

N407. TVA SAVES CRITICAL OUTAGE TIME FOR EXAMINATION OF RPV AND INTERNALS LIFTING DEVICE

Tennessee Valley Authority (TVA) saved an estimated \$600,000 by using acoustic emission (AE) monitoring in lieu of conventional NDE surface techniques to inspect reactor pressure vessel (RPV) head and internals lifting rigs.

With careful planning and minimal impact on the refueling activities, the utility performed AE monitoring to meet the NDE requirements of ANSI N14.6-1978, "American National Standard for Special Lifting Devices for Shipping Containers weighing 10,000 Pounds or More for Nuclear Materials." With AE monitoring, the utility satisfied compliance with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants."

NUREG-0612 requires compliance with ANSI N14.6-1978 to perform either (1) a 10-minute 150% load test of the lifting device in conjunction with a visual inspection of critical areas and welds for deformation and flaws or (2) dimensional testing, visual inspection and nondestructive examination of major load carrying welds and critical components of the lifting device. To perform a 150% load test, the lifting rig would have to be moved outside at a substantial cost since the reactor and auxiliary building cranes are not rated for the required load. Also, it was cost prohibitive to disassemble, prepare parts, including welds for dimensional and surface testing of these components, without incurring damage or impacting reassembly maintenance activities. As a result, the utility selected an alternative inspection approach to satisfying the NDE portion of the ANSI requirements, thus complying with NUREG-0612.

To reduce impact on the refueling activities while minimizing the overall inspection cost, TVA's inspection Services organization elected to apply AE monitoring in lieu of liquid penetrant, magnetic particle, and ultrasonic testing. These conventional examination methods require labor-intensive preparation of parts and areas to be tested. The multiple examination techniques are required to detect both surface and internal flaws possibly present in clevis pins and root areas of fillet welds. In contrast, AE monitoring constitutes a single volumetric examination technique for 100% inspection coverage of the entire lifting rig components. Any active flaws identified and located by AE would then be sized and characterized by ultrasonic inspection methods. Fracture mechanics would ultimately determine the acceptability of any such identified flaws.

No unusual emission activity was noted from the RPV head or the upper internals lifting rigs. Based on the AE monitoring, no active flaws were found in the RPV head and internal lifting rigs.

For more, "TVA Saves Critical Outage Time For Examination of RPV and Internals Lifting Device," NUREG/CR-3693. For further information, contact EPRI NDE Center, P.O.Box 217097, Charlotte, NC 28221.