Hydrodynamic Performance of the Offshore Floating Nuclear Plant

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Nuclear power has the potential to produce electricity cheaply and cleanly throughout the world. However, it has several drawbacks, including large construction costs and susceptibility to natural disasters. The Offshore Floating Nuclear Plant (OFNP) overcomes these drawbacks by placing the plant safely a few miles offshore, removing the need for ground preparation and the dangers posed by earthquakes and tsunamis.

This project ensures the OFNP platforms are able to survive and operate safely in the ocean environment, even under the worst of conditions. Using WAMIT and Orcaflex, the hydrostatic characteristics and hydrodynamic performance of the two major OFNP models are evaluated. The platforms were exposed to monochromatic waves of a wide range of frequencies, and to ocean spectra simulating 100 year storms in both the Gulf of Mexico and the North Sea. The performance of the platforms were evaluated against standards first to ensure that the platform could safely weather the storms, and second to begin gaining an understanding of under what conditions the nuclear plant on the OFNP may continue to operate and under what conditions it should be shut down. Lastly the project designs a mooring system to ensure the OFNP will remain in place during 100 year storms, while minimizing capital and maintenance costs of the mooring system.

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