

Marine Energy Standards TC114 Canadian Subcommittee

IEC TC114 Project

Teams

- [Terminology](#)
- [Wave Energy](#)
[Resource](#)
[Assessment](#)
- [Tidal Energy](#)
[Resource](#)
[Assessment](#)
- [Wave Energy](#)
[Converter](#)
[Performance](#)
- [Wave Energy](#)
[Performance - 2nd](#)
[Site](#)
- [Tidal Energy](#)
[Converter](#)
[Performance](#)
- [Design Requirements](#)

Message from the Chair - Russell Stothers

Welcome to the first newsletter of the Canadian committee responsible for developing marine renewable energy standards. This committee was formed early in 2008 and since that time its members have actively worked on the creation of standards as well as ensuring Canada's voice is heard within the international community.

The creation of this newsletter is an indication that this committee has matured and is entering the next stage in its development. With the addition of Marine Renewables Canada, Canadian Standards Association and a multi-year funding agreement from Natural Resources Canada, this committee now has the foundation to enable it to actively participate and lead standards development work in the international community. This multi-year funding agreement from NRCAN will allow Canadian experts to attend and actively participate in international project team meetings, engage in research that will advance the quality of the standards and perform more extensive outreach functions.

The committee currently consists of approximately 22 dedicated volunteers. As the industry is developing, we need participation from all industry stakeholders to ensure the documents correctly reflect the Canadian perspective. Over the coming year, we will be reaching out to the Canadian community to look for a broader representation of all stakeholders involved in the marine renewable energy industry. In particular, we require assistance in the following areas:

- Individuals to review draft standards documents and provide this feedback to the existing Canadian experts attending international meetings. This group is what we refer to as a "shadow committee". Being a member of a shadow committee is an excellent way to get introduced to the standards development process without making a large commitment of time. Expertise is required in Design Requirements, Moorings, Power Quality, River Energy Converter Performance, River Resource Assessment and Acoustic Characterization.
- Individuals who are interested in developing Canadian

- [Power Quality](#)
- [Mooring Systems](#)
- [Guidelines for the early stage development of wave energy converters](#)

Quick Links

- [IEC TC114 Standards Website](#)
- [International Electrotechnical Commission \(IEC\)](#)
- [Marine Renewable Energy Technology Roadmap](#)

Project Partners:

Canadian Sub-Committee (SMC/IEC TC114)

- Acadia University

specific guidelines that may or may not be aligned with the international standards efforts.

- Individuals to perform research specifically focused on answering some of the existing knowledge gaps that are required for a specific standard

This is just an abbreviated list and more possibilities are coming online as we are always looking to our committee members to propose new guideline topics which have a strategic interest to Canada.

We hope the information contained in this newsletter will pique your interest and perhaps encourage you to investigate a bit further. Our website (<http://tc114.oreg.ca/>) is continuously being updated with the latest information. Please feel free to contact me or Marine Renewables Canada directly for more information on how to get involved with this committee.

Russell Stothers
Chair, Canadian Marine Renewable Energy Committee
(officially known as SMC to IEC/TC114)

Message from Marine Renewables Canada

In the 2011 roadmapping efforts there was consistent theme that emerged. It was that Canada should play a leadership role in defining how the marine renewables industry was developed, how it will operate and how it will continue to evolve. This was in part an echo from the leadership shown by Natural Resources Canada (Melanie Nadeau in fact) in pushing the launch of the TC114 standards initiative of IEC, but it was more because it reflected that some of the practices and approaches that early engagement in Canada could create would become the SOPs for the emerging industry.

A theme of Marine Renewables Canada's communications is that we are now in a phase that is prototyping the industry, not simply prototyping technology. We believe it is important for us to be looking for the integrated systems that will make marine power plants safe, reliable and productive.

While the IEC TC114 work has a scope that addresses much of what is needed, we are expecting that additional codes of practice, guidelines and standards may also emerge from the developments of the next few years. These could address environmental regulatory compliance, address marine safety or extend to community engagement. We must define a scope around our needs and our strengths.

In our (in reality, Chair Russell Stothers) success in partnering with Natural Resources Canada to support our standards work, we have a small budget for research which we hope might open up some of the areas not yet addressed in our mandate with IEC. Regardless, we will have to stimulate a broader discussion of what is needed and also make an effort to collect any of the initiatives by members that should perhaps be a basis for evolving codes

- Bhuyan Consulting
- CanmetENERGY-NRCan
- Cascadia Coast Research
- Clean Current Power Systems
- CSA Group
- Dalhousie University
- Dynamic Systems Analysis
- Emera
- Glas Ocean Engineering Consulting
- Grantec Engineering
- Mavi Innovations
- National Research Council Canada
- Powertech Labs
- University of Victoria

Members:

IEC-TC114

- Chair: Neil Rondorf (USA)

of practice.

All of which perhaps leads to the critical challenge of broadening the participation in these processes. We need to expand the technical capacity of some of the working groups and we need input from sector members on what they believe we should be doing to advance the standards and practices agenda more fully. For those involved already, we ask you to help us identify and recruit expertise to strengthen the efforts. For those who can see that defining these industry practices is an important part of ensuring that we can play a role in an emerging world marketplace, we welcome ideas on what else should be done. I hope that we might explore some of those ideas in upcoming versions of the news "letter".

Finally, this is a public opportunity to thank those who have been dedicating time and effort to these initiatives. It may seem a bit distant still, but you are helping shape this industry. Thank you for the effort.

Chris Campbell, Executive Director
Marine Renewables Canada

Opportunities, Updates & Initiatives

The role of standards for mooring and towing marine renewable technology in the ocean

The ocean is a vast and harsh environment. Many marine renewable energy capture devices will need moorings to hold them in place and may be towed to and from a harbour for maintenance. The failure of towlines of the HMS Athabaskan in January 2013 and MV Miner in September 2011 are two examples that highlight risk and consequences of these types of operations in Canadian waters. As a result of the tow line failure, the HMS Athabaskan suffered hull damage and the MV Miner sits to this day on the rocky shore of Scatarie Island awaiting recovery. Towing operations could become far more frequent as marine renewable energy is adopted and it is the role of TC114 to gather ocean engineering expertise from the world over to produce technical standards that ensure safe operation and reduce the risk of failure. These standards will ensure safe engineering practice and analysis techniques are used to safeguard against costly failures. It is a significant challenge, but the tools and expertise exist to make marine renewables a safe and sustainable technology.

IEC TC114 - PT 102: Equitable comparison of wave energy converter performance

A number of wave energy conversion technologies are nearing commercialization, but objective comparison of these sometimes widely different devices is challenging. For regulators and project developers, one of the most important aspects of a wave energy converter is its electricity generation capability (performance) in the environment in which it will be deployed. A "name-plate" generation capacity is often specified by the technology

- Secretary: Danny Peacock (UK)
 - Technical Officer: Charles Jacquemart
-

Sponsors:



developer, but this value is usually dictated more by engineering and marketing decisions than the device's capability to generate electricity in the real world. Other methods of calculating and reporting performance vary from technology to technology, making it difficult to make equitable comparisons. A specification recently completed by the TC114 provides a standard method for calculating and reporting the performance of a wave energy converter operating in the field. A second specification, currently in development, will provide a standard method for estimating wave energy converter performance at a prospective site based on performance data gathered at a reference site. These specifications will provide a means of equitable comparison of wave energy converter performance and enable regulators and project developers to make well informed decisions, consequently lowering the risk and potentially improving the adoption of renewable wave energy.

IEC TC114 - PT 62600-101: Wave Energy Resource Assessment and Characterization

Scope: This Technical Specification (TS) establishes a system for estimating, analysing and reporting the wave energy resource at sites potentially suitable for the installation of Wave Energy Converters (WECs). The TS may be applied at all stages of site assessment (from initial investigations through to detailed design) and in conjunction with the IEC TS on WEC performance (IEC TC114 PT62600-100) enables an estimate of the annual energy production of a WEC or WEC array to be calculated. It is not intended that this TS is used to estimate extreme wave conditions, although many of the procedures detailed may be suitable for this purpose.

The wave energy resource is primarily defined using hydrodynamic models that are validated against measurements. The framework and methodologies prescribed in this TS are intended to ensure that only adequate models are used, and that they are applied in an appropriate manner so that one can have confidence in the results. Moreover, the document prescribes methods for analysing metocean data (including the data generated by modelling) in order to properly quantify and characterize the scale and attributes of the wave energy resource, and for reporting the results of a resource assessment in a comprehensive and consistent fashion.

Project Team (PT) 62600-101 currently has 5 active or semi-active members representing UK, Ireland, Spain, US and Canada. The last face-to-face meeting took place at Oslo in October 2012. The PT currently meets bi-weekly via either telecon or skype. The PT is currently working to revise and expand the technical specification in response to feedback received on committee draft 2 back in October 2012. The PT hopes to have committee draft 3 ready for release by May 2013. Among the topics currently under active discussion are...

- 1) Specifications concerning wave measurement
- 2) Quantification of uncertainty

- 3) Specific terms and definitions
- 4) Special considerations for nearshore zones
- 5) Inclusion of a measure-correlate-predict methodology for in-filling data gaps
- 6) Specification of suitable boundary conditions for modelling
- 7) Spatial extent of model validation

Marine Energy Standards TC114 Canadian Subcommittee

IEC TC114 – "Marine energy - Wave, tidal and other water current converters" is a technical committee created in 2007 by the International Electrochemical Commission (IEC) to prepare international standards for marine energy conversion systems. The primary focus is on conversion of wave, tidal and other water current energy into electrical energy, although other conversion methods, systems and products are included. The committee consists of members from 14 participating countries and 7 observing countries.

Canadian Sub Committee for TC114 (SMC/IEC TC114): A Canadian subcommittee was formed shortly after the creation of TC114 to participate in all activities of this technical committee. The Canadian subcommittee meets on a regular basis through audio &/or video conferences to discuss existing standards development and proposed new work packages.

Upcoming Meetings

The SMC to IEC/TC114 meets on a monthly basis via teleconference to provide updates on all current activities. The subcommittee also plans for two face-to-face meetings, one typically in the spring and one in the fall to make more progress on significant issues. The meeting in the spring is focused on ensuring all committee members are in agreement with the Canadian position on all issues to be discussed at the annual TC114 plenary meeting. The CSC meeting in the fall is focused on assessing the current and projected needs for the upcoming year.

For 2013, the meeting schedule is as follows:

January 23, 2013 -- Conference Call 10:00 AM PST
February 20, 2013 -- Conference Call 10:00 AM PST
March 20, 2013 -- Conference Call 10:00 AM PST
April 17-19, 2013 -- Spring Face-to-Face Meeting in Campbell River, BC
May 27-31, 2013 -- TC114 Plenary and PT Meetings In Tokyo, Japan
June 19, 2013 -- Conference Call 10:00 AM PST
August 21, 2013 -- Conference Call 10:00 AM PST
September 18, 2013 -- Conference Call 10:00 AM PST
October 2013 -- Fall Face-to-Face Meeting, location TBD
November 20, 2013 -- Conference Call 10:00 AM PST
December 18, 2013 -- Conference Call 10:00 AM PST

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