OMAE 2019

Glasgow

38th International Conference on Ocean, Offshore and Arctic Engineering

Glasgow, Scotland

June 9–14, 2019

OOAE

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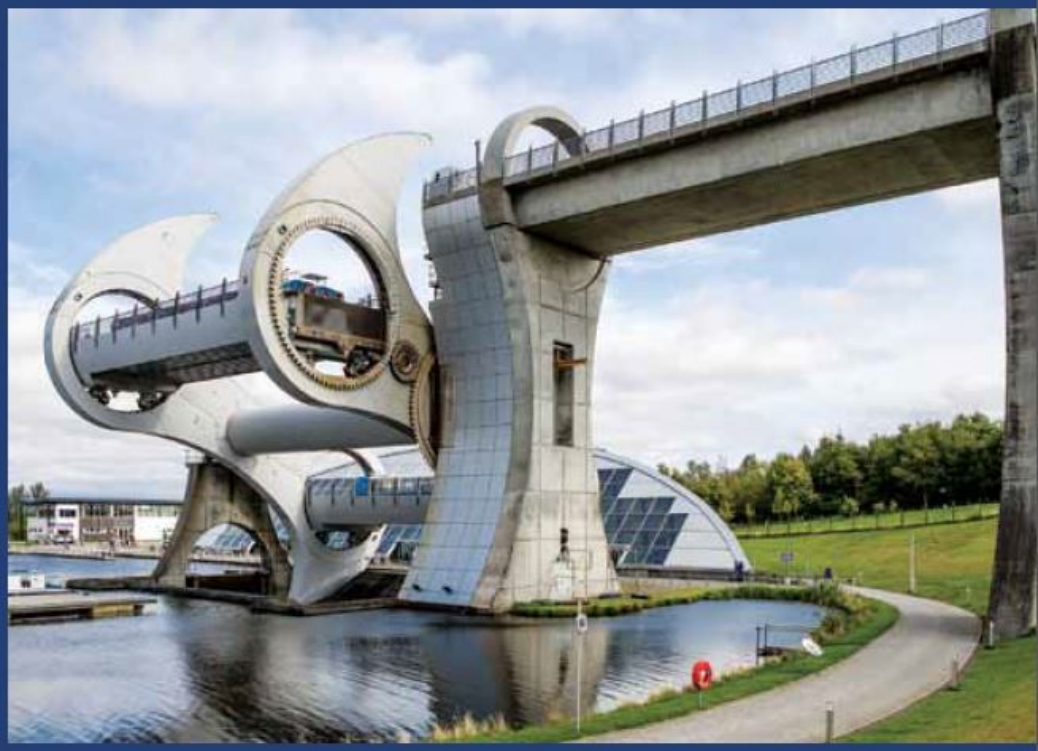
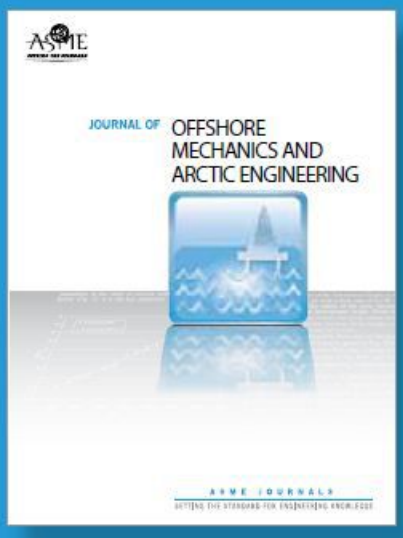
University of Strathclyde Glasgow





EDITOR: Lance Manuel, PhD
The University of Texas at Austin, USA

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PROGRAM AT A GLANCE

Saturday, June 8

Short Courses

- **Corrosion and Fouling in Marine Environment**
  9:00 – 17:00
  Jura (Crowne Plaza)
- **Verification & Validation of Industrial CFD**
  09:00 – 17:00
  Staffa/Shuna (Crowne Plaza)

Outreach

- **Team Building Exercise**
  17:00 – 19:00
  Staffa/Shuna (Crowne Plaza)
- **Welcome Dinner**
  19:00 onwards
  Off-site

Sunday, June 9

Outreach

- **Welcome & Introductions Industry Presentations**
  08:00 – 17:00
  Castle 1 (Crowne Plaza)

