



Power Generation, Hydraulics and Ocean Tribology: Call for Abstracts

Our society has a rich maritime heritage and continues to play a central role in advancing offshore industries. Within this context, the tribological performance of mechanical components is critical in determining the energy efficiency, reliability, and operational lifespan of offshore systems and their constituent subassemblies.

This importance is further amplified in ocean-based renewable energy systems, including offshore wind turbines, wave energy converters, and tidal generators, where components are exposed to harsh marine environments. These include corrosive saltwater, erosive and abrasive flows, lubricant degradation, and contamination, all of which occur under highly dynamic and unpredictable loading conditions. Common challenges include impact loading, cyclic stress, vibration, temperature variation, and multiphase fluid interactions. Experimental investigations, advanced diagnostics, and physics-based simulation and modeling of ocean tribology systems play an increasingly important role in understanding these complex interactions, predicting component performance, and accelerating the development of robust tribological solutions.

At the same time, increasing emphasis on sustainability and environmental stewardship is driving a shift toward eco-friendly materials, surface coatings, and lubricants. There is growing demand for biodegradable, non-toxic, and non-accumulative lubricants, ideally derived from non-mineral, renewable sources. These materials must not only perform under extreme marine conditions but also meet strict regulatory and ecological requirements.

Furthermore, maintenance operations for offshore systems are inherently complex and costly, largely due to the remote locations of the installations and their dependence on environmental conditions such as wave height, sea state, and seasonal accessibility. These constraints underscore the need for durable, low-maintenance tribological solutions that enhance system reliability and reduce life cycle costs.

For more information and to submit your abstract, visit www.stle.org/annualmeeting.