

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 93702

Date: May 31, 1974

Title: Two-Unit Trip at Turkey Point 3 and 4, Loss of Offsite Power at Turkey Point 4

The failure sequence was:

1. Units 3 & 4 were at full power, with unit 4 startup transformer electrically isolated for functional testing of protection system relays and for periodic maintenance on associated equipment.
2. After the transformer protective relays were tested, the transformer lockout relay was reset and current flowed through an unanticipated path (a "sneak circuit") and energized unit 4 generator breaker protection system relays, which opened the generator breakers for units 3 and 4.
3. Both unit 3 & 4 reactors automatically tripped when their turbine-generators tripped. The instantaneous grid loss was 1443 MWe.
4. Since the unit 4 startup transformer was isolated, off-site power was lost to unit 4.

Corrective action;

(see additional page)

1. Modifications were recommended to the startup transformer protective system to provide more complete isolation of the protection system relays during relay tests.
2. The stuck-open safety valve was closed by removing its manual lifting-device.

Design purpose of failed system or component:

1. Offsite electric power provides an alternative source of power to plant auxiliaries in the event the unit generator is inoperable.
2. The main steam safety valves provide over-pressure protection for the steam generators and main-steam piping.

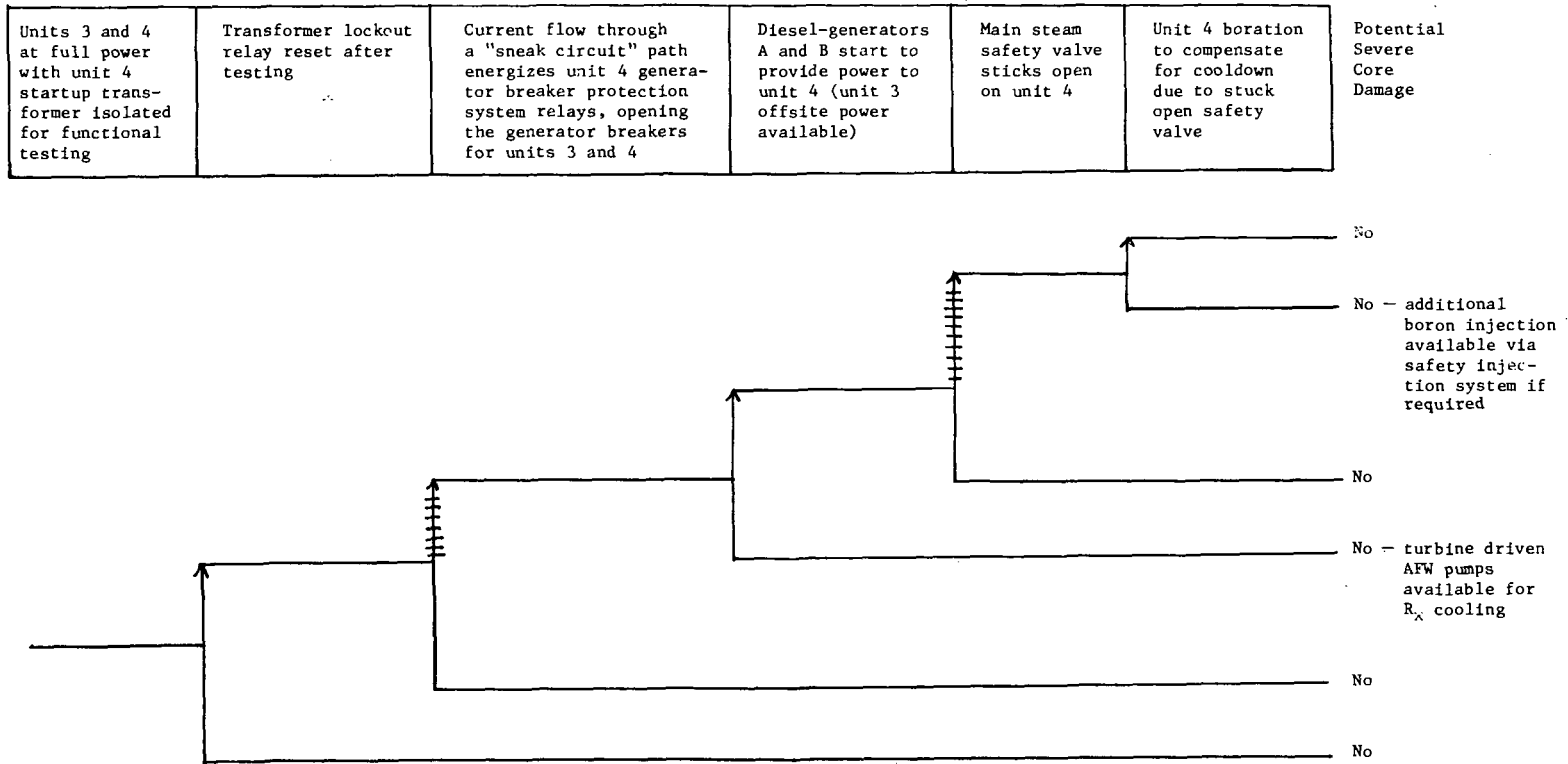
Unavailability of system per WASH 1400:* Offsite power: 10^{-3} following trip

