ABSTRACT SUBMISSION –– SOUMISSION DE RESUME

**Topic No.: / Sujet n° : 8 -------------- or / ou**

**proposed topic / sujet proposé: The Performance of Maritime Hybrid Renewable Energy System in Korea**

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**The most widely used new renewable energy technologies are solar power, wind power, wave power, sea power, and tidal power. Land-based renewable power generation has problems such as large land requirements. A hybrid power generation system which can collect wave energy and solar energy at the same time has been designed and developed in order to solve the problem that the power generation system can only use a single form's marine energy to generate electricity at present. This study provides an analysis of the power generation performance of the hybrid renewable energy systems for offshore. Hybrid renewable energy system was developed with the support of government R&D, performance testing was conducted at sea in order to put into practical application.**

**Ships manoeuvring without appropriate precautions at sea are at risk of accidents because of shallow shoals and hidden rocks under the surface of the water. There are sailing routes in the ocean just like the roads on land, which enable vessels to achieve safe and efficient navigation, avoiding these hazards. Since the routes at sea are invisible, navigators rely heavily upon nautical charts, a kind of sea map to follow those sailing routes in order to safely manoeuvre their vessels. In addition to nautical charts, man-made aids to navigation installed on islands, capes, ports, and narrow channels are imperative in helping navigators have the safest and fastest voyage. The Aids to Navigation (AtoN) is a device or system external to vessels that is designed and operated to enhance the safe and efficient navigation of vessels and/or vessel traffic (MOF, 2015). The visual aids to navigation are navigational marks which enable navigators to confirm their locations by identifying the characteristics of lights from the lighthouse. Although the need for additional electronic devices installed in the Light buoy is increased, and the system for supplying electric power to the solar power is limited. The most widely used new renewable energy technologies are solar power, wind power, wave power, sea power, and tidal power. Land-based renewable power generation has problems such as large land requirements (generating power with solar panels requires a great deal of space) and noise (generating electricity with wind power systems creates noise), which have led to a transition to offshore power generation systems (Kwan Jun Jo, 2012).**

**The experiments were carried out at Busan New Port route, in order to commercialize wave power generation system based 1 hole (wave power). The power system of light buoy was installed combined solar power (160W), wind turbine, and wave generator. The power of wind turbine generator is 40W and that of wave generator is 30W.**

**To maximize restraining of sea algae attachment, multi-channel type AFS (Anti-Fouling System) has been used for the research. AFS installs Cu-Anode on the light buoy and remaining currents flow through anode, emitting Cu in order to restrain sea algae attachment.**

**The generated energy of hybrid power system at light buoy was increased up to 93% compared to the solar power system. The importance of the buoy and the safety facility for marine transportation is needed for the voyage near a port. Thus, such stability and reliability for the electric power system of the safety facility for marine transportation will be important. The reason of buoy’s malfunction is caused mostly by the power system. Therefore, improving the power system is essential to ensure the normal operation of the buoy system. Stability of the power system in the ocean safety facility is secured through the development of hybrid power generation system.**

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