

ATTACHMENT 1, PAGE 1
SURRY POWER STATION, UNIT NO. 1
DOCKET NO: 50-280
REPORT NO: 80-024/03L-0
EVENT DATE: 04-26-80

TITLE OF REPORT: SAFETY INJECTION SYSTEM

1. Description of Event:

On 4-26 and 4-30-80 during maintenance on the unit which was at cold shutdown with the primary system partially drained ECCS water flowed to the reactor without containment integrity. This event is contrary to T.S. 3.8.A.5 and is reportable per TS. 6.6.2.6.4.

2. Probable Consequences and Status of Redundant System:

Because the RCS boron concentration was above the minimum required for cold shutdown, there were not any undesirable consequences as a result of this event. Except during the first segment of the event, the solution flowing to the RCS exceeded the requirements for ECCS fluid for power operation. Following the first event - the primary was still at 3066 ppm boron. The RCS boron concentration was initially at 3217 ppm and it was changed to 2567 ppm which was well above the 820 ppm required for cold shutdown with the core at its present stage of burnup, therefore the health and safety of the general public were not affected.

3. Cause:

On April 26 while performing PT-18.10 the RWST gravity flowed to the reactor because the procedure did not precaution against gravity flow from the RWST to the core during valve cycling. As a result, the RWST gravity flowed to the RCS. A spurious Train A safety injection (SI) occurred at 0218 on April 30. The SI was caused by electricians working in the relay racks due to work required by IEB 79-25. The SI would not reset due to a fault in the circuitry. At 0511 it was discovered that the RWST was gravity draining to the RCS via the boron injection tank (BIT). The motor operated valves (MOV) isolating the RWST from the RCS via the BIT were open due to the "locked-in" SI signal. The MOV's were shut and de-energized to prevent their reopening and the RCS was sampled for boron concentration (C_p). The RCS had been diluted from 3090 ppm to 2926 ppm without containment integrity.

At 0920 while attempting to verify the position of SI accumulator discharge MOV's 1865 A & B the control room operator had power briefly restored to the valves without realizing the SI signal was "locked-in". During the brief time power was restored to these valves, the train "A" SI signal which had not been reset caused the valves to start opening. The amount the valves opened was limited due to the short time power was available to the motors. With the RCS at atmospheric pressure and the "A" & "B" SI accumulator pressurized with nitrogen, there was a rapid influx of borated water from the SI accumulators in the RCS. Due to the fact the RCS was partially

drained for maintenance and an air volume was present in the system, no over pressure condition existed in the RCS. Pressure in the "B" SI accumulator decreased to 120 psig and the pressure in "A" SI accumulator decreased to 380 psig. The pressure in the primary never increased beyond 80 psig. The over pressure mitigation system was fully operational and no actuation of this system occurred.

At 1007 while attempting to close the "A" SI accumulator MOV, an Electrician under Authority of the Shift Supervisor installed a jumper in the MOV power supply breaker and energized the breaker. The jumper if installed correctly should have prevented the valves from opening, however the SI signal again caused the valve to open causing another partial discharge into the RCS. Again, the vented condition did not result in an over pressure condition and the valve was immediately closed electrically, the breaker de-energized and jumper removed.

4. Immediate Corrective Action:

The immediate corrective action was to stop the ECCS injection, and to remove power from the valves (in the closed position) through which the flow was occurring.

5. Subsequent Corrective Action:

The subsequent corrective action was to identify and repair the faulty relay that prevented resetting of the safety injection signal, and the SI signal was reset.

6. Future Corrective Action:

Future corrective action is to add a precautionary statement to PT-18.10 to the effect of verifying that gravity flow from the RWST to the core is not possible during valve cycling.

7. Generic Implications:

There are not any generic implications resulting from this event.