

OMAE



2019

Glasgow



38th

International
Conference on
Ocean, Offshore and
Arctic Engineering

Glasgow, Scotland
June 9–14, 2019





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

Journal of Offshore Mechanics and Arctic Engineering

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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
European Research Council – Funding Opportunities for Creative Minds from All Over the World (SEC)
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 (WECCOMP)
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
Inspired by Myriad Laughing Waves: Euler, Navier, Stokes and Others (SEC)
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
Enjoyable Marine Engineering Researches on Sports, Environment, not only Water Wave Engineering, Nonlinear Hydrodynamic Forces and Statistics (SEC)
 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 Petroleum 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 Manoeuvrability 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	General 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 and 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.

Venue Floor Plans

We are using meeting rooms at the Scottish Event Campus (SEC) and the Crowne Plaza Hotel. There is a walkway/link joining the mezzanine level of the Crowne Plaza Hotel with the upper level of the SEC.

- Opening Ceremony** (SEC Armadillo)
- Exhibits, Refreshment Breaks, Lunches, Registration** (Hall 5, SEC)
- Concurrent Sessions** (Various Rooms, SEC and Crowne Plaza Hotel)
- Farewell Reception** (Argyll Suite, Ground Level, Crowne Plaza Hotel)

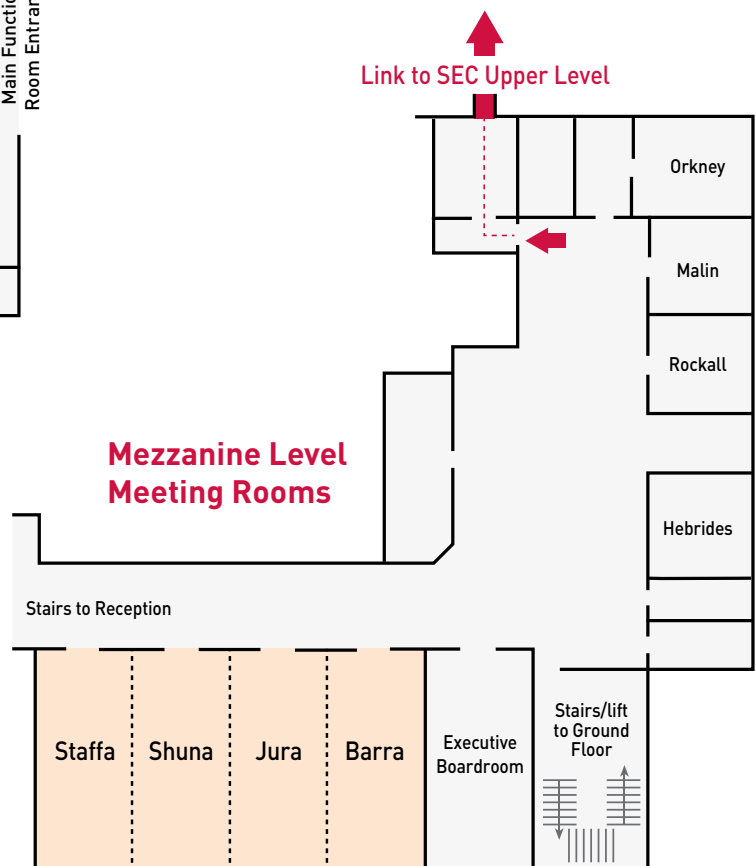
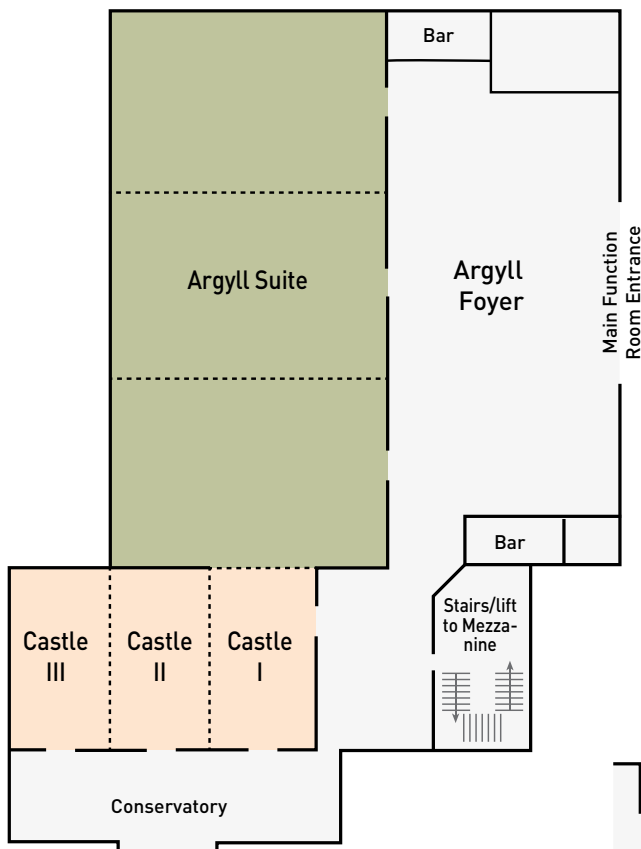
Room Location (Alphabetical)

 Armadillo	SEC-Armadillo
 Alsh 1	SEC-Ground
 Alsh 2	SEC-Ground
 Argyll Suite	Crowne Plaza-Ground
 Barra	Crowne Plaza-Mezzanine
 Boisdale 1	SEC-Ground
 Boisdale 2	SEC-Ground
 Carron 1	SEC-Upper
 Carron 2	SEC-Upper
 Castle 1	Crowne Plaza-Ground
 Castle 2	Crowne Plaza-Ground
 Castle 3	Crowne Plaza-Ground
 Dochart 1	SEC-Upper
 Dochart 2	SEC-Upper
 Etive	SEC-Ground
 Fyne	SEC-Ground
 Hall 5	SEC-Ground
 Jura	Crowne Plaza-Mezzanine
 Lomond Auditorium	SEC-Ground/Upper
 M2	SEC-Upper
 M3	SEC-Upper
 M4	SEC-Upper
 Shuna	Crowne Plaza-Mezzanine
 Staffa	Crowne Plaza-Mezzanine

Crowne Plaza Hotel

Crowne Plaza Hotel, Congress Road, Glasgow, G3 8QT
Tel: +44 (0)871 942 9091

Ground Level Meeting Rooms

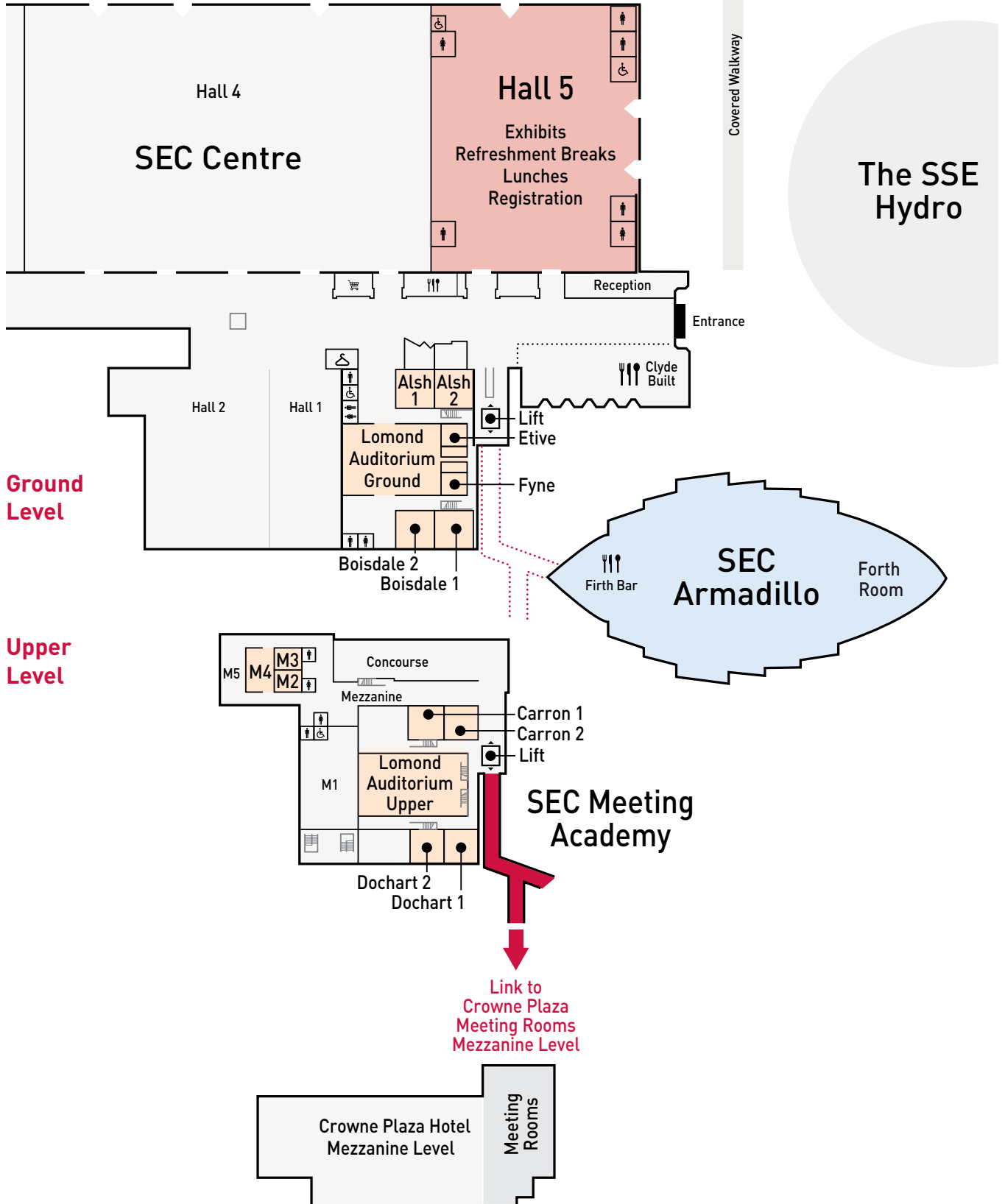


Scottish Event Campus (SEC)

SEC Centre, Exhibition Way, Glasgow City, UK G3 8YW
 Tel: +44 (0) 141 248 3000
 www.sec.co.uk



Exhibition Centre Station





Professor Atilla Incecik

Welcome from the Conference Chair

It is my great privilege and honour to welcome you all to the 38th International Conference on Ocean, Offshore and Arctic Engineering (OMAE) in Glasgow, Scotland, from 9 – 14 June 2019.

I am delighted that OMAE 2019 is being hosted by our Department of Naval Architecture, Ocean and Marine Engineering at the University of Strathclyde in Glasgow, Scotland. Established in 1883, and built on Glasgow's rich heritage of naval architecture and shipbuilding, we are one of the oldest Naval Architecture departments in the world. The Department of Naval Architecture, Ocean and Marine Engineering is part of the largest Faculty of Engineering in Scotland, and our University is home to over 22,000 students. Glasgow houses the second highest number of ship management companies after London, and has the largest shipyard in the UK, cementing the fact that Glasgow remains the hub of the UK's shipbuilding industry.

Over 900 papers have been accepted for the conference, organised around 13 symposia which will take place during the week. Monday's Opening Ceremonies will feature welcome speeches from the University of Strathclyde and the City of Glasgow, along with Keynote Presentations from industry. The conference features three afternoon lectures, including a presentation from the European Research Council on the ERC research funding programme. On Tuesday and Wednesday afternoon, we are pleased that our two conference honourees, Professor Rodney Eatock Taylor and Professor Takeshi Kinoshita, will be giving afternoon plenary lectures. Technical tours on Friday include visits to Subsea7 in Glasgow, the University of Strathclyde's Advanced Forming Research Centre and the Falkirk Wheel.

We have an exciting social programme organised for you including the Conference Banquet which will take place in Glasgow's Merchant City, one of Glasgow's oldest quarters dating back to the 1750s. Throughout the conference we will have a truly Scottish theme, introducing you to Scottish food and culture, giving you a real taste of Scotland which you are sure to remember!

Glasgow was this year named in the top ten of Time Out's best cities in the world for 2019, and has previously been named as one of the world's top ten must see cities by various publications including Rough Guides and the Telegraph. National Geographic named Glasgow as one of its 'Best of the World' destinations and we were also voted 'Friendliest City in the World' in Rough Guide 2016 – something I am sure you will agree with after your stay here!

Finally, the Conference could not be a success without the dedication and the hard work of many people. In particular I would like to recognize our Technical Programme Chair, Professor Krish Thiagarajan Sharman, our Local Organising Committee, Mrs Annabel Anderson (Marketing and Events Coordinator of the Faculty of Engineering at the University of Strathclyde), the many symposia and topic organisers, session chairs and reviewers, authors of papers and conference participants, our sponsors and exhibitors, ASME and Sea to Sky Meeting and Association Management staff, and our Volunteers, who will be around all week in the blue shirts to guide and assist you! Thank you all most sincerely.

I wish you all a very productive conference, and a most enjoyable stay in Glasgow.

—Professor Atilla Incecik
Conference Chair, OMAE 2019
Professor of Offshore Engineering
Associate Principal and Executive Dean
of the Faculty of Engineering
University of Strathclyde, Scotland, UK



Professor Krish
Thiagarajan Sharman

Welcome from the Technical Program Chair

It is a great pleasure for me to address you this year as the Technical Program Chair for this year's Ocean Offshore and Arctic Engineering Conference in the city of Glasgow, a city with deep and rich maritime traditions. Most of us attend the OMAE conference every year to delve into the depths of science, technology and engineering as displayed by the technical program. So it was with a sense of trepidation and respect that I took on the role of TPC for 2019.

Our program this year has exceeded our expectations with a large number of submissions. From the 1060 submitted abstracts, 916 technical papers and 38 presentations were accepted for the conference. Over the years, the technical program committee has continually focused on improving quality of the papers, which implied keeping an eye on the rejection rate. This year, the paper rejection rate is close to 6% of the draft papers that were submitted. You will be able to see improvements in quality as you enjoy the technical sessions. Another aspect we have been working on is to increase the number of technical presentations, which are accompanied by only an abstract. This gives opportunities for our colleagues from industry to present material that they may otherwise not be able to share with others. In consideration of this, please be sensitive about taking pictures of presentations during the sessions without permission from the speaker.

Apart from our regular symposia, this year we are proud to honor two exceptional individuals whose contributions to the fields of offshore engineering and marine hydrodynamics has

been legendary. Professor Rodney Eatock-Taylor has a long history of working on complex problems in wave mechanics and offshore platform dynamics. Professor Takeshi Kinoshita has done pioneering work on many aspects of ocean science and offshore engineering. We will hear from them about their life journeys through two afternoon lectures on Tuesday and Wednesday.

My role as this year's TPC would have been daunting if it were not for the tremendous support from all the symposium coordinators, topic and session organizers. I particularly want to acknowledge the support of Dr. Charles Smith, who handled the Ocean Renewable Energy Symposium while I was focused on the TPC role. Working with Professors Atilla Incecik and Antonio Fernandes, the LOC and Executive Committee has been a pleasure. The support given by Stacey Cooper at ASME and the Sea to Sky team has been invaluable.

I hope you will have a great time at OMAE 2019, and I look forward to seeing you again at future OMAE conferences.

—Professor Krish Thiagarajan Sharman
Technical Program Chair, OMAE 2019

Endowed Chair in Renewable Energy and Professor
Department of Mechanical and Industrial Engineering
University of Massachusetts Amherst, USA





Professor Antonio C. Fernandes

Welcome from the Ocean, Offshore and Arctic Engineering (OOAE) Division

Welcome to the Ocean, Offshore and Arctic Engineering Conference (OMAE), hosted by the American Society of Mechanical Engineers (ASME). This is the 38th edition of the conference, which is held annually around the world. *International* is one word. The OOAE Division volunteers and ASME staff (Houston and New York) come together each year with truly democratic rules to host this conference, seeking sustainable and safe use of ocean resources.

OMAE is an unusual conference for several reasons. It combines Academia with Industry to adapt scientific achievements into practical applications, leading to tangible technological successes. Industry has an obligation to make it feasible and safe. Academia has an obligation to verify the science. This is a wonderful play well represented in OMAE conferences. *Art* is another word. OMAE and its volunteers organize comprehensive Symposia, which organize sessions where one can enjoy professional presentations and discussions that lead to networking in the corridors and in the social events.

Starting last July, I had the honor to assume the mandate as Chair of the Executive Committee of the OOAE/ASME division. To put my journey to Chair into perspective, I remember my first OMAE conference in 1985 in Dallas, where I bought a Stetson cowboy hat. The next conference was in Florence, 1996,

where I listened to a Bach recital in a medieval church. By then I was convinced, and I have attended every OMAE conference since then 23 years in a row. This includes two conferences I helped organize with my friend Segen Farid Estefen, in 2001 and 2012. I have numerous cities and destinations to reminisce about, without forgetting the approximately 80 papers I have co-authored and presented so far. I strongly recommend participation in OMAE to my students and younger colleagues.

Through my OMAE experiences I have made many friends from all over the world, making me feel that I indeed belong to an international network that makes me a better professional. I profit from this and I can create and provide opportunities in this very stable, very productive community that has contributed to mankind's well-being through quality engineering and sustainable technological achievements.

Rewarding is the final word. Welcome to Glasgow!

—Professor Antonio C. Fernandes
OOAE Executive Division Chair

Head Ocean Engineering Program of COPPE/UFRJ LOC
(Laboratório de Ondas e Correntes – Waves and Currents
Laboratory), Coordinator LabOceano,
Director for International Affairs



Eva Bolander

Welcome from the Lord Provost of Glasgow

I'm delighted to welcome the 38th International Conference on Ocean, Offshore and Arctic Engineering to Glasgow.

Delegates, this is a city with a long and rich seafaring history as well as an unrivalled reputation for world-class shipbuilding and engineering. The term 'Clyde-built' synonymous across the globe, with quality and safety.

A tradition I'm proud to say, continues for Glasgow remains the home of the UK's largest shipyard BAE Systems. While nearby Rosyth boasts the largest engineering dockyard facilities. Both sites involved in delivering the Royal Navy's latest aircraft carriers – built by highly skilled workers BAE Systems Shipyards and assembled by equally accomplished workers at Babcock in Rosyth.

Meanwhile, your conference host, the University of Strathclyde is a leading provider of teaching and research in marine technology. Its Department of Naval Architecture, Ocean and Marine Engineering one of the world's oldest - established back in 1883.

Its enviable status enabling it to forge strong and meaningful links with maritime, offshore and renewable industries across the UK and worldwide.

The Department also has a winning team of postgraduate researchers and academic staff, the largest in Europe, committed to diverse, useful and innovative research, education and knowledge exchange.

It's an institution that is also home to the UK's largest engineering faculty with the capability to attract some of the finest minds to teach and learn.

The decision by the UK government to locate the Renewable Energy Catapult Centre on the university campus also emphasising Strathclyde's significant research capability.

You'll be aware, that Glasgow is also a major renewables hub. With some of the United Kingdom's largest offshore renewable companies choosing to locate here. Making it an obvious destination for conferences like yours.

I'm thrilled to have this opportunity to welcome the conference back to Glasgow and I'm sure you'll have a great experience and an enjoyable stay.

This is a city famed for its friendliness and hospitality. Recently ranked the 8th best city in the world by Time Out readers. It was also judged -by the same Time Out readers - as the most improved city in the world! That's something we're incredibly proud of.

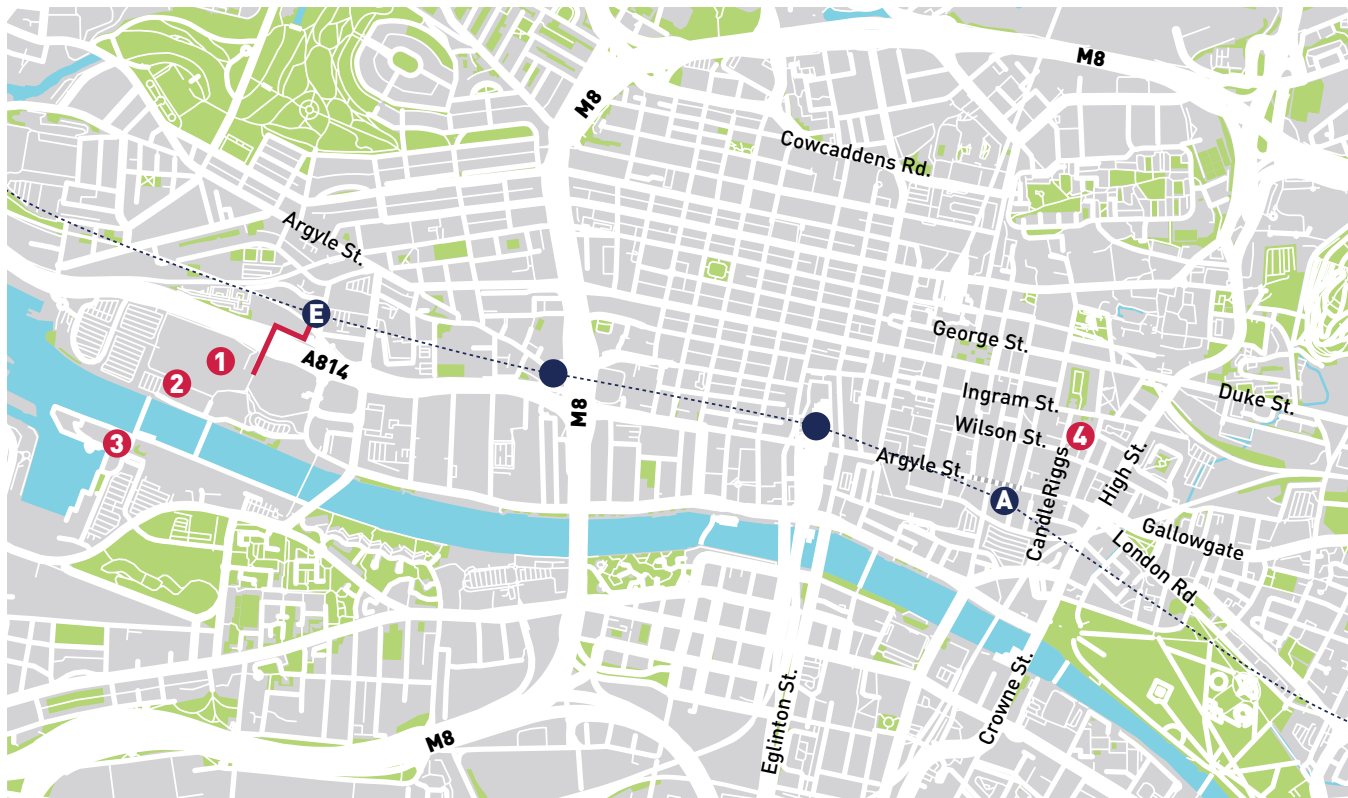
This forward-thinking, progressive and international city owes its status to the skills and expertise of its citizens. They're our greatest asset and consistently demonstrate that 'People Make Glasgow'.

Friends, I'm confident you'll enjoy your stay here and leave Glasgow with fond memories.

—Councillor Eva Bolander
Lord Provost of Glasgow



Glasgow City Map



- 1** **Scottish Event Campus (SEC)** (Conference Venue)
Exhibition Way, Glasgow, G3 8YW
- 2** **Crowne Plaza Hotel** (Breakout Session Rooms, Farewell Reception)
Congress Road, Glasgow, G3 8QT
- 3** **Glasgow Science Centre** (Welcome Reception)
50 Pacific Quay, Glasgow, G51 1EA
- 4** **Merchant Square** (Conference Banquet)
Candleriggs Street, Glasgow



— Covered walkway between SEC and the Exhibition Centre Station

E Exhibition Centre Station

A Argyle Street Station

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Award Winners

The Subrata Chakrabarti Young Professional Award

Dalila Gomes, for her outstanding presentation and paper OMAE2018-77547 “A Transient Flow Model for Investigating Parameters Affecting Kick Behavior in OBM for HPHT Wells and Backpressure MPD Systems”

OMAE 2018 Best Paper Awards

Offshore Technology Symposium, OMAE2018-78315
“Hydrodynamic Coefficients of Simplified Subsea Structures”
by Fredrik Mentzoni, Mia Abrahamsen-Prsic and Trygve Kristiansen

Structures, Safety and Reliability Symposium,
OMA2018-77402 “A Study on the Dynamic Ultimate Strength of Global Hull Girder of Container Ships Subjected to Hogging Moment” by Yasuhira Yamada and Kyoko Kameya

Materials Technology Symposium, OMAE2018-78672
“Integrity of Sour Gas Pipeline Despite Local Hard Zones” by Mamdouh M. Salama, Hernan Rincon and Stuart Wilson

Pipelines, Risers, and Subsea Systems Symposium,
OMA2018-78146 “Equivalent Layer Approaches to Predict the Bissymmetric Hydrostatic Collapse Strength of Flexible Pipes” by José Renato M. de Sousa, Marcelo K. Protasio and Luis V. S. Sagrilo

Ocean Space Utilization Symposium, OMAE2018-77201
“Validation of Applicability of Low Frequency Motion Analysis Theory Using Observation Data of Floating Offshore Substation” by Haruki Yoshimoto, Hisafumi Yoshida and Ken Kamizawa

Ocean Engineering Symposium, OMAE2018-77238 “Semi-Submersible Floater’s VIM Simulation Method for Mooring Line Safety Assessment” by Toshifumi Fujiwara

Polar and Arctic Sciences and Technology Symposium,
OMA2018-78080 “Investigating the Influence of Bridge Officer Experience on Ice Management Effectiveness Using a Marine Simulator Experiment” by Erik Veitch, David Molyneux, Jennifer Smith, and Brian Veitch

CFD & FSI Symposium, OMAE2018-78598 “Validation Exercises for a Free Falling Wedge into Calm Water” by João Muralha, Luís Eça, António Maximiano, and Guilherme Vaz

Ocean Renewable Energy Symposium, OMAE2018-77807
“Using Nonlinear Wave Kinematics to Estimate the Loads on Offshore Wind Turbines in 3-hour Sea States” by Tim Bunnik and Erik-jan de Ridder

Offshore Geotechnics Symposium, OMAE2018-78128
“Simulating the Response of Untrenched Flowlines due to Iceberg-Flowline-Soil Interaction” by Kenton Pike and Andrew Blundon

Petroleum Technology Symposium, OMAE2018-77515
“Experimental and CFD Study of Circulation Efficiency in Simulated Irregular Annulus” by Shreyansh Divyankar, Milad Khatibi, Rune Wiggo Time, Hans Joakim Skadsem and Jan Aage Aasen

Honoring Symposium for Professor Carlos Guedes Soares on Marine Technology and Ocean Engineering, OMAE2018-77672 “Autonomous Ship Navigation under Deep Learning and the Challenges in COLREGs” by L.P. Perera

Honoring Symposium for Professor Bernard Molin on Marine and Offshore Hydrodynamics, OMAE2018-78221 “Hydrodynamic Interactions of the Truncated Porous Vertical Circular Cylinder with Water Waves” by Charaf Ouled Housseine and Sime Malenica

Attendee Information

Registration

The Registration Desk is located in Hall 5, and is open during the following hours:

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

Name Badges

In addition to being a means of identification to colleagues, you are required to wear your name badge for admission to conference sessions and events. Room monitors will check name badges before allowing anyone into the session or event. Replacement badges are available at the Registration Desk at a cost of £20 per badge. Attendees who have paid the author/member, non-member or student registration fee are entitled to admission to all conference sessions, daily refreshment breaks, the Welcome Reception, the Exhibition, the four Lunches, the Conference Banquet and the Farewell Reception. These attendees will also receive a conference bag and a program.

Daily Registration: Attendees who have paid the one-day registration fee qualify for the badge representing the day they have selected to attend. Attendees wearing this badge are entitled to the following on their specified day: admission to conference sessions, refreshment breaks, the Exhibition and food and beverage service. The Conference Banquet is excluded from the daily pass. Daily attendees will also receive a conference bag and a program.

Accompanying Person: Guests who have registered as an accompanying person qualify for this badge and are entitled to admission to the Welcome Reception, the Conference Banquet and a special sightseeing tour on Monday.

Exhibitors: Exhibit staff have access to the Exhibition and may participate in the Welcome Reception, the four Lunches, the Conference Banquet, and the Farewell Reception. One representative from each exhibiting company is permitted to attend conference sessions.

Technical Tours and Social Events: Pre-purchased tickets for technical tours and social events are provided with your name badge.

ASME Crowd Compass App

Engage with sessions, speakers, and organizations, watch social networking in action, including posting on the in-app feed or sharing outside it. Download the Crowd Compass App from your app store. After installation, search for OMAE and download. Once OMAE is downloaded, you can set up a login. You will then receive a verification email with a code you need to enter in the app. Once you have entered the code in the app, this will grant you access to the event.

Author Presentations

If you are a Presenter, please be in the session room 30 minutes prior to the start of the first presentation of your session in order to upload your presentation. You may also upload your presentation any time prior to your talk on the computer in your session room. Screens aspect ratios are 4:3 in Crowne Plaza and 16:9 in SEC session rooms.

Conference Evaluation

Our aim is to deliver a conference that is an enjoyable and educational experience. We rely on your full and honest feedback to improve future conferences. An online survey will be emailed to you following the conference and we appreciate your time and assistance in completing the survey and providing your feedback.

Dietary Requirements

If you advised the Conference Secretariat of your special dietary needs during the registration process, a special meal has been prepared for you. For lunch on Monday, please advise your server of your special requirement. On Tuesday, Wednesday and Thursday, an allergen buffet station will be available where the servers will provide a meal to meet your dietary requirements. Vegetarian meals will be served on the regular buffet stations.

If you did not advise the Conference Secretariat of your special dietary needs during the registration process, advise the staff at the Registration Desk before 18:00 on Sunday, June 9.

First Aid

For medical first aid assistance, please visit the First Aid Room on the main SEC Centre concourse. The nearest hospital is the Queen Elizabeth University Hospital, a ten-minute drive from the Conference venue. Dial 999 or 112 to contact UK emergency services.

Internet

Free Wi-Fi internet is provided by the conference. The network names are "SEC Wi-Fi" and "CrownePlaza". No password is required.

Lost & Found

Should you lose or misplace an item, please go to the Information and Business Centre, located on the public concourse of the SEC Centre.

Meeting Room Protocol

Every effort will be made to ensure that all sessions start and end on time. Presenters and attendees are asked to work together to achieve this. This may mean having to cut short a valuable discussion; however, conference organizers request your cooperation for the benefit of all attendees. Please turn your cell phone and other noise making devices off or set to silent.

Smoking

Smoking, including the use of e-cigarettes, is not permitted within the Hotel and SEC Centre. Smoking shelters are located on the campus grounds.

Social Events

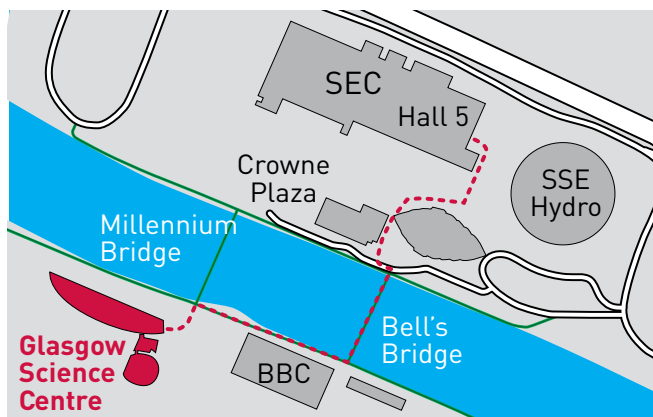
Welcome Reception

Sunday, June 9, 18:30 – 20:30

Location: Glasgow Science Centre
(50 Pacific Quay, Glasgow)

The Rt Hon The Lord Provost Councillor Eva Bolander is hosting the Welcome / Civic Reception at the Glasgow Science Centre, one of Scotland's most popular visitor attractions. Enjoy appetizers and drinks while exploring interactive science displays including "Powering the Future" and "Quantum Technologies"! The Glasgow Science Centre is a five minute walk from the conference venue.

Welcome Reception courtesy of The Rt Hon The Lord Provost Councillor Eva Bolander



Register in Hall 5 at SEC Centre then follow the walking paths across the River Clyde to the Glasgow Science Centre.

Refreshment Breaks

Monday, June 10 to Thursday, June 13

Morning: 10:00 – 10:30 / **Afternoon:** 15:00 – 15:30

Location: Hall 5 (SEC)

Refreshment breaks will take place amongst the exhibits.

Lunches

Monday, June 10 to Thursday, June 13

Location: Hall 5 (SEC)

Monday: Opening Lunch (12:00 – 13:30)
Tuesday: Lunch (12:00 – 13:30)
Wednesday: Lunch (12:00 – 13:30)
Thursday: Technical Session Organizers Lunch (12:00 – 13:30)

Lunch is open to all attendees when lunch is included in their fee.

Monday lunch sponsored by Elsevier



Thursday lunch sponsored by Greater Ft. Lauderdale Convention Bureau

GREATER FORT LAUDERDALE
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Afternoon Drinks Reception

Monday, June 10, 18:15 – 19:15

Location: Hall 5 (SEC)

Celebrate the first day of the conference with Afternoon Drinks amongst the exhibits.

Conference Banquet

Wednesday, June 12, 19:00 – 24:00

Location: Merchant Square (Candleriggs Street, Glasgow)

Transportation to and from the banquet venue via ScotRail train: Walk 8 minutes to the Exhibition Centre Station located across the street from The SSE Hydro via a covered walkway, and board the ScotRail train to the Argyle Street Station (three stops). Exit the station and walk east for 5 minutes along Argyle Street. Take a left on Brunswick Street and walk for about 3 minutes then right onto Wilson Street for 2 minutes. The destination will be in front of you. Look for directions and a map to Merchant Square in the conference app or refer to the map on page 10. You will have the option of sampling menus from each of the restaurants and drinks from any of the conveniently located bars. After dinner we'll put on an old fashioned Ceilidh with great music and dancing to the wee hours!

Farewell Reception

Thursday, June 13

17:30 – 19:00

Location: Argyll Suite,
Crowne Plaza Hotel

Sponsored by Greater Ft. Lauderdale Convention Bureau

GREATER FORT LAUDERDALE
CONVENTION & VISITORS BUREAU

Hosted by the OMAE 2020 committee, celebrate the end of another amazing conference and find out more about next year's conference in Fort Lauderdale, USA. Get a taste of the tropical beach destination awaiting you in 2020 with Florida themed appetizers, drinks and salsa music provided by "Son Sabroso".

Accompanying Persons Program

Monday Tour, June 10

Departure: 08:45

Departure Point: Registration Desk, Hall 5, SEC Centre

The Accompanying Persons Program includes admission to the Welcome Reception, the Conference Banquet and a tour on Monday, June 10 to Loch Lomond including a boat cruise.

Sightseeing Tours

Discounted rates for OMAE 2019 conference attendees and accompanying persons are available for a selection of tours to discover the stunning surroundings of Glasgow and Scotland.

Below is an introduction to the tours available through our partner Rabbie's Tours. OMAE 2019 attendees and accompanying persons receive a 10% discount on the published rates. A Tour Desk will be available in Hall 5 on Monday, June 10th between 10:00 –15:30. To apply the discount, please enter the tour discount code OMA1466 during the check out process when booking the tour on www.rabbies.com. The code is valid until June 30, 2019.

Loch Lomond & Whisky Distillery: Half day tour

Combine a famous loch with a world-renowned whisky on this afternoon trip to the Highlands.

Culzean Castle, Burns Country & the Ayrshire Coast: 1 day tour

Discover the landscapes and myths that inspired Scotland's most famous poet, Robert Burns.

Stirling Castle, Loch Lomond & Whisky: 1 day tour

Journey into the Highlands and the heart of Loch Lomond on this tour from Glasgow.

Oban, Glencoe, Highland Lochs & Castles: 1 day tour

See epic ruined castles, listen to tales of old clan rivalries, and venture through brilliant mountain scenery on this tour to the Scottish Highlands.

Outlander Adventure: 1 day tour

Visit three castles and a well-preserved village on this adventure through the sights and stories of Outlander.

Loch Ness, Glencoe & the Highlands: 1 day tour

Myths, monsters, and mountains: this tour is the best way to see 'Scotland in a day'.

The Isle of Skye: 3 day tour

Venture through breath-taking landscapes, quaint villages and epic castles on this journey to the 'Misty Isle'.

Mull & Iona: 3 day tour

Journey to Mull and discover a paradise for wildlife enthusiasts, history addicts, and seafood connoisseurs.

Isle of Arran Adventure: 3 day tour

Explore the beautiful Isle of Arran and Robert Burns Country.



Sponsors & Exhibitors

HOST



The Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde
www.strath.ac.uk/engineering/navalarchitectureoceanmarineengineering/

The Department of Naval Architecture, Ocean and Marine Engineering at the University of Strathclyde is one of the premier providers of teaching and research in marine technology. The Department, which is one of the oldest Naval Architecture departments in the world, established in 1883, has strong links with the maritime and offshore industry in the UK and worldwide in research, education and knowledge exchange activities related to marine and offshore hydrodynamics, ship stability and safety, marine and offshore structures, offshore engineering, marine and offshore structures, marine renewable energy, marine engineering and emerging technologies.

CONFERENCE SUPPORTER

Glasgow Convention Bureau



Glasgow City Council



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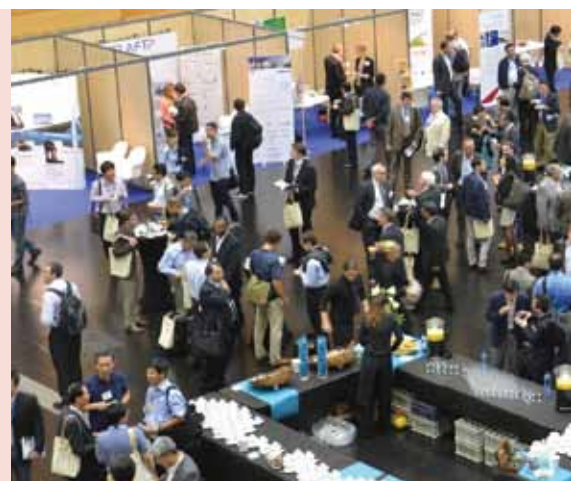
Exhibition

Visit the exhibits to discover new products and services from some of the industry's leading organizations. Coffee and tea will be served amongst the exhibits during Refreshment Breaks.

Location: Hall 5, SEC

Dates & Times:

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



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Elsevier is a world-leading provider of scientific, technical and medical information products and services. The company works in partnership with the global science and health communities to publish more than 2,000 journals, including The Lancet, Cell and Ocean Engineering, Applied Ocean Engineering, Coastal Engineering and Marine Structures.

REFRESHMENT BREAK SPONSORS

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Fugro provide the people, equipment, expertise and technology that support the exploration, development, production and transportation of our world's natural resources. They can provide the technical data and information required to design, construct and maintain client structures and infrastructure in a safe, reliable and efficient manner.

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Lankhorst provides high quality engineered products for offshore risers and flow lines. With their unique thick-walled plastic production technology, they can supply innovative high performance products to meet the demands of the offshore industry. From piggy-back-blocks and clamps for laying pipelines and vortex-induced-vibration-suppression riser protection, through to bend restrictors, Lankhorst's precision engineered components deliver outstanding performance in the most demanding subsea environments. Clients can rely on their proven track record having delivered hundreds of projects all over the world, from the most northern platforms to the deepest waters.

Malin Group

www.malingroup.com



The Malin Group represents a collection of companies under common ownership that offer a diverse and comprehensive set of services to our clients. Our in house team of naval architects, structural engineers, marine engineers, draughtsmen and project managers have a wealth of practical experience across a broad range of projects, including marine, heavy lift, fabrication and complex transportation projects. Malin are in a unique position where we can offer support for the lifecycle of a project, whether it be at Front-End Engineering Design (FEED) stage, through detailed design, fabrication, delivery and installation.

Orcina

www.orcina.com



Orcina is a professional engineering software house specialising in the fields of offshore dynamics, risers, moorings, towed systems and installation procedures. We develop and sell leading edge commercial software packages including OrcaFlex (with VIV analysis), OrcaLay and OrcaBend. We also undertake feasibility and design studies, design audit, and engineering systems analysis.

Our main product is OrcaFlex, the market-leading numerical simulation program for modelling flexible and rigid risers, moorings, cable and pipe lay, pipeline pull-in, towed arrays, installation sequences and many other systems. OrcaFlex provides the best-in-class complete design environment for offshore dynamics.

Siemens

www.plm.automation.siemens.com/global/en/products/simcenter/



Siemens Industry Software NV (SISW) helps manufacturers worldwide bring innovative products to market faster and with greater confidence, by offering them a comprehensive solutions portfolio, called Simcenter™ solutions. This uniquely combines test, system simulation, 3D CAE, CFD and design space exploration, as well as engineering services.

By employing Simcenter, major industry players can more effectively design and optimize key performance aspects, while dealing with complexities such as ever-increasing mechatronics, additive manufacturing, and concepts like cloud or the internet of things.

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Supergen ORE

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Supergen

The Supergen Offshore Renewable Energy (ORE) Hub is an Engineering and Physical Sciences Research Council (EPSRC) funded programme that brings together academic and industrial expertise from across the Offshore Renewable Energy

(ORE) sector. The vision of the Hub is to provide research leadership to connect academia, industry, policy and public stakeholders, inspiring innovation and maximising societal value in offshore wind, wave and tidal energy. The Hub is central to the UK ORE community, bringing together shared skills and expertise, transferring fundamental knowledge, and sharing learning and use of resources for inter-disciplinary research, whilst taking a whole systems approach.

TWI

www.twi-global.com



TWI is a world leading research and technology organisation. Bases in the UK and globally see 800 staff provide technical support in joining and technologies such as material science, structural integrity, NDT, surfacing, electronic packaging and cutting. Services include generic research, contract R&D, technical information, consultancy, standards drafting, training and qualification. TWI offers a single, impartial source of service for joining engineering materials.

TWI is internationally renowned for its multidisciplinary teams that implement established or advanced joining technology solving problems at any stage – from initial design, materials selection, production and quality assurance, through service performance and repair.

Engineering at the University of Strathclyde

www.strath.ac.uk/engineering



The University of Strathclyde is the third largest university in Scotland and our Faculty of Engineering is largest in Scotland, with eight world-class engineering departments.

We have an established record of research excellence evidenced through our expanding research portfolio of over £100 million. Much of our engineering research is done with industry and we work to provide specific business solutions for many engineering sectors.

Our Department of Naval Architecture, Ocean and Marine Engineering has Europe's largest team of postgraduate researchers and academic staff to sustain the production of useful and innovative research ideas. We work closely with key UK and global industry partners and take part in many diverse research projects and networks funded by the UK government, the marine and offshore industry and the EU.

TECHNICAL PROGRAM





Professor Rodney
Eatock Taylor

Professor Rodney Eatock Taylor Honoring Symposium on Marine and Offshore Hydrodynamics

The OMAE 2019 Conference is pleased to dedicate a Special Symposium in honour of Professor Rodney Eatock Taylor. Professor Eatock Taylor has made a significant contribution to the field of Marine and Offshore Hydrodynamics.

Professor Rodney Eatock Taylor (FREng, FRINA, FIMEchE) graduated from King's College, Cambridge (Mechanical Sciences followed by Fine Arts, 1965), and obtained his PhD in Civil Engineering from Stanford University (1968). After two years as a structural engineer with Ove Arup and Partners in London he joined University College London, working on ship structures with Professor R. E. D. Bishop. He became Professor of Ocean Engineering at UCL (1984) and Dean of Engineering (1988-1989). Since then he has been at the University of Oxford as Professor of Mechanical Engineering (now Emeritus), and Head of Engineering Science (1999-2004). His research interests

have concerned vibrations of offshore platforms, numerical and analytical hydrodynamics, hydroelasticity of ships and very large floating structures, and marine renewable energy. This work has been published in some 280 journal articles and conference papers.

He was the UK Representative on the Standing Committee of the ISSC (1992-2000). In 2005-06 he was the 28th Weinblum Memorial Lecturer. Elected as a Fellow of the Royal Academy of Engineering in 1990, he was a Vice-President (2004-2007). In 2008 he was made an Honorary Fellow of University College London and an Honorary Professor of Harbin Engineering University. He has been Visiting Professor at Ecole Centrale de Nantes (1983, 1997), the Research Institute for Applied Mechanics (RIAM) of Kyushu University (1997), the National University of Singapore (2009-2015); and Adjunct Professor at the University of Western Australia from 2015.



Professor Takeshi
Kinoshita

Professor Takeshi Kinoshita Honoring Symposium on Offshore Technology

The OMAE 2019 Conference is pleased to dedicate a Special Symposium in honor of Professor Takeshi Kinoshita. Professor Kinoshita has made a significant contribution to the field of Offshore Technology.

Professor Kinoshita graduated from the department of Naval Architecture of the University of Tokyo with BSc, MSc and PhD.

After his appointments as a lecturer and associate professor in the Department of Naval Architecture at the National Yokohama University Professor Kinoshita was appointed as an associate professor, the Institute of Industrial Science, the University of Tokyo and promoted to a full professor at the same institute.

Professor Kinoshita was seconded to the Japan Society of Promotion of Science as its London Office Director.

After his retirement from the University of Tokyo Professor Kinoshita was appointed as a professor in the Department of Oceanic Architecture, Nihon University.

Professor Kinoshita was the President Nagasaki Institute of Applied Science and is now a visiting Professor at Nagasaki Institute of Applied Science.

Professor Kinoshita received the Appreciation Award, ASME OOA Division in 2007, and ASME Best Paper Award, ASME OOA Division in 2010, ASME.

Afternoon Lecture Series



Monday, June 10
17:40 – 18:10
Location: Lomond Auditorium

European Research Council – Funding Opportunities for Creative Minds from all over the World

Dr.-Ing. Luiz Alves dos Santos

Dr.-Ing. Luiz Alves dos Santos,
Scientific Officer, European Research Council

A presentation about the ERC's mission – to encourage and support the highest quality frontier research in Europe through competitive funding, its funding schemes and opportunities, the evaluation process, and sources of relevant information. Particular remarks would be on the investigator-driven approach of the Work Programme (no thematic specific calls) and on the openness of the programme to non-EU nationals.

L. Santos is a scientific officer at the European Research Council assigned to the management of programmes and projects in the areas of research addressed by the Product and Processes Engineering panel. His technical background is in mechanical engineering and computer sciences, with work experience in the private sector, academia, and public organizations.



Tuesday, June 11
17:40 – 18:30
Location: Lomond Auditorium

Inspired by Myriad Laughing Waves: Euler, Navier, Stokes and others

Professor Rodney Eatock Taylor

Professor Rodney Eatock Taylor,
Emeritus Professor, University of Oxford

Who are these people whose names grace the equations many of us use so regularly: Euler, Laplace, Navier, Cauchy, Stokes, Kelvin etc? The lecture will discuss brief aspects of the lives of some of nineteenth century European scientists who were pioneers in the field of hydrodynamics, and some of their interactions.

See page 21 for Professor Rodney Eatock Taylor's bio.



Wednesday, June 12
17:40 – 18:30
Location: Lomond Auditorium

Enjoyable Marine Engineering Researches on Sports, Environment, not only Water Wave Engineering, Nonlinear Hydrodynamic Forces and Statistics

Professor Takeshi Kinoshita

Professor Takeshi Kinoshita, *Visiting Professor, Nagasaki Institute of Applied Science*

These several decades we have seen big changes in the field of the ocean technology. In 1983 I firstly studied abroad, in Scotland. At that time the tension leg platform was quite a new concept for deep water structures. Research on wave energy utilization was a kind of fashion for marine hydro dynamists. Offshore oil & gas industry is now one of the most important worldwide businesses. Marine renewable energies are now recognized as really the most promising energy resource. Ocean technology have to contribute the improvement of their safety, reliability and cost reduction. On the other hand the marine sports engineering is also valuable for life and “enjoyable”, and recovering from the environmental damage on ocean and coastal zone is inevitably important and in fact “enjoyable” because of truly interdisciplinary collaboration work with many fields of sciences.

See page 21 for Professor Takeshi Kinoshita's bio.

Saturday, June 8



Dr. Tahsin Tezdogan

Short Course

Corrosion and Fouling in Marine Environment

09:00 – 17:00

Location: Jura (Crowne Plaza)

Instructors:

Dr. Tahsin Tezdogan, *Senior Lecturer, University of Strathclyde*

Dr. Yigit Kemal Demirel, *Lecturer, University of Strathclyde*



Dr. Yigit Kemal Demirel

This course is split into two parts, i.e. corrosion and fouling. The first part will cover the corrosion concept in marine environment and the prevention methods. It will focus on the combined use of both cathodic protection (CP) and coatings for ships and offshore structures. A hands-on tutorial will be performed to show the

CP calculation procedure. The second part of the course aims to provide the fundamental concepts of marine biofouling, state-of-the-art fouling control coatings, and the roughness effects of biofouling and coatings on the boundary layer. This module also aims to describe how to estimate the effect of biofouling on the performance of marine vehicles in terms of resistance/power increase through state-of-the-art numerical and experimental approaches.

Short Course

Verification & Validation of Industrial CFD

09:00 – 17:00

Location: Staffa/Shuna (Crowne Plaza)

Instructor:

Luís Eça, *Assistant Professor, IST*



Luís Eça

CFD simulations have become an engineering tool that complements model testing. As for physical models, such capability requires the assessment of the quality of the results, which depends on the mathematical model (basin for physical models) and its numerical solution (instrumentation for experiments).

