Advances In Subsea Pipeline Engineering And Technology Papers Presented At Aspect 90 A Conference Organized By The Society For Underwater Science And Offshore Engineering Volume 24

The offshore industry continues to drive the oil and gas market into deeper drilling depths, more advanced subsea systems, and cross into multiple disciplines to further technology and equipment. Engineers and managers have learned that in order to keep up with the evolving market, they must have an all-inclusive solution reference. Subsea Engineering Handbook, Second Edition remains the go-to source for everything related to offshore oil and gas engineering. Enhanced with new information spanning control systems, equipment QRA, electric tree structures, and manifold designs, this reference is still the one product engineers rely on to understand all components of subsea technology. Packed with new chapters on subsea processing and boosting equipment as well as coverage on newer valves and actuators, this handbook explains subsea challenges and discussions in a well-organized manner for both new and veteran engineers to utilize throughout their careers. Subsea Engineering Handbook, Second Edition remains the critical road map to understand all subsea equipment and technology. Gain access to the entire spectrum of subsea engineering, including the very latest on equipment, safety, and flow assurance systems Sharpen your knowledge with new content coverage on subsea valves and actuators, multiphase flow loop

design, tree and manifold design as well as subsea control Practice and learn with new real-world test examples and case studies

Dr C P Ellinas Advanced Mechanics & Engineering Ltd Major advances have been achieved in recent years in subsea pipeline design and installation. Inspection, maintenance and repair have also received much attention. The development of marginal fields has brought with it special problems, which have necessitated novel methods and solutions. In the meanwhile interest in the development of deepwater fields continues with the development of new technology. This Conference has placed emphasis in addressing developments in pipeline technology under four main headings: pipeline/seabed interaction; flexible pipelines; pipeline design, fabrication and installation; deepwater applications. Advances in North Sea technology over the last few years have been concerned mostly with marginal fields, small diameter pipelines and new materials, which are well covered in the first three topics. Economic development of marginal fields requires processing of oil and gas to take place not at the wellhead but at existing facilities, usually some distance away. Hydrocarbons are thus often transported at high pressure and temperature in small diameter pipelines, which need to be protected through trenching. However, such operational practice has brought to the fore a problem that in the past was of little concern namely, upheaval buckling.

The technology, processes, materials, and theories surrounding pipeline construction, application, and troubleshooting are constantly changing, and this new series, Advances in Pipes and Pipelines, has been created to meet the needs of engineers and scientists to keep them up to date and informed of all of these advances. This second volume in the series focuses on flexible pipelines, risers, and umbilicals, offering the engineer the most thorough

coverage of the state-of-the-art available. The authors of this work have written numerous books and papers on these subjects and are some of the most influential authors on flexible pipes in the world, contributing much of the literature on this subject to the industry. This new volume is a presentation of some of the most cutting-edge technological advances in technical publishing. The first volume in this series, published by Wiley-Scrivener, is Flexible Pipes, available at www.wiley.com. Laying the foundation for the series, it is a groundbreaking work, written by some of the world's foremost authorities on pipes and pipelines. Continuing in this series, the editors have compiled the second volume, equally as groundbreaking, expanding the scope to pipelines, risers, and umbilicals. This is the most comprehensive and in-depth series on pipelines, covering not just the various materials and their aspects that make them different, but every process that goes into their installation, operation, and design. This is the future of pipelines, and it is an important breakthrough. A must-have for the veteran engineer and student alike, this volume is an important new advancement in the energy industry, a strong link in the chain of the world's energy production.

• Updated edition of a best-selling title • Author brings 25 years experience to the work • Addresses the key issues of economy and environment Marine pipelines for the transportation of oil and gas have become a safe and reliable way to exploit the valuable resources below the world’s seas and oceans. The design of these pipelines is a relatively new technology and continues to evolve in its quest to reduce costs and minimise the effect on the environment. With over 25years experience, Professor Yong Bai has been able to assimilate the essence of the applied mechanics aspects of offshore pipeline system design in a form of value to students and designers alike. It represents an excellent source of up to date practices and

knowledge to help equip those who wish to be part of the exciting future of this industry.

Pipelines and Risers

Edited by the Society for Underwater Technology, this text covers advances in subsea pipeline engineering and technology. Topics covered include changes in the industry, high pressure/high temperature, design, construction/installation and operations and maintenance.

Advanced Reservoir Engineering offers the practicing engineer and engineering student a full description, with worked examples, of all of the kinds of reservoir engineering topics that the engineer will use in day-to-day activities. In an industry where there is often a lack of information, this timely volume gives a comprehensive account of the physics of reservoir engineering, a thorough knowledge of which is essential in the petroleum industry for the efficient recovery of hydrocarbons. Chapter one deals exclusively with the theory and practice of transient flow analysis and offers a brief but thorough hands-on guide to gas and oil well testing. Chapter two documents water influx models and their practical applications in conducting comprehensive field studies, widely used throughout the industry. Later chapters include unconventional gas reservoirs and the classical adaptations of the material balance equation. * An essential tool for the petroleum and reservoir engineer, offering information not available anywhere else * Introduces the reader to cutting-edge new developments in Type-Curve Analysis, unconventional gas reservoirs, and gas hydrates * Written by two of the industry's best-known and respected reservoir engineers

A comprehensive and detailed reference guide on the integrity and safety of oil and gas pipelines, both onshore and offshore Covers a wide variety of topics, including design, pipe manufacture, pipeline welding, human factors, residual stresses, mechanical damage, fracture

and corrosion, protection, inspection and monitoring, pipeline cleaning, direct assessment, repair, risk management, and abandonment Links modern and vintage practices to help integrity engineers better understand their system and apply up-to-date technology to older infrastructure Includes case histories with examples of solutions to complex problems related to pipeline integrity Includes chapters on stress-based and strain-based design, the latter being a novel type of design that has only recently been investigated by designer firms and regulators Provides information to help those who are responsible to establish procedures for ensuring pipeline integrity and safety

In determining the response of offshore structures, it is of utmost importance to determine, in the most correct manner, all factors which contribute to the total force acting on these structures. Applying the Morison formula (Morison et. al. , 1950) to calculate forces on offshore slender structures, uncertainties related to the understanding of the wave climate, the hydrodynamic force coefficients and the kinematics of ocean waves represent the most important contributions to the uncertainties in the prediction of the total forces on these structures (Haver and Gudmestad, 1992). Traditional calculation of forces on offshore structures involves the use of regular waves with the following non-linearities inco1porated use of regular wave theories inco1porating higher order terms use of Morison equation having a nonlinear drag term inclusion of the effect of the free surface by integrating all contributions to total forces and moments from the sea floor to the free surface of the waves In order to describe the sea more realistically, the ocean surface is to be described as an irregular sea surface represented by its energy spectrum. The associated decomposition of the sea surface is given as a linear sum of linear waves. The total force is found by integrating the contribution

from all components in the wave spectrum to the free surface. The kinematics of each component must therefore be determined.

Authored by two of the world's most respected authorities in subsea pipeline engineering, this definitive reference book covers the entire spectrum of subjects in the discipline, from route selection and planning to design, construction, installation, materials and corrosion, inspection, welding, repair, risk assessment, and applicable design codes and standards. Particular attention is also devoted to the important specialized subjects of hydraulics, strength, stability, fracture, and buckling.

The aim of this major reference work is to provide a first point of entry to the literature for the researchers in any field relating to structural integrity in the form of a definitive research/reference tool which links the various sub-disciplines that comprise the whole of structural integrity. Special emphasis will be given to the interaction between mechanics and materials and structural integrity applications. Because of the interdisciplinary and applied nature of the work, it will be of interest to mechanical engineers and materials scientists from both academic and industrial backgrounds including bioengineering, interface engineering and nanotechnology. The scope of this work encompasses, but is not restricted to: fracture mechanics, fatigue, creep, materials, dynamics, environmental degradation, numerical methods, failure mechanisms and damage mechanics, interfacial fracture and nano-technology, structural analysis, surface behaviour and heart valves. The structures under consideration include: pressure vessels and piping, off-shore structures, gas installations and pipelines, chemical plants, aircraft, railways, bridges, plates and shells, electronic circuits, interfaces, nanotechnology, artificial organs, biomaterial prostheses, cast structures, mining...

and more. Case studies will form an integral part of the work.

Shallow Gas determination, prior to drilling, is carried out using 'Engineering Seismic' survey methods. Seismic acquisition data quality is fundamental in achieving this objective as both the data processing methods and interpretation accuracy are subject to the quality of the data obtained. The recent application of workstation based data analysis and interpretation has clearly demonstrated the importance of acquisition data quality on the ability to determine the risks of gas with a high level of confidence. The following pages summarise the 5 primary issues that influence acquisition data QC, suggests future trends and considers their potential impact. The primary issues covered in this paper are: A. Seismic B. Positioning C. QC Data Analysis D. Communications E. Personnel 90 SAFETY IN OFFSHORE DRll.LING FIELD QC ..... PRIMARY COMPONENTS COMMERCIAL TECHNICAL 1 OPERATIONAL FIGURE 1 HYDROSEARCH The often complex influences of Technical, Commercial and Operational constraints on the acquisition of high quality data require careful management by the QC supervisor in order to achieve a successful seismic survey data set. The following pages only consider the Technical aspects of QC and assume that no Commercial or Operational restrictions are imposed in the achievement of optimum data quality. It is noted however, that such restrictions are frequently responsible for significant compromise in data coverage and quality during routine rig site surveys.

