

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

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EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

PHONE: (402) 426-4011

LER No. 82-006
Omaha Public Power District
Fort Calhoun Station Unit No. 1
Docket No. 05000285

Attachment No. 1

Safety Analysis

The Fort Calhoun Station is designed such that no single failure, by itself, can adversely affect the safe shutdown of the plant.

The function of HCV-506A (and its redundant valve HCV-506B) is to isolate the header which extends from the containment sump pumps to the waste disposal processing system (when required to do so via a Containment Isolation Actuation Signal or by manual operation of the control switch). Both HCV-506A and HCV-506B are energize-to-open/fail-closed on loss of instrument air valves. During the time HCV-506A could not be operated with the control switch due to a stuck solenoid valve plunger, the redundant valve, HCV-506B was operable and was capable of isolating the waste disposal header at the containment pressure boundary. During the time HCV-506A was being repaired, the operation of HCV-506B was verified by cycling of the valve. In addition, the instrument air feeding valve HCV-506A was isolated and the operator diaphragm vented such that this valve attained its fail-safe (closed) position during solenoid repairs.

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Corrective Action

Maintenance Order No. 14342 was written to investigate the closure problem associated with HCV-506A. Subsequently, it was determined that the solenoid plunger had mechanically stuck in the "energized" position, thereby not allowing air to vent from the operator and allow the valve to close. The solenoid was disassembled and cleaned (it is suspected that a foreign substance may have been introduced onto the solenoid plunger and possibly caused it to stick), reassembled, and returned to service. The valve itself was tested for operability several times with satisfactory results each time. Since the valve (HCV-506A) was repaired and returned to operable status in less than 6 hours (the time allowed for repair without having to start towards hot shutdown per Technical Specification 2.0.1(1)), the plant remained at approximately 99% power throughout the incident.

This is the second failure of an ASCO NP8314C29E solenoid plunger to disengage from its "energized" state. The solenoid valve manufacturer has recently completed a study in an effort to verify causes of this sticking problem. Results have revealed that a type of acrylate ester residue has been found on the plunger and sub-base assembly of the two failed solenoid valves and is believed to be the basic cause of the solenoid failures. Since OPPD, as well as ASCO, has not been able to supply any logical sequence by which acrylate ester materials could have been introduced into the solenoid valve internals, it has been determined that OPPD will purchase and change out ASCO solenoid internals using new spare parts kits to ensure that any potentially faulty plungers/plunger sub-base assemblies be replaced. These solenoid kits will be installed when received by the District and as soon as plant conditions permit. In the interim, the Fort Calhoun Station will continue to perform the necessary Surveillance Tests to assure containment isolation valve operability.

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Failure Data

This is the second reportable failure of a containment isolation valve due to solenoid valve malfunction at the Fort Calhoun Station.