



**BUREAU
VERITAS**

MARINE TECHNICAL ASSISTANCE—MEASUREMENTS

Identifying noise and vibration issues early to avoid costly problems later

BUSINESS CHALLENGE

Shipbuilders and ship owners are looking to limit noise and vibration as much as possible on ships. This is particularly important on passenger vessels.

Ideally, potential problems should be identified at the earliest stages of ship design and shipbuilding, as well as in the earliest stages of part design and manufacture. However, this is not always possible and solutions are therefore also needed for operating vessels.

SOLUTION

What kind of measurements do we provide?

Bureau Veritas is able to perform a complete set of measurements on board a ship, in order to avoid noise and vibration problems before building, and to reduce vibrations on existing ships. The areas covered are:

- Noise: Prediction studies and measurements.
- Vibrations: Excitation tests during outfitting work, operational modal analysis, measurements and monitoring.

What are the key benefits?

- Address potentially excessive noise and vibrations before shipbuilding is complete.
- Achieve acceptable noise and vibration levels required for class notation.
- Optimise comfort for passengers and crew.
- Identify unusual noise or vibrations that need to be addressed during ship operation.

RELATED SERVICES

In addition to classification, Bureau Veritas offers a wide range of related services:

- Classification of ships and off-shore units
- Statutory and non-statutory certification
- Other technical assistance
- Training

WHY CHOOSE BUREAU VERITAS?

Recognition Founded in 1828, Bureau Veritas is a world leader specialising in conformity assessment services related to Quality, Health, Safety & Environment (QHSE).

Certified to ISO 9001 for all of its activities globally, Bureau Veritas is well known for its ability to adapt to changing client environments and situations and for its commitment to providing leading solutions through quality service.

Knowledge & Expertise Through expert local teams and technical knowledge, Bureau Veritas are able to deliver packaged and targeted solutions and information, to support our clients' unique business requirements.

Network With a global network of over 900 locations in more than 140 countries, Bureau Veritas provides tailored solutions to clients throughout the world across a diverse range of industries.



OUR APPROACH

NOISE

Noise Prediction Studies. Using a software based on experimental results, noise levels can be estimated from manufacturers' data, vibrations, sound power spectra of engines and propellers or equipment suppliers (insulation attenuation spectra). Structure borne and airborne noise results can be split or gathered. Results allow us to record noise spectra in different living areas.

Noise measurements. These measurements must be performed for running conditions in agreement with the contract specifications. Noise spectra are recorded by a sound meter and are then plotted in order to compare the measured levels to the specified levels. For instance, the additional class notation COMF-NOISE requires control measurement before granting the notation.

VIBRATIONS

Excitation tests during outfitting work. This study involves applying a coherent excitation to the ship structure over the frequency range of the propulsion plant, using an exciter. Experimental results allow us to propose modifications intended to eliminate local deck vibrations, before completion of the ship.

Operational modal analysis. Modal analysis mainly allows us to determine the following parameters, directly in situ:

- Natural frequencies (hull girder or local structures)
- Natural mode shapes
- Coupling identification between global and local systems
- Rough estimation of damping characteristics
- Local resonance
- Allowing appropriated reinforcements

Vibration measurements. These measurements must be performed for running conditions in agreement with the contract specifications. Vibrations spectra are then plotted in order to compare measured levels to specified levels. For instance the additional class notation COMF-VIB requires control measurement before granting the notation.

Monitoring. Monitoring diesel engine torque vibrations gives a good idea of their operational settings. For instance, Bureau Veritas developed an easy and robust system for amplitude and torque vibrations measurement, in order to obtain:

- Continuous information
- An alarm when the limit is exceeded

The main use of such a device is to survey injection pumps adjustment for ageing of dampers or elastic coupling.

FAQ – FREQUENTLY ASKED QUESTIONS

What differentiates you from other classification societies in terms of in situ measurement?

At Bureau Veritas we have leading specialists in the field of ship noise and vibration measurements and studies. They have been recognised as leaders in this field for more than 25 years. Furthermore, our high technology analytical and modelling tools are second to none.

CONTACT

For details about this service, please contact Bureau Veritas (Marine Division) Aus & NZ
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FOR MORE INFORMATION

Please Visit: www.bureauveritas.com.au
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CLIENT REFERENCES

Bureau Veritas has earned the confidence of many leading companies in the marine sector, including:

- Shipyards: Aker Yards, Dalian, DSME, Fincantieri, Hyundai, IHI, Mitsubishi, Samsung, SWS, Universal.
- Marine Equipment Manufacturers: Bao Steel, Caterpillar, FFE Holdings, Hyundai, Man, Mitsui, Mittal Steel, POSCO, Reintjes, Schneider, Wartsilä.
- Ship owners: Anangel, Boskalis, Broström, Cardiff Maritime, CMA-CGM, Dynacom, Groupe Bourbon, Dredging International, Enterprises Shipping & Trading, Exmar, Jan De Nul, Louis Dreyfus, Maersk, MSC, Nisshin, Norden, Tsakos.