First published in 1981 as the Offshore Information Guide this guide to information sources has been hailed internationally as an indispensable handbook for the oil, gas and marine industries.

This book is about the various methods of installing rigid subsea/submarine pipelines, such as the common methods using S-lay, J-lay, and reel-lay vessels. Other methods like the surface tow, bottom pull, and various other pipeline tow methods are also utilized. It also addresses supplementary activities required as part of a pipeline installation program, such as pipe manufacture and coating, seabed intervention, riser installation, pipeline precommissioning, and pipeline repairs. This book was written for students and newcomers to the oil and gas industry who have little or no knowledge of pipeline construction. Unlike other technical books on pipelines, this one does not address the detailed design of pipelines. Instead, it provides an overview of construction methodologies for subsea pipelines. As such, this book will provide the readers with a different perspective by providing a practical and illustrative approach to explain and illustrate how subsea pipelines can be installed through various methods. The author has used examples from some of his past projects. Where available, he also highlighted the various aspects of the work, and in some cases, he has provided the lessons that he learned from his past experiences so that readers may learn from the author’s experiences too.

This reference focuses on oil, gas, and products pipeline, both on- and offshore. You'll understand why, when, and how to pig a line.

The technology, processes, materials, and theories surrounding pipeline construction, application, and troubleshooting are constantly changing, and this new series,

Advances in Pipes and Pipelines,, has been created to meet the needs of engineers and scientists to keep them up to date and informed of all of these advances. This second volume in the series focuses on flexible pipelines, risers, and umbilicals, offering the engineer the most thorough coverage of the state-of-the-art available. The authors of this work have written numerous books and papers on these subjects and are some of the most influential authors on flexible pipes in the world, contributing much of the literature on this subject to the industry. This new volume is a presentation of some of the most cutting-edge technological advances in technical publishing. The first volume in this series, published by Wiley-Scrivener, is Flexible Pipes, available at www.wiley.com. Laying the foundation for the series, it is a groundbreaking work, written by some of the world's foremost authorities on pipes and pipelines. Continuing in this series, the editors have compiled the second volume, equally as groundbreaking, expanding the scope to pipelines, risers, and umbilicals. This is the most comprehensive and in-depth series on pipelines, covering not just the various materials and their aspects that make them different, but every process that goes into their installation, operation, and design. This is the future of pipelines, and it is an important breakthrough. A must-have for the veteran engineer and student alike, this volume is an important new advancement in the energy industry, a strong link in the chain of the world's energy production

Introducing a new practical approach within the field of applied mechanics developed to

solve beam strength and bending problems using classical beam theory and beam modeling, this outstanding new volume offers the engineer, scientist, or student a revolutionary new approach to subsea pipeline design. Integrating use of the Mathematica program into these models and designs, the engineer can utilize this unique approach to build stronger, more efficient and less costly subsea pipelines, a very important phase of the world's energy infrastructure. Significant advances have been achieved in implementation of the applied beam theory in various engineering design technologies over the last few decades, and the implementation of this theory also takes an important place within the practical area of re-qualification and reassessment for onshore and offshore pipeline engineering. A general strategy of applying beam theory into the design procedure of subsea pipelines has been developed and already incorporated into the ISO guidelines for reliability-based limit state design of pipelines. This work is founded on these significant advances. The intention of the book is to provide the theory, research, and practical applications that can be used for educational purposes by personnel working in offshore pipeline integrity and engineering students. A must-have for the veteran engineer and student alike, this volume is an important new advancement in the energy industry, a strong link in the chain of the world's energy production.

This book constitutes the thoroughly refereed post-conference proceedings of the International IFIP WG 5.7 Conference on Advances in Production Management

Systems, APMS 2011, held in Stavanger, Norway, in September 2011. The 66 revised and extended full papers were carefully reviewed and selected from 124 papers presented at the conference. The papers are organized in 3 parts: production process, supply chain management, and strategy. They represent the breadth and complexity of topics in operations management, ranging from optimization and use of technology, management of organizations and networks, to sustainable production and globalization. The authors use a broad range of methodological approaches spanning from grounded theory and qualitative methods, via a broad set of statistical methods to modeling and simulation techniques.

Aspect '94 is the most up-to-date and comprehensive assessment of the present and future of the pipeline systems industry. It comprises papers from leading experts in all areas of pipeline engineering and technology. As this book shows, the last few years have seen great strides forward in the field of subsea pipelines. Deepwater pipelines, long distance pipelines and complex systems transporting hydrocarbons and fluids to and from marginal field subsea wellheads and templates are all being implemented without significant problems. The pace of progress continues to accelerate in the subsea industry, and the scope to make further improvements is constantly being explored. Operators, consultants, suppliers and contractors are all researching, developing and testing new techniques and ideas.

