LIGHT STRUCTURES
Passion for Monitoring

Cruise and Expedition

SENSFIB COMFORT and SENSFIB ICE
For Comfort and Safety

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SENSFIB COMFORT

Every cruise and ferry operator have their passengers' comfort as their main priority. One of the most common and dreaded problems onboard ships is high levels of vibration. The two most noticeable effects this vibration has on the ship is structural fatigue and discomfort of crew/passengers. Discomfort is most often caused by motion sickness/sea sickness. Through research by classification societies and commercial suppliers, a lot of improvement has been achieved in terms of marine vibrations and motion sickness. Light Structures is proud to introduce SENSFIB COMFORT, a monitoring and guidance solution to aid the navigators in making transits as comfortable as possible. The solution relies on measuring the motions and accelerations passengers experience at different locations in the vessel and calculating (VDV-Vibration Dose Value) risk of passenger discomfort using state-of-the-art methods. The solution is scalable from short-haul ferries to the largest cruise and expedition ships.

As the cruise and expedition destinations grow more exotic and the customers are looking for more extreme experiences, the risk will increase for voyages encountering various and demanding weather conditions. With SENSFIB COMFORT, the operator will be better able to choose the speed and heading that causes the least discomfort. When discomfort is unavoidable, the passengers can be given the heads-up that they are in for a rougher ride.

SENSFIB COMFORT is presented with a freshly developed and user-friendly interface that informs about conditions throughout the vessel at a glance. Up to 8 locations onboard can be monitored for motions simultaneously.

SENSFIB COMFORT can be combined with other monitoring solutions from Light Structures, such as SENSFIB HULL, SENSFIB ICE and SENSFIB GLOBAL FORCES.

Motion Monitoring
Comfort Control

- Dynamic operator guidance
- Improved passenger comfort
- Balance speed vs comfort during blue water transits

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SENSFIB ICE

The challenges of operating in ice infested waters affects more and more vessels as Arctic shipping routes are opening, and offshore oil and gas related activities in the Arctic continues to increase.

Financially it is essential to be able to operate and utilize the vessels all year around. However, ice loads that exceed the design load is a major risk for the hull structure.

SENSFIB ICE measures the actual real time load on the hull structure and sends data to the bridge helping the navigator in making informed decisions.

Saved data provides valuable input for maintenance planning and contributes to a safer, cleaner and more effective usage of the vessel.

SENSFIB ICE is the world's leading technology within Ice Load Monitoring.

Light Structures' advanced fiber optic technology and solution is approved by all major classification societies and is a vital tool for the increasing number of navigators without former arctic experience who will operate these vessels in the future.

SENSFIB ICE can easily be retrofitted and the return on investment is attractive, as the vessel can be better utilized and at the same time keep the maintenance costs down.

Ice Load Monitoring
Operational Control

- Proven technology in Arctic conditions
- Dynamic operator guidance
- Balance speed vs comfort during
  Can easily be retrofitted

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Fibre optic sensors are used for a multitude of applications due to their small size, light weight, inertness to chemical substances, ability to withstand high temperatures and immunity to electromagnetic interference. Subsequently, fibre optic sensors are frequently used for applications such as Structural Health Monitoring (SHM), where the deformation and dynamic response behaviour of objects are measured using mounted or even embedded optic fibres directly into the structure being monitored.

Principle
Over the last years, fibre optic strain sensors based on Fibre Bragg Grating (FBG) technique, have been developed. The basic principle is: light is sent through a fibre optic cable and partially reflected by FBGs. Strain on the fiber, or a temperature change causes a shift in wavelength of the reflected light, which can be measured very precisely and translated into strain or temperature variations.

New Waters

Cruise and Expedition ship owners, opening new destinations and catering to adventurous passengers, will benefit from other SENSFIB products by Light Structures.

Expeditionary cruises to the polar regions will benefit from the SENSFIB ICE which monitors the actual hull structure response to impact, from floating or compact ice. This allows the navigator to keep an eye on the loads in bow/midship/aft structure, to avoid costly damage from ice floe or compact ice interactions.

For novel designs and highspeed blue water transits, SENSFIB offers a range of solutions for monitoring the static and dynamic loads on the hull that cause accumulation of fatigue damage and cracking (visible or nonvisible).

SENSFIB Hull provides basic hull stress monitoring and is available with class notation. The scope recommended by classification societies includes main deck stresses, waterline stresses and (for Ro-Ro vessels) bow door stresses.

More advanced solutions are offered by SENSFIB GLOBAL FORCES, which monitor the deformations of whole cross-sections of the hull, e.g. at Cruise/Expedition ships atrium or high-speed catamaran ferries.

Hull Monitoring Operational Control

- Dynamic operator guidance
- Reduce hull maintenance cost
- Control hull loads during blue water transits
- Class notations option available

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