

HYDRODYNAMIC ANALYSIS OF ROBOTIC JUGGLER 1

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Enorasy LLC is the developer of the Robotic Juggler™ (RJ) series of floating wave energy converters (WEC) and the Wenverter™ submerged Ocean Surge WEC. The first of the RJ WEC devices, the RJ1 (Figure 1), utilizes an eccentrically rotating turbine/generator to capture wave energy and convert it directly to electricity. RJ1 can be constructed by using conventional materials and components only. The robotic aspect of the device enables the turbine to carry out 360° rotations per wave, in multiple wave environments. RJ1 can provide power to the grid and to a plethora of marine applications. Enorasy also plans to develop and test the RJ4 WEC device, in the near future, which will include four eccentrically rotating turbines.

In this research, we present the results of a sizing and hydrodynamic analysis exercise that is optimized for a power production of 1MW. Figure 2 shows a schematic of the RJ that encloses one power take off unit. The Boundary Element Method (BEM) code NEMOH is used to obtain hydrodynamic coefficients [2] and WEC-Sim is used to evaluate the system in various wave conditions [3]. The end result of this work is to uncover the ACE metric of the RJ1 [1]. The RJ1 will be tested at small scale in a series of tank tests at the UMass, Amherst and the university of Maine, Orono.

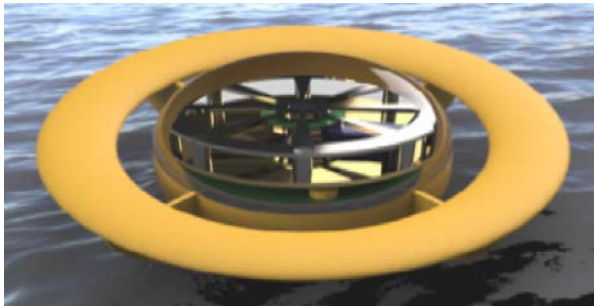


FIGURE 1. ROBOTIC JUGGLER™.

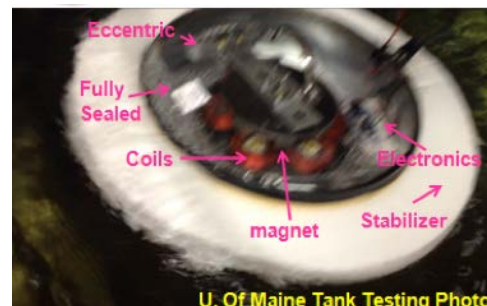


FIGURE 2. RJ1 PROTOTYPE DURING TANK TEST AT UMAINE.

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