

Stressing the Point

hull stress monitoring system

test & measurement

custom electronics
engineering software
data management



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Challenge

The Australian Navy required a system to monitor the condition and dynamic forces on the hulls of its two LPA class ships, the HMAS Kanimbla and the HMAS Manoora. These ships are used to transport and support up to 450 troops, their vehicles and equipment, as well as four Black Hawk helicopters and two landing craft.

HMAS Kanimbla and HMAS Manoora have done more than 40 years of service, and are still required to operate under all weather conditions, often with large amounts of vital equipment and personnel on board. A hull stress monitoring system was needed to inform the ship's crew as to the current and projected forces on the hull, so they can continue to safely operate the ships.

Apart from sending real-time alarms to the crew as the hull stress approaches or exceeds the damage threshold, the system must also keep a comprehensive data log so that developing trends can be determined, and decisions made to prolong the service life of the ships.

Solution

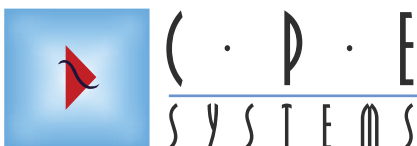
CPE Systems, in collaboration with Endurance Consulting, designed and implemented a custom built hull stress monitoring solution, with an easy to use software interface running on a touch screen panel PC mounted in the ship's bridge.

The software was developed in LabVIEW due to its quick implementation time and ability to interface with all of the necessary sensors. The system simultaneously monitors four stress sensors, two accelerometers, starboard and port motor rpm and wind conditions. Raw data and statistics for all sensors is stored with up to five years of data available for review and export.

By touching areas on the screen, recent history and up to 24 hours of statistics for each stress sensor or accelerometer are displayed. Probability of reaching a threshold or predicted time to reach threshold is also displayed along with each sensors current state.

The project was completed under an extremely tight timeframe, with software development and verification, two sets of hardware installs, and two sets of sea trials being completed within three months.

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