

BNL ALARA CENTER

Processes and Practices Related to Occupational Dose

ID: 11

CONOSEAL MODIFICATION FOR INCORE THERMOCOUPLE PENETRATION (PWRs)**Keywords:** INSTRUMENTATION; CONOSEAL; INCORE THERMOCOUPLE; INCORE INSTRUMENTATION; ALARA; EQUIPMENT MODIFICATION AND REPLACEMENT**Description:**

Westinghouse has developed an upgrade to the instrumentation port column assembly, the pressure-retaining device that seals the upper head penetrations and thermocouple column interfaces used during plant operation. The assembly must be disassembled to remove the vessel head at each refueling outage and then reassembled when the vessel head is replaced. While maintaining the successful features of the existing design, the new upgrade greatly simplifies the assembly/disassembly effort. In an area where temperatures can reach 130 degrees and radiation fields can be as high as 2000 mrem/hr, this upgrade provides significant cost savings in support of the ALARA objective. In addition, the reduction in assembly/disassembly time, from almost 2 hours to less than 10 minutes (per thermocouple column), can significantly reduce critical path outage time.

The new Westinghouse design provides several advantages over the existing hardware. The existing female flange, which is seal welded to the vessel head, is unchanged. Therefore, no machining or welding is required to install the upgrade. The Instrumentation Port Column Assembly Upgrade utilizes the existing conoseal gaskets with which Westinghouse has had a record of success. Conoseal gaskets are easier to handle and require fewer components than alternative gasket materials and sealing surfaces.

The new design replaces both of the existing clamps with articulated clamps. The marman clamps and jack screws at the upper joint are replaced by the upper articulated clamp and upper positioner. The need for lockwires is eliminated. The lower coupling is replaced by the lower positioner, and the axial loading device is eliminated. The former design, which consisted of 27 parts, is reduced to just 6 parts. In addition, the installation of the upgrade and subsequent assembly/disassembly efforts require only ordinary handtools.

References and Selected Abstracts:

Westinghouse Electric Corporation, 1987 Radiation Exposure Management Seminar, Pittsburgh, PA, September 11-14, 1987 (Westinghouse, Box 355, Pittsburgh, PA 15230-0355).