This course teaches CFD practitioners to distinguish numerical and modelling errors. It presents the definitions of the different contributions to the numerical error of steady and unsteady flow simulations. Techniques to quantify numerical (Verification) and modelling errors (Validation) in industrial

Time	Title	Location
09:00 – 17:00	Short Course Corrosion and Fouling in Marine Environment	Jura (Crowne Plaza)
09:00 – 17:00	Short Course Verification & Validation of Industrial CFD	Staffa/Shuna (Crowne Plaza)
17:00 – 19:00	Outreach Team Building Exercise	Staffa/Shuna (Crowne Plaza)
19:00 onwards	Outreach Welcome Dinner	Off-site

CFD Simulations are presented including examples from practical simulations. The course provides a framework for the establishment of the credibility of simulations so that they can be safely used for engineering decisions.

You will learn how to demonstrate the quality of your CFD simulations and evaluate the accuracy of the mathematical models behind those simulations.



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mail@oceanstar.com.sg

Sunday, June 9

Time	Title	Location
08:00 – 17:00	Outreach Welcome & Introductions plus Industry Presentations	Castle 1
09:00 – 17:00	Short Course Offshore Wind Turbines: Dynamic Analysis and Marine Operations	Jura
09:00 – 17:00	Short Course Introduction to Machine Learning and Data-driven Modelling Methods for Engineering Applications	Castle 2
18:30 – 20:30	Welcome Reception	Glasgow Science Centre



Erin Bachynski

Short Course

Offshore Wind Turbines: Dynamic Analysis and Marine Operations

09:00 – 17:00

Location: Jura (Crowne Plaza)

Instructors:

Erin Bachynski, *Norwegian University of Science and Technology*

Zhen Gao, *Norwegian University of Science and Technology*

This course reviews several considerations related to design and operation of offshore wind turbines. Fundamental concepts in aerodynamic (with focus on blade element/momentum theory) and hydrodynamics (with focus on first and second order radiation-diffraction

and Morison-type models) load calculation are presented. The course addresses theoretical background and important practical considerations for structural response analysis considering these load components simultaneously, including wind turbine control, for ULS and FLS design check. A brief review of the state-of-the-art in combined wind-wave testing and the status of validation of the integrated design tools will be provided. Finally, marine operational issues related to transport, installation and access to wind turbines for maintenance and repair, with focus on numerical simulation of onsite installation and weather window analysis, are discussed.



Andrea Coraddu

Short Course

Introduction to Machine Learning and Data-driven Modelling Methods for Engineering Applications

09:00 – 17:00

Location: Castle 2 (Crowne Plaza)

Instructors:

Andrea Coraddu, PhD, *Lecturer in Marine Engineering, University of Strathclyde*

Christos Gkerekos, MEng, PhD *Researcher, University of Strathclyde*



Christos Gkerekos

The course will focus on Data-driven models for engineering applications, including linear and nonlinear models, model selection and error estimation. Numerical examples

and real-life problems will be proposed and analysed, from bearings fault prediction, to fuel consumption optimisation. All course material will be freely available in PDF format for a complete understanding of the related subjects as well as for future consultation. During the afternoon session, a hands-on workshop will be organised with numerical examples focused on various aspects of Data-driven models. The course is designed for professionals who are interested in data analysis and machine learning applications. An engineering background, statistical and numerical skills would be beneficial but not necessary.



Zhen Gao

Welcome Reception

18:30 – 20:30

Location: Glasgow Science Centre

Welcome / Civic Reception courtesy of The Rt Hon The Lord Provost Councillor Eva Bolander. See Social Events, page 14 for more details.



Monday, June 10

Time	Title	Location
08:30 – 19:15	Exhibition open	Hall 5 (SEC)
08:30 – 10:00	Opening Ceremony and Keynote Plenary One Awards Presentations	SEC Armadillo
10:00 – 10:30	Refreshment Break	Hall 5 (SEC)
10:30 – 12:00	Keynote Plenary Two Keynote Panel	SEC Armadillo
12:00 – 13:30	Opening Lunch	Hall 5 (SEC)
13:30 – 15:00	Concurrent Sessions	See pages 27–31 for session titles, authors and locations
15:00 – 15:30	Refreshment Break	Hall 5 (SEC)
15:30 – 17:30	Concurrent Sessions	See pages 31–35 for session titles, authors and locations
17:00 – 18:15	ASME & IMechE Connect Roundtable	Forth Room
17:40 – 18:10	Afternoon Lecture Series	Lomond Auditorium (SEC)
18:15 – 19:15	Afternoon Drinks Reception	Hall 5 (SEC)

OPENING CEREMONY AND KEYNOTE PLENARIES

08:30 – 10:00

Location: SEC Armadillo

Opening Ceremony

Professor Atilla Incecik, Conference Chair, OMAE 2019

Professor Krish Thiagarajan Sharman, Technical Program Chair, OMAE 2019

Professor Antonio C. Fernandes, OMAE Division Chair

Professor Sir Jim McDonald, Principal, University of Strathclyde

Bailie Jacqueline McLaren on behalf of the Lord Provost of Glasgow, Eva Bolander



Professor Atilla Incecik



Professor Krish Thiagarajan Sharman



Professor Antonio C. Fernandes



Professor Sir Jim McDonald



Glasgow City Council



Dr. Bas Buchner

Keynote Plenary One

Blue Oceans: Offshore Research for Future Maritime Challenges

Dr. Bas Buchner, *President, MARIN*

What trends do we foresee in offshore energy and transport over sea? What are the related challenges for offshore engineering? Do renewable energy, food from the seas and floating infrastructure provide new opportunities for the offshore industry and its offshore engineers?

Based on the project 'Blueprint 2050: The Maritime World Beyond the Horizon' in The Netherlands, Dr. Bas Buchner (MARIN) will discuss questions such as: Can we use our FPSO knowledge to develop floating energy hubs for zero emission shipping with Hydrogen, liquid Methane or Ammonia? How do we use our offshore platform knowledge to support fixed and floating mega wind turbines? Can we develop floating ports and cities to cope with sea level rise and overpopulation? What is the role of autonomy and digitalisation at sea? What is the role of future Offshore Engineers and what are their tools?

Dr. Bas Buchner studied at Delft University of Technology and graduated in 1991. He joined MARIN and was responsible for many offshore model test and simulation projects related to mooring, platform response, offloading analysis and wave impact loading. He specialised in the topics of extreme waves, green water loading and wave impacts. He completed his PhD on the subject of 'Green Water Loading on Ship Type Offshore Structures' (2002). He was Manager of the MARIN Offshore Department from 2000 to 2010 and was the leader of many Joint Industry Projects (JIP's) in the Offshore sector. He was the Chairman of OMAE 2011 in Rotterdam and has authored more than 50 papers in the field of Offshore Hydrodynamics. Since 2011, he is President of MARIN.

Awards

The Subrata Chakrabarti Young Professional Award recipient and the OMAE 2018 Best Paper Awards recipients will be recognized. See page 12 for more details.

Refreshment Break

10:00 – 10:30

Location: Hall 5 (SEC)

Refreshment break sponsored by TechnipFMC



OPENING CEREMONIES AND KEYNOTE PLENARIES (Continued)

10:30 – 12:00

Location: SEC Armadillo



David Dickson

Keynote Plenary Two

Advancing a Lower Carbon Future

David Dickson, Vice President, Global Operations, Regions, BP

David Dickson's presentation focuses on:

- More energy, fewer emissions; and
- Engineering being part of the solution

Dave Dickson joined BP as a Graduate Engineer in 1989.

He is currently the VP Global Operations (Regions), within the upstream segment for BP, with a strong and diverse background in Engineering and Operations, Dave covers upstream production facilities offshore and onshore across the BP portfolio in the Eastern Hemisphere.

He is responsible for the Safe, Reliable operations across a broad range of operating facilities, ensuring conformance to BP's Operations Management System, it's HSSE standards and expectations, its operating standards and processes.

Dave began his BP career as a Mechanical Engineer in the North Sea and has acquired deep, engineering, operating and HSE experience in Upstream and Downstream assets including assignments in Engineering and Operations Management in both Upstream Oil and Gas Production facilities and downstream Chemical and Refining facilities.

Dave graduated from the University of Strathclyde, Glasgow with a Bachelor of Engineering - Mechanical Engineering. He is a Chartered Engineer with the Institute of Mechanical Engineers and a Fellow of the Institute of Mechanical Engineers.



Xiaozhi (Christina) Wang

Keynote Panel

Offshore Digital Panel

Moderator: Xiaozhi (Christina) Wang, PhD, Vice President, Global Marine, American Bureau of Shipping (ABS)

Dr. Xiaozhi (Christina) Wang, is currently Vice President of Global Marine American Bureau of Shipping (ABS), focused on strategy and

business development. Prior, Dr. Wang held positions as ABS Vice Presidents of Global Engineering and Technology and Advanced Technology and Research, implementing research and development efforts for developing new and innovative technologies.

Dr. Wang received her B.S. in Naval Architecture and Ocean Engineering from Shanghai Jiao Tong University, her MSc and

PhD degrees in Marine Structures from the Norwegian University of Science and Technology. She is a fellow in SNAME and ASME. She also completed the Stanford University Executive Program.



Professor Kjetil Skaugset

Digitalization — Changing the way to provide energy

Professor Kjetil Skaugset, PhD, Chief Researcher Upstream and Downstream, Technology, Equinor Expert Centre, Equinor ASA

Kjetil Skaugset will take the audience through a digital journey seen from an energy company point of view.

Importance of digital technologies to improve safety, value creation as well as reduction in environmental footprint will be highlighted. Examples will be given across the value chain on present digital initiatives as well as future opportunities offered by a digital transformation.

Kjetil Skaugset studied at Norwegian University of Science and Technology (NTNU) and graduated with a PhD in 2003. He subsequently held post doc positions at Massachusetts Institute of Technology (MIT), and Centre for Ships and Offshore Structures (CeSOS) at NTNU. Kjetil has also worked at the Norwegian Marine Technology Research Institute (MARINTEK) in Trondheim.

Joining Statoil in 2005, he assumed responsibilities for research and development within the area of platform technology. He has since been central in several major field development projects in Statoil. Kjetil has been managing researchers within arctic, pipeline and deep-water technology in Statoil.

The last 7 years (2012-2019) Kjetil has been the Chief Researcher Upstream and Downstream Technology in Equinor. That responsibility entails corporate technical responsibility for all new technologies between wellhead and market in the oil and gas value chain in addition to renewables, new value chains and HSE technologies.

He is currently Board member Centre of Excellence Autonomous Marine Operations and Systems (AMOS) at NTNU, Chairman of the Board of Norwegian Forum for Marine Minerals and heads up the national research strategy OG21 in Norway, technology target area "Future technologies for production, processing and transportation".



Frederic Dabe

The exciting journey to deliver an As-Built Digital Twin

Frederic Dabe, Digital Transformation Director, SBM Offshore

SBM Offshore believes the oceans will provide the world with safe, sustainable and affordable energy for generations to come. Since many years, the

company is delivering large floating energy production systems, involving thousands of tons of steels and millions of man-hours.

Digitalization is a key element in SBM Offshore's strategy in order to improve safety, sustainability & affordability of its solutions. In this era of digital transformation, we now have the opportunity to deliver a digital twin at the same time we are delivering the physical asset.

The potential of a digital twin is impressive and will bring value across the entire life cycle of the asset. It also represents an important paradigm shift for the Engineering, Procurement and Construction value chain both at company level and at the scale of its ecosystem.

Frederic started his career in the naval and nuclear sector as piping production manager and later construction manager. He then spent 6 years developing naval robotics solutions before joining the oil & gas industry.

Covering the full EPC scope, Frederic has delivered many projects (FPSO, FSRU, TLP, CPP, ...), conducted successful transformations and led business units in Europe, Middle East and Asia.

More recently, Frederic was deeply involved with Industry 4.0 projects, working on transformation roadmap and deployment of digital solutions.

Driven by operational excellence and innovation, Frédéric has joined SBM Offshore to lead the overall digital transformation of the group.

OMAE 2020 Presentation

Professor Manhar Dhanak, Conference Chair, OMAE 2020
Professor Ron W. Yeung, Conference Co-Chair, OMAE 2020

Opening Lunch

12:00 – 13:30

Location: Hall 5 (SEC)

Monday lunch sponsored by Elsevier



CONCURRENT SESSIONS

13:30 – 15:00

Offshore Technology

1-1-2 FPSO and Arctic Structures

Monday June 10

Room SEC, Alsh 1 | 13:30 – 15:00

Session Chair: Ewoud van Haaften, Shell Global Solutions International B.V., Netherlands
Session Co-Chair: Anil Sablok, TechnipFMC, USA

Improved Design of Next Generation Hull-platform

"Noah-FPSO Hull" OMAE2019-95269

Shigeru Tanaka, Yasuhiro Sogawa
Mitsui E&S Shipbuilding Co., Ltd., Tokyo, Japan

Development of Harsh Environment Field with Ice Loadings using Concrete Spar – Variability of Options OMAE2019-96322

Anil Sablok¹ Erlend Hovland² Svein Ole Strømme³ Andrew Blundon⁴
1. TechnipFMC, Houston, TX, USA; 2. Equinor ASA, Stavanger, Norway;
3. Kvaerner, Lysaker, Norway; 4. TechnipFMC, St. John's, NL, Canada

Conceptual Design of Single Column Drilling Unit for Arctic Climate and Harsh Environment OMAE2019-96474

Mingyuan Sun, Fan Zhang, Lixin Xu
China Merchants Offshore Technology Research Center, Haimen, China

Direct Time Domain Simulations for a FPSO Tandem Offloading Operation OMAE2019-96638

Bonjun Koo, Manoj Jegannathan, Johyun Kyoung, Ho-Joon Lim
TechnipFMC, Houston, TX, USA

Offshore Technology

1-2-1 Dynamic Positioning I

Monday June 10

Room SEC, Dochart 2 | 13:30 – 15:00

Session Chair: Allan Magee, National University of Singapore, Singapore
Session Co-Chair: Anil Sablok, TechnipFMC, USA

Optimal Setpoint Learning of a Thruster-assisted Position Mooring System with Model-based Acceleration OMAE2019-95215

Bo Li, Lei Wang, Xuefeng Wang
Shanghai Jiao Tong University, Shanghai, China

Dynamic Positioning System: Systematic Weight Assignment for DP Sub-systems using Multi-criteria Evaluation Technique Analytic Hierarchy Process and Validation using DP-RI Tool with Deep Learning OMAE2019-95485

Charles Fernandez¹ Arun Dev² Rose Norman³ Wai Lok Woo³ Shashi Kumar¹
1. DNV GL Singapore Pte Ltd, Singapore, Singapore; 2. Newcastle University in Singapore, Singapore, Singapore; 3. Newcastle University, Newcastle, United Kingdom

Surge Response Control of FPSO using Multiple Tuned Liquid Dampers – A Study on Effect of Multiple Frequencies in TLD OMAE2019-96062

Saravanan Gurusamy, Deepak Kumar
Indian Institute of Technology Madras, Chennai, India

Estimating Second Order Wave Drift Forces and Moments for Calculating DP Capability Plots OMAE2019-96307

Saeed Barzegar Valikchali¹ Mitchell Anderson¹ David Molyneux¹ Dean Steinke²
1. Memorial University of Newfoundland, St. John's, NL, Canada;
2. Dynamic Systems Analysis, Victoria, BC, Canada

Structures, Safety and Reliability

2-10-1 Collision and Crashworthiness I

Monday June 10

Room Crowne Plaza, Castle 1 | 13:30 – 15:00

Session Chair: Sören Ehlers, Hamburg University of Technology, Germany
Session Co-Chair: Zhiqiang Hu, Newcastle University, United Kingdom

Dynamic Responses Prediction for a Spar-type Offshore Floating Wind Turbine under Ship Collision Scenarios OMAE2019-95094

Yichi Zhang, Zhiqiang Hu
Newcastle University, Newcastle upon Tyne, United Kingdom

Numerical Study on the Dynamical Characteristic and Impact Force between Vessel with Rake Bow and Bridge Pier OMAE2019-95602

Ming Cai Xu¹ Zi Xuan Zhang¹ Xiao Qiang Zhang² Jin Pan³ Yi Fei Huang³
 1. Huazhong University of Science and Technology, Wuhan, China; 2. School of Naval Architecture and Ocean Engineering, Huazhong University of Science & Technology, Wuhan, China; 3. Wuhan University of Technology, Wuhan, China

Mechanical Modeling of the Polymeric Coating on a Subsea Pipeline OMAE2019-95920

Ole Vestrum, Magnus Langseth, Tore Børvik
 Norwegian University of Science and Technology, Trondheim, Norway

Structures, Safety and Reliability

2-15-1 Data Driven Models

Monday June 10 Room **Crowne Plaza, Castle 2** | 13:30 – 15:00

Session Chair: YeongAe Heo, Case Western Reserve University, USA

Session Co-Chair: Bernt Leira, Norwegian University of Science and Technology, Norway

Motion and Load Prediction of Floating Platform in South China Sea using Deep Learning and Prototype Monitoring Information OMAE2019-95412

Ji Yao, Wenhua Wu, Zishu Zhao
 Dalian University of Technology, Dalian, China

Power Spectrum for Surface Description of Corroded Ship Structure from Laser Scan OMAE2019-95907

Karoline Mali Neumann¹ Sören Ehlers²
 1. Wood, Sandefjord, Norway; 2. Hamburg University of Technology, Hamburg, Germany

The State-of-the-Art in Structural Integrity Management: A Review and Proposed Data-driven Approach OMAE2019-96396

YeongAe Heo
 Case Western Reserve University, Cleveland, OH, USA

Squall Detection and Analysis from Historical Satellite Data OMAE2019-96549

Laury Renac¹ David Hurdle¹ Francois Enet¹ Joris de Vroom²
 1. Aktis Hydraulics, Zwolle, Netherlands; 2. Argoss, Houten, Netherlands

Materials Technology

3-1-2 Formulation of the Fracture Parameter

Monday June 10 Room **SEC, Boisdale 1** | 13:30 – 15:00

Session Chair: Carey L. Walters, Delft University of Technology, Netherlands

Session Co-Chair: Koji Gotoh, Kyushu University, Japan

Evaluations of Ductile and Cleavage Fracture using Coupled GTN and Beremin Model in API X70 Pipelines Steel OMAE2019-96483

Youn-Young Jang¹ Ji-Hee Moon¹ Nam-Su Huh¹ Ki-Seok Kim²
 Woo-Yeon Cho² Myeong-Woo Lee³ Yun-Jae Kim³
 1. Seoul National University of Science and Technology, Seoul, Korea;
 2. POSCO, Incheon, Korea; 3. Korea University, Seoul, Korea

Parameter Calibration for Continuum Damage Mechanics Models to Simulate Ductile Fracture of High Strength Pipeline Steels OMAE2019-96316

Filip Van den Abeele, ArcelorMittal Global R&D, Zwijnaarde, Belgium

Numerical Investigation of Ductile Crack Growth Behavior at Different Locations of Weld Joint for X80 Pipeline Steel OMAE2019-95517

Bin Qiang, Xin Wang
 Carleton University, Ottawa, ON, Canada

Recent Developments and Challenges of Cleavage Fracture Modelling in Steels: Aspects on Microstructural Mechanics and Local Approach Methods OMAE2019-95464

Quanxin Jiang¹ V.M. Bertolo¹ V.A. Popovich¹ Carey L. Walters²
 1. Delft University of Technology, Delft, Netherlands; 2. TNO, Delft, Netherlands

Pipelines, Risers, and Subsea Systems

4-1-1 Flexible Pipes I

Monday June 10 Room **Crowne Plaza, Staffa / Shuna** | 13:30 – 15:00

Session Chair: Svein Saevik, Norwegian University of Science and Technology, Norway

Session Co-Chair: Zhimin Tan, Baker Hughes, a GE company, USA

Analytical Methodology to Evaluate Flexible Risers Fatigue Lives at the Top Region OMAE2019-96372

Fernando Sousa¹ Marcos Queija de Siqueira² José Renato M. de Sousa¹ George Campello³
 1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. UFRJ/COPPE/LACEO, Rio de Janeiro, RJ, Brazil; 3. Petrobras, Rio de Janeiro, RJ, Brazil

Study of the Vortex-induced Vibration of the Marine Risers with the Buoyancy OMAE2019-96824

Lin Zhao, Hang Su, Yanju Yin
 Ocean University of China, Qingdao, China

Methodology Proposal for Corrosion Fatigue Assessment for Flexible Pipes Tensile Armour in Aggressive Environments OMAE2019-96423

Marcelo Favaro Borges, Mariana dos Reis Tagliari, Rafaela Gonçalves, Carlos Eduardo Fortis Kwietniewski
 UFRGS, Porto Alegre, RS, Brazil

Frequency Domain Fatigue Analysis for a Unbonded Flexible Riser – Damage Induced by Dynamic Tension OMAE2019-95118

Jiabei Yuan, Yucheng Hou, Zhimin Tan
 Baker Hughes, a GE Company, Houston, TX, USA

Pipelines, Risers, and Subsea Systems

4-3-1 Collapse

Monday June 10 Room **Crowne Plaza, Castle 3** | 13:30 – 15:00

Session Chair: Ilson Pasqualino, COPPE/UFRJ, Brazil

Session Co-Chair: Spyros A. Karamanos, University of Thessaly, Greece

Pure Collapse Behavior of Pipelines With D/t Ratio Below 10: Real Scale Experimental Tests and Numerical Studies OMAE2019-95145

Ana Paula França de Souza¹ Ana Carolina Vilas Boas²
 Rafael F. Solano³ Gabriel Jorge⁴ Júlio Márcio Silveira e Silva²
 1. LTS/COPPE, Niterói, RJ, Brazil; 2. Vallourec, Belo Horizonte, MG, Brazil; 3. Petrobras, Rio de Janeiro, RJ, Brazil; 4. Vallourec Competence Center Rio, Rio de Janeiro, RJ, Brazil

Pipe Development ERW/HFIW Casing API5CT Grade P110 High Collapse OMAE2019-95363

Luis Melo, Wilson Cordeiro, Marcus Ferreira
 Apolo Tubulars S/A, Lorena, SP, Brazil

MONDAY

Influence of Residual Curvature in the Pipeline**Pure Collapse** OMAE2019-95768Ana Paula França de Souza¹ Theodoro Netto² Carlos Abad Estrada Quispe³
1. LTS/COPPE, Niterói, RJ, Brazil; 2. COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. COPPE/LTS/UFRJ, Rio de Janeiro, RJ, Brazil**Efficiency of Carbon Fibre Buckle Arrestors****for Subsea Pipelines** OMAE2019-95821Hassan Karampour¹ Mahmoud Alrsai² Wayne Hall³
1. Griffith School of Engineering, Gold Coast, QLD, Australia;
2. Griffith University, Gold Coast, QLD, Australia; 3. Griffith School of Engineering and Built Environment, Gold Coast, QLD, Australia**Ocean Space Utilization****5-1-1 Marine Utilization and Marine Spatial Planning**

Monday June 10 Room SEC, Dochart 1 | 13:30 – 15:00

Session Chair: Kazuhiro Iijima, Dept of NAOE, Osaka University, Japan

Impacts of Educational Outreach on Envisioning Marine Cities of the Future Development Project

OMAIE2019-95431

Ikuo Yoshida
Shimizu Corporation, Tokyo, Japan**Trend of Utilization of Ocean Space according to Structural Form of Oceanic Architectures**

OMAIE2019-96453

Ryo Sugahara¹ Akio Kuroyanagi²
1. Nihon University, Chiba, Japan; 2. Nihon University, Funabashi-shi, Japan**The Application of Nearshore Risk Assessment of Hazard and Vulnerability in Marine Resources Area for National Spatial Planning**

OMAIE2019-96706

Lien-Kwei Chien¹ Chi-Wen Huang¹ Wei-Po Huang¹ Cheng-Yu Ku¹ Chih Hsin Chang²
1. National Taiwan Ocean University, Keelung, Taiwan; 2. National Science and Technology Center for Disaster Reduction, New Taipei City, Taiwan**Ocean Engineering****6-1-2 Floating Body Technology**

Monday June 10 Room SEC, M4 | 13:30 – 15:00

Session Chair: Wei Qiu, Memorial University of Newfoundland, Canada

Virtual Prototyping and Simulation of Multibody Marine Operations using Web-based Technologies

OMAIE2019-96051

Ícaro A. Fonseca, Felipe F. de Oliveira, Henrique M. Gaspar
Norwegian University of Science and Technology, Ålesund, Norway**A Study on Motions and Connector Loads for a New Type of Two-module Semi-submersible**

OMAIE2019-96771

Jun Ding, Chao Tian, Yuji Miao, Zhengwei Zhang, Zhanhua Zhao, Xinyun Ni
China Ship Scientific Research Center, Wuxi, China**Evaluation and Optimization of Trimaran Configurations using Deep Neural Network**

OMAIE2019-96832

Dongchi Yu, Lu Wang, Qian Zhong, Ronald W. Yeung
University of California, Berkeley, Berkeley, CA, USA**Penetration of Annular and General Jets into Underwater Plates**

OMAIE2019-96805

Zhifan Zhang, Haoliang Hu, Cheng Wang
Beijing Institute of Technology, Beijing, China**Ocean Engineering****6-4-1 Marine Control and Automation**

Monday June 10 Room SEC, M2 & M3 | 13:30 – 15:00

Session Chair: Lokukaluge Prasad Perera, UiT The Arctic University of Norway, Norway

Session Co-Chair: Yihan Xing, University of Stavanger, Norway

Development of a Control Strategy for Underway Tandem-like Oil Transfer Operation between a Conventional and a DP Tanker

OMAIE2019-96335

Felipe Moreno¹ José Amendola¹ Eduardo Tannuri² Marcos Ferreira³
1. Universidade de São Paulo, São Paulo, SP, Brazil; 2. Numerical Offshore Tank - Universidade de São Paulo, São Paulo, SP, Brazil; 3. Petrobras, Rio de Janeiro, RJ, Brazil**Dynamic Positioning Observer Design using Exogenous Kalman Filter**

OMAIE2019-96490

Song An, Dengshuo Chen, Yong Bai
Southern University of Science and Technology, Shenzhen, China**Port Channel Navigation Subjected to Environmental Conditions using Reinforcement Learning**

OMAIE2019-96120

José Amendola¹ Eduardo Tannuri² Fábio Cozman¹ Anna Reali Costa¹
1. University of São Paulo, São Paulo, SP, Brazil; 2. Numerical Offshore Tank - University of São Paulo, São Paulo, SP, Brazil**The Modelling and Optimal Control of a Hybrid Propulsion System for an Ice-capable Ship**

OMAIE2019-95142

Yi Zhou¹ Kayvan Pazouki² Rose Norman¹
1. Newcastle University, Newcastle, United Kingdom; 2. Marine, Offshore and Subsea Technology Group, School of Engineering, Newcastle upon Tyne, United Kingdom**CFD & FSI****8-1-1 FSI**

Monday June 10 Room SEC, Lomond Auditorium | 13:30 – 15:00

Session Chair: Allan Magee, National University of Singapore, Singapore

Session Co-Chair: Hyun-chul Jang, TechnipFMC, USA

CFD for VIM and Line Forces of a Floating Caisson with Complex Geometry

OMAIE2019-95789

Boudewijn Decrop, Rohit Kulkarni, Alexander Breugem, Damian Villaverde Vega
IMDC, Antwerp, Belgium**Prediction of Hydrodynamic Damping of Moored Offshore Structures using CFD**

OMAIE2019-95935

Changqing Jiang, Ould el Moctar, Thomas Schellin
University of Duisburg-Essen, Duisburg, Germany**The Vortex and Wall Fluctuating Pressure around Submarine Sail based on DDES Method**

OMAIE2019-96018

Rui Luo¹ Yue Sun² Hang Zhang² Jin Zhan³ Xiao Cai²
1. China Ship Design and Development Center, Wuhan, China; 2. Huazhong University of Science and Technology, Wuhan, China; 3. School of Naval Architecture & Ocean Engineering Huazhong University of Science and Technology, Wuhan, China**Boundary Layer Effects in the Modeling of Semi-submersible Columns**

OMAIE2019-96684

Samuel Holmes
Red Wing Engineering, Inc, Palo Alto, CA, USA

Ocean Renewable Energy

9-1-1 Bottom-fixed Wind Turbines

Monday June 10 Room SEC, Carron 1 | 13:30 – 15:00

Session Chair: Wojciech Popko, Fraunhofer Institute for Wind Energy Systems IWES, Germany
 Session Co-Chair: Tonio Sant, Dept of Mechanical Engineering, University of Malta, Malta

Dynamic Response of a Large-diameter Monopile considering 35-hour Storm Conditions OMAE2019-95170

Erin E. Bachynski¹ Ana Page² George Katsikogiannis¹
 1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian Geotechnical Institute, Oslo, Norway

Validation of Numerical Models of the Offshore Wind Turbine from the Alpha Ventus Wind Farm against Full-scale Measurements within OC5 Phase III OMAE2019-95429

Wojciech Popko¹ Amy Robertson² Jason Jonkman² Fabian Wendt² Philipp Thomas¹ Kolja Müller³ Matthias Kretschmer⁴ Torbjørn Ruud Hagen⁵ Christos Galinos⁶ Jean-Baptiste Le Dreff⁷ Philippe Gilbert⁸ Bertrand Auria⁹ Sho Oh¹⁰ Jacob Qvist¹¹ Stian Høegh Sørum¹² Loup Suja-Thauvin¹³ Hyunkyung Shin¹⁴ Climent Molins¹⁵ Pau Trubat¹⁵ Paul Bonnet¹⁶ Roger Bergua¹⁷ Kai Wang¹⁷ Pengcheng Fu¹⁸ Jifeng Cai¹⁸ Zhisong Cai¹⁸ Armando Alexandre¹⁹ Robert Harries²⁰
 1. Fraunhofer IWES (Fraunhofer Institute for Wind Energy Systems), Bremerhaven, Germany; 2. National Renewable Energy Laboratory, Golden, CO, USA; 3. University of Stuttgart, Stuttgart, Germany; 4. University of Stuttgart, Stuttgart Wind Energy, Stuttgart, Germany; 5. OWEC Tower AS, Oslo, Norway; 6. Technical University of Denmark - Department of Wind Energy, Roskilde, Denmark; 7. Electricité de France, Recherche et Développement, Palaiseau, France; 8. IFP Energies Nouvelles, Solaize, France; 9. Principia, La Ciotat, France; 10. ClassNK, Chiyodaku, Japan; 11. Subsea, Nesbru, Norway; 12. Norwegian University of Science and Technology, Department of Marine Technology, Trondheim, Norway; 13. Simis AS, Trondheim, Norway; 14. University of Ulsan, Ulsan, Korea; 15. Universitat Politècnica de Catalunya, Barcelona, Spain; 16. Siemens Industry Software, Cornellà de Llobregat, Spain; 17. Envision Energy Limited, Shanghai, China; 18. China General Certification, Beijing, China; 19. DNV GL, Bristol, United Kingdom; 20. DNV GL, Zaragoza, Spain

REDWIN Foundation Models for Integrated Dynamic Analyses of Offshore Wind Turbines OMAE2019-96168

Ana Page, Karin Norén-Cosgriff, Kristoffer S. Skau, Amir M. Kaynia
 Norwegian Geotechnical Institute, Oslo, Norway

Development of Offshore Structure Analysis Software X-SEA Coupled with FAST OMAE2019-96778

Ki-Du Kim¹ Sorrasak Vachirapanyakun¹ Pasin Plodpradit¹ Van Nguyen Dinh² Jin Ho Park³
 1. Konkuk University, Seoul, Korea; 2. MaREI Centre, University College Cork, Cork, Ireland; 3. Korean Register, Busan, Korea

Offshore Geotechnics

10-1-1 Seabed Properties and Processes

Monday June 10 Room Crowne Plaza, Jura | 13:30 – 15:00

Session Chair: Henry Milewski, TechnipFMC, United Kingdom

Influence of Suction Dredging on the Failure Mechanism of Sandy Submarine Slopes: Revisited with a Coupled Numerical Approach OMAE2019-95151

Manuela Kanitz, Jürgen Grabe
 Hamburg University of Technology, Hamburg, Germany

Effect of Stress History and Shallow Embedment on Centrifuge Cone Penetration Tests in Sand OMAE2019-95393

Anamitra Roy, Shiao Huey Chow, Conleth O' Loughlin, Mark F. Randolph
 University of Western Australia, Perth, WA, Australia

On the Selection of an Appropriate Consolidation Coefficient for Offshore Geotechnical Design OMAE2019-95800

David J White¹ Jinbo Chen² Susan Gourvenec³ Conleth O' Loughlin⁴
 1. University of Southampton, Southampton, United Kingdom; 2. Shell Global Solutions (US), Inc., Houston, TX, USA; 3. University of Southampton/ Southampton Marine and Maritime Institute, Southampton, United Kingdom; 4. University of Western Australia, Perth, WA, Australia

Fundamental Engineering Characteristics of Cohesive Sediments in the Northern Region of South China Sea OMAE2019-96599

Shuzhao Li, Xu Jia, Zhigang Li, Jiagang Li
 CNOOC Research Institute, Beijing, China

Petroleum Technology

11-7-1 Well Drilling Fluids and Hydraulics I

Monday June 10 Room Crowne Plaza, Barra | 13:30 – 15:00

Session Chair: Arild Saasen, UiS, Norway

Session Co-Chair: Ergun Kuru, University of Alberta, Canada

Modelling of the Movement of a Prolate Particle in the Steady State Flow of a Non-Newtonian Fluid in an Inclined Annulus with Inner String Rotation OMAE2019-95049

Eric Cayeux, NORCE, Stavanger, Norway

A New Three-layer Model for Gravel Packing Applications OMAE2019-95164

Alireza Sarraf Shirazi, Ian Frigaard
 University of British Columbia, Vancouver, BC, Canada

Cuttings Transport Simulation in Large-diameter Inclined Borehole OMAE2019-95228

Yaroslav Ignatenko¹ Andrey Gavrilov² Oleg Bocharov¹ Roland May³
 1. Baker Hughes, Novosibirsk, Russia; 2. Institute of Thermophysics of SB RAS, Krasnoyarsk branch, Krasnoyarsk, Russia; 3. Baker Hughes, a GE company, Celle, Germany

How does a Stationary Sand Bed affect the Flow Dynamics in an Eccentric Annulus? OMAE2019-96338

Majid Bizhani¹ Ergun Kuru²
 1. University of British Columbia, Edmonton, AB, Canada;
 2. University of Alberta, Edmonton, AB, Canada

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-1-1 Numerical and Experimental Methods in Hydrodynamics I

Monday June 10 Room SEC, Carron 2 | 13:30 – 15:00

Session Chair: Paul Taylor, University of Oxford, United Kingdom

Session Co-Chair: Kie Hian Chua, Technology Centre for Offshore and Marine, Singapore

Numerical and Experimental Modelling of Wave Loads on Thin Porous Sheets OMAE2019-95148

Edward Mackay¹ Lars Johanning¹ Dezhi Ning² Dongsheng Qiao²
 1. University of Exeter, Penryn, United Kingdom;
 2. Dalian University of Technology, Dalian, China

MONDAY

Application of 4-phase Decomposition to the Analysis of Random Time Series from Wave Basin Tests OMAE2019-95172

Thomas A.A. Adcock¹ Xingya Feng¹ Tianning Tang¹ Ton S. van den Bremer¹ Sandy Day² Saishuai Dai² Ye Li³ Zhiliang Lin³ Wentao Xu³ Paul Taylor¹
 1. University of Oxford, Oxford, United Kingdom; 2. University of Strathclyde, Glasgow, United Kingdom; 3. Shanghai Jiao Tong University, Shanghai, China

Irregular Frequency Removal and Convergence in Higher-order Bem for Wave Diffraction/Radiation Analysis OMAE2019-95482

Tomoaki Utsunomiya, Kyushu University, Fukuoka, Japan

Numerical Study on Seakeeping Performance of a Damaged Ship OMAE2019-96193

Luning Cui¹ Yi Zheng¹ Yinggang Li² Ling Zhu² Mingsheng Chen²
 1. Naval Research Academy, Beijing, China; 2. Wuhan University of Technology, Wuhan, China

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-7-1 Small Vessel and Related Technology

Monday June 10 Room SEC, Boisdale 2 | 13:30 – 15:00

Session Chair: Daisuke Kitazawa, University of Tokyo, Japan

Session Co-Chair: Yasunori Nihei, Osaka Prefecture University, Japan

Design Methodology and Development of an Independently Rotating Multi-hull Vessel OMAE2019-95401

Yasunori Nihei¹ Sharath Srinivasamurthy¹ Hiroshi Sakamoto² Norikazu Masuda³ Naoyuki Hara¹
 1. Osaka Prefecture University, Osaka, Japan; 2. Fractaly, Osaka, Japan; 3. Nippon Kaiko, Hyogo, Japan

Numerical Hull Resistance and Hydrodynamic Characteristics of an Independently Rotating Multi-hull Vessel OMAE2019-95403

Sharath Srinivasamurthy¹ Hiroshi Sakamoto² Tatsuo Nishikawa³ Yasunori Nihei¹
 1. Osaka Prefecture University, Osaka, Japan; 2. Fractaly, Osaka, Japan; 3. Shipbuilding Research Centre of Japan, Tokyo, Japan

Study on Attitude Control of a Cabin-suspended Catamaran by using a Double-loop Control System OMAE2019-95827

Jialin Han¹ Sota Kanno² Akito Mochizuki² Daisuke Kitazawa² Teruo Maeda³ Hiroshi Itakura²
 1. Osaka Prefecture University, Osaka, Japan; 2. The University of Tokyo, Kashiwa, Japan; 3. Management Strategy Corporation, Yokohama, Japan

REFRESHMENT BREAK

15:00 – 15:30

Location: Hall 5 (SEC)

CONCURRENT SESSIONS

15:30 – 17:30

Offshore Technology

1-4-3 Design Optimization

Monday June 10 Room SEC, Alsh 1 | 15:30 – 17:30

Session Chair: Binbin Zhao, Harbin Engineering University, China

Session Co-Chair: Masoud Hayatdavoodi, University of Dundee, United Kingdom

How Emulation Improves Offshore Operations OMAE2019-95178

Leslie McGuire, Subsea7, Aberdeen, United Kingdom

Machine Learning to Predict Mooring Line Tensions OMAE2019-96488

Hema Wadhwa
 INTECSEA, Perth, WA, Australia

Efficient Anchoring System for FPSO in Arbitrary Waters OMAE2019-96575

Jairo Araujo¹ Antonio Carlos Fernandes² Joel S. Sales Junior³ Mario Santos⁴ Ana Thurler²
 1. ATNAV, Rio de Janeiro, RJ, Brazil; 2. COPPE/Universidade Federal do Rio de Janeiro, Rio De Janeiro, RJ, Brazil; 3. Laboratory of Waves and Current - LOC - Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4. NAVIUM, Rio de Janeiro, RJ, Brazil

The Use of Ensemble Forecast in Defining Offshore Installation Operability: A Case Study on Umbilical Shore Float-in Operations OMAE2019-96137

Francisco Tinoco, Kee Chien Ting, Kishor Chavan
 Subsea 7, Sutton, United Kingdom

Trajectory Prediction of Moored Vessels with Reduced Station Keeping Capability due to Exceeded Anchor Load Limits OMAE2019-96145

Michal Josten
 Hamburg University of Technology, Hamburg, Germany

Offshore Technology

1-6-1 CFD Numerical Waves and Applications

Monday June 10 Room SEC, Dochart 2 | 15:30 – 17:30

Session Chair: Csaba Pakozdi, SINTEF Ocean, Norway

Thorough Verification and Validation of CFD Simulation for FPSO Roll Damping OMAE2019-95046

Donghwan Lee, Zhenjia (Jerry) Huang
 ExxonMobil Upstream Research Company, Spring, TX, USA

Dynamic Response of Monopile Wind Turbine in Large Waves OMAE2019-95288

Sopheak Seng¹ Charles Monroy² Sime Malenica¹
 1. Bureau Veritas, Marine & Offshore, Paris, France; 2. Bureau Veritas, Paris, France

Wave Propagation in CFD-based Numerical Wave Tanks OMAE2019-96460

Jang Kim, Aldric Baquet, Hyunchul Jang
 TechnipFMC, Houston, TX, USA

CFD-based Numerical Wave Basin for FPSO in Irregular Waves OMAE2019-96838

Aldric Baquet¹ Hyunchul Jang¹ Ho-Joon Lim¹ Johyun Kyoung¹ Nicolas Tcherniguin² Timothee Lefebvre² Jang Kim¹
 1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC, Paris, France

Simulation of Irregular Wave Impact on Semi-submersible Platform based on Coupled GN-CFD Method OMAE2019-95675

Kangping Liao¹ Wenyang Duan¹ Qingwei Ma¹ Binbin Zhao¹ Rong-Gui Han² Jang Kim³
 1. Harbin Engineering University, Harbin, China; 2. Yantai CIMC Raffles Offshore Limited, Yantai, China; 3. TechnipFMC, Houston, TX, USA

Structures, Safety and Reliability

2-3-1 Probabilistic Response Models

Monday June 10 Room Crowne Plaza, Castle 2 | 15:30 – 17:30

Session Chair: Lance Manuel, University of Texas at Austin, USA

Session Co-Chair: Sverre K. Haver, University of Stavanger, Norway

Air – Gap Assessment of Semi-submersible Accounting for Simultaneous Occurrence of Wind Sea and Swell OMAE2019-95144

Sverre K. Haver¹ Julio Patino²
 1. University of Stavanger, Stavanger, Norway; 2. Subsea 7, Rayneberg, Norway

A Monte Carlo Based Simulation Method for Damage Stability Problems OMAE2019-95295

Stefan Krueger¹ Hendrik Dankowski²
 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 moto⁴
 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 Yasuda¹ Junji Shimamura¹ Satoshi Igi² Ryuji Muraoka¹
 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 Honma¹ Gen Sasaki¹ Kunihiko Hashi¹ Fumiyoshi Minami²
 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 Terazawa¹ Katsuyuki Ichimiya¹ Keiji Ueda¹ Satoshi Igi¹
 Toshitaka Tanaka² Akiyoshi Tsuji² Minoru Suwa³
 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 Sakimoto¹ Tsunehisa Handa¹ Hisakazu Tajika¹ Yoshiaki Murakami¹ Joe Kondo²
 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 Li¹ Shuangxi Guo² Yue Kong¹ Min Li¹ Weimin Chen²
 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 He¹ Hailong Lu¹ Murilo Augusto Vaz² Marcelo Caire¹
 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 Amaechi¹ Jianqiao Ye¹ Xiaonan Hou¹ Fa-Cheng Wang²
 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 Gao¹ Shan Jin² Peng Cheng¹ Peihua Han¹ Yong Bai³
 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 Knagenhjelm¹ Mons Hauge² Bård Nyhus³
 1. Equinor ASA, Fornebu, Norway; 2. Equinor ASA, Ranheim, Norway; 3. SINTEF, Trondheim, Norway

Finite Element Analysis of Seafloor-SCR Interaction in Touchdown Zone OMAE2019-95830

Zhang Wei¹ Peng Peng²

1. Tianjin University, Tianjin, China; 2. Hunan Hydro and Power Design Institute, Changsha, China

A Fracture Mechanics-based Feasibility Study of Damped Steel Catenary Risers for Pre-salt Field Developments OMAE2019-96297

Alexandre G. Garmbis¹ Petrônio Zumpano Jr.¹ Ludimar L. Aguiar²

Raphael M. Brito² Domingos A. Rade³

1. Petrobras, São José dos Campos, SP, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil; 3. Aeronautics Institute of Technology, São José dos Campos, SP, Brazil

Study on the Design Method of Deepwater

Steel Lazy Wave Riser OMAE2019-95631

Zhao Wang¹ Wei Qin¹ Xiaojie Zhang¹ Jiannan Zhao¹ Yong Bai²

1. Southern University of Science and Technology, Shenzhen, China; 2. Zhejiang University, Zhejiang, China

Ocean Space Utilization

5-6-1 High Tide and Tsunamis

Monday June 10

Room SEC, Dochart 1 | 15:30 – 17:30

Session Chair: Koichi Masuda, Nihon University, Japan

Session Co-Chair: Koji Takahashi, Japan Port Consultants, Ltd., Japan

Introduction of Virtual Structural Boundary for Collision Force

Analysis of Tsunami Drifting Objects in Particle Method OMAE2019-95408

Yasuhiro Aida¹ Koichi Masuda² Tomoki Ikoma² Hiroaki Eto²

1. Nihon University, Chiba, Japan; 2. Nihon University, Funabashi, Japan

Study on Characteristic and Problem of Water Utilization and Management by Floating Residence in the United States OMAE2019-95881

Daisuke Dobashi¹ Akio Kuroyanagi² Ryo Sugahara¹

1. Nihon University, Chiba, Japan; 2. Nihon University, Funabashi-shi, Japan

A Research on Predicting Method of the Damage by

Tsunami Drifting Objects in Urban Port OMAE2019-95927

Koichi Masuda¹ Tomoki Ikoma¹ Yasuhiro Aida² Masayuki Takada³ Yuta Fukunaga⁴

1. Nihon University, Funabashi, Japan; 2. Nihon University, Chiba, Japan; 3. Tohoku Regional Bureau Ministry of Land Infrastructure Transport and Tourism, Sendai, Japan; 4. Nihon University, Funabashi, Japan

A Fundamental Study on Tsunami Protection Measures for a Vessel Moored at a Wharf considering the Backwash Influence OMAE2019-96159

Mitsuhiro Masuda¹ Kiyokazu Minami¹ Koichi Masuda²

1. Tokyo University of Marine Science and Technology, Tokyo, Japan; 2. Nihon University, Funabashi, Japan

Improving the Productivity and Sustainability of Port Management against High Tide and Tsunamis OMAE2019-96406

Koji Takahashi

Japan Port Consultants, Ltd., Shinagawa, Japan

Ocean Engineering

6-4-2 Marine Operations and Vessel Motions

Monday June 10

Room SEC, M2 & M3 | 15:30 – 17:30

Session Chair: Lin Li, University of Stavanger, Norway

Session Co-Chair: Shuzheng Sun, Harbin Engineering University, China

Generic On-board Decision Support System Framework for Marine Operations OMAE2019-95146

Stian Skjong¹ Lars T. Kyllingstad¹ Karl J. Reite¹ Joakim Haugen¹

Jarle Ladstein¹ Karl Gunnar Aarsaether²

1. SINTEF Ocean, Trondheim, Norway; 2. SINTEF Ocean, Tromsø, Norway

A Simulation Program for Load-out Operation using Self-propelled Modular Transporters OMAE2019-95673

Zunfeng Du, Haiming Zhu, Dong Xu

Tianjin University, Tianjin, China

Seismic RTDT – Real-time Digital Twin for Boosting Performance of Seismic Operations OMAE2019-95885

Severin Sadjina¹ Stian Skjong² Armin Pobitzer¹ Lars T. Kyllingstad²

Roy-Jostein Fiskerstrand³ Sverre Torben³ Jason D. D. A. Granholt⁴

1. SINTEF Ålesund, Ålesund, Norway; 2. SINTEF Ocean, Trondheim, Norway; 3. Rolls-Royce Marine AS, Aalesund, Norway; 4. CGG Services AS, Oslo, Norway

Impact of the Uncertainties of the RAOs of a Semi-submersible Platform on the Performance of a Motion-based Wave Inference Method OMAE2019-96670

Jordi Mas Soler¹ Pedro C. de Mello² Eduardo Tannuri³

Alexandre N. Simos² Antonio Souto-Iglesias¹

1. Technical University of Madrid (UPM), Madrid, Spain; 2. Universidade de São Paulo, São Paulo, SP, Brazil; 3. Numerical Offshore Tank - University of São Paulo, São Paulo, SP, Brazil

Downtime Technique using Artificial Intelligence:

A Case Study for an Exposed Berthing Facility OMAE2019-95312

Ghassan El Chahal¹ Peter Morel² Sindhu Mole³ Nadjib Saadali³

1. COWI A/S, Kongens Lyngby, Denmark; 2. COWI A/S, Århus, Denmark; 3. COWI A/S, Dubai, United Arab Emirates

Ocean Engineering

6-11-1 Autonomous Vehicle Technology

Monday June 10

Room SEC, M4 | 15:30 – 17:30

Session Chair: Celso Pesce, University of S. Paulo - Escola Politecnica, Brazil

Session Co-Chair: Daniel Costa, COPPE/UFRJ, Brazil

Path Following and Collision Avoidance of Underactuated Marine Vessels based on MPC Design OMAE2019-95081

Guoping Zheng, Cheng Liu, Cheng Li

Dalian Maritime University, Dalian, China

Situation Awareness of Autonomous Ship Navigation in a Mixed Environment with Advanced Ship Predictor OMAE2019-95571

Lokukaluge Prasad Perera, Brian Murray

UiT The Arctic University of Norway, Tromsø, Norway

Time-varying Vector Field Guidance Law for Path Following and Obstacle Avoidance Control for Underactuated Autonomous Vehicles OMAE2019-96618

Haitong Xu¹ Miguel Hinostroza² Carlos Guedes Soares¹

1. Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 2. Centre for Marine Technology and Ocean Engineering (CENTEC), Lisbon, Portugal

An AIS-based Multiple Trajectory Prediction Approach for Collision Avoidance in Future Vessels OMAE2019-95963

Brian Murray, Lokukaluge Prasad Perera
UiT The Arctic University of Norway, Tromsø, Norway

Towards the Development of an Ocean Engineering Library for OpenModelica OMAE2019-95054

Savin Viswanathan, Christian Holden
Dept. Mechanical and Industrial Engineering, Norwegian University of Science and Technology, Trondheim, Norway

CFD & FSI

8-1-2 Surface Waves

Monday June 10 Room **SEC, Lomond Auditorium** | 15:30 – 17:30

Session Chair: Luis Eca, Technical University of Lisbon, Portugal
 Session Co-Chair: Owen H. Oakley, Jr, Retired, USA

Numerical Simulation of the Effect About Speed and Pitch Angle of Initial Stage on a Airplane Landing in Smooth Water OMAE2019-95438

Yong Ding, Shengcang Li, Kaiye Hu, Mo Chen
Harbin Engineering University, Harbin, China