As deepwater wells are drilled to greater depths, pipeline engineers and designers are confronted with new problems such as water depth, weather conditions, ocean currents, equipment reliability, and well accessibility. Subsea Pipeline Design, Analysis and Installation

is based on the authors' 30 years of experience in offshore. The authors provide rigorous coverage of the entire spectrum of subjects in the discipline, from pipe installation and routing selection and planning to design, construction, and installation of pipelines in some of the harshest underwater environments around the world. All-inclusive, this must-have handbook covers the latest breakthroughs in subjects such as corrosion prevention, pipeline inspection, and welding, while offering an easy-to-understand guide to new design codes currently followed in the United States, United Kingdom, Norway, and other countries. Gain expert coverage of international design codes Understand how to design pipelines and risers for today's deepwater oil and gas Master critical equipment such as subsea control systems and pressure piping

This book “Advanced Engineering for Processes and Technologies II” provides a good platform for participating researchers and academicians to share their latest innovation, technology and research findings in the areas of marine engineering technology and applications, sea management as well as engineering education. It offers an opportunity for academicians of the Universiti Kuala Lumpur, Malaysian Institute of Marine Engineering Technology (UniKL MIMET) to exchange ideas and establish a professional network. There are more than 30 papers covering a wide range of topics related to technologies and education including simulation, intellectual discussion, environmental awareness, enhancement of knowledge and skills. The aim of this book focuses more on the numerous technological methods used for the establishment of engineering innovation and productivity through their competitive research findings and the exposure of their relative merits and limitations. The papers shared in this issue will enable other researchers to generate interest and novel ideas

that can lead to the discovery of new engineering knowledge.

The concept of using flexible, reelable pipe to transport liquids, gases, and vapours is not a new one. As early as the 1940s a steel braided elastomeric pipeline was developed for the Allied Forces in order to transport fuels to support the Normandy Beacheads. In fact, the longest flexible pipeline ever constructed is likely to be that laid across the English Channel as part of 'Operation Pluto'. The methodology used to handle and instal such pipe is also not new. Ellis (1943, London) in an early patent specification identifies three basic objectives for a flexible pipelining method. These are: prefabrication of the pipe onshore; coiling of the pipe on suitable drums or reels; and using such reels to lay pipe from anchored or motorised barges. The design concept for flexible pipe is also not a new invention given that flexible hoses and umbilicals have been in service for more than sixty years. A break-through was however achieved by the French Institute of Petroleum in the early 1970s when they developed an improved steel reinforced pipe structure having a high axial loading capaci ty which utilised corrosion and hydrocarbon resistant polymers to extend pipe service lifetime. This early pipe design utilised established cable making techniques to apply steel armour and axially and radially reinforce alternating layers of polymer sheaths. The pipe was primarily developed as a flowline for use in static seabed applications.

Papers Presented at Aspect '90, a Conference organized by the Society for Underwater Technology and held on May 30-31, 1990, Aberdeen, Scotland

The three parts of this volume - Technical Refinement; Technical Innovation; and Project Management and Risk Minimisation - reflect the areas of opportunity for improved cost effective techniques for exploration and production of oil and gas in the North Sea and

worldwide. The book is indispensable for engineers and scientists interested in the latest advances in technology and resource management that will reduce costs and continue to enhance the safe exploration of oil and gas resources. This volume comprises a selection of contributions presented at the International Conference Subsea International '93, held 28--29 April 1993 in Aberdeen, U.K.

Advances in Subsea Pipeline Engineering and TechnologyPapers presented at Aspect '90, a conference organized by the Society for Underwater Technology and held in Aberdeen, Scotland, May 30–31, 1990Springer Science & Business Media

Recent changes in the codes for building pipelines has led to a boom in the production of new materials that can be used in flexible pipes. With the use of polymers, steel, and other new materials and variations on existing materials, the construction and, therefore, the installation and operation of flexible pipes is changing and being improved upon all over the world. The authors of this work have written numerous books and papers on these subjects and are some of the most influential authors on flexible pipes in the world, contributing much of the literature on this subject to the industry. This new volume is a presentation of some of the most cutting-edge technological advances in technical publishing. This is the most comprehensive and in-depth book on this subject, covering not

just the various materials and their aspects that make them different, but every process that goes into their installation, operation, and design. The thirty-six chapters, divided up into four different parts, have had not just the authors of this text but literally dozens of other engineers who are some of the world's leading scientists in this area contribute to the work. This is the future of pipelines, and it is an important breakthrough. A must-have for the veteran engineer and student alike, this volume is an important new advancement in the energy industry, a strong link in the chain of the world's energy production.

With the rapid development of Machinery, Materials Science and Engineering Application, discussion on new ideas related mechanical engineering and materials science arise. In this proceedings volume the author(s) are focussed on Machinery, Materials Science and Engineering Applications and other related topics. The Conference has pro