

SUPPLEMENTAL INFORMATION

LICENSEE EVENT REPORT 83-001

I. Cause Description and Analysis

On February 7, 1983, at approximately 1400 hours, with the unit at 82% power, an investigation into a Low Flow Alarm condition on Containment Fan Cooler HVH-3 determined that with a Low Flow Alarm signal present HVH-3 would not auto-start on a Safety Injection (SI) signal assuming a concurrent station blackout event.

The Low Flow Alarm was initially received on HVH-3 at 2059 hours on February 4, 1983, and was cleared by Maintenance personnel on shift. The alarm was received again at 1120 hours on February 5, 1983. A review of the HVH flow alarm system was initiated on the morning of February 7, 1983, and the alarm was subsequently cleared at 1430 hours following determination of the necessary corrective action. Also, at 1110 hours on February 11, 1983, the alarm was received and was immediately cleared.

As originally designed, the HVH units motor control circuits contained a trip feature and alarm which was actuated by two redundant air flow switches under low flow conditions. Simultaneous with the trip feature, the start circuit (both auto and manual) was locked out to prevent concurrent start and stop signals. When the HVH motor circuit breaker completed the trip action, the Low Flow Alarm and the start lockout feature were reset. The Low Flow alarm and trip is designed to protect the HVH unit from abnormal operation as indicated by low air flow which, if operation was continued, could potentially disable the unit but would allow the unit to be restarted automatically if required by accident conditions. Due to air turbulence causing spurious Low Flow Alarms and subsequent tripping of the HVH units, a modification was developed and implemented in 1974 which removed the low flow trip feature. It was determined that the low flow trip feature was resulting in excessive HVH unit trips and that Operations personnel should evaluate the presence of a low flow condition and initiate appropriate actions rather than automatically tripping the unit. However, unknown to the personnel involved in this modification, the circuit configuration resulting from this modification prevented the Low Flow Alarm circuit from automatically resetting when the HVH unit tripped. The Low Flow Alarm was therefore sealed in which also maintained the start circuit in a locked out condition.

This event could have resulted in system operation different and less conservative than that assumed in the Final Safety Analysis Report and is, therefore, reported pursuant to Technical Specification 6.9.2.a.9. Although all four HVH units are subject to the same conditions, only HVH-3 has been subject to the Low Flow Alarm condition. Therefore, the three remaining HVH units would have restarted automatically following a Safety Injection signal concurrent with a station blackout event. In addition, HVH-3 could have been placed in operation by stopping the unit to reset the Low Flow Alarm condition and immediately restarting the unit.

II. Corrective Action

Operations personnel were informed of interim corrective action on February 7, 1983. This interim corrective action consisted of stopping the HVH unit, which opens the motor circuit breaker and resets the Low Flow Alarm in the control circuit, and immediately restarting the unit. This action restored the ability of the HVH unit to start automatically if required by plant conditions.

Also, a Temporary Repair Procedure was developed and implemented on February 11, 1983, which placed jumpers on the start circuit lockout contacts for all four HVH units. This action prevents a Low Flow Alarm condition from rendering the HVH unit inoperable. In conjunction with this temporary repair, the Annunciator Procedures for the HVH units were changed to clarify the cause and provide proper guidance on the corrective actions to be taken. This change was also implemented on February 11, 1983.

III. Corrective Action to Prevent Recurrence

In addition to the above actions, one of the flow switches on HVH-3 was found to be inoperable and was jumpered out of the control circuit. The redundant flow switch, suspected of causing the spurious alarms, was adjusted and will continue to provide the necessary alarm function.

Evaluation of this event is continuing and a modification will be developed to provide permanent resolution of this problem. Any additional information identified during our review and the modification details will be provided as a supplement to this report.