Marine Systems

Naval forces must safeguard a nation's maritime borders and work with other defense forces when needed. Consequently, ship inspections are vital to help ensure the fleet is ready for service.

Marine vessels have numerous small, large, and complex machineries that need regular maintenance to extend their life. Nondestructive testing helps ensure the vessels are in good condition.

This section introduces remote visual inspection solutions that can be done onboard and in dry dock

Propulsion: Turbine

Application

Gas turbines are an important part of many marine applications, including power generation and, in some cases, direct propulsion through a reduction gearbox.

These turbines are commonly modified versions of aero-derivative turbines with different access ports for videoscope inspection.

Challenges

The challenges of marine turbine engines are the same as aero turbine engines, such as the ability to locate small defects.

Solutions

- IPLEX™ NX videoscope offers intensely bright laser diode illumination
- IPLEX GX/GT videoscopes have modular designs where multiple scopes and light sources can be exchanged for different visual inspection applications

Recommended Products

IPLEX NX videoscope and IPLEX GX/GT videoscopes

Propulsion: Diesel

Application

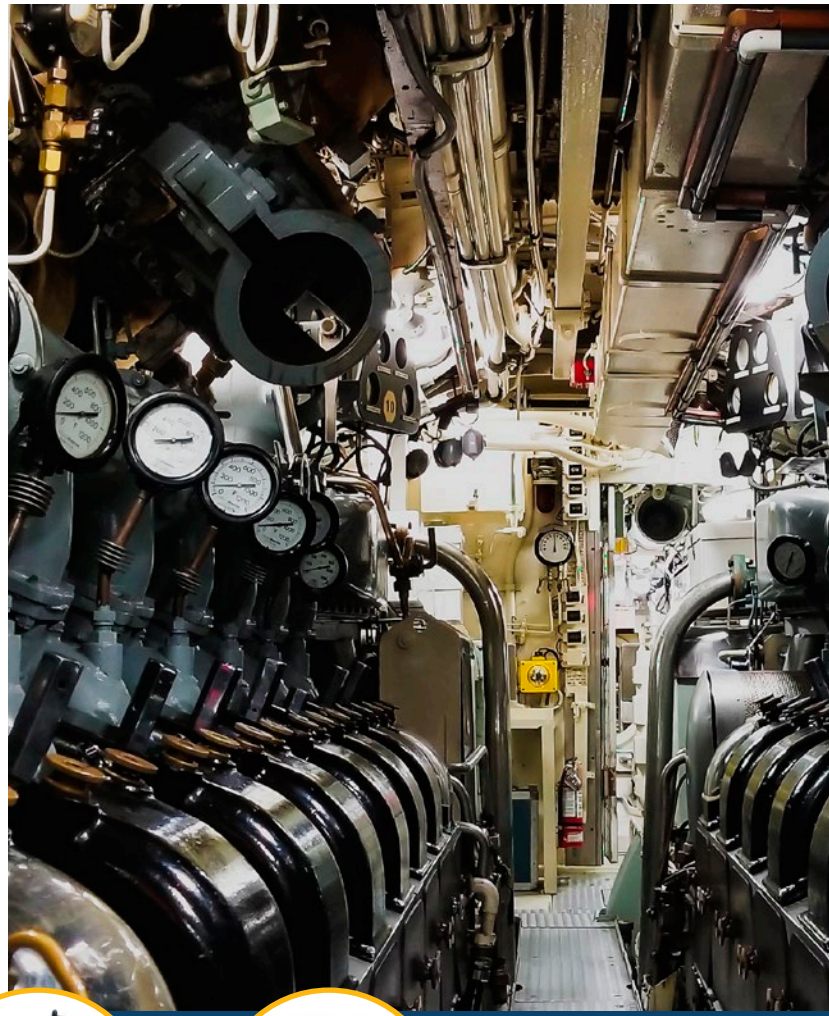
Diesel engines are commonly used as direct or indirect power plants in large- and medium-sized vessels. Either via reduction gearbox or via electric generators, marine diesel engines need frequent inspection as standard preventative maintenance. No matter the size, the typical diesel engine components include pistons, cylinders, valves, and injectors. Remote visual inspection instruments are effective tools to detect wear on these moving parts.

Challenges

Engine blocks are confined in complex environments that are highly reflective and oily. In this case, the visual inspection challenge is how to achieve a balance between bright illumination and reduced halation for maximum probability of detection.

Solutions

- IPLEX™ videoscopes with PulsarPic™ illumination and oil-clearing tip adaptors
- PulsarPic technology automatically adjusts illumination with the CCD image capture frame rate so that high illumination is achieved with less power and over exposure is reduced in highly reflective surfaces; as a result, halation in metallic or oily environments is reduced
- Oil-clearing tip adaptors draw oil away from the tip adaptor lens using natural capillary action



Recommended Products

PLEX GX/GT videoscopes and IPLEX G Lite videoscope

Propulsion: Nuclear

Application

Nuclear submarines enclose many critical internal components, such as steam generators, reactors, steam turbines, propulsion systems, pumps, heat exchangers, and the drivetrain in gearboxes. Periodic inspection and proactive maintenance are essential to avoid lengthy and costly downtime.

Challenges

- Poor image quality and lower probability of detection (POD) due to electromagnetic interference
- Confined and complex environments
- Radioactive environments
- Inspecting long pipes with complex networks
- Small defects need to be quickly found to minimize dry-dock time
- Videoscopes must be durable to perform in any weather and environment

Solutions

- IPLEX™ videoscopes offer bright illumination, high-quality imaging, and a portable design for effective remote visual inspection even in challenging inspection environments
- 3D measurements enable further investigation and accurate measurement for reliable reference against the relevant standard
- Videoscopes feature military-grade ruggedness (MIL-STD-810G and MIL-STD-461F/G) for operating environment performance
- Wide range of scopes available in various diameters (2.4–8.5 mm or 0.09–0.33 in.) and lengths (2–30 m or 6.56–98.4 ft)

Recommended Products

IPLEX NX videoscope with stereo measurement and 3D modeling; IPLEX GAir videoscope

Heat Exchangers

Application

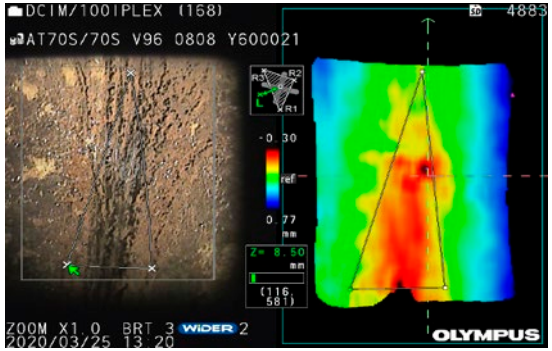
Heat exchangers on surface vessels and submarines play an important role to help ensure relevant systems are operating at optimal temperatures. Direct and indirect cooling systems can be vulnerable to galvanic corrosion and fouling, leading to inefficiency and ultimately system failure.

Challenges

No matter the heat exchanger design, accessibility to confined spaces and long tubing are the main challenges of visual corrosion inspection.

Solutions

Regular inspections using any IPLEX™ videoscope can help identify problems such as corrosion and check the internal condition of nearly all heat exchangers on marine vessels. The IPLEX NX videoscope increases your probability of detection (POD) thanks to an optimal combination of illumination, sensor resolution, and image processing.



Recommended Products

IPLEX NX videoscope with stereo measurement and 3D modeling

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