

In Vessel Visual Inspection (IVVI)

Remote Visual Examination Tools

Challenge

Today's nuclear industry demands better quality control and inspection documentation for all plants. Higher quality examination tools are necessary for additional traceability and reporting. IVVI for Boiling Water Reactors (BWRs) is frequently on the refuel outage critical path, which drives the need for efficiency and accuracy.

Solution

Complementing a large portfolio of High Definition (HD) and High Radiation Tolerant Cameras, Framatome NDE Services has developed an array of tools to ensure quality compliance and shorten the overall outage schedule and provides the opportunity to perform IVVI skip outages.

The global resources of Framatome are responding quickly with advanced innovations for visual examinations. With fully-remote automated tooling, HD camera technology, and advanced software, Framatome increases the quality of plant examinations while decreasing time spent on examinations. Often, IVVI is on critical path, and these time savings will significantly impact overall outage schedule. The reporting software makes data acquisition and final reporting efficient and simple.



Customer benefits

- HawkEye provides INPO-recognized quality examinations while considerably reducing time needed for IVVI examinations in the schedule.
 - Significant dose savings
 - Optimized critical path
 - Enhanced nuclear, industrial and radiological safety
 - Examinations performed on operating jet pump loops
 - High-quality HD examinations
- IVVI scope is invisible to site management and off the Outage Control Center (OCC) radar.
- Significant dose savings compared to traditional manual pole-manipulated examinations.
- Significant component examination coverage due to tool manipulation and HD camera compared to traditional manual camera on a pole.
- ACCURATE HD IVVI software facilitates quality final reports

Your performance
is **our** everyday **commitment**

HawkEye – Multi-Axis Visual Inspection Manipulator

The HawkEye Visual Inspection Manipulator operates on a standard ring platform and performs visual examinations in parallel with shroud UT examinations. It delivers video cameras to target examination areas with full-position feedback integrated into the video record.

Benefits:

HD Cameras:

- Image quality and Field of View (FOV) is much better at any comparable resolution distance (HD display is 6.75x larger); exam times are dramatically reduced with the ability to examine further away from components.

Remote Cleaning:

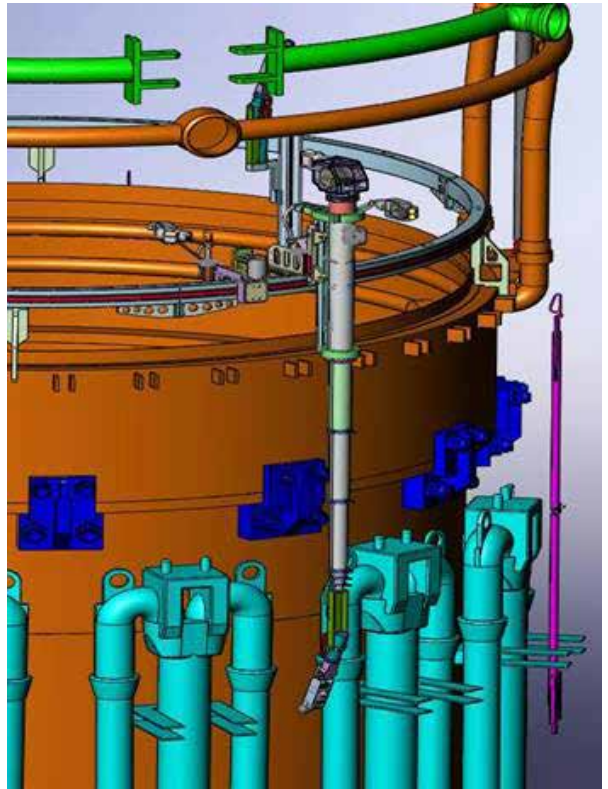
- Saves critical path time; no manual or bridge support required; no one in work cavity platform.
- Used for all cleaning above the steam dam and 98% remote cleaning in the annulus; eliminates multiple personnel working over the Reactor Vessel and Reactor Core.
- Field proven

“Hawk Box” – Modular Equipment Control Unit (MECU):

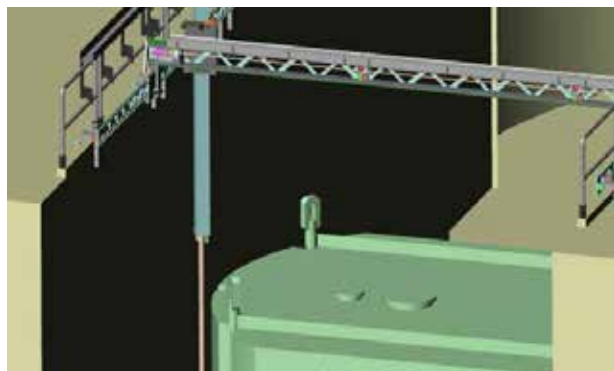
- Enables rapid mobilization of equipment with a reduced shipping and operating foot-print.
- Reduced number of personnel and experience to set-up equipment.
- Provides equipment reliability and reduced costs for our customers.

Loop/SDC dependent:

- HawkEye reduces the impact of “SDC” and “No Flow” windows with a robust design that allows the tool to perform examinations on operating jet pump loops.



HawkEYE ring support for BWR shroud annulus



Gantry HawkEYE mast for steam dryer inspection

Accurate HD IVVI Software

The Accurate HD IVVI Software records and organizes live video and still images into a manageable database. The software was designed with loss-less video encoding, zero loss of data to produce a “true” camera image without degradation during video recording. In turn, the software helps produce a final report for our customers’ records.

Benefits:

Integration:

- Fully integrated with all visual tooling, including HawkEye

Simplicity:

- User-friendly interface with an integrated customer review station for oversight and examination concurrence
- Facilitates real time review by utility and outside entities

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