

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 128935

Date: August 29, 1977

Title: Plant 161 kV Feed Lost Momentarily at Ft. Calhoun 1

The failure sequence was:

1. A target for a backup relay at a substation was being reset after a trip caused by an electrical storm.
2. A defective reset mechanism on the target caused a momentary loss of the 161 kV line to the plant.
3. An automatic fast transfer to the 22 kV reserve feed did not occur due to the fact that such a transfer is initiated by the primary relaying at the same substation.
4. The loss of the 161 kV line and subsequent failure to transfer to the 22 kV line resulted in a loss of offsite power on the safety related buses at the plant.

(See next page)

Corrective action:

After shutdown was completed, the plant was back-fed from the 345 kV buses while the defective relay was repaired.

Design purpose of failed system or component:

The 161 kV offsite line is used to supply power to the safety related buses and to half of the higher voltage buses in the plant during plant operation.

Unavailability of system per WASH 1400: * Offsite power: $2 \times 10^{-5}/\text{hr}$

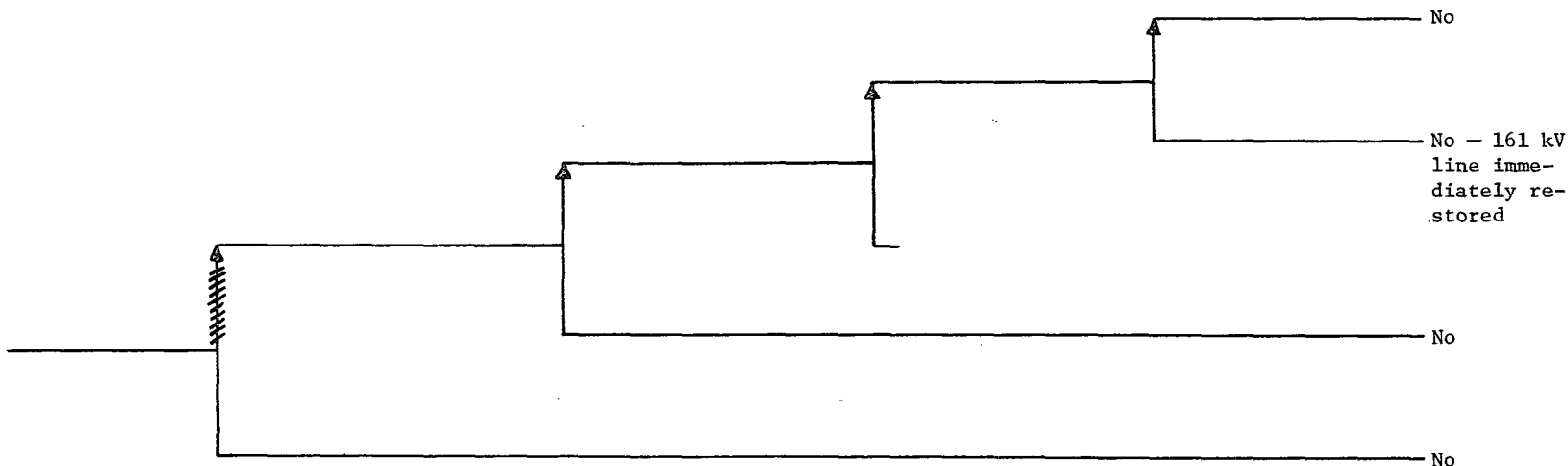
Unavailability of component per WASH 1400: * -

