

SEP 11, 2014

CURRENT DEVELOPMENT OF AN OCEAN THERMAL ENERGY CONVERSION (OTEC) SYSTEM



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ABSTRACT:

Ocean Thermal Energy Conversion (OTEC) systems utilize the temperature difference between the surface water and deep ocean water to generate electrical energy. An ammonia based heat exchanger that uses the Rankine cycle to exploit this temperature difference is commonly employed for power generation. A semi based offshore floating OTEC system consists of a floating platform, a large diameter nearly 1000m long cold water pipe (CWP) to transport water about half the average discharge of the Colorado River from the deep ocean to the surface and equipment like heat exchangers, turbine generators, pumps etc. to generate power. The mass of the cold water pipe with its enclosed water will significantly influence the performance of the platform, therefore it can only be considered as a coupled system.

Dr. Shi will introduce a new floating OTEC system developed by Lockheed Marin, and present the topics related to the design, testing, and analysis of the commercial scale OTEC plant. He will also give a review of the OTEC system development history, key components, and challenges.

BIOGRAPHY:

Dr. Shan Shi is currently the Manager of Riser Systems at Houston Offshore Engineering, LLC. He has over 20 years extensive work experience for the design and analysis of Tension Leg Platforms, Semisubmersibles, Spars and FPSOs. Dr. Shi's specific areas of competence include riser system design and analysis, and coupled global performance analysis of deepwater systems. His other areas of specialization include structural mechanics, hydrodynamics and finite element analysis. Has provided engineering support for fabrication, installation and completion, including project execution with experience and skills to interface with multiple disciplines. Dr. Shi has participated in many notable worldwide offshore projects ranging concept development through detailed engineering, fabrication and installation.

Dr. Shi received a BE degree in Naval Architecture & Ocean Engineering from Harbin Engineering University in China, and an MS degree in Structural Engineering & Mechanics from the University of Wisconsin. He also received an MS and a PhD degree in Structural and Earthquake Engineering from the University of Illinois at Urbana-Champaign. Dr. Shi is a principal developer of the HARP software package for the analysis of coupled offshore floating systems, and riser systems.