

Abstract Submitted  
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**Effect of Free Stream Turbulence on the Performance of a Marine Hydrokinetic Turbine** ASHWIN VINOD, ARINDAM BANERJEE, Lehigh University — The effects of controlled and elevated levels of free stream turbulence on the performance characteristics of a three bladed, constant chord, untwisted marine hydrokinetic turbine is tested experimentally. Controlled homogeneous free stream turbulence levels ranging from 3% to ~20% are achieved by employing an active grid turbulence generator that is placed at the entrance of the water channel test section and is equipped with motor controlled winglet shafts. In addition to free stream turbulence, various (turbine) operating conditions such as the free stream velocity and rotational speed are varied. A comparison of performance characteristics that includes the mean and standard deviations of the power coefficient ( $C_P$ ), and thrust coefficient ( $C_T$ ) will be presented and compared to the case of a laminar free stream with FST levels <1%.

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