PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 141097

Date: March 29, 1978

Title: Safety Injection Occurs at TMI-2

The failure sequence was:

1. Alternate power source feeder breakers to vital bus 2-IV (120 V a-c) were tripped for test.
2. Frequency control module failed resulting in blown fuses in the DC input to invertor.
3. Vital bus 2-IV tripped on invertor failure, resulting in the PORV failing open.
4. Because of the reactor coolant pump configuration at the time, a reactor trip also occurred.
5. The operators did not realize the relief valve had failed open because of lack of PORV position indication.
6. ECCS was initiated at 1650 psig.
7. Four minutes into the transient, vital bus 2-IV was re-energized, which closed the relief valve and terminated the transient.

Corrective action;

1. A design change was initiated to change the failure position of the relief valve upon loss of power to closed in lieu of open.
2. Relief valve position indication was provided in the control room.

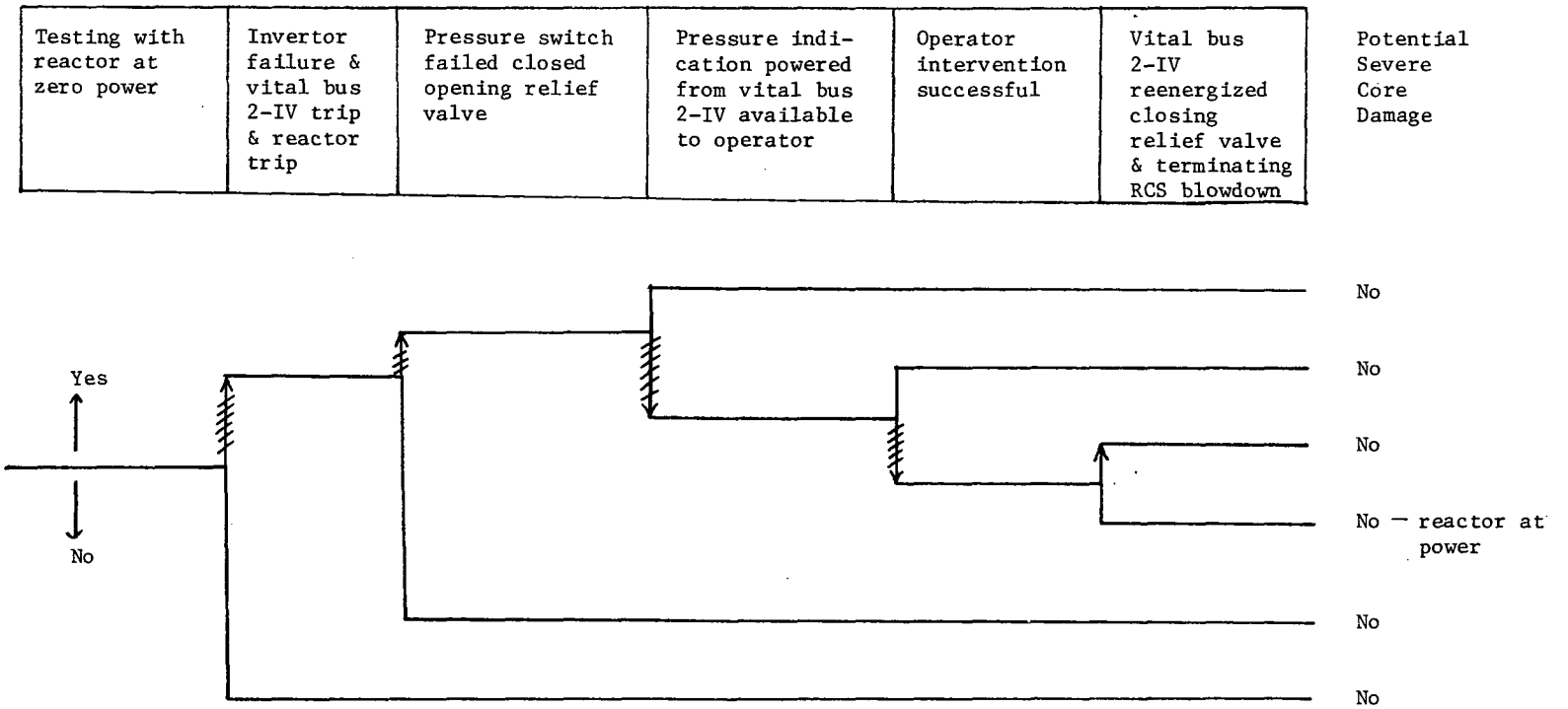
Design purpose of failed system or component:

1. Provide 120 V a-c power for loads which require uninterrupted power.
2. The pilot operated relief valve provides overpressure protection for the RCS.

Unavailability of system per WASH 1400:* N/A

Unavailability of component per WASH 1400:* solid state device, high power application: 3×10^{-6}/hr.

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



NSIC 141097 — Actual Occurrence for Loss of Vital Bus and Relief Valve Opening at Three Mile Island 2

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.
					No	1
					Yes	2
					Yes	3
////////*					No	4
					Yes	5
					Yes	6
					Yes	7

NSIC 141097 — Sequence of Interest for Safety Injection Occurs at Three Mile Island 2

*failure requires operator error of failing to close the PORV isolation valve.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 141097

DATE OF LER: June 27, 1978

DATE OF EVENT: March 29, 1978

SYSTEM INVOLVED: 120 V a-c vital power, RCS

COMPONENT INVOLVED: Vital bus invertor

CAUSE: Blown fuse, faulty invertor control module

SEQUENCE OF INTEREST: small LOCA - stuck open PORV

ACTUAL OCCURRENCE: stuck open PORV

REACTOR NAME: Three Mile Island 2

DOCKET NUMBER: 50-320

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 906 MWe

REACTOR AGE: 0.0+ yr

VENDOR: Babcock & Wilcox

ARCHITECT-ENGINEERS: Burns & Roe

OPERATORS: Metropolitan Edison Co.

LOCATION: 10 miles SE of Harrisburg, PA

DURATION: N/A

PLANT OPERATING CONDITION: Zero power physics testing

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

DISCOVERY METHOD: incident during physics testing

COMMENT: Vital bus tripped because of invertor failure while alternate power source was removed for testing.