

BNL ALARA CENTER

Processes and Practices Related to Occupational Dose

ID: 16

ELIMINATE REACTOR TEMPERATURE DETECTOR BYPASS MANIFOLD (PWRs)

Keywords: REACTOR TEMPERATURE DETECTOR BYPASS MANIFOLD; THERMOWELL; INSTRUMENTATION; EQUIPMENT MODIFICATION; EQUIPMENT REPLACEMENT; ALARA; RTD BYPASS MANIFOLD; REACTOR TEMPERATURE DETECTOR

Description:

The purpose of the RTD bypass elimination was to replace the existing RTD bypass manifold system with fast-response, narrow-range thermowell-type RTDs installed in the existing hot leg loops, and the cold leg of each RCS loop. The modification removes the valves, piping, snubbers, and supports associated with the RTD Bypass System and replaces them with thermowell mounted fast response RTDs which are installed directly in the reactor coolant pipe.

Mechanical modification begins with the removal of the existing bypass piping at each connection point to the reactor coolant system. The existing hot and cold leg penetrations are machined to accept RTD thermowells. The thermowell is mounted inside the scope and the RTD is installed within the thermowell. The crossover leg connection is capped and an additional cold leg boss, thermowell and RTD are added as an installed spare.

This change will reduce plant shutdown caused by excessive primary leakage through valves, flanges, etc., reduce radiation exposure due to maintenance on the bypass line and to crud traps which increase radiation exposure throughout the lower portion of containment, and use a thermowell which permits RTD replacement without plant draindown. The major health physics advantage in removing RTD piping is the reduction of dose over the life of the plant. RTD systems have been a major contributor to outage dose due to the maintenance required on the systems and the configuration of the piping and manifolds next to high maintenance areas.

References and Selected Abstracts:

1. Deal, W.P., "RTD Bypass Elimination Report: Unit #2 Catawba Nuclear Station," Presented at Westinghouse Electric Corporation, 1988 Radiation Exposure Management Seminar, Pittsburgh, PA, Sept. 12, 1988.