Short Courses

- **Offshore Wind Turbines: Dynamic Analysis and Marine Operations**
  09:00 – 17:00
  Jura (Crowne Plaza)
- **WEC Dynamics and Control Design**
  09:00 – 17:00
  Castle 3 (Crowne Plaza)
- **Introduction to Machine Learning and Data-driven Modelling Methods for Engineering Applications**
  09:00 – 17:00
  Castle 2 (Crowne Plaza)

Welcome Reception
18:30 – 20:30
Glasgow Science Centre

Monday, June 10

Opening Ceremony and Keynote Plenaries 08:30 – 10:00 — SEC Armadillo

Welcome and Opening Remarks
Prof. Atilla Incecik, *Conference Chair, OMAE 2019*
Prof. Krish Thiagarajan Sharman, *Technical Program Chair, OMAE 2019*
Prof. Antonio C. Fernandes, *OOAE Division Chair*
Prof. Sir Jim McDonald, Principal, *University of Strathclyde*
Eva Bolander, *Lord Provost of Glasgow*

Keynote Plenary One
Blue Oceans: Offshore Research for Future Maritime Challenges
Dr. Bas Buchner, *President, MARIN*

Awards

Refreshment Break 10:00 – 10:30 — Hall 5 (SEC)

Keynote Plenaries (Continued) 10:30 – 12:00 — SEC Armadillo

Keynote Plenary Two
Advancing a Lower Carbon Future
David Dickson, *Vice President, Safety & Operational Risk, Global Operations, BP*

Keynote Panel
Offshore Digital
Moderator: Xiaozhi (Christina) Wang, PhD, *Vice President, Global Marine, American Bureau of Shipping (ABS)*
Panelists: Prof. Kjetil Skaugset, PhD, *Chief Researcher Upstream and Downstream, Technology, Equinor Expert Centre, Equinor ASA*
Frederic Dabe, *Digital Transformation Director, SBM Offshore*

OMAE 2020 Presentation
Prof. Manhar Dhanak, *Conference Chair, OMAE 2020*
Prof. Ron W. Yeung, *Conference Co-Chair, OMAE 2020*

Opening Lunch 12:00 – 13:30 — Hall 5 (SEC)

Concurrent Sessions 13:30 – 15:00

OT	1-1-2	FPSO and Arctic Structures
OT	1-1-2	FPSO and Arctic Structures
OT	1-2-1	Dynamic Positioning I
SSR	2-10-1	Collision and Crashworthiness I
SSR	2-15-1	Data Driven Models
MAT	3-1-2	Formulation of the Fracture Parameter
PRS	4-1-1	Flexible Pipes I
PRS	4-3-1	Collapse
OSU	5-1-1	Marine Utilization and Marine Spatial Planning
OE	6-1-2	Floating Body Technology
OE	6-4-1	Marine Control and Automation
CFD	8-1-1	FSI
ORE	9-1-1	Bottom-fixed Wind Turbines
OG	10-1-1	Seabed Properties and Processes
PT	11-7-1	Well Drilling Fluids and Hydraulics I
HRT	12-1-1	Numerical and Experimental Methods in Hydrodynamics I
OT	13-7-1	Small vessel and Related Technology

Refreshment Break 15:00 – 15:30 — Hall 5 (SEC)

Concurrent Sessions 15:30 – 17:30

OT	1-4-3	Design Optimization
OT	1-6-1	CFD Numerical Waves and Applications
SSR	2-3-1	Probabilistic Response Models
SSR	2-10-2	Collision and Crashworthiness II
MAT	3-9-1	Advances in Materials Characterization
PRS	4-1-4	Flexible Pipes IV
PRS	4-2-5	SCRs and SLWRs II
OSU	5-6-1	High Tide and Tsunamis
OE	6-4-2	Marine Operations and Vessel Motions
OE	6-11-1	Autonomous Vehicle Technology
CFD	8-1-2	Surface Waves
ORE	9-2-1	Aerodynamics I
OG	10-3-1	Anchors
PT	11-7-3	Well Drilling Fluid and Hydraulics III
HRT	12-2-1	Multi-Body Hydrodynamics
OT	13-2-1	Numerical Methods