Numerical Investigations of Ship Parametric Rolling in Regular Head Waves of DTC OMAE2019-95515

Qing Wang
Huazhong University of Science and Technology, Wuhan, China

Numerical Manoeuvrable Tank on Wave Based Moving Domain OMAE2019-95714

Dakui Feng¹ Xiao Cai¹ Yue Sun¹ ZhiGuo Zhang¹ XiaoWei Huang²
 1. *Huazhong University of Science and Technology, Wuhan, China;*
 2. *China Ship Design and Development Center, Wuhan, China*

Assessment of LNG Pump Tower Loads OMAE2019-96138

Michael Thome, Jens Neugebauer, Ould el Moctar
University of Duisburg-Essen, Duisburg, Germany

Numerical Simulation of Damaged Ship's Motion in Beam Waves OMAE2019-96791

Qing Wang¹ Xuanshu Chen¹ Liwei Liu¹ Xianzhou Wang¹ Mingjing Liu²
 1. *Huazhong University of Science and Technology, Wuhan, China;*
 2. *China Ship Design and Development Center, Wuhan, China*

Ocean Renewable Energy

9-2-1 Aerodynamics I

Monday June 10 Room **SEC, Carron 1** | 15:30 – 17:30

Session Chair: Jason Jonkman, National Renewable Energy Laboratory, USA

Impact of Rotor Misalignment due to Platform Motions on Floating Offshore Wind Turbine Blade Loads OMAE2019-95759

Rachael E. Smith, Ajit C Pillai, Gavin Tabor, Philipp R. Thies, Lars Johanning
University of Exeter, Exeter, United Kingdom

An Experimental Apparatus for Investigating the Unsteady Aerodynamics of a Floating Wind Turbine OMAE2019-95915

Binrong Wen, Qi Zhang, Haoxue Liu, Xinliang Tian, Xingjian Dong,
 Zhi-Ke Peng, Yongsheng Zhao, Yufeng Kou
Shanghai Jiao Tong University, Shanghai, China

A 6-DOFs Hardware-in-the-loop System for Wind Tunnel Tests of Floating Offshore Wind Turbines OMAE2019-95967

Alessandro Fontanella¹ Ilmas Bayati² Federico Taruffi¹
 Francesco La Mura¹ Alan Facchinetti¹ Marco Belloli¹
 1. *Politecnico di Milano, Milano, Italy;* 2. *MARIN, Wageningen, Netherlands*

Numerical and Experimental Wind Tunnel Analysis of Aerodynamic Effects on a Semi-submersible Floating Wind Turbine Response OMAE2019-95976

Alessandro Fontanella¹ Ilmas Bayati² Federico Taruffi¹ Alan Facchinetti¹ Marco Belloli¹
 1. *Politecnico di Milano, Milano, Italy;* 2. *MARIN, Wageningen, Netherlands*

Aerodynamic Analysis of a Wind Turbine with Elevated Inflow Turbulence and Wake using Harmonic Method OMAE2019-96769

Shine Win Naung, Mohammad Rahmati, Hamed Farokhi
Northumbria University, Newcastle upon Tyne, United Kingdom

Offshore Geotechnics

10-3-1 Anchors

Monday June 10 Room **Crowne Plaza, Jura** | 15:30 – 17:30

Session Chair: Fu-Ping Gao, Institute of Mechanics, Chinese Academy of Sciences, China

CFD Analysis on Hydrodynamic Characteristics for Optimizing Torpedo Anchors OMAE2019-95778

Jing Sun, Haixiao Liu
Tianjin University, Tianjin, China

CFD Analysis on Similarity Criteria of Hydrodynamic Characteristics for Gravity-installed Anchors OMAE2019-95960

Jiancai Gao, Haixiao Liu
Tianjin University, Tianjin, China

Effect of Seabed Trenching on Holding Capacity of Suction Anchors in Deepwater Gulf of Guinea Clays – A Numerical Study OMAE2019-96096

Pablo Castillo Garcia¹ Regis Wallerand² Dinh Hong Doan¹
 1. *Subsea7 France, Suresnes, France;* 2. *Total, La Défense, France*

Combined Wave-current Induced Instantaneous Liquefaction of a Sandy Seabed OMAE2019-96655

Lijing Yang¹ Chang-Fei Li¹ Jun-Qin Wang² Fu-Ping Gao¹
 1. *Institute of Mechanics, Chinese Academy of Sciences, Beijing, China;*
 2. *China National Offshore Oil Company (CNOOC) Research Institute, Beijing, China*

Petroleum Technology

11-7-3 Well Drilling Fluid and Hydraulics III

Monday June 10 Room **Crowne Plaza, Barra** | 15:30 – 17:30

Session Chair: Ergun Kuru, University of Alberta, Canada

Rheology of Brine-based Fuzzy-ball Drilling Fluids in Deepwater Drilling OMAE2019-96094

Zhaochuan Li¹ Lihui Zheng¹ Panfeng Wei¹ Xiaojuan Dai² Weian Huang³
 1. *China University of Petroleum, Beijing, China;* 2. *Jilin University, Jilin, China;* 3. *China University of Petroleum (East China), Qingdao, China*

A Field Study on the Marine Environmental Impact of the Drilling Fluid's Discharge OMAE2019-96231

Meirong Jiang¹ Xiaohan He²
 1. *CNOOC Research Institute, Beijing, China;* 2. *China MEHECO Corporation, Beijing, China*

Viscosity Models for Drilling Fluids – Viscosity Parameters and their Use OMAE2019-96595

Arild Saasen¹ Jan David Ytrehus²
1. UIS, Gullaug, Norway; 2. SINTEF, Trondheim, Norway

Rheological Properties of Water Based Drilling Fluids in Deep Offshore Conditions with Large Temperature Difference and High Pressure OMAE2019-96719

Qian Ding, Baojiang Sun, Zhiyuan Wang, Yonghai Gao, Yu Gao, Yongqiang Liao, Di Wang, Andi Xia
China University of Petroleum, Qingdao, China

Effect of LCM Fibers on the Rate of THF-water Clathrate Hydrate Growth in Water-based Drilling Fluids OMAE2019-96682

James L. Nielsen¹ Syed Y. Nahri¹ Panfeng Wei² Wei Zhao³ Yuanhang Chen¹
1. Louisiana State University, Baton Rouge, LA, USA; 2. Beijing LihuiLab Energy Technology Co.,Ltd Plugging Fluid Technology Research and Development Branch, Beijing, China; 3. China University of Petroleum, Beijing, China

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-2-1 Multi-Body Hydrodynamics

Monday June 10 Room SEC, Carron 2 | 15:30 – 17:30
Session Chair: Wei Bai, Manchester Metropolitan University, United Kingdom
Session Co-Chair: Wei Qiu, Memorial University of Newfoundland, Canada

Model Experiments of Floating Side-by-side Barges OMAE2019-95238

Kie Hian Chua¹ Pedro de Mello² Kazuo Nishimoto³ Yoo Sang Choo⁴
1. Technology Centre for Offshore and Marine, Singapore, Singapore; 2. Tanque de Provas (TPN-USP), São Paulo, SP, Brazil; 3. University of São Paulo, São Paulo, SP, Brazil; 4. National University of Singapore, Singapore, Singapore

Numerical Modelling of Wave Resonance in a Narrow Gap between Two Floating Bodies in Close Proximity using a Hybrid Model OMAE2019-95247

Shiqiang Yan, Qingwei Ma, Junxian Wang, Jinghua Wang
City, University of London, London, United Kingdom

Unified One-fluid Approach for Multi-body Hydrodynamics OMAE2019-96814

Liang Yang, Christopher C Pain
Imperial College London, London, United Kingdom

Numerical Analysis of GBS Float-over Deck Installation at Docking and Undocking Stages based on a Coupled Heave-Roll-Pitch Impact Model OMAE2019-95717

Mingsheng Chen, Meiyuan Zou, Ling Zhu, Liang Sun
Wuhan University of Technology, Wuhan, China

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-2-1 Numerical Methods

Monday June 10 Room SEC, Boisdale 2 | 15:30 – 17:30
Session Chair: Celso Morooka, University of Campinas, Brazil
Session Co-Chair: Yuri Coelho Del Sarto, Universidade Estadual de Campinas, Brazil

Investigation on the Effect of DNVGL OTG 13 on Air Gap Assessment of a Semi-submersible Unit OMAE2019-95072

Youwei Kang¹ Bing Wang² Lei Li¹ Zhao Ziguang¹
1. CIMC Offshore Co. Ltd., Shenzhen, China; 2. COOEC Subsea Technology. Ltd, Shenzhen, China

Time Domain Simulations of Ship Maneuvering and Roll Motion in Regular Waves based on a Hybrid Method OMAE2019-95562

Chengqian Ma, Ning Ma, Xiechong Gu
Shanghai Jiao Tong University, Shanghai, China

Study on the Influence of Mesh Grouping on Numerical Simulation Results of Fish Cages OMAE2019-95706

Liuyi Huang¹ Yuyan Li¹ Yi Ni¹ Hui Cheng² Xinxin Wang¹ Gang Wang¹ Fenfang Zhao¹
1. Ocean University of China, Qingdao, China; 2. University of Stavanger, Stavanger, Norway

The Analysis of the Joint Limitation Condition of Wave Height-period on the Floating Crane Lifting Operation OMAE2019-96461

Xue-gang Wang, Ying Zong-quan, Chen Ze-cong
CCCC Fourth Harbor Engineering Institute Co., Ltd, Guangzhou, China

Nonlinear Analysis of an Oscillating Water Column Wave Energy Device in Frequency Domain via Statistical Linearization OMAE2019-96727

Leandro Souza Pinheiro da Silva¹ Celso Pesce² Hélio Morishita¹ Rodolfo T. Gonçalves³
1. University of São Paulo, São Paulo, SP, Brazil; 2. University of São Paulo - Escola Politecnica, São Paulo, SP, Brazil; 3. University of Tokyo, Bunkyo, Japan

ASME & IMECHE CONNECT ROUNDTABLE

17:00 – 18:15
Location: Forth Room

Afternoon Lecture

17:40 – 18:10
Location: Lomond Auditorium (SEC)



Dr.-Ing. Luiz Alves dos Santos

European Research Council – Funding Opportunities for Creative Minds from All Over the World

Dr.-Ing. Luiz Alves dos Santos,
Scientific Officer, European Research Council

See Afternoon Lecture Series, page 22 for more details.

AFTERNOON DRINKS RECEPTION

18:15 – 19:15
Location: Hall 5 (SEC)

Tuesday, June 11

Time	Title	Location
08:30 – 17:30	Exhibition open	Hall 5 (SEC)
08:30 – 10:00	Concurrent Sessions	See pages 36–40 for session titles, authors and locations
10:00 – 10:30	Refreshment Break	Hall 5 (SEC)
10:30 – 12:00	Concurrent Sessions	See pages 40–44 for session titles, authors and locations
12:00 – 13:30	Lunch	Hall 5 (SEC)
13:30 – 15:00	Concurrent Sessions	See pages 44–48 for session titles, authors and locations
15:00 – 15:30	Refreshment Break	Hall 5 (SEC)
15:30 – 17:30	Concurrent Sessions	See pages 49–53 for session titles, authors and locations
17:40 – 18:30	Afternoon Lecture Series	Lomond Auditorium (SEC)

CONCURRENT SESSIONS

08:30 – 10:00

Offshore Technology

1-1-3 Floating Wind Platforms

Tuesday June 11 Room SEC, Alsh 1 | 08:30 – 10:00

Session Chair: Bonjun Koo, TechnipFMC, USA

Session Co-Chair: Mareike Leimeister, Fraunhofer IWES (Fraunhofer Institute for Wind Energy Systems), Germany

Larger MW-class Floater Designs without Upscaling? – A Direct Optimization Approach OMAE2019-95210

Mareike Leimeister¹ Athanasios Kolios² Maurizio Collu² Philipp Thomas¹
 1. Fraunhofer IWES (Fraunhofer Institute for Wind Energy Systems), Bremerhaven, Germany; 2. University of Strathclyde, Glasgow, United Kingdom

Effect of Wind Turbulence on Extreme Load Analysis of an Offshore Wind Turbine OMAE2019-95634

Xiaolu Chen¹ Zhiyu Jiang² Qinyuan Li³ Ye Li¹
 1. Shanghai Jiao Tong University, Shanghai, China; 2. University of Agder, Grimstad, Norway; 3. Norwegian University of Science and Technology, Trondheim, Norway

Baseline Design of the Deep Turbine Installation-Floating, a New Floating Wind Concept OMAE2019-95477

Jordi Serret¹ Tahsin Tezdogan² Tim Stratford³ Philipp R. Thies⁴ Vengatesan Venugopal³
 1. University of Edinburgh – IDCORE, Edinburgh, United Kingdom; 2. University of Strathclyde, Glasgow, United Kingdom; 3. University of Edinburgh, Edinburgh, United Kingdom; 4. University of Exeter, Penryn, United Kingdom

A Review of Offshore Structures Science and Engineering for Future Floating Wind Platforms OMAE2019-95795

Maria Lourdes Jalon Ramirez, Feargal Brennan
 University of Strathclyde, Glasgow, United Kingdom

Offshore Technology

1-2-2 Mooring System Design and Analysis I

Tuesday June 11 Room SEC, Dochart 2 | 08:30 – 10:00

Session Chair: Djoni Sidarta, TechnipFMC, USA

Session Co-Chair: Jaakko Lehtonen, TechnipFMC Genesis, USA

Snap Load Induced by Slack-taut Process in a Taut Mooring Line OMAE2019-95016

Dongsheng Qiao¹ Wei Tang¹ Yunfei Suo² Jun Yan¹ Yugang Li¹ Daocheng Zhou¹
 1. Dalian University of Technology, Dalian, China; 2. CCC-CFHD Engineering Company, Guangzhou, China

Spring-Dashpot Simulations of Polyester Ropes – Validation of the Syrope Model OMAE2019-95469

Erik Falkenberg, Limin Yang, Vidar R. Åhjem
 DNV GL, Høvik, Norway

Three-Dimensional Dynamic Analysis Method of Multi-component Mooring Lines OMAE2019-96056

Yuda Apri Hermawan, Yoshitaka Furukawa
 Kyushu University, Fukuoka, Japan

Structures, Safety and Reliability

2-4-1 Fatigue and Fracture Reliability I

Tuesday June 11 Room SEC, Alsh 2 | 08:30 – 10:00

Session Chair: Marcelo Igor Lourenço Souza, UFRJ, Brazil

Session Co-Chair: Fredhi Agung Prasetyo, Research & Development Division, Biro Klasifikasi Indonesia, Indonesia

Inner Bend Cracks in Mooring Chain – Investigation of Cracks Observed on Chains Taken Out of Service OMAE2019-95084

Øystein Gabrielsen¹ Inge Morten Kulbotten² Imanol Martinez Perez³ Lars Håskoll⁴
 1. Equinor, Trondheim, Norway; 2. Equinor ASA, Trondheim, Norway; 3. Principia, La Ciotat, France; 4. Equinor ASA, Stjørdal, Norway

Fracture Mechanics Based Mooring Fatigue Analysis for a Semi-submersible Subjected to Triple Narrow-band Loading Processes OMAE2019-95108

Xutian Xue¹ Nianzhong Chen² Yongchang Pu³
 1. Newcastle University, Newcastle upon Tyne, United Kingdom; 2. Tianjin University, Tianjin, China; 3. Marine, Offshore and Subsea Technology Group, School of Engineering, Newcastle upon Tyne, United Kingdom

Computational Fatigue Assessment of Mooring Chains Working in Twisted Conditions OMAE2019-96000

Imanol Martinez Perez¹ Øystein Gabrielsen²
 1. Principia, La Ciotat, France; 2. Equinor, Trondheim, Norway

Predictions of Tensile Strain Capacity for Strain-based Pipelines with a Circumferential and Internal Surface Flaw OMAE2019-96480

Youn-Young Jang¹ Ju-Yeon Kang¹ Nam-Su Huh¹
 Ik-Joong Kim² Cheol-Man Kim² Young-Pyo Kim²
 1. Seoul National University of Science and Technology, Seoul, Korea; 2. KOGAS, Ansan, Korea

Structures, Safety and Reliability

2-9-1 Extreme Loading and Responses I

Tuesday June 11 Room **Crowne Plaza, Castle 1** | 08:30 – 10:00

Session Chair: Carlos Guedes Soares, Instituto Superior

Técnico, Universidade de Lisboa, Portugal

Session Co-Chair: Luis V.S. Sagrilo, LACEO/COPPE/

Federal University of Rio De Janeiro, Brazil

Elementary Loading Processes and Scale Effects involved in Wave-in-Deck Type of Loading – A Summary of the BreakIn JIP

OMAE2019-95004

Jule Scharnke

MARIN, Wageningen, Netherlands

Numerical Simulation and Analysis of Phase Focused Breaking and Non-breaking Wave Impact on Fixed Offshore Platform Deck

OMAE2019-95193

Rameeza Moideen¹ Manasa Ranjan Behera¹ Arun Kamath² Hans Bihs³

1. Indian Institute of technology Bombay, Mumbai, India;

2. Norwegian University of Science and Technology, Trondheim, Norway;

3. Norwegian University of Science and Technology, Sør-Trøndelag, Norway

The Impact of Climate Change on the Long-term Response of Offshore Structures: A Study Case

OMAE2019-95261

Irvin Alberto Mosquera¹ Luis V.S. Sagrilo² Paulo M. Videiro²

1. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. LACEO/

COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Study of Uncertainties in Laboratory Wave Impact Measurements on Dike Mounted Walls due to

Non-repeatability, Scale- and Model-effects

OMAE2019-96703

Maximilian Streicher¹ Andreas Kortenhaus¹ Corrado Altomare¹ Steven Hughes²

Krasimir Marinov³ Bas Hofland⁴ Xuexue Chen⁵ Tomohiro Suzuki⁶ Lorenzo Cappiotti⁷

1. Ghent University, Ghent, Belgium; 2. Colorado State University, Fort Collins, CO, USA;

3. University of Architecture, Civil Engineering and Geodesy Sofia, Sofia, Bulgaria; 4. TU Delft,

Delft, Netherlands; 5. Haskoning DHV Nederland B.V., Rotterdam, Netherlands; 6. Flanders

Hydraulics Research, Antwerp, Belgium; 7. Università degli Studi di Firenze, Florence, Italy

Structures, Safety and Reliability

2-12-1 Structural Analysis and Optimization I

Tuesday June 11 Room **Crowne Plaza, Castle 2** | 08:30 – 10:00

Session Chair: Jonas W. Ringsberg, Chalmers University of Technology, Sweden

Session Co-Chair: Paulo M. Videiro, LACEO/COPPE/

Federal University of Rio De Janeiro, Brazil

Analytical Method for Preliminary Design of Anchor Flanges for Subsea Structures

OMAE2019-95051

Sabesan Rajaratnam¹ Sriskandarajah Thurairajah¹ Daryl Clayton¹

Graeme Roberts¹ Vincent Loentgen² Carlos Charnaux¹

1. Subsea 7, Sutton, United Kingdom; 2. Subsea7, Paris, France

Simplifying Methods for Fatigue Analysis of Risers

OMAE2019-95386

Luiz Otavio C. M. Pereira¹ Paulo M. Videiro² Luis V.S. Sagrilo²

1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil;

2. LACEO/COPPE/Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Four-point Bending of Metallic I-Core Sandwich Beams with Longitudinal Girder

OMAE2019-95491

Wenwei Hu, Jun Liu, Pan Zhang, Yuansheng Cheng

Huazhong University of Science and Technology, Wuhan, China

Validation of External Moment Determination for the Shaft-line of the SA Agulhas II

OMAE2019-96746

Brendon Nickerson, Annie Bekker

Stellenbosch University, Department of Mechanical and

Mechatronic Engineering, Stellenbosch, South Africa

Materials Technology

3-1-1 Fracture Toughness Measurement and Assessment

Tuesday June 11 Room **SEC, Boisdale 1** | 08:30 – 10:00

Session Chair: Xin Wang, Carleton University, Canada

Session Co-Chair: Myung-Hyun Kim, Pusan National University, Korea

Influence of Microstructural Variation in Thick Section Steels on the Characterisation of Fracture Toughness using Sub-size Specimens

OMAE2019-96010

Philippa Moore¹ Borislava Yordanova² Yong Lu² Yin Jin Janin¹

1. TWI Ltd, Cambridge, United Kingdom;

2. University of Edinburgh, Edinburgh, United Kingdom

Correlation between Steel Microstructural Characteristics and the Initiation and Arrest Toughness Determined from Small-scale Mechanical Testing

OMAE2019-95290

Jessica Taylor¹ Philippa Moore² Ali Mehmanparast¹ Rob Kulka²

1. Cranfield University, Cranfield, United Kingdom; 2. TWI Ltd, Cambridge, United Kingdom

CTOD Fracture Toughness Assessment under Different Notch Type (Fatigue Pre-cracking and EDM)

OMAE2019-95130

Israel Marines-Garcia¹ Aaron Aguilar¹ Kristian Carreon¹ Philippe Darcis²

1. Tenaris TISA, Veracruz, Mexico; 2. Dalmine S.p.A., Dalmine, Italy

Scaling of Pop-ins during Brittle Fracture Testing

OMAE2019-95368

Okko J Coppejans¹ Carey L. Walters²

1. TNO, Delft, Netherlands; 2. Delft University of Technology, Delft, Netherlands

Scatter in Charpy Data Considered as a Transferrable Parameter

OMAE2019-96748

William Mohr, Neal Birchfield

EWI, Columbus, OH, USA

Pipelines, Risers, and Subsea Systems

4-1-2 Flexible Pipes II

Tuesday June 11 Room **Crowne Plaza, Staffa / Shuna** | 08:30 – 10:00

Session Chair: Zhimin Tan, Baker Hughes (a GE company), USA

Session Co-Chair: Adrian Connaire, Wood, Ireland

Session Co-Chair: Svein Saevik, Norwegian University

of Science and Technology, Norway

A Symbolic Regression Formulation to Estimate the Lateral Buckling Resistance of the Tensile Armors in Flexible Pipes

OMAE2019-95510

Gabriel Gonzalez¹ José Renato M. de Sousa¹ Luis V.S. Sagrilo²

Ricardo R. Martins³ Djalene Rocha³

1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. LACEO/COPPE/Federal

University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. Petrobras, Rio de Janeiro, RJ, Brazil

An Application of Fault Tree Analysis for Decommissioning of Subsea Flexible Pipeline in Brazil

OMAE2019-96730

Rafaela Ramos¹ Ilson Pasqualino² Marcelo Igor Lourenço Souza³ Eduardo Ribeiro Nicolosi⁴

1. Fundação - COPPETEC - Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil;

2. COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. Universidade

Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4. Petrobras, Rio de Janeiro, RJ, Brazil

Tie in of a Rigid Pipeline to a Flexible Riser – Design and Installation – Challenges and Lessons Learned OMAE2019-95057

Curti Gianbattista¹ François Lirola² Pirinu Gianluigi³ Pavone Diego¹ Perrin Frederic³
1. Saipem, Fano, Italy; 2. Saipem, Montigny le Bretonneux, France; 3. Saipem, Saint Quentin Yvelines, France

Pipelines, Risers, and Subsea Systems

4-3-2 Installation

Tuesday June 11 Room **Crowne Plaza, Castle 3** | 08:30 – 10:00

Session Chair: Julian Hallai, ExxonMobil, USA
Session Co-Chair: Chris Timms, C-FER Technologies, Canada

Improved Pipelay Equipment Settings Methodology for Rigid Pipes OMAE2019-95475

Geoffrey Marmonier, Andrew Harrop, Ludovic Lacan
TechnipFMC, Westhill, United Kingdom

Prediction of Liner Wrinkling during High Strain Bending of Mechanically Lined Pipe OMAE2019-95511

Aurelien Pepin¹ Tomasz Tkaczyk² Martinez Michael³ Noel O'Dowd⁴ Kamran Nikbin⁵
1. Technip UK / Imperial College London, Aberdeen, United Kingdom; 2. TechnipFMC, Westhill, United Kingdom; 3. IFP Energies Nouvelles, Solaize, France; 4. University of Limerick, Limerick, Ireland; 5. Imperial College London, London, United Kingdom

Influence of Lined-pipe Fabrication on Liner Wrinkling OMAE2019-95743

Ilias Gavriilidis¹ Spyros A. Karamanos²
1. School of Engineering, Edinburgh, United Kingdom;
2. The University of Edinburgh, Edinburgh, United Kingdom

Polymer Liner Collapse Design Model OMAE2019-96219

Scott Mathieson, Colin Jones, Allan Feeney
Swagelining, Glasgow, United Kingdom

Ocean Space Utilization

5-2-1 Aquaculture I: Design and Modeling I

Tuesday June 11 Room **SEC, Dochart 1** | 08:30 – 10:00

Session Chair: Muk Chen Ong, University of Stavanger, Norway
Session Co-Chair: Lin Li, University of Stavanger, Norway

A Multipurpose Framework for Modelling and Simulation of Marine Aquaculture Systems OMAE2019-95414

Biao Su¹ Karl J. Reite¹ Martin Føre² Karl Gunnar Aarsaether³ Morten Omholt Alver²
Per Christian Endresen¹ David Kristiansen¹ Joakim Haugen¹ Walter Caharija¹ Andrei Tsarau¹
1. SINTEF Ocean, Trondheim, Norway; 2. Norwegian University of Science and Technology, Trondheim, Norway; 3. SINTEF Ocean, Tromsø, Norway

Coupled Motion and Sloshing Analysis of a Cylindrical Closed Fish Cage in Regular Waves OMAE2019-96002

Yuelin Tan¹ Yanlin Shao² Robert Read³
1. Technical University of Denmark, Vanløse, Denmark; 2. Technical University of Denmark, Kongens Lyngby, Denmark; 3. Delft University of Technology/Mechanical Engineering, Lyngby, Denmark

Hydrodynamic Load Modeling for Offshore Free-floating Macroalgal Aquaculture under Extreme Environmental Conditions OMAE2019-96803

Ming Chen¹ Solomon Yim¹ Daniel Cox¹ Taiping Wang² Michael Huesemann²
Zhaoqing Yang³ Thomas Mumford⁴ Geoffrey Wood⁵
1. Oregon State University, Corvallis, OR, USA; 2. Pacific Northwest National Laboratory, Sequim, WA, USA; 3. Pacific Northwest National Laboratory, Seattle, WA, USA; 4. Marine Agronomics, LLC, Olympia, WA, USA; 5. Composite Recycling Technology Center, Port Angeles, WA, USA

Current Induced Drag Forces on Cultivated Sugar Kelp OMAE2019-96375
Per Christian Endresen, Carina Norvik, David Kristiansen, Jens Birkevold, Zsolt Volent
SINTEF Ocean, Trondheim, Norway

Ocean Engineering

6-2-1 Coastal Engineering I

Tuesday June 11 Room **SEC, M4** | 08:30 – 10:00

Session Chair: Masoud Hayatdavoodi, University of Dundee, United Kingdom

Numerical Study on Influence of Width of Vegetated Zone on Wave Attenuation OMAE2019-95713

Jun Tang, Yongming Shen
Dalian University of Technology, Dalian, China

Wave Response of a Novel Floating Breakwater-windbreak with Oscillating Water Columns OMAE2019-95860

Mengmeng Han¹ Chien Ming Wang¹ Wenhui Duan²
1. University of Queensland, Brisbane, QLD, Australia;
2. Monash University, Clayton, VIC, Australia

Solitary Wave Interaction with Vertical Porous Barriers OMAE2019-95194

Vivek Francis¹ Balaji Ramakrishnan² Murray Rudman³
1. IITB-Monash Research Academy, Mumbai, India; 2. IIT Bombay, Mumbai, India; 3. Monash University, Melbourne, VIC, Australia

Bore Pressure on Horizontal and Vertical Surfaces OMAE2019-96013

Jiaqi Liu¹ Masoud Hayatdavoodi¹ R. Cengiz Ertekin²
1. University of Dundee, Dundee, United Kingdom;
2. University of Hawaii, Township of Washington, NJ, USA

Effect of the Wind Drag Estimation Methods on Numerical Storm Surge Modeling OMAE2019-95895

C. Gowri Shankar, Manasa Ranjan Behera
Indian Institute of Technology Bombay, Mumbai, India

Ocean Engineering

6-4-3 Marine Engineering and Applications I

Tuesday June 11 Room **SEC, M2 & M3** | 08:30 – 10:00

Session Chair: Muk Chen Ong, University of Stavanger, Norway
Session Co-Chair: Guang Yin, University of Stavanger, Norway

Multi Objective Design of Ships: A Pareto Procedure OMAE2019-96643

Sander Calisal
University of British Columbia, Vancouver, BC, Canada

Noise Reduction of Bio-inspired Marine Propeller based on Serrated Trailing Edge OMAE2019-96782

Wencai Zhu, Hongtao Gao
Dalian Maritime University, Dalian, China

Experimental and Numerical Study Propeller Shaft Oil Whip OMAE2019-95331

Adarsh D¹ Kiran Vijayan² Kartheek Amaroju¹
1. OENA, IIT Kharagpur, Kharagpur, India; 2. IIT Kharagpur, Kharagpur, India

Openmodelica Modelling of the Thruster in a Compact Work-class Remotely Operated Vehicle OMAE2019-96839

Yihan Xing¹ Kristian Fotland² Muk Chen Ong¹
1. University of Stavanger, Stavanger, Norway; 2. IKM Technology AS, Bryne, Norway

CFD & FSI

8-2-1 Free Surface Modeling

Tuesday June 11 Room **SEC, Lomond Auditorium** | 08:30 – 10:00

Session Chair: Hans Bihs, Norwegian University of Science and Technology, Norway

Session Co-Chair: Arun Kamath, Norwegian University of Science and Technology, Norway

Numerical Simulation of Solitary Wave Breaking with Adaptive Mesh Refinement OMAE2019-95224

Yunxing Zhang, Wenyang Duan, Kangping Liao, Shan Ma, Guihua Xia
Harbin Engineering University, Harbin, China

REEF3D Wave Generation Interface for

Commercial CFD Codes OMAE2019-95921

Csaba Pakozdi¹ Hans Bihs² Arun Kamath³ Elin Marita H. Hermundstad¹
1. SINTEF Ocean, Trondheim, Norway; 2. Norwegian University of Science and Technology, Sør-Trøndelag, Norway; 3. Norwegian University of Science and Technology, Trondheim, Norway

Numerical Study on the Temporal Discretization Schemes in Two-phase Wave Simulation OMAE2019-96278

Young Jun Kim¹ Benjamin Bouscasse¹ Sopheak Seng² David Le Touze¹
1. Ecole Centrale de Nantes, Nantes, France; 2. Bureau Veritas, Marine & Offshore, Paris, France

REEF3D::FNPF – A Flexible Fully Nonlinear Potential

Flow Solver on Fixed Grids OMAE2019-96524

Hans Bihs¹ Weizhi Wang² Tobias Martin² Arun Kamath²
1. Norwegian University of Science and Technology, Sør-Trøndelag, Norway;
2. Norwegian University of Science and Technology, Trondheim, Norway

Ocean Renewable Energy

9-3-1 Wave Energy Converter Control Systems Competition (WECCOMP)

Tuesday June 11 Room **SEC, Carron 1** | 08:30 – 10:00

Session Chair: John Ringwood, Maynooth University, Ireland

The WECCOMP Wave Energy Control

Competition – Overview OMAE2019-95216

John Ringwood¹ Francesco Ferri² Nathan Tom³ Kelley Ruehl⁴
Nicolás Faedo⁵ Giorgio Bacelli⁴ Yi-Hsiang Yu² Ryan Coe⁴
1. Maynooth University, County Kildare, Ireland; 2. Dept. of Civil Engineering, Aalborg University, Aalborg, Denmark; 3. National Renewable Energy Laboratory, Golden, CO, USA; 4. Sandia National Laboratories, Albuquerque, NM, USA; 5. Maynooth University, Maynooth, Ireland

An Energy-maximising MPC Solution to the WEC

Control Competition OMAE2019-95197

Paolino Tona, Guillaume Sabiron, Hoai-Nam Nguyen
IFP Energies Nouvelles, Solaize, France

Development of a Model Predictive Controller for the Wave Energy Converter Control Competition OMAE2019-95544

Bradley A. Ling
Northwest Energy Innovations, Portland, OR, USA

Learning a Predictionless Resonating Controller for Wave Energy Converters OMAE2019-95619

Shuo Shi, Ron Patton, Mustafa Abdelrahman, Yanhua Liu
University of Hull, Hull, United Kingdom

Offshore Geotechnics

10-4-1 Pile Foundations I

Tuesday June 11 Room **Crowne Plaza, Jura** | 08:30 – 10:00

Session Chair: Susan Gourvenec, University of Southampton/

Southampton Marine and Maritime Institute, United Kingdom

Method Evaluating Axial Response of Vertically-loaded Piles during Spudcan Penetration OMAE2019-95422

Yifei Fan, Jianhua Wang
Tianjin University, Tianjin, China

Feasibility Study of an Innovative Large Open-ended Monopile Foundation for Offshore Wind Turbine OMAE2019-95641

Jiale Li¹ Xuefei Wang¹ Xiong Yu² Yougang Tang³
1. Hebei University of Technology, Tianjin, China; 2. Case Western Reserve University, Cleveland, OH, USA; 3. Tianjin University, Tianjin, China

Evaluation of Uncertainty of Damage Results in Experimental Modelling of Monopile Foundation Scour Protection OMAE2019-95793

Minghao Wu¹ Jonas Arnout¹ Josep Molina Ruiz¹
Carlos Arboleda Chavez¹ Vasiliki Stratigaki² Peter Troch¹
1. Ghent University, Zwijnaarde, Belgium; 2. Ghent University, Ghent, Belgium

Application of Friction Fatigue Pile Driving

Models in GRLWEAP OMAE2019-95944

Henry Milewski, Justin Kennedy
TechnipFMC, Westhill, United Kingdom

Petroleum Technology

11-7-2 Well Drilling Fluids and Hydraulics II

Tuesday June 11 Room **Crowne Plaza, Barra** | 08:30 – 10:00

Session Chair: Ergun Kuru, University of Alberta, Canada

Session Co-Chair: Majid Bizhani, University of British Columbia, Canada

Hydraulic Behaviour in Cased and Open Hole Sections in Highly Deviated Wellbores OMAE2019-96347

Jan David Ytrehus¹ Bjørnar Lund¹ Ali Taghipour¹ Birgitte Ruud Kosberg¹
Luca Carazza² Knud Richard Gyland³ Arild Saasen⁴
1. SINTEF, Trondheim, Norway; 2. Aker BP, Stavanger, Norway; 3. M-I Swaco Schlumberger Fluids, Stavanger, Norway; 4. UIS, Gullaug, Norway

Use of Tracer Particles for Tracking Fluid Interfaces in Primary Cementing OMAE2019-96400

Amir Taheri¹ Jan David Ytrehus² Ali Taghipour³ Bjørnar Lund²
Alexandre Lavrov² Malin Torsæter²
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF, Trondheim, Norway; 3. Sintef Petroleum Research AS, Trondheim, Norway

Hole Cleaning Related Stuck Pipe Analysis during Extended Reach Drilling by using a Transient Cuttings Transport Model – A Case Study OMAE2019-96617

Hao Zeng¹ Yijin Zeng¹ Feifei Zhang² Guang Yang³ Yuezhi Wang² Xi Wang²
1. Sinopec, Beijing, China; 2. Yangtze University, Wuhan, China; 3. CNPC, Beijing, China

Mechanical Friction in Well Construction and Laboratory Testing of Friction Coefficients OMAE2019-96594

Parisa Ghaedi¹ Mahmoud Khalifeh¹ Arild Saasen² Helge Hodne¹
Tor Henry Omland³ Farzad N. Shoghi³
1. University of Stavanger, Stavanger, Norway; 2. University of Stavanger, Gullaug, Norway; 3. Equinor ASA, Stavanger, Norway

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-4-1 Hydrodynamic Aspects of Offshore Renewable Energy

Tuesday June 11 Room SEC, Carron 2 | 08:30 – 10:00

Session Organizer: Xingya Feng, University of Oxford, United Kingdom
Session Co-Chair: Deborah Greaves, University of Plymouth, United Kingdom

Experimental and Numerical Investigations on Wave Dynamics of a Dual-chamber OWC Wave Energy Device OMAE2019-95165

Dezhi Ning¹ Rongquan Wang¹ Qingping Zou² Bin Teng¹

1. Dalian University of Technology, Dalian, China;
2. Heriot-Watt University, Edinburgh, United Kingdom

Evaluation of the Performance of an Integrated WEC Type of Breakwater System OMAE2019-95739

Haoyu Ding¹ Jun Zang¹ Dezhi Ning² Xuanlie Zhao²

Qiang Chen¹ Chris Blenkinsopp¹ Junliang Gao³
1. University of Bath, Bath, United Kingdom; 2. Dalian University of Technology, Dalian, China; 3. Jiangsu University of Science and Technology, Zhenjiang, China

Rigid and Flexible Inter-connection of Arrays of Oscillating Water Column Wave Energy Converters: Findings from the WETFEET Project OMAE2019-96573

Keri Collins¹ Deborah Greaves² Martyn Hann¹ Ben Howey¹

Rui P. F. Gomes³ Joao C.C. Henriques³
1. School of Engineering, University of Plymouth, Plymouth, United Kingdom; 2. University of Plymouth, Plymouth, United Kingdom; 3. IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

Time-domain Diffraction Modelling with Mean Force Effects and Experimental Comparison with Slack-moored M4 Wave Energy Converter OMAE2019-96756

Peter Stansby, Efrain Carpintero Moreno
University of Manchester, Manchester, United Kingdom

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-2-2 Experiments and Numerical Validation

Tuesday June 11 Room SEC, Boisdale 2 | 08:30 – 10:00

Session Chair: Marcio Yamamoto, National Maritime Research Institute, Japan
Session Co-Chair: Celso Morrooka, University of Campinas, Brazil

Ship as a Wave Buoy – Estimating Relative Wave Direction from In-service Ship Motion Measurements using Machine Learning OMAE2019-96201

Bart Mak, Bulent Duz
Maritime Research Institute in the Netherlands (MARIN), Wageningen, Netherlands

Ship as a Wave Buoy – Using Simulated Data to Train Neural Networks for Real Time Estimation of Relative Wave Direction OMAE2019-96225

Bart Mak, Bulent Duz
Maritime Research Institute in the Netherlands (MARIN), Wageningen, Netherlands

An Experimental Study of Snap Loads on a Vertical Hanging Cable System OMAE2019-96424

Wei-Ting Hsu¹ Tzu-Ching Chuang² Wen-Yang Hsu³ Krish Sharman⁴ Ray-Yeng Yang²
1. Ergo Engineering, a KBR Company, Houston, TX, USA; 2. National Cheng Kung University, Tainan, Taiwan; 3. Tainan Hydraulics Laboratory, National Cheng Kung University, Tainan, Taiwan; 4. University of Massachusetts Amherst, Amherst, MA, USA

Experimental and Numerical Study of Motion of Rotating Drill Pipe Owing to Magnus Effect OMAE2019-96602

Tomoya Inoue¹ Hiroyoshi Suzuki² Tokihiro Katsui³ Keita Tsuchiya² Yusuke Notani³
1. JAMSTEC, Yokosuka, Japan; 2. Osaka University, Suita, Japan; 3. Kobe University, Kobe, Japan

Refreshment Break

10:00 – 10:30

Location: Hall 5 (SEC)

Sponsored by Babcock

babcock

CONCURRENT SESSIONS

10:30 – 12:00

Offshore Technology

1-1-4 Fixed Platforms and Foundations

Tuesday June 11 Room SEC, Alsh 1 | 10:30 – 12:00

Session Chair: Partha Chakrabarti, Zentech Inc, USA
Co-Chair: Marc Cahay, TechnipFMC

Punch-through Structural Analysis of Jack-up Rigs during Preloading of the Foundations OMAE2019-95537

Partha Chakrabarti, Abhijeet Chawan
Zentech, Inc., Houston, TX, USA

Critical Review of Early Age Cycling Effects on the Capacity of Pile to Sleeve Grouted Connections as Treated in ISO 19902 OMAE2019-95626

Andi Merxhani¹ Jacob Fisker Jensen² Joao Caetano² Casper Klintø Christiansen²
1. Ramboll Energy, Copenhagen, Denmark; 2. Ramboll Offshore Wind, Copenhagen, Denmark

Effects of Cap Bottom Elevation on Wave Loads on the Piles under the Cap OMAE2019-96777

Jifu Zhou, Xu Wang
Institute of Mechnaics, Chinese Academy of Sciences, Beijing, China

Offshore Technology

1-2-3 Dynamic Positioning II

Tuesday June 11 Room SEC, Dochart 2 | 10:30 – 12:00

Session Chair: Xinshu Zhang, Shanghai Jiao Tong University, China
Session Co-Chair: Xinliang Tian, Shanghai Jiao Tong University, China
Session Co-Chair: Dimitris Chalkias, GustoMSC, Netherlands

Learning from Our Dynamic Positioning Events OMAE2019-96710

Arne Kvitrud
Petroleum Safety Authority (PSA), Stavanger, Norway

QUAD Lift: Enabling Lifting of Larger Integrated Topsides OMAE2019-95375
Ivan van Winsen, Radboud van Dijk
Heerema Marine Contractors, Leiden, Netherlands

Can the Shore Tension System Reduce Sloshing during LNG Terminal Loading Operations OMAE2019-96548
Olger Koop
Aktis Hydraulics, Zwolle, Netherlands

Realistic Adaptive DP Controller for Flotel Operating in Side-by-side Configuration with FPSO OMAE2019-96577
Anurag Yenduri¹ Allan Magee¹ Jing Liu² Wei Xu² Ankit Choudhary² Anis Altaf Hussain²
1. National University of Singapore, Singapore, Singapore;
2. Keppel Offshore and Marine Technology Centre, Singapore, Singapore

Structures, Safety and Reliability

2-4-2 Fatigue and Fracture Reliability II

Tuesday June 11 Room SEC, Alsh 2 | 10:30 – 12:00
Session Chair: Nianzhong Chen, Tianjin University, China
Session Co-Chair: Fang Wang, Shanghai Ocean University, China

Low-cycle-fatigue Crack Closure Effect of Ship Cracked Plate considering the Accumulative Plastic Damage OMAE2019-95230
Yuelin Song, Ping Yang, Ziya Peng, Wei Jiang, Kang Hu
Wuhan University of Technology, Wuhan, China

Multiobjective Reliability-based Design of Ship Structures Subjected to Fatigue Damage and Compressive Collapse OMAE2019-96666
Yordan Garbatov, Huang Yingcai
University of Lisbon, Lisboa, Portugal

Comparative Study on Fatigue Damage Assessment of a Structure Member in a Bulk Carrier using Various Environmental Conditions OMAE2019-96760
Fredhi Agung Prasetyo¹ Naoki Osawa² Mohammad Arif Kurniawan¹ Siti Komariyah¹
1. Research & Development Division, Biro Klasifikasi Indonesia, Jakarta, Indonesia; 2. Osaka University, Suita, Japan

Fatigue Behavior of Large, Rolled-after-heat-treatment and Hot-dip Galvanized HT Bolts OMAE2019-96808
Julian Unglaub, Klaus Thiele
Institute of Steel Structures, TU Braunschweig, Braunschweig, Germany

Structures, Safety and Reliability

2-9-2 Extreme Loading and Responses II

Tuesday June 11 Room Crowne Plaza, Castle 1 | 10:30 – 12:00
Session Chair: Kazuhiro Iijima, Dept of NAOE, Osaka University, Japan
Session Co-Chair: Hans Bihs, Norwegian University of Science and Technology, Norway

Comparison of the Environmental Contour Method and Response-based Analysis using Response Emulator for Estimating Extreme Ship Responses OMAE2019-95098
Erik Vanem, Bingjie Guo
DNV GL, Høvik, Norway

Long-term Extreme Response Analysis for a Straight Floating Bridge Across the Bjørnafjord OMAE2019-95212
Finn-Idar G. Giske¹ Arnt G. Fredriksen²
1. Multiconsult, Oslo, Norway; 2. Multiconsult, Tromsø, Norway

A New Approach for Environmental Contour and Multivariate De-clustering OMAE2019-95993
Quentin Derbanne¹ Guillaume de Hauteclocque²
1. Bureau Veritas, Marine & Offshore, Paris, France; 2. Bureau Veritas, Paris, France

Experimental Assessment of Vertical Shear Force and Bending Moment in Severe Sea Conditions OMAE2019-96272
Boris Horel¹ Benjamin Bouscasse² Arnaud Merrien¹ Guillaume de Hauteclocque³
1. Ecole Centrale Nantes, LHEEA res. dept. (ECN and CNRS), Nantes, France;
2. Ecole Centrale de Nantes, Nantes, France; 3. Bureau Veritas, Paris, France

Structures, Safety and Reliability

2-12-2 Structural Analysis and Optimization II

Tuesday June 11 Room Crowne Plaza, Castle 2 | 10:30 – 12:00
Session Chair: Paulo M. Videiro, LACEO/COPPE/
Federal University of Rio De Janeiro, Brazil
Session Co-Chair: Jonas W. Ringsberg, Chalmers University of Technology, Sweden

Numerical Simulation of Container Stacks Dynamics under Typical Motion Excitation OMAE2019-95644
Chuntong Li, Deyu Wang, Jiaqi Liu
Shanghai Jiao Tong University, Shanghai, China

Dynamic Response of Metallic Y-type Core Sandwich Panels Subjected to Air Blast Loading – Numerical Investigation OMAE2019-96628
Ting Liu, Yuansheng Cheng, Jun Liu, Ganchao Chen, Changhai Chen, Pan Zhang
Huazhong University of Science and Technology, Wuhan, China

Quasi-static and Dynamic Compressive Behaviors of Closed-cell Stochastic Foams based on Voronoi Model OMAE2019-95924
Jianyong Chen, Jun Liu, Yuansheng Cheng, Pan Zhang
Huazhong University of Science and Technology, Wuhan, China

Materials Technology

3-4-1 Steel Performance in Sour Environment

Tuesday June 11 Room SEC, Boisdale 1 | 10:30 – 12:00
Session Chair: Agnes Marie Horn, DNV GL, Norway
Session Co-Chair: Carol Johnston, TWI Ltd, United Kingdom

Fatigue Performance and Crack Growth Assessments of Riser Welds in Mild Sour Environment OMAE2019-96329
Rupak Ghosh¹ Robert Aune² Carl Popelar³
1. ExxonMobil, Spring, TX, USA; 2. ExxonMobil Production Company, Spring, TX, USA; 3. Southwest Research Institute, San Antonio, TX, USA

Local Hard Zones in Sour Service Steels OMAE2019-96593
Doug Fairchild¹ Brian Newbury¹ Tim Anderson¹ Neeraj Thirumalai²
1. ExxonMobil Production Company, Spring, TX, USA;
2. Exxonmobil Research and Engineering Co, Annandale, NJ, USA

Qualification of TMCP Pipe for Sour Service: Mitigation of Local Hard Zones OMAE2019-96614
Brian Newbury¹ Doug Fairchild¹ Andrew Prescott¹ Andrew Wasson² Tim Anderson¹
1. Exxonmobil Production Company, Spring, TX, USA;
2. Exxonmobil Upstream Research Company, Spring, TX, USA

An Investigation Concerning the Sulfide Stress Cracking of TMCP Steels OMAE2019-96556

Xin Yue¹ Andrew Wasson¹ David Fischer¹ Tim Anderson²
 Brian Newbury² Weiji Huang² Doug Fairchild²
 1. Exxonmobil Upstream Research Company, Spring, TX, USA;
 2. ExxonMobil Production Company, Spring, TX, USA

Pipelines, Risers, and Subsea Systems

4-1-3 Flexible Pipes III

Tuesday June 11 Room **Crowne Plaza, Staffa / Shuna** | 10:30 – 12:00
 Session Chair: Murilo Augusto Vaz, COPPE/UFRJ, Brazil
 Session Co-Chair: Anh Tuan Do, TechnipFMC, France

Evaluation of the Temperature Effect on the Viscoelastic Responses of Flexible Risers OMAE2019-95141

Junpeng Liu¹ Jinsheng Ma² Murilo Augusto Vaz³ Menglan Duan¹
 1. China University of Petroleum, Beijing, China; 2. Fudan University, Shanghai, China; 3. COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Study on Mechanical Behavior of Tensile Armor Wires of Marine Flexible Pipes and Cables during Winding Process OMAE2019-95426

Qingzhen Lu¹ Shanghua Wu² Dong Wang¹ Zhixun Yang²
 Yuanchao Yin² Haitao Hu² Jun Yan² Qianjin Yue¹
 1. Dalian University of Technology, Panjin, China; 2. Dalian University of Technology, Dalian, China

Recent Advances in the Prediction and Mitigation of Flow Induced Pulsations in Flexible Risers and Flowlines OMAE2019-95906

Stefan Belfroid, Nestor Gonzalez Diez, Harry Korst
 TNO, Delft, Netherlands

Effect of Local Model Dynamics on Flexible Riser Tensile Armor Wire Stress Predictions OMAE2019-95303

Gabriel Rombado¹ Krassimir Doynov² Nathan Cooke³ Arya Majed⁴
 1. ExxonMobil Production Company, Spring, TX, USA; 2. ExxonMobil Upstream Integrated Solutions, Spring, TX, USA; 3. INTECSEA, St. John's, NL, Canada; 4. INTECSEA, Houston, TX, USA

Pipelines, Risers, and Subsea Systems

4-3-6 ECA

Tuesday June 11 Room **Crowne Plaza, Castle 3** | 10:30 – 12:00
 Session Chair: Bostjan Bezensek, Shell, United Kingdom
 Session Co-Chair: Andrew Cosham, Ninth Planet Engineering Ltd, United Kingdom

Fatigue Life Assessment for Pipeline Dents under Highway Crossings OMAE2019-95450

