

# PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 130788

Date: October 7, 1977

Title: Half-trip of SFRCS Causes RCS Pressure Rise at Davis-Besse 1

The failure sequence was:

1. A spurious half-trip of the SFRCS occurred, which initiated closure of a feedwater valve, resulting in loss of water to one steam generator.
2. The reduction in heat removal resulted in operation of the pressurizer relief valve, which failed open after 9 open/close cycles.
3. The operator manually tripped the reactor; within six minutes the RCS was at saturation pressure/temperature.
4. The pressurizer level went to maximum.
5. Approximately 25 minutes later the operator realized the relief valve was stuck open and closed the block valve, terminating the transient.

Corrective action:

1. The SFRCS was monitored to detect spurious signals.
2. Plans were also being developed to add additional SFRCS alarm windows and seal in alarm conditions.
3. A missing PORV control circuit relay was installed.

Design purpose of failed system or component:

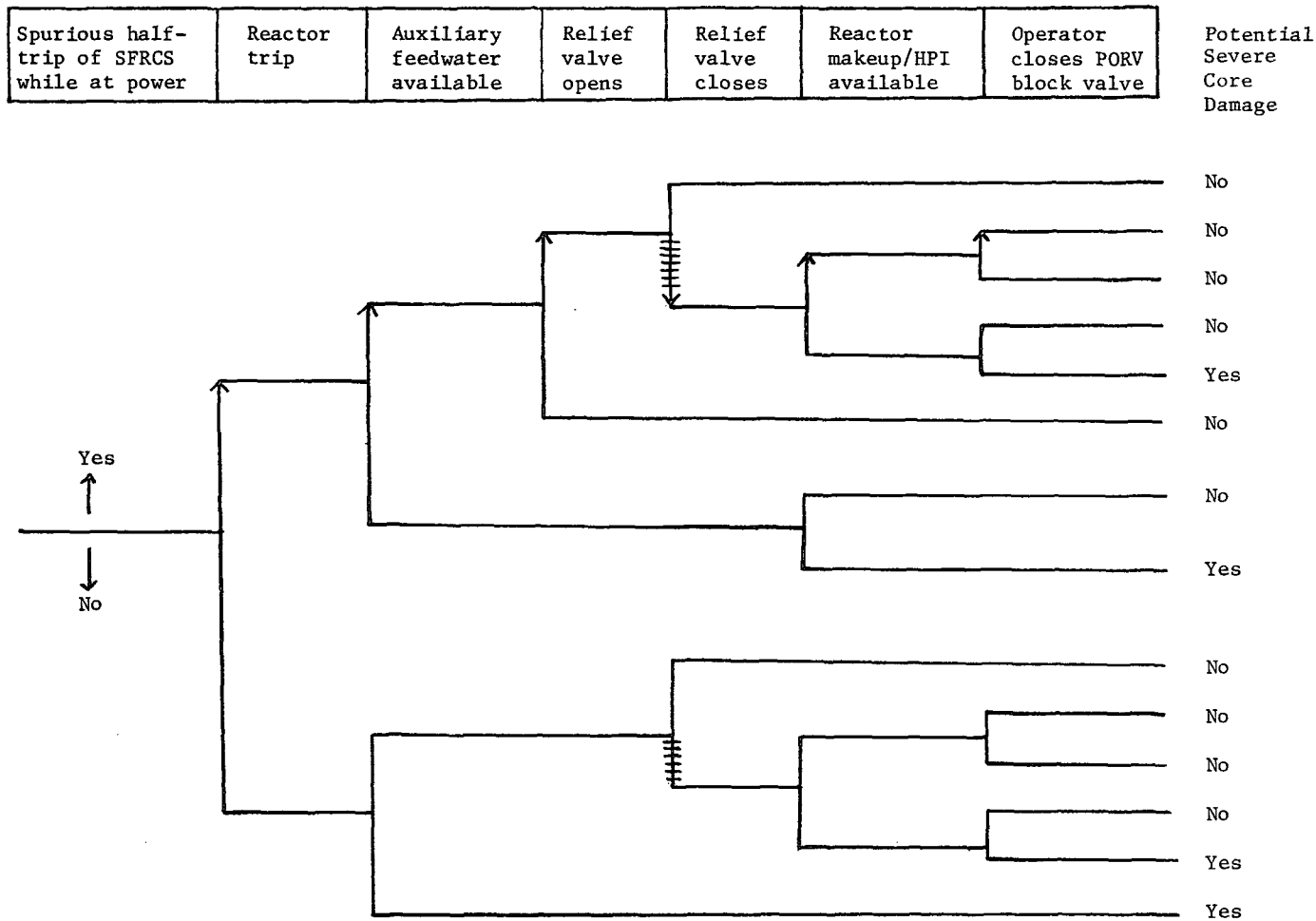
1. Steam generator isolation during a steam line break.