ASME & IMechE Connect Roundtable 16:00 – 18:00 — Forth Room

Afternoon Lecture Series 17:40 – 18:10 — Lomond Auditorium (SEC)
European Research Council – Funding Opportunities for Creative Minds from All Over the World
Dr.-Ing. Luiz Alves dos Santos, *Scientific Officer, European Research Council*

Afternoon Drinks Reception 18:15 – 19:15 — Hall 5 (SEC)

Tuesday, June 11

Concurrent Sessions 08:30 – 10:00

OT	1-1-3	Floating Wind Platforms
OT	1-2-2	Mooring System Design and Analysis I
SSR	2-4-1	Fatigue and Fracture Reliability I
SSR	2-9-1	Extreme Loading and Responses I
SSR	2-12-1	Structural Analysis and Optimization I
MAT	3-1-1	Fracture Toughness measurement and Assessment
PRS	4-1-2	Flexible Pipes II
PRS	4-3-2	Installation
OSU	5-2-1	Aquaculture I: Design and Modeling I
OE	6-2-1	Coastal Engineering I
OE	6-4-3	Marine Engineering and Applications I
CFD	8-2-1	Free Surface Modeling
ORE	9-3-1	Wave Energy Converter Control Systems Competition (WECCCOMP)
OG	10-4-1	Pile Foundations I
PT	11-7-2	Well Drilling Fluids and Hydraulics II
HRT	12-4-1	Hydrodynamic Aspects of Offshore Renewable Energy
OT	13-2-2	Experiments and Numerical Validation

Refreshment Break 10:00 – 10:30 — Hall 5 (SEC)

Concurrent Sessions 10:30 – 12:00

OT	1-1-4	Fixed Platforms and Foundations
OT	1-2-3	Dynamic Positioning II
SSR	2-4-2	Fatigue and Fracture Reliability II
SSR	2-9-2	Extreme Loading and Responses II
SSR	2-12-2	Structural Analysis and Optimization II
MAT	3-4-1	Steel Performance in Sour Environment
PRS	4-1-3	Flexible Pipes III
PRS	4-3-6	ECA
OSU	5-2-2	Aquaculture II: Design and Modeling II
OE	6-2-2	Coastal Engineering II
OE	6-4-4	Marine Engineering and Applications II
CFD	8-2-2	Free Surface Loading and Structure Interaction I
ORE	9-4-4	Optimization and Load Analysis
OG	10-5-1	Bucket Foundations, Suction Caissons and Spudcans
PT	11-6-1	Integrity of Well Barriers I
HRT	12-5-1	Non-Linear Waves and Wave Effects I
OT	13-2-3	Flow-Induced Motions (FIM)

Lunch 12:00 – 13:30 — Hall 5 (SEC)

Concurrent Sessions 13:30 – 15:00

OT	1-1-5	Artificial Intelligence and Advance Analysis
OT	1-2-4	Mooring System Design and Analysis II
SSR	2-4-3	Fatigue and Fracture Reliability III
SSR	2-9-3	Extreme Loading and Responses III
SSR	2-12-3	Structural Analysis and Optimization III
MAT	3-3-2	Performance of Mooring Chains
PRS	4-1-5	Flexible Pipes V
PRS	4-2-1	General Design and Analysis I
OSU	5-4-1	Underwater Vehicle and Technology
OE	6-2-3	Coastal Engineering III
OE	6-4-5	Very Large Floating Structures
CFD	8-2-3	Free Surface Loading and Structure Interaction II
ORE	9-5-2	Concepts and Design
OG	10-6-1	Pipeline Geotechnics
PT	11-6-2	Integrity of Well Barriers II
HRT	12-5-2	Non-Linear Waves and wave Effects II
OT	13-2-4	Fluid-Structure Interactions (FSI)

Refreshment Break 15:00 – 15:30 — Hall 5 (SEC)

Concurrent Sessions 15:30 – 17:30

OT	1-6-2	Loads and Responses in Current and Wind I
SSR	2-8-1	Well Integrity and Reliability Assessment
SSR	2-9-4	Extreme Loading and Responses IV
MAT	3-3-3	Advances on Assessing Performance of Steel
PRS	4-2-2	General Design and Analysis II
PRS	4-5-1	Flow Assurance I
OSU	5-3-1	Development of Deep Sea Mining and Resources
OE	6-4-6	Towed Cables, Ropes and Mooring Systems
OE	6-11-2	Floating Bodies Technology
OE	6-12-1	Ocean Measurement and Data Interpretation
PAT	7-1-1	Arctic Frontiers and Manoeuvring in Ice
CFD	8-5-1	Wave CFD modeling Applications
ORE	9-2-3	Floating Wind Designs
OG	10-7-1	Pile Foundations II
PT	11-12-1	Cementing I
HRT	12-7-1	Large-Amplitude Non-Linear Ship Motions
OT	13-2-5	Others

Afternoon Lecture Series 17:40 – 18:30 — Lomond Auditorium (SEC)
Inspired by Myriad Laughing Waves: Euler, Navier, Stokes and Others
Prof. Rodney Eatock Taylor, *Emeritus Professor, University of Oxford*

Wednesday, June 12

Concurrent Sessions 08:30 – 10:00

OT	1-5-1	FLNG
SSR	2-1-1	Abnormal or Rogue Waves I
SSR	2-11-1	Ultimate Strength I
MAT	3-6-1	Advances in Materials Characterization
PRS	4-1-6	Flexible Pipes VI
PRS	4-3-4	Thermo-Mechanical I
OSU	5-5-1	Floating Systems for Renewable Energy
OE	6-3-1	Fluid-Structure Interaction/Hydroelasticity
OE	6-5-1	Advanced Marine Hydrodynamics I
OE	6-8-1	Wave Loads
PAT	7-3-1	Structures in Ice
CFD	8-3-1	Data-Driven Modeling and Machine Learning
ORE	9-1-3	FWT - Numerical Analysis II
PT	11-15-1	Well Abandonment I - Rules and Regulations
PT	11-2-1	Drilling Mechanics Session I
HRT	12-1-2	Numerical and Experimental Methods in Hydrodynamics II
OT	13-1-1	Extremes and Environmental Modelling

Refreshment Break 10:00 – 10:30 Hall 5 (SEC)

Concurrent Sessions 10:30 – 12:00

OT	1-4-2	Numerical Design and Analysis
SSR	2-1-2	Abnormal or Rogue Waves II
SSR	2-11-2	Ultimate Strength II
MAT	3-3-1	Fatigue Improvement and Repairs
PRS	4-1-7	Flexible Pipes VII
PRS	4-3-5	Thermo-Mechanical II
OSU	5-1-2	Hybrid and Complex Use of Floating Systems I
OE	6-3-2	Wave-Body Interactions/CFD
OE	6-5-2	Advanced Marine Hydrodynamics II
OE	6-8-2	Ship Hydrodynamics
PAT	7-4-1	Vessels in Ice and Waves
CFD	8-3-2	Code Development and V&V
ORE	9-2-2	Aerodynamics II
ORE	9-3-2	Wave Energy: Oscillating Water Column I
PT	11-2-2	Drilling Mechanics Session II
PT	11-15-2	Well Abandonment II - Research and Operational Experiences
OT	13-1-2	Fluid Body Interaction

Lunch 12:00 – 13:30 Hall 5 (SEC)

Concurrent Sessions 13:30 – 15:00

OT	1-3-1	Nonlinear Wave and Wave Effects
SSR	2-2-1	Probabilistic and Spectral Wave Models I
SSR	2-11-3	Ultimate Strength III
MAT	3-11-1	Developments in BS 7910 and other Fitness-for-service Procedures: Session I
PRS	4-2-3	Drilling Risers I
PRS	4-3-3	Mechanics I
OSU	5-1-3	Hybrid and Complex Use of Floating Systems II
OE	6-15-1	Underwater Vehicles Control
OE	6-3-3	Damping and Viscous Effects
OE	6-5-3	Advanced Marine Hydrodynamics III
PAT	7-11-1	Ice Model Tests and Structure-Ice-Interactions
CFD	8-1-3	Ship Performance I
ORE	9-4-2	Wave Farms and Alternative Markets
ORE	9-6-1	Thermal, Hybrid and Others: Analysis, Design and Prediction
PT	11-3-1	Drilling Geomechanics
PT	11-5-1	Well Inflow Control and Reservoir Management
OT	13-1-3	Nonlinear Waves I