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

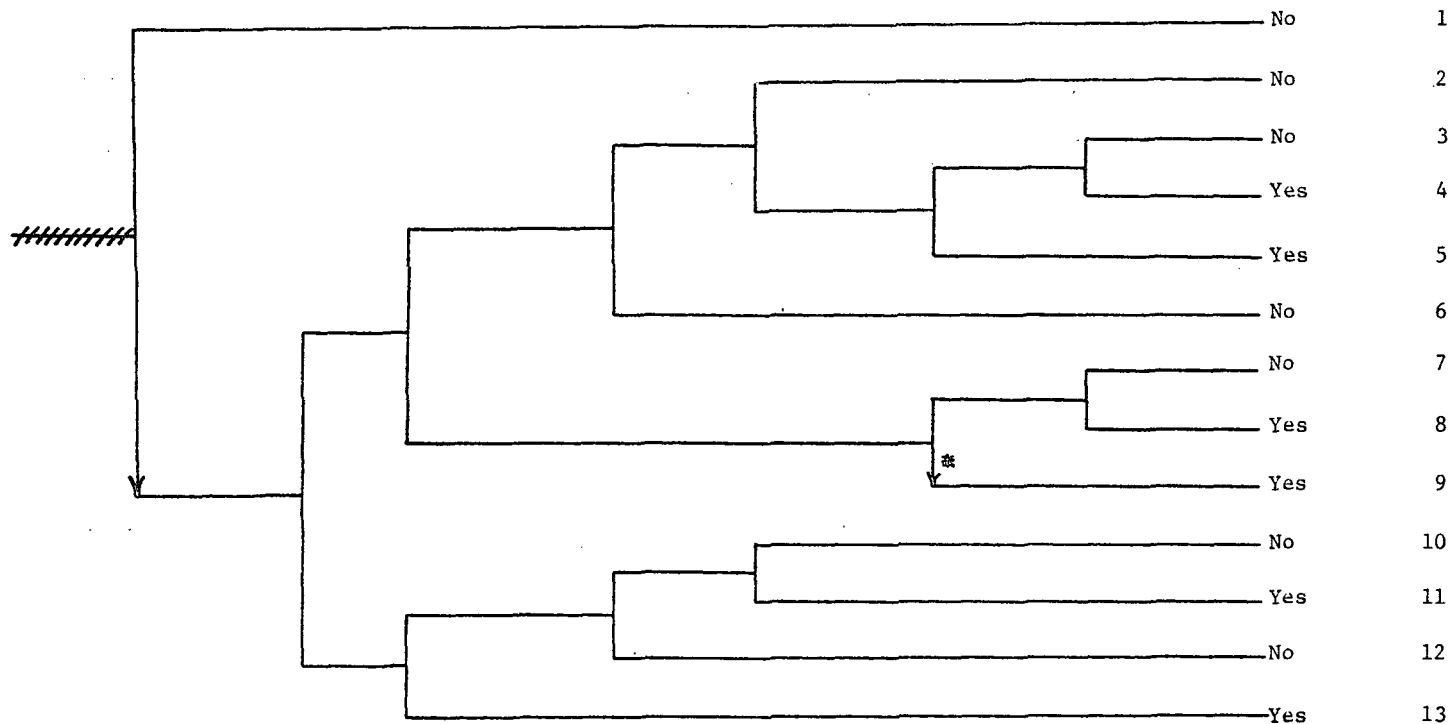
The failure sequence was: (continued)

5. This loss of voltage resulted in the tripping of two reactor coolant pumps and a subsequent reactor trip on low coolant flow.
6. The diesel generators automatically started and supplied power to the safety-related buses.
7. The substation was restored immediately after tripping.

Reactor at 98% Power and Backup Relay Target at 161 kV Substation Being Reset	Defective Reset Mechanism on Backup Relay Results in Loss of 161 kV Lines to Plant	Fast Transfer to 22 kV Reserve Feed Does Not Occur Due to Fact That Such Transfers are Initiated by Primary Relaying at 161 kV Substation	Loss of 161 kV Power Results in Trip of Two Reactor Coolant Pumps and Reactor Trip on Low Coolant Flow	Diesel Generators Start and Provide Power to Safety-Related Buses	Potential Severe Core Damage
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Loss of Offsite Power	Turbine Generator Runs Back and Assumes House Loads	Emergency Power	Auxiliary Feedwater and Secondary Heat Removal	PORV Demanded	PORV or PORV Isolation Valve Closure	High Pressure Injection	Long Term Core Cooling	Potential Severe Core Damage	Sequence No.
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NSIC 128935— Sequence of Interest for Plant 161 kV Feed Lost Momentarily at Ft. Calhoun 1

* Not included in mitigation procedures.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 128935

DATE OF LER: August 29, 1977

DATE OF EVENT: August 22, 1977

SYSTEM INVOLVED: Offsite power

COMPONENT INVOLVED: backup relay target mechanism

CAUSE: Failure cause not specified

SEQUENCE OF INTEREST: Loss of offsite power

ACTUAL OCCURRENCE: Loss of offsite power

REACTOR NAME: Fort Calhoun 1

DOCKET NUMBER: 50-285

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 457 MWe

REACTOR AGE: 4.0 yr

VENDOR: Combustion Engineering

ARCHITECT-ENGINEERS: Gibbs & Hill

OPERATORS: Omaha Public Power District

LOCATION: 19 mi north of Omaha, Nebraska

DURATION: N/A

PLANT OPERATING CONDITION: 98% power

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

DISCOVERY METHOD: operational event

COMMENT: