CASE STUDY - LNG Tanker – CCTV Upgrade Using Existing Cable Infrastructure

Overview

Paragon Security was commissioned to design a full CCTV system upgrade for a 300 metre long LNG tanker, delivering a modern, high-resolution IP solution while overcoming the unique operational and environmental challenges of a working commercial vessel.

The Challenge

The vessel's owners required a CCTV upgrade that addressed several critical constraints:

- Replacement of an outdated analogue CCTV system with a high-resolution IP-based solution
- Installation to be completed while the vessel remained operational and underway
- Minimal disruption to ship operations and crew
- Reuse of the existing coaxial cable infrastructure to avoid the cost, time, and risk associated with installing new network cables
- Multiple video monitoring locations around the vessel
- Provision of rugged, marine-grade cameras capable of operating in harsh environmental conditions, including wash/wipe functionality
- Supply of ATEX-certified cameras and monitors for use in hazardous areas

These requirements demanded a carefully engineered, bespoke solution rather than a standard off-the-shelf CCTV system.

The Solution

Following a detailed survey, Paragon designed a bespoke CCTV system tailored to the vessel's operational requirements. This included detailed system drawings and engineering documentation demonstrating how each requirement would be met.

Key elements of the solution included:

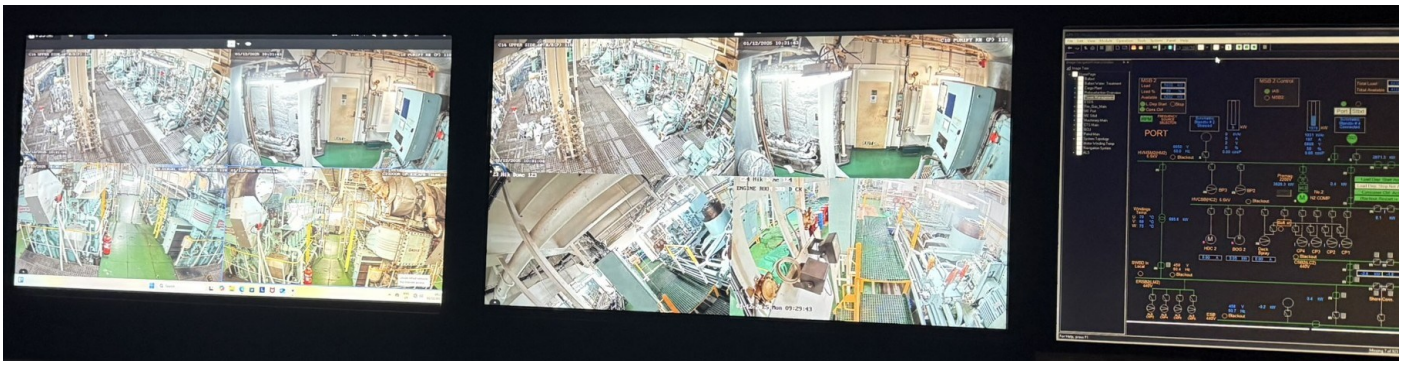
Sophisticated Video Management System (VMS)

Paragon used a versatile video management and recording system which offered the flexibility to support the wide range of different cameras required – including marine grade and explosionproof PTZs.

The video management software supported five multi-screen viewing stations around the ship, each one able to view live and replay recording. Camera on-screen icons give washer and wiper control.

All 24 cameras are continuously recorded in high resolution 32-channel network video recorder (NVR). This supports RAID 0, 1 and 5 to prevent recording loss. The system supports "*Deep Search"* which uses multiple attributes (e.g., gender, age group, clothing, colour etc.) to quickly and accurately find a recording of interest.

A key benefit of the system is the ability to show any combination of cameras on any screen. This can range from all cameras displayed together in matrix format, or a single camera displayed on screen on alarm. Short-cuts were set-up for particular tasks including loading and berthing.



Rugged Marine-Grade Cameras

PTZ cameras were selected with 4MP high resolution, x30 motorised zoom lens and marine grade paint finish. The cameras are designed for tough, outdoor, surveillance applications. The die-cast aluminium body is anodised before being powder coated, making it environmentally tough and resistant to malicious attack. The Marine Paint finish is designed to give enhanced corrosion resistance with an ultra-durable coating conforming to the requirements of EN 12206 and EN 13438 (High Durability systems). The combination of ultra-durable paint and sunshield helps to reduce extremes of temperature in direct sunlight. All moving parts are designed to last including the long-life, silicon wiper and the motor technology used in its pan and tilt mechanism.

The cameras are fitted with a water jet nozzle and freshwater washer tank to ensure that the window always gives clear views.

Advanced IP-over-Coaxial Transmission

Paragon implemented innovative transmission technology enabling high-definition IP CCTV video to be carried over the vessel's existing coaxial cabling. The solution supports bandwidths of up to 200 Mbps, allowing multi-camera matrix views at CCTV monitoring stations. IP PTZ cameras also transmit their signals over the coax. Paragon's system is capable of powering devices drawing up to 90W (PoE++) over coaxial cable – so can accommodate PTZ cameras with high power infra-red lamps if needed - eliminating the need for new cable runs.

Bespoke Mechanical Engineering

Custom stainless-steel adaptor plates were manufactured to allow the new IP cameras to be mounted onto existing camera brackets. This significantly reduced engineering work avoided hot works and minimised installation time.

Integrated Hazardous and Safe Area Monitoring

Both hazardous and safe area cameras were fully integrated into a single Video Management System (VMS). Wash/wipe functionality was controlled directly via the IP system, providing operators with clear visibility in all weather conditions.

ATEX-Certified Equipment

Paragon supplied their ATEX-certified explosion-proof fixed and PTZ cameras, along with EX monitors, ensuring full compliance with hazardous area requirements.

Project Outcome

By leveraging the existing cable infrastructure and providing bespoke mounting solutions, Paragon Security enabled the complete CCTV upgrade to be installed by two engineers in under two weeks. The project was delivered without operational disruption and was completed to the full satisfaction of the vessel's Captain and Chief Engineer.

Key Value Delivered

- Minimal vessel downtime
- Reduced installation cost and risk
- Fully compliant hazardous-area CCTV coverage
- Future-proof, high-resolution IP surveillance system
- Demonstrated expertise in the design of CCTV in complex marine and LNG environments

Paragon will be delighted to assist with your vessel's CCTV upgrade.

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