

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

6000 1.075

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ATTACHMENT 1

SURRY POWER STATION, UNIT NO

DOCKET NO: 50-281

REPORT NO: 81-055/03X-1

EVENT DATE: 08-20-81

TITLE OF THE EVENT: CHARGING PUMP SERVICE WATER PUMPS INOPERABLE

1. DESCRIPTION OF EVENT:

With Unit 2 operating at 100% power, both charging pump service water pumps failed to operate. This is contrary to T.S.3.3.A.8.b. A ramp down was commenced about 3.5 hours later, in accordance with T.S.-3.0.1. Approximately 4 hours into the event, pump 2-SW-P-10B was returned to service, the rampdown halted, and the unit returned to full power. Less than 12 hours into the event, pump 2-SW-P-10A was returned to service.

This event is reportable per T.S.6.6.2.b.(2).

2. PROBABLE CONSEQUENCES AND STATUS OF REDUNDANT EQUIPMENT:

The charging pump service water pumps, 2-SW-P-10A and 10B, provide cooling water to the charging pump intermediate seal coolers and lubricating oil coolers. During the period both pumps were inoperable, charging pump temperatures were closely monitored. Charging pump bearing temperatures remained below the maximum allowable (185°F, according to pump manufacturer). Thus, the health and safety of the public were not affected.

For a short period of time, cooling water was provided by use of the chiller service water pumps backwash flow through the strainer, thru 2-SW-P-10B, to the charging pump coolers.

3. CAUSE:

Pump 2-SW-P-10B failed when the carbon steel impeller cap screw failed. This allowed the impeller to slide off the shaft in such a manner as to bind the pump shaft.

When pump 2-SW-P-10A attempted to start in automatic, the pump failed to start. When start was attempted in manual, the overload tripped. After several attempts to start, the motor failed. Investigation showed stator windings to be shorted out, yet both pump and motor turned freely. The stator windings were wet from pump leakage from 2-SW-P-10B which is located above 2-SW-P-10A.

4. IMMEDIATE CORRECTIVE ACTION:

The immediate corrective action was to replace the failed cap screw on pump 2-SW-P-10B and return the pump to service in accordance with PT 18.8.

5. SUBSEQUENT CORRECTIVE ACTION:

The motor stator and bearings were replaced in pump motor 2-SW-P-10A. Pump 2-SW-P-10A was returned to service in accordance with PT 18.8, less than 12 hours into the event. A temporary mechanical shield was placed over 2-SW-P-10A to prevent water damage from leaking seals on the other pump, but was later removed after 2-SW-P-10B was repacked, and the leakage stopped.

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6. ACTION TAKEN TO PREVENT RECURRENCE:

The other Unit 2 service water pump, as well as the two Unit 1 pumps, were inspected to verify integrity of the cap screws. The Unit 1 pumps are equipped with carbon steel screws, while the Unit 2 pumps have stainless steel screws. An Engineering Study was performed to determine the suitability of the carbon steel screw material for the service involved. The study has recommended the replacement of the carbon steel cap screws in the charging pump service water pumps, as well as the charging pump cooling water pumps, with stainless steel cap screws and appropriate locking devices.

In addition, two current Design Changes call for the replacement of the charging pump cooling water pumps and the replacement and relocation of the charging pump service water pumps. The new pumps have been specified to be compatible with their brackish water environment.

Until either existing carbon steel cap screws, or the entire pumps, are replaced, the cap screws will be inspected every three months to verify their integrity.

7. GENERIC IMPLICATIONS:

The above planned actions apply to both units.