PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 159136

Date: July 7, 1980

Title: Loss of Offsite Power at Arkansas Nuclear 2

The failure sequence was:

1. With the unit at 91% power, switchyard circuit breakers tripped apparently due to a ground fault, isolating the Mabelvale 500 kV line. Unit 2 and Unit 1 generation 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 end due to feeder overload. (The Mabelvale line became available but failed to close onto the ring bus because of a lack of synchonization.)
3. Unit 2 tripped on DNBR due to decreasing RCP pump speed, a result of frequency and voltage upsets on the grid.
4. The Morrilton East 161 kV line tripped on overload, leaving only Unit 1 generator output feeding the autotransformer and the Russellville East line carrying Unit 1 power generation. Startup transformer No. 3 remained energized from the autotransformer, and startup transformer No. 2 remain tied to the 161 kV bus.
5. The unit auxiliaries were transferred to startup transformer No. 3. (The 6.9 kV buses had been transferred to startup transformer No. 3 prior to the start of the event.)
6. Undervoltage relays on the 6.9 kV buses operated and shed the RC pumps and circulating water pumps.
7. The 4.16 kV auxiliary circuit indicated low voltage and stripped the 4.16 kV buses from the startup transformer.
8. Subsequently the auto transformer bank locked out due to a faulted relay, locking out startup transformer No. 3 and the Unit 1 startup transformer No. 1.
9. This resulted in a loss of all auxiliary bus voltage.
10. The unit diesel generators started and provided power to safety-related loads. (Power remained available by manual transfer from startup transformer No. 2.)

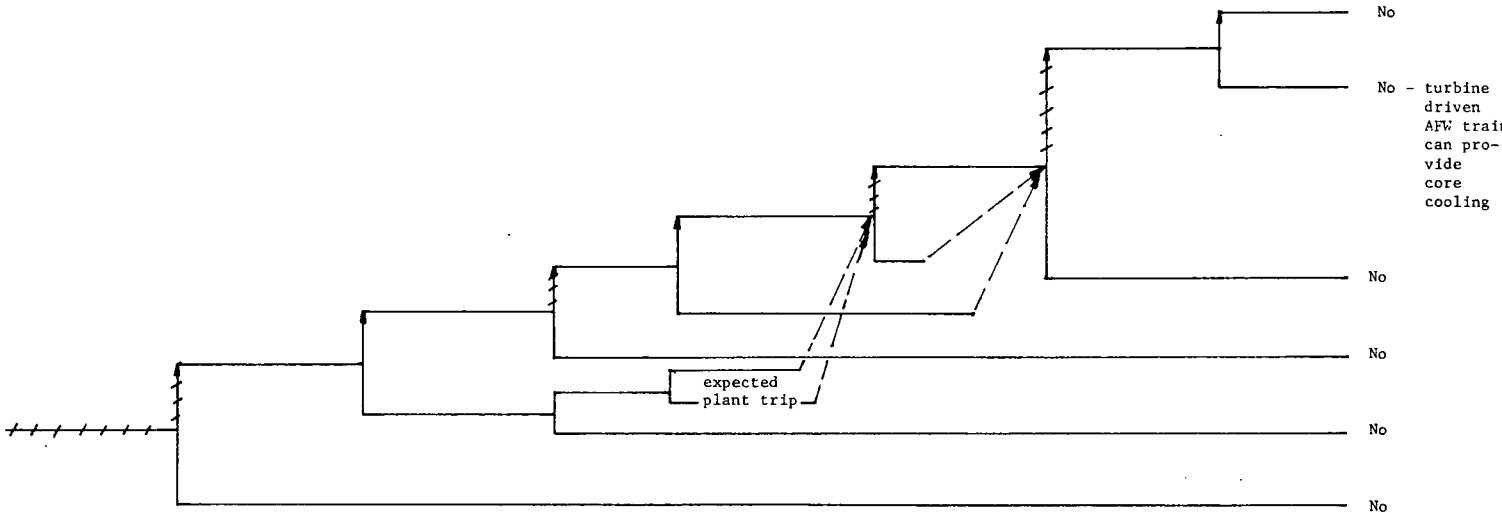
Corrective action:

Buses 2 A1 and 2 H1 were manually energized from startup transformer No. 2 four minutes later. Approximately 55 minutes later all house loads were transferred to startup transformer No. 3 and both emergency diesels were secured.

