

Floating Type Ocean Current Turbine

Ken Takagi

The University of Tokyo

The Kuroshio is one of the biggest ocean currents. We have studied a floating type ocean current turbine system to utilize this energy and established elemental technologies for the system under the support of the New Energy and Industrial Technology Development Organization (NEDO). Based on this study, NEDO and IHI Corp. developed a 100 kW class (11m turbine diameter) ocean current turbine system named “Kairyu” and successfully conducted a sea trial near Kuchinoshima Island last year.

The full scale floating type twin turbine system will have two turbines of about 40m diameter for the 1MW generator at a rated speed of 1.5m/s. The floating body is moored by a single mooring system with synthetic fiber rope to have a weather bane function. The turbine will be operated 50m under the sea surface. The motion simulator is one of the important technologies which were developed in the project and validated with a tank test and a sea trial. Using the simulator, we have tested the system in several situations such as at a sudden change of flow direction, at starting-up the generator and in case of an accident on the turbine. Based on these elemental technologies, Kairyu was designed and constructed at the Yokohama works of IHI Corp. A towing test of Kairyu was conducted off Kushikino and it successfully generated 100kW. After the towing test, Kairyu was deployed near Kuchinoshima

Island and a power generation test was conducted for one week. A brief history of the development and the sea trial will be presented at the conference.