

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 80138

Date: June 10, 1972

Title: Valve Problem Causes Flooding of Turbine-Building Basement at Quad Cities 1

The failure sequence was:

1. The 10' diameter butterfly valves in the circulating water system of the main condenser were being modified during a scheduled maintenance outage. Operators were venting the actuator on a valve in one of the circulating water discharge lines. The valve slammed shut. Three circulating water pumps were operating when the valve slammed shut and this resulted in a water hammer which ruptured a rubber expansion joint in the recirculation line.
2. The flooding was immediately reported to the control room and operators shut down the pumps. However during the interim (~6 min) river water flooded the turbine building basement to a depth of ~15.5 ft.
3. Several pieces of equipment were flooded including the following safety related equipment:
 1. four emergency service water pumps (RHR system cooling)
 2. cooling water pumps for the unit diesel (#1) and the swing diesel (#1/2).

Corrective action:

1. The water was pumped out of the basement and was continuously monitored for radiation.
 2. The damaged equipment was repaired.
 3. New procedures were adopted for venting the valve hydraulic actuation.
 4. Flood alarms were installed, and a "very high level" trip was installed to shut down the circulating water pump should an expansion joint rupture while the pumps are in operation.
- (see attached sheet)

Design purpose of failed system or component:

1. The emergency service water pumps provide cooling water to the RHR heat exchangers.
2. The diesels provide emergency power should all offsite power and unit power be lost.

Unavailability of system per WASH 1400:* RHR (HPSW): $4 \times 1 \times 10^{-5}/D$

Unavailability of component per WASH 1400:* --

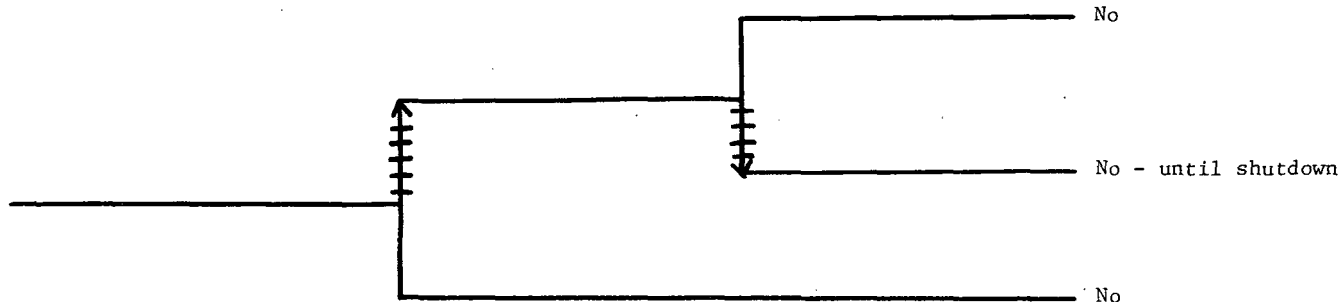
* Unavailabilities are in units of per demand D^{-1} . Failure rates are in units of per hour HR^{-1} .

Corrective action: (continued)

