Subsea Pipeline Engineering

An intensive 4-day course

Course Lecturers: Prof. Andrew Palmer
Dr. Roger King

Date: 12-15 November 2007

Venue: National University of Singapore

Professional Activities Centre
Faculty of Engineering
National University of Singapore
9 Engineering Drive 1
Blk EA #05-34
Singapore 117576

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2 Easy Ways to Register!

Mail

Fax (65) 6874 5097

Registration Fees: (Course registration fees include course materials, refreshments and lunch)
Participants from Singapore: SGD3,700.00 + prevailing GST (Local)
Overseas participants: SGD3,700.00 (GST Exempted for foreign participants)

For enquiries, please call Ms Lilian CHOONG at Tel: 6516 5113. Alternatively you can drop an email at engcll@nus.edu.sg

Payment: Payment is required prior to the workshop. Crossed cheques should be made payable to “National University of Singapore”.

Discount: A 10% discount will be given for companies/organizations sending 3 or more participants for the workshop. NUS Alumni will also enjoy the 10% discount off the registration fees.

Refunds and Cancellations: A 50% refund will be given for withdrawals (received in writing) ten working days before the commencement of the workshop. No refunds will be made thereafter. However, a replacement will be accepted upon prior arrangement at no extra cost. Please inform us of the changes, if any, by fax.

The Organizer reserves the right to cancel the workshop and fully refund the participants, should unforeseen circumstances warrant it. Every effort will be made to inform participants of any changes.

Payment Modes: Visa/Mastercard/AMEX, Cheque (All cheques are to be made payable to “National University of Singapore”)

Closing Date: 1 November 2007

Jointly Organised By:

Professional Activities Centre
Centre for Offshore Research & Engineering
Introduction

Subsea pipelines are the arteries of the offshore industry, and form an essential component of the transportation of oil, gas and water. Their design, construction and operation generate many difficult challenges. They form a substantial part of the cost of many projects, and there is an unrelenting need to build pipelines more cheaply without sacrificing safety and operability.

The 4-day course will focus on all aspects of subsea pipelines, from route selection and front-end engineering, through design, construction and operation to ultimate decommissioning. It is much more than a familiarisation course, and includes a large amount of technical content, but the course is designed to be accessible to engineers with no previous experience of marine pipelines. It is illustrated by a large number of case studies, many of them unpublished, taken from real projects in many parts of the world, from Australia to the North Sea and from Argentina to the Canadian Arctic.

The lecturers have between them seventy years of experience with subsea pipelines, gained in many parts of the world in the service of oil and gas companies, contractors, government agencies, courts and public inquiries, and other consultants. Among the companies they have advised are BP, Shell, ExxonMobil, ConocoPhillips, Woodside, Petronas, Statoil, Total Oil Marine, British Gas, RHP, Chevron, Adma Opco, Zosco, BC Hydro, Petronas and Talisman.

Prof. Palmer has been involved with pipelines since 1969. His background is in civil engineering and applied mechanics. He was initially at Cambridge University, then at R.J. Brown and Associates, then founder and director of Andrew Palmer and Associates, a company of consulting engineers involved in pipeline projects in every continent, latterly as Research Professor of Petroleum at Cambridge University, as a Visiting Professor at Harvard University, and now as Kepel Chair Professor in the Centre for Offshore Research and Engineering at the National University of Singapore. He has written three books and more than 180 research papers. He has an extensive consulting practice, and is in demand as an expert witness.

Dr. King has been engaged with pipelines since 1969. He is a chemical engineer and now specialises in off-site corrosion, cathodic protection and materials selection and retains particular expertise in microbiological corrosion. He was a founder of CRPCU (Corrosion and Protection Industrial Services), a consulting and research centre within the University of Manchester Institute of Science and Technology. He too has an extensive consulting and expert witness practice. He has written over 80 papers.

Professor Palmer and Dr. King have written a book ‘Subsea Pipeline Engineering’, published by Pennwell in 2004. Each participant in the course will receive a copy.

The course is descended from courses that Professor Palmer and Dr. King have given over some fifteen years, previously in the USA, the United Kingdom, the Netherlands, Germany, Argentina, Mexico, Brazil, Egypt, Bahrain, the United Arab Emirates, Malaysia, Singapore, Viet Nam, Thailand and Australia. The course is constantly changing, in response to new technology, new experience, and the comments of participants.

The style is deliberately informal. Participants are encouraged to ask questions, to contribute their own experiences, and to seek advice from the lecturers about current issues and problems. The course runs from 9 am to 5 pm, with a 1-hour break for lunch, which is provided. Each lecture lasts one hour, and every hour there is a break. Each participant receives a copy of the book and a printed copy of the slides shown in the lectures. At the end of the course each participant receives a completion certificate.

The course includes a design exercise, which begins on the first day. Participants work together in groups (usually of four or five people), and carry out the design of a pipeline system. The project begins with configuration selection and the choice of route, and continues to the choice of diameter, wall thickness, steel, anti-corrosion coating, weight coating and cathodic protection system. Participants select the construction method and the design of the shore crossings, and summarise the information they would need for the subsequent stages of design. Participants are often surprised by how much can be accomplished in a short time by a motivated group working together. After each phase, each group presents its conclusions to the other groups. The lecturers lead a general discussion about the design, and put forward a model solution.

Course content

The lectures are grouped into themes, as follows

Theme 1 Introduction

Overview and introductory films.

Theme 2 System configuration and conceptual design

This theme consists of six lectures, on system configuration, route selection, shore approaches, environmental design parameters, pipeline hydraulics, and current and future developments. The sixth lecture illustrates the point that marine pipeline technology is not a static and ‘mature’ technology, but that many interesting developments are in progress.

Theme 3 Materials

This theme consists of four lectures. They begin by describing the metallurgy, manufacture and specification of low-alloy carbon-manganese steel pipes, and go on to consider ways of increasing corrosion resistance and meeting the requirements of your service. The alternatives of flexible and composite pipelines are described and assessed in a separate lecture.

Theme 4 Mechanical design

Mechanical design is covered in four lectures, which examine in turn design for strength (so that the pipeline shall be robust), and safety against upheaval and lateral buckling. Mechanical design is often governed by established codes, and another lectures examines codes and current developments.

Theme 5 Construction

Marine pipelines can be constructed by laybarges, by belling, and by several pull and float methods. Many pipelines are trenched, and again there are several ways of carrying out this task. This group of lectures examines the different techniques and considers their advantages and limitations. Several videos show applications to actual projects.

Theme 6 Corrosion, cathodic protection, weight coating and insulation

Steel is subject to internal corrosion by the fluid that is being transported, and to external corrosion by the sea. A pipeline is protected against corrosion by a coating and by cathodic protection, usually in combination. Microbiological corrosion is often a potential problem. Many pipelines need an additional weight coating to stabilise them on the seabed, and to protect the anti-corrosion coating against mechanical damage. A pipeline often needs thermal insulation. Six lectures examine these linked topics.

Theme 7 Case studies

This theme examines how the knowledge developed in earlier themes has been applied in several actual projects.

Theme 8 Operations, mishaps, and decommissioning

A pipeline in operation has to be inspected, maintained, and sometimes repaired. This theme begins by considering how inspection should be carried out, and how possible defects should be assessed. Spars are a possible source of trouble, and a separate lecture discusses how they can be assessed and if necessary corrected. Two lectures present case studies of a large number of instructive failures. Ultimately, a pipeline is no longer needed, and a final lecture examines what need to be done to decommission a pipeline safely and economically.

Closing date: Please send in your registration form together with your payment before 21st October 2007.