M Liu¹ Colin Cross² Jason Brown³
 1. Aker Solutions, Windsor, United Kingdom; 2. Aker Solutions, London, United Kingdom; 3. Aker Solutions, Aberdeen, United Kingdom

Integrity Assessment of Subsea Pipeline Dent / Buckle using ILI Data OMAE2019-95470

Gurumurthy Kagita, Gudimella G. S., Achary, Mahesh Babu Addala, Balaji Srinivasan, Penchala S. K., Pottem, Deepak Gupta, Subramanyam V. R., Sripada
 Engineers India Limited, Gurugram, India

ECAs and Lateral Buckling OMAE2019-95529

Andrew Cosham¹ Malcolm Carr² Ian MacRae³ Kenneth Macdonald⁴
 1. Ninth Planet Engineering Ltd, Newcastle upon Tyne, United Kingdom;
 2. Crondall Energy, Cramlington, United Kingdom; 3. Crondall Energy, Aberdeen, United Kingdom; 4. University of Stavanger, Hafrsjord, Norway

Dented Externally-pressurised Pipes Subjected to Cyclic Axial Loading OMAE2019-95814

Konstantinos Chatziioannou, Yuner Huang, Spyros A. Karamanos
 The University of Edinburgh, Edinburgh, United Kingdom

Ocean Space Utilization

5-2-2 Aquaculture II: Design and Modeling II

Tuesday June 11 Room **SEC, Dochart 1** | 10:30 – 12:00
 Session Chair: Yanlin Shao, Technical University of Denmark, Denmark
 Session Co-Chair: Xu Xiang, Norwegian Public Roads Administration, Norway

Numerical Modelling of Net Motion in Waves and Current using CFD OMAE2019-95154

Tobias Martin¹ Arun Kamath¹ Hans Bihs²
 1. Norwegian University of Science and Technology, Trondheim, Norway;
 2. Norwegian University of Science and Technology, Sør-Trøndelag, Norway

Numerical Study of a Single-point Mooring Gravity Fish Cage with Different Deformation Suppression Methods OMAE2019-96079

Hui Cheng¹ Karl Gunnar Aarsaether² Lin Li¹ Muk Chen Ong¹
 1. University of Stavanger, Stavanger, Norway; 2. SINTEF Ocean, Tromsø, Norway

Experimental Study on the Motion of a Flexible Hose Net used in Automated Net-hauling System OMAE2019-95670

Yue Li¹ Yoichi Mizukami² Takero Yoshida² Qiao Li² Jialin Han² Daisuke Kitazawa³
 1. The University of Tokyo, Tokyo, Japan; 2. Institute of Industrial Science, The University of Tokyo, Kashiwa, Japan; 3. The University of Tokyo, Kashiwa, Japan

Three-Dimensional Physical Environment Modelling for Integrated Multi-trophic Aquaculture (IMTA)

Implementation in Onagawa Bay, Japan OMAE2019-95672
 Jinxin Zhou¹ Takero Yoshida² Junbo Zhang³ Sanggyu Park¹ Daisuke Kitazawa⁴
 1. Institute of Industrial Science, The University of Tokyo, Chiba, Japan; 2. Institute of Industrial Science, The University of Tokyo, Kashiwa, Japan; 3. College of Marine Sciences, Shanghai Ocean University, Shanghai, China; 4. The University of Tokyo, Kashiwa, Japan

Ocean Engineering

6-2-2 Coastal Engineering II

Tuesday June 11 Room **SEC, M4** | 10:30 – 12:00
 Session Chair: Neelamani Subramaniam, Kuwait Institute for Scientific Research, Kuwait
 Session Co-Chair: Ghassan El Chahal, COWI A/S, Denmark

Effect of Reynolds Number on Local Scour around a Monopile in Steady Current OMAE2019-96735

Xiaofan Lou, Kaibing Zhang, Zhenhong Chen
 Dalian University of Technology, Dalian, China

Bulk and LNG Terminals: An Advanced Approach for Downtime Estimate and Breakwater Optimization OMAE2019-95313

Ghassan El Chahal
 COWI A/S, Kongens Lyngby, Denmark

Numerical Simulation of Consecutive Multiple Lateral Impact on the Reinforced Concrete Pier OMAE2019-96508

Shuai Yang¹ Xiaozhou Xia² Qing Zhang² Xue-gang Wang¹ Ying Zong-quan¹
 1. CCCC Fourth Harbor Engineering Institute Co., Ltd., Guangzhou, China; 2. Hohai University, Nanjing, China

Coastal Engineering Analysis, Field Measurements, Numerical Modeling and Design for the Optimized Extension of the Beach in Ras Al-Ardh Area, Salmiya, Kuwait OMAE2019-95236
Neelamani Subramaniam, Bassam Shuhaibar, Khaled Al-Salem,
Yousef Al-Osairi, Qusaie E. Karam, Dana Al-Houti, Noor Al-Anjari
Kuwait Institute for Scientific Research, Shuwaikh, Kuwait

Ocean Engineering

6-4-4 Marine Engineering and Applications II

Tuesday June 11 Room SEC, M2 & M3 | 10:30 – 12:00

Session Chair: Muk Chen Ong, University of Stavanger, Norway
Session Co-Chair: Zhenhui Liu, Aker Solutions AS, Norway

A Broadband Underwater Acoustic Signal Array Signal Processing Method based on the Joint Sparsity of Signal Spatial Domain OMAE2019-95530

Daqian He, Dahai Zhang, Congying Wang, Xirui Peng
China Ship Development and Design Center, Wuhan, China

Research on Characteristics of Removing Particles in Ship Exhaust Gas by Charged Droplets OMAE2019-96716

Lei Jiao¹ Zhaohui Qian¹ Dekai Huang¹ Peilin Zhou² Pengfei Chen¹ Lida Meng¹
1. Zhejiang University, Zhoushan, China; 2. University of Strathclyde, Glasgow, United Kingdom

Design of Performance Monitoring System for Diesel Generators of Offshore Drilling Platform OMAE2019-96726

Lei Hu, Jianguo Yang
Wuhan University of Technology, Wuhan, China

The Design and Simulation of Hull Segmentation Docking and Correcting Hydraulic System OMAE2019-95926

Yuhao Zeng, Zuyao Yu, Tang Xu
Huazhong University of Science and Technology, Wuhan, China

CFD & FSI

8-2-2 Free Surface Loading and Structure Interaction I

Tuesday June 11 Room SEC, Lomond Auditorium | 10:30 – 12:00

Session Chair: Tim Bunnik, MARIN, Netherlands
Session Co-Chair: Csaba Pakozdi, SINTEF Ocean, Norway

A Ghost Cell Method Based FDM-FEM Model for Free-surface Flow Interactions with Deformable Structures OMAE2019-95209

Xizeng Zhao, Zhijian Yang, Kaiyuan Zheng, Songchang Duan
Zhejiang University, Zhoushan, China

Numerical Prediction of the Ship Resistance and Vertical Motions in Regular Head Waves OMAE2019-95237

Adham S. Bekhit, Adrian Lungu
"Dunărea de Jos" University of Galati, Galati, Romania

Unsteady Numerical Simulation of the Behavior of a Ship Moving in Head Sea OMAE2019-95239

Adrian Lungu
"Dunărea de Jos" University of Galati, Galati, Romania

Numerical Investigation of the Roll Decay of a Container Ship Moving with Forward Speed in Calm Water OMAE2019-95240

Adrian Lungu
"Dunărea de Jos" University of Galati, Galati, Romania

Ocean Renewable Energy

9-4-4 Optimization and Load Analysis

Tuesday June 11 Room SEC, Carron 1 | 10:30 – 12:00

Session Chair: Yi-Hsiang Yu, National Renewable Energy Laboratory, USA

Making Effective WEC Design Choices based on Simulation and Analysis OMAE2019-95138

Charlene Vance, Jonas W. Ringsberg, Shun-Han Yang
Chalmers University of Technology, Gothenburg, Sweden

Fluid-Structure-Soil Interaction of a Moored Wave Energy Device OMAE2019-95419

Joe Tom¹ Dirk Rijnsdorp¹ Raffaele Ragni¹ David J White²
1. University of Western Australia, Perth, WA, Australia; 2. University of Southampton, Southampton, United Kingdom

Shape Optimization of a Submerged Pressure Differential Wave Energy Converter for Load Reductions OMAE2019-96390

Michael Kelly, Mohammad-Reza Alam
University of California, Berkeley, Berkeley, CA, USA

Offshore Geotechnics

10-5-1 Bucket Foundations, Suction Caissons and Spudcans

Tuesday June 11 Room Crowne Plaza, Jura | 10:30 – 12:00

Session Chair: Tulio Quiroz, Fraunhofer Institute for Wind Energy Systems IWES, Germany

Protection of Pipelines and Cables with a Combination of Soil and Rock Cover OMAE2019-95262

Damian R Morrow¹ Andrew A Small²
1. Marine Geoengineering Ltd, Aberdeen, United Kingdom;
2. Xodus Group, Aberdeen, United Kingdom

Simplified Numerical Simulation of the Dense Sand Progressive Failure involved in Spudan Punch-through Failure OMAE2019-95911

Jun Zhao, Futai Sun, Wenbo Jin
Xi'an Shiyou University, Xi'an, China

Bearing Capacities of Shallow Skirted Foundations after the Action of Multi-directional Cyclic Displacements considering Soil Degradation OMAE2019-96036

Zhong Xiao, Donghai Zhang, Haixiao Liu, Ying Liu
Tianjin University, Tianjin, China

Cone Penetration Test in Stiff Over Soft Clay in Centrifuge Test OMAE2019-96698

Qiang Xie¹ Yuxia Hu¹ Mark J. Cassidy² Alireza Salehi¹
1. University of Western Australia, Perth, WA, Australia;
2. University of Melbourne, Parkville, VIC, Australia

Petroleum Technology

11-6-1 Integrity of Well Barriers I

Tuesday June 11 Room **Crowne Plaza, Barra** | 10:30 – 12:00
 Session Chair: Jan David Ytrehus, SINTEF, Norway

Numerical Modelling and Sensitivity Analysis of Gas Kick

Migration and Unloading of Riser OMAE2019-95214

Dalila Gomes¹ Knut Bjarkevoll² Kjell Kåre Fjelde¹ Johnny Froyen²
 1. University of Stavanger, Stavanger, Norway; 2. SINTEF Petroleum, Bergen, Norway

Nano-modified Rock-based Geopolymers as Supplement to

Portland Cement for Oil Well Cementing OMAE2019-95380

Mahmoud Khalifeh¹ Saeed Salehi² Aleksandra Jamrozik³
 Raymos Kimanzi⁴ Saeid Abdollahpour⁵
 1. UIS, Stavanger, Norway; 2. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA; 3. AGH University of Science and Technology, Krakow, Poland; 4. The Oklahoma University, Norman, OK, USA; 5. University of Stavanger, Stavanger, Norway

Improved Model for Tubular Burst OMAE2019-95819

Bjorn Brechan, Sigbjørn Sangesland, Stein Dale
 Norwegian University of Science and Technology, Trondheim, Norway

Next Generation Well Design and Integrity Digital Tools –

Boosting Drilling Systems Automation (DSA) OMAE2019-95995

Bjorn Brechan, Stein Dale, Sigbjørn Sangesland
 Norwegian University of Science and Technology, Trondheim, Norway

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-5-1 Non-Linear Waves and Wave Effects I

Tuesday June 11 Room **SEC, Carron 2** | 10:30 – 12:00
 Session Chair: Ronald W. Yeung, University of California, Berkeley, USA
 Session Co-Chair: Mamoun Naciri, Single Buoy Moorings Inc, Monaco

Numerical Analysis of Nonlinear Wave Loads on an

Offshore Wind Turbine Monopile OMAE2019-95161

Xingya Feng¹ Richard H.J. Willden¹ Binzhen Zhou² Thomas A.A. Adcock¹
 1. University of Oxford, Oxford, United Kingdom;
 2. Harbin Engineering Technology, Harbin, China

Nonlinear Wave Loads on Offshore Wind Turbines:

Extreme Statistics and Fatigue OMAE2019-96679

Yu Zhang, Paul Sclavounos
 MIT, Cambridge, MA, USA

Numerical Simulation of Multidirectional Waves with

Full-spectrum using DualSPHysics OMAE2019-96405

Taiga Kanehira¹ Hidemi Mutsuda¹ Samuel Draycott² David Ingram² Yasuaki Doi¹
 1. Hiroshima University, Higashi-Hiroshima, Japan;
 2. The University of Edinburgh, Edinburgh, United Kingdom

Recreating the Draupner Wave in the Laboratory OMAE2019-96817

Mark McAllister¹ Sam Draycott² Thomas A.A. Adcock¹ Paul Taylor¹ Ton van den Bremer¹
 1. University of Oxford, Oxford, United Kingdom;
 2. University of Edinburgh, Edinburgh, United Kingdom

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-2-3 Flow-Induced Motions (FIM)

Tuesday June 11 Room **SEC, Boisdale 2** | 10:30 – 12:00
 Session Chair: Rodolfo T. Gonçalves, University of Tokyo, Japan
 Session Co-Chair: Longfei Xiao, Shanghai Jiao Tong University, China

Experimental Study of the Effect of the Pontoon Presence

on the Flow-induced Motions of a Semi-submersible

Platform with Four Square Columns OMAE2019-95250

Rodolfo T. Gonçalves¹ Hideyuki Suzuki² Fredi Cenci³
 André L. C. Fajarra³ Shinichiro Hirabayashi⁴
 1. University of Tokyo, Bunkyo, Japan; 2. University of Tokyo, Tokyo, Japan; 3. Federal University of Santa Catarina, Joinville, SC, Brazil; 4. The University of Tokyo, Chiba, Japan

Hydrodynamics Interactions on Vortex-induced Motions

of a Multi-body Floating System OMAE2019-95597

Yibo Liang, Longbin Tao
 University of Strathclyde, Glasgow, United Kingdom

Numerical Study on Vortex-induced Motions of Semi-submersibles

with Three Columns with Different Sections Types OMAE2019-95601

Chenling Tian, Longfei Xiao, Mingyue Liu, Lijun Yang, Jing Liu
 Shanghai Jiao Tong University, Shanghai, China

Analysis of Wake Interaction of Oscillating

Platform with Four Columns OMAE2019-95749

Shinichiro Hirabayashi¹ Murilo M. Cicolini² Rodolfo T. Gonçalves³
 Gustavo R. S. Assi² Hideyuki Suzuki⁴
 1. The University of Tokyo, Chiba, Japan; 2. Univeristy of Sao Paulo, São Paulo, SP, Brazil;
 3. The University of Tokyo, Bunkyo, Japan; 4. The University of Tokyo, Tokyo, Japan

Lunch

12:00 – 13:30
 Location: Hall 5 (SEC)

CONCURRENT SESSIONS

13:30 – 15:00

Offshore Technology

1-1-5 Artificial Intelligence and Advance Analysis

Tuesday June 11 Room **SEC, Alsh 1** | 13:30 – 15:00
 Session Chair: Allan Magee, National University of Singapore, Singapore
 Session Co-Chair: Erwan Auburtin, TechnipFMC, France

Detection of Mooring Line Failure of a Spread-moored FPSO,

Part 1: Development of an Artificial Neural

Network Based Model OMAE2019-96288

Djoni Sidarta¹ Ho-Joon Lim¹ Johyun Kyoung¹ Nicolas Tcherniguin²
 Timothee Lefebvre² Jim O'Sullivan¹
 1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC, Paris, France

Detection of Mooring Line Failure of a Spread-moored FPSO,**Part 2: Global Performance Analysis using MLTSIM** OMAE2019-96339Johyun Kyoung¹ Ho-Joon Lim¹ Djon Sidarta¹ Nicolas Tcherniguin² Timothee Lefebvre²

1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC, Paris, France

Response Based Time Domain Structural Analysis on Floating Offshore Platform OMAE2019-96139Johyun Kyoung¹ Sagar Samaria¹ Jang Kim¹ Brian Duffy²

1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC/Genesis, Houston, TX, USA

A Study of Trajectory based on AIS Positions by Genetic Algorithm OMAE2019-95879

Hitoi Tamaru, Ruri Shoji

Tokyo University of Marine Science and Technology, Tokyo, Japan

Offshore Technology**1-2-4 Mooring System Design and Analysis II**

Tuesday June 11

Room SEC, Dochart 2 | 13:30 – 15:00

Session Chair: David Molyneux, Memorial University of Newfoundland, Canada

Session Co-Chair: Allan Magee, National University of Singapore, Singapore

Study on Anchor Leg Installation Sequence of Nanhai**Shengli FPSO under Typhoon Season** OMAE2019-96650Hui Shen¹ Huoping Wang² Weiquan Zhu¹ Deyang Wang²

1. COTEC Offshore Engineering Services(Beijing), Beijing, China; 2. CNOOC China Ltd., Shenzhen, China

A New Fully Detailed Finite Element Model of Wire Rope for Fatigue Life Estimate of a Mooring Line OMAE2019-96165Federico Bussolati¹ Martin Guiton¹ Pierre-Alain Guidault²Yann Poirrette¹ Martinez Michael¹ Olivier Allix²

1. IFP Energies Nouvelles, Solaize, France; 2. ENS-Paris-Saclay, Cachan, France

Fatigue Performance of Mooring Chains Subjected to Wear Degradation OMAE2019-96386Gilang Muhammad Gemilang¹ Philippa Reed² Adam Sobey²

1. University of Pertamina and University of Southampton, Southampton, United Kingdom; 2. University of Southampton, Southampton, United Kingdom

Structures, Safety and Reliability**2-4-3 Fatigue and Fracture Reliability III**

Tuesday June 11

Room SEC, Alsh 2 | 13:30 – 15:00

Session Chair: Yordan Garbatov, University of Lisbon, Portugal

Session Co-Chair: Myung-Hyun Kim, Pusan National University, Korea

On Calculating the Crack Growth within a Single**Load-Dwell-Unload Cycle for Metal Structures** OMAE2019-95327

Fang Wang, Xuezhong Zhang, Zhe Jiang, Weicheng Cui

Shanghai Ocean University, Shanghai, China

Two-parameter J-A Estimation for Weld Centerline Cracks in Welded**Single Edge Cracked Plate under Tensile Loading** OMAE2019-95392

Chuanjie Duan, Shuhua Zhang

Hohai University, Nanjing, China

Study on Fatigue Crack of Marine Typical Sandwich Composite Joint OMAE2019-95630

Luo Bailu, Shaowen Zheng

China Ship Development and Design Center, Hubei, China

Study on Mechanical Behaviors of Low-cycle Fatigue Crack Tip for**Notch Cracked Plate under Variable Amplitude Loading** OMAE2019-96052

Bo Du

Qinzhou University, Qinzhou, China

Structures, Safety and Reliability**2-9-3 Extreme Loading and Responses III**

Tuesday June 11

Room Crowne Plaza, Castle 1 | 13:30 – 15:00

Session Chair: Erik Vanem, DNV GL, Norway

Session Co-Chair: Guillaume de Hauteclocque, Bureau Veritas, France

Wave Load and Response Predictions combining**HOSM, CFD and Machine Learning** OMAE2019-95352Jan Oberhagemann¹ Anna Kringlen Ervik² Odin Gramstad²Jan Kaufmann¹ Jens B. Helmers² Francois-Xavier Sireta³

1. DNV GL, Hamburg, Germany; 2. DNV GL, Høvik, Norway; 3. DNV GL, Singapore, Singapore

Experimental Validation of FORM-based Approach for**Predicting Extreme Value Distribution of Hull Girder****Bending Moment in a Ship** OMAE2019-95389Tomoki Takami¹ Yusuke Komoriyama¹ Takahiro Ando¹ Kazuhiro Iijima²

1. National Institute of Maritime, Port and Aviation Technology, Mitaka, Japan; 2. Department of NAOE, Osaka University, Osaka, Japan

Evaluation of an Equivalent Design Wave Method to Define Lifetime**Combined Loading Scenarios for Trimarans** OMAE2019-95497

Harleigh C Seyffert, Austin Kana

Technical University Delft, Delft, Netherlands

Dynamic Load Inversion Method of Ship Body based on**Influence Coefficient Matrix** OMAE2019-95777

Huילong Ren, Guoqing Feng, Hao Liu, Xuecong Hu, Jian Zou

Harbin Engineering University, Harbin, China

Analysis of Fatigue Life of Ship Structure under the**Non-linear Slamming Load** OMAE2019-95781

Huילong Ren, He Ma

Harbin Engineering University, Harbin, China

Structures, Safety and Reliability**2-12-3 Structural Analysis and Optimization III**

Tuesday June 11

Room Crowne Plaza, Castle 2 | 13:30 – 15:00

Session Chair: Jonas W. Ringsberg, Chalmers University of Technology, Sweden

Session Co-Chair: Paulo M. Videiro, LACEO/COPPE/

Federal University of Rio De Janeiro, Brazil

Study on Impact Resistance of Ship Arrow-shaped Negative**Poisson Ratio Honeycomb Pedestal** OMAE2019-95745

Haoran Wu, Xiaobin Li, Jie Zhang

Wuhan University of Technology, Wuhan, China

Study on the Effect of Impact Load Generated from Pile**Driving on Aged Berthing Structure** OMAE2019-96092Jeena Mary John¹ Nilanjan Saha² Ranganathan Sundaravivelu²

1. Department of Ocean Engineering, Chennai, India; 2. Indian

Institute of Technology Madras, Chennai, India

Impacts of Condensate Storage on the Hull Structure

Design of Semi-submersible Platform OMAE2019-96601
 Jiaguo Feng¹ Yi Yu² Da Li³ Bin Xie¹ Wenhui Xie¹ Haishan Zhu¹ Min Wu³
 1. CNOOC Research Institute, Beijing, China; 2. CNOOC, Ltd., Beijing, China; 3. SBM Offshore USA, Inc., Houston, TX, USA

Materials Technology

3-3-2 Performance of Mooring Chains

Tuesday June 11 Room SEC, Boisdale 1 | 13:30 – 15:00
 Session Chair: Jens Tronskar, Det Norske Veritas Pte Ltd, Singapore
 Session Co-Chair: Koji Gotoh, Kyushu University, Japan

Testing and Modeling of Mooring Chains Subjected to Cyclic Out-of-plane Bending OMAE2019-95369
 Edgar Mamiya¹ Fabio Castro¹ Lucival Malcher¹ Guilherme Ferreira¹ Eduardo Nunes Filho¹ Raniere Neves¹ Felipe Canut¹ Carlos Augusto² Mario Ribeiro³ Pedro Teixeira³
 1. Universidade de Brasilia, Brasilia, DF, Brazil; 2. Petrogal Brasil, Rio de Janeiro, RJ, Brazil; 3. Galp Energia, Lisbon, Portugal

A Comprehensive Set of Round-bar Stress Intensity Factor Solutions for ECA of Mooring Shackle and Chain Components OMAE2019-96631
 Pingsha Dong¹ Jean-Michel Aubert² Jean-Pierre Sauvage³
 1. University of Michigan, Ann Arbor, MI, USA; 2. Total, Paris, France; 3. Bureau Veritas, Paris, France

Wear Performance of Mooring Chain in Wet Environment with Substitute Ocean Water OMAE2019-95822
 Koji Gotoh, Tetsuya Ueda, Koji Murakami, Tomoaki Utsunomiya
 Kyushu University, Fukuoka, Japan

Development of a New Material Technology for Offshore Mooring Chains – High Manganese Steel OMAE2019-95541
 Neerav Verma¹ Andrew Wasson¹ Zhen Li² Harpreet Sidhar² Haiping He² Hyunwoo Jin³ HyunJo Jun² Adnan Ozekcin² Shiun Ling³
 1. ExxonMobil Upstream Research Company, Spring, TX, USA; 2. ExxonMobil, Spring, TX, USA; 3. Exxonmobil Research and Engineering Co, Annandale, NJ, USA

Pipelines, Risers, and Subsea Systems

4-1-5 Flexible Pipes V

Tuesday June 11 Room Crowne Plaza, Staffa / Shuna | 13:30 – 15:00
 Session Chair: Krassimir Doynov, ExxonMobil Upstream Integrated Solutions, USA
 Session Co-Chair: Lin Zhao, Ocean university of China, China

Qualification of Thermoplastic Composite Pipe Risers – Combined Pressure and Bending Loading OMAE2019-95274
 Ali Bahtui, Karl Kidykas, Josh Richardson, Jonathan Wilkins
 Magma Global, Portsmouth, United Kingdom

Prediction and Design of Internal Pressure of Flexible Pipe OMAE2019-95458
 Qiangqiang Shao¹ Ting Liu² Shuai Yuan² Peihua Han¹ Yong Bai²
 1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Analysis of Polyester Reinforced Flexible Composite Pipe under Internal Pressure OMAE2019-95903
 Xinyu Sun¹ Yong Bai² Xiaojie Zhang¹ Chang Liu¹ Jiannan Zhao¹
 1. Southern University of Science and Technology, Shenzhen, China; 2. Zhejiang University, Zhejiang, China

Research on Fatigue Life Assessment of Fiber Glass Reinforced Flexible Pipe OMAE2019-95676
 Jiannan Zhao¹ Xiaojie Zhang¹ Xinyu Sun¹ Zhao Wang¹ Yong Bai²
 1. Southern University of Science and Technology, Shenzhen, China; 2. Zhejiang University, Zhejiang, China

Pipelines, Risers, and Subsea Systems

4-2-1 General Design and Analysis I

Tuesday June 11 Room Crowne Plaza, Castle 3 | 13:30 – 15:00
 Session Chair: Vishnu Vijayaraghavan, Aker Solutions Inc., USA

The Branched Riser Systems – Concept Development OMAE2019-95160
 Achoyamen M. Ogbeifun¹ Selda Oterkus¹ Julia Race¹ Naik Harit² Decnop Eduardo² Moorthy Dakshina³
 1. University of Strathclyde, Glasgow, United Kingdom; 2. McDermott International, Surrey, United Kingdom; 3. McDermott International, Houston, TX, USA

Corrosion-fatigue Crack Growth Performance of Titanium Grade 29 Welds in Tapered Stress Joints OMAE2019-95175
 Gabriel Rombado¹ David A. Baker² Lars M. Haldorsen³ Pedro Craidy⁴ Jim H. Feiger⁵ Stephen J. Hudak, Jr.⁶
 1. ExxonMobil Production Company, Spring, TX, USA; 2. Exxon Mobil Upstream Research Co, Spring, TX, USA; 3. Equinor, Forus, Norway; 4. Petrobras R&D Center, Rio de Janeiro, RJ, Brazil; 5. Southwest Research Institute, San Antonio, TX, USA; 6. Consultant, San Antonio, TX, USA

Vessel Interface Considerations for Ultra-deepwater Intervention Risers OMAE2019-95519
 Rohit Vaidya¹ Mahesh Sonawane¹ Ben Toleman¹ Elaine Whiteley² Jonathan Rourke³
 1. 2H Offshore inc, Houston, TX, USA; 2. 2H Offshore Engineering Ltd, Bridge of Don, United Kingdom; 3. Helix, Houston, TX, USA

Life Extension of Deepwater Risers used for a Spar Application in Gulf of Mexico OMAE2019-95804
 Yongming Cheng¹ Chenteh Alan Yu² Guangqiang Yang³ Manuel Carballo⁴
 1. FloaTec, A Company of Keppel, Houston, TX, USA; 2. ABS, Spring, TX, USA; 3. Exxon Mobil Company, Spring, TX, USA; 4. ExxonMobil, Spring, TX, USA

Ocean Space Utilization

5-4-1 Underwater Vehicle and Technology

Tuesday June 11 Room SEC, Dochart 1 | 13:30 – 15:00
 Session Chair: Yoshitaka Watanabe, JAMSTEC, Japan
 Session Co-Chair: Tomoya Inoue, JAMSTEC, Japan

A Low Cost Autonomous Underwater Vehicle for Irrigation Canal Monitoring OMAE2019-95134
 Mamoona Masud, Suleman Mazhar
 Information Technology University, Lahore, Pakistan

On the Use of Consumer-grade Remotely Piloted Aircraft Systems for Monitoring Shallow Coral Reefs in Colombia: Case Old Providence Island OMAE2019-95385
 Manuela Lopera-Gil, Rafael E. Vasquez, Carlos A. Zuluaga, Paula Andrea Zapata-Ramírez
 Universidad Pontificia Bolivariana, Medellín, Colombia

Integrated Acoustic Communication and Positioning System between an Autonomous Surface Vehicle and Multiple Autonomous Underwater Vehicles OMAE2019-96623
 Yoshitaka Watanabe, Koji Meguro, Mitsuyasu Deguchi, Yukihiro Kida, Takuya Shimura
 JAMSTEC, Yokosuka, Japan

Ocean Engineering

6-2-3 Coastal Engineering III

Tuesday June 11

Room **SEC, M4** | 13:30 – 15:00

Session Chair: Ian Robertson, University of Hawaii, USA

Study of Extreme Waves Propagating over Reefs in Large Wave Flume

OMAE2019-95039

Songgui Chen¹ Zeming Wang² Jinhai Zheng² Chi Zhang² Ke Hu¹

1. Tianjin Research Institute of Water Transport Engineering, Tianjin, China; 2. HoHai University, Nanjing, China

Numerical Simulation of Drifting and Run-up Ice Floes driven by Tsunami

OMAE2019-95901

Shinji Kioka¹ Maiko Ishida¹ Takahiro Takeuchi²

1. Civil Engineering Research Institute for Cold Region Public Works Research, Sapporo, Japan; 2. Hachinohe Institute of Technology, Hachinohe, Japan

Designing Coastal Structures for Tsunami Loads per ASCE 7-16

OMAE2019-95101

Ian Robertson, Jacob McKamey

University of Hawaii, Honolulu, HI, USA

Ocean Engineering

6-4-5 Very Large Floating Structures

Tuesday June 11

Room **SEC, M2 & M3** | 13:30 – 15:00

Session Chair: Zhengshun Cheng, Shanghai Jiao Tong University, China

Session Co-Chair: Xu Xiang, Norwegian Public Roads Administration, Norway

Numerical Study into Site-specific Effect on the Response of Sea-crossing Bridge under Correlated Wind and Wave Loadings

OMAE2019-95687

Kai Wei¹ Saad Riaz¹ Jin Zhu¹ Hasan Imani² Jiarui Zhang¹

1. Southwest Jiaotong University, Chengdu, China; 2. Sharif University of Technology, Tehran, Iran

Dynamics of an Array of Submersible Mussel Rafts in Waves and Current

OMAE2019-96388

Tobias Dewhurst¹ Spencer Hallowell² Carter Newell³

1. Maine Marine Composites, Portland, ME, USA; 2. Independent Author, West Bath, ME, USA; 3. Pemaquid Mussel Farm, Damariscotta, ME, USA

Extreme Response Analysis of an End-anchored Floating Bridge

OMAE2019-96793

Zhengshun Cheng¹ Zhen Gao² Torgeir Moan³

1. Shanghai Jiao Tong University, Shanghai, China; 2. Norwegian University of Science and Technology, Trondheim, Norway; 3. Center For Ships & Ocean Structures, Trondheim, Norway

Experimental and Numerical Investigation on Planar Motion Responses of a Single Point Moored Shuttle Tanker in Waves

OMAE2019-95251

Ning He¹ Cheng Zhang² Zhuang Kang² Youwei Kang³ Changhong Wang²

1. China Offshore Oil Engineering Co. (COOEC), Tianjin, China; 2. Harbin Engineering University, Harbin, China; 3. CIMC Offshore Co. Ltd., Shenzhen, China

Dynamic Response of Spar Wind Turbine Moored by Dynamic Catenaries under Random Wind and Wave Loads

OMAE2019-95658

Yilun Li¹ Shuangxi Guo² Yue Kong¹ Weimin Chen² Min Li¹

1. Beijing University of Aeronautics and Astronautics, Beijing, China; 2. Institute of Mechanics, Chinese Academy of Sciences, Beijing, China

CFD & FSI

8-2-3 Free Surface Loading and Structure Interaction II

Tuesday June 11

Room **SEC, Lomond Auditorium** | 13:30 – 15:00

Session Chair: Arun Kamath, Norwegian University of Science and Technology, Norway

Session Co-Chair: Csaba Pakozdi, SINTEF Ocean, Norway

Multi-phase Simulation of Droplet Trajectories of Wave-impact Sea Spray Over a Vessel

OMAE2019-95799

Shafiq Mintu, David Molyneux, Bruce Colbourne

Memorial University of Newfoundland, St. John's, NL, Canada

Wave Impact Loads Prediction with Compressible Air Effects using CFD

OMAE2019-96026

Inno Gatin¹ Shengnan Liu² Nikola Vladimir¹ Hrvoje Jasak³

1. University of Zagreb, Zagreb, Croatia; 2. University of Stavanger, Stavanger, Norway; 3. Wikki Ltd, London, United Kingdom

CFD Analysis of a Captive Bullet Entry in Calm Water: Turbulence Modelling

OMAE2019-96099

René Bettencourt Rauffus¹ António Maximiano² Luis Eca³ Guilherme Vaz⁴

1. Instituto Superior Técnico, Lisboa, Portugal; 2. WavEC - Offshore Renewables, Lisboa, Portugal; 3. Technical University of Lisbon, Lisbon, Portugal; 4. MARIN, Wageningen, Netherlands

Computational Methods for Moving and Deforming Objects in Extreme Waves

OMAE2019-96321

Arthur Veldman¹ Henk Seubers¹ Martin Hosseini² Xing Chang²

Peter Wellens² Peter van der Plas³ Joop Helder³

1. University of Groningen, Groningen, Netherlands; 2. TU Delft, Delft, Netherlands; 3. MARIN, Wageningen, Netherlands

Ocean Renewable Energy

9-5-2 Concepts and Design

Tuesday June 11

Room **SEC, Carron 1** | 13:30 – 15:00

Session Chair: Madjid Karimirad, Queen's University Belfast, United Kingdom

Session Co-Chair: Wei Shi, Dalian University of Technology, China

Feasibility Study of Mooring Lines Design for a Tidal Turbine Platform using Floating Double Hull

OMAE2019-95998

Nu Rrahida Arini¹ Philipp R. Thies¹ Lars Johanning¹ Edward Ransley²

Scott Brown³ Nan Xie³ Deborah Greaves³

1. University of Exeter, Penryn, United Kingdom; 2. Plymouth University, Plymouth, United Kingdom; 3. University of Plymouth, Plymouth, United Kingdom

Synergistic Flow Induced Vibration of Multiple Cylinders in Harvesting Marine Hydrokinetic Energy

OMAE2019-96671

Hai Sun¹ Michael Bernitsas² Chen Zhiyun¹

1. Harbin Engineering University, Harbin, China; 2. University of Michigan, Michigan, MI, USA

FIV Energy Harvesting from Sharp-edge Oscillators

OMAE2019-95227

Vahid Tamimi¹ Milad Armin² Selda Shahvaghari-Asl³

Seyed Taghi Omid Naeeni¹ Mostafa Zeinoddini⁴

1. University of Tehran, Tehran, Iran; 2. Liverpool John Moores University, Liverpool, United Kingdom; 3. Sharif University of Technology, Tehran, Iran; 4. K.N.Toosi University of Technology, Tehran, Iran

Implementation of Tidal Stream Turbines and Tidal Barrage Structures in DG-SWEM OMAE2019-95767

Andrea M. Schnabl¹ Tulio M. Moreira² Dylan Wood³ Ethan J. Kubatko³

Guy T. Houlsby¹ Ross A. McAdam⁴ Thomas A.A. Adcock¹

1. University of Oxford, Oxford, United Kingdom; 2. Federal University of Minas Gerais (UFMG), Belo Horizonte, MG, Brazil; 3. The Ohio State University, Columbus, OH, USA;

4. Department of Engineering Science, University of Oxford, Oxford, United Kingdom

Offshore Geotechnics

10-6-1 Pipeline Geotechnics

Tuesday June 11

Room **Crowne Plaza, Jura** | 13:30 – 15:00

Session Chair: Borana Kullolli, Bundesanstalt für

Materialforschung -und prüfung, Germany

Axial Resistance of Smooth Polymer Pipelines on Sand OMAE2019-95938

Henry Milewski¹ Matt Dietz² Andrea Diambra² Lawrence de Leeuw²

1. TechnipFMC, Westhill, United Kingdom; 2. University of Bristol, Bristol, United Kingdom

Drained Lateral Breakout Resistance of Subsea Pipelines OMAE2019-96174

Jean-Christophe Ballard¹ Zack Westgate²

1. Fugro Geoconsulting, Brussels, Belgium; 2. Fugro USA Marine, Inc., Houston, TX, USA

Centrifuge Modelling of Skirted Spudcan

Penetration in Layered Soil OMAE2019-96541

Conleth O’Loughlin¹ Christophe Gaudin¹ Matthew Quah² Michael Perry²

1. University of Western Australia, Perth, WA, Australia; 2. Keppel, Singapore, Singapore

FEA Based Simplified Integrated Analysis

for Mudmat Design OMAE2019-96754

Srikanth Srigiriraju, Arindam Chakraborty, Burak Ozturk, Devvrat Rathore

Virtual Integrated Analytics Solutions, Houston, TX, USA

Petroleum Technology

11-6-2 Integrity of Well Barriers II

Tuesday June 11

Room **Crowne Plaza, Barra** | 13:30 – 15:00

Session Chair: Jan David Ytrehus, SINTEF, Norway

Numerical Modeling of Radial Fracturing of Cement

Sheath Caused by Pressure Tests OMAE2019-96319

Sohrab Gheibi¹ Sigbjørn Sangesland¹ Torbjorn Vralstad²

1. Norwegian University of Science and Technology, Trondheim,

Norway; 2. SINTEF, Trondheim, Norway

Effect of Rock on Cement Sheath Integrity:

Shale vs. Sandstone OMAE2019-96738

Ragnhild Skorpa, Benjamin Werner, Torbjorn Vralstad

SINTEF, Trondheim, Norway

A Discussion on Different Types of Cement Bond Strength OMAE2019-96773

Nils Opedal¹ Pierre Cerasi² Torbjorn Vralstad²

1. SINTEF Industry, Trondheim, Norway; 2. SINTEF, Trondheim, Norway

Comparative Evaluation of Elastomer Seal Energization in

Conventional and Expandable Hanger Assembly OMAE2019-96776

Harshkumar Patel¹ Saeed Salehi²

1. University of Oklahoma, Norman, OK, USA; 2. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-5-2 Non-Linear Waves and wave Effects II

Tuesday June 11

Room **SEC, Carron 2** | 13:30 – 15:00

Session Chair: Robert Beck, University of Michigan, USA

CFD Investigations of 2D Greenwater Overtopping of

a Freely Floating Offshore Vessel OMAE2019-95865

Xiantao Zhang¹ Scott Draper² Hugh Wolgamot² Wenhua Zhao² Lifan Chen² Liang Cheng²

1. Shanghai Jiao Tong University, Shanghai, China;

2. University of Western Australia, Perth, WA, Australia

Development of 3-Dimensional Fully Nonlinear Potential

Flow Wave Tank in Framework of Openfoam OMAE2019-96098

Zaibin Lin, Ling Qian, Wei Bai, Zhihua Ma, Hao Chen, Jian Guo Zhou

Manchester Metropolitan University, Manchester, United Kingdom

A 2D Nonlinear Numerical Wave Tank with a

Moored Floating Body OMAE2019-96669

Hui Sun¹ Jens B. Helmers²

1. DNL GL, Høvik, Norway; 2. DNV GL, Høvik, Norway

Wave Interaction with a Shallowly Submerged Step in 2D OMAE2019-95933

Guy McCauley, Hugh Wolgamot, Scott Draper, Jana Orszaghova

University of Western Australia, Perth, WA, Australia

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-2-4 Fluid-Structure Interactions (FSI)

Tuesday June 11

Room **SEC, Boisdale 2** | 13:30 – 15:00

Session Chair: Longfei Xiao, Shanghai Jiao Tong University, China

Session Co-Chair: Shinichiro Hirabayashi, University of Tokyo, Japan

Force Measurements and Stationarity Analysis on the Flow around

a Single Square Column with Rounded Edges OMAE2019-95353

Dennis Gambarine¹ Arjen Koop² Gustavo R. S. Assi³

Fabiano Rampazzo¹ Rodolfo T. Gonçalves⁴

1. Technomar Engenharia, São Paulo, SP, Brazil; 2. MARIN, Wageningen, Netherlands;

3. University of São Paulo, São Paulo, SP, Brazil; 4. University of Tokyo, Bunkyo, Japan

Hydrodynamics around a Deep-draft Semi-submersible

with Biomimetic Tubercle Corner Design OMAE2019-95607

Yibo Liang, Weichao Shi, Longbin Tao

University of Strathclyde, Glasgow, United Kingdom

Investigation of the 2D Behavior of a Rotating Cylinder in

Flow using the Discrete Vortex Method OMAE2019-95841

Changkyu Rheem

The University of Tokyo, Tokyo, Japan

REFRESHMENT BREAK

15:00 – 15:30

Location: Hall 5 (SEC)

CONCURRENT SESSIONS

15:30 – 17:30

Offshore Technology**1-6-2 Loads and Responses in Current and Wind I**

Tuesday June 11

Room **SEC, Alsh 1** | 15:30 – 17:30

Session Chair: Arjen Koop, MARIN, Netherlands

Session Co-Chair: António Maximiano, WavEC - Offshore Renewables, Portugal

Thorough Verification and Validation of CFD Prediction of FPSO Current Load for Confident Applications OMAE2019-95017Wei Xu¹ Zhenjia (Jerry) Huang² Hyun Joe Kim³

1. ExxonMobil, Spring, TX, USA; 2. Exxonmobil Upstream Research Company, Spring, TX, USA; 3. Samsung Heavy Industries, Daejeon, Korea

Numerical Investigation for Vortex-induced Vibrations of Steel-Lazy-Wave-Risers, Part I: CFD Validation against Forced Oscillation Model Test OMAE2019-96401

Hyunchul Jang, Jang Kim

TechnipFMC, Houston, TX, USA

Thorough Verification and Validation of CFD Prediction of FPSO Wind Load for Confident Applications OMAE2019-95018Wei Xu¹ Zhenjia (Jerry) Huang² Hyun Joe Kim³

1. ExxonMobil, Spring, TX, USA; 2. Exxonmobil Upstream Research Company, Spring, TX, USA; 3. Samsung Heavy Industries, Daejeon, Korea

Numerical Investigation of Scour around Subsea Pipelines near the Seabed OMAE2019-96069Guang Yin¹ Zhen Cheng² Shengnan Liu¹ Muk Chen Ong¹

1. University of Stavanger, Stavanger, Norway; 2. Applied Ocean Physics and Engineering, Woods Hole Oceanographic Institution, Woods Hole, MA, USA

Numerical Modeling Practice and Verification of the Wind Load Estimation for FPSO and Semi-submersible OMAE2019-96429SeongMo Yeon¹ Hyunchul Jang² Jang Kim² Joo-Sung Kim³ Bo Woo Nam⁴Zhenjia (Jerry) Huang⁵ Jim O'Sullivan² Hyun Joe Kim³ Sa Young Hong⁴
1. Ship and Offshore Performance Research Center, Daejeon, Korea;
2. TechnipFMC, Houston, TX, USA; 3. Samsung Heavy Industries, Daejeon, Korea; 4. Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea; 5. Exxonmobil Upstream Research Company, Spring, TX, USA**Structures, Safety and Reliability****2-8-1 Well Integrity and Reliability Assessment**

Tuesday June 11

Room **Crowne Plaza, Castle 2** | 15:30 – 17:30

Session Chair: Max Russo, Konsberg, Norway

Tethered Bops – Performance and Monitoring OMAE2019-95523Stuart Killbourn¹ Elizbar B Kebedze² James Maher³

1. Fugro GB Marine, Glasgow, United Kingdom; 2. BP Exploration Operating Company, Sunbury-on-Thames, United Kingdom; 3. Trendsetter Vulcan Offshore, Houston, TX, USA

Wellhead Fatigue: Benefits of Structural Reliability Analysis Applied to Groups of Wells OMAE2019-96214Torfinn Horte¹ Michael Macke² Andreas Buvarp Aardal¹Lorents Reinas³ Paal Bjonnes³ Erik Frimanslund³
1. DNV GL, Høvik, Norway; 2. DNV GL, Oslo, Norway; 3. Equinor, Stavanger, Norway**Well Integrity: Preliminary Risk Analysis for Different Well Life Cycle Phases** OMAE2019-96280Danilo T. M. P. Abreu¹ Carlos H. B. Morais¹ Joaquim Santos²Danilo Colombo³ Marcelo Ramos Martins¹

1. LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, São Paulo, SP, Brazil; 2. University of São Paulo, São Paulo, SP, Brazil; 3. Petrobras, Rio de Janeiro, RJ, Brazil

Structures, Safety and Reliability**2-9-4 Extreme Loading and Responses IV**

Tuesday June 11

Room **Crowne Plaza, Castle 1** | 15:30 – 17:30

Session Chair: YeongAe Heo, Case Western Reserve University, USA

Session Co-Chair: Deyu Wang Shanghai Jiao Tong University, China

A Calculation Method for the Quasi-stationary Pressure in Cabin Explosion with Venting OMAE2019-95776Pengduo Zhao¹ Haojie Wang² Zhipeng Du¹ Xiaobin Li²

1. Naval Research Academy, Beijing, China; 2. Wuhan University of Technology, Wuhan, China

Explosion Response of Cold Bond Corrosion Repairs Applied to Offshore Living Quarters OMAE2019-95810

Trey Turner, Abhimanyu Kumar

Atkins, Houston, TX, USA

Localisation Analysis in an X65 Offshore Pipeline Steel OMAE2019-96786

Martin Kristoffersen, David Morin, Odd Sture Hopperstad, Tore Børvik

Norwegian University of Science and Technology, Trondheim, Norway

Materials Technology**3-3-3 Advances on Assessing Performance of Steel**

Tuesday June 11

Room **SEC, Boisdale 1** | 15:30 – 17:30

Session Chair: Carol Johnston, TWI Ltd, United Kingdom

Session Co-Chair: Jens Tronskar, Det Norske Veritas Pte Ltd, Singapore

Life Extension of Environmental Assisted Cracking of High Strength Subsea Material due to CP OMAE2019-96685Agnes Marie Horn¹ Erling Østby² Viggo Roneid² Finn Kirkemo³

1. DNV GL, Oslo, Norway; 2. DNV GL, Høvik, Norway; 3. Equinor, Tranby, Norway

Investigation of Strain-based Failure Assessment based on Reference Strain Method for Welded Pipes OMAE2019-96489

Jae Sung Lee, Myung-Hyun Kim

Pusan National University, Busan, Korea

Accurate Closed-form SIF Determination and Fatigue Life Investigation on Ship Construction Model OMAE2019-95268

Benqiang Lou

Jiangsu University of Science and Technology, Zhenjiang, China

Magnetoelastic Characteristics of Pipeline Steel under Tensile Stress OMAE2019-95275Sheng Bao¹ Pengfei Jin¹ Ashri Mustapha² Zhengye Zhao¹

1. Zhejiang University, Hangzhou, China; 2. Petronas, Kuala Lumpur, Malaysia

Material Property Requirements for High Strength Steels used in Mobile Offshore Units OMAE2019-96844

Rolf H. Hinderaker

Petroleum Safety Authority, Stavanger, Norway

Pipelines, Risers, and Subsea Systems

4-2-2 General Design and Analysis II

Tuesday June 11 Room **Crowne Plaza, Castle 3** | 15:30 – 17:30
 Session Chair: Olav Fyrileiv, DNV GL, Norway

Multi-pronged Approach for the Design of HP/HT

Deepwater Steel Catenary Risers OMAE2019-96249
 Gurudutt Bangalore, Yongming Cheng, Surya Banumurthy
 KeppelFloaTEC, Houston, TX, USA

Seismic Design Challenges of High Pressure Riser Systems on Gravity Based Structures

OMAIE2019-96409
 Mahesh Sonawane¹ Rohit Vaidya¹ Ronak Kadakia² Hunter Haerberle² Phil Ward³
 1. 2H Offshore Inc, Houston, TX, USA; 2. Baker Hughes, a GE Company, Houston, TX, USA; 3. 2H Offshore Engineering Ltd, Bridge of Don, United Kingdom

Flow Past a Forced Oscillating Cylinder:

A Three-Dimensional Numerical Study OMAE2019-96477
 Huan Ping, Yan Bao, Dai Zhou, Zhaolong Han
 Shanghai Jiao Tong University, Shanghai, China

A Numerical Investigation on the Effect of Heave Motion Frequency in the Deep Sea Mining System

OMAIE2019-95292
 Qi Wu, Jianmin Yang, Haining Lu, Wenyue Lu, Tao Peng, Jun Li
 Shanghai Jiao Tong University, Shanghai, China

Pipelines, Risers, and Subsea Systems

4-5-1 Flow Assurance I

Tuesday June 11 Room **Crowne Plaza, Staffa / Shuna** | 15:30 – 17:30
 Session Organizer: Daniel Carneiro, Wood, Brazil

Session Co-Chair: Paulo Paz, Federal University of Rio de Janeiro, Brazil

Session Co-Chair: Hualei Yi, CNOOC Research Institute Co., Ltd, China

Flow-induced Vibration Analysis of a Water Injection System at Elevated Flow Rates of an FPSO

OMAIE2019-95019
 Nestor Gonzalez Diez¹ Oluwaseun M. Awe² Pieter Van Beek¹ Can Tümer¹ Juan Pontaza³
 1. TNO, Delft, Netherlands; 2. Shell Nigeria Exploration & Production Company, Ltd., Lagos, Nigeria; 3. Shell, Houston, TX, USA

On Deriving High Pressure Empirical Multiphase Forcing Functions from CFD Analysis

OMAIE2019-96155
 Olivier Macchion¹ Stefan Belfroid² Leszek Stachyra¹ Atle Jensen³
 1. TechnipFMC, Lysaker, Norway; 2. TNO, Delft, Netherlands; 3. University of Oslo, Oslo, Norway

Examination and Analysis of Four-phase Four-fluid Flow Techniques in Offshore Pipelines

OMAIE2019-95005
 Mohamed Odan¹ Faraj Ben Rajeb¹ Mohammad Azizur Rahman²
 Amer Aborig¹ Syed Imtiazi¹ Yan Zhang¹ M. M. Awad³
 1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. Texas A&M University at Qatar, Doha, Qatar; 3. Mansoura University, Mansoura, Egypt

Computational Investigation of Oil Accumulation in a Subsea Deadleg

OMAIE2019-96804
 Egemen Caglar, Yi Zeng, Jeyhoon Khodadadi
 Auburn University, Auburn, AL, USA

Automated Subsea Architecture Optimization using Low-dimensional Multiphase Flow Models

OMAIE2019-96293
 Zurwa Khan¹ Amine Meziou² Reza Tafreshi¹ Matthew Francheck² Karolos Grigoriadis²
 1. Texas A&M University at Qatar, Doha, Qatar; 2. University of Houston, Houston, TX, USA

Ocean Space Utilization

5-3-1 Development of Deep Sea Mining and Resources

Tuesday June 11 Room **SEC, Dochart 1** | 15:30 – 17:30
 Session Chair: Yoshiyasu Watanabe, Tokai University, Japan
 Session Co-Chair: Marcio Yamamoto, National Maritime Research Institute, Japan

Experimental Study on Bubble Size Measurement for Development of Seafloor Massive Sulfides

OMAIE2019-95186
 Seira Imai¹ Yasuharu Nakajima² Motohiko Murai¹
 1. Yokohama National University, Yokohama, Japan; 2. National Maritime Research Institute, Mitaka, Japan; 3. National Maritime Research Institute, Mitaka, Japan

Study on Pipe Wear Evaluation based on Large Scale Experiment for Deep Sea Mining

OMAIE2019-95270
 Satoru Takano¹ Hirotaka Sato² Takashi Terao³ Sotaro Masanobu⁴ Seiya Kawano⁵
 1. National Maritime Research Institute, Mitaka, Japan; 2. Nippon Steel & Sumikin Engineering Co., Ltd., Futtsu-city, Japan; 3. Mitsui Miike Machinery Co., Ltd., Omuta-city, Japan; 4. National Maritime Research Institute, Tokyo, Japan; 5. Japan Oil, Gas and Metals National Corporation, Meguro-ku, Japan

Research and Development on a Self-walking Vertical Mining System using DTH for Seafloor Mining and Sampling

OMAIE2019-95394
 Yoshiyasu Watanabe¹ Keisuke Watanabe¹ Hideyuki Suzuki²
 Teruo Ooshima³ Yoshiaki Tsukamoto³
 1. Tokai University, Shizuoka-shi Shizuoka, Japan; 2. University of Tokyo, Tokyo, Japan; 3. Furukawa Co., Ltd., Tsukuba-Shi Ibaraki-Ken, Japan

Experimental Analysis of Reduced-scale Jumper for Deep-sea Mining

OMAIE2019-95990
 Marcio Yamamoto, Tomo Fujiwara, Shigeo Kanada,
 Masao Ono, Satoru Takano, Joji Yamamoto
 National Maritime Research Institute, Mitaka, Japan

Development of Elemental Technologies for Seafloor Mineral Processing of Seafloor Massive Sulfides

OMAIE2019-96040
 Yasuharu Nakajima¹ Joji Yamamoto¹ Tomoko Takahashi²
 Blair Thornton³ Yuta Yamabe⁴ Gjergj Dodbiba⁴ Toyohisa Fujita⁵
 1. National Maritime Research Institute, Mitaka, Japan; 2. Institute of Industrial Science, The University of Tokyo, Meguro-ku, Japan; 3. Institute of Industrial Science, The University of Tokyo, and University of Southampton, Meguro-ku, Japan; 4. University of Tokyo, Bunkyo, Japan; 5. University of Tokyo, Meguro-ku, Japan

Ocean Engineering

6-4-6 Towed Cables, Ropes and Mooring Systems

Tuesday June 11 Room **SEC, M2 & M3** | 15:30 – 17:30
 Session Chair: Muk Chen Ong, University of Stavanger, Norway
 Session Co-Chair: Zhiyu Jiang, University of Agder, Norway

Application for Improved Awareness of Cable Geometry during Seismic Survey Operation

OMAIE2019-95038
 Jan Vidar Grindheim¹ Ken Welker¹ Inge Revhaug²
 1. Geograf AS, Stavanger, Norway; 2. NMBU, REALTEK, Ås, Norway

Sensitivity Analysis of Different Parameters of Taut Mooring System of a Truss Spar

OMAIE2019-95490
 Zhuang Kang¹ Rui Chang¹ Youwei Kang² Shanchuan Liu¹
 1. Harbin Engineering University, Harbin, China; 2. CIMC Offshore Co. Ltd., Shenzhen, China

Experimental Validation of Towed Underwater**Cable Codes** OMAE2019-96349

Jan Vidar Grindheim¹ Antonio Carlos Fernandes² Joel S. Sales Junior³ Inge Revhaug⁴
 1. Geograf AS, Stavanger, Norway; 2. UFRJ/COPPE, Rio de Janeiro, RJ, Brazil;
 3. Laboratory of Waves and Current - LOC - Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4. NMBU, REALTEK, Ås, Norway

Tension Based Heading Control Strategy of the Arctic FPSO with DP Assisted Mooring System

OMA E2019-96557

Jaeyong Lee¹ Sol-Mi Choi² Seung Jae Lee² Kwang Hyo Jung³
 1. Dong-eui University, Busan, Korea; 2. Korea Maritime and Ocean University, Busan, Korea; 3. Pusan National University, Busan, Korea

Experimental Investigation of Stresses in Winch Drums subjected to Multilayer Spooling Loads from Synthetic Fibre Ropes

OMA E2019-95283

Reidar André Skarbøvik^{1,2} Henry Piehl² Sverre Torben¹

Mette Lokna Nedreberg³ Vilmar Esøy²
 1. Rolls-Royce Marine AS, Ålesund, Norway; 2. Norwegian University of Science and Technology, Ålesund, Norway; 3. Rolls-Royce Marine AS, Ulsteinvik, Norway

Ocean Engineering**6-11-2 Floating Bodies Technology**

Tuesday June 11

Room SEC, Dochart 2 | 15:30 – 17:30

Session Chair: Joel S. Sales Junior, Laboratory of Waves and Current - LOC - Universidade Federal do Rio de Janeiro, Brazil

Session Co-Chair: Milad shadman, COPPE/UFRJ, Brazil

Experimental and Numerical Study on Dynamic Responses of FSRU-LNGC Side-by-side Mooring System

OMA E2019-95473

Jingxia Yue (Le)¹ Weili Kang¹ Wengang Mao² Pengfei Chen³ Xi Wang⁴

1. Wuhan University of Technology, Wuhan, China; 2. Chalmers University of Technology, Gothenburg, Sweden; 3. Shanghai Investigation, Design & Research Institute Co., Ltd., Shanghai, China; 4. CCS Wuhan Rules & Research Institute, Wuhan, China

Ship Manoeuvring Model Parameter Identification using Intelligent Machine Learning Method and the Beetle Antennae Search Algorithm

OMA E2019-95565

Changyuan Chen¹ Manases Tello Ruiz² Evert Lataire¹ Guillaume Delefortrie²

Marc Mansuy¹ Tianlong Mei³ Marc Vantorre¹
 1. Ghent University, Ghent, Belgium; 2. Flanders Hydraulics Research, Antwerp, Belgium; 3. Shanghai Jiao Tong University, Shanghai, China

Study on the Multi-body Dynamic Characteristics of FPSO Soft Yoke Mooring System based on Symplectic Algorithm

OMA E2019-96464

Wenhua Wu¹ Baicheng Lyu¹ Ji Yao¹ Qianjin Yue² Zhang Yantao³ Xinglin Guo¹

1. Dalian University of Technology, Dalian, China; 2. Dalian University of Technology, Panjin, China; 3. CNOOC, Tianjin, China

Effect of Irregular Seabed on the Dynamic Response of Spar-type Floating Offshore Platform

OMA E2019-96816

Atul Krishna Banik, Shovan Roy

National Institute of Technology, Durgapur, India

Experimental Study on the Mechanics of a Coiled Tubing Working within a Marine Riser under the Affection of Marine Loads

OMA E2019-95840

Yingchun Chen¹ Chang Wang¹ Xinhua Wang¹ Wenming Wang² Wenda Wang³

1. Beijing University of Technology, Beijing, China; 2. China University of Petroleum-Beijing, Beijing, China; 3. China HuanQiu Contracting & Engineering Corp., Ltd, Beijing, China

Ocean Engineering**6-12-1 Ocean Measurement and Data Interpretation**

Tuesday June 11

Room SEC, M4 | 15:30 – 17:30

Session Chair: Gus Jeans, Oceananalysis Ltd, United Kingdom

Developments in Metocean HF Radar Technology, Applications and Accuracy

OMA E2019-95202

Lucy Wyatt¹ M.D. Moorhead² I.A. Fairley³

1. University of Sheffield, Sheffield, United Kingdom; 2. Neptune Radar Ltd, Gloucester, United Kingdom; 3. Swansea University, Swansea, United Kingdom

Studies Toward the Development of Accurate Directional Spectrum Estimation Method using Field Observation Data

OMA E2019-95220

Noriaki Hashimoto¹ Masao Mitsui² Koji Kawaguchi³ Takashi Fujiki³

1. Kyushu University, Fukuoka, Japan; 2. Sonic Corporation, Tokyo, Japan;
 3. Port and Airport Research Institute, Kanagawa, Japan

Effective Harmonic analysis with Spectrum

Filtering Technique OMA E2019-96021

Zhong Peng, Hazel Grant, Richard Sproson

Fugro GB Marine Limited, Wallingford, United Kingdom

Polar and Arctic Sciences and Technology**7-1-1 Arctic Frontiers and Manoeuvring in Ice**

Tuesday June 11

Room SEC, Alsh 2 | 15:30 – 17:30

Session Chair: Walter Kuehnlein, sea2ice Ltd. & Co. KG, Germany

Session Co-Chair: Sören Ehlers, Hamburg University of Technology, Germany

Introduction to Polar and Arctic Sciences and Technology Symposium

OMA E2019-96846

Sören Ehlers

Hamburg University of Technology, Hamburg, Germany

Numerical Simulation of Ice Load of a Ship Turning in Level Ice considering Fluid Effects

OMA E2019-95694

Baoyu Ni¹ Zhipeng Li¹ Fan Jiang² Meng Wu³ Yanzhuo Xue¹

1. Harbin Engineering University, Harbin, China; 2. Jiujiang Vocational and Technical College, Jiujiang, China; 3. Guangzhou Marine Engineering Corporation, Guangzhou, China

A Voyage Planning Tool for Arctic Transit of Cargo Ships

OMA E2019-95128

Zhiyuan Li, Jonas W. Ringsberg, Francisco Afonso Rita

Chalmers University of Technology, Gothenburg, Sweden

The Calving Events of Petermann Glacier from 2008 to 2012: Ice Island Drift Characteristics, Assessment of Fracture

Events, and Geographical Data Analysis OMA E2019-96732

Reza Zeinali Torbati¹ Ian Turnbull² Rocky Taylor¹ Derek Mueller³

1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. Captain Robert A. Bartlett Building, C-CORE, St. John's, NL, Canada; 3. Carleton University, Ottawa, ON, Canada

CFD & FSI

8-5-1 Wave CFD Modeling Applications

Tuesday June 11 Room **SEC, Lomond Auditorium** | 15:30 – 17:30

Session Chair: Madhusuden Agrawal, BP, USA

Session Co-Chair: Yuwang Xu, Shanghai Jiao Tong University, China

Numerical and Mechanistic Modelling of Two-phase Liquid-gas Flow's Pressure Drop across Sharp-edged Orifices OMAE2019-96305

Zurwa Khan¹ Reza Tafreshi¹ Matthew Franchek² Karolos Grigoriadis²
1. Texas A&M University at Qatar, Doha, Qatar; 2. University of Houston, Houston, TX, USA

Numerical Simulation of Ship-Ship Interactions in Waves OMAE2019-95737

Xueshen Xie¹ Yuxiang Wan² Qing Wang² Hao Liu² Dakui Feng²
1. China Ship Design and Development Center, Wuhan, China; 2. Huazhong University of Science and Technology, Wuhan, China

Numerical Convergence on the Hydroelasticity of a Large Containership OMAE2019-95200

Ye Lu¹ Pandeli Temarel² Qiu Jin² Yousheng Wu¹ Xinyun Ni¹ Chao Tian¹
1. China Ship Scientific Research Center, Wuxi, China;
2. University of Southampton, Southampton, United Kingdom

Two-phase MPS Method for Dam-break Flows OMAE2019-95518

Xiao Wen, Decheng Wan
Shanghai Jiao Tong University, Shanghai, China

Numerical Investigations on the Flow Past an Inclined Thin Square Plate at Re=300 OMAE2019-95744

Yakun Zhao, Xinliang Tian, Xia Wu, Xiantao Zhang, Xin Li
Shanghai Jiao Tong University, Shanghai, China

Ocean Renewable Energy

9-2-3 Floating Wind Designs

Tuesday June 11 Room **SEC, Carron 1** | 15:30 – 17:30

Session Chair: Amy Robertson, National Renewable Energy Laboratory, USA

Performance of a Passive Tuned Liquid Column Damper for Floating Wind Turbines OMAE2019-96360

Wei Yu, Frank Lemmer, Po Wen Cheng
University of Stuttgart, Stuttgart, Germany

A Novel Semi-submersible Floating Wind Turbine Platform Design based on Tuned Liquid Column Dampers OMAE2019-95945

Baijin Mao, Jili Sun, Zecheng Tang, Bo Feng, Weijie Zhang, Dahai Zhang, Yulin Si
Zhejiang University, Zhoushan, China

Bottom Supported Tension Leg Tower with Inclined Tethers for Offshore Wind Turbines OMAE2019-95014

Mohd Ishtiyak, Arunjyoti Sarkar
Indian Institute of Technology, Kharagpur, India

Coupled Numerical Analysis of a Concept TLB Type Floating Offshore Wind Turbine OMAE2019-95244

Iman Ramzanpoor, Martin Nuernberg, Longbin Tao
University of Strathclyde, Glasgow, United Kingdom

Dynamic Response of a Conceptual Designed Articulated Offshore Wind Turbine OMAE2019-95635

Yan Li, Zheng Liu, Yougang Tang, Xiyang Zhu, Ruoyu Zhang
Tianjin University, Tianjin, China

Offshore Geotechnics

10-7-1 Pile Foundations II

Tuesday June 11 Room **Crowne Plaza, Jura** | 15:30 – 17:30

Session Chair: Manuela Kanitz, Hamburg University of Technology, Germany

Assessment of Offshore Wind Turbine with Hybrid Monopile Foundation under Lateral Load using Centrifuge Tests OMAE2019-95637

Xuefei Wang¹ David Zeng² Jiale Li¹ Yougang Tang³
1. Hebei University of Technology, Tianjin, China; 2. Case Western Reserve University, Cleveland, OH, USA; 3. Tianjin University, Tianjin, China

Model Tests and Numerical Simulation on Effect of Spudcan Penetration on P-Delta of an Adjacent Pile OMAE2019-95752

Jianhua Wang, Yifei Fan, Dong Guo
Tianjin University, Tianjin, China

An Enhanced Interface Model for Friction Fatigue Problems of Axially Loaded Piles OMAE2019-96078

Borana Kullolli¹ Matthias Baessler¹ Pablo Cuellar¹ Shilton Rica² Frank Rackwitz³
1. Bundesanstalt für Materialforschung und -prüfung, Berlin, Germany;
2. University of Luxembourg, Luxembourg, Luxembourg; 3. Technische Universität Berlin, Faculty Planning Building Environment, Berlin, Germany

Influence of Different Pile Installation Methods on Dense Sand OMAE2019-96109

Severin Spill, Tulio Quiroz, Aligi Foglia
Fraunhofer Institute for Wind Energy Systems IWES, Hanover, Germany

Petroleum Technology

11-12-1 Cementing I

Tuesday June 11 Room **Crowne Plaza, Barra** | 15:30 – 17:30

Session Chair: Ian Frigaard, University of British Columbia, Canada

Exchange Flow in Well Abandonment Operations OMAE2019-95131

Mônica Naccache¹ Priscilla Vargas¹ Paulo de Souza Mendes¹
Bruno Fonseca¹ Gabriella Cavalcante² Cristiane Miranda²
1. Pontificia Universidade Católica do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil

A Fast 3D Model for Annular Flows of Wellbore Completion Fluids OMAE2019-95133

Philippe M.J. Tardy
Schlumberger Technology Corp., Sugar Land, TX, USA

Efficient Fluid-Fluid Displacement of Yield Stress Fluids in Axially Rotating Pipes OMAE2019-95382

Shan Lyu, Seyed Mohammad Taghavi
Université Laval, Québec, QC, Canada

Effect of Buoyancy and Inertia on Viscoplastic Fluid-Fluid Displacement in an Eccentric Annulus with an Irregular Section, Part 2: Displacements in Vertical Annulus OMAE2019-95700

Hans Joakim Skadsem, Steinar Kragset
Norwegian Research Centre AS, Stavanger, Norway

Enhanced Cement Composition for Preventing Annular Gas Migration OMAE2019-95589

Mustafa Al Ramadan¹ Saeed Salehi² Catalin Teodoru² George Kwatia¹
1. University of Oklahoma, Norman, OK, USA; 2. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-7-1 Large-Amplitude Non-Linear Ship Motions

Tuesday June 11

Room **SEC, Carron 2** | 15:30 – 17:30

Session Chair: Allan Magee, National University of Singapore, Singapore

Session Co-Chair: Longbin Tao, University of Strathclyde, United Kingdom

Experimental Study on a Relation between Nonlinear Hydrodynamic Forces and Wave-induced Ship Motions

OMAE2019-95555

Masakazu Taguchi, Masashi Kashiwagi

Osaka University, Osaka, Japan

An Improved Body-exact Method to Predict the Maneuvering of Ships in a Seaway

OMAE2019-96441

Rahul Subramanian¹ Robert Beck²

1. Texas A&M University, Galveston, TX, USA; 2. University of Michigan, Ann Arbor, MI, USA

Solving 2-D Slamming Problems by the Higher-order MPS Method with an Improved Pressure Gradient Model

OMAE2019-96775

Ruosi Zha, Heather Peng, Wei Qiu

Memorial University of Newfoundland, St. John's, NL, Canada

CFD Modelling to Investigate Design of a Whaleback-type Forecastle for Greenwater Protection

OMAE2019-95198

Lifen Chen¹ Xiantao Zhang¹ Paul Taylor² Scott Draper¹ Hugh Wolgamot¹

1. University of Western Australia, Perth, WA, Australia;

2. University of Oxford, Oxford, United Kingdom

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-2-5 Loads Induced in Floating Systems

Tuesday June 11

Room **SEC, Boisdale 2** | 15:30 – 17:30

Session Chair: Shinichiro Hirabayashi, University of Tokyo, Japan

Evaluation of Contact Forces in the Vertical Connection of a Flexible Riser in the Subsea Equipment

OMAE2019-95204

Yuri Coelho Del Sarto¹ Ricardo Franciss² Celso Morooka¹

1. Universidade Estadual de Campinas, Campinas, SP, Brazil;

2. University of Petropolis, Petropolis, RJ, Brazil

Effects of Euler Angles of Vertical Cambered Otter Board on Hydrodynamics based on Response Surface Methodology and MOGA

OMAE2019-95308

Gang Wang¹ Rong Wan¹ Liuyi Huang¹ Fenfang Zhao¹ Xinxin Wang¹

Wenbin Zhu² Lei Wang³ Qing Chang Xu¹ Yuyan Li¹

1. Ocean University of China, Qingdao, China; 2. Marine Fisheries Research

Institute of Zhejiang, Zhejiang, China; 3. East China Sea Fisheries Research

Institute, Chinese Academy of Fishery Sciences, Shanghai, China

Fundamental Study on Structural Strength of Large-scale

Floating Coal Transshipment Station

OMAE2019-96482

Hiroaki Eto¹ Koji Iizuka¹ Ryo Nishigochi¹ Tomoki Ikoma¹ Yasuhiro Aida² Koichi Masuda¹

1. Nihon University, Funabashi, Japan; 2. Nihon University, Chiba, Japan

On GIS Based Facility Scale and Selection of Suitable Site of

Floating Medical Support System on Big Disaster

OMAE2019-96493

Hiroaki Eto¹ Sachio Togawa¹ Morikazu Yamamoto² Shintaro Miyasawa³ Junko Yamaguchi⁴

Tomoki Ikoma¹ Yasuhiro Aida⁵ Koichi Masuda¹ Sena Shimomoto¹ Yuichi Kitabatake⁶

1. Nihon University, Funabashi, Japan; 2. Nihon University, Tokorozawa, Japan;

3. S Music and Express, Setagaya, Japan; 4. Nihon University, Itabashi, Japan;

5. Nihon University, Chiba, Japan; 6. Penta-Ocean Construction Co., Ltd., Bunkyo, Japan

Afternoon Lecture Series

17:40 – 18:30

Location: Lomond Auditorium



Professor Rodney Eatock Taylor

Inspired by Myriad Laughing Waves: Euler, Navier, Stokes and Others

Professor Rodney Eatock Taylor, Emeritus Professor, University of Oxford

See Afternoon Lecture Series, page 22 for more details.

Wednesday, June 12

Time	Title	Location
08:30 – 17:30	Exhibition open	Hall 5 (SEC)
08:30 – 10:00	Concurrent Sessions	See pages 54–58 for session titles, authors and locations
10:00 – 10:30	Refreshment Break	Hall 5 (SEC)
10:30 – 12:00	Concurrent Sessions	See pages 58–62 for session titles, authors and locations
12:00 – 13:30	Lunch	Hall 5 (SEC)
13:30 – 15:00	Concurrent Sessions	See pages 63–66 for session titles, authors and locations
15:00 – 15:30	Refreshment Break	Hall 5 (SEC)
15:30 – 17:30	Concurrent Sessions	See pages 67–71 for session titles, authors and locations
17:40 – 18:30	Afternoon Lecture Series	Lomond Auditorium (SEC)
19:00 – 24:00	Conference Banquet	Offsite: Merchant Square

CONCURRENT SESSIONS

08:30 – 10:00

Offshore Technology

1-5-1 FLNG

Wednesday June 12

Room **SEC, A1sh 1** | 08:30 – 10:00

Session Chair: Wenhua Zhao, University of Western Australia, Australia

Session Co-Chair: Marc Cahay, TechnipFMC, France

Support of Operational Decisions for Prelude's

Side-by-side LNG Offloading OMAE2019-96090

Erwan Auburtin¹ Thiago Miliante¹ Ewoud van Haaften² Finlay McPhail²

1. TechnipFMC, La Defense Cedex, France; 2. Shell Global Solutions International B.V., Rijswijk, Netherlands

A Simple Conceptual Methodology for the Operability

Analysis of a Floating Liquefied Natural Gas (FLNG)

Unit in Small Production Fields OMAE2019-96135

Lionel Wamba¹ Zhiming Yuan²

1. University of Strathclyde, Glasgow, United Kingdom; 2. University of Strathclyde, NAOME, Glasgow, United Kingdom

ARCOS: Advancing Ship-to-Ship LNG Transfer Solutions OMAE2019-96840

Raphael Poichot, Stephane Paquet

TechnipFMC, Sens, France

Structures, Safety and Reliability

2-1-1 Abnormal or Rogue Waves I

Wednesday June 12

Room **Crowne Plaza, Castle 1** | 08:30 – 10:00

Session Chair: Elzbieta M. Bitner-Gregersen, DNV GL, Norway

Session Co-Chair: Alexander V. Babanin, University of Melbourne, Australia

Identifying Higher-order Interactions in Wave Time-series

OMAE2019-95378

Kevin Ewans¹ Marios Christou² Suzana Ilic³ Philip Jonathan⁴

1. MetOcean Research Ltd, New Plymouth, New Zealand; 2. Imperial College London, London, United Kingdom; 3. Lancaster University, Lancaster, United Kingdom; 4. Shell Research Ltd., London, United Kingdom

Extending Integrability of Nonlinear Water Wave Equations:

Nonlinear Fourier Analysis of Breather Packets and

Rogue Waves at Higher Order OMAE2019-95543

Alfred R. Osborne

Nonlinear Wave Research Corporation, Alexandria, VA, USA

Quantification of Predicted Wave Forces from Distant

Elevation Measurements OMAE2019-96289

Spencer Hallowell¹ Sanjay R. Arwade² Hannah Johlas² Pedro Lomonaco³ Andrew T. Myers⁴

1. Independent Author, West Bath, ME, USA; 2. University of Massachusetts Amherst, Amherst, MA, USA; 3. O.H. Hinsdale Wave Research Laboratory, Corvallis, OR, USA; 4. Northeastern University, Boston, MA, USA

Nonlinear Airy Wave Pulses on the Sea Surface OMAE2019-96298

Igor Shugan¹ Sergei Kuznetsov² Yana Saprykina³ Y.-Y. Chen¹

1. National Sun Yat-Sen University, Kaoshiung, Taiwan; 2. Shirshov Institute of Oceanology of the Russian Academy of Sciences, Moscow, Russia; 3. Shirshov Institute of Oceanology, Moscow, Russia

Structures, Safety and Reliability

2-11-1 Ultimate Strength I

Wednesday June 12

Room **Crowne Plaza, Castle 2** | 08:30 – 10:00

Session Chair: Masahiko Fujikubo, Osaka University, Japan

Session Co-Chair: Deyu Wang Shanghai Jiao Tong University, China

Numerical and Experimental Research on Residual Ultimate

Strength of Hull Plates under Uniaxial Cyclic Loads OMAE2019-95226

Tian Xia¹ Ping Yang¹ Cui Cong² Ziya Peng¹ Li Ma¹

1. Wuhan University of Technology, Wuhan, China; 2. Xinlian College of Henan Normal University, Zhengzhou, China

An Empirical Formula for Predicting Elastic Ultimate Buckling Strength

of Flat-bar Stiffened Panels with Initial Imperfections OMAE2019-95683

Hongyuan Mei, Deyu Wang

Shanghai Jiao Tong University, Shanghai, China

Materials Technology

3-6-1 Advances in Materials Characterization

Wednesday June 12 Room SEC, Boisdale 1 | 08:30 – 10:00

Session Chair: Agnes Marie Horn, DNV GL, Norway
Session Co-Chair: Xin Wang, Carleton University, Canada

Safe Operations of Bolted Connections in the Oil and Gas Industries OMAE2019-95260

Morten Langøy, Rolf H. Hinderaker, Terje L. Andersen
Petroleum Safety Authority, Stavanger, Norway

An Improved Methodology to Assess Weldability of Line Pipe Steel OMAE2019-95953

Laura Alleva¹ Mauro Monti¹ Emanuele Paravicini Bagliani²
Alessandro Paggi³ Philippe Darcis²
1. Rina Consulting Centro Sviluppo Materiali, Roma, Italy;
2. Dalmine S.p.A., Dalmine, Italy; 3. Tenaris, Dalmine, Italy

A Study on Unification of Welding Consumables in Construction of Chemical Cargo Tanker Made of Duplex Stainless Steel OMAE2019-95818

Takayuki Yotsuzuka¹ Yusuke Endo¹ Eiji Niino¹ Koji Gotoh²
1. Shin Kurushima Dockyard Co., Ltd., Imabari, Japan; 2. Kyushu University, Fukuoka, Japan

Standardisation on Measurement and Interpretation of Residual Stress Data OMAE2019-96615

Ali Mirzaee Sisan¹ P John Bouchard² Foroogh Hosseinzadeh²
1. AMS Energy Solutions, Barnet, United Kingdom;
2. The Open University, Milton Keynes, United Kingdom

Small-scale HISC Testing of a Superduplex Stainless Steel Welded Joint: The Impact and Interaction of Testing and Residual Stresses OMAE2019-95053

Lisa Blanchard¹ Kasra Sotoudeh² Tyler London³ Saurabh Kabra⁴
1. University of Leicester, Leicester, United Kingdom; 2. TWI Ltd, Cambridge, United Kingdom; 3. TWI Ltd, Middlesbrough, United Kingdom; 4. Science and Technology Facilities Council, Didcot, United Kingdom

Pipelines, Risers, and Subsea Systems

4-1-6 Flexible Pipes VI

Wednesday June 12 Room Crowne Plaza, Staffa / Shuna | 08:30 – 10:00

Session Chair: Lin Zhao, Ocean university of China, China
Session Co-Chair: Krassimir Doynov, ExxonMobil Upstream Integrated Solutions, USA

Theoretical Modeling of Steel Strip Reinforced Flexible Pipe With Swaging End Fitting by Taking Into Account Stress Concentration Effect OMAE2019-95462

Yifan Gao¹ Wei Chen¹ Yong Bai²
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Controlling Factors of Carcass Fatigue in Unbonded Flexible Pipes OMAE2019-96310

Upul Fernando¹ Andrew Roberts¹ Michelle Davidson²
1. Baker Hughes, a GE Company, Newcastle upon Tyne, United Kingdom; 2. GE, Newcastle upon Tyne, United Kingdom

Assessment the Carcass Role in Designing Deepwater Riser Connectors OMAE2019-96597

Mohsen Saneian¹ Yong Bai²
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Mechanical Analysis of Fiber Glass Reinforced Bonded Flexible Pipe under External Pressure OMAE2019-95692

Xiaojie Zhang, Yong Bai, Chang Liu, Zhao Wang, Jiannan Zhao
Southern University of Science and Technology, Shenzhen, China

Pipelines, Risers, and Subsea Systems

4-3-4 Thermo-Mechanical I

Wednesday June 12 Room Crowne Plaza, Castle 3 | 08:30 – 10:00

Session Chair: Rafael F. Solano, Petrobras, Brazil
Session Co-Chair: Celso Morooka, University of Campinas, Brazil

Analytical Study for Lateral Buckling of Imperfect Pipelines with Distributed Buoyancy Section OMAE2019-95031

Zhenkui Wang¹ G.H.M. van der Heijden² Yougang Tang¹
1. Tianjin University, Tianjin, China; 2. University College London, London, United Kingdom

Large Diameter Deepwater Gas Pipelines Subjected to Global Buckling Behavior OMAE2019-95343

Bruno R. Antunes, Rafael F. Solano, Carlos O. Cardoso
Petrobras, Rio de Janeiro, RJ, Brazil

Controlled Lateral Buckling of a Pipeline on the Seabed by Residual Curvature Imperfections OMAE2019-96694

Weihan Zhang, Stelios Kyriakides
University Texas at Austin, Austin, TX, USA

Application of the MCC Model on 2-D Finite Element Analyses for the Assessment of Pipe-Soil Lateral Response OMAE2019-95577

Tianna Thomaz¹ Daniel Carneiro² Gilberto Bruno Ellwanger³ Leonardo Nascimento⁴
1. University of Edinburgh, Edinburgh, United Kingdom; 2. Wood Group, Rio de Janeiro, RJ, Brazil; 3. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4. Bureau Veritas, Rio de Janeiro, RJ, Brazil

Ocean Space Utilization

5-5-1 Floating Systems for Renewable Energy

Wednesday June 12 Room SEC, Dochart 1 | 08:30 – 10:00

Session Chair: Motohiko Murai, Yokohama National University, Japan
Session Co-Chair: Qiao Li, Institute of Industrial Science, the University of Tokyo, Japan

Validation of the Motion Analysis Method of Floating Offshore Wind Turbines using Observation Data Acquired by Full Scale Demonstration Project OMAE2019-95828

Haruki Yoshimoto, Ken Kamizawa
Japan Marine United Corporation, Yokohama, Japan

Quantitative Wear Estimation for Mooring Chain of Floating Structures and its Validation OMAE2019-96750

Takaaki Takeuchi¹ Tomoaki Utsunomiya¹ Koji Gotoh¹ Iku Sato²
1. Kyushu University, Fukuoka, Japan; 2. Toda Corporation, Tokyo, Japan

Development of Wireless Control System with Underwater Fish Eye Video Camera to Monitor Fish at the Test Site of Marine Renewable Energy OMAE2019-95978

Takeru Yoshida¹ Yoichi Mizukami¹ Jinxin Zhou² Daisuke Kitazawa³
1. Institute of Industrial Science, The University of Tokyo, Kashiwa, Japan; 2. Institute of Industrial Science, The University of Tokyo, Chiba, Japan; 3. The University of Tokyo, Kashiwa, Japan

Investigation on the Relationship between Rotor Speed and Flow Rate of Rotary Energy Recovery Device OMAE2019-96715

Lei Jiao, Dekai Huang, Zhaohui Qian, Tianzhuang Ye, Ming Sheng, Han Ge
Zhejiang University, Zhoushan, China

Ocean Engineering

6-3-1 Fluid-Structure Interaction/Hydroelasticity

Wednesday June 12 Room SEC, M4 | 08:30 – 10:00
Session Organizer: Pierre Ferrant, Ecole Centrale De Nantes/CNRS, France

A Fluid-structure Interaction Study on a Passively Deformed Fish Fin OMAE2019-95578

Yang Luo¹ Qing Xiao¹ Guangyu Shi¹ Li Wen² Zhiming Yuan³
1. University of Strathclyde, Glasgow, United Kingdom; 2. Beihang University, Beijing, China; 3. University of Strathclyde, NAOME, Glasgow, United Kingdom

Impact of a Plate on an Asymmetric Water Wedge OMAE2019-95556

Xueliang Wen, Peiqing Liu, Qiulin Qu, Qingchuan Liu
Beihang University, Beijing, China

The Development of 3D Hydroelastic Software and its Application on Platform OMAE2019-96122

Xinyun Ni, Zhengwei Zhang, Chao Tian, Ye Lu, Jun Ding
China Ship Scientific Research Center, Wuxi, China

Air-gap Analyses of a Semi-submersible considering Full Second Order Effects OMAE2019-95300

Zhiyuan Pan, Torgeir Kirkhorn Vada, Arne Nestegaard
DNV GL, Høvik, Norway

A Numerical Evaluation of the Quadratic Transfer Function for a Floating Structure OMAE2019-95620

Zhitian Xie, Yujie Liu, Jeffrey Falzarano
Texas A&M University, College Station, TX, USA

Ocean Engineering

6-5-1 Advanced Marine Hydrodynamics I

Wednesday June 12 Room SEC, M2 & M3 | 08:30 – 10:00
Session Chair: Gregor Macfarlane, Australian Maritime College, University of Tasmania, Australia

Session Co-Chair: Sanne van Essen, MARIN, Netherlands

Validation of Hydrodynamic Loads on a Large-diameter Monopile in Regular Waves OMAE2019-95929

Fatemeh H. Dadmarzi¹ Maxime Thys² Erin E. Bachynski¹
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Ocean AS, Trondheim, Norway

Improvement of Wave Loads Estimation using Spatial Pressure Distribution on Ship Hull OMAE2019-95273

Kurniawan T. Waskito, Masashi Kashiwagi
Osaka University, Osaka, Japan

Large Amplitude Time Domain Seakeeping Simulations of KVLCC2 in Head Seas taking into account Forward Speed Effect OMAE2019-95316

Christos Pollalis¹ Evangelos Boulougouris² Osman Turan¹ Olgun Hizir¹
1. University of Strathclyde, Glasgow, United Kingdom; 2. University of Strathclyde, MSRC, Glasgow, United Kingdom

On the Hydrodynamic Interaction between Ship and Free-surface Motions on Vessels with Moonpools OMAE2019-95932

Senthuran Ravinthrakumar¹ Trygve Kristiansen¹ Babak Ommani²
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Ocean, Trondheim, Norway

Ocean Engineering

6-8-1 Wave Loads

Wednesday June 12 Room SEC, Dochart 2 | 08:30 – 10:00
Session Chair: Longbin Tao, University of Strathclyde, United Kingdom

Preliminary Experimental Study on the Influence of the Local Wind Field on Forces from Breaking Waves on a Circular Cylinder OMAE2019-95179

Julie Caroe Kristoffersen¹ Henrik Bredmose² Christos Thomas Georgakis¹ Longbin Tao³
1. Aarhus University, Aarhus, Denmark; 2. Delft University of Technology wind, Copenhagen, Denmark; 3. University of Strathclyde, Glasgow, United Kingdom

A Method for Designing the Backbone for the Segmented Model of an Ultra-large Container Carrier OMAE2019-96136

Hui Li¹ Jian Zou¹ Weijia Sheng² Xuecong Hu¹ Wenjia Hu¹
1. Harbin Engineering University, Harbin, China; 2. Haerbin Engineering University, Harbin, China

Study on Flow Field and Shielding Effect of Semi-sphere Artificial Reef and other Submarine Structures OMAE2019-96444

Lin Zhao, Junwei Tan
Ocean University of China, Qingdao, China

Experimental Evaluation of Hydrodynamic Loads on Marine Risers OMAE2019-96569

Vinicius Vileti¹ Paulo de Tarso T. Esperança¹ Marcelo A. Vitola² Mario Vignoles³
1. LabOceano/COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. LabOceano - Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. TechnipFMC, Rio de Janeiro, RJ, Brazil

Numerical and Experimental Study on the Dynamics of a High Compressed Air Generated Bubble OMAE2019-95232

Shiping Wang, Xiugang Lu, Aman Zhang
Harbin Engineering University, Harbin, China

Polar and Arctic Sciences and Technology

7-3-1 Structures in Ice

Wednesday June 12 Room SEC, Alsh 2 | 08:30 – 10:00
Session Chair: Michael Huisman, Hamburg University of Technology, Germany

Session Co-Chair: Walter Kuehnlein, sea2ice Ltd. & Co. KG, Germany

Wear Amount of Steel Structure in Ice-infested Sea by Sliding Wear Test OMAE2019-95654

Takahiro Takeuchi¹ Shinji Kioka²
1. Hachinohe Institute of Technology, Hachinohe, Japan; 2. Civil Engineering Research Institute for Cold Region Public Works Research, Sapporo, Japan

Validation of Pack Ice Resistance in Oblique Condition by the Comparison with Ice Model Test Results OMAE2019-95689

HyunSoo Kim¹ Erinc Ozden² Jae-bin Lee²
1. Inha Technical College, Incheon, Korea; 2. South Korea / Inha university, Incheon, Korea

Hydrodynamic Modelling and Estimating Response of Glacial Ice Near a Drilling Rig OMAE2019-95798

Babak Ommani¹ Petter Andreas Berthelsen¹ Halvor Lie¹ Vegard Aksnes¹ Geir Løland²
1. SINTEF Ocean, Trondheim, Norway; 2. Petroleum Safety Authority Norway, Stavanger, Norway

Eliminating the Uncertainties in Hydraulic and Ice

Loads on Berm Breakwaters OMAE2019-95139

Maria Pontiki¹ Bernt Leira² Knut Vilhelm Høyland²
1. University of Delaware, Department of Civil and Environmental Engineering, Newark, DE, USA; 2. Norwegian University of Science and Technology, Trondheim, Norway

CFD & FSI

8-3-1 Data-Driven Modeling and Machine Learning

Wednesday June 12 Room SEC, Lomond Auditorium | 08:30 – 10:00

Session Chair: Rajeev Kumar Jaiman, University of British Columbia, Canada
Session Co-Chair: Luis Eca, Technical University of Lisbon, Portugal

Numerical Study of Breaking Waves and Associated Wave Forces on a Jacket Substructure for Offshore Wind Turbines OMAE2019-95233

Ankit Aggarwal, Tobias Martin, Seimur Shirinov, Hans Bihs, Arun Kamath
Norwegian University of Science and Technology, Trondheim, Norway

Three-Dimensional Numerical Analysis of Horizontal and Vertical Coalescence of Bubbles at Two Submerged Horizontal Orifices on the Wall OMAE2019-95850

Zhipeng Li, Longquan Sun, Xiongliang Yao, Yi Piao
Harbin Engineering University, Harbin, China

A Hybrid Data-driven Deep Learning Technique for Fluid-Structure Interaction OMAE2019-95870

Tharindu Pradeeptha Miyawala¹ Rajeev Kumar Jaiman²
1. National University of Singapore, Singapore, Singapore;
2. University of British Columbia, Vancouver, BC, Canada

Reduced Order Model for Unsteady Fluid Flows via Recurrent Neural Networks OMAE2019-96543

Sandeep Bukka Reddy¹ Allan Magee¹ Rajeev Kumar Jaiman²
Jing Liu³ Wei Xu³ Ankit Choudhary³ Anis Altat Hussain³
1. National University of Singapore, Singapore, Singapore;
2. University of British Columbia, Vancouver, BC, Canada;
3. Keppel Offshore and Marine Technology Centre, Singapore, Singapore

Ocean Renewable Energy

9-1-3 FWT – Numerical Analysis II

Wednesday June 12 Room SEC, Carron 1 | 08:30 – 10:00

Session Chair: Carlos Souza, Norwegian University of Science and Technology, Norway
Session Co-Chair: Wei Shi, Dalian University of Technology, China

Numerical Simulations of OC3 Spar and OC4 Semi-submersible Type Platforms under Extreme

Conditions in the East Sea, Korea OMAE2019-95919
Hyunyoung Shin, Youngjae Yu, Thanh Dam Pham, Junbae Kim, Rupesh Kumar
University of Ulsan, Ulsan, Korea

A Comparative Study on the Dynamic Response of Three Semi-submersible Floating Offshore Wind Turbines OMAE2019-96221

Wei Shi¹ Lixian Zhang¹ Dezhi Ning¹ Zhiyu Jiang² Constantine Michailides³ Madjid Karimirad⁴
1. Dalian University of Technology, Dalian, China; 2. University of Agder, Grimstad, Norway; 3. Cyprus University of Technology, Limassol, Cyprus; 4. Queen's University Belfast, Belfast, United Kingdom

Effects of Platform Mounting Orientations on the Long-term Performance of a Semi-submersible Floating Wind Turbine OMAE2019-96240

Shengtao Zhou¹ Chao Li¹ Yiqing Xiao¹ Frank Lemmer² Wei Yu² Po Wen Cheng²
1. Harbin Institute of Technology, Shenzhen, China;
2. University of Stuttgart, Stuttgart, Germany

Dynamic Response of Spar-type Floating Offshore Wind Turbine in Freak Wave OMAE2019-95638

Youngang Tang¹ Yan Li¹ Peng Xie¹ Xiaohu Qu¹ Bin Wang²
1. Tianjin University, Tianjin, China; 2. CCS, Tianjin, China

Petroleum Technology

11-15-1 Well Abandonment I – Rules and Regulations

Wednesday June 12 Room Crowne Plaza, Jura | 08:30 – 10:00

Session Chair: Mahmoud Khalifeh, UiS, Norway

Well Abandonments in British Columbia OMAE2019-95163

Majid Bizhani¹ Elizabeth Trudel² Ian Frigaard²
1. University of British Columbia, Edmonton, AB, Canada;
2. University of British Columbia, Vancouver, BC, Canada

A Critical Review of Rules and Regulations for Permanently Plugged and Abandoned Wells OMAE2019-95330

Mahmoud Khalifeh¹ Babak Akbari² Ahsan Khan¹ Daniel Braga²
1. UiS, Stavanger, Norway; 2. Louisiana State University, Baton Rouge, LA, USA

Robust Leakage Modeling for Plug & Abandonment Applications OMAE2019-95612

Mustafa Al Ramadan¹ Saeed Salehi² Catalin Teodoru²
1. University of Oklahoma, Norman, OK, USA; 2. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Fate of Hydrocarbon Leaks from Plugged and Abandoned Wells Compared to Natural Seepages OMAE2019-95674

Mari R. Tveit¹ Mahmoud Khalifeh¹ Tor Nordam² Arild Saasen³
1. UiS, Stavanger, Norway; 2. SINTEF Ocean AS, Trondheim, Norway; 3. UiS, Gullaug, Norway

Petroleum Technology

11-2-1 Drilling Mechanics Session I

Wednesday June 12 Room Crowne Plaza, Barra | 08:30 – 10:00

Session Chair: Jorge H B Sampaio Jr., Colorado School of Mines, USA

On the Importance of the Coupling between Transient Mechanical, Hydraulic and Thermal Effects for the Modelling of Real-time Drilling Operations OMAE2019-95062

Erik W. Dvergsnes¹ Eric Cayeux²
1. NORCE, Kristiansand, Norway; 2. NORCE, Stavanger, Norway

Experimental Study of Drillstring Dynamics using a High-speed Camera as a Non-invasive Motion Sensor OMAE2019-95217

Ekaterina Wiktorski, Milad Khatibi, Suranga Geekiyanage, Dan Sui, Rune Wiggo Time
University of Stavanger, Stavanger, Norway

Modal Interactions in Drillstring Borehole Interactions OMAE2019-95871

Kartheek Amaroju¹ Kiran Vijayan² Michael Friswell³
1. OENA, IIT Kharagpur, Kharagpur, India; 2. IIT Kharagpur, Kharagpur, India;
3. Swansea University, Bay Campus, Swansea, United Kingdom

The Characteristics of Numerical Solution of NDDE to Solve the Drill Pipe Stick-slip OMAE2019-95883

Tokihiro Katsui¹ Tomoya Inoue² Daisuke Sogawa¹ Yusuke Notani¹
 1. Kobe University, Kobe, Japan; 2. JAMSTEC, Yokosuka, Japan

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-1-2 Numerical and Experimental Methods in Hydrodynamics II

Wednesday June 12 Room SEC, Carron 2 | 08:30 – 10:00

Session Chair: Arne Løken, Dr. Ing. Arne E. Løken Engineering & Consulting, Norway

Session Co-Chair: Xinshu Zhang, Shanghai Jiao Tong University, China

Hydro-elastic Analysis and Validation of an End-anchored Floating Bridge under Wave and Current Loads OMAE2019-95114

Xu Xiang¹ Arne Løken²

1. Norwegian Public Roads Administration, Oslo, Norway;
 2. Dr. Ing. Arne E. Løken Engineering & Consulting, Lier, Norway

Development of an Experimental System for the Twin-lift Decommissioning Operation OMAE2019-96739

Xin Li¹ Zhihuan Hu¹ Andy Wang² Weidong Zhang¹ Xiao Wu¹ Xinliang Tian¹ Hao Sun³

1. Shanghai Jiao Tong University, Shanghai, China; 2. DNV GL - Oil & Gas China, Shanghai, China; 3. COSCO Shipping Specialized Carriers Co. Ltd, Guangzhou, China

Edge Effect on Numerical Calculation of Nonlinear Radiation Forces for a Submerged Body OMAE2019-95421

Jianye Yang, Bin Teng, Ying Gou

Dalian University of Technology, Dalian, China

Hydrodynamic Investigation of a Novel Concept of OWC Type Wave Energy Converter Device OMAE2019-96510

Kourosh Rezanejad¹ Carlos Guedes Soares²

1. Centre for Marine Technology and Ocean Engineering (CENTEC), Instituto Superior Técnico (IST), Lisboa, Portugal; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-1-1 Extremes and Environmental Modelling

Wednesday June 12 Room SEC, Boisdale 2 | 08:30 – 10:00

Session Chair: Kevin Ewans, MetOcean Research Ltd, New Zealand

Estimation of Expected Loss by Storm Surges along Tokyo Bay Coast OMAE2019-95336

Rikito Hisamatsu¹ Sooyoul Kim² Shigeru Tabeta¹

1. The University of Tokyo, Kashiwa, Japan; 2. Tottori University, Tottori, Japan

Estimating Extreme Waves in Gulf of Mexico using a Simple Spatial Extremes Model OMAE2019-95442

Ryota Wada¹ Philip Jonathan² Takuji Waseda¹ Shejun Fan³

1. The University of Tokyo, Kashiwa, Japan; 2. Shell Research Ltd., London, United Kingdom; 3. Shell Oil Company, Houston, TX, USA

Environmental Restoration for a Small-scale Beach “Heda-Mihama Project” OMAE2019-95596

Shigeru Tabeta¹ Ken Okamoto² Takayoshi Kato² Rikito Hisamatsu¹ Hiroaki Muto¹

Akinori Hino³ Motohiko Murai⁴ Sho Ito⁵ Daisuke Kitazawa¹ Takeshi Kinoshita⁶

1. The University of Tokyo, Kashiwa, Japan; 2. The University of Tokyo, Tokyo, Japan; 3. Marine Ecology Research Institute, Tokyo, Japan; 4. Yokohama National University, Yokohama, Japan; 5. Nichimo Co.Ltd, Tokyo, Japan; 6. Nagasaki Institute of Applied Science, Nagasaki, Japan

Application of the Spectral Nudging on Global Tides towards a Global Total Water Level Prediction System OMAE2019-95842

Tsubasa Kodaira¹ Natacha Bernier² Keith Thompson³

1. The University of Tokyo, Kashiwa, Japan; 2. Environment and Climate Change Canada, Dorval, QC, Canada; 3. Dalhousie University, Halifax, NS, Canada

REFRESHMENT BREAK

10:00 – 10:30

Location: Hall 5 (SEC)

CONCURRENT SESSIONS

10:30 – 12:00

Offshore Technology

1-4-2 Numerical Design and Analysis

Wednesday June 12

Room SEC, A1sh 1 | 10:30 – 12:00

Session Chair: Yanlin Shao, Technical University of Denmark, Denmark

Session Co-Chair: Xu Xiang, Norwegian Public Roads Administration, Norway

Calculation of the Dynamic Positioning Capability of an Offshore Wind Farm Vessel during the Jack-up Process in the Early Design Stage OMAE2019-95248

Maximilian Liebert

Hamburg University of Technology, Hamburg, Germany

Evaluation of Impact Loads on Offshore Jacket Platform during Float-over Mating Operation OMAE2019-95467

Gurumurthy Kagita, Mahesh Babu Addala, Gudimella G. S.,

Achary, Subramanyam V. R., Sripada

Engineers India Limited, Gurugram, India

Component-based Modeling and Simulation of Nonlinear Drill-string Dynamics OMAE2019-95474

Njaal Tengesdal¹ Christian Holden¹ Eilif Pedersen²

1. Dept. Mechanical and Industrial Engineering, Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian

University of Science and Technology, Trondheim, Norway

Use of 3D Scan of Weld Joint in Finite Element Analysis and Stochastic Analysis of Hot-spot Stresses in Tubular Joint for Fatigue Life Estimation OMAE2019-95704

Mikkel L. Larsen¹ Vikas Arora² Marie Lützen² Ronnie R. Pedersen³ Eric Putnam⁴

1. Ramboll Offshore Wind, København S, Denmark; 2. University of Southern Denmark, Odense, Denmark; 3. Ramboll Offshore Wind,

Esbjerg, Denmark; 4. FORCE Technology, Munkebo, Denmark

Asymmetrical Twin-hull Crane Vessel Global Performance Study OMAE2019-96603

Joe Zhou, Kai Huang, Jinguang Wang, Indra Datta, Lixin Xu

China Merchants Offshore Technology Research Center, Haimen, China

Structures, Safety and Reliability

2-1-2 Abnormal or Rogue Waves II

Wednesday June 12 Room **Crowne Plaza, Castle 1** | 10:30 – 12:00

Session Chair: Alexander V. Babanin, University of Melbourne, Australia

Session Co-Chair: Elzbieta M. Bitner-Gregersen, DNV GL, Norway

Comparison of Temporal and Spatial Statistics of Nonlinear Waves OMAE2019-95357

Elzbieta M. Bitner-Gregersen, Odin Gramstad
DNV GL, Høvik, Norway

Effect of Spectrum Tail Length on Modulational Instability and Freak Wave Occurrence in JONSWAP Sea States OMAE2019-95740

Cagil Kirezci, Alexander V. Babanin
University of Melbourne, Melbourne, VIC, Australia

Predicting Extreme Waves from Wave Spectral Properties using Machine Learning OMAE2019-96061

Odin Gramstad, Elzbieta M. Bitner-Gregersen
DNV GL, Høvik, Norway

“Three Sisters” Measured as a Triple Rogue Wave Group OMAE2019-96837

Anne Karin Magnusson¹ Karsten Trulsen² Elzbieta M. Bitner-Gregersen³
Ole Johan Aarnes¹ Mika Malila⁴
1. Norwegian Meteorological Institute, Bergen, Norway; 2. University of Oslo, Oslo, Norway; 3. DNV GL AS, Høvik, Norway; 4. Norwegian Meteorological Institute/University of Bergen, Bergen, Norway

Structures, Safety and Reliability

2-11-2 Ultimate Strength II

Wednesday June 12 Room **Crowne Plaza, Castle 2** | 10:30 – 12:00

Session Chair: Deyu Wang Shanghai Jiao Tong University, China

Session Co-Chair: Masahiko Fujikubo, Osaka University, Japan

Evaluation of Hull Girder Capacity considering the Effects of Lateral Pressure and Transverse Stresses OMAE2019-95867

Karan Doshi, Yogendra Parihar, Saikat Dan
Indian Register of Shipping, Mumbai, India

Experimental Study on Ultimate Strength of Thin-walled Square Tube under Axial Compression OMAE2019-96134

Hanwei Zhou¹ Ling Zhu¹ Shengming Zhang² Tongxi Yu³
1. Wuhan University of Technology, Wuhan, China; 2. Lloyd's Register, Southampton, United Kingdom; 3. Hong Kong University of Science & Technology, Clear Water Bay-kowloon, Hong Kong

Ultimate Compressive Strength of Eccentrically Loaded Stiffened Panels in Ship Structures: A Computational Study OMAE2019-96708

Konstantinos Anyfantis
National Technical University of Athens, Zografou, Greece

Materials Technology

3-3-1 Fatigue Improvement and Repairs

Wednesday June 12 Room **SEC, Boisdale 1** | 10:30 – 12:00

Session Chair: Yanhui Zhang, TWI Ltd, United Kingdom

Session Co-Chair: Myung-Hyun Kim, Pusan National University, Korea

A Study on Improvement of Fatigue Performance by Shot Blasted Surface Treatment OMAE2019-95817

Toshihiro Fujii¹ Koji Gotoh² Junichi Deguchi¹ Koji Murakami²
1. Oshima Shipbuilding Co., Ltd., Saikai, Japan; 2. Kyushu University, Fukuoka, Japan

Fatigue Life Evaluation for the Repaired Methods of High Pressure Gas Pipeline OMAE2019-95281

Woo Sik Kim
KOGAS, Ansan, Korea

World First Fatigue S-N Curve for Bonded Repairs and FPSO Application OMAE2019-96239

Hamza Abbad el Andaloussi¹ Luc Mouton² Firas Sayed Ahmad¹
Stéphanie Maherault-Mougin³ Stéphane Paboeuf² Xabier Errotabehere¹
1. COLPAD, Paris, France; 2. Bureau Veritas, Nantes, France; 3. Bureau Veritas, Puteaux, France

Numerical Investigation on Surface Crack Growth in Steel Plates Repaired with Carbon Fiber-reinforced Polymer OMAE2019-95746

Zongchen Li, Xiaoli Jiang, Hans Hopman
Delft University of Technology, Delft, Netherlands

Pipelines, Risers, and Subsea Systems

4-1-7 Flexible Pipes VII

Wednesday June 12 Room **Crowne Plaza, Staffa / Shuna** | 10:30 – 12:00

Session Chair: José Renato M. de Sousa, Federal University of Rio de Janeiro, Brazil

Session Co-Chair: Farzan Parsinejad, Chevron, USA

Development of Flexible Composite Pipe Cross-section Design Software based on Visual Basic OMAE2019-95916

Xinyu Sun¹ Yong Bai² Jiannan Zhao¹ Chang Liu¹ Xiaojie Zhang¹
1. Southern University of Science and Technology, Shenzhen, China; 2. Zhejiang University, Zhejiang, China

Thermal and Mechanical Coupled Analysis of Marine Composite Cryogenic Pipeline OMAE2019-96144

Haitao Hu¹ Jun Yan¹ Baoshun Zhou¹ Zhixun Yang¹ Liang Yang² Jiakun Fan²
1. Dalian University of Technology, Dalian, China; 2. CNOC Gas & Co., Ltd, Beijing, China

A Three-Dimensional FE Approach for the Stress Analysis of Tensile Armors inside End Fittings OMAE2019-95506

Marcelo Miyazaki¹ José Renato M. de Sousa² Gilberto Bruno Ellwanger²
1. Technip FMC, Rio de Janeiro, RJ, Brazil; 2. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

An Analytical Approach for Predicting the Collapse Pressure of the Flexible Risers with Initial Ovalization and Gap OMAE2019-95642

Xiao Li¹ Xiaoli Jiang² Hans Hopman²
1. Delft University of Technology, Delft, Netherlands; 2. TU Delft, Delft, Netherlands

Pipelines, Risers, and Subsea Systems

4-3-5 Thermo-Mechanical II

Wednesday June 12 Room **Crowne Plaza, Castle 3** | 10:30 – 12:00

Session Chair: Daniel Carneiro, Wood, Brazil

Session Co-Chair: Rafael F. Solano, Petrobras, Brazil

Overview of the Lateral Buckling and Walking Designs of Deepwater Pipelines in Offshore Brazil OMAE2019-95289

Rafael F. Solano, Carlos O. Cardoso, Bruno R. Antunes
Petrobras, Rio de Janeiro, RJ, Brazil

Lessons Learned from Operational Integrity of HP/HT Deepwater Pipelines OMAE2019-95298

Carlos O. Cardoso, Rafael F. Solano, Bruno R. Antunes
Petrobras, Rio de Janeiro, RJ, Brazil

Walking Anchors – When to Fix One or Both Ways? OMAE2019-95359

Daniel Carneiro¹ Luciano Franco²
1. Wood, Rio de Janeiro, RJ, Brazil; 2. McDermott, Rio de Janeiro, RJ, Brazil

Challenges and Lessons Learnt from the Design, Fabrication, and Installation of Pipe Walking Mitigations OMAE2019-95055

Curti Gianbattista¹ Pavone Diego¹ Marchionni Lorenzo¹
Guyon Vivien² Perrin Frederic² Pirinu Gianluigi²
1. Saipem, Fano, Italy; 2. Saipem, Saint Quentin Yvelines, France

Ocean Space Utilization

5-1-2 Hybrid and Complex Use of Floating Systems I

Wednesday June 12 Room **SEC, Dochart 1** | 10:30 – 12:00

Session Chair: Fonseca Nuno, SINTEF Ocean, Norway

Session Co-Chair: Tomoki Ikoma, Nihon University, Japan

New Engineering Approach for the Development and Demonstration of a Multi-purpose Platform for the Blue Growth Economy OMAE2019-96104

Fabrizio Lagasco¹ Maurizio Collu² Alessandra Mariotti³ Elchanan Safer⁴ Felice Arena⁵
Timothy H. Atack⁶ Giulio Brizzi⁷ Paul Tett⁸ Anita Santoro⁹ Sylvain Bourdier¹⁰
Fernando Salcedo Fernandez¹¹ Muggiasca Sara¹² Ibon Larrea¹³
1. RINA Consulting S.p.A., Genova, Italy; 2. University of Strathclyde, Glasgow, United Kingdom; 3. Fincosit s.r.l., Genova, Italy; 4. Safer Ingenierie SAS, Serris, France; 5. Mediterranea University, Reggio Calabria, Italy; 6. Sagro Aquaculture Ltd, Limassol, Cyprus; 7. Chlamys s.r.l., Trani, Italy; 8. The Scottish Association For Marine Science LBG, Dunbeg Oban, United Kingdom; 9. Wavenergy.It srl, Reggio Calabria, Italy; 10. Ecole Centrale de Nantes, Nantes, France; 11. Fundacion Tecnalia Research & Innovation, Derio Bizkaia, Spain; 12. Politecnico di Milano, Milano, Italy; 13. Ditre Industrial S.L., Vitoria, Spain

Frequency Domain Analysis of a Hybrid Aquaculture-Wind Turbine Offshore Floating System OMAE2019-96171

Abhinav K A¹ Maurizio Collu² Sun Ke³ Zhou Bin Zhen³
1. Dept. of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde, Glasgow, United Kingdom; 2. University of Strathclyde, Glasgow, United Kingdom; 3. College of Shipbuilding Engineering, Harbin, China

Analysis of the Coupled Dynamics of an Offshore Floating Multi-purpose Platform, Part A: Rigid Body Analysis OMAE2019-96212

Liang Li¹ Maurizio Collu¹ Carlo Ruzzo² Giuseppe Failla² K A Abhinav¹ Felice Arena²
1. University of Strathclyde, Glasgow, United Kingdom;
2. Mediterranea University, Reggio Calabria, Italy

Analysis of the Coupled Dynamics of an Offshore Floating Multi-purpose Platform, Part B: Hydro-elastic Analysis with Flexible Support Platform OMAE2019-96282

Carlo Ruzzo¹ Giuseppe Failla¹ Felice Arena¹ Maurizio Collu² Liang Li² Alessandra Mariotti³
1. Mediterranea University, Reggio Calabria, Italy; 2. University of Strathclyde, Glasgow, United Kingdom; 3. Fincosit s.r.l., Genova, Italy

Ocean Engineering

6-3-2 Wave-Body Interactions/CFD

Wednesday June 12 Room **SEC, M4** | 10:30 – 12:00

Session Chair: Jeffrey Falzarano, Texas A&M University, USA

Interaction of Fixed Cylinder with Waves through Weakly Coupled FNPT and Lagrangian Navier-stokes OMAE2019-96745

Shagun Agarwal, Sriram Venkatachalam, K. Murali
Indian Institute of Technology Madras, Chennai, India

Numerical Simulation of Fully Nonlinear Interaction between Regular and Irregular Waves and a 2D Floating Body OMAE2019-96680

Haoran Li, Erin E. Bachynski
Norwegian University of Science and Technology, Trondheim, Norway

Gap Resonance of Fixed Floating Multi Caissons OMAE2019-96383

Limin Chen¹ Guanghua He² Harry B. Bingham³ Yanlin Shao⁴
1. Harbin Institute of Technology, Harbin, China; 2. Harbin Institute of Technology, Weihai, China; 3. Delft University of Technology, Lyngby, Denmark; 4. Technical University of Denmark, Kongens Lyngby, Denmark

A Numerical Study of Wave Impacts on a Semi-submersible OMAE2019-95070

Yanfei Deng, Wei Feng, Lei Li, Youwei Kang, Xiqia Chen
CIMC Offshore Co. Ltd., Shenzhen, China

Ocean Engineering

6-5-2 Advanced Marine Hydrodynamics II

Wednesday June 12 Room **SEC, M2 & M3** | 10:30 – 12:00

Session Chair: Ilmas Bayati, MARIN, Netherlands

Numerical Modelling of Wave Interaction with an FPSO under Different Incident Wave Conditions OMAE2019-96004

Arun Kamath¹ Tobias Martin¹ Hans Bihs²
1. Norwegian University of Science and Technology, Trondheim, Norway;
2. Norwegian University of Science and Technology, Sør-Trøndelag, Norway

Parametric Rolling in Regular Head Waves of the KRISO Container Ship (KCS): Numerical and Experimental Investigation in Shallow Water OMAE2019-96341

Manases Tello Ruiz¹ Jose Villagomez² Guillaume Deflefortrie² Evert Lataire¹ Marc Vantorre¹
1. Ghent University, Ghent, Belgium; 2. Flanders Hydraulics Research, Antwerp, Belgium

Wave Effects on the Turning Circle Ability of an Ultra Large Container Ship in Shallow Water OMAE2019-96346

Manases Tello Ruiz¹ Marc Mansuy¹ Luca Donatini¹ Jose Villagomez²
Guillaume Deflefortrie² Evert Lataire¹ Marc Vantorre¹
1. Ghent University, Ghent, Belgium; 2. Flanders Hydraulics Research, Antwerp, Belgium

System Identification of Abkowitz Model for Ship Manoeuvring Motion based on Epsilon-support Vector Regression OMAE2019-96699

Bin Liu¹ Yuting Jin¹ Allan Magee¹ Lucas J. Yiew¹ Shanli Zhang²
1. Technology Centre for Offshore and Marine Singapore, Singapore, Singapore; 2. TCOMS, Singapore, Singapore

Ocean Engineering

6-8-2 Ship Hydrodynamics

Wednesday June 12 Room SEC, Dochart 2 | 10:30 – 12:00
 Session Chair: Claudio A. Rodriguez C., Universidade Federal de Rio de Janeiro, Brazil

Uncertainty Analysis of Free Running Manoeuvring Model Tests on a Modern Ferry, with Emphasis on Heel Angles OMAE2019-95513

Anton Kisjes¹ Frans H. H. A. Quadvlieg² Victor Ferrari²
 1. MARIN, Overveen, Netherlands; 2. MARIN, Wageningen, Netherlands

Biofouling Characterization and its Effect on Resistance of Surface Ship OMAE2019-96220

Della Thomas, S. Surendran, Nilesh J. Vasu
 Indian Institute of Technology Madras, Chennai, India

Estimation of Roll Damping Coefficients based on Model Tests Responses of a FPSO in Waves OMAE2019-96334

Claudio Alexis Rodriguez¹ Paulo de Tarso T. Esperança² Mauro C. de Oliveira³
 1. LabOceano - Universidade Federal do Rio de Janeiro, Rio De Janeiro, RJ, Brazil; 2. LabOceano/COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. CENPES/PETROBRAS, Rio de Janeiro, RJ, Brazil

Experimental and Numerical Investigation on the Hydrodynamic Performance of a CRP Propulsor OMAE2019-95311

Zheng Huang, Shancheng Li, Peng Xi, Ying Xiong
 NUE, WuHan, China

Outcomes of Recent Work on the Optimisation of Ride Control Operation to Reduce Motions and Loads of High-speed Catamarans OMAE2019-96562

Javad Mehr¹ Jason Lavroff² Damien Holloway² Michael Davis² Giles Thomas³
 1. University of Tasmania, Launceston, TAS, Australia; 2. University of Tasmania, Hobart, TAS, Australia; 3. University College London, London, United Kingdom

Polar and Arctic Sciences and Technology

7-4-1 Vessels in Ice and Waves

Wednesday June 12 Room SEC, Alsh 2 | 10:30 – 12:00
 Session Chair: Sören Ehlers, Hamburg University of Technology, Germany
 Session Co-Chair: Walter Kuehnlein, sea2ice Ltd. & Co. KG, Germany

Numerical Simulation of Ship-Ice Interaction OMAE2019-96740

Michael Huisman, Sandro Erceg, Rüdiger Ulrich Franz Von Bock Und Polach, Thomas Rung, Sören Ehlers
 Hamburg University of Technology, Hamburg, Germany

Numerical Simulation of Ice-Wave Interaction by Coupling DEM-CFD OMAE2019-95105

Lu Tengchao, Zaojian Zou
 Shanghai Jiao Tong University, Shanghai, China

Numerical Study on Nonlinear Wave-Ice-Interaction OMAE2019-95116

Moritz Hartmann¹ Rüdiger Ulrich Franz Von Bock Und Polach¹
 Sören Ehlers¹ Norbert Hoffmann¹ Miguel Onorato² Marco Klein¹
 1. Hamburg University of Technology, Hamburg, Germany; 2. Università di Torino, Torino, Italy

State of the Art and Knowledge Gaps on Modelling Structures in Cold Regions OMAE2019-95085

Rüdiger Ulrich Franz Von Bock Und Polach, Marco Klein, Jan Kubiczek, Leon Kellner, Moritz Braun, Hauke Hermming
 Hamburg University of Technology, Hamburg, Germany

CFD & FSI

8-3-2 Code Development and V&V

Wednesday June 12 Room SEC, Lomond Auditorium | 10:30 – 12:00
 Session Chair: Luis Eca, Technical University of Lisbon, Portugal
 Session Co-Chair: Rajeev Kumar Jaiman, University of British Columbia, Canada

Plastic Accumulation in Front of a Plate in Cross Flow – Model Scale Test and CFD-DEM Modeling OMAE2019-96095

Hendrik Wrenger¹ Bruno Sainte-Rose¹ Christoph Goniva² Renan Hilbert³
 1. The Ocean Cleanup, Rotterdam, Netherlands; 2. DCS Computing, Linz, WA, Austria; 3. Y-plus, Paris, France

Comparisons between the Particle-based Methods Smoothed Particle Hydrodynamics (SPH) and Moving Particle Semi-implicit (MPS) to Model Dam Breaking Event OMAE2019-95102

Sergey Buruchenko¹ Rubens Augusto Amaro Jr.² Liang-Yee Cheng²
 1. South Ural State University, Chelyabinsk, Russia; 2. University of São Paulo, São Paulo, SP, Brazil

Numerical Study on Vortex Induced Motion of Circular Cylinder with Low Aspect Ratio in Currents OMAE2019-95525

Jiawei He, D.C. Wan
 Shanghai Jiao Tong University, Shanghai, China

Understanding the Capability of RANS Based Turbulence Models on Fully Turbulent Channel Flow OMAE2019-96290

Yasin Kaan Ilter, Ugur Oral Unal
 Istanbul Technical University, Istanbul, Turkey

Ocean Renewable Energy

9-2-2 Aerodynamics II

Wednesday June 12 Room SEC, Carron 1 | 10:30 – 12:00
 Session Chair: Kurt Delpeche, Pacifico Energy K.K., Japan
 Session Co-Chair: Nigel Terry, Marine Renewable Engineering, United Kingdom

The Aerodynamic Performance of Offshore Twin Vertical Axis Wind Turbines with Deflector OMAE2019-95104

Yichen Jiang, Peidong Zhao, Li Zou, Guiyong Zhang, Zhi Zong
 Dalian University of Technology, Dalian, China

The Aerodynamic Analysis of Helical-type VAWT with Semi Empirical and CFD Method OMAE2019-95207

Ying Guo, Liqin Liu, Xinxin Lv, Yougang Tang
 Tianjin University, Tianjin, China

Analyzing the Effect of Shaft and End-plates of a Newly Developed Elliptical-bladed Savonius Rotor from Wind Tunnel Tests OMAE2019-95570

Nur Alom¹ Nitish Kumar² Ujjwal K. Saha¹
 1. Indian Institute of Technology Guwahati, Guwahati, India; 2. Larsen and Toubro, Mumbai, India

Aeromechanical Analysis of Wind Turbines using Non-linear Harmonic Method OMAE2019-96256

Shine Win Naung, Mohammad Rahmati, Hamed Farokhi
 Northumbria University, Newcastle upon Tyne, United Kingdom

Ocean Renewable Energy

9-3-2 Wave Energy: Oscillating Water Column I

Wednesday June 12 Room **SEC, Carron 2** | 10:30 – 12:00

Session Chair: Kourosh Rezanejad, Centre for Marine Technology and Ocean Engineering (CENTEC), Instituto Superior Técnico (IST), Portugal
Session Co-Chair: Alessandra Romolo, University Mediterranea, Italy

Geometrical Optimization of U-Oscillating Water

Columns in Random Waves OMAE2019-95973

Andrea Scialò, Giovanni Malara, Felice Arena
Mediterranea University, Reggio Calabria, Italy

Oscillating Water Column Motion inside Circular

Cylindrical Structures OMAE2019-96048

Daniel de Oliveira Costa¹ Joel S. Sales Junior¹ Antonio Carlos Fernandes²
1. Laboratory of Waves and Current - LOC - Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. UFRJ/COPPE, Rio de Janeiro, RJ, Brazil

The Impact of Modelling Air Compressibility in the Selection of Optimal OWC Design Parameters in Site Specific Wave Conditions

OMA2019-96123
Irene Simonetti, Lorenzo Cappiotti
University of Florence, Florence, Italy

Improving the Hydrodynamic Performance of OWC Wave

Energy Converter by Attaching a Step OMAE2019-96408

Kourosh Rezanejad¹ Jorge Filipe Marques Gadelho¹ Ivan López²
Rodrigo Carballo² Carlos Guedes Soares³
1. Centre for Marine Technology and Ocean Engineering (CENTEC), Instituto Superior Técnico (IST), Lisboa, Portugal; 2. Hydraulic Engineering Area, Universidade de Santiago de Compostela, Lugo, Spain; 3. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

Petroleum Technology

11-2-2 Drilling Mechanics Session II

Wednesday June 12 Room **Crowne Plaza, Barra** | 10:30 – 12:00

Session Chair: Jorge H B Sampaio Jr., Colorado School of Mines, USA

Fatigue Evaluation of Drill Pipes for Scientific Drilling Program by Applying Non-stop Driller Concept

OMA2019-95896
Tomoya Inoue¹ Masahiko Fujikubo² Kenji Nakano² Noriaki Sakurai³
1. JAMSTEC, Yokosuka, Japan; 2. Osaka University, Suita, Japan; 3. JAMSTEC, Yokohama, Japan

A Random Method for Calculation of Hoisting Drag

OMA2019-96170
Hongyuan Qiu, Jianming Yang, Geoff Rideout, Stephen Butt
Memorial University of Newfoundland, St. John's, NL, Canada

Selecting the Best 3D Wellbore Trajectory using a Fast Stiff Semi-analytical 3D Torque&Drag Simulator

OMA2019-96385
Jorge H B Sampaio Jr., Ahmed Mansour
Colorado School of Mines, Golden, CO, USA

A Simplified Fatigue Assessment Procedure for Drilling Pipes of Scientific Vessels

OMA2019-96639
Martina Aguiari¹ Cesare Mario Rizzo² Tomoya Inoue³
1. University of Genoa - DITEN, Genova, Italy; 2. Università Degli Studi di Genova, Genova, Italy; 3. JAMSTEC, Yokosuka, Japan

Petroleum Technology

11-15-2 Well Abandonment II – Research and Operational Experiences

Wednesday June 12 Room **Crowne Plaza, Jura** | 10:30 – 12:00

Session Chair: Mahmoud Khalifeh, UIS, Norway

Cement Plug Sealing Studies of Silica Cement System

OMA2019-95928
Anisa Noor Corina¹ Nils Opedal² Torbjorn Vralstad³ Sigbjørn Sangesland¹
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Industry, Trondheim, Norway; 3. SINTEF, Trondheim, Norway

Time-to-failure Estimation of Barrier Systems in Permanently Plugged and Abandoned Wells

OMA2019-96546
Øystein Arild¹ Hans Petter Lohne¹ Hans Joakim Skadsem¹
Eric Patrick Ford¹ Jon Tømmerås Selvik²
1. NORCE, Stavanger, Norway; 2. University of Stavanger, Stavanger, Norway

Experimental Study of Pipe Pulling through Settled Barite

OMA2019-96547
Ali Taghipour, Torbjorn Vralstad, Ragnhild Skorpa,
Mohammad Hossain Bhuiyan, Jan David Ytrehus, Anna Stroisz
SINTEF, Trondheim, Norway

Effect of Well Construction on Efficient P&A Process

OMA2019-96607
Farzad N. Shoghli¹ Arild Saasen² Mahmoud Khalifeh³
1. Equinor ASA, Stavanger, Norway; 2. Uis, Gullaug, Norway; 3. Uis, Stavanger, Norway

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-1-2 Fluid Body Interaction

Wednesday June 12 Room **SEC, Boisdale 2** | 10:30 – 12:00

Session Organizer: Takanori Hino, Yokohama National University, Japan

Evaluation of Flow Field in the Layouts of

Cross-shaped Artificial Reefs OMAE2019-95192
YanLi Tang, Qi Hu, Xinxin Wang, Fenfang Zhao, Liuyi Huang, Tao Xie
Ocean University of China, Qingdao, China

Nonlinear Wave Surface Elevation Characteristic Analysis around a Multi-body Offshore Platforms System

OMA2019-95203
Xiudi Ren, Yibo Liang, Longbin Tao
University of Strathclyde, Glasgow, United Kingdom

Two-Dimensional Numerical Simulation of Vortex Shedding of Multiple Stranded Rope

OMA2019-95225
Xinxin Wang, Liuyi Huang, YanLi Tang, Fenfang Zhao, Peng Sun
Ocean University of China, Qingdao, China

Experimental Study on the Hydrodynamic

Characteristics of Artificial Reefs OMAE2019-96019
Fenfang Zhao¹ Muk Chen Ong² YanLi Tang¹ Xinmeng Wang¹
1. Ocean University of China, Qingdao, China; 2. University of Stavanger, Stavanger, Norway

Lunch

12:00 – 13:30

Location: Hall 5 (SEC)

CONCURRENT SESSIONS

13:30 – 15:00

Offshore Technology**1-3-1 Nonlinear Wave and Wave Effects**Wednesday June 12 Room **SEC, Alsh 1** | 13:30 – 15:00

Session Chair: Longfei Xiao, Shanghai Jiao Tong University, China
 Session Co-Chair: Zhenhua Huang, University of Hawaii at Manoa, USA

Behaviour of a Suspended Wellbay Module and Flare Tower in Waves during Transit to Shore OMAE2019-95001

Hoi-Sang Chan, Evren Armaoglu, Matthew Thomson, Alistair Garner
Saipem Ltd, Kingston-upon-Thames, United Kingdom

Slamming Force Contributions due to Plunging Breakers on Different Geometrical Cylinders OMAE2019-95126

Xin Wang¹ Arun Dev¹ Longbin Tao² DW Chia³ Yali Zhang³
 1. *Newcastle University, Singapore, Singapore*; 2. *University of Strathclyde, Glasgow, United Kingdom*; 3. *Lloyd's Register Singapore Pte Ltd, Singapore, Singapore*

Hydrodynamic Analysis of Deep-water Fish Cage based on Two Different Methods in Waves OMAE2019-96486

Yihou Wang, Yuwang Xu, Shuai Li, Haojie Ren, Shixiao Fu
Shanghai Jiao Tong University, Shanghai, China

Experimental Research of Wave Transformation on Porous Coral Reef OMAE2019-96582

Gancheng Zhu¹ Bing Ren² Yongxue Wang¹ Chao Wang²
 1. *State Key Laboratory of Coastal and Offshore Engineering, Dalian University of Technology, Dalian, China*; 2. *Dalian University of Technology, Dalian, China*

Structures, Safety and Reliability**2-2-1 Probabilistic and Spectral Wave Models I**Wednesday June 12 Room **Crowne Plaza, Castle 1** | 13:30 – 15:00

Session Chair: Carlos Guedes Soares, Instituto Superior Técnico, Universidade de Lisboa, Portugal
 Session Co-Chair: Felice Arena, Univ Mediterranea, Italy

Nonlinear Fourier Analysis Algorithm and Models for Water Waves in Terms of Surface Elevation, Amplitude Modulations and Frequency Modulations OMAE2019-95546

Alfred R. Osborne
Nonlinear Wave Research Corporation, Alexandria, VA, USA

Optimal Methods for Estimating the JONSWAP Spectrum Peak Enhancement Factor from Measured and Hindcast Wave Data OMAE2019-95451

Kevin Ewans¹ Jason McConochie²
 1. *MetOcean Research Ltd, New Plymouth, New Zealand*;
 2. *Shell Development Australia, Perth, WA, Australia*

A Benchmarking Exercise on Estimating Extreme Environmental Conditions for Engineering Design OMAE2019-96523

Andreas F Haselsteiner¹ Ryan Coe² Lance Manuel³
 Phong T. T. Nguyen³ Nevin Martin⁴ Aubrey Eckert-Gallup⁴
 1. *University of Bremen, Bremen, Germany*; 2. *Sandia National Laboratories, Albuquerque, NM, USA*; 3. *University of Texas at Austin, Austin, TX, USA*; 4. *Sandia National Labs, Albuquerque, NM, USA*

Structures, Safety and Reliability**2-11-3 Ultimate Strength III**Wednesday June 12 Room **Crowne Plaza, Castle 2** | 13:30 – 15:00

Session Chair: Masahiko Fujikubo, Osaka University, Japan
 Session Co-Chair: Deyu Wang Shanghai Jiao Tong University, China

Analysis of Strain Characteristic of Carbon Filament-wound Composite Cylinders under Hydrostatic Pressure OMAE2019-95106

Ke Chun Shen, Guang Pan, Ran Feng Wei, Zhun Li
Northwestern Polytechnical University, Xi'an, China

Study on Residual Strength of Egg-shaped Pressure Shell with Local Damage OMAE2019-95456

Siming Yuan, He Gao
Naval Research Academy, PLA, Beijing, China

Axial and Moment Carrying Capacity of Split Sleeve Grouted Connection for Tubular Members OMAE2019-96267

Vignesh Chellappan N, Nallayarasu Seenainaidu
Indian Institute of Technology Madras, Chennai, India

Materials Technology**3-11-1 Developments in BS 7910 and other Fitness-for-service Procedures: Session I**Wednesday June 12 Room **SEC, Boisdale 1** | 13:30 – 15:00

Session Chair: Bostjan Bezensek, Shell Global Solutions UK, United Kingdom
 Session Co-Chair: Isabel Hadley, TWI Ltd, United Kingdom

A Brief Guide to BS 7910 OMAE2019-96619

Isabel Hadley
TWI Ltd, Cambridge, United Kingdom

Emerging Technology in Fitness-for-service Assessment of Crack-like Flaws OMAE2019-96415

Ted Anderson
TL Anderson Consulting, Longmont, CO, USA

Estimating Fracture Toughness from Charpy Data OMAE2019-95787

Henryk Pisarski¹ Bostjan Bezensek²
 1. *Independent Consultant, Cambridge, United Kingdom*;
 2. *Shell, Laurencekirk, United Kingdom*

Residual Stress in Girth Welds: Seeing Measurement Data Differently OMAE2019-96622

Ali Mirzaee Sisan¹ Guiyi Wu²
 1. *AMS Energy Solutions, Barnet, United Kingdom*; 2. *TWI Ltd, Cambridge, United Kingdom*

Pipelines, Risers, and Subsea Systems**4-2-3 Drilling Risers I**Wednesday June 12 Room **Crowne Plaza, Castle 3** | 13:30 – 15:00

Session Chair: Chenteh Alan Yu, ABS, USA

Emergency Disconnect and Storm Hang-off – Reducing Risk for Drilling Risers in Harsh Environments OMAE2019-95213

Conor Gallagher, Dara Williams
Wood PLC, Galway, Ireland

Mitigated Riser Response during Submerged BOP Move through use of Drillstring Active Heave Compensation System OMAE2019-95809

Lucas Sevillano¹ Celso Morooka¹ Sigbjorn Sangesland²
 1. University of Campinas, Campinas, SP, Brazil;
 2. Norwegian University of Science and Technology, Trondheim, Norway

Advances in Riser Management Technology Enabling Improved Efficiency for Deepwater and Harsh Environment Drilling OMAE2019-96261

Donogh Lang¹ Paul Bohan¹ Victor Gomes² Germain Venero² Hugues Corrigan²
 1. Wood PLC, Galway, Ireland; 2. Wood, Rio de Janeiro, RJ, Brazil

Field Trial of Vortex-induced Vibration Suppression Technology for Drilling Riser Buoyancy OMAE2019-96426

Phillip P. Kurts¹ Hayden Marcollo² Andrew A. Kilner¹
 Daniel Johnstone² Andrew E. Potts² Peter Pezet³ Tricia Hill⁴
 1. AMOG Consulting, Houston, TX, USA; 2. AMOG Consulting, Notting Hill, VIC, Australia; 3. Matrix Composites and Engineering, Henderson, WA, Australia; 4. Matrix Composites and Engineering, Houston, TX, USA

Pipelines, Risers, and Subsea Systems

4-3-3 Mechanics I

Wednesday June 12 Room **Crowne Plaza, Staffa / Shuna** | 13:30 – 15:00
 Session Chair: Theodoro Netto, COPPE/UFRJ, Brazil
 Session Co-Chair: Duane DeGeer, INTECSEA, USA

A Method to Calculate the Multi-axial Fatigue of Subsea Rigid Jumper due to VIV OMAE2019-96332

Kunal Kapoor¹ Zhenhui Liu² Muk Chen Ong³
 1. University of Stavanger, Delhi, India; 2. Aker Solutions AS, Trondheim, Norway; 3. University of Stavanger, Stavanger, Norway

Dynamic Behaviour of Subsea Pipeline Crossings under Compressive Axial Loads OMAE2019-96662

Abdul El-Chayeb, Don Wang, Faris Kamal, Oussama Takieddine
 National Petroleum and Construction Company, Abu Dhabi, United Arab Emirates

A Design Practice for Subsea Pipeline Subjected to UXO Hazards OMAE2019-96343

Zhenhui Liu¹ Ragnar Igland¹ Sindre Bruaseth¹ Luca Ercoli-Malacari² Odd Arne Lillebø³
 1. Aker Solutions AS, Trondheim, Norway; 2. Equinor AS, Trondheim, Norway; 3. Equinor AS, Stavanger, Norway

Fatigue Assessment of Dented Rigid Risers OMAE2019-96741

Elvis J Osorio Santander¹ Bianca Pinheiro² Carlos Magluta² Ney Roitman¹
 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

Ocean Space Utilization

5-1-3 Hybrid and Complex Use of Floating Systems II

Wednesday June 12 Room **SEC, Dochart 1** | 13:30 – 15:00
 Session Chair: Maurizio Collu, University of Strathclyde, United Kingdom
 Session Co-Chair: Tomoki Ikoma, Nihon University, Japan

Experimental and Numerical Study on the Hydrodynamic Properties of a Simplified Floating Hydrocarbon Storage Facility OMAE2019-96753

Chi Zhang¹ Fonseca Nuno² Allan Magee¹ Nianxin Ren¹
 1. National University of Singapore, Singapore, Singapore;
 2. SINTEF Ocean, Trondheim, Norway

Hydrodynamic Model Tests with a Large Floating Hydrocarbon Storage Facility OMAE2019-96761

Fonseca Nuno¹ Chi Zhang² José Miguel Rodrigues¹
 Nianxin Ren² Oyvind Hellan¹ Allan Magee²
 1. SINTEF Ocean, Trondheim, Norway; 2. National University of Singapore, Singapore, Singapore

Effect of Special Outermost Module Designs on the Hydrodynamic Responses of a Modular Multi-purpose Floating Structure System OMAE2019-96789

Nianxin Ren¹ Chi Zhang¹ Allan Magee¹ Xiao Liu¹ Oyvind Hellan² Kok Keng Ang¹
 1. National University of Singapore, Singapore, Singapore;
 2. SINTEF Ocean, Trondheim, Norway

Design and Inclusion of a Desalination System in a Floating Offshore Wind Farm OMAE2019-95024

Davide Miriello¹ Michael Walker² Loris Canizares² Aaron Smith³ Dominique Roddier²
 1. Principle Power, Inc., Italy; 2. Principle Power, Inc., Emeryville, CA, USA; 3. Principle Power, Lisbon, Portugal

Ocean Engineering

6-15-1 Underwater Vehicles Control

Wednesday June 12 Room **SEC, Dochart 2** | 13:30 – 15:00
 Session Organizer: Eduardo Tannuri, Numerical Offshore Tank - University of São Paulo, Brazil
 Session Co-Chair: Zhe Jiang, Shanghai Ocean University, China
 Session Co-Chair: Alexandre Immas, University of California, Berkeley, USA

Development of an Image Processing Module for Autonomous Underwater Vehicles through Integration of Object Recognition with Stereoscopic Image Reconstruction OMAE2019-95321

Yu-Hsien Lin, Shao-Yu Chen
 National Cheng-Kung University, Tainan, Taiwan

Development of a PID Control Strategy for a Compact Autonomous Underwater Vehicle OMAE2019-95345

Avilash Sahoo¹ Santosha K. Dwivedy² P. S. Robi²
 1. National Institute of Technology Meghalaya, Shillong, India;
 2. Indian Institute of Technology Guwahati, Guwahati, India

High-bandwidth Underwater Wireless Communication using a Swarm of Autonomous Underwater Vehicles OMAE2019-96270

Alexandre Immas, Mohsen Saadat, Jesus Navarro, Matthew Drake, Julie Shen, Mohammad-Reza Alam
 University of California, Berkeley, Berkeley, CA, USA

Optimization of a Swarm of Autonomous Underwater Vehicles for High-bandwidth Underwater Wireless Communication OMAE2019-96285

Alexandre Immas, Mohammad-Reza Alam
 University of California, Berkeley, Berkeley, CA, USA

Ocean Engineering

6-3-3 Damping and Viscous Effects

Wednesday June 12 Room **SEC, M4** | 13:30 – 15:00
 Session Organizer: Torgeir Kirkhorn Vada, DNV GL, Norway

Vortex Shedding and Roll Damping from Hulls with Rounded Bilges OMAE2019-95629

Ian A Milne¹ Feifei Tong¹ J. Michael R. Graham²
 1. University of Western Australia, Perth, WA, Australia;
 2. Imperial College London, London, United Kingdom

A Semi-analytical Method for Calculating the Hydrodynamic Force on Perforated Plates in Oscillating Flow OMAE2019-95093

Fredrik Mentzoni, Trygve Kristiansen
Norwegian University of Science and Technology, Trondheim, Norway

An Experimental and Numerical Study of Added Mass and Damping for Side by Side Plates in Oscillating Flow OMAE2019-96008

Frøydis Solaas¹ Fredrik Mentzoni² Mia Abrahamsen-Prsic² Trygve Kristiansen²
1. SINTEF Ocean, Trondheim, Norway; 2. Norwegian University of Science and Technology, Trondheim, Norway

The Hydrodynamic Reflection Characteristic Study on the Wave Dissipating and Protecting System with a Submerged Structure Before the Vertical Wall OMAE2019-95942

Zhenglin Tian, Zhaochen Sun, Shuxiu Liang
The State Key Laboratory of Coastal and Offshore Engineering, Dalian University of Technology, Dalian, China

Ocean Engineering

6-5-3 Advanced Marine Hydrodynamics III

Wednesday June 12 Room SEC, M2 & M3 | 13:30 – 15:00

Session Chair: Mohammad Rahmati, Northumbria University, United Kingdom
Session Co-Chair: Joop Helder, MARIN, Netherlands

The Increase in Wave Wake Characteristics of Marine Vessels when Accelerating OMAE2019-95337

Gregor Macfarlane¹ Keegan Graham-Parker² Michael Connellan¹
1. Australian Maritime College, University of Tasmania, Launceston, TAS, Australia; 2. ASC Pty Ltd, Henderson, WA, Australia

Achieving a High Accuracy Numerical Simulations of the Flow around a Full Scale Ship OMAE2019-95769

Blanca Pena¹ Ema Muk-Pavic¹ Dmitriy Ponkratov²
1. University College London, London, United Kingdom;
2. JoRes Joint Research Project, London, United Kingdom

Numerical Simulation of the Ducted Propeller and Application to a Semi-submerged Vehicle OMAE2019-96799

Guoge Tan¹ Jin Zou¹ Jie Xu²
1. Harbin Engineering University, Harbin, China;
2. Chongqing Changan Automobile Co., Ltd, Chongqing, China

Research on the Estimated Error of Wave Action by using Wave Elevation Data OMAE2019-96657

Jiabin Liu, Anxin Guo
Harbin Institute of Technology, Harbin, China

Polar and Arctic Sciences and Technology

7-11-1 Ice Model Tests and Structure-Ice-Interactions

Wednesday June 12 Room SEC, Alsh 2 | 13:30 – 15:00

Session Chair: Walter Kuehnlein, sea2ice Ltd. & Co. KG, Germany
Session Co-Chair: Sören Ehlers, Hamburg University of Technology, Germany

Design Optimization of Ship's Bow Sailing in Kara Sea and Barents Sea OMAE2019-95586

Jianfei Liu, Guoqing Feng, Huilong Ren, Wenjia Hu, Yuwei Sun
Harbin Engineering University, Harbin, China

Ice Model Tests for Semi-submersible Platforms in Pack Ice Conditions OMAE2019-95786

Luping Liu, Xin Li, Xiao Wu, Bo Wu
Shanghai Jiao Tong University, Shanghai, China

Experimental and Theoretical Investigations on the Characteristics of Ice Floes Broken by Ships Sailing Ahead in Level Ice OMAE2019-95936

Daniela Myland
HSVA, Hamburg, Germany

Anti-icing and De-icing of Pipe Structures on Marine Vessels using Waste Heat Recovery OMAE2019-96689

Lene Aesoy¹ Henry Piehl² Palmar Bjornoy³
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian University of Science and Technology, Ålesund, Norway; 3. Ulmtec Pyro, Gamlem, Norway

CFD & FSI

8-1-3 Ship Performance I

Wednesday June 12 Room SEC, Lomond Auditorium | 13:30 – 15:00

Session Chair: Ould el Moctar, University of Duisburg-Essen, Germany
Session Co-Chair: Prasanta Sahoo, Florida Institute of Technology, USA

A Study of Ship's Frictional Resistance in Extremely Shallow Water OMAE2019-95076

Qingsong Zeng, Robert Hekkenberg, Cornel Thill
Delft University of Technology, Delft, Netherlands

Added Resistance CFD Analysis of the KVLCC2 with the Naval Hydro Pack OMAE2019-95293

Vuko Vukcevic¹ Inno Gatin² Geon-Hong Kim³ Hrvoje Jasak⁴
1. Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia;
2. University of Zagreb, Zagreb, Croatia; 3. Hyundai Heavy Industries, Hyundai Maritime Research Institute, Ulsan, Korea; 4. Wikki Ltd, London, United Kingdom

Numerical Simulation of Trim Optimization on Resistance Performance based on CFD Method OMAE2019-96181

Wenyang Duan, Hongsen Zhang, Limin Huang, Jianyu Liu, Wenbo Shao, Guanzhou Cao, Zhang Shi
Harbin Engineering University, Harbin, China

Fundamental CFD Study on the Hydrodynamic Performance of the DARPA Suboff Submarine OMAE2019-96190

Kenshiro Takahashi, Prasanta Sahoo
Florida Institute of Technology, Melbourne, FL, USA

Ocean Renewable Energy

9-4-2 Wave Farms and Alternative Markets

Wednesday June 12 Room SEC, Carron 1 | 13:30 – 15:00

Session Chair: Kelley Ruehl, Sandia National Laboratories, USA
Session Co-Chair: Ryan Coe, Sandia National Laboratories, USA

Wave-powered AUV Recharging: A Feasibility Study OMAE2019-95383

Blake Driscoll¹ Andy Gish¹ Ryan Coe²
1. US Naval Academy, Annapolis, MD, USA; 2. Sandia National Laboratories, Albuquerque, NM, USA

Development Demonstration of an Automated, Economic Patented Modular Industrial, Environmentally Friendly Multi-functional Platform for Open Sea Farm Installations OMAE2019-95900

Elchanan Safier
Safier Ingenierie SAS, Serris, France

Analysis of WEC Array and Influence of Plant Level

Power Management Control OMAE2019-96466
 Jeremy Stefek, Dominique Bain, Yi-Hsiang Yu, Dale Jenne, Greg Stark
National Renewable Energy Laboratory, Golden, CO, USA

Ocean Renewable Energy

9-6-1 Thermal, Hybrid and Others: Analysis, Design and Prediction

Wednesday June 12 Room **SEC, Carron 2** | 13:30 – 15:00
 Session Chair: Fabio Licheri, University of Cagliari, Italy

Impact of the Swansea Bay Lagoon on Storm Surges in the Bristol Channel OMAE2019-95075

Qian Ma¹ Tulio M. Moreira² Thomas A.A. Adcock¹
 1. University of Oxford, Oxford, United Kingdom; 2. Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil

Numerical Study on Aero-hydrodynamics with Inter-turbine Spacing Variation for Two Floating Offshore Wind Turbines OMAE2019-95520

Yang Huang, Decheng Wan
Shanghai Jiao Tong University, Shanghai, China

Evaluation of Entropy Generation Methods in Wells Turbines OMAE2019-96513

Fabio Licheri¹ Tiziano Ghisu¹ Irene Viridis¹ Pierpaolo Puddu¹ Francesco Cambuli²
 1. University of Cagliari, Cagliari, Italy; 2. University of Cagliari, DIMCM, Cagliari, Italy

Failure Estimation of Offshore Renewable Energy Devices based on Hierarchical Bayesian Approach OMAE2019-95099

Mohammad Mahdi Abaei, Nu Rrahida Arini, Philipp R. Thies, Lars Johanning
University of Exeter, Penryn, United Kingdom

Petroleum Technology

11-3-1 Drilling Geomechanics

Wednesday June 12 Room **Crowne Plaza, Barra** | 13:30 – 15:00
 Session Chair: Arash Dahi Taleghani, Pennsylvania State University, USA

Experimental Study on Conductivity of Regional Sand and its Field Application OMAE2019-95624

Jin Wang, Fujian Zhou, Lufeng Zhang, Minghui Li, Yuechun Wang
China University of Petroleum-Beijing, Beijing, China

Additives to Enhance Cement Sheath Durability OMAE2019-96421

Maryam Tabatabaei, Arash Dahi Taleghani, Nasim Alem
Pennsylvania State University, University Park, PA, USA

An Experimental Investigation on Filtercake Reinforced Wellbore Strengthening and Fracture Sealing OMAE2019-96675

Mingzheng Yang¹ Yuanhang Chen¹ Frederick B Growcock² Feifei Zhang³
 1. Louisiana State University, Baton Rouge, LA, USA; 2. Occidental Oil and Gas Corp, Houston, TX, USA; 3. Yangtze University, Jingzhou, China

Quantification of the Effects of Filtercake on Wellbore Strengthening: Filtercake Rupture Resistance and Fracture Sealing Time OMAE2019-96676

Mingzheng Yang¹ Yuanhang Chen¹ Frederick B Growcock²
 1. Louisiana State University, Baton Rouge, LA, USA; 2. Occidental Oil and Gas Corp, Houston, TX, USA

Petroleum Technology

11-5-1 Well Inflow Control and Reservoir Management

Wednesday June 12 Room **Crowne Plaza, Jura** | 13:30 – 15:00
 Session Chair: Bernt Aadnoy, University of Stavanger, Norway

Probabilistic Estimation of Recovery from Naturally Fractured Bottom-water Reservoir with Uncertain Well Placement in Fracture Network OMAE2019-96836

Samir Prasun, Andrew Wojtanowicz
Louisiana State University, Baton Rouge, LA, USA

Visualization Study on Plugging Mechanism of Fibers and Particles in Rough and Tortuous Fracture OMAE2019-95480

Fan Fan, Fujian Zhou, Lishan Yuan, Xuda Yang
China University of Petroleum-Beijing, Beijing, China

Increased Recovery using Autonomous Inflow Management OMAE2019-96003

Bernt Aadnoy¹ Beder Al Furati²
 1. University of Stavanger, Stavanger, Norway; 2. Equinor AS, Bergen, Norway

A Pilot Study on Time-dependent Dissolution of CO₂ in Oil for Prediction of Gas Kick Behaviors in Non-aqueous Fluids OMAE2019-96678

Mahendra Kunju¹ James L. Nielsen¹ Yuanhang Chen¹ Otto Santos¹ Wesley Williams¹ Paulo Ribeiro² Felipe Chagas²
 1. Louisiana State University, Baton Rouge, LA, USA; 2. Universidade Estadual de Campinas, Campinas, SP, Brazil

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-1-3 Nonlinear Waves I

Wednesday June 12 Room **SEC, Boisdale 2** | 13:30 – 15:00
 Session Organizer: Alessandro Iafra, CNR-INM (INstitute of Marine Engineering), Italy

On Signatures and Features of Modulational Instability in Ocean Waves OMAE2019-95633

Alexander V. Babanin
University of Melbourne, Melbourne, VIC, Australia

Data Assimilation of the Stereo Reconstructed Wave Fields to a Nonlinear Phase Resolved Wave Model OMAE2019-95949

