

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 158229

Date: July 28, 1980

Title: Scram Discharge Volume Fails to Drain and Alarms Clear at Dresden 3

The failure sequence was:

1. Data on EWR scram system was being gathered as requested by IE Bulletin 80-17.
2. The reactor was manually scrambled, and the system was aligned to obtain data.
3. Approximately 8 minutes after scram the scram instrument volume (SIV) level instrumentation indicated that the scram discharge volumes (SDVs) had drained.
4. Ultrasonic test, however, showed that the 4-inch piping of the west SDV was still 80% full.
5. The ball check valve (vacuum breaker) on the west SDV alternate vent path was found to be stuck closed.
6. The cause for the failure of west side SDV drainage is believed to be due to unavailability of the normal vent path combined with unavailability of the alternate vent path. Both SDVs are normally vented via a common header that is piped to a vented tank, the RBEDT (reactor building equipment drain tank). [At the time of this event the level in the RBEDT was reported to be above normal, such that the SDV vent header was emersed and could not be vented. The east SDV would also have been prevented from draining if its alternate vent path was not functioning (i.e., if its ball check valve was stuck closed).]

Corrective action:

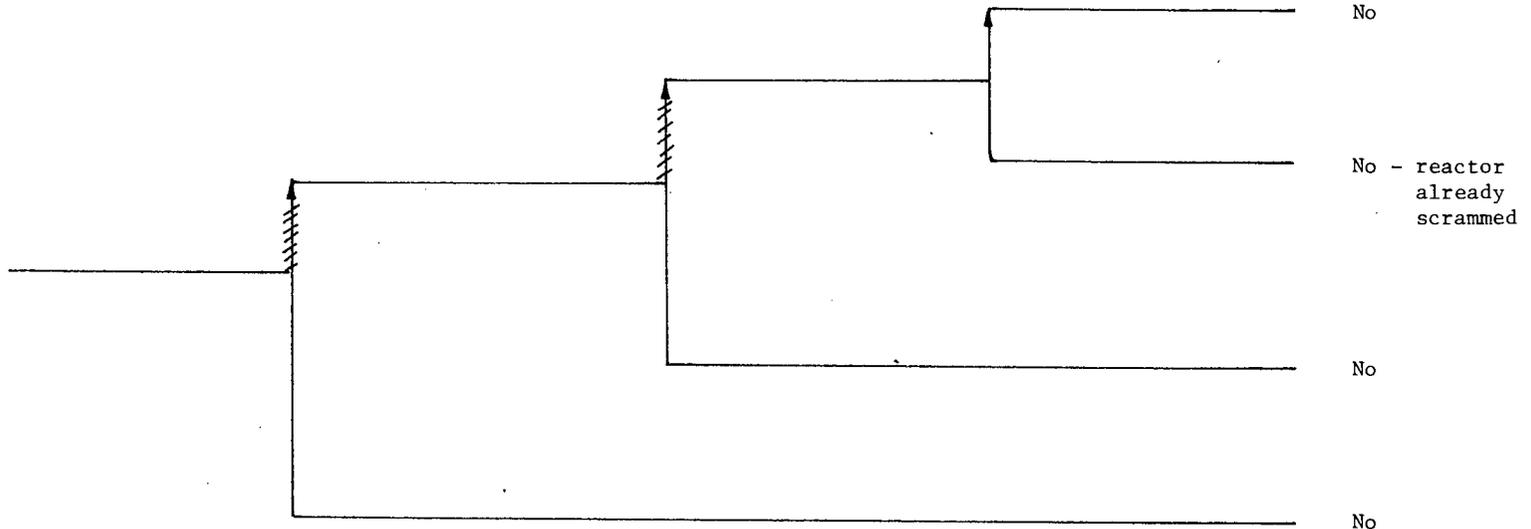
1. The west ball check valve was manually opened establishing a positive venting path, and the SDV drained.
2. A daily ultrasonic test to verify SDV drainage and scram volume availability was immediately implemented.
3. Both east and west ball check valves were removed and cleaned and were shown to operate satisfactorily.
4. An alternate continuous vent path was established that only depends on the SDV vent valves and not the ball valves.
5. Installation of a continuous water level monitoring system was to be investigated.

