PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 97107

Date: October 31, 1974

Title: BIT Auto-Injection Failure at Zion 2

Meets precursor criteria no:

The failure sequence was:

1. An instrument mechanic inadvertently tripped a RCS pump.
2. The resulting flow transient caused a reactor trip and SI signal.
3. Train A safeguards failed due to a loss of power.
4. The train B inlet valve to BIT failed to open.

Corrective action:

Valve stem was cleaned, packing was changed, and torque limits were increased.

Design purpose of failed system or component:

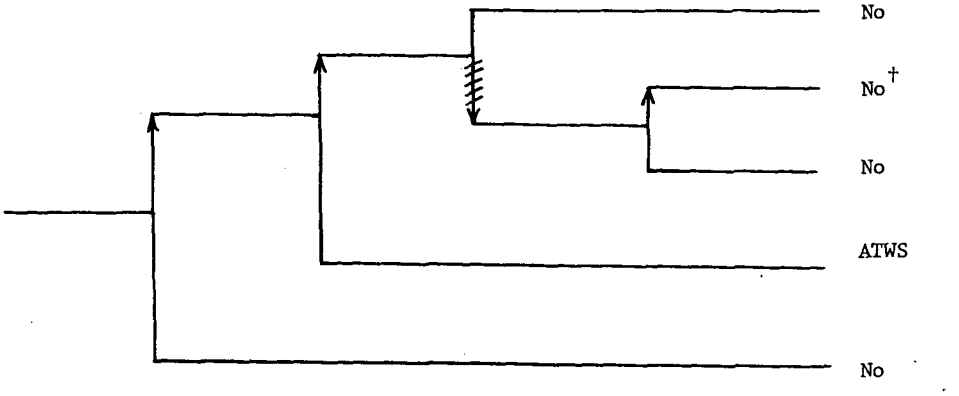
BIT protects the core from a main steam pipe break.

Unavailability of system per WASH 1400:* -

Unavailability of component per WASH 1400:* valve, failure to operate: $1 \times 10^{-3}/D$
safeguards, train A: $5.8 \times 10^{-3}/D$
125 VDC system: $1.1 \times 10^{-6}/D$

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

RC pump tripped	Flow transient & SIS	Reactor trip	Auto BIT injection	Core goes critical & returns to power	Potential Severe Core Damage



NSIC 97107 — Actual Occurrence for Boron Injection Tank Inlet Valve Failures at Zion 2 (BIT is primarily for main steam pipe break — FSAR says no core melt for any pump trips. †To return to criticality would require the most reactive RCCA to be stuck fully withdrawn and end of core life negative coolant temperature coefficient.)

Steam Line Break	Reactor Trip	Steam Generator Isolation	Auxiliary Feedwater and Secondary Heat Removal	High Pressure Injection	PORV Opened Due to Continued HPI	PORV or PORV Isolation Valve Closure	Long Term Core Cooling	Potential Severe Core Damage	Sequence No.
								No	1
							(D)	No	2
								Yes	3
								No	4
				(F)				Possible (with worst case stuck rod)	5
			(D)				(D)	No	6
								Yes	7
				(F)				Yes	8
								Yes	9
								Yes	10

NSIC 97107 — Sequence of Interest for Boron Injection Tank Valve Failures at Zion 2

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 97107

DATE OF LER: October 31, 1974

DATE OF EVENT: October 22, 1974

SYSTEM INVOLVED: Safety Injection

COMPONENT INVOLVED: Valves — 2

CAUSE: Power failure to one safeguards train and stuck valve on other train, (human error)

SEQUENCE OF INTEREST: Main steam pipe break

ACTUAL OCCURRENCE: Instrument mechanic inadvertently tripped a RCS pump, operator error

REACTOR NAME: Zion 2

DOCKET NUMBER: 50-304

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 1040 MWe

REACTOR AGE: 0.8 yr

VENDOR: Westinghouse

ARCHITECT-ENGINEERS: Sargent & Lundy

OPERATORS: Commonwealth Edison Co.

LOCATION: 40 miles north of Chicago, Ill.

DURATION: 360(a) hours

PLANT OPERATING CONDITION: 57% power

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

DISCOVERY METHOD: Operational event

COMMENT: