

# Marine Engineering Digest

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Technical side

## Trihedral Engineering

### Coast Guard upgrades control system onboard patrol vessel

With a cruising range of 12,000 nautical miles and a crew complement of 19, the CCGS Leonard J. Cowley is a key vessel in the Canadian Coast Guard's east coast fleet. Classed as an off-shore ice-strength multi-task cutter, the 2243 grt ship's duties include fisheries patrol and search & rescue. In recent years, the 1980's-vintage onboard control system had been causing persistent problems for sea staff and vessel support engineers.

Remote indicator panels were not working, sensors were malfunctioning, and the entire system would periodically "lock up", leaving the Cowley unable to perform its duties. The aging system consisted of custom software which could no longer be supported, plus

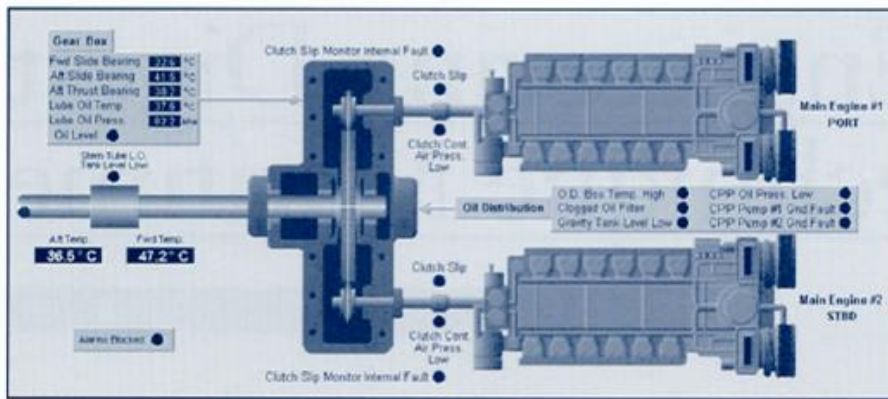
non-standard hardware which was difficult to replace or unavailable. As a result, in 1996 Lloyd's Register retracted the Cowley's UMS (unmanned machinery space) certification.



CCGS Leonard J. Cowley

In search of a technologically current, functional and open system, the Coast Guard turned to Visual Tag System™ (VTS™) monitoring and control software from Trihedral Engineering of Bedford, Nova Scotia, Canada. The VTS software replaced

the existing system, automating the onboard alarm and monitoring functions. Installed on an industry-standard Pentium II PC and communicating with two Allen Bradley SLC 505 Ethernet Series programmable controllers (PLCs), VTS reads 250 digital and analog I/O



Visual Tag System screen monitoring the status of the clutch and gear box.

points from equipment sensors around the ship. These include sensors at the two main engines, three auxiliary engines, gearbox, emergency generator, reverse osmosis units, and tanks for ballast, potable water and fuel. From the main control station in the motor control room, sea staff can monitor all sensor data such as main engine lube oil pressure and temperature, exhaust gas temperature and deviations, engine turbocharger temperature, and engine safety systems. Basic alarm notification is also provided at remote panels located on the bridge, engineers' cabins, officers' mess and crew's mess. The alarm system consists of three levels: the sensors, the PLCs, and the VTS software, providing necessary redundancy within and between each system level. In addition, system parameters are logged so sea staff can compare, for example, historical engine operation to current engine status, and tune the engine accordingly.

"Because of the remote and harsh environments they operate in, shipboard systems require a high level of reliability. You simply can't call in the local systems integrator when you are 300 miles out in the North

Atlantic," states Barry Baker, Trihedral Control Systems Engineer on the project. "Reliable components coupled with a redundant system architecture provide the critical care needed." According to Scott Atkinson, Coast Guard Project Engineer, Vessel Support, "The system had to consist of easy to obtain parts, good after market service, and Lloyds-approved components. The new

system met these requirements, and we are saving money already."

The Cowley's main propulsion is geared diesel with one controllable pitch propeller powered by two Polar 12 cylinder engines, for a total of 3160 kw. With an overall length of 72 metres, breadth of 14.2 metres and draft of 4.5 metres, the Cowley is equipped with a helicopter pad and hangar, plus fast rescue craft.

The Cowley sea staff can now efficiently monitor overall vessel performance, freeing time for maintenance and other duties. "There is lots of room for expansion, and that's what we aim to do," says CCG's Atkinson about the VTS software. In the future, the aviation fuel tanks and the propulsion control system may be added to the VTS monitoring system. As well, the new system is open enough to connect to the Cowley's predictive maintenance software from another vendor, should the Coast Guard wish to make that link. And as a direct result of the new automated alarm system, in September 1999 the Cowley regained its Lloyd's Register UMS rating.

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