

Marine Energy Standards TC114 Canadian Subcommittee

IEC TC114 Project

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Message from the Chair

It has been a very busy Spring with Canadian delegates attending international meetings, reviewing documents and actively drafting new content as the Project Teams continue to advance their work and get closer to releasing initial standards. As of this Spring, there are 3 standards that have completed the process and are now published and available for public use. These standards are the following:

- IEC/TS 62600-1: Terminology
- IEC/TS 62600-100: Electricity producing wave energy converters - Power performance assessment
- IEC/TS 62600-200: Electricity producing tidal energy converters - Power performance assessment

Further information on obtaining a copy of these documents can be obtained directly from IEC (<http://webstore.iec.ch/>).



One of the meetings that several Canadian delegates recently attended was the 2013 TC114 Plenary meeting in Tokyo, Japan. The meeting was hosted by J-Power, one of the large utilities in Japan. Project team meetings occurred over the first 3 days and the final 2 days were

devoted to the overall Plenary meeting. The Plenary meeting discussions focused around conformity assessment and the need to align standards development with the certification requirements that will be required as this industry reaches commercialization. There was also active discussion around new work item proposals on river energy converter power performance assessment and the acoustic characterization of noise from wave and tidal energy converters.

During this week, the Japanese National committee also treated all of the international delegates to a dinner cruise up the Sumida river through the heart of Tokyo.

This combination of both formal meetings and social events provided an excellent opportunity for international delegates to exchange ideas and work towards the common goal of advancing standards for the marine renewable energy industry.

[Energy Conversion](#)

[\(OTEC\) Systems](#)

- [Power Performance Assessment for River 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)**

Next year, Canada will be hosting the TC114 plenary meeting in Vancouver. We are hoping to get a large Canadian contingent out for this meeting as Canadian delegates will be participating in both Project Team meetings as well as the overall Plenary meeting. The meeting is currently scheduled for the week of April 21-25, 2014.

I would like to wish everyone a great summer and I am looking forward to another busy, yet productive fall of standards development activities.

Cheers,
Russell Stothers
Chair, Standards Mirror Committee to IEC TC114

Spring 2013 Regional Meeting

In September 2012 it was the OREG/Marine Renewables Canada transition conference that provided a backdrop to the Canadian Standards Committee meeting at Emera's "redeveloped power plant" headquarters.

For Spring 2013 the decision was to use the SCC Mirror Committee (SMC) to TC114 meeting to strengthen a regional meeting in Campbell River BC. But more importantly, the committee members got the chance to visit the site being developed by Canoe Pass Tidal Corp and New Energy. This was a boat ride through the tidal regime at Seymour Narrows and, for some, a scramble ashore to see first hand the tidal forces that will be opened up when the project installs turbines in place of the man-made causeway in place now.

The committee was hosted by Rivercorp, Campbell River's economic development corporation who provided an opportunity to meet with some of the city's tidal-enthusiastic Councillors and board members, and provided the meeting location and communications. Rivercorp



and a group of BC marine energy interests (including 3 SMC members) have been working to retain momentum in the region and work toward securing economic benefit. Local leaders were impressed by the opportunity "to meet with so many national experts" and see the work being done to make this a reliable and sustainable industry. Rivercorp is now more convinced than ever and is about to launch a small development/planning project (Campbell River previously has had Michael Tarbotton and Clayton Hiles develop a regional tidal model).

That sense carried over into a public outreach meeting that local media reported as 75 locals engaging with the industry's leadership.

The work of the committee got done, committee members were exposed to another marine energy environment and the community interest in renewable marine energy was notched up - a win all around for renewable marine

- Acadia University
- 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

energy!

Chris Campbell, Executive Director
Marine Renewables Canada

Updates & Initiatives

Standards Related R&D

One of the opportunities that Russell Stothers wrote into our application for financial support by NR Canada was the ability to develop new input to the standards approach by commissioning strategically valuable R&D. For 2013/14 we launched a competition and we received six proposals for work costing more than three times our budget. The proposals were evaluated by the Chair's Advisory Group, which meant working through conflict of interest issues by ensuring all were aware of the issues. Incidentally, we should not be surprised by the probability of conflicts of interest if we have the right people on the Canadian Standards Committee, proposing appropriate research and even in the evaluation team. If we understand that the same companies or individuals may find themselves in all three roles, and we understand their interests, we can avoid putting them in a real conflict situation. We had spent some time in spelling out the information asked for in the proposal so that we could evaluate proposals in a matrix.

With three possible choices, the priority criteria emerged around Canadian knowledge leadership and applicability to existing standards initiatives or initiatives that are particularly advantageous to Canada. Extension of the work by MAVI and partners was found to have merit in its own right. Recruitment of Hatch expertise in river systems was deemed a priority in that it extended involvement of company expertise and is adding to the ability to understand river hydrokinetic resource assessment and siting issues. This, together with the Canada-wide river resource estimate prepared by NRC and NR Can was deemed to be a solid demonstration that Canada is serious about advancing the river current energy portfolio within IEC TC114.

This Fall, we will launch a call for proposals for 2013/14, for which we may have as much as \$130,000. We will clarify priorities in the call and have decisions made for an April 1 2014 start date. We will be looking for highly topical and significant projects and is possible we may only be able to back one, if it is compelling. But that decision will be made in the evaluations and smaller projects that launch new directions will not be discouraged. Some were disappointed that we had only six proposals this year. Others saw that almost all had responded to our general guidelines. Maybe next time we can steer all to our goal, maybe we get more proposals and maybe we get more proposals that bring new expertise into our standards development expertise.

