ClassNK

Activities of ClassNK

Marine Renewable Energy

4 Aug. 2014 Tokyo, Japan

International Workshop on Marine Renewable Energy

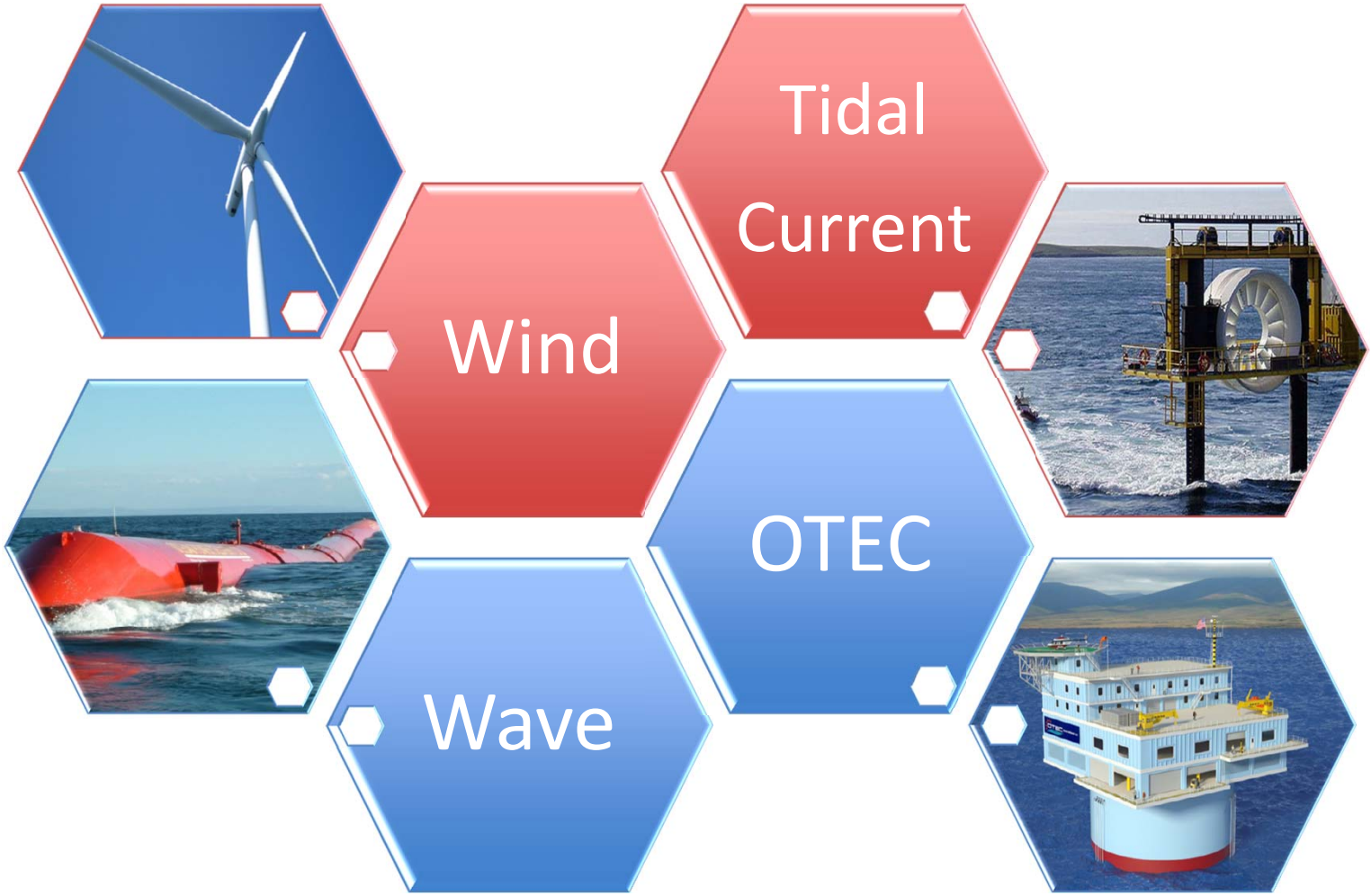
Contents

