PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 39024

Date: January 25, 1972

Title: Loss of Off Site Power and Other Failures At Big Rock Point

The failure sequence was:

1. "Galloping Conductors" caused line faults which resulted in the failure of the Gaylord 388 oil circuit breaker (OCB).
2. Other breakers at the substation acted to clear the fault. This, however, left the plant in a no load condition, resulting in a turbine trip on overspeed and subsequently in a reactor trip due to high neutron flux.
3. The 199 OCB was manually opened since the 138 kv line was de-energized intermittently (unspecified reasons) for 20 minutes.
4. The station transferred to the 46 kv back-up line, however, the breaker tripped. A stuck contact of an instantaneous overcurrent relay (1288 OCB) in conjunction with operation of the undervoltage bus fault relay caused the 46 kv line to de-energize.

(see attached page)

Corrective action:

1. An inspection of the transmission lines indicated they had received no damage during event.
2. The faulty trip coil (388 OCB) and the faulty overcurrent relay (1288 OCB) were repaired.

Design purpose of failed system or component:

1. Offsite electric power (both normal and backup) provide power to the station when the unit operator is not inservice.
2. Relays and circuit breakers are provided to protect electrical components from excessive and insufficient current and voltage conditions.

Unavailability of system per WASH 1400:* LOOP: 2×10^{-5}/Hr.

Unavailability of component per WASH 1400:*

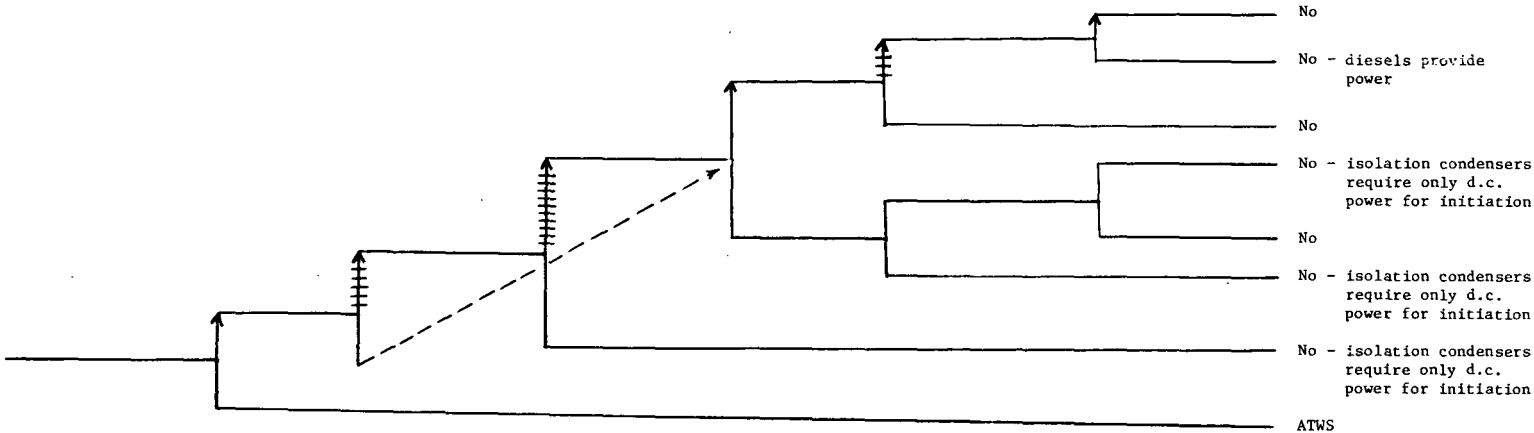
circuit breakers	1×10^{-3}/D
relays	1×10^{-4}/D

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

The failure sequence was: (continued)

