

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 103207

Date: June 4, 1975

Title: Diesel Generator Breaker and Bus Stripping Relay Malfunction at Turkey Point 4

The failure sequence was:

1. With Unit 4 in a refueling shutdown and Unit 3 in hot shutdown, an Engineered Safeguards and Emergency Power System Integrated Test was in progress.
2. The Unit 4 safety-related buses were manually deenergized and safety injection and containment isolation signals initiated.
3. Diesel generator 3 started, came up to rated speed and then shutdown due to closure of its lockout relay as a result of failure of output breaker 4A to close.
4. Diesel generator 4 started and came up to speed. However, its 4B breaker did not close due to loads not being stripped from the 4B bus because of a load stripping relay failure.

Corrective action;

1. Offsite power was restored and the necessary equipment restarted.
2. The 4A diesel generator breaker and the load stripping relay were replaced.

Design purpose of failed system or component:

1. The diesel generator breaker loads the diesel generator output on a safety related bus.
2. The stripping relay removes all loads from a bus prior to the diesel generator being loaded on the bus.
3. The diesel generators provide emergency power to safety-related loads in the event normal power is unavailable.

Unavailability of system per WASH 1400:* emergency power: $1 \times 10^{-2}/D$

Unavailability of component per WASH 1400:* relay, failure to operate:
 $1 \times 10^{-4}/D$

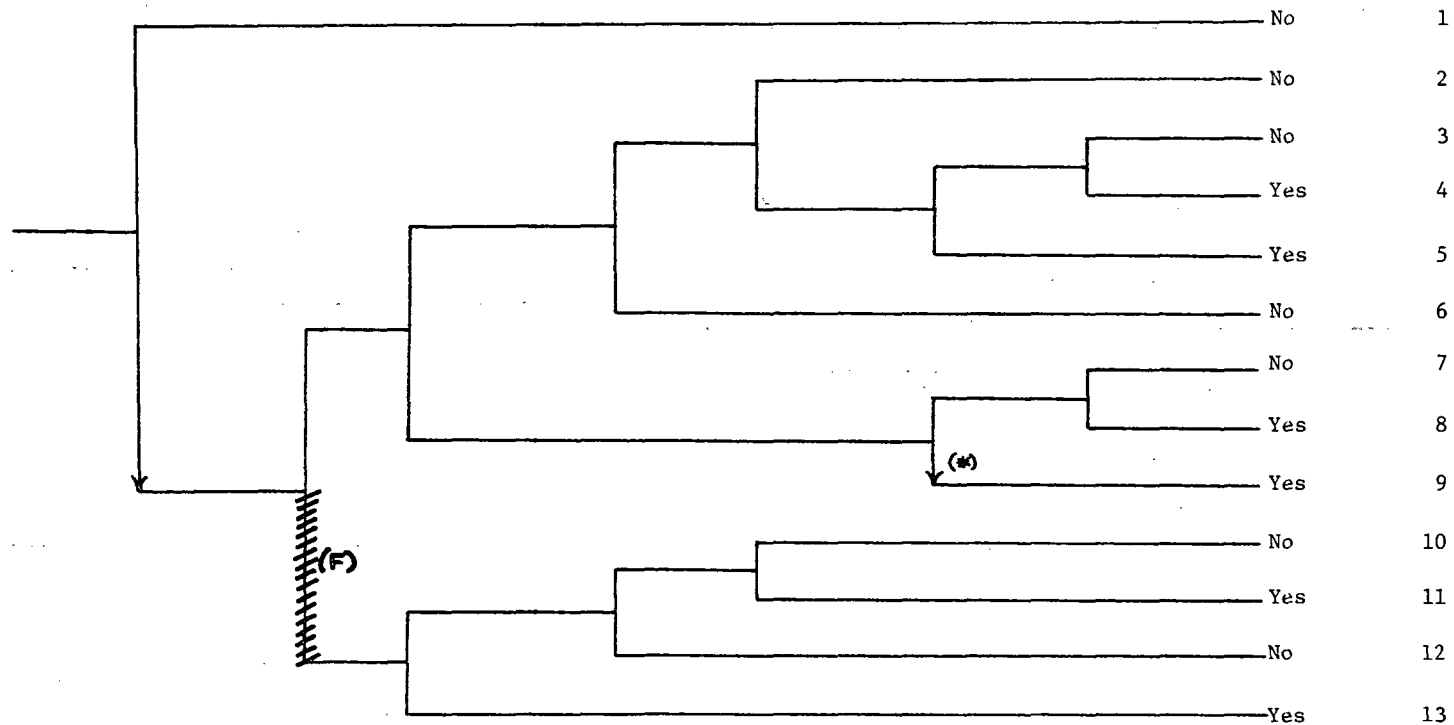
* Unavailabilities are in units of per demand D^{-1} . Failure rates are in units of per hour HR^{-1} .

| | | | | | | |
|---|---|---|------------------------------|---|---|---------------------------------------|
| Unit 4 reactor in refueling shutdown, unit 3 in hot shutdown and engineered safeguards and emergency power system integrated test in progress | Unit 4 safety-related buses manually deenergized and safety injection and containment isolation signals initiated | Diesel-generator #3 failure to run due to lockout relay closure because of failure of breaker 4A to close | Diesel-generator #4 operable | Diesel-generator #3B output breaker closure (D.G. #4) | Diesel-generator #4B output breaker failure to close due to loads not stripped from bus because of load stripping relay failure | Potential Severe Core Damage |
|---|---|---|------------------------------|---|---|---------------------------------------|


```

graph TD
    A[Yes] --> B[Unit 4 reactor in refueling shutdown, unit 3 in hot shutdown and engineered safeguards and emergency power system integrated test in progress]
    B --> C[Unit 4 safety-related buses manually deenergized and safety injection and containment isolation signals initiated]
    C --> D[Diesel-generator #3 failure to run due to lockout relay closure because of failure of breaker 4A to close]
    D --> E[Diesel-generator #4 operable]
    E --> F[Diesel-generator #3B output breaker closure (D.G. #4)]
    F --> G[Diesel-generator #4B output breaker failure to close due to loads not stripped from bus because of load stripping relay failure]
    G --> H[Potential Severe Core Damage]
  
```

| 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. |
|-----------------------|---|-----------------|--|---------------|--------------------------------------|-------------------------|------------------------|------------------------------|--------------|
|-----------------------|---|-----------------|--|---------------|--------------------------------------|-------------------------|------------------------|------------------------------|--------------|



NSIC 103207 — Sequence of Interest for Diesel Generator Breaker and Bus Stripping Relay Malfunction at Turkey Point 4

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

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 103207

DATE OF LER: June 4, 1975

DATE OF EVENT: May 25, 1975

SYSTEM INVOLVED: electric power

COMPONENT INVOLVED: diesel generator breaker, load stripping relay

CAUSE: The breaker failed to close, the relay failed to strip loads.

SEQUENCE OF INTEREST: Reactor trip with loss of offsite power

ACTUAL OCCURRENCE: Failure of breaker and relay to operate during engineered safeguards and emergency power system integrated test.

REACTOR NAME: Turkey Point 4

DOCKET NUMBER: 50-251

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 693 MWe

REACTOR AGE: 2.1 yr

VENDOR: Westinghouse

ARCHITECT-ENGINEERS: Bechtel

OPERATORS: Florida Power & Light Co.

LOCATION: 25 miles south of Miami, Fla.

DURATION: 360(a) hours

PLANT OPERATING CONDITION: Unit 3 in hot shutdown. Unit 4 in refueling shutdown.

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

DISCOVERY METHOD: during testing

COMMENT: -