

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 159134

Date: July 7, 1980

Title: Loss of Offsite Power at Arkansas Nuclear 1

The failure sequence was:

1. With the unit at 100% power, switchyard circuit breakers tripped apparently due to a ground fault, isolating the Mabelvale 500 kV line. Unit 2 and Unit 1 generation was transferred to the Fort Smith 500 kV line. (The Mayflower line was out of service.)
2. The Fort Smith 500 kV line tripped open at the Fort Smith and due to feeder overload. (The Mabelvale line became available but failed to close onto the ring bus because of a lack of synchronization.)
3. The Morrilton East 161 kV line tripped on overload, leaving only Unit 1 generator output feeding the auto transformer and the Russellville East line carrying Unit 1 power generation. Startup transformer No. 1 remained energized from the autotransformer and startup transformer No. 2 remained tied to the 161 kV bus.
4. A manual runback was initiated following an automatic generator runback. The reactor subsequently tripped.
5. Auxiliary loads were transferred to startup transformer No. 1, which was already experiencing low output voltage.
6. The autotransformer bank locked out due to a faulted relay, locking out startup transformer No. 1 and Unit 2 startup transformer No. 3.
7. This resulted in a loss of all auxiliary bus voltage.
8. The unit diesel generators started and provided power to safety-related loads. (Power remained available by manual transfer from startup transformer No. 2.)

Corrective action:

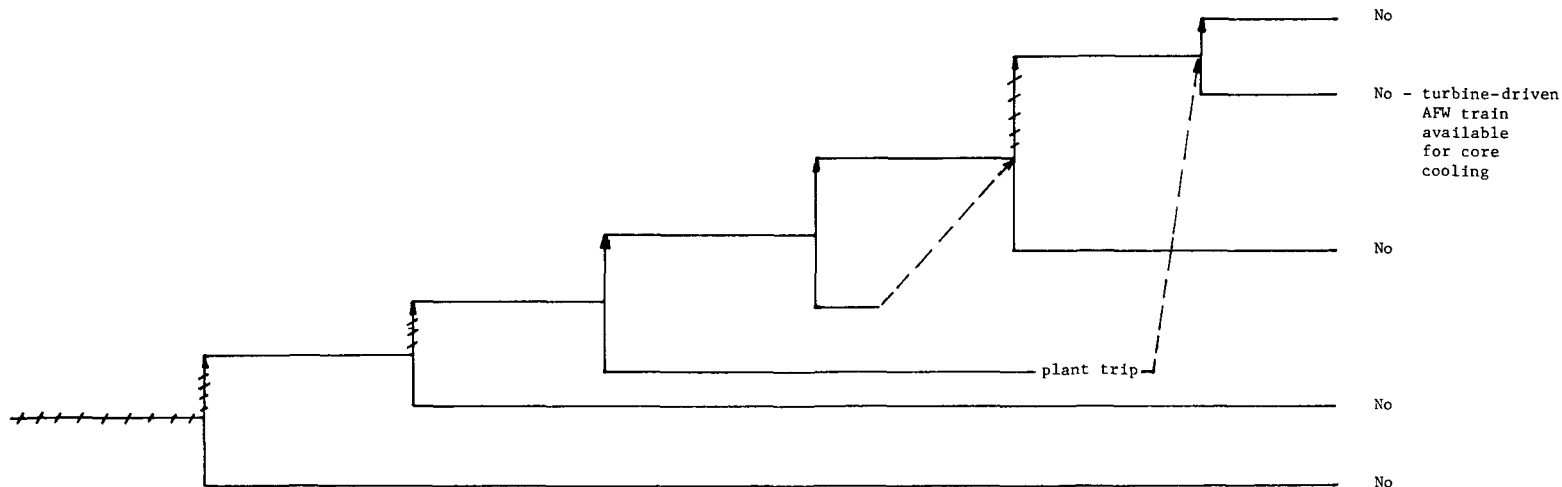
Approximately 65 minutes later house loads were transferred to startup transformer No. 1.

