

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 152187

Date: September 3, 1979

Title: Startup Transformer Fails and Diesel Generator Fails to Start at St. Lucie 1

The failure sequence was:

1. With the reactor in cold shutdown during the passage of hurricane David, a support cable for a crane used in the Unit 2 construction fell across the lines to the "B" startup transformer.
2. The East switchyard bus locked-out and the "B" startup transformer de-energized, resulting in de-energization of the "B" and "AB" (because of the alignment at the time) electrical systems.
3. The "B" diesel-generator failed to start due to a binding relay in its auto-start circuitry, the "B" inverter failed due to a blown fuse, and the "AB" 125VDC bus tripped due to a current transient during the event, resulting in the loss of numerous instrumentation.

Corrective action:

1. The binding relay was replaced.
2. The auto-start and loading capability of the "B" diesel generator was verified.

Design purpose of failed system or component:

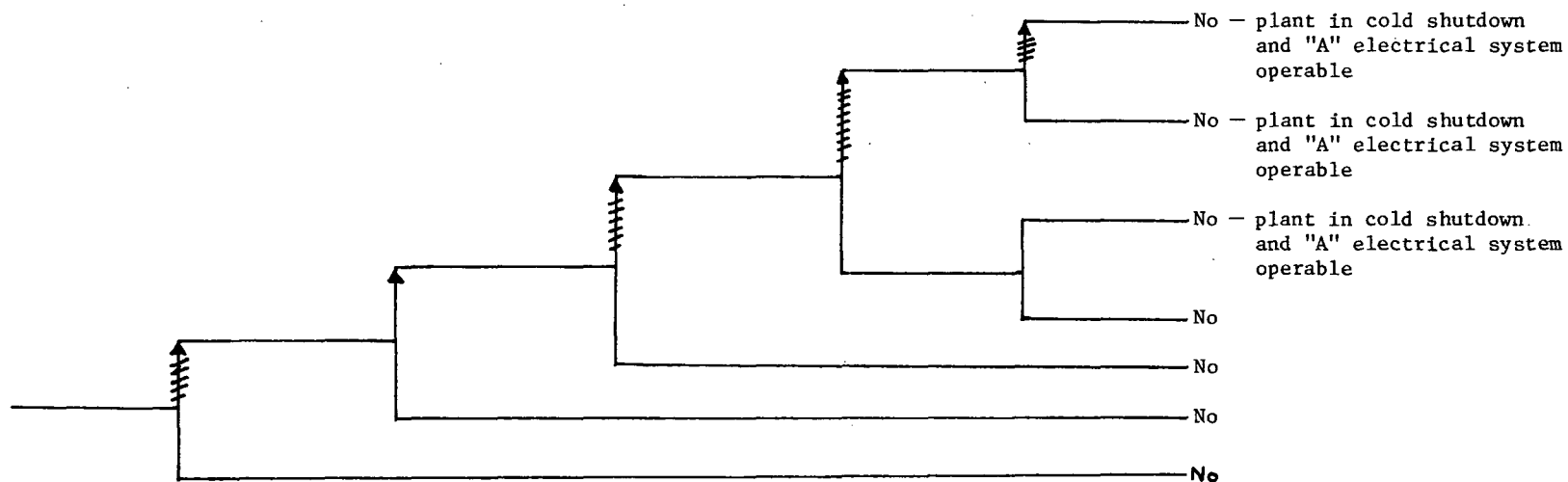
1. The diesel-generator provides an on-site source of electric power for safety-related loads when the unit generator and offsite sources are unavailable.
2. The inverter provides regulated 120 VAC for instrumentation loads from the plant batteries.
3. DC bus "AB" provides power to the steam inlet valves to the AFW pump turbine

Unavailability of system per WASH 1400:* —

Unavailability of component per WASH 1400:* Diesel generator: $3 \times 10^{-2}/D$
 Inverter: $3 \times 10^{-6}/hr$

