2-Day Intensive Practical Course

on

Contemporary Practices and Technology for Cranes and Derricks Operating in Harbour and Offshore

23-24 June 2016

NTU @ one-north campus, Seminar room SR708
11 Slim Barracks Rise (off North Buona Vista Road)
Singapore 138664
Dr Gho Wie Min
BEng (Hons) MSc DIC PhD

Dr Gho is a consultant with more than 25 years of experience in the offshore, marine and building industries. He received his BEng (Class One honours) in Civil and Structural Engineering from The University of Sheffield (1990) and MSc DIC in Earthquake Engineering and Structural Dynamics from Imperial College London (1991). He has worked as a production engineer at Batam fabrication yard, McDermott Indonesia, and a structural, pipeline and project engineer at McDermott Singapore (1992-97). He was involved on technology development of LPG terminal system and jack-up barge, and served as a quality assurance coordinator in the company. He pursued his PhD programme on tubular joint research under the recommendation of McDermott Engineering in 1997.

Dr Gho was an assistant professor and director for MSc in offshore engineering at NTU (2001-06). He worked as a senior engineer at ABS Pacific on the guide development of offshore floating structures and assisted on the setup of offshore technology centre. He joined Marine Engineering Services as a consultant for technology and business development thereafter (2006-09). Dr Gho was a task force member in developing the Singapore National Annex for EC3. He was in the subcommittee proposing the offshore and marine technology roadmap for R&D advisory panel, MPA. He has published some 50 technical papers and more than 50 engineering reports, and served as reviewer for several international journals. He has conducted regular training courses qualified for professional development under PE Board and in-house courses for organizations. He is currently the director of his own company and Archipelago Offshore Engineering Indonesia, and a guest lecturer at Maritime Research Centre (MRC), NTU.

Dr Gho developed his practical knowledge on cranes and derricks from the production engineering work at Batam fabrication yard Indonesia in the nineties. During this period, he was involved extensively in heavy and multiple lift operations such as the stacking and rollup of plane frames, transportation, lifting and loadout of deck and jacket structures, and other lifting activities on site. His main job responsibility, apart from justification of cranes and slings, and design of rigging for heavy lifts, was to propose suitable lifting procedures according to operational requirement with detailed analysis on strength integrity of lifting attachments, members and joints of structures. In 1994-95, he was the lead structural engineer responsible for the rollup of loaded bents and loadout of two 5,500 mton offshore steel jackets for Xijiang field development project at Chiwan fabrication yard Shenzhen China. He was a team member at MRC to examine the abnormal behaviour of crane structures as part of the structural health monitoring programme for shipyard and offshore cranes, 2005-07. In recent years, he has been a consultant to several organisations such as PetroVietnam TSC for the review of heavy lift procedure, Triyards Holdings for the assessment of 850 mton offshore crane and Compass Energy for the finite element analysis of lifting 5,000 mton barge.
COURSE PROGRAMME

23 June 2016 (Thursday)

8:30am  Registration

9:00am  **Session 1: Basic Concepts and Considerations**
Basic hoisting and luffing mechanism, structural components of cranes and derricks, critical rigging components, shipboard, offshore and heavy lift cranes, safety and safety equipment, materials, welding and fabrication, specification and design considerations

10:30am  Tea / Coffee

11:00am  **Session 2: Design Loads and Stresses**
In-service and out-of-service loads due to operation motions, loads due to motion of vessel, wind load, column buckling stresses, members subjected to combined axial and bending stresses, crane capacity rating chart, calculation of design loads and overturning moments

12:30pm  Lunch

1:30pm  **Session 3: Ultimate Strength Assessment (Member Design)**
Beam and plated structural elements, built-up compression members, cold-formed members, structural hollow sections, resistance of cross sections, buckling resistance of members, plate buckling effects, worked example based on standards for certification of lifting appliances

3:00pm  Tea / Coffee

3:30pm  **Session 4: Ultimate Strength Assessment (Joint Design)**
Basis of design, connections made with bolts and pins, welded connections, structural joints connecting H/I-sections, hollow section joints, checking with respect to material yielding and buckling, worked example based on standards for certification of lifting appliances

5:00pm  Q&A

5:30pm  End of session

24 June 2016 (Friday)

9:00am  **Session 5: Fatigue Assessment of Cranes**
Basis of fatigue design, effects of size and mean stress, fatigue loads, nominal stresses, hot spot stresses, stress concentration factors, stress range, worked example based on standards for certification of lifting appliances

