

# EERI LECTURE & MEETING

## Extreme Engineering for Multiple Extreme Hazards Applications to Offshore Structures

### ABOUT THE LECTURE

Global energy demand will be approximately 30 percent higher in 2035 compared to 2010, according to the World Energy Outlook published by the International Energy Agency (IEA). Meeting this demand will require oil and gas companies to push the boundaries of both technological and geographic frontiers – while maintaining a relentless and uncompromising commitment to safety.

Offshore structures used in the oil and gas industry must be designed to resist various combinations of extreme wave, wind, earthquake and even ice/iceberg loads. They are constructed onshore and are towed (while floating) sometimes thousands of miles to the reservoir offshore - therefore they must be designed to resist demanding transportation loads in addition to environmental loads.

These challenges are highlighted using the Arkutun-Dagi platform as an illustrative example. This structure will be installed in 2013 off the coast of Sakhalin Island in far eastern Russia. The platform must operate in a highly seismic environment – one that is also covered in sea ice over 6ft. thick several months of the year. The design, construction and installation of massive concrete structures (comparable in height to a 15-story building) to resist the ice loads will be described. In addition, the reliability-based methodology used to rigorously determine project-specific design factors will be discussed.

### DANIEL FENZ

Daniel Fenz is a Research Specialist in the Offshore Function of ExxonMobil Upstream Research Company. He received his Bachelor's, Master's and Ph.D. Degrees all from The State University of New York, University at Buffalo. While at SUNY Buffalo, he performed analytical and experimental work formulating and verifying the behavior of the Triple Friction Pendulum bearing.

Daniel has worked in the Arctic, Metocean and Structures Section since joining ExxonMobil Upstream Research Company in 2008. His research work has focused on conceptual development of Arctic bottom-founded structures and Arctic floating drilling vessels. In addition, he has also provided support to ExxonMobil projects in the areas of analysis and monitoring of traditional and seismically isolated offshore structures.



Please contact [jrichins@mrce.com](mailto:jrichins@mrce.com) to RSVP

**Wednesday February 20<sup>th</sup>**

**Registration 5:30 to 6 PM, Lecture 6 to 7 PM**

**Pratt School of Architecture**

**144 West 14<sup>th</sup> Street**

**Room 213**

**1 PDH will be provided  
\$10 Fee for non-EERI members**



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