1. Development of Comprehensive Certification Scheme for Renewable Energy

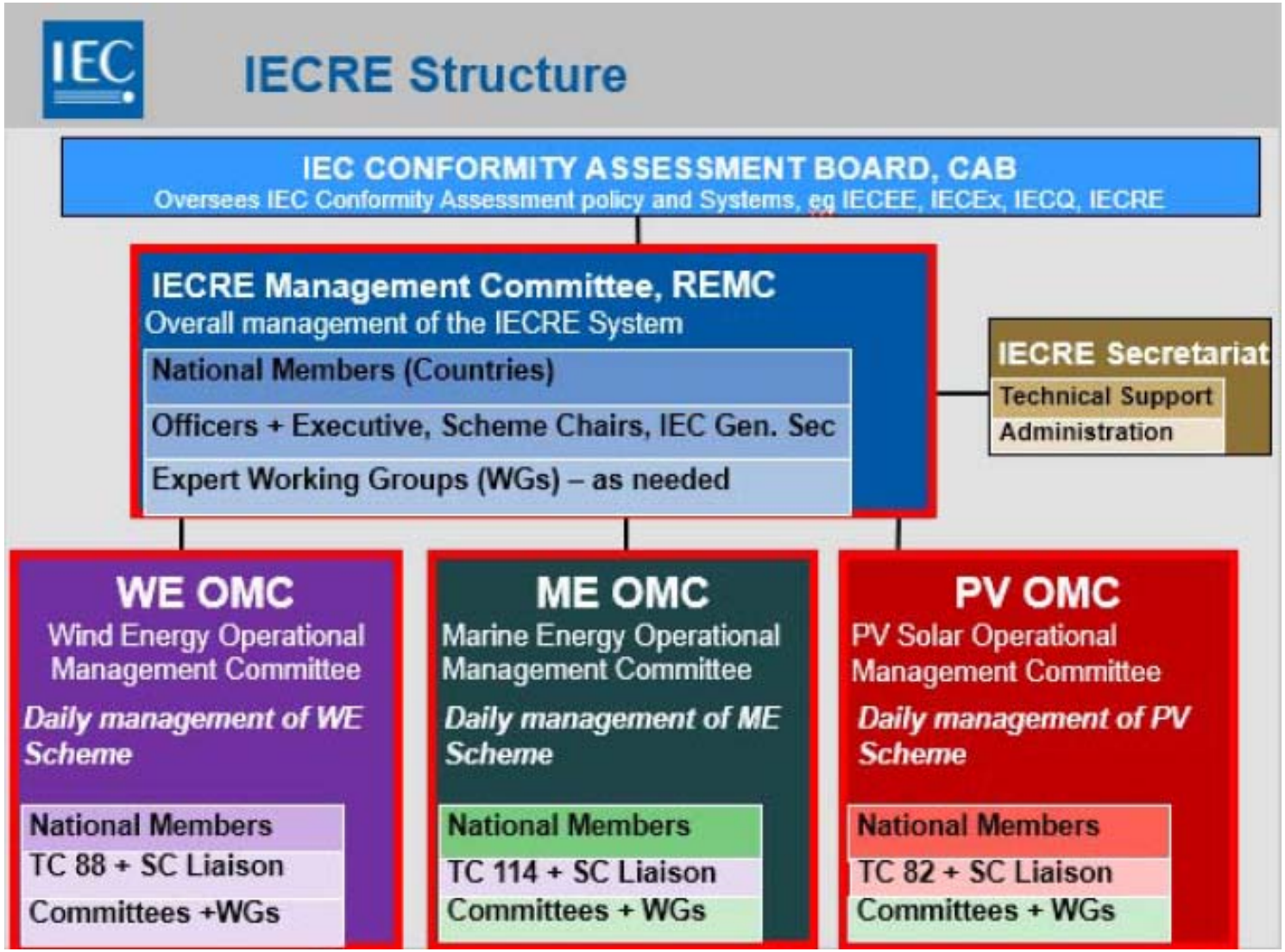
2. Setting up the Environment for the promotion of Marine Renewable Energy in Japan

