

BlueRad™ 5-Sided Fuel Inspection Service

Background

Since 2013, debris-induced fuel failures have led to declining fuel performance industrywide as addressed in INPO Event Report 19-6. Not only do these failures lead to increased fission products in the reactor coolant system (RCS), but it may also cause lost generation, mid-cycle outages to remove failed fuel, core redesigns, and increased radiation exposure to workers. It is very important to prevent foreign material from entering the RCS and equally important to find and remove foreign material that are already present in the system and commonly collect in the reactor and its fuel.

Westinghouse has developed a shielded BlueRad™ 5-Sided Fuel Inspection System designed and built from the ground up to provide the best possible visual examination of each fuel assembly during or after core offload.



One 5-Sided Camera Viewing Fuel Assembly

Description

The Westinghouse BlueRad™ 5-Sided Fuel Inspection System consists of five high definition BlueRad™ cameras to view each side of the fuel assembly and the bottom nozzle simultaneously. The cameras are mounted to a common custom-made frame and controlled by a simplified controller for easy operation. The inspection can be viewed live and/or recorded for future viewing.

The Westinghouse BlueRad™ 5-Sided Fuel Inspection System includes:

Features

- Five High Definition (HD) tungsten-shielded BlueRad™ underwater cameras to view each side of the fuel assembly and the bottom nozzle
- Simplified custom camera controls and recording software to allow ease of operation during inspection activities
- All-digital, full-HD resolution, for real-time viewing and recording
- Custom telephoto lens allows cameras to be positioned anywhere from 18-50 inches from the fuel assembly
- High intensity LED lighting
- Radiation tolerant up to 2×10^6 R of Co-60 equivalent at 2×10^4 R/hr
- High-speed shutter minimizes motion blur during fuel movement
- Small, lightweight, portable controller
- High definition h.264 video encoding saved in convenient MP4 format, which can be viewed by almost any computer
- Automatic duplication of video to external storage media
- A mounting bracket system custom designed for each plant for quick and easy installation

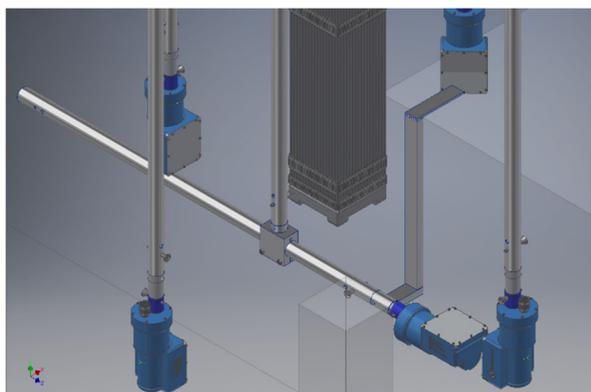


Inspection Services

Benefits

The Westinghouse BlueRad™ 5-Sided Fuel Inspection System provides high definition video that allows operators to easily locate and identify foreign material within, or damage to, each fuel assembly removed from the core. The custom designed frame for the system allows it to be placed in such a position that it does not interfere with the fuel offload process. Once identified, operators can then remove the foreign material or repair the assembly at a later time during the refueling outage to allow reuse of the assembly and prevent a future failure.

Have the confidence that your next cycle will operate leaker-free for the entire cycle by preventing debris or damaged fuel from being reloaded into your plant at the start of the cycle.



BlueRad™ 5-Sided Fuel Inspection System

Deliverables

Westinghouse can provide equipment and services to support each utility's needs:

Option 1 - BlueRad™ 5-Sided Fuel Inspection System (equipment only) customized based on the needs of each individual utility/site.

Option 2 - BlueRad™ 5-Sided Fuel Inspection System services which includes procedures, video file, and trip report.

Additional Resources

For more information, visit the product video at:

<https://youtu.be/JLnWyJBnJq8>

Ask us how we can provide this valuable service to your plant!

Experience

Westinghouse has been providing 5-Sided Fuel Inspection Services for many years utilizing various technology. The BlueRad™ 5-Sided Fuel Inspection System is designed and built for fuel inspectors, by fuel inspectors and combines the latest in optics technology with our extensive fuel inspection experience resulting in an innovative camera for your inspection needs.



Fuel Assembly Inspection

Westinghouse has sold and used the BlueRad™ 5-Sided Fuel Inspection System at multiple customer sites. The clarity of the high-definition image and the ease of use of the system is just some of the positive feedback received.



BlueRad™ Shielded Camera