Unavailability of component per WASH 1400:* Relief valves, failure to close: $10^{-2}/D$

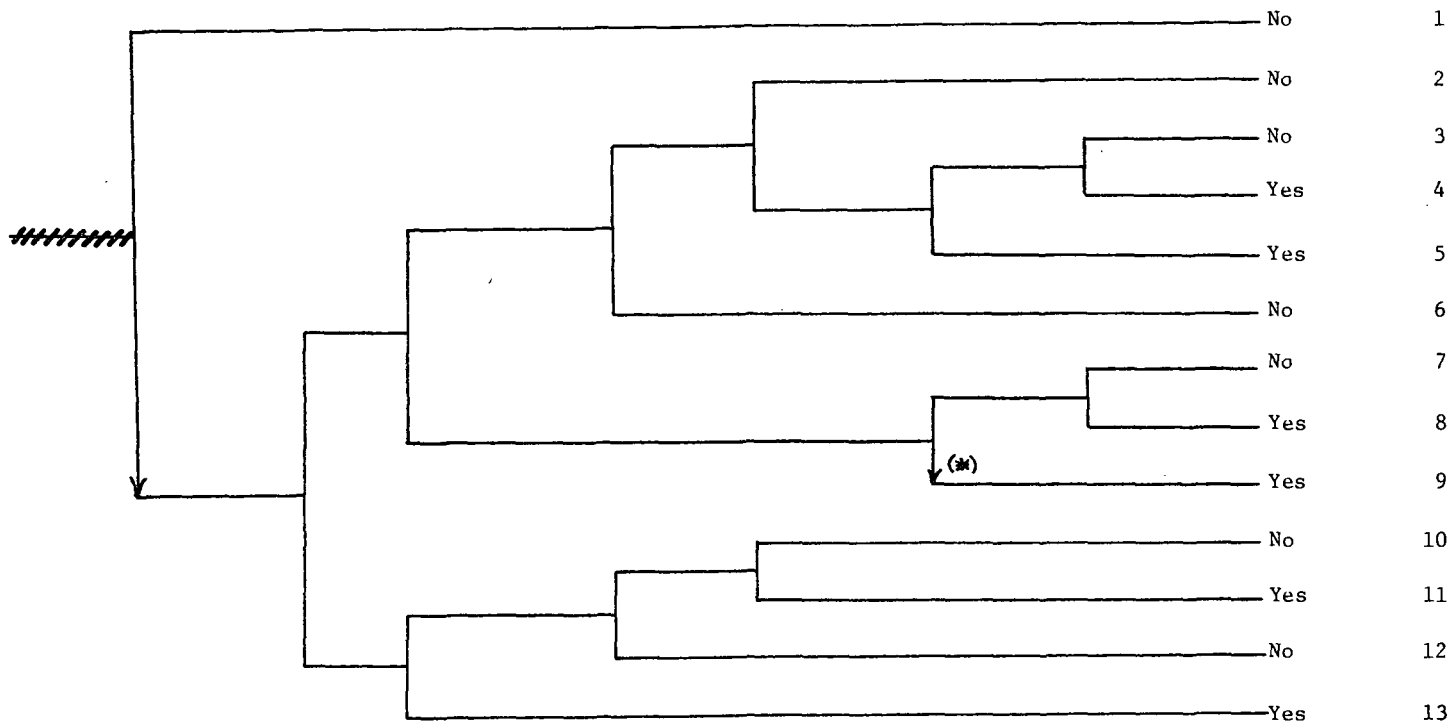
*Unavailabilities are in units of per demand D^{-1} . Failure rates are in units of per hour HR^{-1} .

The failure sequence was: (Continued)

5. Diesel-generators A & B started and assumed safety-related loads for unit 4.
6. Five minutes after reactor trip on unit 4, a main steam safety valve lifted and did not reseal.
7. Additional boron was added to the reactor coolant system to provide shut-down margin for the additional cooldown resulting from the stuck-open safety valve.



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 93702 - Sequence of Interest for Two Unit Trip at Turkey Point 3 & 4

*Use of HPI following AFW failure not included in mitigation procedures.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 93702

DATE OF LER: May 31, 1974

DATE OF EVENT: April 25, 1974

SYSTEM INVOLVED: Electric power system, main steam

COMPONENT INVOLVED: Startup transformer protective relays, main steam safety valve

CAUSE: Current flow in a sneak circuit during protective relay testing resulted in actuation of the Unit 3 & 4 generator breakers. After reactor trip, a Unit 4 main

SEQUENCE OF INTEREST: Reactor trip with loss of offsite power steam safety valve stuck open.

ACTUAL OCCURRENCE: Reactor trip with loss of offsite power (Unit 4 only)

REACTOR NAME: Turkey Point 4

DOCKET NUMBER: 50-251

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 693 MWe

REACTOR AGE: .9 yr

VENDOR: Westinghouse

ARCHITECT-ENGINEERS: Bechtel

OPERATORS: Florida Power & Light Co.

LOCATION: 25 miles south of Miami, Fla.

DURATION: N/A

PLANT OPERATING CONDITION: Both units at full power.

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

DISCOVERY METHOD: During operation

COMMENT: This event and a previous event on March 1, 1974 resulted in the separation of both Turkey Point Units from the grid. However, only Unit #4 and only during this event lost offsite power.