PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 128906

Date: August 31, 1977

Title: No Break Power Panel De-energized at Cooper

The failure sequence was:

1. A blown fuse in the no break power panel (NBPP) caused it to de-energize. The automatic power backup source was out of service (due to a failed K10 contactor).
2. The NBPP supplies both the feedwater controller and the RCIC, thus a partial loss of feedwater flow and degraded operation of the RCIC resulted.
3. The reactor tripped on low water level.
4. The MSIVs closed and the HPCI and RCIC systems initiated on low-low water level.
5. Neither the RCIC nor the HPCI responded adequately. The RCIC did not go to full speed because of the loss of the NBPP. The HPCI, however, did not accelerate to full speed because the governor actuator was not functioning.

(see attached page)

Corrective action:

1. The blown fuse was replaced.
2. The contactor for the auxiliary power source was replaced and reconnected.

Design purpose of failed system or component:

1. The NBPP provides a continuous supply of power to vital loads.
2. The K10 contactor allows the NBPP to switch to an alternate source of power.

Unavailability of system per WASH 1400:* RCIC: $8.0 \times 10^{-2}/D$
HPCI: $8.8 \times 10^{-2}/D$

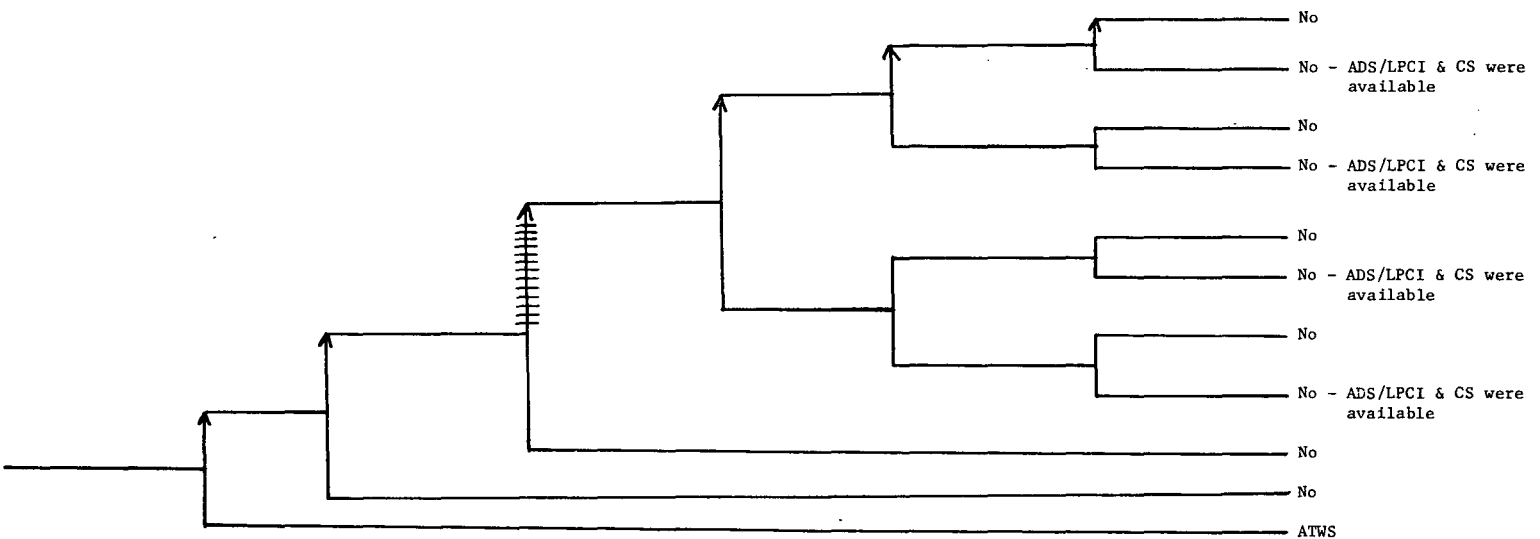
Unavailability of component per WASH 1400:* fuse $1 \times 10^{-6}/hr$, solid state devices $3 \times 10^{-6}/hr$

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

The failure sequence was: (continued)

6. A relief valve opened at 1080 psig for pressure control.
7. At -110" the operator opened another relief valve in order to increase HPCI flow. At that point power was restored and the RCIC pump ramped up to power and provided proper water level control.

Blown fuse fails the no break power panel resulting in minimum feedwater flow	Reactor trips on low water level	Low-low water level reached, causes MSIV to close and sends initiation signal to HPCI/RCIC	RCIC/HPCI system response is insufficient to control water level	Pressure relief valve opens at 1080 psig	Water level reaches -110 inches, operator actuate relief valve to increase HPCI flow	Power restored to panel, HPCI/RCIC respond satisfactorily	Potential Severe Core Damage



NSIC 128906 – Actual Occurrence for No Break Power Panel De-energized at Cooper

Loss of Feedwater Flow	Reactor Subcritical	RCIC/HPCI Response Adequate	Automatic Depressurization System Operates	LPCI or CS Response Adequate	Long Term Core Cooling	Potential Severe Core Damage	Sequence No.
Yes						No	1
						Yes	2
		(F)[1]				No	3
						Yes	4
						Yes	5
						Yes	6
No						Yes	7

NSIC 128906 — Sequence of Interest for No Break Power Panel De-energized at Cooper

[1]Success requires restoration of power to the NBPP.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 128906

DATE OF LER: September 30, 1977

DATE OF EVENT: August 31, 1977

SYSTEM INVOLVED: electric power, feedwater, RCIC, HPCI

COMPONENT INVOLVED: fuses and circuit breakers

CAUSE: a blown fuse

SEQUENCE OF INTEREST: loss of feedwater flow

ACTUAL OCCURRENCE: no break power panel de-energized at Cooper

REACTOR NAME: Cooper

DOCKET NUMBER: 50-298

REACTOR TYPE: BWR

DESIGN ELECTRICAL RATING: 778 MWe

REACTOR AGE: 3.5 yr

VENDOR: GE

ARCHITECT-ENGINEERS: Burns and Roe

OPERATORS: Nebraska Public Power District

LOCATION: 23 miles S of Nebraska City

DURATION: N/A

PLANT OPERATING CONDITION: 92%

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

DISCOVERY METHOD: operational event

COMMENT: -