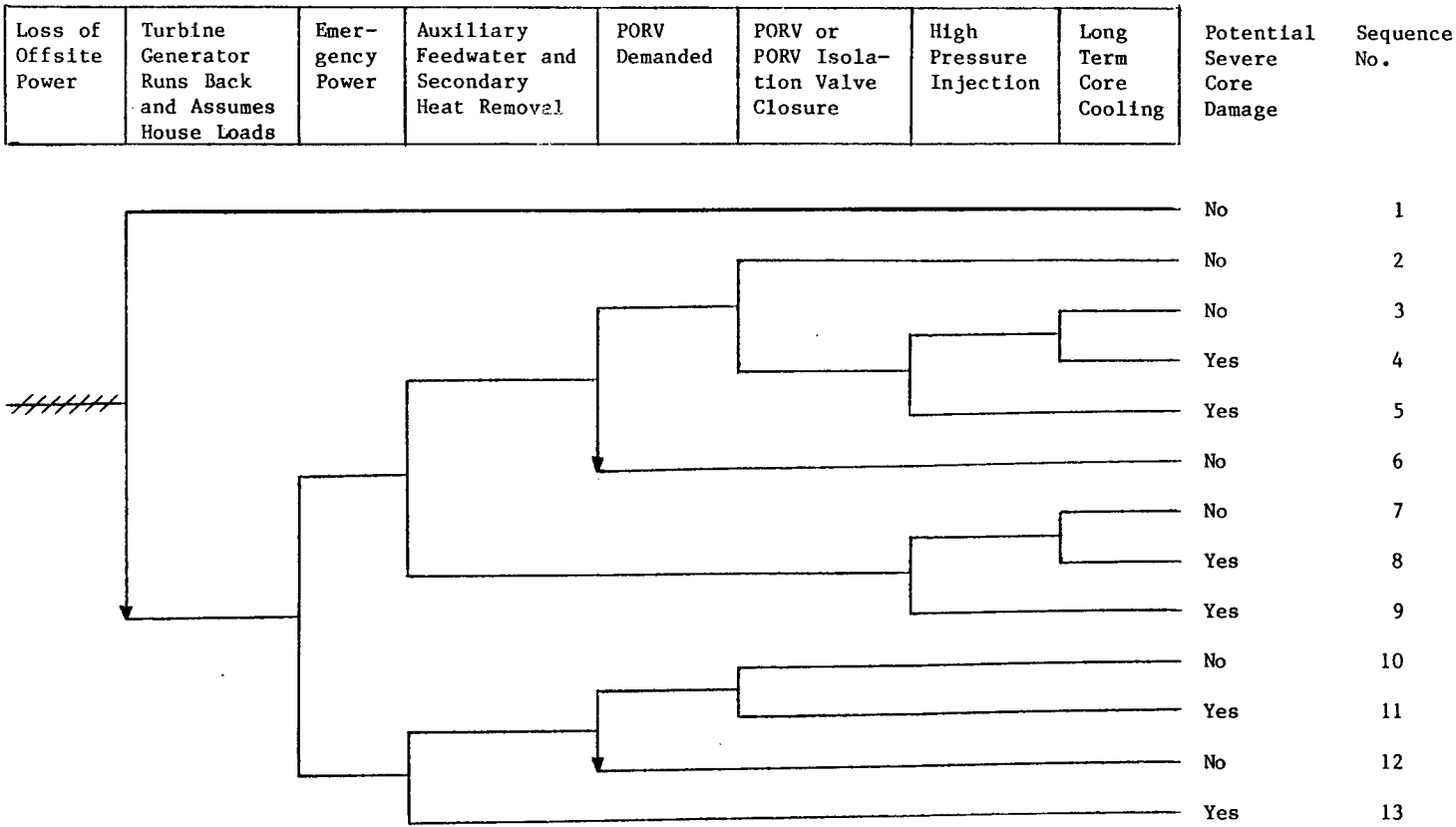
Design purpose of failed system or component:

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

Reactor at 90% power and loss of 500-kV line due to ground fault. (One 500-kV line previously out of service)	Loss of second 500-kV line due to overload	Reactor trip in DNBR due to decreasing RC pump speed because of voltage/frequency problems	Loss of 161-kV line due to overload	Unit auxiliaries transferred to SU transformer #3	Loss of major 6.9-kV loads and 4.16-kV bus loads due to undervoltage	Faulted relay results in SU transformer #3 and Unit 1 SU transformer #1 lockout (loss of voltage in all auxiliary buses)	Diesel generators start and provide power to safety-related loads	Potential Severe Core Damage



NSIC 159136 - Actual Occurrence for Loss of Offsite Power at Arkansas Nuclear 2



NSIC 159136 - Sequence of Interest for Loss of Offsite Power at Arkansas Nuclear 2

CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 159136

LER NO.: 80-042

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 2

DOCKET NUMBER: 50-386

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 912 MWe

REACTOR AGE: 1.6 years

VENDOR: Combustion Engineering

ARCHITECT-ENGINEERS: Bechtel

OPERATORS: Arkansas Power and Light

LOCATION: 6 miles NW of Russellville, Arkansas

DURATION: N/A

PLANT OPERATING CONDITION: 91% power

TYPE OF FAILURE: Made inoperable

DISCOVERY METHOD: Operational event

COMMENT: See NSIC 159134 (Arkansas Nuclear 1, 50-313, LER-80-022, July 7, 1980).