

Study of Floater for Electricity Production from Wave Energy

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The wave energy is an alternative energy type. The energy quantity obtained from wave depended on many parameters such as the shape of floater, the wave height and the mechanism of energy transformation. Understandings in the effect of these parameters are necessary for wave energy utilization. Therefore, this research designed and constructed the floater testing set (FTS) for study the effect of floater, wave height and energy transformation method on electricity production by wave energy. The FTS size was 1.4 m x 6 m x 1.5 m for the width, the length, and the height, respectively. The FTS consisted of two main parts namely wave creation part and energy transformation part. In the wave creation part, there was a paddle which is driven by motor 2 HP for push water become a predetermined wave. The energy transformation part comprised of generator, inverter and floater. In experimental operation, the wave height was varied between 15 and 20 cm at the frequency of 38 waves per minute. The floater used three types as followed boat floater (BF), pontoon floater (PF) and round floater (RF). The method of energy transformation used two methods namely fixed and non-fixed base of energy transformation part. The experimental results were shown regarding electrical power output (EPO) and the efficiency of generator. Results showed that the EPO and efficiency of generator significantly increased with the wave height. The fixed base of energy transformation part gave the EPO and generator efficiency higher than the non-fixed base. BF type had the maximum value of EPO in fixed base case, but it had the minimum value of EPO in non-fixed base case. The EPO maximum value in fixed base case was 2.52 and 6.67 W/minute for the wave height of 15 and 20 cm, respectively. In non-fixed base case, the EPO maximum value got from RF type at 1.81 and 6.21 W/minute for the wave height of 15 and 20 cm, respectively. RF type gave the EPO minimum value in another case. On the other hand, the PF type gave the value of EPO in the middle range for both cases about 1.93 and 5.63 W/minute for the wave height of 15 and 20 cm, respectively. Moreover, the PF type had the most regularity of EPO and generator efficiency. Hence, PF type was an appropriate floater for electricity production by wave energy.

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