Refreshment Break 15:00 – 15:30 Hall 5 (SEC)

Concurrent Sessions 15:30 – 17:30

OT	1-3-2	Fluid-Structure Interaction
SSR	2-2-2	Probabilistic and Spectral Wave Models II
SSR	2-6-1	Reliability of Mooring and Riser Systems I
MAT	3-11-2	Developments in BS 7910 and other Fitness-for-service Procedures; Session II
PRS	4-2-4	SCRs and SLWRs I
PRS	4-5-2	Flow Assurance II
OE	6-15-2	Underwater Vehicles Design Technology and Hydrodynamics
OE	6-3-4	Wave-body interactions: Special Problems
OE	6-5-4	Advanced Marine Hydrodynamics IV
PAT	7-12-1	Numerical Ice Modeling
CFD	8-1-4	Ship Performance II
CFD	8-4-1	Cylinder VIV
ORE	9-1-2	FWT - Numerical Analysis I
ORE	9-7-1	Drivetrain Design, Operation and Condition Monitoring I
PT	11-4-1	Petroleum Production Systems Design and Operation
PT	11-12-2	Cementing II
OT	13-1-4	Nonlinear Waves II

Afternoon Lecture Series 17:40 – 18:30 Lomond Auditorium (SEC)
Enjoyable Marine Engineering Researches on Sports, Environment, not only Water Wave Engineering, Nonlinear Hydrodynamic Forces and Statistics
Prof. Takeshi Kinoshita, *Visiting Professor, Nagasaki Institute of Applied Science*

Conference Banquet 19:00 – 24:00 Merchant Square

Thursday, June 13

Outreach Breakfast / Feedback Session 07:30 – 10:00 Alsh 2 (SEC)

Concurrent Sessions 08:30 – 10:00

OT	1-1-1	Semi-Submersibles and TLPs
SSR	2-13-1	Risk Analysis and Management I
SSR	2-6-2	Reliability of Mooring and Riser Systems II
MAT	3-2-1	Fabrication and Performance of Clad Pipes
PRS	4-1-10	Umbilicals and Cables I
PRS	4-3-7	Thermo-Mechanical III
OE	6-13-1	Ship Resistance and Wave Loads
OE	6-17-1	Wave loads on structures
OE	6-7-1	Regional Metocean I
CFD	8-1-5	Seakeeping I
CFD	8-4-2	Risers, Jumpers and Pipelines
ORE	9-1-5	FWT - Mooring Systems
ORE	9-5-3	Numerical Analysis I
PT	11-1-1	General Petrolum Technology I
PT	11-13-1	LSU Workshop on Riser Gas Management and Well Control
OT	13-3-2	Wave Energy I

Refreshment Break 10:00 – 10:30 Hall 5 (SEC)

Concurrent Sessions 10:30 – 12:00

OT	1-7-1	Wave Loading and Motions in Extreme Seas I
SSR	2-13-2	Risk Analysis and Management II
SSR	2-6-3	Reliability of Mooring and Riser Systems III
MAT	3-5-1	Fatigue Assessment and Improvement
PRS	4-1-11	Umbilicals and Cables II
PRS	4-3-8	Mechanics II
OE	6-13-2	Ship Manoeuverability and Motion
OE	6-17-2	Nonlinear and Breaking Waves
OE	6-7-2	Regional Metocean II
CFD	8-1-6	Seakeeping II
CFD	8-4-3	Interference, Proximity and Geometry Effects
ORE	9-1-8	FWT Hydrodynamics I
ORE	9-4-3	Advanced Controls
PT	11-1-2	General Petroleum Technology II
PT	11-10-1	New Materials for Well Construction
OT	13-3-4	Wave Energy II

Technical Session Organizers' Lunch 12:00 – 13:30 Hall 5 (SEC)

Concurrent Sessions 13:30 – 15:00

OT	1-7-2	Wave Loading and Motions in Extreme Seas II
SSR	2-14-1	Risk Based Maintenance
SSR	2-7-1	Reliability of Renewable Energy Systems
MAT	3-2-2	Analysis and Fatigue Performance of Tubular Joints (John Sharp Honorary Session)
PRS	4-4-1	Subsea Structures I
PRS	4-6-1	Innovative Technologies for Deepwater Low-Cost Production I
OE	6-13-3	Numerical Methods
OE	6-7-3	Metocean Criteria I
CFD	8-1-7	Propulsion
CFD	8-4-4	VIV Suppression and Control
ORE	9-4-1	Power Take-offs and Experiments
ORE	9-5-4	Numerical Analysis II
PT	11-1-3	Genral Petroleum Technology III
PT	11-11-1	Innovations in Drilling, Production and Transport
OT	13-3-3	Ocean Current Energy, OTEC and Related Technology