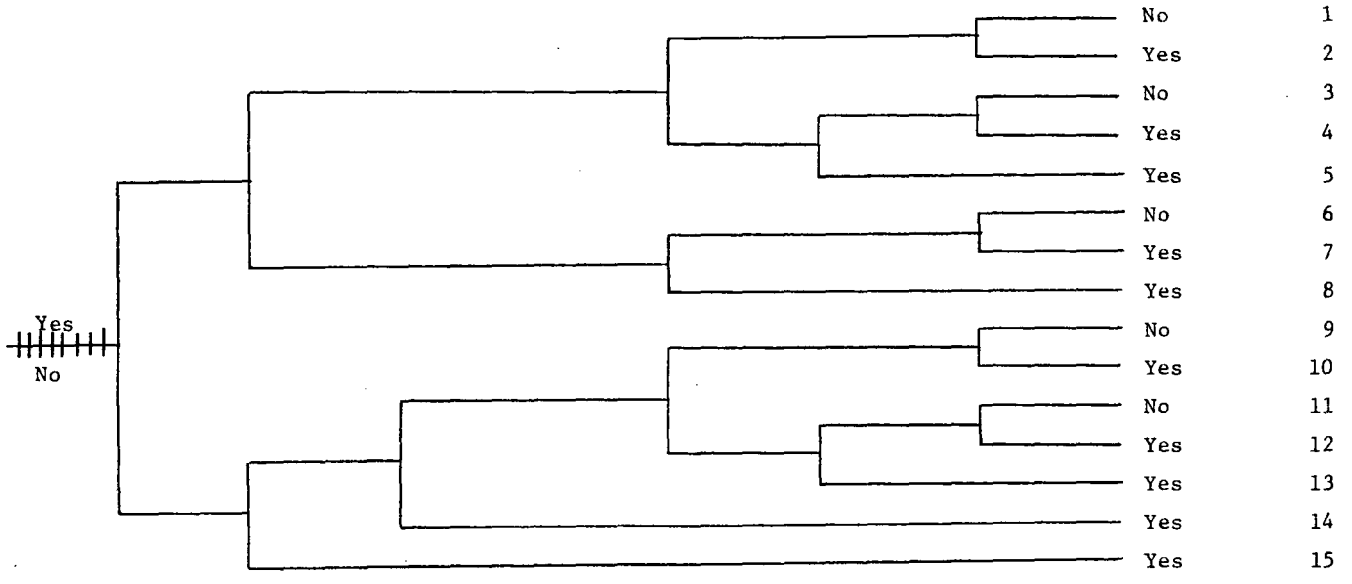
5. Upon loss of both offsite lines the diesel generator started and loaded the 2-B bus.
6. The 138 kv line was re-energized approximately 20 minutes after the turbine trip. Attempts to close the 199 OCB failed due to false trip signals from the audio relay equipment.
7. The audio relay equipment was overridden and offsite power was restored.

Line faults induced by "galloping conductors" resulted in 388 OCB trip. Substation CB cleared the fault, but momentarily isolated the plant from the grid. This resulted in a turbine trip on overspeed.	Reactor trip on high neutron flux	199 OCB manually opened because 138kv line intermittently de-energized. Automatic transfer to the back-up 46kv line occurs	A faulty trip coil (380 OCB) and a faulty overcurrent relay (1288 OCB) caused the 46kv line to de-energize	Diesel starts and loads emergency bus	Voltage restored to 138kv line within 20 minutes, but broken trips on false signal from audio tone relay equipment	Audio tone relay overridden and power is restored to the 138kv line	Potential Severe Core Damage



NSIC 39024 — Actual Occurrence of Loss of Offsite Power and Other Failures at Big Rock Point

Loss of Offsite Power	Reactor Scram	Diesel Start and Load	Reactor Made Sub-critical by the SBLCS Or Rods Are Manually Driven In	RCIC/HPCI[1] Initiates	ADS/LPCI CS Initiates	Long Term Core Cooling[2]	Potential Severe Core Damage	Sequence No.
							No	1
							Yes	2
							No	3
							Yes	4
							Yes	5
							No	6
							Yes	7
							Yes	8
Yes							No	9
No							Yes	10
							No	11
							Yes	12
							Yes	13
							Yes	14
							Yes	15



NSIC 39024 — Sequence of Interest of Loss of Offsite Power and Other Failures at Big Rock Point

[1] Big Rock Point utilizes isolation condenser instead of RCIC

[2] Success requires return of A.C. power within a day.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 39024

DATE OF LER: March 3, 1972

DATE OF EVENT: January 25, 1972

SYSTEM INVOLVED: electric power

COMPONENT INVOLVED: relays and circuit breakers

CAUSE: line faults induced by a violent storm

SEQUENCE OF INTEREST: loss of offsite power

ACTUAL OCCURRENCE: loss of offsite power

REACTOR NAME: Big Rock Point

DOCKET NUMBER: 50-155

REACTOR TYPE: BWR

DESIGN ELECTRICAL RATING: 72 MWe

REACTOR AGE: 9.3 yr

VENDOR: General Electric

ARCHITECT-ENGINEERS: Bechtel

OPERATORS: Consumers Power Company

LOCATION: Four miles NE of Charlevoix, Mich.

DURATION: N/A

PLANT OPERATING CONDITION: just scrammed

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

DISCOVERY METHOD: operational event

COMMENT: -