactor vessel head area (CRDM's & conoseals)		_____
4. Reactor vessel cavity		_____
5. Reactor coolant loops (including RCP seal hangers, snubbers and valves):	Loop A	_____
	Loop B	_____
	Loop C	_____
	Loop D	_____
6. Pressurizer relief tank (including rupture discs)		_____
7. Reactor coolant drain tank		_____

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APPENDIX F (Continued)

8. Accumulators:

Accumulator A _____

Accumulator B _____

Accumulator C _____

Accumulator D _____

9. RCS instrumentation (walk down of all RCS instrument racks outside of the missile barriers).

Outside barrier upper level _____

Outside barrier lower level _____

Inspected by _____ SE/SF (SRO)

_____ Date

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APPENDIX G

ECCS VALVE INTERLOCKS

RH8701 & RH8702

RHR suction valves from loop "A" hot leg cannot be opened unless reactor coolant system pressure is equal to or less than 425 psig.

RH8700A

RHR pump "A" individual suction valve can be opened only if the following is satisfied:

CS0049 is closed

CS0050 is closed

SI-8804A is closed

SI8811A is closed

RH8700B

RHR pump "B" individual suction valve can be opened only if the following is satisfied:

CS0049 is closed

CS0050 is closed

SI8804B is closed

SI8811B is closed

CS0049

RHR supply to containment spray header can be opened only if SI8811A is open

CS0050

RHR supply to containment spray header can be opened only if SI8811B is open

SI8811A

Containment sump suction valve can be opened only if RH8700A is closed

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APPENDIX G (Continued)

SI8811B

Containment sump suction valve can be opened only if RH8700B is closed

SI8804A

RHR supply to the centrifugal charging pump suction header can be opened only if the following is satisfied:

SI8811A is open and either RH8701 or RH8702 is closed

or

Control switch on safeguards test panel in test and either RH 8701 or RH 8702 is closed

SI8804B

RHR supply to the SI pump suction header can be opened only if the following is satisfied:

SI8813 or SI8814 is closed (SI recirc. to RWST) and either SI8811B open or control switch on safeguard test panel is in test and either RH8701 or RH8702 closed

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APPENDIX H

IW SYSTEM MANUAL VALVES UNIT 1 & 2

NOTE

On actuation of Phase B containment isolation, these IW system manual valves must be repositioned to the open position in order to complete containment isolation.

IW-154; RCP seal water, 574' pipe chase

IW-155; RCP seal water, 574' pipe chase

IW-156; RCP seal water, 574' pipe chase

IW-157; RCP seal water, 574' pipe chase

IW-[illegible]5; 122; CC to RCP's, 582' pipe chase

IW-19[illegible]; 199; CC from RCP's, 582' pipe chase

IW-197; 120; CC from RCP's, 582' pipe chase

IW-153; Charging header, 590' pipe chase

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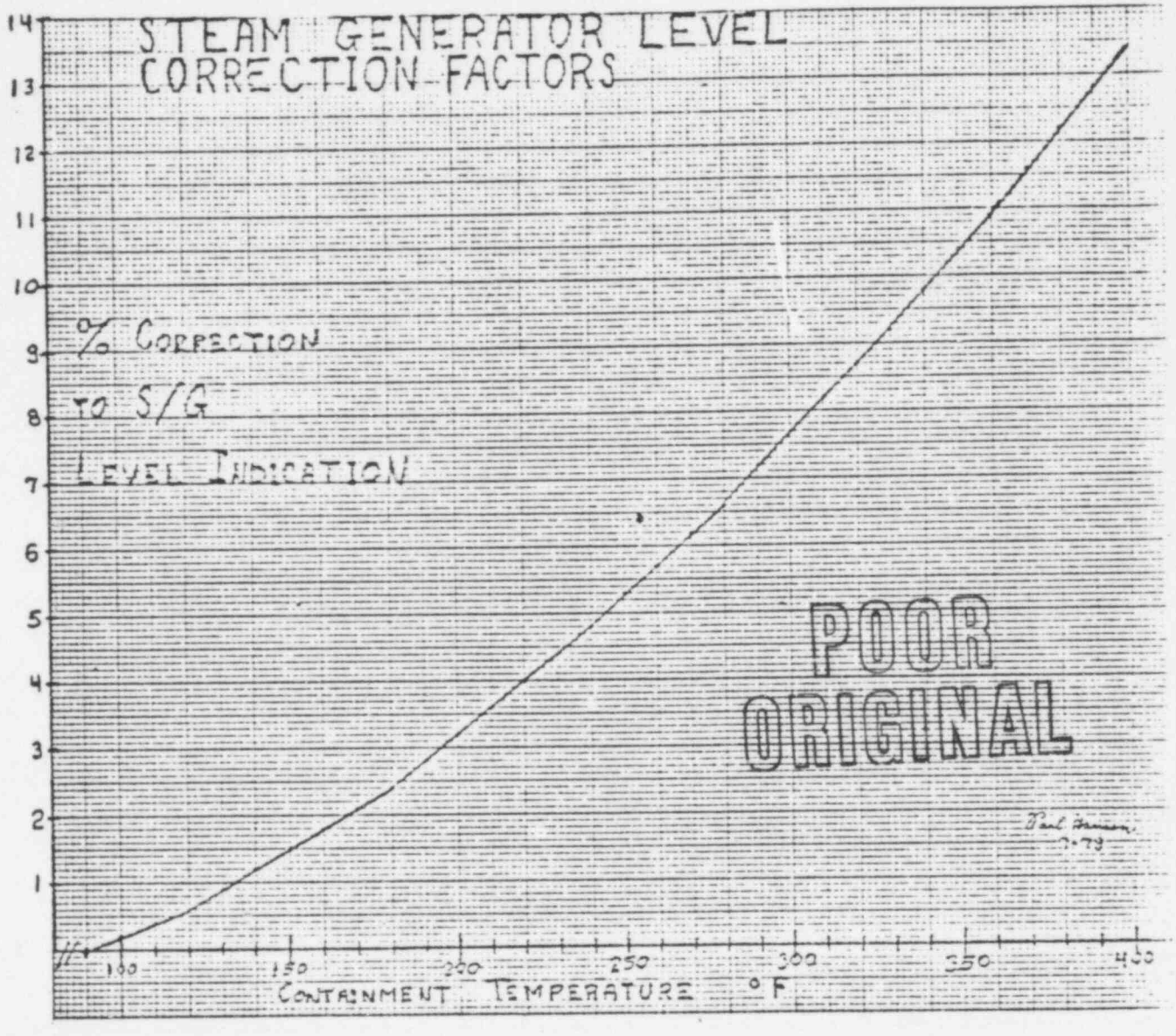
APPENDIX I

AUG 6 79

Steam Generator Level Correction Factors



% Actual Level = % Indicated Level - % Correction

Applicable to both Narrow and Wide Range Level Channels

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