3. Activities of ClassNK on Marine Renewable Energy

Variety of Marine Renewable Energy Converter



Comprehensive Approach for R.E. Conformity Assessment



TC114 Marine energy – Wave, tidal and other water current converters

TC114 Scope

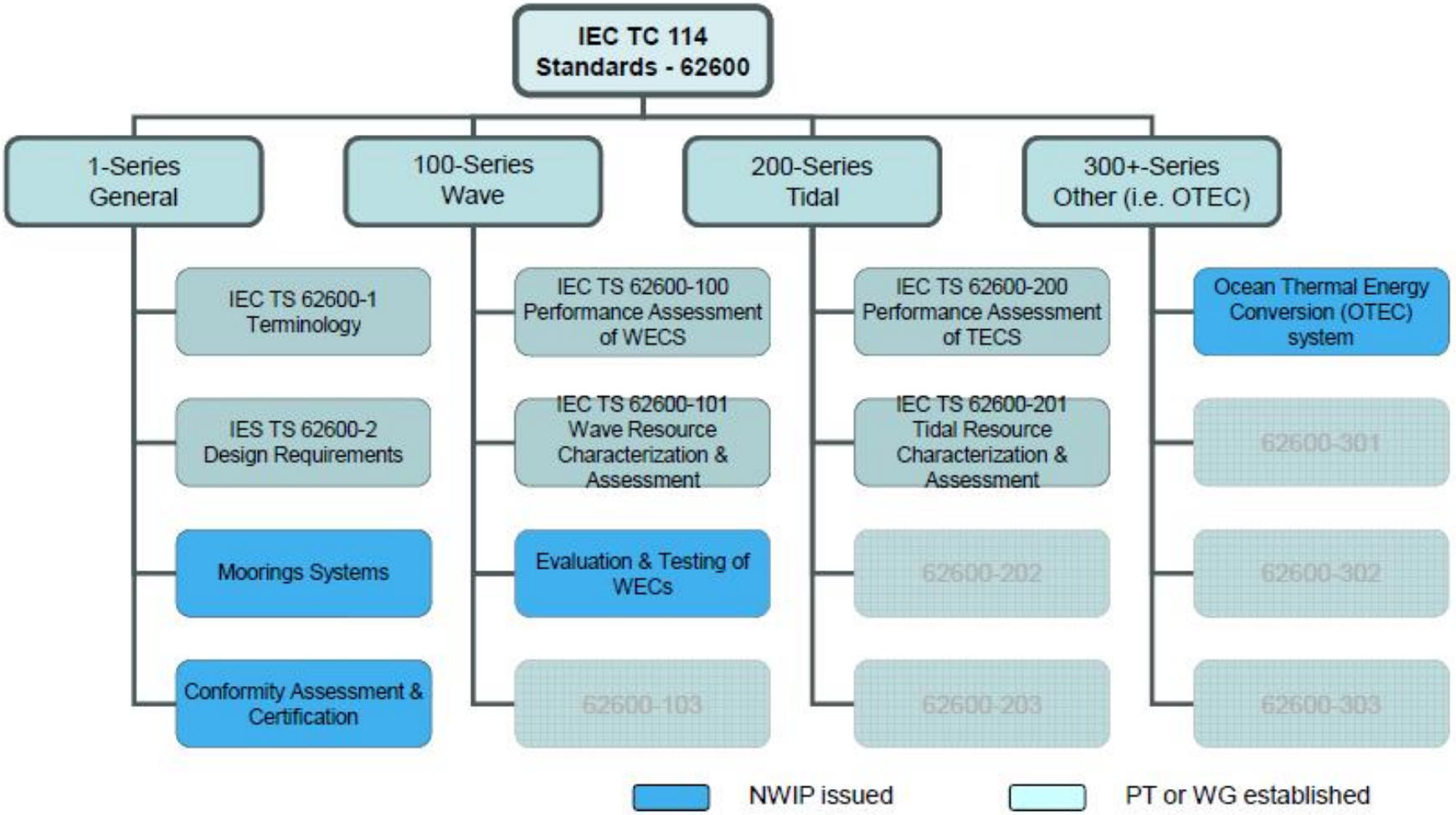
To prepare international standards for marine energy conversion systems. The primary focus will be on conversion of wave, tidal and other water current energy into electrical energy, although other conversion methods, systems and products are included. Tidal barrage and dam installations, as covered by TC 4, are excluded.

