

# **“International Standards & Certification for the Marine Energy Industry”**

**NHA-MEC Featured Presentation**

***July 18<sup>th</sup>, 2023***

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# The Role of Standards & Certification

## International Standards and Technical Specifications

- Are **consensus-based** with input from experts globally
- Ensure a uniform, **best-practice approach** is applied
- Use a **common “language”** to communicate
- Enable direct technology comparisons



## 3<sup>rd</sup>-party Verification, known as Certification

- Improves both the terms of, and access to, **financing and insurance**
- Utilizes an **independent entity** with expertise to verify compliance
- Provides the **highest level of confidence** while reducing risk
- Reduces barriers to global markets



# IEC TC 114 – Marine Energy Standards

## IEC Technical Committee (TC) 114

“Marine energy - Wave, tidal and other water current converters”

- Approved and formed in 2007
- Annual Plenary Meeting (15 held to date in 10 countries)
- 2023 Meeting was held in Edinburgh, Scotland
  - 70+ Subject Matter Experts attended
  - Tours of FloWave, FASTBLADE, EMEC
- 2024 Meeting to be held in South Korea
  
- US activities managed by the US Technical Advisory Group (TAG)
  - NREL is the TAG Administrator
  - Nearly 100 US subject matter experts involved in the TAG



# IEC TC 114 – Marine Energy Standards

## IEC Technical Committee (TC) 114

“Marine energy - Wave, tidal and other water current converters”

- 200 Subject Matter Experts
  - 100 in c. 2010
- 29 Countries (National Committees)
  - 18 in c. 2010
- 18 Working Groups
  - Advisory Groups, Ad-hoc Groups, Project Teams, Maintenance Teams
- 20 Publications to date
  - 17 1<sup>st</sup> Editions; 3 2<sup>nd</sup> Editions
- **Publicly available Vocabulary for Marine Energy ([IEV Part 417](#))**



# IEC TC 114 – Participating Members (17)



# IEC TC 114 – Observing Members (12)



# IEC TC 114 – Marine Energy Standards

## IEC Technical Committee (TC) 114

“Marine energy - Wave, tidal and other water current converters”

- Advisory Group on Alignment (Turbulence, Accuracy, Classification, etc.)
- Liaisons with:
  - IEC: TC 82 (Solar Photovoltaic); TC 88 (Wind Energy); Others
  - ISO: TC 43/SC 3 (Acoustics); TC 108/SC 5 (Condition Monitoring)
  - **International Energy Agency Ocean Energy Systems (IEA-OES)**
  - International Towing Tank Conference (ITTC)
- Potential Upcoming New Work Includes:
  - OTEC Power Performance & Resource Assessment
  - Turbulence Characterization
  - Small WEC Design
  - IO&M Guidance



# IEC TC 114 – Resource Agnostic Standards

Number	Abbreviated Title	Edition	Publication Year
62600-1	Vocabulary	2	2020
62600-2	Marine Energy Converter Design	2	2019
62600-3	Measurement of Mechanical Loads	1	2020
<b>62600-4</b>	<b>Technology Qualification</b>	<b>1</b>	<b>2020</b>
62600-10	Moorings	2	2021
62600-30	Power Quality	1	2018
62600-40	Acoustic Characterization	1	2019
<b>62600-41</b>	<b><i>Biofouling Characterization</i></b>	<b>1</b>	<b><i>Target 2025</i></b>



# IEC TC 114 – Resource Specific Standards

Number	Abbreviated Title	Edition	Publication Year
62600-20	Ocean Thermal Energy Conversion (OTEC) Design	1	2019
62600-100	Wave Energy Converter (WEC) Power Performance	1	2012
62600-101	Wave Energy Resource Assessment	1	2015
62600-102	WEC Power Performance at a 2 <sup>nd</sup> Location	1	2016
62600-103	WEC Pre-prototype Device Testing	1	2018
<b>62600-200</b>	<b>Tidal Energy Converter (TEC) Power Performance</b>	<b>1</b>	<b>2013</b>
62600-201	Tidal Energy Resource Assessment	1	2015
62600-202	TEC Device Scale-Testing	1	2022
62600-300	River Energy Converter (REC) Power Performance	1	2019
62600-301	River Energy Resource Assessment	1	2019

# IECRE – Certification

Certification (3rd party verification) to consensus-based, International Standards and Technical Specifications can reduce risk, improve market access and support the commercialization of the Marine Energy industry

## IECRE System: Marine + Solar PV + Wind

- Three Sector Working Groups (SWGs)
- **6 Member Bodies (countries) in Marine Sector**
- Test Reports, Conformity Statements, Feasibility Statements
- Certificates (Prototype, Component, Type, Project)
- **Renewable Energy Certification Bodies (RECBs)**
- **Renewable Energy Test Laboratories (RETLs)**
- Renewable Energy Inspection Bodies (REIBs)





# IECRE Test Report (RETR)

## IECRE Test Laboratory (RETL)

- EMEC, UK
- Recognized within the IECRE with a scope in the IEC TS 62600-200 (TEC Power Perf.)

## Tidal Energy Converter Developer (i.e., Customer)

- Verdant Power, US
- TriFrame™ at the Roosevelt Island Tidal Energy (RITE) Project, NY, NY

## Result

- EMEC provided 3<sup>rd</sup>-party verification of compliance to IEC TS 62600-200
- Issued first IECRE Test Report: [IECRE.ME.TR.TPP.21-00001-R0](#)
- Cover letter is publicly available; Full report is protected

# IECRE Feasibility Statement

## IECRE Certification Body (RECB)

- Lloyd's Register, UK
- Recognized within the IECRE with a scope in the IEC TS 62600-4 (Tech. Qual.)

## Tidal Energy Converter Developer (i.e., Customer)

- Flex Marine Power Ltd., UK
- SwimmerTurbine™ SW2

## Result

- LR provided 3<sup>rd</sup>-party verification of compliance to IEC TS 62600-4
- Issued first IECRE Feasibility Statement: [IECRE.ME.FS.23-0001-R0](#)
- Cover letter is publicly available; Full statement is protected

# Brief Summary – Reduce Risk!

## IEC TC 114 Technical Specifications and Standards

- Ensure a common language
- Codify global best practices
- Provide the detailed “How to”
- ***Experts are encouraged to join!***



## IECRE Conformity Assessment System

- Harmonizes rules for testing and certification activities
- Reduces barriers to trade and enables market access
- Increases confidence in technology
- ***Developers are encouraged to request IECRE Deliverables!***



# Contact Details

## IEC TC 114: US Technical Advisory Group (TAG)

- Manages US engagement with IEC TC 114
- NREL administers the US TAG (minimal cost to participate)
- Bill Staby – Technical Advisor
- Phil Beauchamp – Deputy Technical Advisor
- Arielle Cardinal – Secretary
- [info@tc114.us](mailto:info@tc114.us)



## IECRE: USNC/IECRE

- Manages US engagement with the IECRE
- ARESCA administers the USNC/IECRE (dues-based model to participate)
- Bob Sherwin – Chair
- George Kelly – Secretary
- Gabe Alsenas – Treasurer
- [secretary@aresca.us](mailto:secretary@aresca.us)

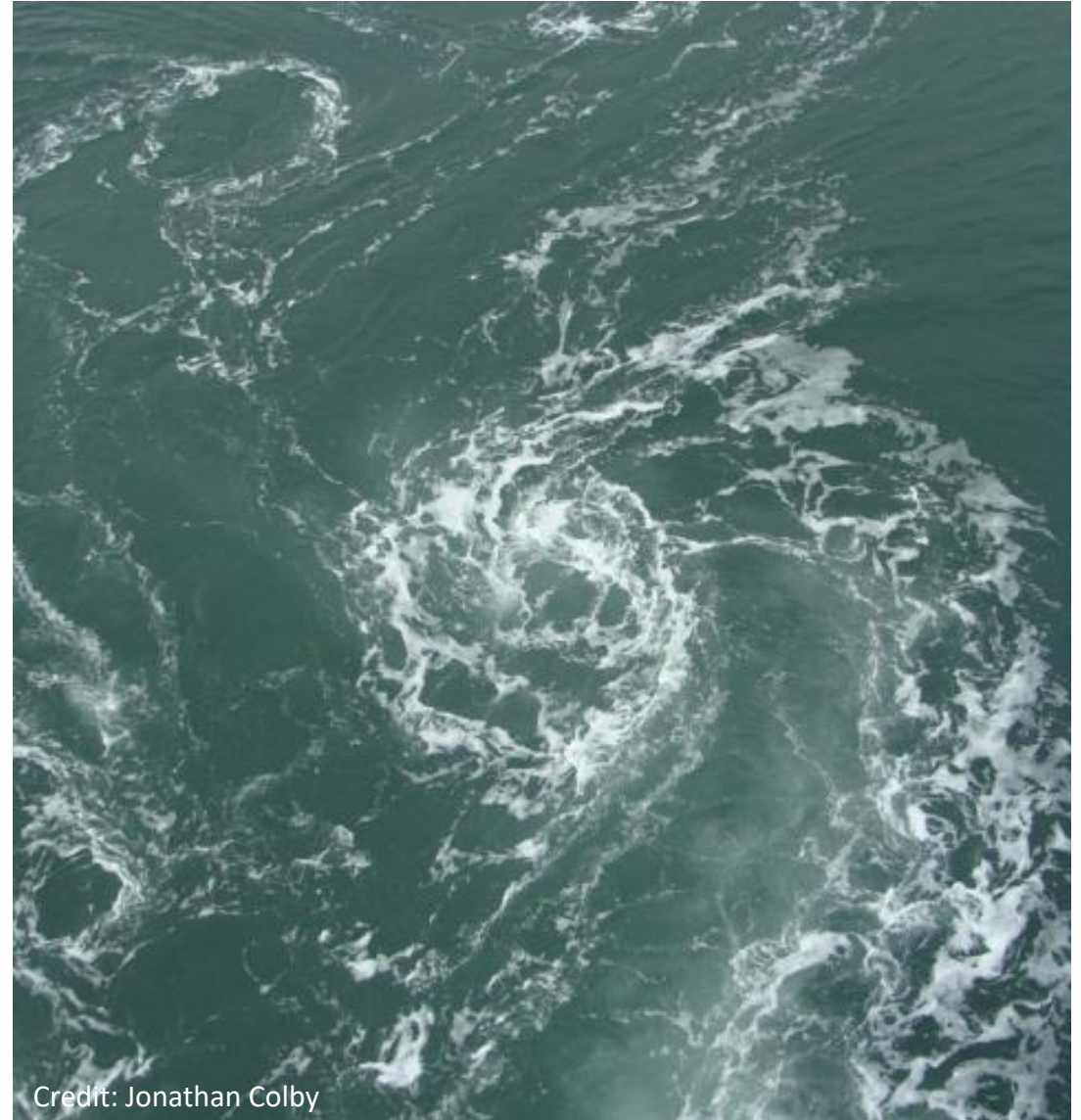


# Thank You

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Credit: Jonathan Colby