

B*CN Classroom information
5/2/79

CRITERIA FOR SECURING HIGH PRESSURE INJECTION
FLOW FOLLOWING AUTOMATIC ACTUATION OF ESAS

CASE ONE: LOCA CONDITIONS (ALL 3 MUST BE MET PRIOR TO SECURING)

- A. On Low Pressure Injection
- B. Greater Than 1,000 GPM LPI Flow
- C. Stable for Greater Than 20 Minutes

CASE TWO: COLD LEG BREAK ON RCP DISCHARGE

- A. Greater Than 20 Minutes

CASE THREE: NO HEAT SINK (ALL MUST BE MET PRIOR TO SECURING)

- A. RCS is 50 F° Subcooled
- B. RCP's Running 1/1 Configuration
- C. Heatsink is Available
- D. RC Pressure is Being Maintained
- E. Pressurizer Level is Increasing

NOTE: UNIT I PROC (1202-6) AND II PROC (2202-1,3)
ONLY STATES TO "THROTTLE MOV 16A/B/C/D AS
NECESSARY TO MAINTAIN 220° PRESSURIZER LEVEL
AND NOT TO EXCEED 250 GPM.

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OPERATOR EXAMINATIONS

- A. Principles of Reactor Operation
- B. Features of Facility Design
- C. General Operating Characteristics
- D. Instruments and Controls
- E. Safety and Emergency Systems
- F. Standard and Emergency Operating Procedures
- G. Radiation Control and Safety
- H. Reactor Theory
- I. Radioactive Material Handling, Disposal & Hazards
- J. Specific Operating Characteristics
- K. Fuel Handling and Core Parameters
- L. Administrative Procedures, Conditions & Limitations

OUTLINE OF B&W TRANSIENT TAPE ON THE TMI INCIDENT

FINAL SUMMARY

- A. Follow procedures, even in multiple casualty conditions.
- B. Allow the automatic systems to perform as designed.
- C. Pressurizer level is not always a reliable indication of primary system fluid condition. Remember: We just saw pressurizer level going up while pressure went down.
- D. Core safety can be assured only if the core is being cooled, and this requires water and water flow. After a trip the primary system must be subcooled, a heat sink must be provided.
- E. Keep the high pressure injection operating until a subcooled condition exists. Only when the primary is subcooled, is filling the pressurizer above the level of indication a serious condition.
- F. If the steam generators cannot be used as a heat sink, the core must be cooled by high pressure injection, and forcing the relief valves open.

- 2.1.1 MU-V17 will open to compensate for reduced pressurizer level.
- 2.1.2 Additional pressurizer heaters will come on in response to reduced reactor coolant pressure.

2.2 Manual Action

- 2.2.1 Verify MU-V17 open and pressurizer heaters on.
- 2.2.2 "CLOSE" MU-V376 letdown isolation valve, & "START" the backup MU pump, if required.
- 2.2.3 Reduce load at 10% minute & proceed with normal shutdown.
- 2.2.4 "LINE-UP" waste transfer pump from a R.C. Bleed Holdup Tank & pump to the makeup tank to maintain required level.
- 2.2.5 If for any reason the operator cannot maintain Make-up Tank and Pressurizer levels above their respective low level alarm setpoints, "TRIP" the reactor, "INITIATE" Safety Injection manually (push buttons on panel 3), & then "Close" MU-V12.

3.0 FOLLOW UP ACTION

- 3.1 Safety Injection Not Initiated.
 - 3.1.1 Initiate unit shutdown & cooldown per 2102-3.1 and 2102-3.2 respectively.
- 3.2 Safety Injection Manually Initiated (HPI and LPI).
 - 3.2.1 Verify that the Makeup Pumps & Decay Heat Removal Pumps start satisfactorily.
 - 3.2.1.1 Close MU-V12 and MU-V18.
 - 3.2.2 Bypass the SAFETY INJECTION by DEPRESSING the Group Reset Pushbuttons & "THROTTLE" MU-V16A/B/C/D as necessary to maintain 220" pressurizer level and not exceed 250 GPM/HPI flow leg.
 - 3.2.3 If MU pump flow drops below 95 GPM, trip excess MU pumps.

