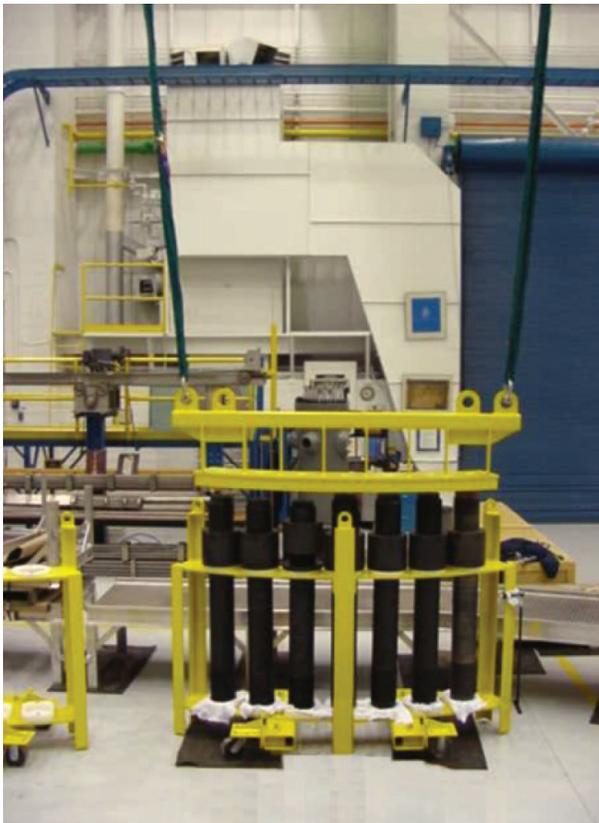


Reactor Vessel Stud-handling System

Background

The movement of reactor vessel studs is an important and often time-consuming outage activity used in preparation of opening or closing the reactor vessel head. Westinghouse has developed a remote studhandling system to perform this activity both safely and efficiently.



Main system components

Description

- The transport segment is used to move the studs between the reactor vessel head and the stud racks.
- For a typical four-loop reactor vessel, the system includes six 7-position stud racks and two 6-position stud racks.
- Eye bolts are provided for each stud to support the studs during movement with the transport segment.
- A single lift beam connected to the polar crane auxiliary hook stays above the reactor head seismic platform and supports the transport segment via two 30-foot (minimum) high-strength, synthetic slings.
- Specially designed support clips are used to securely support each spherical washer on the shank of the associated stud during movement to or from the stud racks.
- Supplied rigging includes the two 30-foot (minimum) high-strength synthetic slings described above for connecting the lift beam to the transport segment. In addition, there are two 3-leg bridle sling assemblies that permit lifting and moving the loaded or unloaded stud racks with any properly rated overhead crane or hoist.

The optional coating for the main components of the system complies with industry requirements for equipment stored in containment during reactor operation.

The fabricated components of the system are fully load tested prior to delivery.

Benefits

The Westinghouse remote stud-handling system provides the following benefits:

- Improved Safety – The curved shape of the transport segment and stud racks matches the curve of the reactor vessel head and provides a means to safely move multiple reactor vessel studs without the need to push or pull on the studs, as was often the case with earlier stud rack designs.
- Lower Radiation Exposure – Fewer personnel are needed near the reactor because the stud racks are located outside the reactor cavity.
- Schedule Improvement – All 54 studs are safely moved in a typical four-loop reactor vessel with only eight polar crane lifts. Additional schedule gains are achievable if plant design permits storing the main components of the system in containment during plant operation.

Experience

To date, the Sequoyah, D.C. Cook, Callaway and Wolf Creek nuclear power plants have all realized the benefits of this system.

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