

SUBJECT

EVENT FOLLOWUP REPORT NO. 87-150
 50.72 EVENT NOS. 10320, 10331/345/347-OCTOBER 10-16, 1987
 PLANT - WOLF CREEK UNIT 1
 PROJECT MANAGER - P. O'CONNOR
 COGNIZANT - N. FIELDS

PROBLEM

Personnel contamination, hydrogen burn, death, lake water pumped into steam generators.

CAUSE

Apparent lack of control over outage activities.

SIGNIFICANCE

Series of events which creates a concern that procedural or personnel inadequacies exist at the plant.

DISCUSSION

While the Wolf Creek facility was engaged in a refueling outage (reactor in mode 6), several events occurred which collectively indicate a lack of administrative control over activities at the plant.

- ° On October 10, 1987 contract personnel were contaminated when they broke a vent valve fitting from the top of a demineralizer which was pressurized. At the time they were attempting to unclog a transfer pipe which was being used to remove resin beads from the demineralizer. Two workers received a 260 mrad skin dose and resin beads were strewn over the ceiling, the floor and equipment in the room.
- ° On October 14, 1987, there was a suspected hydrogen burn in the pressurizer when a workman, attempting to weld a valve associated with a pressurizer level transmitter, reported hearing a loud noise for several seconds. A temporary cover which had been placed on the flange of a code safety valve was blown off. There were no injuries reported as a result of this incident; however, the lives of several workers were placed at unusual risk (IE Information Notice No.82-26 discusses the issue of inadequate degassing and purging).
- ° On October 14, 1987, a contract electrician was killed when he made contact with an energized 4160 ESF bus section while cleaning a potential transformer. The cubicle in which he was killed was not identified as containing energized equipment. A nearby cubicle containing another section of bus was tagged as energized.

The tagging system used to mark the equipment was not under formal plant control. There was an assumption among workers that "everyone knew" the state of each piece of equipment being maintained.

- ° On October 15, 1987, with the reactor nearly defueled, control room, fuel building and containment purge isolation signals and an auxiliary feedwater initiation signal were generated (the train "B" AFW pump was locked out).

These actuations occurred due to the failure of the 125V DC battery supply for one of two train "B" ESF AC inverters. The two train "B" battery banks had been supplying power to the two AC inverters for over

24 hours, since the start of maintenance on the 4160V bus. About two hours following the initial battery failure, the second battery bank failed resulting in the start of an essential service water (ESW) pump and a switchover of AFW suction from the condensate storage tank (CST) to the ESW system. The emergency diesel generator also started and loaded to the bus. (Shutdown cooling was lost for about 30 seconds as the RHR and spent fuel pool cooling pumps were shed and reloaded).

Since the ESW system takes its suction from the cooling lake, lake water was subsequently pumped into the secondary system, including 7,500 to 10,000 gallons (calculated) into the steam generators. Because of an informal tagging procedure used in the control room, operators incorrectly assumed that AFW pump suction and discharge lines were isolated and therefore did not manually shut the ESW pump down. Operators further neglected to secure the train "A" AFW pump. It is assumed that this pump contributed to the inventory of lakewater pumped into the reactor.

The pumping continued for over 2 1/2 hours. The steam generators were already in wet "layup" (nearly full) and this added water filled the steam generator and steam lines up to the closed main steam isolation valves.

FOLLOWUP

- ° A connection was made from the "A" train bus to a spare train "B" charger to provide power to the train "B" batteries, making the associated 120 VAC inverter busses operable.
- ° Licensee has cleaned lake water from the steam generators, condensate storage tank and other secondary water systems.
- ° Licensee is voluntarily placing a hold on outage activities while root cause determination is attempted.
- ° Licensee has established four task forces, one for each of the four events.
- ° Region is following, talking with licensee regarding apparent loss of administrative control during outage and apparent lack of objectivity of task force membership.
- ° Region has issued several Preliminary Notifications.
- ° Region is contemplating other actions including increased monitoring of the licensee's practices.

STATUS OF REVIEW

This review is closed.

Nick Fields
PWR Section
Events Assessment Branch

cc: P. O'Connor
C. E. Ross