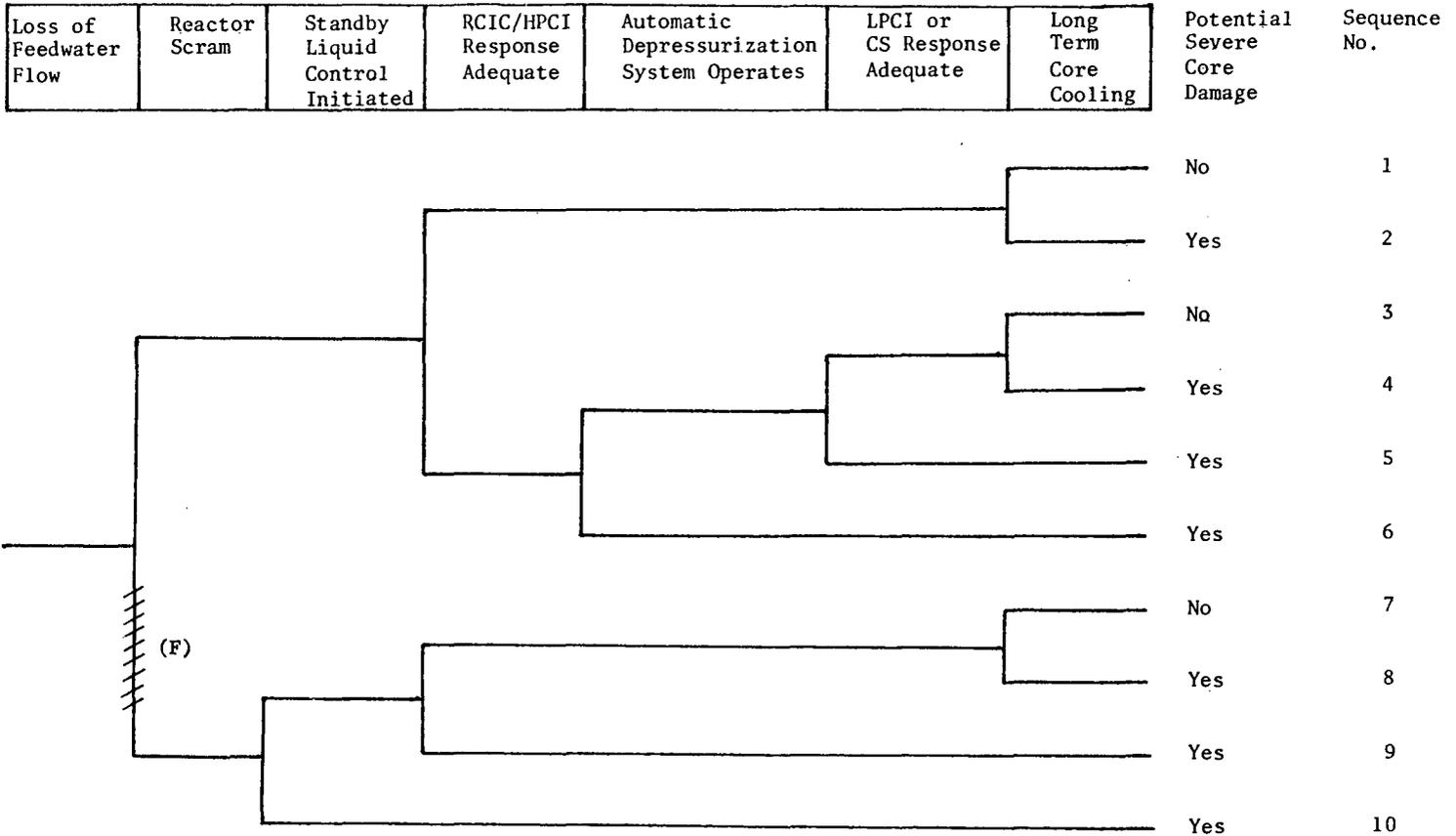
Design purpose of failed system or component:

The scram system is designed to rapidly insert the control rods in the event of required shutdown.

<p>Test requested by IE Bulletin 80-17 in progress</p>	<p>Eight minutes after the reactor was manually scrammed and the SDV vent/drain valves had been manually opened, the level switches on the scram instrument volume cleared, indicating that the SDVs had drained</p>	<p>56 minutes after the scram, ultrasonic testing indicated the west SDV still 80% full due to unavailable normal and backup vent paths</p>	<p>Ball check valve on west SDV vent was manually opened from stuck closed position, allowing SDV to drain</p>
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Potential Severe Core Damage





NSIC 158229 - Sequence of Interest for Scram Discharge Fails to Drain and Alarms Clear at Dresden 3

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 158229

LER NO.: 80-031

DATE OF LER: July 28, 1980

DATE OF EVENT: July 19, 1980

SYSTEM INVOLVED: Scram system

COMPONENT INVOLVED: Scram discharge volume

CAUSE: Mechanical failure of vent check valve and level switch

SEQUENCE OF INTEREST: Loss of feedwater

ACTUAL OCCURRENCE: Failure of scram discharge volume (SDV) to drain and
SDV level instrument to transmit correct signal

REACTOR NAME: Dresden 3

DOCKET NUMBER: 50-249

REACTOR TYPE: BWR

DESIGN ELECTRICAL RATING: 794 MWe

REACTOR AGE: 9.5 years

VENDOR: General Electric

ARCHITECT-ENGINEERS: Sargent & Lundy

OPERATORS: Commonwealth Edison

LOCATION: 9 miles east of Morris, Illinois

DURATION: 24 hours (estimated) (service failure duration would have
been controlled by emptying of the RBEDT. The duration is
based on an assumed RBEDT drainage once per day (24 h).

PLANT OPERATING CONDITION: 0% power (test scram just initiated)

TYPE OF FAILURE: Inadequate performance;
made inoperable;

DISCOVERY METHOD: Test required by IE Bulletin 80-17

COMMENT: The 4-inch piping of the west SDV was reported to be 80% full. Based on SDV piping information for Dresden 3 available at NSIC, it appears that overall the west SDV was on the order of 40% full. Even with the CRD seal leakage and bypass flow accumulating nominally in excess of 5 gpm, the SDV may have been able to accommodate at least a partial scram. See also NUREG-0090, Vol. 3, No. 2.