Unavailability of system per WASH 1400:\* SFRCS — type systems were not considered in WASH-1400.

Unavailability of component per WASH 1400:\*

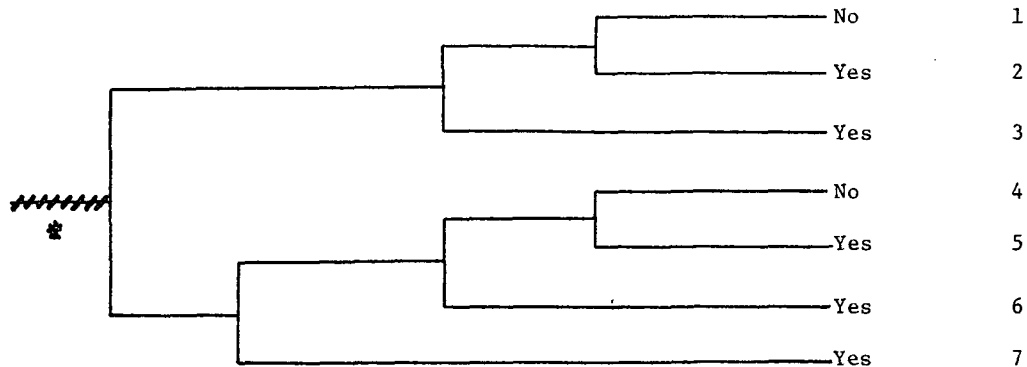
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\*Unavailabilities are in units of per demand  $D^{-1}$ . Failure rates are in units of per hour  $HR^{-1}$ .



NSIC 130788 — Actual Occurrence for Spurious Half-Trip fo SFRCS Causes RCS Pressure Rise at Davis-Besse 1

Small LOCA	Reactor Trip	Auxiliary Feedwater and Secondary Heat Removal	High Pressure Injection	Low Pressure Recirculation and LPR/HPI Cross-Connect	Potential Severe Core Damage	Sequence No.
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NSIC 130788 -- Sequence of Interest for Spurious Half-Trip of SFRCS Causes RCS Pressure Rise at Davis-Besse 1

\* failure requires operator error in failing to close PORV block valve.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 130788

DATE OF LER: October 7, 1977

DATE OF EVENT: September 24, 1977

SYSTEM INVOLVED: Pressure relief of RC system

COMPONENT INVOLVED: Valve

CAUSE: Close relay missing from relief valve control circuit (PORV failure).

SEQUENCE OF INTEREST: Stuck open PORV — small LOCA.

ACTUAL OCCURRENCE: Spurious 1/2 trip of steam and feedwater rupture control system.

REACTOR NAME: Davis-Besse 1

DOCKET NUMBER: 50-346

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 906 MWe

REACTOR AGE: 0.5 yr

VENDOR: B&W

ARCHITECT-ENGINEERS: Bechtel

OPERATORS: Toledo Edison Co.

LOCATION: 21 miles east of Toledo, Ohio

DURATION: N/A

PLANT OPERATING CONDITION: 9% power

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

DISCOVERY METHOD: Operational error.

COMMENT: No cause found for the 1/2 trip valve stuck open because pilot valve stem failed.