



ATTACHMENT TO:

LER NO. 82-043/01T-0

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CAUSE DESCRIPTION AND CORRECTIVE ACTIONS - Continued

The valves had been closed and locked by the Startup Group during the final days of startup testing, prior to initial fuel loading. This was as directed by the Startup Superintendent as an added precaution against inadvertent spray actuation during final testing. Subsequently, from the time of turnover to the Operations Group in January, 1981, until the date of discovery on October 28, 1982, there was one documented verification of the containment spray system lineup, plus a locked valve check and a personal check of the two valve positions by the Operations Superintendent. The valve lineup verification was completed in March, 1981 prior to initial plant startup, and the locked valve check and Operations Superintendent check were conducted in February, 1982 during an outage.

The valve line-up verification consisted of three basic steps:

- (1) A verification by a first operator against a checklist showing the normal position for each valve. The operator recorded any as-found deviation from the checklist. He did not reposition any valves.
- (2) A supervisory review of the checklist, resolution of any deviations from normal positions, completion of any required repositioning action by an operator, and annotation of the checklist as appropriate.
- (3) A verification by a second different operator against the checklist.

During the verification, the following procedures were used for verifying valve position:

Normally Closed - Attempt to close. If valve is in correct closed position, no motion will occur.

Normally Open - Attempt to move handwheel or operator in closed direction. In this case the stem should turn indicating the valve is open. Return valve to original position.

Locked Closed - Verify locking device is securely locked and in good condition. Visually verify that valve stem is at full travel in closed direction.

Locked Open - Verify locking device is securely locked and in good condition. Visually verify that valve stem is at full travel in open direction.

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CAUSE DESCRIPTION AND CORRECTIVE ACTIONS - Continued

The containment spray header isolation valves are normally locked open and, accordingly, are so indicated on the valve lineup check sheets. In the verification completed in March, 1981, the locked valve check completed in February, 1982, and the check by the Operations Superintendent, the position of the valves was determined to be "Locked Open" using the procedure as shown for "Locked Open" valves above. However, the stems of these two valves were not in accordance with design in that the stems were approximately 6 inches too long. These are rising stem valves such that the stem rises above the handwheel. If these valves had been in accordance with design, the stems would have been nearly flush with the retainer on top of the handwheel rather than extruding up six inches when in the closed position. The fully open stem travel (extension) by design is eight inches. This deviation from design, in combination with the procedure used for valve verification and check, resulted in the incident.

The two principal corrective actions include restoration of the valve stem to design length and changing procedural guidance as follows:

Locked Closed - Attempt to move handwheel or operator in the closed direction. If valve is in the correct position, no motion will occur. If unable to move the operator because of the locking device, remove the locking device and attempt to move the operator in the closed direction. Re-install the locking device and verify that it is securely locked and in good condition. If the locking device was unlocked, a second verification of the locking device installation is required.

Locked Open - Attempt to move handwheel or operator in the closed position only enough to verify valve movement. The handwheel or operator should turn, indicating the valve is open. Return valve to original position. If unable to move the operator due to the locking device, remove the locking device and attempt to move the operator, or handwheel in the closed direction only enough to verify valve movement. Return valve to original position. Re-install the locking device and verify that it is securely locked and in good condition. If the locking device was unlocked, a second verification of the locking device installation is required.

A fourth step in the verification sequence has been added for locked valves in which the locking device is verified to be properly secured and locked if the valve was unlocked to verify position.

A meeting has been scheduled with Region II Headquarters for November 19, 1982 for in-depth discussion of our investigation and corrective actions.