Design purpose of failed system or component:

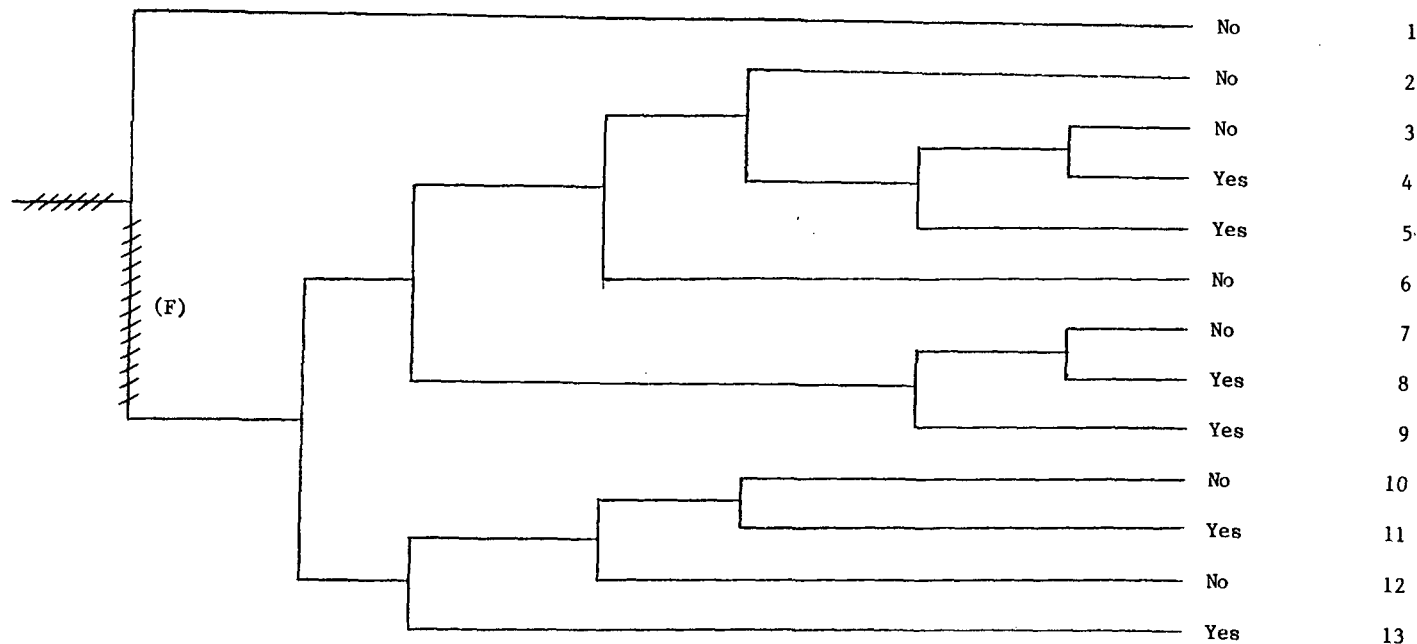
Offsite power provides the preferred source of power to safety related loads when the unit generator is unavailable.

Reactor at 100% power and loss of 500-kV line due to ground fault (one 500-kV previously out of service)	Loss of second 500-kV line due to overload	Loss of 161-kV line due to overload	Manual reactor runback and subsequent reactor trip	Auxiliary loads transferred to startup transformer #1 (which was already experiencing low output voltage)	Faulted relay results in SU transformer #1 lockout (loss of voltage on all auxiliary buses)	Diesel generators start and provide power to safety-related loads
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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.
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NSIC 159134 - Sequence of Interest for Loss of Offsite Power at Arkansas Nuclear - Unit 1

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 159134

LER NO.: 80-022

DATE OF LER: July 7, 1980

DATE OF EVENT: June 24, 1980

SYSTEM INVOLVED: Offsite power

COMPONENT INVOLVED: Transmission lines, relay

CAUSE: Sequential loss of transmission lines due to ground fault and overload, transformer lockout due to unspecified relay fault.

SEQUENCE OF INTEREST: Loss of offsite power

ACTUAL OCCURRENCE: Loss of offsite power

REACTOR NAME: Arkansas Nuclear 1

DOCKET NUMBER: 50-313

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 850 MWe

REACTOR AGE: 5.9 years

VENDOR: Babcock & Wilcox

ARCHITECT-ENGINEERS: Bechtel

OPERATORS: Arkansas Power and Light

LOCATION: 6 miles NW of Russellville, Arkansas

DURATION: N/A

PLANT OPERATING CONDITION: 100% power

TYPE OF FAILURE: Made inoperable

DISCOVERY METHOD: Operational event

COMMENT: See NSIC 159136 (Arkansas Nuclear 2, 50-368, LER 80-042, July 7, 1980).