2. Close MU-V3, letdown isolation valve, & start additional MU pump (normally MU-P1A) Rev. 1
3. Reduce load at 10%/minute & proceed with normal shutdown.
4. Line up a waste transfer pump to the "B" R. C. Bleed Tank & pump to the makeup tank to maintain required level.
5. If for any reason, the operator cannot maintain make-up tank and pressurizer levels above their respective low level alarm setpoints, trip the reactor, initiate hi pressure injection manually, & then close MU-V12. Rev.1

6.3 Follow Up Action (Leak within system capability)

A. Hi Pressure Injection Not Initiated

1. Initiate plant shutdown & cooldown per OP-1102-10.

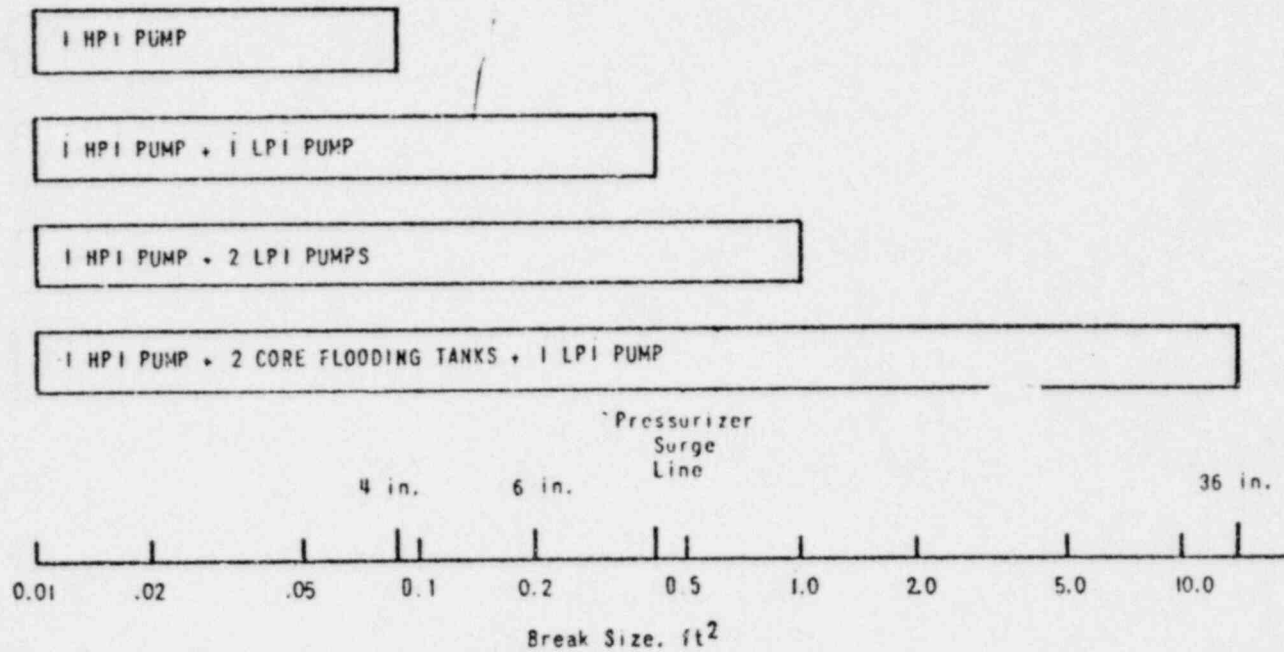
B. Hi Pressure Injection Manually Initiated

1. Verify that the makeup pumps & decay heat removal pumps start satisfactorily.
2. Bypass the E.S. signal, & throttle MU-V16A/B/C/D as necessary to maintain 220" pressurizer level and not exceed 250 GPM/HP1 flow leg. Rev. 1
3. When MU pump flow drops below 80 GPM, as a result of throttling MU-V16A/B/C/D open MU-V36&37 to provide MU pump recirculation path to MU tank.

NOTE: RCS Loop A MU pump flow is the sum of MU23 FE1&2. RCS Loop B MU pump flow is the sum of MU23 FE3&4.

LEGEND:

HPI - HIGH PRESSURE INJECTION
LPI - LOW PRESSURE INJECTION



EMERGENCY CORE COOLING SYSTEMS CAPABILITY
TO MEET FUEL CLAD TEMPERATURE DESIGN LIMIT
THREE MILE ISLAND NUCLEAR STATION, UNIT 1

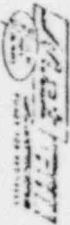


FIGURE 14-54

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