



Marine Renewable Energy

Guide to Certification



Move Forward with Confidence



What does this Guide cover?

This Guide covers certification of an emerging group of technologies that includes tidal turbines, wave energy converters and ocean thermal energy converters. Harnessing the sea's kinetic and thermal energy to generate electricity, they represent a growing part of the Marine Renewable Energy (MRE) sector.

Offshore wind farms, an established technology often included in definitions of MRE, are not covered, as they benefit from their own Guide developed by Bureau Veritas, based on the existing international standard IEC 61400-22.

Existing wind energy certification is also currently being adapted to floating offshore wind turbines by Bureau Veritas, in coordination with IEC developments.



The benefits of Marine Renewable Energy certification

Marine Renewable Energy (MRE) offers promising sources of clean energy. Certification can provide confidence in the safety, quality and performance of these emerging technologies, and support their commercial development.

Emerging technologies that generate electricity by harnessing the power of tidal streams, waves and temperature gradients, are moving from research phase to commercial use. Over the next 5-10 years, the number of tidal turbines in particular, but also wave energy converters and ocean thermal energy converters, is set to multiply.

However to ensure the commercial viability of their projects, designers and operators involved in marine energy must be able to demonstrate their technologies are safe, and offer strong quality and reliability. This can be complex in an emerging sector with no real track record, and international standards under development*.

Bureau Veritas, as an established certification body with extensive experience in renewable energy and marine markets, has developed certification for emerging MRE technologies. Certification is the written assurance by an independent accredited body of conformity to specific requirements. It represents a third-party stamp of approval that a design, component or project conforms to an agreed standard.

In the case of MRE, certification has the potential to accelerate development and commercialization, by providing investors, insurers, test site owners and end users with confidence in a project. It also enables owners and designers to compare performance, and gain reassurance on safety and quality.

This Guide sets out our approach to MRE certification: how we identify requirements, the methodology we apply, and how you can obtain certification for your design, component or project.

*The International Electrotechnical Commission (IEC) is currently developing a set of standards (the IEC 62600 series) for MRE and associated procedures, a program in which Bureau Veritas is involved.

Our approach to certification

We offer certification along the MRE value chain, from components through to manufactured converters and farms installed offshore.



Certification is traditionally based on conformity with a reference set of codes and standards. Bureau Veritas is closely involved in the development of IEC standards dedicated to MRE and associated certification schemes.

Our approach to certification of MRE is therefore based on Bureau Veritas rules development, our work with the IEC and the certification principles used in other sectors, notably wind energy and offshore oil and gas.

Combining existing standards with a risk-based methodology

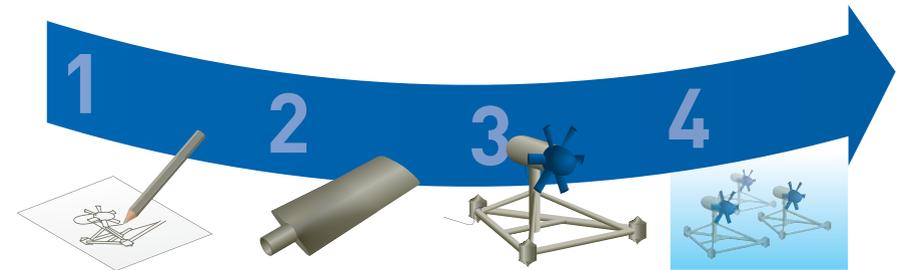
Where possible, we select available MRE standards or relevant ones from related sectors and use them to establish requirements for each of the components and systems. An important part of this work is to determine when existing standards are not relevant. In this case, we carry out a specific risk assessment on the component. This is what we mean by combining existing standards with a risk-based methodology.

Four certification offers to meet client and project needs

We offer four certification schemes (see diagram). These are designed to meet a broad range of needs within the MRE industry: prototype and component certification, valuable to commercialize this innovation, and type and project certification, applicable to established engineering and energy companies.

In practice, certification is cumulative: type certification requires assessment of design and components, and project certification demands type certification as well as more site-specific assessments. The process for project certification is illustrated opposite.

Four types of MRE certification



Prototype certification

Used to assess the structural integrity and safety of the first marine energy device of a new generation, at sea trial stage.

Component certification

Confirms that a standard component to be used in multiple projects is designed, documented and manufactured in conformity with specific requirements.

Type certification

Conformity assessment for a series of marine energy devices of common design and manufacture

Project certification

Conformity assessment of a farm, installed at a specific site, over its entire lifecycle*

*excludes decommissioning which is usually specified by local regulations

Provides confidence in the design, enabling the designer/operator to continue development, and identifies risk areas.

Speeds up certification of projects, and helps commercialize components.

Indicates a marine energy device is ready for market by demonstration of compliance with specified safety and quality standards.

Provides confidence in a project's long-term safety and performance.

Focus on project certification

Project certification follows an eight-step process. Once issued, the validity of the certificate is subject to in-service surveys.



One of the world's leading certification bodies

Bureau Veritas serves clients across all industries and sectors. Our hallmarks? Technical expertise, impartiality, and detailed knowledge of international and local regulations.



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.

With over 1,000 accreditations and authorizations across a range of industry sectors, our report and certifications are globally recognized and respected.

Our subsidiary Tecnicas, Bureau Veritas' advisory arm, offers technical assistance for Marine Renewable Energy projects. Our wide range of customized services includes among others risk assessment, moorings, hydrodynamics and structural analyses to ensure the reliability of a project. Tecnicas also answers the needs of many other leading industrial sectors by providing consulting services worldwide.

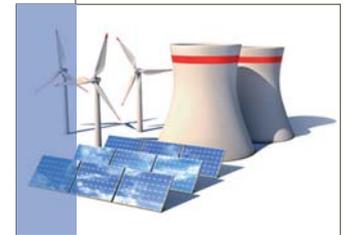
One of our key strengths is our ability to apply the in-depth research and expertise we build in one sector to new, related sectors.

The examples opposite provide a flavor of our work in sectors related to Marine Renewable Energy.



POWER

We support clients in all power sectors, from traditional fossil fuel to nuclear, hydropower, wind and solar energy. Our focus is on maintaining production and distribution, and on the integrity of assets. Our involvement begins at design stage, with feasibility and design assistance, and covers procurement, construction, operation and decommissioning. We have developed a complete range of services for renewable energy sectors, including certification for wind turbines and wind farm projects.



OIL AND GAS

Bureau Veritas' upstream and downstream services for the oil and gas industry focus on safeguarding people and assets, and on helping clients accurately determine the quality of their oil. We offer inspection, non-destructive testing, and asset management integrity solutions to help clients maximize the effectiveness and life of onshore and offshore facilities. Our certification and classification services cover platforms and equipment, as well as health and safety management systems.



MARINE

We are a leading ship classification society, with over 11,000 ships worldwide classed to Bureau Veritas rules. We also offer a wide range of 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. We have also developed advanced calculation and simulation tools to analyze the behavior of ships and offshore structures.



NEW TECHNOLOGIES

Bureau Veritas' cross-industry expertise and knowledge of the principles of testing, inspection and certification mean we are well placed to develop new services to meet the needs of emerging sectors and new technologies. For example, we have recently issued certificates of concept approval for innovative equipment on oil and gas platforms based on our guidelines about the qualification of new technologies. A key focus has also been the development of certification guidelines for embedded software.





Move Forward with Confidence

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