Wet Annular Burnable Assembly Handling Tool

Background

Westinghouse has developed the wet annular burnable assembly handling tool (WABAHT), an innovative tool designed to eliminate the problems associated with handling a wet annular burnable assembly (WABA) with a burnable poison rod assembly (BPRA) handling tool. The WABAHT transfers WABAs between fuel assemblies, as well as fuel rack inserts, by raising the WABA out of one location, into the handling tool, and then lowering it out of the tool into another location. The WABAHT is suspended from the fuel-handling machine hoist and is operated from the bridge walkway.

Description

The WABAHT is a telescoping tool, consisting of an upper support tube and main frame assembly. The support tube comprises the insert gripper, gripper shaft, lift bail and gripper latch. The frame assembly consists of the cage, comb assemblies, comb tracks, cable/pulley system and latch. Relative movement of these two assemblies is controlled by the tool latch. The latch locks the tool in the extended or collapsed position during movement within the spent fuel pool. The track-mounted comb assemblies position the rods during insertion and withdrawal.

The WABAHT is moved in the collapsed locked position when it is empty; i.e., without a WABA and with the comb assemblies on the outside of the tool cage. The tool is placed on the fuel assembly top nozzle to withdraw a WABA. The tool is unlocked and the gripper lowered onto the WABA hold-down assembly. The gripper is latched and then lifted with the overhead hoist, raising the WABA into the cage assembly.

As the gripper and WABA are raised, the comb assemblies are lowered to align the WABA rods. The gripper is raised, withdrawing the WABA fully inside the cage. The tool automatically locks in position and the WABA can be relocated.

The WABAHT is moved in the extended locked condition when latched onto a WABA. In this condition, the comb assemblies are inserted into the cage and the gripper is in the full-up position. The tool is then placed on the top nozzle of a fuel assembly to insert the WABA. The tool is unlocked and the gripper and WABA lowered with the fuel-handling machine overhead hoist. Once the WABA rods have entered the fuel assembly, the comb assemblies are raised and withdrawn from the cage. This allows the gripper to reach a full-down position and the WABA is fully inserted into the fuel assembly. The gripper is disengaged and withdrawn into the housing and the tool is locked in the collapsed condition, ready for another transport.

Deliverables

The WABAHT and related services are provided in accordance with the Westinghouse Quality Management System, which complies with ISO 9001 requirements.

Westinghouse Scope

- WABA handling tool(s) – standard delivery lead time is approximately six months
- Technical manual, including assembly drawings and operating and maintenance procedure
- Data package, including Certificate of Compliance to customer order requirements

Westinghouse

Customer Scope

To tailor the WABAHT to plant-specific conditions, the following interface dimensions for the spent fuel pool are required from the utility:

- Maximum fuel-handling machine hoist hook height (with load-measuring device installed)
- Elevations of fuel-handling machine handrail, walkway and bottom of bridge (for clearance with bail of tool when stored)
- Spent fuel rack and weir gate openings
- Elevations of the top of the fuel assemblies, spent fuel racks floor of weir gate opening, spent fuel pool floor, bottom of fuel-handling machine, and pool water level

Customer scope also includes:

- Unpacking and assembly of the tool
- Tool storage bracket fabrication and installation (a custom tool storage bracket is available as an option)

Westinghouse Optional Scope

Upon request, Westinghouse can provide an optional scope of:

- On-site assistance in acquiring required measurements for the design
- Design and fabrication of a custom tool storage bracket
- Training services at Waltz Mill Service Center in Madison, Pennsylvania (USA)
- On-site assembly and operation advisory services

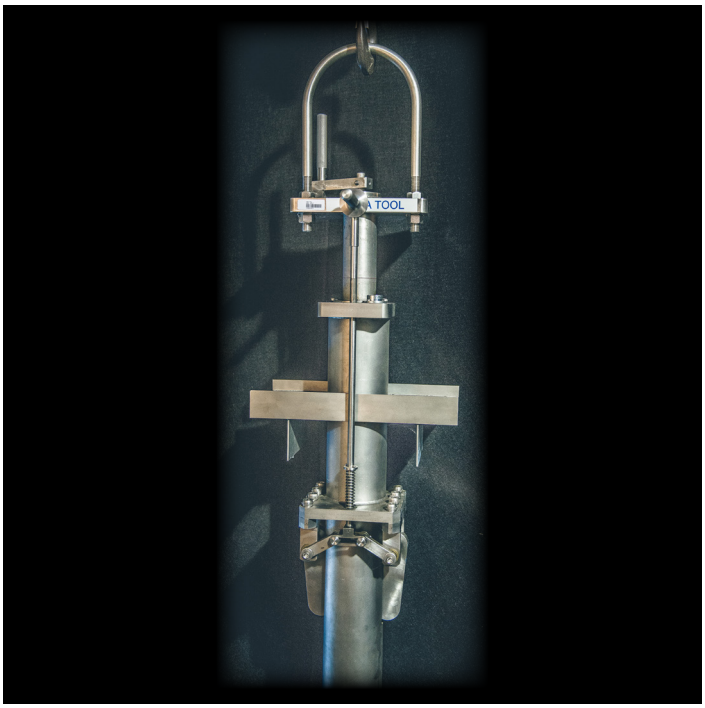
Benefits

The benefits offered by the WABAHT include:

- Mechanical operation using the fuel-handling machine hoist, which eliminates the BPRA winch
- Reduced critical path fuel insert handling times
- Improved WABA rod alignment due to closer comb assembly proximity to the fuel assembly

Experience

- Over 15 WABAHTs have been delivered for use at U.S. nuclear plants and **AP1000**® plant sites.
- A training tool is available at the Westinghouse Waltz Mill Service Center in Madison, Pennsylvania (USA).



Top of tool

Bottom of tool

Westinghouse Electric Company
1000 Westinghouse Drive
Cranberry Township, PA 16066

www.westinghouse**nuclear**.com

June 2015 NS-FS-0095