Chris Campbell, Executive Director
Marine Renewables Canada

(USA)

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

Sponsors:



University of Victoria Wave Energy Conversion Research Supports Marine Energy Standards

With Canadian input, the IEC TC114 has published a Technical Specification (62600-100) that standardizes the method for assessment of the power performance of electricity producing wave energy converters (WECs). The power performance is to be represented by a normalized power matrix that requires time synchronized records from two main data sources: the WEC power delivery and the statistical wave parameters. To illustrate the power matrix calculation, an example set of these data sources is required. UVic, as part of the West Coast Wave Initiative, has undertaken that a model scale test program that enables fundamental research on WECs and provides data to support standards development. Supported in part by Natural Resources Canada, Natural Science and Engineering Research Council, and the Pacific Institute for Climate Solutions, the UVic team has successfully developed and tested a 1:25 scale generic point absorber WEC model. The first phase of experimental testing was successfully completed in December 2012 at Memorial University's Ocean Engineering Research Centre tow tank. The results provided validation of the WEC mathematical modeling approach being used by the research team inside WEC design studies. The tests also successfully proved the functionality of a power-take-off (PTO) emulator that was installed in the model. Further tests, slated for July 2013, will focus on an expanded range of wave conditions that will produce example data for illustrating methodologies in the IEC62600-100, -102, and -103 technical specifications that are either published or under development.



Images of UVic's experimental WEC. From left to right: Snapshot of the CAD model. View of the WEC mounted in the test tank. View from below the water of the WEC mounted in the test tank.

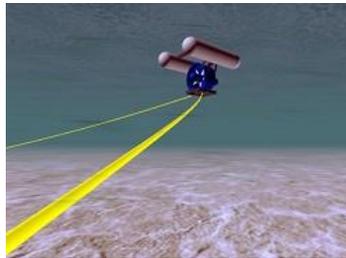
Scott Beatty, Phd Candidate,
Institute for Integrated Energy Systems
West Coast Wave Initiative
University of Victoria

Stringing Underwater Kites: Standardizing the Mooring Challenge of Tidal, Ocean Current and River Energy Capture

For centuries, water wheels and turbines have been put to work by running water. The ongoing increase in demand of electricity has recently led to a nascent marine and river

current power capture industry. The range of devices vary in size and can operate singly or in array to meet the energy needs of a cottage or a small city, offering many economic and reliability benefits through localized and distributed power generation.

The industry is still young and growing. Many devices are designed to sit on the seabed or river bottom. While this is a sound solution for many applications, there are also many advantages to using devices that can float in the water. One major driver is that water flows tend to be higher speed, and hence have substantially more energy available, closer to the water surface. Another reason is to simplify deployment and recover and thereby reduce risk and costs. With the use of a mooring, a turbine device could be located anywhere in the water column and could also be recovered and redeployed faster and easier than a bottom fixed system.



However, the use of a mooring introduces complexity and dynamics in operations that need to be understood to increase reliability, to prevent loss of life, damage to equipment or the environment,

and to control costs. Standards coalesce the best practices in engineering design procedures and analysis. A standard that addresses the challenges of mooring turbines in the water column is just one of the important components needed in a robust framework that will enable the marine current electricity industry to flourish.

Power Performance Assessment of Tidal Energy Converters

This past May, the IEC TC114 released its third publication: Technical Specification (TS) 62600-200 Electricity producing tidal energy converters - Power performance assessment. This TS provides parameters for the performance testing of a Tidal Energy Converter (TEC), and covers a broad range of information, including:

- TEC-specific definitions;
- Suitability of a test location;
- Technology description;
- Acceptable measurement equipment and methods;
- Current profiler placement;
- Calculation of the power curve; and,
- Reporting of the results.

This document will provide confidence to project developers, utilities, and technology developers that devices are being evaluated consistently and to the same criteria. Procedures have been developed for both floating and bottom-mounted devices, and to accommodate a range

of TEC designs including horizontal-axis and cross-flow turbines, oscillating foils, and the use of ducting.

Work on the TS began in August 2009. Five face-to-face meetings, and many more conference calls, were required amongst the international Project Team members between then and early 2013 to take the document from scope definition to publication. Moving forward, an ad-hoc working group will be established to ensure the TS is kept up to date by reviewing feedback from end-users, and incorporating new industry knowledge. An ad-hoc committee has also been established by IEC TC114 to review the document's applicability to the evaluation of river energy converters (RECs). This ad-hoc committee is expected to lead to the establishment of a project team to develop a TS for REC power performance assessment within the next couple of years.

It is important to note that Canada was able to play a prominent role in the development of TS 62600-200 thanks to the support received from Natural Resources Canada, the Canadian Standards Association, Marine Renewables Canada, and industry sponsors Emera. The PT would also like to thank the Canadian Sub-Committee and Mirror Committee members who volunteered their time to review the document, and provide comments to improve its content.

Upcoming Meetings

The SMC to 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 SMC to TC114 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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Marine Renewables Canada
121 Bird Sanctuary Drive
Nanaimo, British Columbia V9R 6H1
Canada

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