

The French frigate, DENTI

osmos

Integrated safety for structures



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Optical extensometer on the underface of the deck girder

Surveillance of a French navy ship

Client

Ministry of Defense
Armaments Division

Structure

French navy frigate, used to pick up torpedoes, built in 1976.

Context

The client wants to have precise information about the swell loads exerted on the hulls of the ships in the French navy.

Therefore, he decided to take measurements on the deformations on a number of ships in active service.

Client's requirements

The client wants a reliable measurement-taking system. It is very difficult to take measurements owing to the highly charged electromagnetic environment: due to the subsequent "parasites", traditional methods using extensometer gauges have proved to be inefficient.

Instruments

- 1 monitoring station
- 4 optical extensometers installed on the ship's head beam
- 1 temperature probe

Initial results

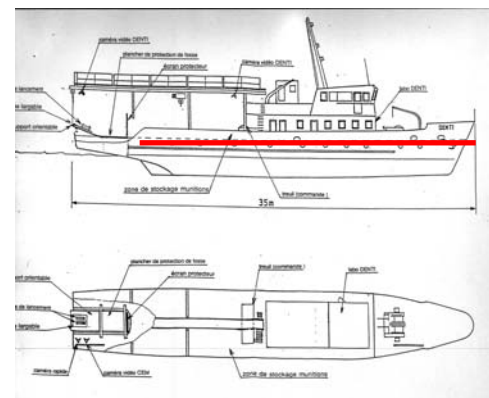
The results were reassuring. The strain caused by the swell were braced by the ship's deck girder. There are no net tendencies towards compression or tension.

Shocks caused by the swell on the ship's hull cause slight deformations which can all be reversed.

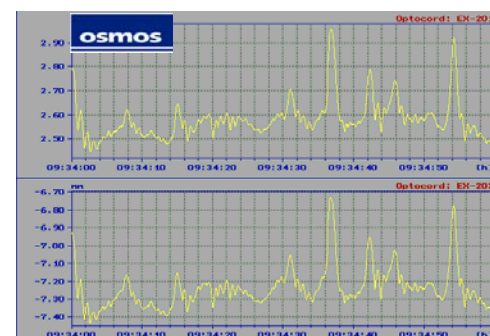
Advantages for the client

"An OSMOS system based on the use of optical extensometers was installed in the French navy's trial ships. Experiments and measurements carried out to measure the loads fluctuating owing to the swell proved the efficacy of the system. The technique also has the advantage of being able to secure the measurement even in a highly charged electromagnetic environment."

Bernard Auroire,
Ministry of Defense
Naval Systems Technical Division



Ship's deck girder shown in red
The deck girder is the bracing deck lengthwise which takes the force of the swell.



60 μm deformation caused by the shock from the swell on the hull.
The deformation can be totally reversed.