

PRECURSOR DESCRIPTION AND DATA

NSIC Accession Number: 89205

Date: November 30, 1973

Title: Failure of Reactor Coolant Pump Shaft at Surry 1

The failure sequence was:

1. With the reactor at 95% power, operations personnel noted reactor coolant flow fluctuations varying between 96-100% and a 12 mil (peak-peak) vibration of reactor coolant pump (RCP) A.
2. A controlled shutdown was initiated.
3. At 42% power the reactor tripped coincident with a sudden loss of flow in loop A, which resulted from the failure of the RCP A shaft between the thermal barrier and the lower radial bearing.

Corrective action:

1. The pump was disassembled and the shaft removed for examination. Westinghouse and Battelle concluded the failure was caused by fatigue at an improperly machined groove on the shaft.
2. A more recently manufactured shaft was installed in the pump.

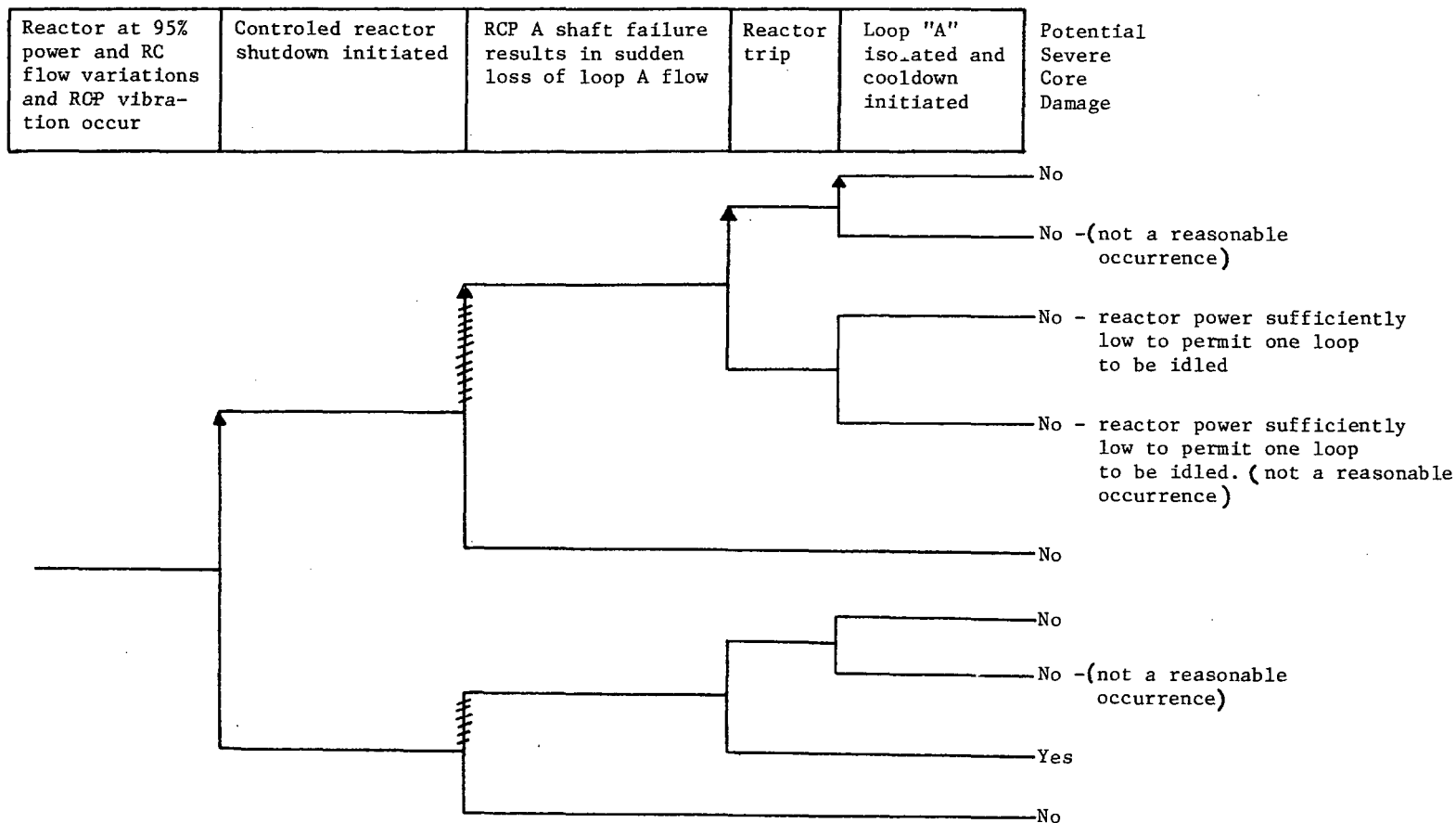
Design purpose of failed system or component:

The reactor coolant pumps provide forced reactor coolant flow through the core and steam generators.

Unavailability of system per WASH 1400:* N.A.

Unavailability of component per WASH 1400:* pump, failure to run: 3×10^{-4} /hr.

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



CATEGORIZATION OF ACCIDENT SEQUENCE PRECURSORS

NSIC ACCESSION NUMBER: 89205

DATE OF LER: February 24, 1974

DATE OF EVENT: November 30, 1973

SYSTEM INVOLVED: Reactor Coolant System

COMPONENT INVOLVED: Reactor Coolant Pump

CAUSE: Failed shaft

SEQUENCE OF INTEREST: Locked RCP Rotor at Full Power

ACTUAL OCCURRENCE: Failed RCP Shaft at 42% Power

REACTOR NAME: Surry 1

DOCKET NUMBER: 50-280

REACTOR TYPE: PWR

DESIGN ELECTRICAL RATING: 822 MWe

REACTOR AGE: 1.4 yr

VENDOR: Westinghouse

ARCHITECT-ENGINEERS: Stone & Webster

OPERATORS: Virginia Electric and Power Co.

LOCATION: 17 mi Northwest of Newport News, Va.

DURATION: N/A

PLANT OPERATING CONDITION: 42% power

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

DISCOVERY METHOD: operator observation

COMMENT:

A reactor coolant isolation valve shaft also failed during the shutdown for this incident.