Shogo Watanabe¹ Wataru Fujimoto² Takehiko Nose¹ Tsubasa Kodaira¹ Graham Davies³ Daniel Lechner⁴ Takuji Waseda¹
 1. The University of Tokyo, Kashiwa, Japan; 2. MS&AD InterRisk Research & Consulting, Inc., Tokyo, Japan; 3. Waseda University, Tokyo, Japan; 4. Karlsruhe Institute of Technology, Karlsruhe, Germany

On the Rogue Wave Occurrence in Crossing Wave Fields OMAE2019-96029

Shuai Liu, Xinshu Zhang, Xingyu Song, Ke Chen
Shanghai Jiao Tong University, Shanghai, China

Generalized Nonlinear Fourier Analysis for Water Waves OMAE2019-96613

Alfred R. Osborne
Nonlinear Wave Research Corporation, Alexandria, VA, USA

REFRESHMENT BREAK

15:00 – 15:30
 Location: Hall 5 (SEC)

CONCURRENT SESSIONS

15:30 – 17:30

Offshore Technology**1-3-2 Fluid-Structure Interaction**

Wednesday June 12

Room **SEC, Alsh 1** | 15:30 – 17:30

Session Chair: Tahsin Tezdogan, University of Strathclyde, United Kingdom

Session Co-Chair: Yibo Liang, University of Strathclyde, United Kingdom

Hydrodynamic Forces on Intermittently Spanning**Pipelines in Steady Currents** OMAE2019-95585Yunfei Teng¹ Liang Cheng² Hongwei An² Feifei Tong²Terry Griffiths² Wei Sun² Jiawei Chi² Zhijian Xiong²

1. Dalian University of Technology, Dalian, China;

2. University of Western Australia, Perth, WA, Australia

The Effect of Aspect Ratio on the Drag of Bare Cylinders OMAE2019-96431Douglas A. Potts¹ Jonathan R. Binns¹ Andrew E. Potts² Hayden Marcollo²

1. University of Tasmania Australian Maritime College, Launceston, TAS,

Australia; 2. AMOG Consulting, Notting Hill, VIC, Australia

Hydrodynamics of Towed Vertical Surface-piercing**Cylinders** OMAE2019-95109Douglas A. Potts¹ Jonathan R. Binns¹ Hayden Marcollo² Andrew E. Potts²

1. University of Tasmania Australian Maritime College, Launceston, TAS,

Australia; 2. AMOG Consulting, Notting Hill, VIC, Australia

Experimental and Numerical Study of Horizontal Wave Impact**Loads for a Semi-submersible Drilling Unit** OMAE2019-96236

Joo-Sung Kim, Seon Oh Yoo, Hyun Joe Kim, Jong Hun Lee, So Lyoung Han, DongYeon Lee

Samsung Heavy Industries, Daejeon, Korea

An Iterative Updating Method for Dynamic Responses of a Floating**Platform under Action of Internal Solitary Waves** OMAE2019-96553

Junrong Wang, Junfeng Du, Min Zhang, Anteng Chang

Ocean University of China, Qingdao, China

Structures, Safety and Reliability**2-2-2 Probabilistic and Spectral Wave Models II**

Wednesday June 12

Room **Crowne Plaza, Castle 1** | 15:30 – 17:30

Session Chair: Felice Arena, Univ Mediterranea, Italy

Session Co-Chair: Carlos Guedes Soares, Instituto Superior

Técnico, Universidade de Lisboa, Portugal

Quantitative Evaluation of Ship Operational Effect in**Actually Encountered Sea States** OMAE2019-95121

Rei Miratsu, Tsutomu Fukui, Toshiyuki Matsumoto, Tingyao Zhu

Nippon Kaiji Kyokai (ClassNK), Tokyo, Japan

Estimation and Comparison of Accuracy in Various Data Resolutions**on Optimal Ship Routing across the North Pacific Ocean** OMAE2019-95173Kenji Sasa¹ Takuya Fujimatsu¹ Chen Chen¹ Ruri Shoji²

1. Kobe University, Kobe, Japan; 2. Tokyo University of

Marine Science and Technology, Tokyo, Japan

Comparison of VOS and ERA-Interim Wave Data OMAE2019-95287Roberto Vettor¹ Carlos Guedes Soares²

1. Centre for Marine Technology and Ocean Engineering,

Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal;

2. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

A Parameterization of DNV Storm Profile for Long-term Analysis of Ocean Storms: Equivalent Trapezoidal Storm Model OMAE2019-95880Valentina Laface¹ Elzbieta M. Bitner-Gregersen² Felice Arena¹ Alessandra Romolo¹

1. University Mediterranea, Reggio Calabria, Italy; 2. DNV GL AS, Høvik, Norway

Structures, Safety and Reliability**2-6-1 Reliability of Mooring and Riser Systems I**

Wednesday June 12

Room **Crowne Plaza, Castle 2** | 15:30 – 17:30

Session Chair: Ying Min Low, National University of Singapore, Singapore

Session Co-Chair: Luis V.S. Segrilo, LACEO/COPPE/

Federal University of Rio De Janeiro, Brazil

An Efficient System Reliability Approach against**Mooring Overload Failures** OMAE2019-95048Darrell Leong¹ Ying Min Low¹ Youngkook Kim²

1. National University of Singapore, Singapore, Singapore;

2. Lloyd's Register, Singapore, Singapore

Numerical Modelling of the Mooring Line Failure**Induced Performance Changes of a Marine Fish Cage****in Irregular Waves and Currents** OMAE2019-95730Hung-Jie Tang¹ Ray-Yeng Yang¹ Chai-Cheng Huang²

1. National Cheng Kung University, Tainan, Taiwan;

2. National Sun Yat-sen University, Kaohsiung, Taiwan

Assessment of the Reliability of the Moorings of a Floating**Structure against the Extreme Cyclone Hazard** OMAE2019-96032Mark Manzocchi¹ Vikas Kejriwal² Eric Hoo²

1. Atkins Energy, Edinburgh, United Kingdom; 2. Atkins - SNC Lavalin, Perth, WA, Australia

Extreme Value Estimation of Mooring Lines Top Tension OMAE2019-96210Marina L. Simão¹ Paulo M. Videiro² Mauro C. de Oliveira³ Luis V.S. Segrilo²

1. LACEO/Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil;

2. LACEO/COPPE/Federal University of Rio de Janeiro, Rio de Janeiro,

RJ, Brazil; 3. CENPES/PETROBRAS, Rio de Janeiro, RJ, Brazil

Application of Machine Learning Techniques as a Means**of Mooring Integrity Monitoring** OMAE2019-96411

Jonathan M. Gumley, Hayden Marcollo, Stuart Wales, Andrew E. Potts, Christopher J. Carra

AMOG Consulting, Notting Hill, VIC, Australia

Materials Technology**3-11-2 Developments in BS 7910 and other Fitness-for-service Procedures; Session II**

Wednesday June 12

Room **SEC, Boisdale 1** | 15:30 – 17:30

Session Chair: Isabel Hadley, TWI Ltd, United Kingdom

Session Co-Chair: Bostjan Bezensek, Shell Global Solutions UK, United Kingdom

Proposed Updates to the Buried-to-Surface Flaw Recharacterization**Rules in the Annex E of BS 7910** OMAE2019-96327Bostjan Bezensek¹ Yuri Tkach (WG)² John Sharples³ Harry Coules⁴

1. Shell, Laurencekirk, United Kingdom; 2. Wood PLC, Aberdeen, United Kingdom;

3. Wood PLC, Warrington, United Kingdom; 4. University of Bristol, Bristol, United Kingdom

The Assessment of Locally Thinned Areas subject to a Hoop Stress**and an Axial Stress: Background to the Guidance given in Annex G****of BS 7910:2013** OMAE2019-95532Andrew Cosham¹ Robert Andrews²

1. Ninth Planet Engineering Ltd, Newcastle upon Tyne, United Kingdom;

2. ROSEN Group, Newcastle upon Tyne, United Kingdom

Optimising Fracture Assessment of Welded Structures using BS 7910, R6 and FEA OMAE2019-95934

Isabel Hadley¹ Tyler London²
1. TWI Ltd, Cambridge, United Kingdom; 2. TWI Ltd, Middlesbrough, United Kingdom

Review of Available Probabilistic Models of the Crack Growth Parameters in Paris Equation OMAE2019-96161

Peyman Amirafshari¹ Alexander Stacey²
1. University of Strathclyde, Glasgow, United Kingdom; 2. Energy Division, Health & Safety Executive, London, United Kingdom

BS7910 Procedure for Probabilistic Fracture Mechanics Assessment OMAE2019-96843

Alexander Stacey
Energy Division, Health & Safety Executive, London, United Kingdom

Pipelines, Risers, and Subsea Systems

4-2-4 SCRs and SLWRs I

Wednesday June 12 Room **Crowne Plaza, Castle 3** | 15:30 – 17:30
Session Chair: Alan Whooley, Wood Plc, USA

Impact of Soil Modeling on Fatigue Design of Lazy Wave Riser Systems OMAE2019-96156

Rupak Ghosh¹ Haydar Arslan²
1. ExxonMobil, Spring, TX, USA; 2. ExxonMobil Production Company, Spring, TX, USA

Design of Steel Lazy Wave Riser for External Turret Moored FPSO OMAE2019-96422

Jingyun Cheng, Peimin Cao
SBM Offshore, Houston, TX, USA

Fatigue Assessment of SLWR Riser in Brazilian Pre-salt: The Impact of Slope Changing Point in SN Curve OMAE2019-96592

Stael Ferreira Senra¹ Ludimar L. Aguiar¹ Eduardo Hippert¹ Alexandre G. Garmbis² Marcelo Dos Santos³ Marcos Andre Duarte Martins¹ Luis Manoel Paiva Nunes¹
1. Petrobras, Rio de Janeiro, RJ, Brazil; 2. Petrobras, São José dos Campos, SP, Brazil; 3. Petrobrás (cenpes), Rio de Janeiro, RJ, Brazil

The Impact of Second-order FPSO Motions on the Fatigue Performance of Large Diameter SCRs OMAE2019-96451

Rasoul Hejazi, Andrew Grime, Mark F. Randolph, Mike Efthymiou
University of Western Australia, Perth, WA, Australia

Effect of Flexible Joint Modelling Method on Deep Water Catenary Riser Hang-off Fatigue Response OMAE2019-96826

Guanyu Hu¹ Chaojun Huang¹ Fengjie Yin¹ Mark Cerkovnik¹ Guangqiang Yang²
1. 2H Offshore Inc., Houston, TX, USA; 2. Exxon Mobil Company, Spring, TX, USA

Pipelines, Risers, and Subsea Systems

4-5-2 Flow Assurance II

Wednesday June 12 Room **Crowne Plaza, Staffa / Shuna** | 15:30 – 17:30
Session Organizer: Daniel Carneiro, Wood, Brazil
Session Co-Chair: Jongbae Kim, University of Ulsan, Korea
Session Co-Chair: Nestor Gonzalez Diez, TNO, Netherlands

A Study of Hydrate Inhibition for Deepwater Gas Field Development OMAE2019-95177

Hualei Yi¹ Yun Hao¹ Xiaohong Zhou²
1. CNOOC Research Institute, Beijing, China; 2. CNOOC, Beijing, China

Numerical Simulation of the Fluid-Solid Two-phase in the Horizontal Pipe based on DEM-CFD Coupling Method OMAE2019-95455

J.S., Pu¹ Yongping Chen² Peng Yao³
1. Hohai University, NanJing, China; 2. Hohai University, Hon, China; 3. Sun yat-sen University, Guangdong, China

Introducing a Novel MEG/EtOH Mixture to Improve Gas Hydrate Blockages Removal during Offshore Oil and Gas Production OMAE2019-95808

Paulo Paz¹ Theodoro Netto²
1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. COPPE/Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Analysis of Heat Transfer Performance for Deepwater Phase Change Material Sandwich Pipes OMAE2019-95876

Chen An, Hui Wang, Menglan Duan
China University of Petroleum, Beijing, China

Optimization Design of FPSO Central Cooling Water System based on Pipe Network Fluid Analysis OMAE2019-95966

Huan Zhang, Yuan Hongtao, Wang Chao, Kong Weiwen, Xu Jiangguo, Wang Zhaoqiang
Shanghai Waigaoqiao Shipbuilding Co., Ltd., Shanghai, China

Ocean Engineering

6-15-2 Underwater Vehicles Design Technology and Hydrodynamics

Wednesday June 12 Room **SEC, Dochart 2** | 15:30 – 17:30
Session Organizer: Celso Morooka, University of Campinas, Brazil
Session Co-Chair: Zhe Jiang, Shanghai Ocean University, China
Session Co-Chair: Alexandre Immas, University of California, Berkeley, USA

A Preliminary Study on the Development of a Novel Marine Growth Cleaning Robot for Jacket Platforms OMAE2019-95176

Zhe Jiang, Tao Sun, Gaosheng Luo, Biao Wang, Wei Guo
Shanghai Ocean University, Shanghai, China

Analysis of the Pitting Corrosion's Effect on the Residual Strength of Submerged Pressure Shell OMAE2019-96001

Weijun Xu, Tianyi Chen, Chenfeng Li, Xueqian Zhou, Feng Liu
Harbin Engineering University, Harbin, China

Hydrodynamic Design of a Morpich Autonomous Underwater Vehicle using Neural Networks OMAE2019-96469

Quentin Becker, Mohammad-Reza Alam, Alexandre Immas
University of California, Berkeley, Berkeley, CA, USA

Experimental Study on Hydrodynamic Performance of Mini-AUV in Non-uniform Flow Field OMAE2019-96835

Jiayuan Zhuang¹ Cao Jian¹ Yumin Su¹ Lei Zhang¹ Xianzhao Yu²
1. Harbin Engineering University, Harbin, China; 2. China Shipbuilding Information Center, Beijing, China

A Study on Piping Design Neutral File to Convert Augmented Reality Model in Real-time OMAE2019-96053

Jung Min Lee, Kyung Ho Lee, Young Soo Han
Inha University, Incheon, Korea

Ocean Engineering

6-3-4 Wave-Body Interactions: Special Problems

Wednesday June 12

Room **SEC, M4** | 15:30 – 17:30

Session Organizer: Fonseca Nuno, SINTEF Ocean, Norway

Experimental Investigation of Wave Runup on Offshore Intake Wells in a Random Wave Environment OMAE2019-96505

Venkatraman Prabu Kumar, Ranganathan Sundaravadevelu, K. Murali
Indian Institute of Technology Madras, Chennai, India

Efficacy of Analysis Techniques in Assessing Broken Wave Loading on a Cylinder Upon a Shoal OMAE2019-96262

Darshana T. Dassanayake, Alessandro Antonini, Alison Raby
Plymouth University, Plymouth, United Kingdom

Piston-modal Resonance in a Box-wall System OMAE2019-95006

Sheng-Chao Jiang¹ Yu-Xin Huang² Baolei Geng²
1. *Dalian University of Technology, Dalian, China*; 2. *Tianjin Research Institute for Water Transport Engineering, Tianjin, China*

Dynamic Response of a Gangway between Two Floating Bodies in a Side-by-side Configuration OMAE2019-96578

Qing Dong¹ Jianmin Yang² Haining Lu² Xin Li² Wenyue Lu² Lei Liu²
1. *State Key Laboratory of Ocean Engineering, Shanghai Jiao Tong University, Shanghai, China*; 2. *Shanghai Jiao Tong University, Shanghai, China*

Water Wave Scattering by Two Circular-arc-shaped Thin Plates with Non-uniform Permeability OMAE2019-95498

Rupanwita Gayen, Sourav Gupta
Indian Institute of Technology, Kharagpur, India

Ocean Engineering

6-5-4 Advanced Marine Hydrodynamics IV

Wednesday June 12

Room **SEC, M2 & M3** | 15:30 – 17:30

Session Chair: Jule Scharnke, MARIN, Netherlands

Session Co-Chair: Joost Sterenborg, MARIN, Netherlands

Influence of Mixed Flows on Ship Hydrodynamics in Dredged Channels OMAE2019-95445

Momchil Terziev, Tahsin Tezdogan, Atilla Incecik
University of Strathclyde, Glasgow, United Kingdom

Big Data Analytics as a Tool to Monitor Hydrodynamic Performance of a Ship OMAE2019-95815

Prateek Gupta¹ Sverre Steen¹ Adil Rasheed²
1. *Department of Marine Technology, Norwegian University of Science and Technology (NTNU), Trondheim, Norway*; 2. *Department of Engineering Cybernetics, Norwegian University of Science and Technology (NTNU), Trondheim, Norway*

An Investigation of the Effect of Biomimetic Tubercles on a Flat Plate OMAE2019-96276

Alessandro Marino, Mehmet Atlar, Yigit Demirel
University of Strathclyde, Glasgow, United Kingdom

Research on the Probability Distribution of the Underwater Moving of the Wrecked Targets OMAE2019-96581

Wenyang Duan, Zhang Shi, Yunsai Chen, Li Min Huang, Guanzhou Cao, Hongsen Zhang
Harbin Engineering University, Harbin, China

Polar and Arctic Sciences and Technology

7-12-1 Numerical Ice Modeling

Wednesday June 12

Room **SEC, A1sh 2** | 15:30 – 17:30

Session Chair: Sören Ehlers, Hamburg University of Technology, Germany

Session Co-Chair: Walter Kuehnlein, sea2ice Ltd. & Co. KG, Germany

A Numerical Method for Ice Resistance Calculation of Polar Ships Navigating in Floating Ice Region OMAE2019-96131

Hui Li, Yuan Qian, Yan Feng, Weijia Sheng, Hao Jin Li
Haerbin Engineering University, Harbin, China

Investigation of the Effect of Block Size, Shape and Freeze-bond Strength on Flexural Failure of Freshwater Ice Rubble using the Discrete Element Method OMAE2019-96722

Soroosh Afzali¹ Rocky Taylor¹ Eleanor Bailey² Robert Sarracino² Marjan Taghi Boroojerdi¹
1. *Memorial University of Newfoundland, St. John's, NL, Canada*; 2. *C-CORE, St. John's, NL, Canada*

Optimization of Insulation and Heating System of Derrick for Arctic Mobile Offshore Drilling Unit OMAE2019-95930

Dahui Liu¹ Zhiyuan Wang² KaiBo Zheng³
1. *CIMC Raffles, Yantai, China*; 2. *University of Petroleum East China, Qingdao, China*; 3. *China University of Petroleum (East China), Qingdao, China*

Closing Remarks OMAE2019-96845

Walter Kuehnlein
sea2ice Ltd. & Co. KG, Hamburg, Germany

CFD & FSI

8-1-4 Ship Performance II

Wednesday June 12

Room **SEC, Lomond Auditorium** | 15:30 – 17:30

Session Chair: Prasanta Sahoo, Florida Institute of Technology, USA

Session Co-Chair: Ould el Moctar, University of Duisburg-Essen, Germany

Evaluation of a Practical Approach to Numerical Propulsion Tests OMAE2019-95339

Andreas Giannoulis, Karl Halse
Norwegian University of Science and Technology, Aalesund, Norway

Studies About Design of Rear Stator of Ducted Propeller using CFD OMAE2019-96020

Dakui Feng¹ Hang Zhang¹ Yue Sun¹ Qing Wang¹ Xiaofei Hu²
1. *Huazhong University of Science and Technology, Wuhan, China*; 2. *China Ship Design and Development Center, Wuhan, China*

Strategies to Minimise Numerical Ventilation in CFD Simulations of High-speed Planing Hulls OMAE2019-95784

Angus G. D. Gray-Stephens, Tahsin Tezdogan, Sandy Day
University of Strathclyde, Glasgow, United Kingdom

Shipboard Fuel Consumption Reduction by Air Lubrication and Trim Optimization OMAE2019-96770

Waleed Yehia¹ M. M. Moustafa¹ Adel A. Tawfik¹ A. Nassef²
1. *Port Said University, Port Said, Egypt*; 2. *Egyptian Authority for Maritime Safety, Suez, Egypt*

Numerical Study on the Effect of Stern Flap for Hydrodynamic Performance of Catamaran OMAE2019-96819

Peng Zhou¹ Liwei Liu² Lixiang Guo² Qing Wang² Xianzhou Wang²
1. *Shanghai Division, China Ship Development and Design Center, Shanghai, China*; 2. *Huazhong University of Science and Technology, Wuhan, China*

CFD & FSI

8-4-1 Cylinder VIV

Wednesday June 12 Room **SEC, Dochart 1** | 15:30 – 17:30
 Session Chair: Michael Bernitsas, University of Michigan, USA
 Session Co-Chair: Long Ge, BP, USA

Cross-flow VIV Simulation of a Circular Cylinder under Oscillatory Flow with Different KC Number OMAE2019-95271

Kunpeng Wang, Qinghai Chi, Yizhao Zhang
Jiangsu University of Science and Technology, Zhenjiang, China

Vortex Induced Vibration of a Steel Catenary Riser under Out-of-plane Current: An Experimental Study OMAE2019-96112

Yuwang Xu¹ Jungao Wang² Haojie Ren¹ Mengmeng Zhang¹ Shixiao Fu¹
 1. *Shanghai Jiao Tong University, Shanghai, China;*
 2. *Norwegian Public Roads Administration, Stavanger, Norway*

In-line VIV based on Forced-vibration Tests OMAE2019-95972

Decao Yin¹ Jie Wu¹ Elizabeth Passano¹ Halvor Lie¹ Ralf Peek²
 Octavio Sequeiros³ Sze Yu Ang³ Chiara A. Bernardo⁴ Meliza Atienza⁴
 1. *SINTEF Ocean, Trondheim, Norway;* 2. *Peek Solutions, St. Andreu de Llavaneres, Spain;* 3. *Shell Global Solutions International B.V., Rijswijk, Netherlands;* 4. *Shell Philippines Exploration B.V., Manila, Philippines*

Numerical Investigation for Vortex-induced Vibrations of Steel-Lazy-Wave-Risers, Part II: CFD Study on Long Flexible Riser

OMA2019-96404
 Hyun-chul Jang, Jang Kim
TechnipFMC, Houston, TX, USA

Vortex-induced Vibration of a Flexible Cylinder Experiencing Oscillatory Flow with Different Aspect Ratios OMAE2019-95522

Di Deng, Lei Wu, Decheng Wan
Shanghai Jiao Tong University, Shanghai, China

Ocean Renewable Energy

9-1-2 FWT – Numerical Analysis I

Wednesday June 12 Room **SEC, Carron 1** | 15:30 – 17:30
 Session Chair: Alessandro Fontanella, Politecnico di Milano, Italy
 Session Co-Chair: Ilmas Bayati, MARIN, Netherlands

Impact of Simulation Duration Analysis for Offshore Floating Wind Turbines using a Coupled FAST-OrcaFlex Model OMAE2019-95159

Ajit C Pillai, Philipp R. Thies, Lars Johanning
University of Exeter, Penryn, United Kingdom

Upgrading the Numerical Analysis of the Mooring System and the Aerodynamics of the TELWIND Platform OMAE2019-96380

Tommaso Battistella¹ José Armesto¹ Álvaro Rodríguez Luis¹
 Lucia Meneses¹ Bernardino Couñago² José Serna² Raúl Guanache¹
 Joaquin Urbano² Sergio Hernandez² José Fernandez²
 1. *Environmental Hydraulics Institute of Cantabria, Santander, Spain;* 2. *Esteyco SAP, Madrid, Spain*

Second-order Responses of a 10 MW Floating Wind Turbine, considering the Full QTF OMAE2019-95661

Qun Cao, Longfei Xiao, Xiaoxian Guo, Mingyue Liu
Shanghai Jiao Tong University, Shanghai, China

Impact of High Order Wave Loads on a 10MW Tension-leg Platform Floating Wind Turbine at Different Tendon Inclination Angles

OMA2019-96243
 Daniel Milano¹ Christophe Peyrard² Matteo Capaldo³
 David Ingram⁴ Qing Xiao⁵ Lars Johanning⁶
 1. *University of Edinburgh, Edinburgh, United Kingdom;* 2. *EDF R&D, Chatou, France;* 3. *EDF Lab Saclay, Paris, France;* 4. *The University of Edinburgh, Edinburgh, United Kingdom;* 5. *University of Strathclyde, Glasgow, United Kingdom;* 6. *University of Exeter, Penryn, United Kingdom*

Hybrid Model Testing of Floating Wind Turbines: Test Bench for System Identification and Control Performance Assessment OMAE2019-96374

Vincent Arnal, Felicien Bonnefoy, Jean-Christophe Gilloteaux, Sandrine Aubrun
Ecole Centrale de Nantes, Nantes, France

Ocean Renewable Energy

9-7-1 Drivetrain Design, Operation and Condition Monitoring I

Wednesday June 12 Room **SEC, Carron 2** | 15:30 – 17:30
 Session Chair: Amir R. Nejad, Norwegian University of Science and Technology, Norway
 Session Co-Chair: Jan Helsen, Vrije Universiteit Brussel, Belgium

On Digital Twin Condition Monitoring System for Drivetrains OMAE2019-95152

Sigrid Siksjø Johansen, Amir R. Nejad
Norwegian University of Science and Technology, Trondheim, Norway

Gaining Insights in Wind Turbine Drivetrain Dynamics by Means of Automatic Operational Modal Analysis combined with Machine Learning Algorithms OMAE2019-96731

Nicoletta Gioia¹ Roberto Medico² Pieter-Jan Daems¹ Cédric Peeters¹
 Dirk Deschrijver² Tom Dhaene² Patrick Guillaume¹ Jan Helsen¹
 1. *Vrije Universiteit Brussel, Brussel, Belgium;* 2. *Ghent University, Ghent, Belgium*

The Effect of Operational Parameters on Vibration Signals of Wind Turbine Gearboxes OMAE2019-96720

Sofia Koukoura¹ Eric Bechhoefer² James Carroll¹ Alasdair McDonald¹
 1. *University of Strathclyde, Glasgow, United Kingdom;* 2. *GPMS, Cornwall, VT, USA*

Wind Turbine Planetary Gear Fault Identification using Statistical Condition Indicators and Machine Learning OMAE2019-96713

Cédric Peeters, Timothy Verstraeten, Ann Nowé, Jan Helsen
Vrije Universiteit Brussel, Brussel, Belgium

On Design and Analysis of a Drivetrain Test Rig for Wind Turbine Health Monitoring OMAE2019-96721

Lorenzo Balestra¹ Amir R. Nejad² Giovanni Naldi³
 1. *University of Bologna, Cervia, Italy;* 2. *Norwegian University of Science and Technology, Trondheim, Norway;* 3. *University of Bologna, Bologna, Italy*

Petroleum Technology

11-4-1 Petroleum Production Systems Design and Operation

Wednesday June 12 Room **Crowne Plaza, Jura** | 15:30 – 17:30

Session Organizer: Sergio Bordalo, Unicamp, Brazil

Session Co-Chair: Juliana Baioco, LAMCSO/COPPE/UFRJ, Brazil

Session Co-Chair: Lucas Sevillano, State University of Campinas, UNICAMP, Brazil

CFD Simulation of Two-phase Vertical Annular Flow in Both Upward and Downward Direction in a Small Pipe OMAE2019-96311

Ekhwaite Abobaker¹ Abadelhalim Elsanoo¹ John Shirokoff¹ Mohammad Rahman²

1. Memorial University of Newfoundland, St. John's, NL, Canada;

2. Texas A&M University at Qatar, Doha, Qatar

Operational Safety Risk Assessment in Offshore Oil Wells OMAE2019-95069

Marcelo A. Jaculli¹ Danilo Colombo² José Ricardo P. Mendes¹

Cinara F. G. Marculino¹ Beethoven G. S. Costa¹

1. University of Campinas, Campinas, SP, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil

Optimizing Production Facilities using a Transient

Multiphase Flow Simulator OMAE2019-95002

Abdulaziz AlQasim¹ Fahad AlMudairis² Abdulrahman Bin Omar¹ Abdullatif Omair¹

1. Saudi Aramco, Dhahran, Saudi Arabia; 2. Kuwait University, Kuwait, Kuwait

Uncertainty Analysis in the Multi-objective

Optimization of Hydraulic Fracture OMAE2019-96103

Juliana Baioco¹ Breno Jacob² Luis Felipe Mazadiego³

1. LACEO/COPPE/Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil;

3. UPM - Polytechnic University of Madrid, Madrid, Spain

Petroleum Technology

11-12-2 Cementing II

Wednesday June 12 Room **Crowne Plaza, Barra** | 15:30 – 17:30

Session Chair: Ian Frigaard, University of British Columbia, Canada

Session Co-Chair: Majid Bizhani, University of British Columbia, Canada

Laminar Displacement Flows in Vertical Eccentric Annuli:

Experiments and Simulations OMAE2019-95180

Ali Etrati, Ian Frigaard

University of British Columbia, Vancouver, BC, Canada

Removal of Viscoplastic Gels from Conduits OMAE2019-95218

Kamran Alba¹ Olamide Oladosu¹ Paris Brown¹ Jai Bhakta¹ Ian Frigaard²

1. University of Houston, Houston, TX, USA;

2. University of British Columbia, Vancouver, BC, Canada

Real-time Measurement of Eccentricity in Primary

Cementing of Oil and Gas Wells OMAE2019-95415

Amir Maleki, Ian Frigaard

University of British Columbia, Vancouver, BC, Canada

Developing Sensitivity Response Curves to Evaluate

Mechanical Integrity of Set Cement OMAE2019-95588

Harshkumar Patel¹ Saeed Salehi² Catalin Teodoriu²

1. University of Oklahoma, Norman, OK, USA; 2. Mewbourne School

of Petroleum and Geological Engineering, Norman, OK, USA

Real Time Cementing Hydraulics Simulations

Bring Risk Down OMAE2019-95100

Sviatoslav Pelipenko¹ Nicolas Flamant² Simon Impey¹

1. Oxford Numerics, London, United Kingdom; 2. Schlumberger, Sugar Land, TX, USA

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-1-4 Nonlinear Waves II

Wednesday June 12

Room **SEC, Boisdale 2** | 15:30 – 17:30

Session Organizer: Takuji Waseda, University of Tokyo, Japan

Second Order Wave Propagating Along VLFS OMAE2019-95132

Kazuhiro Iijima¹ Chong Ma²

1. Dept of NAOE, Osaka University, Osaka, Japan;

2. National Maritime Research Institute, Tokyo, Japan

Nonlinear Generation of Narrow-banded Wave Trains OMAE2019-95364

Anatoliy Khait, Lev Shemer

Tel Aviv University, Tel Aviv, Israel

Analysis of the Momentum Transfer Operated by the Breaking in

Modulated Wave Trains in Wind and No-wind Conditions OMAE2019-95756

Alessandro Iafrazi, Massimo Falchi

CNR-INM (INstitute of Marine Engineering), Roma, Italy

CFD Simulations of Breaking Stokes Waves OMAE2019-95946

Takanori Hino, Harushi Ikenoue, Youhei Takagi

Yokohama National University, Yokohama, Japan

Performance of a Two-phase Flow Solver for the

Simulation of Breaking Waves OMAE2019-96326

Qiu Jin, Dominic A. Hudson, Pandeli Temarel, W. Geraint Price

University of Southampton, Southampton, United Kingdom

Afternoon Lecture Series

17:40 – 18:30

Location: Lomond Auditorium (SEC)



Professor Takeshi Kinoshita

Enjoyable Marine Engineering Researches on Sports, Environment, not only Water Wave Engineering, Nonlinear Hydrodynamic Forces and Statistics

Professor Takeshi Kinoshita, Visiting Professor, Nagasaki Institute of Applied Science

See Afternoon Lecture Series, page 22 for more details.

Conference Banquet

Banquet: 19:00 – 24:00

Location: Merchant Square

See Social Events, page 14 for more details.

Thursday, June 13

Time	Title	Location
07:30 – 10:00	Outreach Breakfast / Feedback Session	Alsh 2 (SEC)
08:30 – 15:30	Exhibition open	Hall 5 (SEC)
08:30 – 10:00	Concurrent Sessions	See pages 72–75 for session titles, authors and locations
10:00 – 10:30	Refreshment Break	Hall 5 (SEC)
10:30 – 12:00	Concurrent Sessions	See pages 76–80 for session titles, authors and locations
12:00 – 13:30	Technical Session Organizers' Lunch	Hall 5 (SEC)
13:30 – 15:00	Concurrent Sessions	See pages 80–84 for session titles, authors and locations
15:00 – 15:30	Refreshment Break	Hall 5 (SEC)
15:30 – 17:30	Concurrent Sessions	See pages 84–86 for session titles, authors and locations
17:30 – 19:00	Farewell Reception	Argyll Suite (Crowne Plaza)

CONCURRENT SESSIONS

08:30 – 10:00

Offshore Technology

1-1-1 Semi-submersibles and TLPs

Thursday June 13 Room SEC, Alsh 1 | 08:30 – 10:00

Session Chair: Johyun Kyoung, TechnipFMC, USA
Session Co-Chair: Sandeep Bukka Reddy, National University of Singapore, Singapore

Global Performance Analysis of Deep Draft Semi-submersible Designed for Standard GoM Application OMAE2019-95272

Raehyoung Yuck¹ Daehoon Kang¹ Eung-su Kim² Munsung Kim²
Tae-min Kim² Hyun Joe Kim¹ DongYeon Lee¹ Young-chan Park³
1. Samsung Heavy Industries, Daejeon, Korea; 2. Samsung Heavy Industries, Seongnam, Korea; 3. Williams, Houston, TX, USA

A Conjoint Analysis of the Stability and Time-domain Analysis on Floating Platform during Mooring Line Breaking OMAE2019-96661

Jiaguo Feng¹ Yi Yu² Yan Qu³ Wenhui Xie¹ Min Wu⁴ Jingrui Zhao⁵
1. CNOOC Research Institute, Beijing, China; 2. CNOOC, Ltd., Beijing, China;
3. Southern University of Science and Technology, Shenzhen, China; 4. SBM Offshore USA, Inc., Houston, TX, USA; 5. CNOOC Research Institute, Shenzhen, China

First in Place Replacement of a TLP Top Tendon Connector Flex Bearing OMAE2019-96232

Jeffrey D. Otten¹ Vinu Kuriakose¹ Shakib Amini²
1. SBM Offshore USA, Inc., Houston, TX, USA; 2. Baker Hughes a GE Company, Houston, TX, USA

Concept Design of Very Large Floating Structures and Laboratory-scale Physical Modelling OMAE2019-96259

Lorenzo Cappietti, Irene Simonetti, Ilaria Crema
University of Florence, Florence, Italy

Structures, Safety and Reliability

2-13-1 Risk Analysis and Management I

Thursday June 13 Room Crowne Plaza, Castle 2 | 08:30 – 10:00

Session Chair: Marcelo Ramos Martins, LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, Brazil
Session Co-Chair: Amir R. Nejad, Norwegian University of Science and Technology, Norway

The Influence of Non-prescriptive Legislation in the Evolution of Offshore Well Integrity Practices: An Exploratory Review OMAE2019-96269

Carlos H. B. Morais¹ Danilo T. M. P. Abreu¹ Joaquim Santos²
Marcos C. Maturana³ Danilo Colombo⁴ Marcelo Ramos Martins¹
1. LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, São Paulo, SP, Brazil; 2. University of São Paulo, São Paulo, SP, Brazil; 3. Centro Tecnológico da Marinha em São Paulo, São Paulo, SP, Brazil; 4. Petrobras, Rio de Janeiro, RJ, Brazil

On Disaster Risk Reduction in Norwegian Oil & Gas Industry through Life-cycle Perspective OMAE2019-95622

Michaela Ibrion, Nicola Paltrinieri, Amir R. Nejad
Norwegian University of Science and Technology, Trondheim, Norway

Towards Implementing Condition-based Maintenance (CBM) Policy for Offshore Blowout Preventer (BOP) System OMAE2019-95539

Tobiloba Elusakin, Mahmood Shafiee, Tosin Adedipe
Cranfield University, Bedford, United Kingdom

Subsea Spares Analysis Optimisation OMAE2019-96100

Tiarnan Coffey, Christopher Rai, John Greene, Stephen O'Brien Bromley
Wood, Galway, Ireland

Research on Assessment Method for Bridge Pier Foundation Stability using Non-destructive Tests OMAE2019-95845

Mintaek Yoo
Korea Railroad Research Institute, Ui Wang, Korea

Structures, Safety and Reliability

2-6-2 Reliability of Mooring and Riser Systems II

Thursday June 13 Room Crowne Plaza, Castle 1 | 08:30 – 10:00

Session Chair: Luis V.S. Segrilo, LACEO/COPPE/
Federal University of Rio De Janeiro, Brazil
Session Co-Chair: Ying Min Low, National University of Singapore, Singapore

Mean Load Impact on Mooring Chain Fatigue Capacity – Lessons Learned from Full Scale Fatigue Testing of Used Chains OMAE2019-95083

Øystein Gabrielsen¹ Kjell Larsen² Oddgeir Dalane³ Hans B. Lie⁴ Svein-Arne Reinholdtsen⁵
1. Equinor, Trondheim, Norway; 2. Equinor ASA, Trondheim, Norway; 3. Equinor ASA, Stavanger, Norway; 4. Equinor ASA, Sandli, Norway; 5. Equinor ASA, Stjardal, Norway

Finite Element Analysis of the Effect of Twist on Chain Fatigue Performance OMAE2019-95276

Justin Jones
Petrofac, Woking, United Kingdom

Fatigue Tests on Corroded Mooring Chains Retrieved from Various Fields in Offshore West Africa and the North Sea OMAE2019-95618

Kai-tung Ma¹ Øystein Gabrielsen² Zhen Li³ David A. Baker⁴ Aifeng Yao¹
Pedro Vargas⁵ Meng Luo⁶ Amir Izadparast⁷ Alberto Arredondo⁸

Linfang Zhu⁹ Nina Sverdløva¹⁰ Ingrid Skulte Høgsæt¹¹

1. Chevron, Houston, TX, USA; 2. Equinor, Trondheim, Norway; 3. ExxonMobil, Spring, TX, USA; 4. Exxon Mobil Upstream Research Co, Spring, TX, USA; 5. Chevron Energy Technology Company, Houston, TX, USA; 6. Shell International Exploration and Production Inc., Houston, TX, USA; 7. Sofec, Houston, TX, USA; 8. Vicinay Marine Innovación, Leioa, Spain; 9. ZhengMao Group, Zhenjiang, China; 10. Feubo, Hattingen, Germany; 11. DNV GL, Høvik, Norway

Fatigue Performance of High Strength and Large Diameter Mooring Chain in Seawater OMAE2019-95984

Yanhui Zhang¹ Philip Smedley²

1. TWI Ltd, Cambridge, United Kingdom; 2. BP, London, United Kingdom

Fatigue Assessment of “Corroded” Mooring Chain OMAE2019-96191

David A. Baker¹ Zhen Li² Sue Wang³ Xiyang Zhang³ Yunliang Shao⁴

Harry Li⁵ Xiaoqin Zhan⁶ Linfang Zhu⁶ Xing Tao⁷

1. Exxon Mobil Upstream Research Co, Spring, TX, USA; 2. ExxonMobil, Spring, TX, USA; 3. ABS, Houston, TX, USA; 4. Jiangsu Asian Star Anchor Chain Co., Ltd., Jingjiang City, China; 5. Asian Star Anchor Chain, Jiangjiang, China; 6. Zhengmao Group, Zhenjiang, China; 7. Asian Star Anchor Chain, Jiangsu, China

Materials Technology

3-2-1 Fabrication and Performance of Clad Pipes

Thursday June 13

Room SEC, Boisdale 1 | 08:30 – 10:00

Session Chair: Agnes Marie Horn, DNV GL, Norway

Session Co-Chair: Koji Gotoh, Kyushu University, Japan

Review of the In-air Fatigue Behaviour of CRA Clad and Lined Pipe OMAE2019-96233

Carol Johnston, Jennifer Crump

TWI Ltd, Cambridge, United Kingdom

Fatigue Crack Growth Rate Testing for Clad and Lined Pipe Girth Weld OMAE2019-95500

Zhengmao Yang¹ Youyou Wu² Jens Tronskar³ Daqin Xu²

1. DNV GL, Singapore, Singapore; 2. DNV GL Laboratory, Singapore, Singapore; 3. Det Norske Veritas Pte Ltd, Singapore, Singapore

Recent Developments on Welding NDT and ECA of Clad and Lined Offshore Pipelines OMAE2019-96358

Petrônio Zumpano Jr.¹ Alexandre G. Garmbis¹ Diogo O. Moraes¹

Fausto Hirata¹ Bruno R. M. Cunha² Eduardo Hippert² Marcelo Paes²

1. Petrobras, São José dos Campos, SP, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil

Assessment of Weld Overlays in a Cladded Piping Systems with Varied Thicknesses OMAE2019-96348

Bridget Kogo¹ Bin Wang² Luiz Wrobel² Mahmoud Chizari²

1. Brunel University London, Worcester, United Kingdom;

2. Brunel University London, London, United Kingdom

Pipelines, Risers, and Subsea Systems

4-1-10 Umbilicals and Cables I

Thursday June 13

Room Crowne Plaza, Staffa / Shuna | 08:30 – 10:00

Session Chair: Jun Yan, Dalian University of Technology, China

Session Co-Chair: Alan Dobson, Technip Umbilicals, United Kingdom

Section Translational Movement Imposition for Macroelements OMAE2019-95033

Rodrigo Provasi, Clovis de Arruda Martins

University of São Paulo, São Paulo, SP, Brazil

Extreme and Fatigue Analysis of a Dynamic Subsea Power Umbilical OMAE2019-95123

Yan Qu¹ Hong Guo² Lei Zhang³ Zhenqin Yuan⁴ Juyue Li⁴

1. Southern University of Science and Technology, Shenzhen, China;

2. CNOOC Research Institute, Beijing, China; 3. Hengtong Submarine Cable Ltd., Changshu, China; 4. Hengtong Submarine Cable Ltd., Jiangshu, China

Effect of Weld Porosity on Super Duplex Stainless Steel Umbilical Tubes under Hydrogen Induced Stress Cracking Exposure Condition OMAE2019-95986

Mariana Socariceanu, Xiaoxue An

TechnipFMC Umbilicals, Newcastle upon Tyne, United Kingdom

The Design and Installation of Wet Park Configuration for Dynamic Umbilicals in Ultra-deep Environment OMAE2019-96006

Perdinan Reagan, Graeme Lovie

Subsea 7, Sutton, United Kingdom

Pipelines, Risers, and Subsea Systems

4-3-7 Thermo-Mechanical III

Thursday June 13

Room Crowne Plaza, Castle 3 | 08:30 – 10:00

Session Chair: Celso Morooka, University of Campinas, Brazil

Session Co-Chair: Daniel Carneiro, Wood, Brazil

Effect of Seabed Imperfection on the Buckling of Buried Pipelines Subjected to Wave-induced Loads OMAE2019-95409

Duggivalasa Suresh Kumar, Mohammed Rabius Sunny, Trilochan Sahoo

Indian Institute of Technology Kharagpur, Kharagpur, India

Pipeline Rockberm Design Principles for UHB Mitigation OMAE2019-95444

M Liu¹ Colin Cross²

1. Aker Solutions, Windsor, United Kingdom; 2. Aker Solutions, London, United Kingdom

UHB Design Approach for Multiple Pipelines Installed in Shared Trench OMAE2019-95448

M Liu¹ Colin Cross²

1. Aker Solutions, Windsor, United Kingdom; 2. Aker Solutions, London, United Kingdom

Design of Buried Pipelines in Soft Clay: A Case Study OMAE2019-95505

Martin Gallegillo¹ Michele Cerulli¹ Ali Haghghi² Justin Kennedy²

1. Genesis, London, United Kingdom; 2. TechnipFMC, Westhill, Scotland

Ocean Engineering

6-13-1 Ship Resistance and Wave Loads

Thursday June 13

Room SEC, M2 & M3 | 08:30 – 10:00

Session Chair: Atilla Incecik, University of Strathclyde, United Kingdom

Validation of a Multi-level Approach to the Prediction of the Added Resistance and Powering of Ships in Waves OMAE2019-95113

Shukui Liu¹ Apostolos Papanikolaou² Peiyuan Feng³ Sheming Fan³

1. Nanyang Technological University, Singapore, Singapore; 2. National Technical University of Athens, Athens, Greece; 3. Marine Design and Research Institute of China, Shanghai, China

Study of Wave Added Resistance and Motions of KCS in Waves with Different Wave Lengths OMAE2019-95526

Hao Guo, D.C. Wan

Shanghai Jiao Tong University, Shanghai, China

An Experimental Investigation of the Trim Effect on the Behaviour of a Containership in Shallow Water OMAE2019-95790

Khaled Elsherbiny¹ Tahsin Tezdogan¹ Mohamed Kotb² Atilla Incecik¹ Sandy Day¹

1. University of Strathclyde, Glasgow, United Kingdom; 2. Arab Academy for Science, Technology and Maritime Transport, Alexandria, Egypt

Capturing Two Consecutive Green Water

Events by Convolution OMAE2019-96747

Jassiel V. Hernández-Fontes, Rodolfo Silva-Casarin, Edgar Mendoza
Universidad Nacional Autónoma de México, Mexico City, DF, Mexico

Ocean Engineering

6-17-1 Wave Loads on Structures

Thursday June 13

Room **SEC, Dochart 2** | 08:30 – 10:00

Session Chair: Sanne van Essen, MARIN, Netherlands

Systematic Experimental Validation of High-order Spectral

Method for Deterministic Wave Prediction OMAE2019-95063

Marco Klein¹ Matthias Dudek² Günther Claus³

Norbert Hoffmann¹ Jasper Behrendt¹ Sören Ehlers¹

1. *Hamburg University of Technology, Hamburg, Germany*; 2. *Neue Warnow Design & Technology GmbH, Rostock, Germany*; 3. *Technische Universität Berlin, Berlin, Germany*

Variability in Encountered Waves during Deterministically

Repeated Seakeeping Tests at Forward Speed OMAE2019-95065

Sanne van Essen, MARIN, Wageningen, Netherlands

Multi-focused Wave Groups in Wave Flume OMAE2019-95831

Qinghe Fang¹ Cunbao Zhao² Anxin Guo¹

1. *Harbin Institute of Technology, Harbin, China*; 2. *Shijiazhuang Tiedao University, Shijiazhuang, China*

Experimental Study of Wave Loading by Internal Solitary

Waves on a Semi-submersible Platform OMAE2019-95891

Jingjing Zhang, Ke Chen, Yunxiang You, Xinsu Zhang

Shanghai Jiao Tong University, Shanghai, China

Linear Evolution of a Narrow-banded Surface Gravity

Wavepacket Over an Infinite Step OMAE2019-96082

Yan Li, Thomas A.A. Adcock, Ton S. van den Bremer

University of Oxford, Oxford, United Kingdom

Numerical Simulation of the Loads on Cylinders

Exerted by Internal Wave Trains OMAE2019-96828

Xu Wang, Jifu Zhou

Institute of Mechnaics, Chinese Academy of Sciences, Beijing, China

Ocean Engineering

6-7-1 Regional Metocean I

Thursday June 13

Room **SEC, M4** | 08:30 – 10:00

Session Chair: Gus Jeans, Oceananalysis Ltd, United Kingdom

Session Co-Chair: Kevin Ewans, MetOcean Research Ltd, New Zealand

Study on Gust Parameters and Wind Spectrum

of South China Sea OMAE2019-95779

Botao Xie¹ Xuhe Ren¹ Jiayang Li¹ Wenyang Duan² Junrong Wang³ Binbin Zhao²

1. *CNOOC Research Institute, Beijing, China*; 2. *Harbin Engineering University, Harbin, China*; 3. *Ocean University of China, Qingdao, China*

Statistical Analysis for the Duration and Time Intervals

of Tropical Cyclones, Hong Kong OMAE2019-95791

Shanshan Tao, Jialing Song, Zhifeng Wang, Yong Liu, Sheng Dong

Ocean University of China, Qingdao, China

Evaluation of the Ocean Circulation for the Solomon Sea using

the Regional Ocean Modelling System (ROMS) OMAE2019-96179

A. Rute Bento, Henrique Coelho, Chunxue Yang

Fugro GB Marine Ltd, Wallingford, United Kingdom

A Probabilistic Approach to Tropical Cyclone Modelling OMAE2019-96245

Stephen Grey, Ye Liu

HR Wallingford Ltd, Wallingford, United Kingdom

CFD & FSI

8-1-5 Seakeeping I

Thursday June 13

Room **SEC, Dochart 1** | 08:30 – 10:00

Session Chair: Sandy Day, University of Strathclyde, United Kingdom

Session Co-Chair: Kie Hian Chua, Technology Centre

for Offshore and Marine, Singapore

URANS Predictions of Low-frequency Viscous

Damping of a LNGC OMAE2019-95171

Frédéric Jaouën¹ Arjen Koop¹ Lucas Vatinel²

1. *MARIN, Wageningen, Netherlands*; 2. *MARIN Academy, Wageningen, Netherlands*

Predicting Roll Damping for Barge-type FPSO using CFD OMAE2019-95306

Arjen Koop¹ Frédéric Jaouën¹ Xavier Wadbled² Erwan Corbineau²

1. *MARIN, Wageningen, Netherlands*; 2. *MARIN Academy, Wageningen, Netherlands*

Numerical Simulations of KCS Parametric

Rolling in Head Waves OMAE2019-95563

Shuang Wang¹ Junkai Wei² Xuanshu Chen¹ Liwei Liu¹ ZhiGuo Zhang¹

1. *Huazhong University of Science and Technology, Wuhan, China*;

2. *China Ship Design and Development Center, Wuhan, China*

URANS Prediction of ONR Tumblehome Parametric

Rolling Characteristics in Waves OMAE2019-96425

ZhiGuo Zhang¹ Lixiang Guo¹ Shuang Wang¹ Ye Yuan² Can Chen²

1. *Huazhong University of Science and Technology, Wuhan, China*;

