Session 1: Overview of Design Codes for Offshore Fixed Structures
(90 minutes)

Abstract:

American Petroleum Institute (API) Recommended Practice (RP) 2A provides guidance for the design of fixed offshore platforms. RP 2A has historically used a Working Stress Design (WSD) approach but there is a growing demand for a reliability-based Load and Resistance Factor Design (LRFD) version. API is therefore currently developing the next generation RP 2A that will be based primarily on RP-2A LRFD 1st edition (published in 1993 but not widely used) and International Standard ISO 19902 (published in 2007). The background of developing the original RP 2A LRFD 1st edition will be reviewed and the reliability calculation basis will be explained including recent calibration work performed in order to update the original API LRFD calibration performed in the 1980s. The reliability framework between the API and ISO LRFD documents will be compared and any differences discussed with the goal of providing a consistent reliability basis between these two documents. In addition, overview of API/ISO design code structures and their inter-relations will be discussed. Design guidelines under seismic conditions will be elaborated from the API/ISO provisions.

Dr. Albert Ku (顧寶鼎博士)

Dr. Ku received his bachelor and master degree, both in Civil Engineering, from National Cheng Kung University (Taiwan) and National Chiao Tung University (Taiwan), respectively. Later he received his PhD in Civil Engineering from Rice University in Houston, Texas. After graduating from Rice he worked at McDermott Engineering, EQE (a structural consultant company) and American Bureau of Shipping (ABS) between 1997 and 2004. In 2004 he founded Energo Engineering with 3 other partners with the focus on advanced structural analysis and structural integrity management. Energo was acquired by Kellogg Brown & Root (KBR) in 2010, and Dr. Ku is currently the Managing Director of Energo. Dr. Ku is currently the chairman of API Task Group 19 which focuses on next generation of fixed offshore structural design. Dr. Ku has published 23 papers in technical conference proceedings as well as peer-reviewed journals.

Education:

Ph.D., Civil Engineering
Rice University, 1997

M.S., Civil Engineering
National Chiao-Tung University, 1991

B.S., Civil Engineering
National Cheng-Kung University, 1988

Awards:


Selected Publications:


Session 2: Metocean Criteria
(60 minutes)

Abstract

Discussions will be focused on the response-based metocean criteria, which will be developed using statistical methods by associating site-specific existing and hindcast storms and current events with responses of offshore wind turbine platforms. Procedures and specific steps for deriving the response-based criteria will be discussed in details. The response-based criteria are deemed robust and can be used to design the offshore wind turbine platforms to achieve risk management objectives. Directionality of storm criteria as suggested in API Bulletin 2INT-MET will also be discussed and presented.

Dr. ERIC S.-H. CHANG (張書豪博士)

Dr. Chang received both of his bachelor and master degrees in civil engineering from National Taiwan University. He achieved his PhD degree of civil engineering with focus on fluid/structure interaction and computational fluid hydrodynamics from the University of Texas at Austin in 2012. After graduating from UT-Austin, Dr. Chang worked for SBM Offshore USA, Inc. as a naval architect and participated in an ultra-deep offshore oil field development project, Shell Stones FPSO, in the Gulf of Mexico. He deeply involved in the hull structural design and modifications and life cycle management of FPSO hull structures. Dr. Chang joined Energo Engineering Inc. (A KBR Company) in 2015 as a project engineer. He focused on the advanced structural analysis and structural integrity management of floating production assets for several major oil companies. In December 2016, Dr. Chang started his career in MCT Engineering Inc. as a senior lead engineer to carry out detailed offshore platform and subsea structural design and analysis. Dr. Chang is a registered Professional Engineer (Civil) in Texas State, U.S.A.

Education:

Ph.D., Civil Engineering
University of Texas at Austin, 2012

M.S., Civil Engineering
National Taiwan University, 2003

B.S., Civil Engineering
National Taiwan University, 2001

Publications:


10. HULLFPP: Software developed by Ocean Engineering Group, UT-Austin for the analysis of pressure force harmonics and phase angles on the hull surface induced by marine propulsors.
Session 3: Introduction to Offshore Engineering, Procurement, Construction, and Installation

(120 minutes)

Abstract:

There are four major phases of an offshore project - Engineering, Procurement, Construction, and Installation; or EPCI. The four phases are interconnected and a seamless execution is critical to the success of an offshore project.

Engineering phases comprise around 10% of a traditional offshore project, the least cost among the four phases. However, the influence of the engineering is paramount and the courses could become very hard to be changed in the later times.

Procurement, on the other hand, comprises the highest cost in a full scope offshore platform. For a offshore wind turbine project, the wind turbine is the major item, followed by the offshore grade steel.

Construction phase is a relative straight forward process. However, the material specs, construction procedures, and testings shall all be based on the offshore codes and regulations. A quay-side fabrication yard is also required in order to loadout the finished structures to the transportation vessels.

Installation phase is the most critical phase among all phases. The rate of a vessel is generally high. The capacity and the functionality of vessels as well as the installation logics/procedures would determine the installability of a project. Without thoroughly considering the adequacy of the offshore vessels, an offshore is hardly successful in terms of execution and finance.

Mr. Warren Kuo (郭原宏先生)

Warren received his bachelor degree in Civil Engineering and master degree in Structural Engineering from National Taiwan University (Taiwan). Later he pursued his PhD in Construction Engineering and Project Management (CEPM) but elected to graduate with a master degree from UT-Austin in Austin, Texas. After graduating from UT-Austin, he worked at McDermott International Inc. between 2008 and 2016. Warren received his MBA degree from McCombs School of UT-Austin in 2014. In 2015, he founded MCT Engineering with the focus on detailed offshore platform design and subsea engineering. Warren is a Professional Engineer (Civil & Structural) in Texas and is a PE (Structural) in Taiwan. He has published 7 papers in technical conference proceedings as well as peer-reviewed journals. Warren has been actively participate in the Taiwanese community over the years. His current and previous positions include President/Vice President/Director/Consultant of National Taiwan University Alumni Association in Greater Houston (NTUAH), Chair of Offshore Technology Symposium in Science, Engineering and Technology Seminar.

Education:

M.B.A., McCombs School of Business
UT-Austin, 2014
M.S., Construction Engineering and Project Management
UT-Austin, 2007
M.S., Structural Engineering
National Taiwan University, 2002
B.S., Civil Engineering
National Taiwan University, 1998

Publications:


12. Presenter (2017), Suction Pile Application in the offshore projects, PETROLEUM TECHNICAL SYMPOSIUM