The standards produced by TC 114 will address:

- system definition
- performance measurement of wave, tidal and water
- current energy converters
- resource assessment requirements, design and survivability
- safety requirements
- power quality
- manufacturing and factory testing
- evaluation and mitigation of environmental impacts

Source : IEC Web Site

International Standard for Marine Energy



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Marine Renewable Energy Potential in Japan

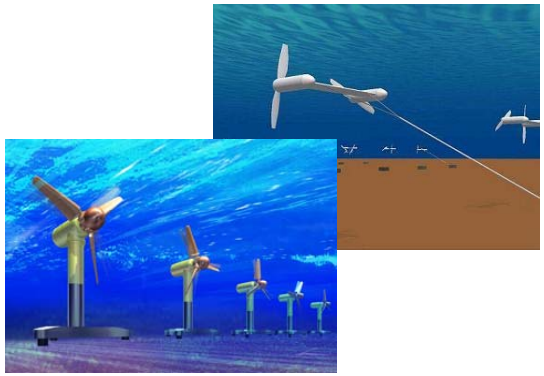
Wave	Tidal, Current	OTEC	Wind
300～400GW	16GW （Kuroshio Current）	120GW	1570GW

SOURCE：Research Report of ‘Ministry of Environment’
Ref. Total Power Generating Capacity in Japan ：Approximate 200GW

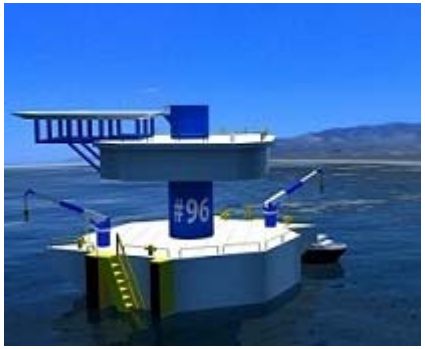
Development of Marine Energy in Japan

Wave

Tidal, Current



OTEC



Wind

Source：from left Mitsui Engineering & Shipbuilding, Kawasaki Heavy Industry, IHI Corporation, Japan Marine United and MES HP etc. respectively

Basic Plan on Ocean Policy

Cabinet Decision based on Basic Act on Ocean Policy in May 2013

Six basic philosophies	including Harmonization of Development and Use of the Oceans with Conservation of the Marine Environment
Twelve basic measures	including Promotion of Development and Use of Marine Resources and Securing Maritime Transport

Promotion of the use of marine renewable energy

- Acceleration of the technological development to commercialize marine renewable energy
- Promotion of practical application and commercialization of marine renewable energy
- Construction of infrastructure and the environment for increased use of marine renewable energy
- Wind turbines on the sea
- Marine energy, such as wave energy

Basic Plan on Ocean Policy

☐ Promotion of practical application and commercialization of marine renewable energy