Refreshment Break 15:00 – 15:30 Hall 5 (SEC)

Concurrent Sessions 15:30 – 17:30

OT	1-4-1	Experimental Design and Analysis
SSR	2-5-1	Reliability of Marine Structures
MAT	3-13-1	Dr. John Sharp Honorary Session
PRS	4-4-2	Subsea Structures II
PRS	4-6-2	Innovative Technologies for Deepwater Low-Cost Production II
OE	6-7-4	Metocean Criteria II
CFD	8-5-2	VIV Theory and CFD&FSI Symposium Workshop
ORE	9-2-6	Hybrid Systems ans Farm Analysis
ORE	9-3-3	Wave Energy: CFD Simulations
PT	11-11-2	Innovations in Drilling, Production and Transport
OT	13-3-1	Wind Energy

Farewell Reception 17:30 – 19:00 Argyll Suite (Crowne Plaza)

Friday, June 14

Technical Tours
- **Technical Tour to Advancing Forming Research Centre and Falkirk Wheel**
- **Technical Tour to Subsea 7 and Falkirk Wheel**

Wi Fi Network

Network at SEC: SEC Wi-Fi
Network at Crowne Plaza: CrownePlaza
No password required

Registration

	Hall 5 (SEC)
Sunday, June 9	13:00 – 20:00
Monday, June 10	07:00 – 17:30
Tuesday, June 11	08:00 – 17:30
Wednesday, June 12	08:00 – 17:30
Thursday, June 13	08:00 – 17:30

Exhibition

	Hall 5 (SEC)
Monday, June 10	08:30 – 19:15
Tuesday, June 11	08:30 – 17:30
Wednesday, June 12	08:30 – 17:30
Thursday, June 13	08:30 – 15:30

Daily Program Handout

An updated daily program handout will be available at the Registration Desk the mornings of Tuesday, Wednesday and Thursday. The handout will incorporate any last-minute program changes and show the time-synchronized order of presentations in each session for that day. You can use this handout as a general reference and to easily plan your personal attendance schedule for the day. The program changes will also be updated on the ASME Crowd Compass App.

Key to Symposium Abbreviations

CFD&FSI	CFD & FSI
MAT	Materials Technology
OE	Ocean Engineering
OG	Off shore Geotechnics
ORE	Ocean Renewable Energy
OFT	Offshore Technology
OSU	Ocean Space Utilization
PAS	Polar and Arctic Sciences and Technology
PRS	Pipelines, Risers, and Subsea Systems
PT	Petroleum Technology
SSR	Structures, Safety and Reliability
ET	Prof. Rodney Eatock Taylor Honoring Symposium on Marine and Offshore Hydrodynamics
TK	Prof. Takeshi Kinoshita Honoring Symposium on Offshore Technology

See Detailed Program starting on page xx for concurrent session room locations.

TECHNICAL PROGRAM

A Monte Carlo Based Simulation Method for Damage Stability Problems OMAE2019-95295
Stefan Krueger[1] Hendrik Dankowski[2]
1. Hamburg University of Technology, Hamburg, Germany; 2. Flensburger Schiffbau Gesellschaft, Flensburg, Germany

Optimal Control for Response Reduction Of Single Hinged Articulated Tower using MR-damper OMAE2019-96076
Kushal Solomon, Deepak Kumar
Indian Institute of Technology Madras, Chennai, India

Extended Kalman Filtering for Estimating Drag and Inertia Coefficients for Slender Offshore Structures OMAE2019-96630
Dhruv Bhagtani, Nilanjan Saha
Indian Institute of Technology Madras, Chennai, India

Structures, Safety and Reliability

2-10-2 Collision and Crashworthiness II

Monday June 10 Room **Crowne Plaza, Castle 1** | **15:30 – 17:30**
Session Chair: Zhiqiang Hu, Newcastle University, United Kingdom
Session Co-Chair: Sören Ehlers, Hamburg University of Technology, Germany

