

**FEA STUDY IN WOBBLING EFFECT ON A LARGE DIAMETER TURBINE-  
ENERGETECH 1<sup>st</sup> GENERATION WAVE ENERGY TURBINE HUB**

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**ABSTRACT**

In general the large diameter turbines made linkage failures at their lower speeds subject to various static displacements of the design. It is observed that at lower speeds the turbine made possible to vibrate the system components such as inner nacelles, mounting bases, diffusers or it's bell mouth with the resonant frequencies. The wave energy harnessing turbines subject to by flow arrangement is under gone the higher risks of operating them at lower speeds.

The study focuses the behavior of static displacements of large diameter turbines with lower rotational speeds. In this study the turbine hub is used with 21 blades with 1028mm dia. with a range of speeds from 80 rpm to 750 rpm with by flow arrangement. CAD models were used to virtually describe the various sizes of the turbine compared with the existed Energetech Turbine hub. This study introduces the FEA models of the turbine to derive the static displacements at various speeds. The study reveals that the hub has a tendency to wobble about its rotational axis at the lower speed of the turbine rotation. This phenomenon is discussed with the help of various FEA models.

**Keywords:** Wave energy, static displacement, resonant frequencies, and risk