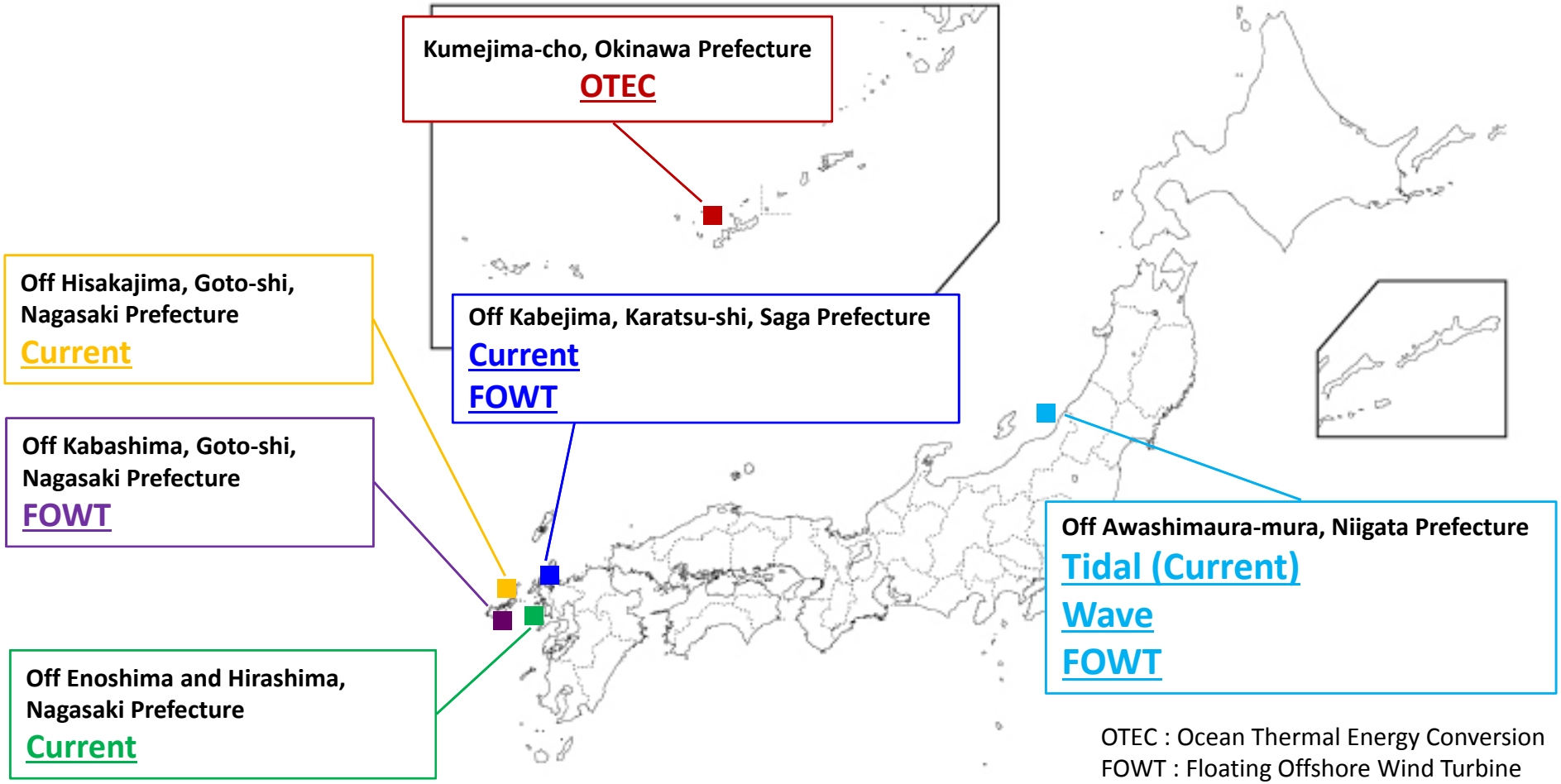
Clearly define regulations that ensure safety of marine structures and power generations, and the initiative in international technological standardization, based on Japan's technologies from the perspective of improving the international competitiveness of Japan's marine industries.

