

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

REPORT NOS: 50-387; 388/93-18
LICENSE NOS: NPF-14, NPF-22
LICENSEE: Pennsylvania Power & Light Company
2 North Ninth Street
Allentown, Pennsylvania 81801
FACILITY: Susquehanna Steam Electric Station
INSPECTION DATES: September 27-October 1, 1993
INSPECTORS: C. Sisco, Operations Engineer
D. Mannai, Resident Inspector
LEAD INSPECTOR: C. Sisco, Operations Engineer

REVIEWED BY: *C. Sisco*
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10/18/93
Date

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10/18/93
Date

Inspection Summary: Inspection conducted from September 27-October 1, 1993 (Report Nos. 50-387/93-18; 50-388/93-18)

Areas Inspected: An inspection of selective review of licensee records, interviews with personnel, and observations by the inspectors was conducted.

Results: The inspectors concluded control room operations are conducted in accordance with station procedures. In addition, operations management was present in the control room providing adequate management oversight. Likewise, maintenance activities were performed in accordance with station procedures and with appropriate supervisory oversight.

The continuation of status control events with low safety consequences indicated that the licensee's corrective actions have been ineffective. In addition, the repetitive nature of mispositioned valves indicated that the licensee's root cause analysis of mispositioned valve(s) may not have been sufficiently independent or thorough enough to include all human performance aspects.



DETAILS

1.0 INTRODUCTION AND SCOPE

The purpose of this inspection was to review licensee actions to control equipment status. This initiative inspection was performed to evaluate the effectiveness of the licensee's root cause evaluations and corrective action implementation for events status was not maintained. These events, in some cases, led to adverse consequences such as primary containment leakpaths; minor, uncontrolled releases; and system trips or degradations. Many of these events were caused by valve mispositionings.

The inspection consisted of a review of selective records, interviews with personnel, and observations of plant activities by the inspectors. The inspectors used inspection procedures 71715 and 92720 during the course of this inspection.

2.0 FINDINGS

2.1 Observations of Plant Activities

The purpose of this review was to assure that safety-related activities were conducted in accordance with approved station procedures and that management was involved in routine activities including event reviews.

The inspectors observed licensee activities in the control room during 100% power operations of Unit 2, and shutdown activities of Unit 1. The inspectors noted that activities were conducted in a professional manner in accordance with station procedures, and management oversight of control room activities were conducted on a routine basis.

The inspectors conducted observations of maintenance activities in the reactor building of Unit 1. The inspectors observed the repacking of valves at the hydraulic control units and work preparations to remove the drywell equipment hatch. The work activities were conducted in accordance with station procedures, and these procedures were located at the work sites. Maintenance supervision was observed in the work areas providing management oversight.

2.2 Control of Valve Positions

The licensee has long identified the issue of maintaining the correct valve positions as a problem in their facility. The inspectors reviewed several of the licensee's Nuclear Safety Assessment Group (NSAG) annual summary assessments that identified valve position control as a weakness. In 1992, the licensee formed a Status Control Review Team that issued a report detailing the team's findings and corrective action recommendations. The Status Control Review Team Report was reviewed by the inspectors. In addition, the inspectors reviewed facility generated Significant Operating Occurrence Reports (SOORs). Based on a



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review of these documents, and past NRC Inspection Reports, the licensee's control of valve positions continues to be less than effective. Examples of this continuing problem are listed below.

- In July 1992 and during power operations at Unit 1, the licensee identified that five containment atmosphere sampling lines were disconnected at the "B" containment radiation monitoring (CRM) panel by the removal of five solenoid operated valves. The valves were inadvertently removed during a maintenance activity (past unresolved item No. 387,388/92-20-01). The primary containment penetration isolation valve was operable while these sample valves were removed from the system.
- In April 1993, an NRC inspector identified that a High Pressure Coolant Injection (HPCI) turbine exhaust vacuum breaker test valve was closed, capped and containment tagged, but was not chain locked closed as required by facility procedure on Unit 1. This event resulted in a Notice of Violation and is detailed in NRC Inspection Report 50-387/93-07.
- In June 1993 and during power operation at Unit 2, the licensee identified that a 3/8" drain valve on the suppression chamber narrow range pressure instrument line was found open and the end uncapped. This uncapped and open drain valve allowed a leak path between the primary and secondary containments. The leakage amount was within regulatory limits and was of minor safety significance.
- In July 1993, the licensee identified that a drain valve at the Condensate Storage Tank berm of Unit 2 was mispositioned by being open. This event resulted in a small unmonitored and uncontrolled release (low level) of radioactivity from the berm area.
- In August 1993, the licensee identified that a valve in the Containment Instrument Gas (CIG) system was mispositioned. This event caused the CIG system to transfer automatically to the gas bottle backup system. The gas bottles provide an emergency backup supply of nitrogen pressure for the Automatic Depressurization System.
- In September 1993, the licensee identified that the vent valves on the Main Generator exciter heat exchanger were mispositioned by being closed on Unit 2.
- In September 1993, the licensee identified that a valve in the Fuel Pool Cooling (FPC) system was mispositioned by being open. This event resulted in a low level in the skimmer surge tank of the FPC system and the resultant trip of the FPC system pumps.

The licensee took immediate corrective action(s) to restore the mispositioned valve(s) and plant systems to the correct configuration once identified for each of these cases. With

respect to long-term corrective actions, the licensee's NSAG group has long identified and tracked equipment status control events. The licensee's 1992 report identified status control events as needing additional management attention.

The licensee has implemented several additional corrective actions since mid-1993. However, the inspectors noted that these corrective actions could have been implemented in a more timely fashion since the licensee's Status Control Review Team Report was issued in September 1992. Based on recent examples, these actions have not prevented recurrence.

The individual examples of mispositioned valves by themselves has low safety consequences. However, the continuing nature of valve mispositioning events that have occurred indicated that licensee's corrective actions have been ineffective in maintaining complete control of valve positions. In addition, the repetitive nature of mispositioned valves indicated that the licensee's root cause analysis of mispositioned valve(s) may not have been sufficiently independent or thorough enough to include all human performance aspects.

3.0 SUMMARY

The inspectors concluded control room operations are conducted in accordance with station procedures. In addition, operations management was present in the control room providing adequate management oversight. Likewise maintenance activities were performed in accordance with station procedures and with appropriate supervisory oversight.

The continuation of status control events with low safety consequences indicated that the licensee's corrective actions have been ineffective. In addition, the repetitive nature of mispositioned valves indicated that the licensee's root cause analysis of mispositioned valve(s) may not have been sufficiently independent or thorough enough to include all human performance aspects.

4.0 EXIT MEETING

An exit meeting was conducted October 1, 1993, at the Susquehanna Steam Electric Station. The inspector's findings and conclusions were discussed at this meeting. Those in attendance are listed below.

At the meeting, the NRC staff focused on its concern with the ineffectiveness of the licensee's corrective actions with respect to status configuration control on valve positions. In response to the staff's request, the licensee representatives agreed to a written response detailing additional actions and controls to minimize further valve mispositioning events. The area addressed in this report is unresolved pending NRC staff review of the licensee's response as noted above (387,388/93-18-01). (An unresolved item is an area in which more information is needed to determine if the item is acceptable, a violation, or a deviation.)



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