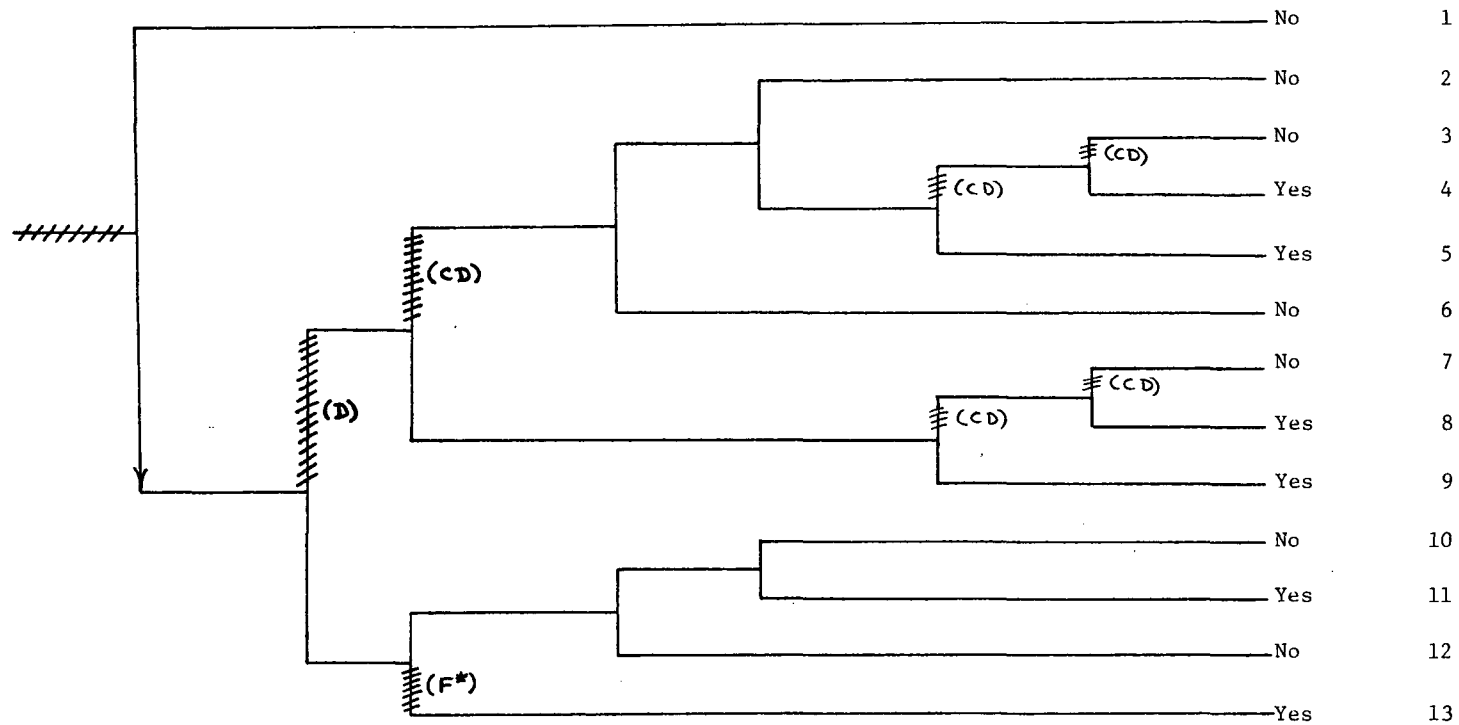
* Unavailabilities are in units of per demand D^{-1} . Failure rates are in units of per hour HR^{-1} .

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|---|---|---|--|--|---|------------------------------|
| Reactor in Cold Shut-down During Passage of Hurricane David | Support Cable for Crane (Unit 2 Construction Falls Across Lines to "B" Startup Trans. | East Switch-yard Bus Lockout and De-energization of "B" Startup Trans. ("B" and "AB" Electrical Systems De-energized) | "B" Diesel-Generator Fails to Start Due to Binding Relay in Auto-Start Circuitry | "B" Inverter Fails Due to a Blown Fuse | "AB" D.C. Bus De-energized Due to a Current Transient | Potential Severe Core Damage |
|---|---|---|--|--|---|------------------------------|



NSIC 152187 - Actual Occurrence for Startup Transformer Fails and Diesel-Generator Fails to Start at St. Lucie 1

| 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 152187 - Sequence of Interest for Startup Transformer Fails and Diesel-Generator Fails to Start at St. Lucie 1

*Manual action may be successful in initiating the turbine-driven AFW pump.

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 152187

DATE OF LER: September 17, 1979

DATE OF EVENT: September 3, 1979

SYSTEM INVOLVED: Electric power

COMPONENT INVOLVED: Diesel generator, inverter, startup transformer

CAUSE: Cable drop across startup transformer lines, binding relay in diesel generator start circuitry, blown inverter fuse.

SEQUENCE OF INTEREST: Loss of offsite power

ACTUAL OCCURRENCE: Switchyard lockout due to cable drop during storm.

REACTOR NAME: St. Lucie 1

DOCKET NUMBER: 50-335

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 802 MWe

REACTOR AGE: 3.4 yr

VENDOR: Combustion Engineering

ARCHITECT-ENGINEERS: Ebasco

OPERATORS: Florida Power & Light Co.

LOCATION: 12 miles SE of Fort Pierce, Florida

DURATION: N/A

PLANT OPERATING CONDITION: Cold shutdown

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

DISCOVERY METHOD: Event during shutdown

COMMENT: -