Study the approach of building working vessels engaged in safe efficient installation and maintenance operations and infrastructure that are used as the backyards in order to respond to issues related to costs peculiar operations.

Excerption from Basic Plan on Ocean Policy

Test Field for Demonstration Projects

Headquarter of Ocean Policy decided 6 ocean areas as Test Fields for Demonstration Projects in Japan.



OTEC : Ocean Thermal Energy Conversion
FOWT : Floating Offshore Wind Turbine

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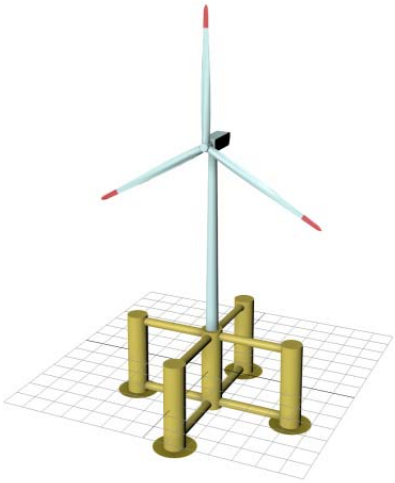
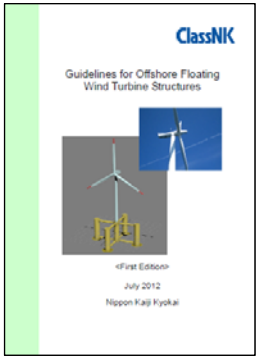
Activities on Floating Offshore Wind Turbine



- **Electricity Business Act is applied to FOWT Unit as an electric generating facility.**
- **Ship Safety Act is applied to Tower, Floater and Mooring unit.**

ClassNK conducts the classification survey on behalf of Japanese Government

- ClassNK Rule Part P is applied to FOWT Unit.
- Specific requirements are indicated in the Guideline for Floating Offshore Wind Turbine Structures issued in July 2012.
- Classification survey during construction is conducted in accordance with above Rule and Guideline.



Activities on Floating Offshore Wind Turbine

ClassNK has carried out the survey of following items on the demonstration test now underway in Japan.

Plan Approval

Survey of Material and Equipment

Attending Survey

- **Classification Certificate is issued.**
- **Periodical Survey in operation is carried out in accordance with our guideline.**

Activities on Marine Warranty Survey Service

- **A Marine Warranty Survey is the supervision of marine operations on behalf of a client and according to the insurer's interest.**

- **The typical marine operations include:**
  - Transportation and installation of foundations, floating structures and mooring systems
  - Installation of subsea cables
  - Transportation and installation

ClassNK is developing a framework for a marine warranty survey service in Japan

Activities on Marine Energy Converters

1. Certification for Marine Energy Conversion Systems

- ClassNK will publish the Certification Guideline for Marine Energy Conversion Systems until the end of 2014.
- This guideline is applicable to conversion system of wave, tidal, current, and OTEC.
- The contents of this guideline is based on IEC Standards, but some parts are modified according to conditions surrounding Japan.
- Feedback from “REIDS Offshore - Marine Renewable Energy Scale-Up Test Site” in Singapore to the certification scheme.

2. Participation in IEC Meetings

- ClassNK has participated in preliminary committee for IECRE Scheme, and Project Team in TC114

Conclusions

- Participation and Contribution in the Development of IEC Marine Energy Converter C.A. Scheme
- Certification of Offshore Marine Energy Converter
- Investigation into the Possibility of Asian M.E. Center,
  - *nursery testing field before Full Scale Model testing* -
- Contribution to the marine resources development in the exclusive economic zone (EEZ) of Japan in accordance with a Basic Plan on Ocean Policy.

THANK YOU

for your kind attention