10:30am  Tea / Coffee

11:00am  **Session 6: Finite Element Modelling for Stress Analysis**
Concept and application of finite element method, linear static analysis, modelling, errors and accuracy, modelling of structures and checking results, nonlinearity in stress analysis, finite element analysis of offshore pedestal mounted rotating crane

12:30pm  Lunch

1:30pm  **Session 7: Wire Rope Non-Destructive and Quantitative Inspection**
Rope failures, rope inspection and replacement, rope safety program, use of magnetism inspection technology, demonstration of quantitative detection on wire rope defects

3:00pm  Tea / Coffee

3:30pm  **Session 8: Case Studies**

5:00pm  Q&A

5:30pm  End of session
About the Course
This intensive practical course discusses the fundamental concept and principle, technical requirement and acceptance criteria for the assessment of crane and derrick structures subject to continuously changing distribution of loads and forces due to operational and lateral motions. Apart from the basic concept and considerations to understand better the engineering mechanics of hoisting equipment, it also covers the load effects imposed by wind, acceleration of crane motions and interaction with vessel movement. Important factors controlling the load rating of a crane such as the stability against overturning, global performance, support conditions and structural components are addressed. The ultimate strength and fatigue assessment is carried out in accordance to International codes and standards for certification of lifting appliances. As finite element simulation has become a popular analytical tool for stress analysis, modelling of offshore pedestal mounted rotating crane will be used as an example for demonstration. The non-destructive testing of wire ropes is based on magnetism inspection technology. Several worked examples showing the application of engineering mechanics and recommendations in standards for problem solving are presented to reinforce the subjects discussed in the course.

Objectives
This course is aimed to provide participants with complete understanding on the ability and limitations of cranes and derricks as part of the evaluation procedure in lift assessment from the aspect of structural performances. Through the discussion of theories and methodologies of structural systems and recommendations in standards, participants will have a better confidence to identify and assess the potential risks of cranes and derricks for an effectively lifting operation in harbour and offshore.

Who should attend
This course will be beneficial to people working in crane and construction industries, including managers, engineers, crane and derrick users, technical specialists and supervisors, concerned with structural integrity and safe operation of cranes and derricks to lift objects in harbour and offshore.

Accreditation
This short course is qualified for Professional Development Units under the Professional Engineers Board Singapore Continuing Professional Development programme (12 PDU).

A certificate of attendance will be given to participants with at least 75% attendance of the entire course.

Contact Information
The Secretariat
Maritime Research Centre, School of CEE, NTU
50 Nanyang Avenue, N1-B1a-03
Singapore 639798
Email: maritime@ntu.edu.sg
Tel: (65) 6790 6618
Fax: (65) 6790 6620
Location Map

NTU@one-north campus, Seminar room SR708
11 Slim Barracks Rise (off North Buona Vista Road)
Singapore 138664
REGISTRATION FORM

2-Day Intensive Practical Course:
CONTEMPORARY PRACTICES AND TECHNOLOGY FOR CRANES AND DERRICKS OPERATING IN HARBOUR AND OFFSHORE

Date: 23 - 24 June 2016
Time: 9:00am - 5:30pm
Venue: NTU @ one-north campus, Seminar room SR708
11 Slim Barracks Rise Singapore 138664
(off North Buona Vista Road)
Fee: SGD900.00 per participant

Participant Particulars (Please attach a separate sheet, if necessary)

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Contact Person (if different from above)

Business / Email Address

Telephone & Fax No.

PAYMENT
Registration fee is inclusive of 7% GST, course materials, refreshments and lunches. Complimentary car park coupons are available for participants. Payment must be made in Singapore Dollars by local crossed cheque, made payable to “Nanyang Technological University” at least one week before the commencement of the course.

Please mail the cheque to the following address:

The Secretariat
Maritime Research Centre, School of CEE
Nanyang Technological University
50 Nanyang Avenue, N1-B1a-03
Singapore 639798

Cheque Number: ___________________ Bank: _______________ Amount: S$ _______________

Cancellation / Refund Policy
The organiser reserves the rights to cancel the course and fully refund the paid registration fee to the participants. Request for withdrawal must be made in writing to the organiser. No refund will be made if the notice of withdrawal is not received 1 week prior to the commencement of the course.