



Underwater Radiated Noise

Additional class notation



Vibration and Noise
Engineering Solutions

TÉCNICAS Y SERVICIOS DE INGENIERÍA, S.L.



BUREAU
VERITAS

Why has Bureau Veritas introduced certification for underwater radiated noise?

Underwater noise from commercial shipping contributes significantly to ocean ambient noise, and can have a major impact on marine life. Bureau Veritas offers a voluntary class notation to help shipbuilders and operators measure and reduce underwater noise radiating from their vessels.



Every self-propelled ship radiates continuous underwater noise. This comes primarily from the engine and propeller, as propeller and hull vibrations radiate noise into the ocean: intensity of noise depends on ship design and operating conditions.

The expansion in commercial shipping has resulted in a large increase in noise footprint, and negative impacts on marine life, including whales, dolphins and fish. In the short-term, underwater noise can block an animal's ability to communicate, navigate or detect prey; in the long-term, it may even lead to loss of hearing ability.

The issue has recently attracted the attention of regulators and standards bodies. The European Marine Strategy Framework Directive includes demands for noise mitigation solutions (implementation: 2016), and the IMO has published guidelines to reduce noise from commercial ships.

It is against this backdrop of increased environmental threat and future regulations that Bureau Veritas has introduced NR 614, a voluntary class notation to reduce underwater radiated noise. This Guide explains how to measure underwater noise, and the benefits to shipbuilders and operators of adopting the new notation.

Why adopt the additional class notation NR 614?

PROTECT THE ENVIRONMENT

- Mitigate the impact of noise on sensitive marine life
- Prove your commitment to the marine environment

IMPROVE CREW COMFORT

- Reducing underwater noise is linked to lowering noise and vibration on board. The result is a better working and living environment for crew

GAIN CONFIDENCE IN YOUR DATA

- The notation brings transparency on measurement uncertainty and repeatability giving you full confidence in the results.

FUTURE-PROOF YOUR SHIP

- Anticipate future international regulations and standards on underwater noise radiation
- Ensure reduced noise impact for navigation in protected areas

BOOST EFFICIENCY

- Focusing on reducing underwater noise tends to result in choices that drive energy efficiency and improved performance of underwater equipment

A COST-EFFECTIVE APPROACH, BACKED BY SOLID ENGINEERING

- Recommendations from our specialist engineers enable you to integrate the notation requirements from design stage: a cost-effective way to meet future requirements.

To read the notation in detail, please visit our client portal <http://www.veristar.com>



Four steps to URN certification

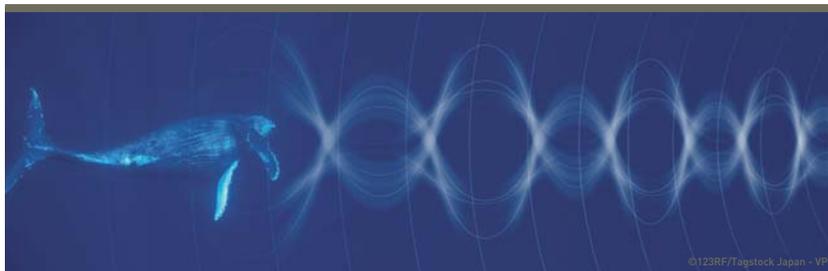
We deliver three different types of Underwater Radiated Noise (URN) certificates, representing different levels of control and specialist functions. The key steps involved are the same for each.



Bureau Veritas introduced NR 614 Underwater Radiated Noise in 2014, a voluntary notation, which concerns underwater radiated noise emitted by any self-propelled ships. It covers both shallow and deep water conditions, sets out a dedicated comprehensive measurement procedure, explains how to manage measurement uncertainties, and establishes maximum underwater noise levels.

We offer two levels of URN notation: one for vessels seeking to reduce noise impact to an acceptable level (URN – controlled vessel) and a second with more stringent demands in terms of noise control, for improved environmental protection (URN- advanced vessel).

We also offer a specialist notation (URN – specified vessel) for ships such as fishing research vessels or oceanographic vessels with specific equipment or requirements. This involves a case-by-case study to define underwater radiated noise limits for the vessel type.



The process involves four key steps

1- DEFINE THE TEST SITE

Factors taken into account include water depth, the profile of the sea bottom and local weather. A site should be chosen with low ship traffic and current, to minimize background noise.



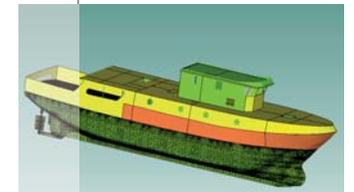
2- MEASURE AND ASSESS

Measurements are carried out by a Bureau Veritas underwater noise specialist, during sea trials or while the ship is in service. Underwater noise is evaluated via three hydrophones. The data is then processed and compared with underwater limits defined by Bureau Veritas as part of the notation. These limits are based on a representative measurement database.



3- ASSESSMENT REPORT AND RECOMMENDATIONS

A report is provided detailing measurements, areas for improvement and potential solutions. These might include changes to design or operation, or simple maintenance actions such as polishing the propeller. Shipbuilders and owners can decide the extent of the mitigating actions they wish to take to meet basic or advanced notation requirements.



4- OBTAIN CLASS CERTIFICATE

The URN class certificate is provided by Bureau Veritas and the notation is added to the ship's class profile.



A key feature of the certification is that it actively recognizes the issue of measurement uncertainty and repeatability. Measurement procedures include repeating the test to improve data reliability. In addition, Bureau Veritas is transparent on statistical variations, and takes them into account in its recommendations. As a result, shipbuilders and owners who implement our recommendations can be confident in their vessels' performance.

Why choose Bureau Veritas?

One of the world's largest classification societies, Bureau Veritas is also a global leader in environmental protection and certification.



Bureau Veritas is a leading classification society and a trusted partner of the Marine industry since the early 19th century. We also offer a wide range of marine advisory services focused on safety, performance and environmental protection.

A key player in maritime research and development since the mid-19th century, we have contributed to most historic industry innovation and developed expertise in areas such as hydrodynamics, vibration and structural fatigue. This expertise, combined with deep industry relationships, enables us to continually support the development of the marine industry with new rules and services.

The URN notation series is the result of involvement in industry research projects and our active role in developing international standards:

- Strong involvement in European research projects into underwater noise: SILENV and AQUO. The latter included the work of 13 partners from eight countries, among which shipyards, hydrodynamic research institutes and bio-acoustic experts.
- Bureau Veritas represented France in the development of the IMO Guidelines relating to underwater noise.¹

The series was developed in close collaboration with our partner Técnicas y Servicios de Ingeniería, S.L., a company specializing in noise and vibrations engineering solutions.

¹Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life, published 2014.



A global leader in testing, inspection and certification

Bureau Veritas serves clients' needs in quality, health, safety, environmental protection and social responsibility. Our mission: to help identify, prevent, manage and eliminate risks.

For over 180 years, our clients across all industries have looked to us to provide technical support, verify compliance, or obtain certification. Our network of over 1,300 offices and laboratories meets our clients' needs, wherever they are in the world.



Move Forward with Confidence

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