3D Printing Miniature Marine Structures Models for Structural Analysis Purpose: Is it Possible? OMAE2019-95772
Miguel Angel Calle Gonzales, Pentti Kujala
Aalto University, Espoo, Finland

Enhancement of Structural Redundancy of Hull Structure in Accidental Condition by Applying Highly Ductile Steel OMAE2019-95912
Shin moto[4]
1. Mitsubishi Ship Building, Nagasaki, Japan; 2. JFE Steel Corporation, Kurashiki, Japan; 3. JFE Steel Corporation, Tokyo, Japan; 4. Nippon Kaiji Kyokai (ClassNK), Tokyo, Japan

Materials Technology

3-9-1 Advances in Materials Characterization

Monday June 10 Room **SEC, Boisdale 1** | **15:30 – 17:30**
Session Chair: Sheng Bao, Zhejiang University, China
Session Co-Chair: Yanhui Zhang, TWI Ltd, United Kingdom

Corrosion Behaviour of Cupronickel 90/10 Alloys in Arabian Sea Conditions and its Effect on Maintenance of Marine Structures OMAE2019-96227
Muntazir Abbas, Mahmood Shafiee, Nigel Simms
Cranfield University, Bedford, United Kingdom

A Comparative Study of Mechanical Properties of Biodegradable PBSAT and PA Gillnets in Norwegian Coastal Waters OMAE2019-95350
Biao Su, Heidi Moe Føre, Eduardo Grimaldo
SINTEF Ocean, Trondheim, Norway

Material Design of Offshore Linepipe Steels for Ultra Deep Water Application OMAE2019-95863
Kyono Yasuda[1] Junji Shimamura[1] Satoshi Igi[2] Ryuji Muraoka[1]
1. JFE Steel Corporation, Fukuyama, Japan; 2. JFE Steel Corporation, Kurashiki, Japan

Improvement on Toughness of Weld Heat Affected Zone of Cu-containing Low Alloy Steel of Long Part Forging for Offshore Applications by Optimizing Chemical Composition OMAE2019-95816
Yuta Honma[1] Gen Sasaki[1] Kunihiko Hashi[1] Fumiyoshi Minami[2]
1. The Japan Steel Works, Ltd., Muroran, Japan; 2. Osaka University, Ibaraki, Japan

Development of YS 500MPA Thick Steel Plate with Weld Joint CTOD Property for Offshore Structures OMAE2019-95465
Yusuke Terazawa[1] Katsuyuki Ichimiya[1] Keiji Ueda[1] Satoshi Igi[1] Toshitaka Tanaka[2] Akiyoshi Tsuji[2] Minoru Suwa[3]
1. JFE Steel Corporation, Kurashiki, Japan; 2. JFE Steel Corporation, Fukuyama, Japan; 3. JFE Steel Corporation, Tokyo, Japan

Effect of Tensile Pre-strain on Collapse Pressure of Coated Linepipe OMAE2019-95923
Takahiro Sakimoto[1] Tsunehisa Handa[1] Hisakazu Tajika[1] Yoshiaki Murakami[1] Joe Kondo[2]
1. JFE Steel Corporation, Chiba, Japan; 2. JFE Steel Corporation, Tokyo, Japan

Pipelines, Risers, and Subsea Systems

4-1-4 Flexible Pipes IV

Monday June 10 Room **Crowne Plaza, Staffa / Shuna** | **15:30 – 17:30**
Session Chair: Anh Tuan Do, TechnipFMC, France
Session Co-Chair: Murilo Augusto Vaz, COPPE/UFRJ, Brazil

Lean Global Analysis of Marine Slender Structures with Machine Learning OMAE2019-95147
Vinicius Ribeiro Machado da Silva, Matheus Santos, Mario Vignoles
TechnipFMC, Rio de Janeiro, RJ, Brazil

Non-linearly Restoring Performance and its Hysteresis Behavior of Dynamic Catenary OMAE2019-95651
Yilun Li[1] Shuangxi Guo[2] Yue Kong[1] Min Li[1] Weimin Chen[2]
1. Beijing University of Aeronautics and Astronautics, Beijing, China; 2. Institute of Mechanics, Chinese Academy of Sciences, Beijing, China

Flexible Riser Top Connection Analysis with I-Tube Interface and Bending Hysteresis Effect OMAE2019-95826
Yangye He[1] Hailong Lu[1] Murilo Augusto Vaz[2] Marcelo Caire[1]
1. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. COPPE/ Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Sensitivity Studies on Offshore Submarine Hoses on CALM Buoy with Comparisons for Chinese-Lantern and Lazy-S Configuration OMAE2019-96755
Chiemela Victor Amaechi[1] Jianqiao Ye[1] Xiaonan Hou[1] Fa-Cheng Wang[2]
1. Lancaster University, Lancaster, United Kingdom; 2. Tsinghua University, Beijing, China

Investigation on Mechanical Properties of Fiberglass Reinforced Flexible Pipes under Bending OMAE2019-95457
Yifan Gao[1] Shan Jin[2] Peng Cheng[1] Peihua Han[1] Yong Bai[3]
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, College of Civil Engineering and Architecture, Hangzhou, China; 3. Zhejiang University, Zhejiang, China

Pipelines, Risers, and Subsea Systems

4-2-5 SCRs and SLWRs II

Monday June 10 Room **Crowne Plaza, Castle 3** | **15:30 – 17:30**
Session Chair: Olav Fyrileiv, DNV GL, Norway

Strength and Fatigue Performance of Steel Lazy Wave Risers with Change in Configuration Parameters OMAE2019-95135
Mayank Lal, **Feng Wang**, Xiaohua Lu, Abhilash Sebastian
Genesis Oil and Gas Consultants, Houston, TX, USA

Improved Fatigue Design of SCR-modified Miner's Rule OMAE2019-95344
Hans Olav Knagenhjelm[1] Mons Hauge[2] Bård Nyhus[3]
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OMAE2019-96755 (Status: Abstract accepted) **Schedule:** June 10, 2019 03:30PM - 05:30PM

Technical Presentation

Sensitivity studies on offshore submarine hoses on CALM buoy with comparisons for Chinese-lantern and Lazy-S configuration

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SYMP 4 Pipelines, Risers, and Subsea Systems

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Topic: 4-1 Flexible Pipes and Umbilicals

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Session: 4-1-4 Flexible Pipes IV

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Abstract

With more developments into cost-effective offshore designs, the application of offshore hoses has been adapted for water depths that are not too deep, and for short-service life platforms. This has led to the advances on offloading and loading operations in the offshore industry based on the utilization of Catenary Anchor Leg Moorings (CALM) buoys. However variations in the soil stiffness and environmental conditions necessitates the investigation on the behaviour of the submarine hoses based on the structural and hydrodynamic behaviour. The sensitivity study will help hose manufacturers in the problem of submarine hose failures due to high curvatures. In this study, dynamic analysis is carried out based on the design of the submarine hoses attached to a CALM buoy for both cases of the Chinese-lantern configuration and Lazy-S configurations. Six mooring lines are attached to the CALM buoy with a water depth of 26 m and 100 m, respectively. Hydrodynamic simulation using ANSYS AQWA is first conducted and later coupled into the dynamic models in Orcaflex. Sensitivity studies were conducted to study the effect of wave height, flow angles, soil stiffness and hose hydrodynamic loads on the structural behaviour of the submarine hoses.

Status

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February 20, 2019

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Dear Chiemela Victor Amaechi

It is my understanding that you plan to participate in and present a paper at the 38th International Conference on Ocean, Offshore & Arctic Engineering, which is being held from June 9 – 14, 2019 in Glasgow, Scotland. This conference is being financially sponsored by ASME.

You will be presenting the paper **OMAE2019-96755** entitled "**Sensitivity studies on offshore submarine hoses on CALM buoy with comparisons for Chinese-lantern and Lazy-S configuration.**"

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Sincerely,

Jeff Patterson
Chief Operating Officer

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Director, Events Management

SENSITIVITY STUDIES ON OFFSHORE SUBMARINE HOSES ON CALM BUOY WITH COMPARISONS FOR CHINESE-LANTERN AND LAZY-S CONFIGURATION

ASME OMAE 2019 38th International Conference on Ocean, Offshore and Arctic Engineering,
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