

In Vessel Visual Inspection (IVVI)

Remote Visual Examination Tools

Reduce safety risk, costs and dose impacts by remotely performing 98% of high-quality cleaning and High Definition (HD) examinations driving schedule efficiency — proven tool for In Vessel Visual Inspection skip outages

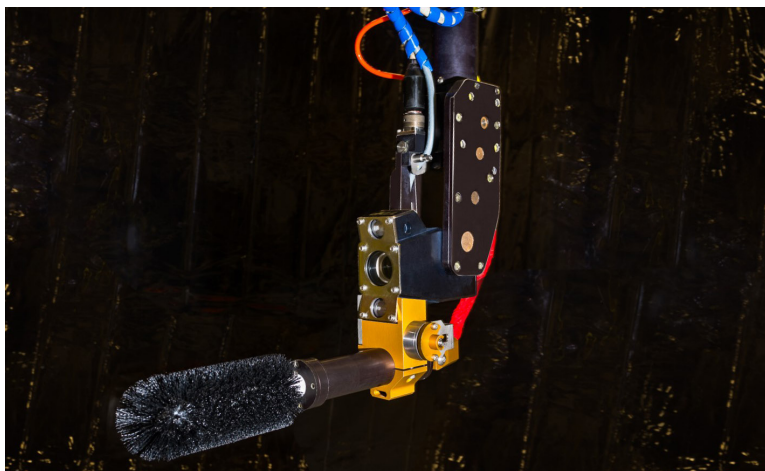
Challenge

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. Driving efficiency and accuracy ensures IVVI does not become critical path.

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, plus 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 examinations while decreasing schedule impact. The reporting software makes data acquisition and final reporting efficient and simple.



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

Customer benefits

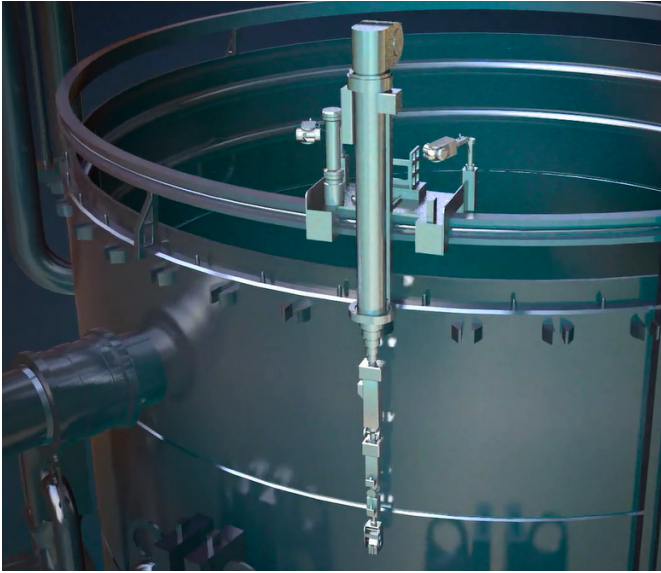
- HawkEye provides INPO-recognized quality examinations while considerably reducing time needed for IVVI examinations in the schedule
 - Significant dose savings
 - Enhanced nuclear, industrial and radiological safety
 - Safely perform cleaning and examination throughout operational jet pump loops
 - High-quality HD examinations
- 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

NEI TIP Award for Innovative Practices

2018 - HawkEye recognized by NEI, receiving a Top Innovative Practice (TIP) award.

2019 - Framatome recognized by NEI for its employment of remote IVVI tooling in conjunction with executing an IVVI Skip Outage.

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 significantly reduced as a result of the enhanced resolution and increased viewing area

Remote Cleaning:

- No manual or bridge support required; no one on 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 footprint
- 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

Remote Dryer/Separator Inspection Tool

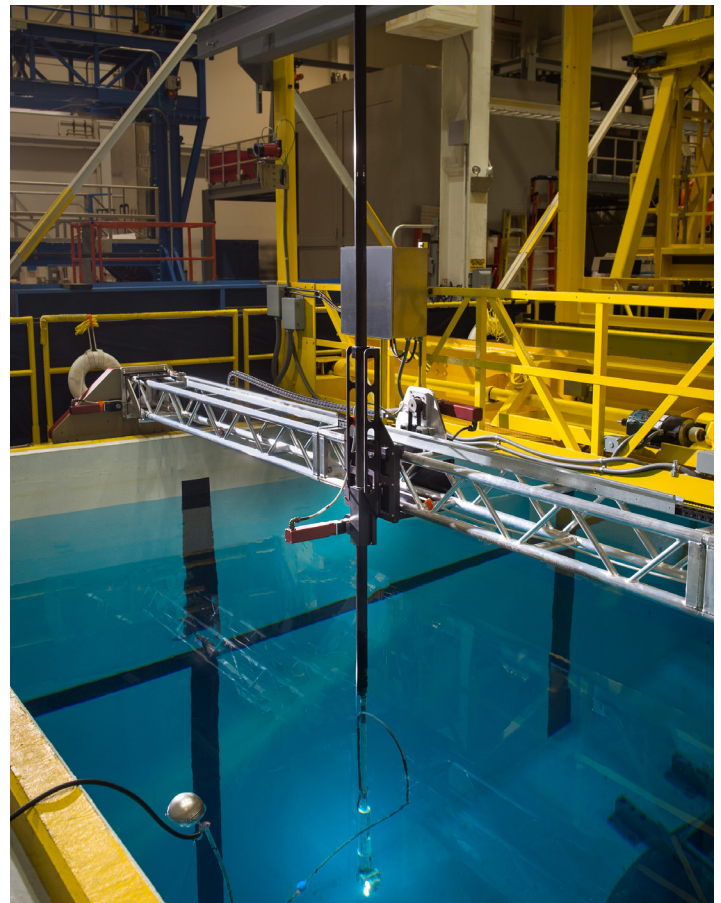
The Remote Dryer/Separator Inspection Tool, a simplified automated X,Y, Z scanner, reduces schedule and dose associated with existing IVVI manual inspections.

Benefits:

- Performs efficient and high quality examinations in high definition (HD)
- Further saves site dose by eliminating manual IVVI from Aux Bridge
- Examinations conducted remotely from office or Framatome trailer
- Rides on existing refueling equipment bridge rails or trusses

Technical features:

- Designed, tested, qualified and implemented in three months
- Completed 315 Dryer/Separator examinations with 100% tooling reliability
- Adaptability — able to span any width/length D/S Equipment Pit



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