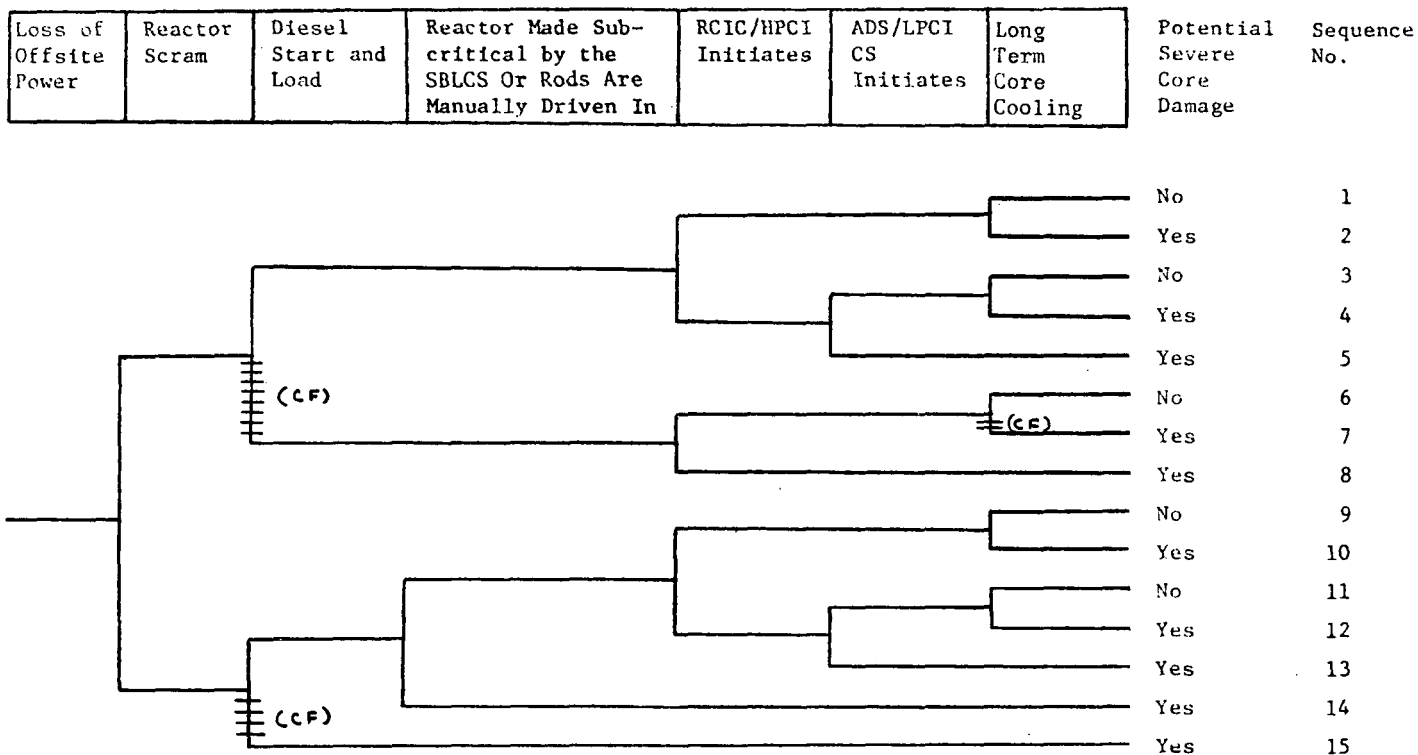
5. Safety related equipment located in the condenser pump room was enclosed in water tight vaults.

6. The ability to cross tie RHR systems of the two units was also installed.

10' butterfly valve slams shut as operator vents valve actuator. A water hammer results from the valve slamming and the operation of 3 circulating water pumps	The water hammer results in a rupture of 9 snubber expansion joints	Circulating water pumps shutdown in time to prevent loss of safety related equipment	Potential Severe Core Damage
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NSIC 80138 — Actual Occurrence of Valve Flooding of the Turbine Building Basement at Quad Cities 1



NSIC 80138 — Sequence of Interest for Valve Problem Causes Flooding of Turbine Building Basement at Quad Cities 1

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 80138

DATE OF LER: June 19, 1972

DATE OF EVENT: June 10, 1972

SYSTEM INVOLVED: RHR, electric power

COMPONENT INVOLVED: All 4 RHR emergency service water pumps, cooling water pumps
to diesels 1 and 1/2.

CAUSE: ruptured expansion joint (human error)

SEQUENCE OF INTEREST: loss of offsite power

ACTUAL OCCURRENCE: Valve Problem Causes Flooding of Turbine Building at Quad Cities 1

REACTOR NAME: Quad Cities 1

DOCKET NUMBER: 50-254

REACTOR TYPE: BWR

DESIGN ELECTRICAL RATING: 789 MWe

REACTOR AGE: .69 yr

VENDOR: General Electric

ARCHITECT-ENGINEERS: Sargent & Lundy

OPERATORS: Commonwealth Edison

LOCATION: 20 miles NE of Moline, Ill.

DURATION: 5 (a) hours

PLANT OPERATING CONDITION: Shutdown

SAFETY FEATURE TYPE OF FAILURE: (a) inadequate performance; (b) failed to start;
(c) made inoperable; (d) _____

DISCOVERY METHOD: Operational event

COMMENT: