Risk, Regulation, and Insurance of Floating Infrastructure

Lars Samuelsson | 18 March 2019
French American Innovation Day - Boston

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What is ABS?

- ABS Mission

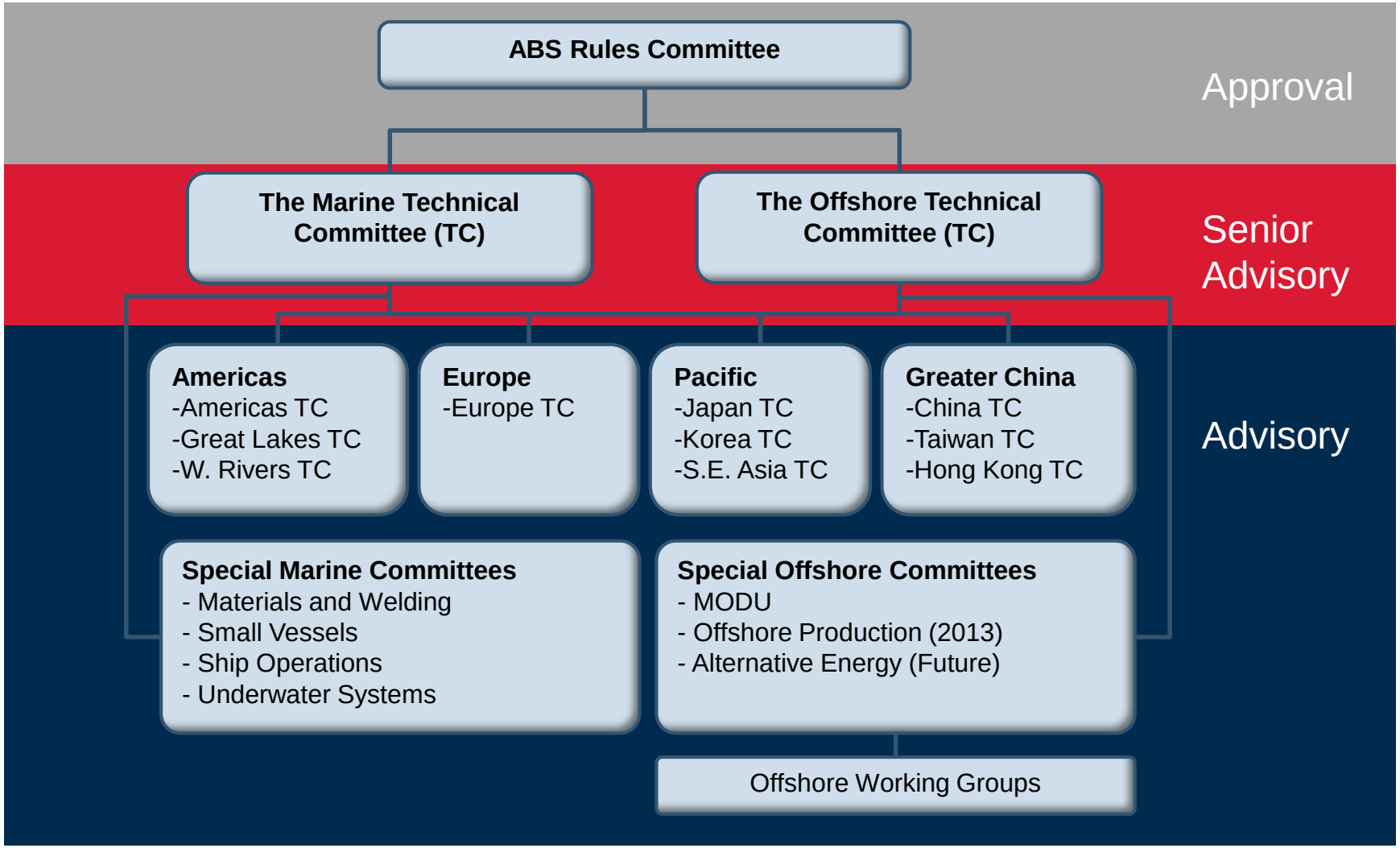
  The mission of ABS is to serve the public interest as well as the needs of our members and clients by promoting the security of life and property and preserving the natural environment

- Founded in 1862 by 9 US marine insurance companies
- ‘Not-For-Profit’ Marine Classification Society
- No owners/shareholders, ABS Board of Directors are appointed from its Membership
- ABS Members are the owners, operators, designers and builders of ships, offshore units and associated equipment
- ABS as a class society represents industry and helps develop standards related to;
  - Design
  - Construction
  - Operational maintenance

The Origin of Class

- Year is 1688. In a Coffee House in London, Edward Lloyd helped clients collecting and circulating news about maritime business
- Underwriters rented booths in Lloyd's coffee house
  - Formed Lloyd's of London in 1771
  - Published list of ships (and their particulars)
  - Formed a committee in 1760 to assign ratings to ships – The list was called Lloyd's Register
- At that time, ships were 'classified' annually based on their conditions
  - Condition of hull was classified A, E, I, O or U
  - Equipment was classified G, M, B – subsequently replaced by 1, 2 or 3
  - Best hull and equipment were assigned "A1".

The Establishment of ABS Rules



Technical Committee's are representatives from the industry:

- **Developers**
- **Owners**
- **Designers**
- **Consulting companies**
- **Fabricators**

ABS also develops

- **Guides**
- **Guidance Notes**
- **Technical Advisories**

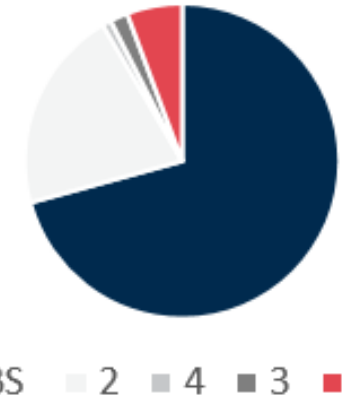
ABS is the leading Offshore Class Society

- ABS has been involved in more than 10 Floating Offshore Wind Turbine projects
- Experience range from Approval in Principle of novel FOWT concepts to full Classification of proven design

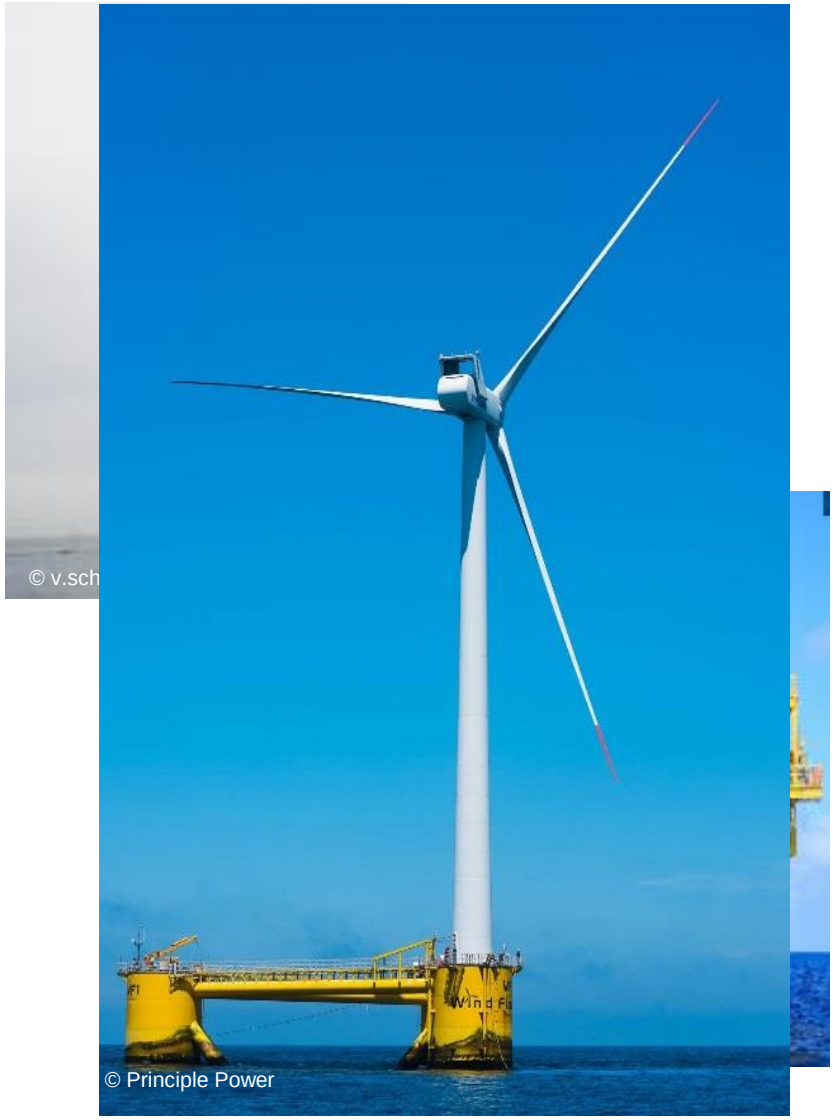
ABS Acted as CVA for 53 of 56 GoM FPI's

> 180 ABS Classed Offshore Production Units

> 470 ABS Classed Offshore Drilling Units



Why Class a Floating Offshore Wind Turbine Installation



- Experience with Floating Offshore Structures is key

Role of ABS Classification

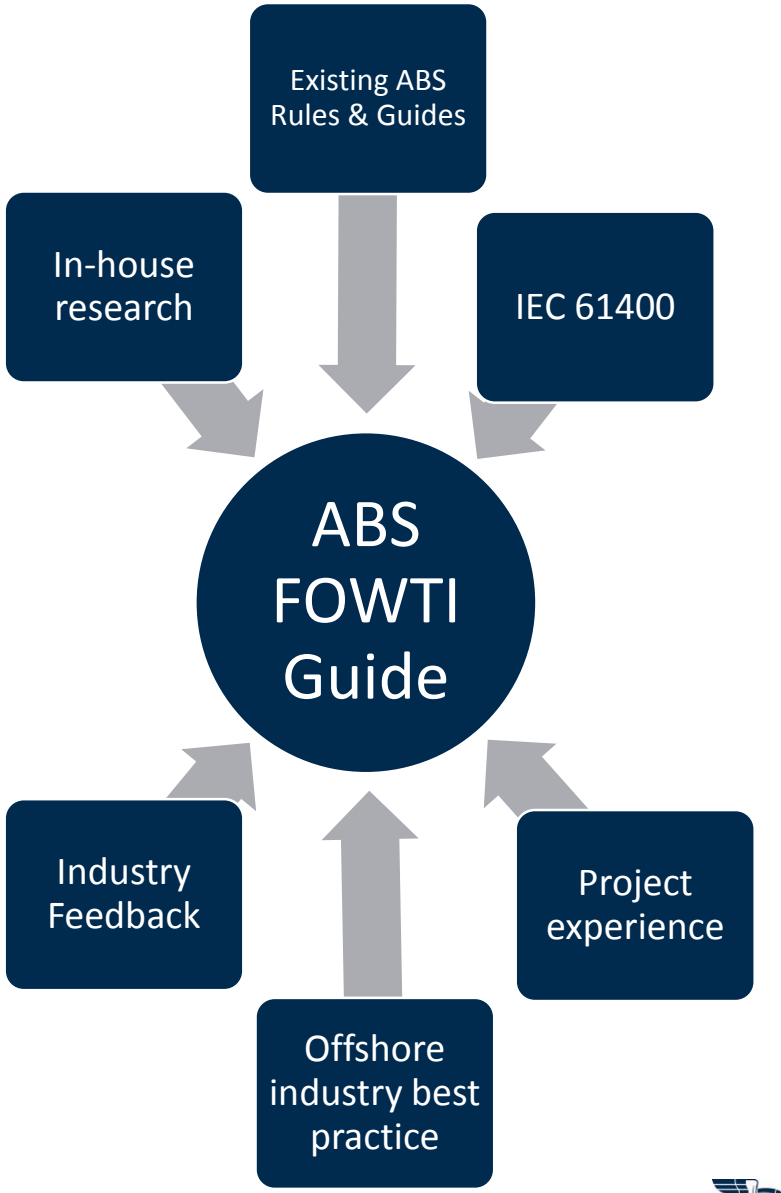
- Develop standards with industry participation (Rules and Guides)
- Design review and approval
- Surveys during construction
- Surveys during installation
- Periodic surveys to maintain Class

Personnel Safety

Asset Integrity

Environmental Protection

Life Cycle Approach



ABS Involvement in WindFloat Atlantic

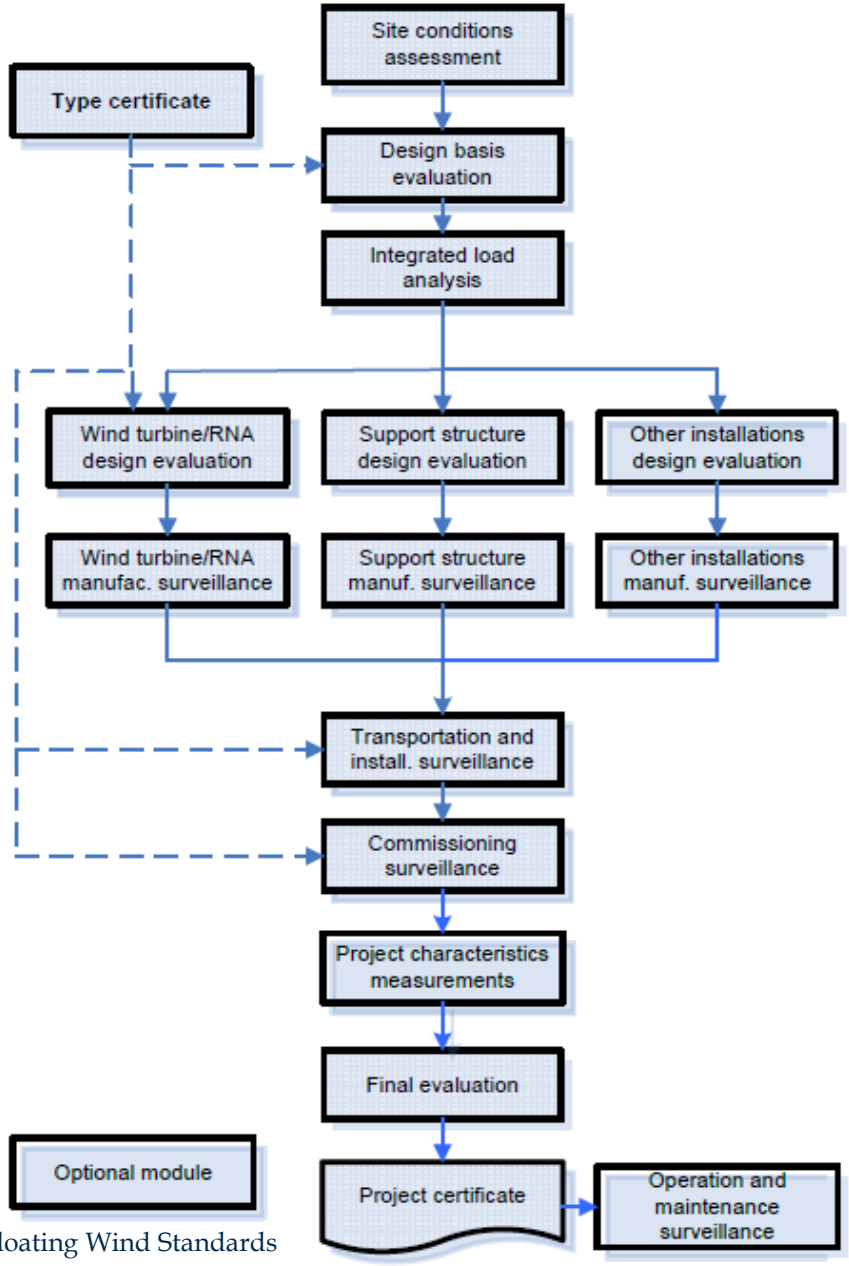
- ÀA1 Offshore Wind Turbine Installation (Floating), FL(25), UWILD

Design Review Houston	Hull Fabrication Portugal & Spain	Vendor Survey	Installation
• Structure • Stability • Mooring • Global Performance • Systems • Mechanical	• Welder qualifications • Material • Fabrication Survey	• Anchors • Chain • Mooring Components • Equipment	• Mooring • Hook-Up • Commissioning • Periodic survey through life of installation

IEC 61400/TC88/ & IECRE– Wind Turbine Standards

- The International Electrotechnical Commission, IEC, is a non-profit, non-governmental international standards organization that prepares and publishes International Standards for all electrical, electronic and related technologies

- Applicable standards
  - IECRE OD-502 Project Certification Scheme
  - IEC PT 61400-3-2 Design requirements for floating offshore wind turbines (to be published)
  - IEC 61400-3-1 Design requirements for offshore wind turbines
  - IEC 61400-1 Design requirements for landbased wind turbines



IECRE Project Certification

- Project Certification based on Design Basis approach
- During fabrication, the inspection/audit activities shall focus on the quality system implemented during manufacturing and evaluate that the quality system is appropriate.
- The RECB will tailor a scope of work for surveillance activities. The exact scope should be defined during the project design basis
- Operation and maintenance surveillance shall be carried out at regular intervals based on an agreement between applicant and RECB.

From IECRE OD-502 Project Certification Scheme
http://www.iecre.org/documents/refdocs/pdf/od-502ed.1.0.pdf

IEC PT 61400-3-2

- Only address items that are different or not covered in IEC 61400-3-1
  - External Conditions and Assessment
  - Global Analysis
  - Design Loads
  - Hydrostatic Stability
  - Stationkeeping System
  - Mechanical and Electrical Systems
- Acceptance criteria largely based on ISO
- Fabrication/Manufacturing is not explicitly addressed

Summary

- A technical standard is an established norm or requirement in regard to technical systems. It is usually a formal document that establishes **uniform** engineering or technical criteria, methods, processes and practices.
- In contrast, a custom, convention, company product, corporate standard, etc. that becomes generally accepted and dominant is often called a de facto standard
- Standards helps you to get an Apple when you want an Apple

Thank You

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