2. *China Ship Design and Development Center, Wuhan, China*

CFD & FSI

8-4-2 Risers, Jumpers and Pipelines

Thursday June 13

Room **SEC, Lomond Auditorium** | 08:30 – 10:00

Session Chair: Hai Sun, Harbin Engineering University, China

Session Co-Chair: Aravind Nair, DNV GL, USA

Flow-induced Vibration Screening of a Thermoplastic

Composite Pipe Water Injection Jumper OMAE2019-95030

Juan Pontaza¹ Meng Luo² Varadarajan Nadathur¹ John Rosche¹

1. *Shell, Houston, TX, USA*; 2. *Shell International Exploration and Production Inc., Houston, TX, USA*

Vertical Riser under VIV: A Numerical Assessment of Experimental

Results using a Reduced Order Model OMAE2019-95150

Renato Orsino¹ Guilherme Lopes¹ Celso Pesce² Guilherme Franzini¹ Fernanda Takafuji¹

1. *University of São Paulo, São Paulo, SP, Brazil*;

2. *University of S. Paulo - Escola Politécnica, São Paulo, SP, Brazil*

Three-Dimensional Numerical Simulations of Severe

Gas-Liquid Slugging Flows in S-shaped Riser OMAE2019-95459

Youn-Wook Moon¹ Narakorn Srinil¹ Jong-Chun Park²

1. *Newcastle University, Newcastle upon Tyne, United Kingdom*;

2. *Pusan National University, Busan, Korea*

Fluid Dynamics Numerical Assessment to Evaluate the

Ice Formation around the Pipeline OMAE2019-95528

Giuseppe Blasioli, Furio Marchesani

Saipem S.p.A., Fano, Italy

Ocean Renewable Energy

9-1-5 FWT – Mooring Systems

Thursday June 13

Room **SEC, Carron 1** | 08:30 – 10:00

Session Chair: Tonio Sant, Dept of Mechanical Engineering, University of Malta, Malta

Session Co-Chair: Erin E. Bachynski, Norwegian University of Science and Technology, Norway

Mooring Line Dynamics of a Semi-submersible Wind Energy

Platform: Cross Validation of Two Commercial Numerical

Codes with Experimental Data OMAE2019-96295

Rachel Chester¹ Cian Desmond¹ Jimmy Murphy¹ Simon J. Watson²

1. University College Cork, Cork, Ireland; 2. TU Delft, Delft, Netherlands

Force Dynamics and Stationkeeping Costs for

Multiline Anchor Systems in Floating Wind Farms with

Different Spatial Parameters OMAE2019-96395

Casey M. Fontana¹ Sanjay R. Arwade¹ Don J. Degroot¹ Spencer Hallowell²

Melissa E. Landon³ Charles Aubeny⁴ Brian Diaz⁴ Andrew T. Myers⁵ Senol Ozmutlu⁶

1. University of Massachusetts Amherst, Amherst, MA, USA; 2. Independent Author, West Bath, ME, USA; 3. University of Maine, Orono, ME, USA; 4. Texas A&M University, College Station, TX, USA; 5. Northeastern University, Boston, MA, USA; 6. Vryhof Anchors, Schiedam, Netherlands

Analysis on Hydrodynamic Responses of a Spar Offshore Wind

Turbine with an Innovative Type of Mooring System OMAE2019-96759

Yuan Ma, Chaohe Chen, Xinkuan Yan, Yijun Shen, Tianhui Fan

South China University of Technology, Guangzhou, China

Modeling a Non-linear Mooring System for Floating Offshore

Wind using a Hydraulic Piston Analogy OMAE2019-96080

Magnus Harrold¹ Philipp R. Thies¹ David Newsam²

Claudio Bittencourt Ferreira³ Lars Johanning¹

1. University of Exeter, Penryn, United Kingdom; 2. Teqniqa Systems Ltd., Lavister, United Kingdom; 3. DNV GL, London, United Kingdom

Ocean Renewable Energy

9-5-3 Numerical Analysis I

Thursday June 13

Room **SEC, Carron 2** | 08:30 – 10:00

Session Chair: Marc Cahay, TechnipFMC, France

Session Co-Chair: Qing Xiao, University of Strathclyde, United Kingdom

CFD-based Study of a Tidal Current Turbine in a

Horizontal Axis under Regular Waves OMAE2019-95231

Jing Liu¹ Longfei Xiao¹ Fengmei Jing²

1. Shanghai Jiao Tong University, Shanghai, China; 2. Harbin Engineering University, Harbin, China

Local Blockage Effects for Idealised Turbines

in Tidal Channels OMAE2019-95347

Lei Chen¹ Paul A.J. Bonar² Christopher Vogel¹ Thomas A.A. Adcock¹

1. University of Oxford, Oxford, United Kingdom; 2. University of Edinburgh, Edinburgh, United Kingdom

Numerical Analysis of Tidal Turbine Performance

for Floating Platform OMAE2019-95884

Xiuqing Xing¹ Chang Wei Kang¹ George Xu¹ Jing Lou¹ Ken Takagi² Jarrod Sinclair³

1. Institute of High Performance, A*STAR, Singapore, Singapore; 2. The University of Tokyo, Tokyo, Japan; 3. Mako Turbines Asia Pte. Ltd, Singapore, Singapore

Effects of Tubercles on Blade and Wake of HAMCT in Post

Stall Regimes – Linear Cascade Study OMAE2019-96287

Varun Dondapati, K. Murali

Indian Institute of Technology Madras, Chennai, India

Petroleum Technology

11-1-1 General Petroleum Technology – Production Enhancement

Thursday June 13

Room **Crowne Plaza, Jura** | 08:30 – 10:00

Session Chair: Stephen Butt, Memorial University of Newfoundland, Canada

Session Co-Chair: Mohammad Rahman, Texas A&M University at Qatar, Qatar

CO₂-Foam Rheology Behavior under Reservoir Conditions OMAE2019-95191

Abdulaziz AlQasim, Sunil Kokal, Fawaz AlOtaibi

Saudi Aramco, Dhahran, Saudi Arabia

Experimental and Numerical Investigation of Gas-yield

Power-law Fluids in a Horizontal Pipe OMAE2019-95219

Abdalsalam Ihmoudah¹ M. M. Awad² Mohammad Azizur Rahman³ Stephen Butt¹

1. Memorial University of Newfoundland, St. John's, NL, Canada; 2. Mansoura University, Mansoura, Egypt; 3. Texas A&M University at Qatar, Doha, Qatar

Software Simulation and Experimental Study on Wax Deposition

Pattern of Deep Condensate Gas OMAE2019-95326

Jie Wang¹ Fujian Zhou¹ Erdong Yao¹ Fan Fan¹ Lishan Yuan¹ Yanpeng Xue²

1. China University of Petroleum-Beijing, Beijing, China; 2. Tarim Oilfield, CNPC, Korla, China

Experimental Investigation on Stress Sensitivity Behavior for

Tight Naturally Fractured Sandstone Reservoirs OMAE2019-95774

Y.C Wang, Fujian Zhou, Lufeng Zhang, Jin Wang

China University of Petroleum, Beijing, China

Petroleum Technology

11-13-1 LSU Workshop on Riser Gas Management and Well Control

Thursday June 13

Room **Crowne Plaza, Barra** | 08:30 – 10:00

Session Chair: Yuanhang Chen, Louisiana State University, USA

Session Co-Chair: Kjell Kåre Fjelde, University of Stavanger, Norway

Buoyancy Induced Convection of Riser Gas in

Deepwater Drilling Operations OMAE2019-96649

Syed Y. Nahri¹ Yuanhang Chen¹ Wesley Williams¹ Otto Santos¹ Ting Sun²

1. Louisiana State University, Baton Rouge, LA, USA;

2. China University of Petroleum, Beijing, China

Numerical Simulations of Riser Gas Behavior in Non-aqueous

Muds using a Modified Drift Flux Model OMAE2019-96672

Nnamdi Nwaka, Yuanhang Chen

Louisiana State University, Baton Rouge, LA, USA

Well Control Simulation with Non-aqueous Drilling Fluids OMAE2019-96736

Felipe Chagas¹ Paulo Ribeiro¹ Otto Santos²

1. Universidade Estadual de Campinas, Campinas, SP, Brazil;

2. Louisiana State University, Baton Rouge, LA, USA

Experimental Investigation of Absorption and Desorption

of Gas in Riser during MPD Well Control OMAE2019-96767

James L. Nielsen¹ Mahendra Kunju¹ Yuanhang Chen¹ Ting Sun²

1. Louisiana State University, Baton Rouge, LA, USA;

2. China University of Petroleum, Beijing, China

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-3-2 Wave Energy I

Thursday June 13 Room SEC, Boisdale 2 | 08:30 – 10:00

Session Organizer: Tomoki Ikoma, Nihon University, Japan

Session Co-Organizer: Yukitaka Yasuzawa, Kyushu University, Japan

Session Co-Organizer: Changkyu Rheem, University of Tokyo, Japan

Study on the Generated Power Changes by the Relation between an Arrangement of an Array of Point Absorber Type WECs and an Incident Wave Angle OMAE2019-95400

Motohiko Murai, Qiao Li, Junki Funada
Yokohama National University, Yokohama, Japan

Nonlinear Analysis of a Heaving Point Absorber in Frequency Domain via Statistical Linearization OMAE2019-95785

Leandro Souza Pinheiro da Silva¹ Hélio Morishita¹ Celso Pesce² Rodolfo T. Gonçalves³
1. University of São Paulo, São Paulo, SP, Brazil; 2. University of São Paulo - Escola Politécnica, São Paulo, SP, Brazil; 3. University of Tokyo, Bunkyo, Japan

A Strategy of a Control Algorithm for a Point Absorber Wave Energy Converter OMAE2019-95836

Qiao Li, Motohiko Murai
Yokohama National University, Yokohama, Japan

Fundamental Study on Development on Numerical Method for Evaluation of Wave Power Generating Systems with Pendulum Type by the Particle Method OMAE2019-95869

Kazuki Murata¹ Changkyu Rheem² Tomoki Ikoma³
1. Institute of Industrial Science, The University of Tokyo, Meguro-ku, Japan; 2. The University of Tokyo, Tokyo, Japan; 3. Nihon University, Funabashi, Japan

REFRESHMENT BREAK

10:00 – 10:30

Location: Hall 5 (SEC)

CONCURRENT SESSIONS

10:30 – 12:00

Offshore Technology

1-7-1 Wave Loading and Motions in Extreme Seas I

Thursday June 13 Room SEC, Alsh 1 | 10:30 – 12:00

Session Chair: Limin Yang, DNV GL, Norway

Experimental Evaluation of Wave Impact Loads on Semi-submersible Structure according to Trim Angle OMAE2019-95406

Min-Guk Seo¹ Yoon-Jin Ha¹ Nam-Woo Kim¹ Bo Woo Nam¹ Kang-Su Lee²
1. Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea; 2. Korea Institute of Ocean Science and Technology, Daejeon, Korea

Efficient Indicators for Screening of Random Waves for Wave Impacts on a Jacket Platform and a Fixed Offshore Wind Turbine OMAE2019-95481

Tim Bunnik, Jule Schamke, Erik-Jan de Ridder
MARIN, Wageningen, Netherlands

Effect of Non-Gaussian Distribution in Fully-nonlinear Waves on Offshore Platform Motion Responses OMAE2019-96465

Aldric Baquet, Ho-Joon Lim, Jang Kim
TechnipFMC, Houston, TX, USA

Structures, Safety and Reliability

2-13-2 Risk Analysis and Management II

Thursday June 13 Room Crowne Plaza, Castle 2 | 10:30 – 12:00

Session Chair: Marcelo Ramos Martins, LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, Brazil

Session Co-Chair: Mahmood Shafiee, Cranfield University, United Kingdom

A Hybrid Methodology for Maritime Accident Analysis:

The Case of Ship Collision OMAE2019-96663
Ludfi Pratiwi Bowo, Ramdhani Eka Prilana, Masao Furusho
Kobe University, Kobe, Japan

Human Reliability Analysis of Ship Maneuvers in Harbor Areas OMAE2019-96251

Daniilo T. M. P. Abreu¹ Marcos C. Maturana² Marcelo Ramos Martins¹ Siegberto R. Schenk Jr.³
1. LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, São Paulo, SP, Brazil; 2. Centro Tecnológico da Marinha em São Paulo, São Paulo, SP, Brazil; 3. Brazilian Maritime Pilots Association (CONAPRA), Rio de Janeiro, RJ, Brazil

Analysing Dependent Failures in a Bayesian

Belief Network OMAE2019-95853

Mei Ling Fam¹ Dimitrios Konovessis² Xuhong He³ Lin Seng Ong¹ Hoon Kiang Tan⁴
1. Nanyang Technological University, Singapore, Singapore; 2. Singapore Institute of Technology, Singapore, Singapore; 3. Lloyd's Register Consulting - Energy AB, Sundbyberg, Sweden; 4. Global Technology Centre, Lloyd's Register Singapore, Singapore, Singapore

Risk Assessment of Ship Systems based on

Forward FTF Method OMAE2019-95320

SongYan Mai¹ Ji Zeng¹ Qi Feng² Renan Liu³ Yan Chen²
1. Shanghai Maritime University, Shanghai, China; 2. Shanghai Honghua Ocean Oil & Gas Equipment Co., Ltd., Shanghai, China; 3. AFFCO Flow Control (Shanghai) Co., Ltd, Shanghai, China

Risk Assessment in Offshore Salt Caverns to Store CO₂ OMAE2019-96250

Marco A. Pestana¹ Carlos H. B. Morais¹ Alvaro M. Costa²
Camila Brandão³ Marcelo Ramos Martins¹
1. LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, São Paulo, SP, Brazil; 2. MODECOM - Tecnologia em Geomecânica e Modelagem Computacional, Rio de Janeiro, RJ, Brazil; 3. Shell Brasil Ltda., Rio de Janeiro, RJ, Brazil

Structures, Safety and Reliability

2-6-3 Reliability of Mooring and Riser Systems III

Thursday June 13 Room Crowne Plaza, Castle 1 | 10:30 – 12:00

Session Chair: Ying Min Low, National University of Singapore, Singapore

Session Co-Chair: Luis V.S. Sagrilo, LACEO/COPPE/

Federal University of Rio De Janeiro, Brazil

Review and Comparison of Collated Offshore Mooring Chain Fatigue Test Data OMAE2019-95875

Gary H. Farrow¹ Andrew E. Potts¹ Andrew A. Kilner² Eric Jal¹ Nicholas D'Arcy Evans¹
1. AMOG Consulting, Notting Hill, VIC, Australia; 2. AMOG Consulting Inc, Houston, TX, USA

Development of a New, Correlated FEA Method of

Assessing Mooring Chain Fatigue OMAE2019-95882

Gary H. Farrow¹ Andrew E. Potts¹ Andrew A. Kilner²
Phillip P. Kurts² Simon Dimopoulos¹ Eric Jal¹
1. AMOG Consulting, Notting Hill, VIC, Australia; 2. AMOG Consulting, Houston, TX, USA

Numerical Methods for Interlink Stiffness Formulations and Parameters Sensitivity of Out-of-plane Bending Fatigue Failure in Mooring Chains

OMAE2019-96042

Ceasar Edward, Arun Dev

Newcastle University in Singapore, Singapore, Singapore

Fatigue of Mooring Chains Connected to Offshore Floating Structures considering Out-of-plane Bending Effects

OMAE2019-96114

Vidar Hellum¹ Songxiong Ding¹ Tom Lassen²

1. University of Agder, Grimstad, Norway; 2. APL/NOV, Arendal, Norway

Materials Technology

3-5-1 Fatigue Assessment and Improvement

Thursday June 13

Room SEC, Boisdale 1 | 10:30 – 12:00

Session Chair: Carol Johnston, TWI Ltd, United Kingdom

Session Co-Chair: David A. Baker, Exxon Mobil Upstream Research Co, USA

Fatigue Life Estimation for HFMI Treated Weldments considering Weld Toe Magnification Factor

OMAE2019-95910

Dong Yub Kim¹ Myung-Hyun Kim²

1. Dept. of Naval Architecture and Ocean Engineering; Pusan National University, Busan, Korea; 2. Pusan National University, Busan, Korea

Girth Weld Joints from Long Upset Pipe Ends for Improving Fatigue Strength of Offshore Oil & Gas Pipelines

OMAE2019-96345

Israel Marines-García¹ Aaron Aguilar¹ Ramon Aguilar² Mauricio Pelcastre³ Philippe Darcis⁴

1. Tenaris TTSA, Veracruz, VER, Mexico; 2. Testing and Technical Solutions S.A De C.V, Veracruz, VER, Mexico; 3. Tubos de Acero de Mexico S.A, Veracruz, VER, Mexico; 4. Dalmine S.p.A., Dalmine, Italy

Process-Structure-Property Fatigue Characterisation for Welding of X100 Steel Catenary Risers

OMAE2019-96516

Ronan J. Devaney¹ Adrian Connaire² Padraic E. O'Donoghue¹ Sean B. Leen¹

1. NUI Galway, Galway, Ireland; 2. Wood, Galway, Ireland

Evolution of the Stress-induced Magnetic Field of Pipeline Steel due to Fatigue Loading

OMAE2019-95547

Sheng Bao, Zhengye Zhao, Qiang Luo, Yibin Gu

Zhejiang University, Hangzhou, China

Data Mining for Estimating Fatigue Strength based on Composition and Process Parameters

OMAE2019-95155

Arvind Keprate, R.M. Chandima Ratnayake

University of Stavanger, Stavanger, Norway

Pipelines, Risers, and Subsea Systems

4-1-11 Umbilicals and Cables II

Thursday June 13

Room Crowne Plaza, Staffa / Shuna | 10:30 – 12:00

Session Chair: Alan Dobson, Technip Umbilicals, United Kingdom

Session Co-Chair: Jun Yan, Dalian University of Technology, China

Analysis of Mechanical Properties of Carbon Fiber Reinforced Spiral Rod in Umbilical

OMAE2019-95988

Yu Zhang¹ Peng Zhang² Ningyi Cheng¹ Yi Zhao¹

1. China University of Petroleum, Beijing, China; 2. Fudan University, Shanghai, China

Coupled Thermo-elastic Analysis on Cross-section of Umbilical Cables

OMAE2019-96195

Jun Yan¹ Haitao Hu¹ Qi Su¹ Qingzhen Lu² Zhixun Yang¹ Qianjin Yue²

1. Dalian University of Technology, Dalian, China; 2. Dalian University of Technology, Panjin, China

Experimental Study on Friction of Steel Wires of Dynamic Umbilical for Fatigue Life Analysis

OMAE2019-96491

Yuanhao Yin¹ Qingzhen Lu² Shanguhua Wu¹ Jun Yan¹ Qianjin Yue² Jinlong Chen³

1. Dalian University of Technology, Dalian, China; 2. Dalian University of Technology, Panjin, China; 3. Panjin Institute of Industrial Technology, Dalian University of Technology, Panjin, China

Analysis of Subsea Umbilical Mechanical Behavior under Simultaneous Bending, Tension and Torsion

OMAE2019-96596

Mohsen Saneian¹ Yifan Gao¹ Yong Bai² Ting Liu¹

1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Pipelines, Risers, and Subsea Systems

4-3-8 Mechanics II

Thursday June 13

Room Crowne Plaza, Castle 3 | 10:30 – 12:00

Session Chair: Doug Swanek, C-FER Technologies, Canada

Session Co-Chair: Corey Drake, C-FER Technologies, Canada

Parametric Resonance Analysis of a Submerged Floating Pipeline Considering Uncertainties

OMAE2019-95266

Hezhen Yang¹ Fei Xiao²

1. University of Glasgow, Glasgow, United Kingdom; 2. Nanyang Technological University, Singapore, Singapore

Case Study: Non-conventional Remaining Life Assessment of a Significant Dent in a Subsea Pipeline Scheduled for Decommissioning

OMAE2019-95277

Alex Brett, Andy Russell

Rosen UK, Newcastle upon Tyne, United Kingdom

Hydrodynamic Forces on Near-bed Small Diameter Cables and Pipes in Currents, Waves and Combined Flow

OMAE2019-95557

Terry Griffiths¹ Yunfei Teng² Liang Cheng¹ Hongwei An¹ Scott Draper¹

Henning Mohr¹ Antonino Fogliani¹ Alessio Mariani³ David J White⁴
1. University of Western Australia, Crawley, WA, Australia; 2. Dalian University of Technology, Dalian, China; 3. Woodside Energy Ltd, Perth, WA, Australia; 4. University of Southampton, Southampton, United Kingdom

Out-of-roundness of the Turkstream Project Line Pipe

OMAE2019-96154

Ruud Selker¹ Ping Liu¹ Erich Jurdik² Jay Chaudhuri²

1. INTECSEA, Delft, Netherlands; 2. South Stream Transport B.V., Amsterdam, Netherlands

Ocean Engineering

6-13-2 Ship Manoeuvrability and Motion

Thursday June 13

Room SEC, M2 & M3 | 10:30 – 12:00

Session Chair: Atilla Incecik, University of Strathclyde, United Kingdom

Hybrid Method for Predicting Ship Manoeuvrability in Regular Waves

OMAE2019-95249

Tianlong Mei¹ Yi Liu² Manases Tello Ruiz³ Marc Vantorre³

Evert Lataire³ Changyuan Chen³ Zaojian Zou¹

1. Shanghai Jiao Tong University, Shanghai, China; 2. Marine Design and Research Institute of China, Shanghai, China; 3. Ghent University, Ghent, Belgium

The Hydrodynamic Analysis of Dolphin Fluke Motion with a Flexible Tail

OMAE2019-95727

Xi Chen¹ Wenjing Yang² Jiawei Yu² Dakui Feng² Yongfeng Wu²

1. Shanghai Division China Ship Development and Design Center Shanghai, Shanghai, China; 2. Huazhong University of Science and Technology, Wuhan, China

System Based Prediction of Ship's Manoeuvrability in Varying Water Depth Area OMAE2019-95868

Shi He¹ Atilla Incecik² Zhiming Yuan³ Paula Kellett⁴
 1. Shanghai Maritime University, Shanghai, China; 2. University of Strathclyde, Glasgow, United Kingdom; 3. University of Strathclyde, NAOME, Glasgow, United Kingdom; 4. European Marine Board, Ostend, Belgium

Research of Wind Resistance and Flow Field of Container Ship OMAE2019-96798

Zhiyuan Sun, Hanbing Sun, Ping Li
 Harbin Engineering University, Harbin, China

Ocean Engineering

6-17-2 Nonlinear and Breaking Waves

Thursday June 13 Room SEC, Dochart 2 | 10:30 – 12:00
 Session Chair: Thomas A. A. Adcock, University of Oxford, United Kingdom

The Average Shape of Large Waves in the Norwegian Sea – Is Non-linear Physics Important? OMAE2019-95068

Tianning Tang¹ Margaret J. Yelland² Thomas A. A. Adcock¹
 1. University of Oxford, Oxford, United Kingdom; 2. National Oceanography Centre, Southampton | NOCS, Southampton, United Kingdom

Nonlinear Evolution of a Steep, Focusing Wave Group in Deep Water Simulated with OceanWave3D OMAE2019-95299

Dylan Barratt¹ Harry B. Bingham² Thomas A. A. Adcock¹
 1. University of Oxford, Oxford, United Kingdom; 2. Delft University of Technology, Lyngby, Denmark

Numerical Simulation of Water Wave Propagation over Porous Slope Bottom by using Two-domain Method OMAE2019-95664

Eun-Hong Min, Weoncheol Koo
 Inha University, Incheon, Korea

Characteristics of Transforming Waves Breaking over a Fringing Reef OMAE2019-96674

Fuxian Gong¹ Manhar Dhanak²
 1. Florida Atlantic University, Boca Raton, FL, USA; 2. Florida Atlantic University, Dania Beach, FL, USA

Numerical Modeling of the Nonlinear Standing Waves in a Rectangular Tank and Damping Devices OMAE2019-96790

Xin Jin¹ Pengzhi Lin²
 1. Chengdu University of Technology, Chengdu, China; 2. Sichuan university, Chengdu, China

Ocean Engineering

6-7-2 Regional Metocean II

Thursday June 13 Room SEC, M4 | 10:30 – 12:00
 Session Chair: Gus Jeans, Oceanalysis Ltd, United Kingdom
 Session Co-Chair: Kevin Ewans, MetOcean Research Ltd, New Zealand

The Wave Climate of the Southern Ocean OMAE2019-95168

Ian Young
 The University of Melbourne, Melbourne, VIC, Australia

The Increasing Prevalence of High Frequency Internal Waves in an Arctic Ocean with Declining Sea Ice Cover OMAE2019-96621

Tom Rippeth¹ Vasily Vlasenko² Igor Kozlov³ Nataliya Stashchuk⁴
 Brian Scannell⁵ Mattias Green¹ Ben Lincoln⁶ Yueng-Djern Lenn⁷
 1. Bangor University, Menai Bridge, United Kingdom; 2. School of Biological and Marine Sciences, Plymouth, United Kingdom; 3. Russian State Hydrometeorological University,

St Petersburg, Russia; 4. Plymouth University, Plymouth, United Kingdom; 5. School of Ocean Sciences, Ynys Mon, United Kingdom; 6. Bangor University, School of Ocean Sciences, Bangor, United Kingdom; 7. School of Ocean Sciences, Menai Bridge, United Kingdom

Extreme Wind and Wave Predictability from Operational Forecasts at Drake Passage OMAE2019-96626

Ricardo Campos¹ Andressa D'Agostini² Leandro Machado Cruz²
 Bruna Reis Leite França³ Carlos Guedes Soares⁴
 1. CENTEC - Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 2. Centro de Hidrografia da Marinha CHM, Seção de Modelagem Oceanográfica/REMO, Marinha do Brasil, Niteroi, RJ, Brazil; 3. Oceanographic Modeling and Observation Network (REMO), Niteroi, RJ, Brazil; 4. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

Global Assessments of Surface Winds and Waves from an Ensemble Forecast System using Satellite Data OMAE2019-96627

Ricardo Campos¹ Carlos Guedes Soares²
 1. CENTEC - Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

CFD & FSI

8-1-6 Seakeeping II

Thursday June 13 Room SEC, Dochart 1 | 10:30 – 12:00
 Session Chair: Steve Cosgrove, Altair Engineering, Inc., USA
 Session Co-Chair: Samuel Holmes, Red Wing Engineering, Inc, USA

Development and Validation of CFD Analysis Procedure for Predicting Wind Load on Commercial Ships OMAE2019-95410

Sang-Hun Lee¹ Sei-Hwan Kim² Deok-Su Kim¹ Young-Bum Lee²
 1. Daewoo Shipbuilding and Marine Engineering CO., Ltd., Geoje-si, Korea; 2. Daewoo Shipbuilding and Marine Engineering CO., Ltd., Seoul, Korea

Wind and Current Loads on Barges and Ships OMAE2019-95716

Ould el Moctar, Thomas Schellin, Jens Neugebauer
 University of Duisburg-Essen, Duisburg, Germany

Cargo Liquefaction and Influence on Ship Stability OMAE2019-96448

Kie Hian Chua¹ Yali Zhang² Dimitrios Konovessis³
 1. Technology Centre for Offshore and Marine, Singapore, Singapore;
 2. Lloyd's Register Singapore Pte Ltd, Singapore, Singapore;
 3. Singapore Institute of Technology, Singapore, Singapore

Numerical Study on Scale Effect of KCS OMAE2019-96831

Yujie Zhou¹ Liwei Liu¹ Xiao Cai¹ Dakui Feng¹ Bin Guo²
 1. Huazhong University of Science and Technology, Wuhan, China;
 2. China Ship Design and Development Center, Wuhan, China

CFD & FSI

8-4-3 Interference, Proximity and Geometry Effects

Thursday June 13 Room SEC, Lomond Auditorium | 10:30 – 12:00
 Session Chair: Rajeev Kumar Jaiman, University of British Columbia, Canada
 Session Co-Chair: Mohammed Abdul Hannan, Newcastle University, UK (Singapore Campus), Singapore

Numerical Investigation on Vortex Dynamics around Vibrant Monopile Regarding Cross-sectional Shape and Keulegan-Carpenter Number OMAE2019-96827

Mohammad Mohammad Beigi Kasvaei¹
 Mohammad Hossein Kazeminezhad¹ Abbas Yeganeh-Bakhtiary²
 1. Iranian National Institute for Oceanography and Atmospheric Science, Tehran, Iran; 2. Iran University of Science and Technology, Tehran, Iran

Numerical Investigation of Steady Flow Induced Rotary Response of Circular Cylinder with Splitter Plate OMAE2019-95584

Dan Pang, Huili Xi, Zhongbing Zhou, Guoqiang Tang, Lin Lu
Dalian University of Technology, Dalian, China

The Evolutionary Geometric Physics of Vortex-induced Vibrations OMAE2019-95548

Robert Zueck
US Navy - NAVFAC EXWC, Port Hueneme, CA, USA

Three-Dimensional Direct Numerical Simulations of Flows Past an Inclined Cylinder Near a Plane Boundary OMAE2019-95466

Chunning Ji¹ Zhimeng Zhang¹ Dong Xu¹ Narakorn Srinil²
1. Tianjin University, Tianjin, China; 2. Newcastle University, Newcastle upon Tyne, United Kingdom

Ocean Renewable Energy**9-1-8 FWT Hydrodynamics I**

Thursday June 13 Room SEC, Carron 1 | 10:30 – 12:00
Session Chair: Jean-Christophe Gilloteaux, Ecole Centrale de Nantes, France

Investigation of Focused Wave Impact on Floating Platform for Offshore Floating Wind Turbine – A CFD Study OMAE2019-96043

Yang Zhou¹ Qing Xiao¹ Yuanchuan Liu¹ Atilla Incecik¹ Christophe Peyrard²
1. University of Strathclyde, Glasgow, United Kingdom; 2. EDF R&D, Chatou, France

Development of a Panel Cutting Method Coupled with a Time-domain Potential Flow Model based on the Weak-scatterer Approximation OMAE2019-96296

Pierre-Yves Wuillaume¹ Aurelien Babarit² Mattias Lynch³ Pierre Ferrant⁴
1. LHEEA Ecole Centrale de Nantes / INNOSEA, Nantes, France; 2. Centrale Nantes, Nantes, France; 3. INNOSEA, Nantes, France; 4. Ecole Centrale de Nantes/CNRS, Nantes, France

Hydrodynamic Analysis of a Suspended Cylinder under Regular Wave Loading based on Computational Fluid Dynamics OMAE2019-95533

Philipp Mucha, Amy Robertson, Jason Jonkman, Fabian Wendt
National Renewable Energy Laboratory, Golden, CO, USA

On Motion and Hydroelastic Analysis of a Floating Offshore Wind Turbine OMAE2019-96034

Azin Lamei¹ Masoud Hayatdavoodi¹ Carlos Wong² Bin Tang³
1. University of Dundee, Dundee, United Kingdom; 2. CBJ Ocean Engineering Corp., Zhuhai, China; 3. Harbin Engineering University, Harbin, China

Ocean Renewable Energy**9-4-3 Advanced Controls**

Thursday June 13 Room SEC, Carron 2 | 10:30 – 12:00
Session Chair: Ryan Coe, Sandia National Laboratories, USA

Study on a Wave Energy Converter with Tension Leg Mooring under Optimal Control OMAE2019-95650

Jun Umeda¹ Tomoki Taniguchi² Toshifumi Fujiwara²
1. National Maritime Research Institute, Mitaka, Japan;
2. National Maritime Research Institute, Tokyo, Japan

Assessment of Latching Control of Hemispherical Heaving Buoy Point Absorber with Nonlinear Froude-Krylov Force OMAE2019-96055

Sung-Jae Kim, Weoncheol Koo, Chul Hee Jo
Inha University, Incheon, Korea

Load Reduction for a WEC via PTO Control OMAE2019-96382

Ryan Coe, Giorgio Bacelli, Steven J. Spencer, Hanchool Cho, Victor Nevarez
Sandia National Laboratories, Albuquerque, NM, USA

Modeling and Analysis of Nonlinear Effects of Ocean Waves and Power-take-off Control on Wave Energy Conversion System Dynamics OMAE2019-96802

Solomon Yim¹ Nasim Adami¹ Bret Bosma¹ Ted Brekken¹ Ming Chen¹
Leila Ghorban Zadeh¹ David Glennon¹ Yushun Lian¹ Pedro Lomonaco²
Ali Mohtat¹ Tuba Ozkan-Haller¹ Jim Thomson³
1. Oregon State University, Corvallis, OR, USA; 2. O.H. Hinsdale Wave Research Laboratory, Corvallis, OR, USA; 3. University of Washington, Seattle, WA, USA

Petroleum Technology**11-1-2 General Petroleum Technology – Production and Drilling Enhancement**

Thursday June 13 Room Crowne Plaza, Jura | 10:30 – 12:00
Session Chair: Stephen Butt, Memorial University of Newfoundland, Canada
Session Co-Chair: Mohammad Rahman, Texas A&M University at Qatar, Qatar

Evaluation Adaptability of Nano Wetting Fluid for Releasing Tight Sandstone Gas Reservoir Water Locking Effect OMAE2019-95402

Erdong Yao¹ Jie Wang¹ Yanpeng Xue² Fujian Zhou¹ Le Zhang¹ Yafei Li¹
1. China University of Petroleum-Beijing, Beijing, China; 2. Tarim Oilfield, CNPC, Korla, China

Study of the influence of Controlled Axial Oscillations of pVARD on Generating Downhole Dynamic WOB and Improving Coring and Drilling Performance in Shale OMAE2019-96189

Abdelsalam Abugarara, John Molgaard, Charles Hurich, Stephen Butt
Memorial University of Newfoundland, St. John's, NL, Canada

An Experimental Development to Characterise the Flow Phenomena at the Near-wellbore Region OMAE2019-96373

Mohammad Ahammad¹ Mohammad Rahman² Stephen Butt¹ Jahrul Alam¹
1. Memorial University of Newfoundland, St. John's, NL, Canada;
2. Texas A&M University at Qatar, Doha, Qatar

Understanding the Phenomenon of Dissolved Gas Migration of Gas in Riser during Drilling Operations OMAE2019-96683

Syed Y. Nahri¹ Jianjun Zhu² Wesley Williams¹ Otto Santos¹
Louis Thibodeaux¹ Yuanhang Chen¹
1. Louisiana State University, Baton Rouge, LA, USA; 2. University of Tulsa, Tulsa, OK, USA

Petroleum Technology**11-10-1 New Materials for Well Construction**

Thursday June 13 Room Crowne Plaza, Barra | 10:30 – 12:00
Session Chair: Mihail Minescu, University Oil And Gas Ploiesti, Romania
Session Co-Chair: Catalin Teodoriu, Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Potentials of Nano-designed Plugs: Implications for Short and Long Term Well Integrity OMAE2019-95614

Raymos Kimanzi¹ Harshkumar Patel¹ Mahmoud Khalifeh² Saeed Salehi³ Catalin Teodoriu³
1. University of Oklahoma, Norman, OK, USA; 2. Uis, Stavanger, Norway;
3. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Efficiency Assessment of the Composite Materials Repair Systems Intended for Corrosion Damaged Pipelines OMAE2019-96279

Andrei Dumitrescu, Alin Dinita
Petroleum-Gas University of Ploiesti, Ploiesti, Romania

Assessment of Variations in the Physico-mechanical Properties of Fiberglass Tubing Working in Different Environments OMAE2019-96283

Alin Dinita¹ Mihail Minescu² Andrei Dumitrescu¹ Catalin Teodoriu³ Codrut-Stefan Sararu⁴
 1. Petroleum-Gas University of Ploiesti, Ploiesti, Romania; 2. University Oil And Gas Ploiesti, Ploiesti, Romania; 3. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA; 4. OMV Petrom SA, Bucharest, Romania

How Heuristics and Biases Impact Judgment and Decision

Making in Well Integrity Operations OMAE2019-96820

Catalin Teodoriu, Saeed Salehi
 Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-3-4 Wave Energy II

Thursday June 13 Room SEC, Boisdale 2 | 10:30 – 12:00

Session Chair: Yasunori Nihei,
 Osaka Prefecture University, Japan

A Basic Study on Influence of Airchamber Volume on OWC

Models to Power Conversion Performance OMAE2019-95925

Tomoki Ikoma¹ Yoshiyuki Kihara¹ Shota Hirai¹ Yasuhiro Aida² Koichi Masuda¹ Hiroaki Eto¹
 1. Nihon University, Funabashi, Japan; 2. Nihon University, Chiba, Japan

Numerical Modelling of a Relatively Small Floating Body's Wave and Low Frequency Motion Response, Compared with Observational Data OMAE2019-96443

Christopher Wright¹ Haruki Yoshimoto² Ryota Wada³ Ken Takagi³
 1. The University of Tokyo, Chiba, Japan; 2. Japan Marine United Corporation, Yokohama, Japan; 3. The University of Tokyo, Kashiwa, Japan

Observation of Waves in Naru Strait, Goto, Nagasaki, a Tidal Current Test Site OMAE2019-96652

Yusaku Kyozuka
 Nagasaki University, Nagasaki, Japan

Technical Session Organizers' Lunch

12:00 – 13:30

Location: Hall 5 (SEC)

Thursday lunch sponsored by Greater Fort Lauderdale Convention & Visitors Bureau

GREATER FORT LAUDERDALE
 CONVENTION & VISITORS BUREAU

CONCURRENT SESSIONS

13:30 – 15:00

Offshore Technology

1-7-2 Wave Loading and Motions in Extreme Seas II

Thursday June 13 Room SEC, Alsh 1 | 13:30 – 15:00

Session Chair: Babak Ommani, SINTEF Ocean, Norway

Wave Impact Load and Corresponding Nonlinear Response of a Semi-submersible OMAE2019-95693

Yinghao Guo¹ Longfei Xiao¹ Handi Wei² Lei Li³ Yanfei Deng³
 1. Shanghai Jiao Tong University, Shanghai, China; 2. State Key Laboratory of Ocean Engineering, Shanghai Jiao Tong University, Shanghai, China; 3. CIMC Offshore Co. Ltd., Shenzhen, China

The Ocean Cleanup System 001 Performance during Towing and Seakeeping Tests OMAE2019-96207

Joost Sterenborg¹ Nicola Grasso¹ Rogier Schouten¹ Arjen Tjallega²
 1. MARIN, Wageningen, Netherlands; 2. The Ocean Cleanup, Rotterdam, Netherlands

Structures, Safety and Reliability

2-14-1 Risk Based Maintenance

Thursday June 13 Room Crowne Plaza, Castle 2 | 13:30 – 15:00

Session Chair: Bernt Leira, Norwegian University of Science and Technology, Norway

Session Co-Chair: Nianzhong Chen, Tianjin University, China

New Advances and Developments in Risk-based Inspection (RBI) of Marine Structures OMAE2019-95137

Mahmood Shafiee¹ Carlos Guedes Soares²
 1. Cranfield University, Bedford, United Kingdom; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

An Ontology-based Approach for Developing Offshore and Onshore Process Equipment Inspection Knowledge Base OMAE2019-95478

Andika Rachman, R.M. Chandima Ratnayake
 University of Stavanger, Stavanger, Norway

Asset Integrity Control: Prioritization of Offshore Topside Flange Openings during Preventive Maintenance Shutdowns OMAE2019-96576

R.M. Chandima Ratnayake
 University of Stavanger, Stavanger, Norway

Bayesian Networks for Risk-based Decision Making OMAE2019-96833

Sima Rastayesh
 Aalborg University, Aalborg, Denmark

Structures, Safety and Reliability

2-7-1 Reliability of Renewable Energy Systems

Thursday June 13 Room Crowne Plaza, Castle 1 | 13:30 – 15:00

Session Chair: Zhen Gao, Norwegian University of Science and Technology, Norway

Session Co-Chair: Athanasios Kolios, University of Strathclyde, United Kingdom

Sensitivity Analysis of a 5MW Bottom Fixed Offshore Wind Turbine using the Environmental Contour Method OMAE2019-95390

David Barreto¹ Abdolmajid Moghtadaei² Madjid Karimirad² Arturo Ortega³
 1. Universidad Nacional de Ingeniería, Lima, Peru; 2. Queen's University Belfast, Belfast, United Kingdom; 3. The University of Edinburgh, Edinburgh, United Kingdom

Impacts of Reliability on Operational Performance and Cost of Energy Evaluation of Multimewatt, Far-offshore Wind Turbines OMAE2019-95561

Cuong Dao, Behzad Kazemtabrizi, Christopher Crabtree
Durham University, Durham, United Kingdom

Structural Safety Assessment of Marine Operations from a Long-term Perspective – A Case Study of Offshore Wind Turbine Blade Installation OMAE2019-96686

Amrit Shankar Verma¹ Zhen Gao¹ Zhiyu Jiang² Zhengru Ren¹ Nils Petter Vedvik¹
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. University of Agder, Grimstad, Norway

A Sensitivity Study for Operational Availability of Offshore Wind Energy Assets OMAE2019-96323

Juan Chiachio-Ruano, Mahé Hermile, Athanasios Kolios
University of Strathclyde, Glasgow, United Kingdom

Materials Technology

3-2-2 Analysis and Fatigue Performance of Tubular Joints (John Sharp Honorary Session)

Thursday June 13 Room SEC, Boisdale 1 | 13:30 – 15:00
Session Chair: Alexander Stacey, Energy Division, Health & Safety Executive, United Kingdom
Session Co-Chair: Carol Johnston, TWI Ltd, United Kingdom

Large-scale Resonant Fatigue Testing of Welded Tubular X-Joints for Offshore Jacket Foundations OMAE2019-96371

Jeroen Van Wittenberghe, Philippe Thibaux, Maarten Van Poucke
OCAS NV, Gent, Belgium

Fatigue of Welded Tubular X-Joints in Offshore

Wind Platforms OMAE2019-95812
Theocharis Papatheocharis, Gregory C. Sarvanis, Philip C. Perdikaris, Spyros A. Karamanos
University of Thessaly, Volos, Greece

Numerical Simulation and Result Interpretation of Large Scale Fatigue Testing of Tubular X-Joint Close to Resonance Frequency OMAE2019-96198

Philippe Thibaux, Jeroen Van Wittenberghe, Maarten Van Poucke
OCAS NV, Gent, Belgium

Study of Grouted Connections in Offshore Structures OMAE2019-95446

Efstathios Theotokoglou, Georgia Papaefthimiou
National Technical University of Athens, Athens, Greece

Pipelines, Risers, and Subsea Systems

4-4-1 Subsea Structures I

Thursday June 13 Room Crowne Plaza, Staffa / Shuna | 13:30 – 15:00
Session Chair: Marcelo Igor Lourenço Souza, UFRJ, Brazil
Session Co-Chair: Ping Liu, INTECSEA, Netherlands

Challenges and Lessons Learnt from the Design, Fabrication and Installation of Rigid Tie-in Spools OMAE2019-95056

Curti Gianbattista¹ Pavone Diego¹ Pirinu Gianluigi² Qin Jianjun³
1. Saipem, Fano, Italy; 2. Saipem, Saint Quentin Yvelines, France; 3. Saipem, Kingston-upon-Thames, United Kingdom

Experimental Investigation of Over-trawlability of an Innovative Arctic Subsea Production Unit (SPU) OMAE2019-95503

Jie Wu¹ Chittiappa Muthanna¹ Hagbart Alsos¹ Rasmus Juhlin² Daniel Karunakaran²
1. SINTEF Ocean, Trondheim, Norway; 2. Subsea7, Stavanger, Norway

Subsea Rigid Jumper Design Optimization for Sour Service Application OMAE2019-95536

Ben Toleman¹ Chaojun Huang¹ Mahesh Sonawane¹ Rohit Shankaran² Danny Foster³
1. 2H Offshore Inc., Houston, TX, USA; 2. 2H Offshore Engineering Ltd., Woking, United Kingdom; 3. OneSubsea, Houston, TX, USA

A Study on the Validity of a One Degree of Freedom Model for Deepwater Subsea Lifts OMAE2019-96047

Rodrigo Batista Tommasini¹ Leonardo de Oliveira Carvalho² Renato Pavanello¹
1. Unicamp, Campinas, SP, Brazil; 2. Petrobras, Rio de Janeiro, RJ, Brazil

Pipelines, Risers, and Subsea Systems

4-6-1 Innovative Technologies for Deepwater Low-Cost Production I

Thursday June 13 Room Crowne Plaza, Castle 3 | 13:30 – 15:00
Session Chair: Chris Timms, C-FER Technologies, Canada
Session Co-Chair: Ruud Selker, INTECSEA, Netherlands

Full Scale Thermal Testing of a New Flowline Intervention System OMAE2019-95354

Stéphanie Harchambois¹ Vincent Le Toux¹ Geoffrey Guindeuil¹
Romain Vivet¹ François-Xavier Pasquet² Guillaume Tosi²
Thierry Palermo² Christophe T'Joens³ Gilbert Herrera⁴
1. TechnipFMC, Rueil-Malmaison, France; 2. Total, Pau, France; 3. Shell, Rijswijk, Netherlands; 4. Shell, Houston, TX, USA

CFD Modelling of an Electrically Trace Heated Blanket OMAE2019-95493

Vincent Le Toux¹ Stéphanie Harchambois² Geoffrey Guindeuil¹
Romain Vivet¹ François-Xavier Pasquet³ Guillaume Tosi³
Thierry Palermo³ Gilbert Herrera⁴ Christophe T'Joens⁵
1. TechnipFMC, Rueil-Malmaison, France; 2. TechnipFMC, Rueil Malmaison, France; 3. Total, Pau, France; 4. Shell, Houston, TX, USA; 5. Shell, Rijswijk, Netherlands

Active Control of Flexible Riser Vibration by Boundary Control based on LQR Controller OMAE2019-95839

Jin Xin Yu¹ Weimin Chen²
1. Institute of Seismology, China Earthquake Administratio, Wuhan, China; 2. Institute of Mechanics, Chinese Academy of Sciences, Beijing, China

Hydrate Remediation Philosophy for a New Flowline Intervention System based on Active Heating OMAE2019-96059

Geoffrey Guindeuil¹ Arnaud Sanchis² Stéphanie Harchambois¹ Romain Vivet¹
Thierry Palermo³ François-Xavier Pasquet³ Guillaume Tosi³
1. TechnipFMC, Rueil-Malmaison, France; 2. TechnipFMC, Lysaker, Norway; 3. Total, Pau, France

Ocean Engineering

6-13-3 Numerical Methods

Thursday June 13 Room SEC, M2 & M3 | 13:30 – 15:00
Session Chair: D.C. Wan, Shanghai Jiao Tong University, China

RANS Based Resistance Prediction for Tumblehome Hull with Different Bow Appendages in Calm Water OMAE2019-95449

Shuzheng Sun, Xin Zhao
Harbin Engineering University, Harbin, China

CFD Simulation of a Twin-screw Ship Self-propulsion using DDES-Overset Method OMAE2019-95527

Jianhua Wang, D.C. Wan
Shanghai Jiao Tong University, Shanghai, China

A Numerical Method for Calculation of Ship-Ship Hydrodynamics Interaction in Shallow Water

Accounting for Sinkage and Trim OMAE2019-96151

Huilong Ren¹ Chen Xu¹ Xueqian Zhou¹ Serge Sutulo² Carlos Guedes Soares³
1. Harbin Engineering University, Harbin, China; 2. Lisbon University, Lisbon, Portugal; 3. Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal

Computations of Hydrodynamic Forces on Vessels Advancing in Waves by Four-node Higher-order Boundary Element Method OMAE2019-96792

Yuntao Yang, Renchuan Zhu, Shan Huang
Shanghai Jiao tong University, Shanghai, China

Improved Transient FSI Model in SPH Method and its Applications OMAE2019-95257

Aman Zhang¹ Pingping Wang¹ Furen Ming¹ Pengnan Sun²
1. Harbin Engineering University, Harbin, China; 2. Ecole Centrale Nantes, Nantes, France

Research on The Blade Element Theory Coupled with Viscous Flow OMAE2019-95887

Zhiheng Li¹ Jiawei Yu² Dakui Feng² Kaijun Jiang² Yujie Zhou²
1. China Ship Design and Development Center, Wuhan, China; 2. Huazhong University of Science and Technology, Wuhan, China

Numerical Simulation of Submarine Self-propulsion based on Different Turbulent Simulation Models OMAE2019-95874

Tiechao Bai¹ Yongfeng Wu² Peng Wei² Shuang Wang² Liwei Liu²
1. China Ship Design and Development Center, Wuhan, China; 2. Huazhong University of Science and Technology, Wuhan, China

CFD Study of Propeller Cavitation with Hull-propeller Interaction OMAE2019-95892

Chang Wei Kang, Xiuqing Xing
Institute of High Performance, A*STAR, Singapore, Singapore

Ocean Engineering

6-7-3 Metocean Criteria I

Thursday June 13 Room SEC, M4 | 13:30 – 15:00

Session Chair: Gus Jeans, Oceananalysis Ltd, United Kingdom
Session Co-Chair: Kevin Ewans, MetOcean Research Ltd, New Zealand

Including the Impact of Climate Change in Offshore and Onshore Metocean Design Criteria to Ensure Asset Robustness OMAE2019-95205

Alison Brown¹ Ag Stephens² Ben Rabb³ Richenda Connell⁴ Jon Upton⁵
1. Shell Research Ltd, Aberdeen, United Kingdom; 2. STFC Centre for Environmental Data Analysis, Didcot, United Kingdom; 3. Acclimatise Group Ltd, Cardiff, United Kingdom; 4. Acclimatise Group Ltd, Oxford, United Kingdom; 5. Shell Research Ltd., Aberdeen, United Kingdom

Estimating Operational Weather Downtime: A Comparison of Analytical Methods OMAE2019-95367

David Lambkin, Ian Wade, Robin Stephens
ABPmer, Southampton, United Kingdom

Decisional Criteria for Offshore Operations Interruption due to Adverse Weather OMAE2019-96086

Michele Drago¹ Luigino Vitali¹ Andrea Del Guzzo² Federico Gaggiotti¹
1. Saipem S.p.A., Fano, Italy; 2. Saipem, Kuala Lumpur, Malaysia

A New Method for Deriving Soliton Design Criteria OMAE2019-96637

Gus Jeans¹ Oliver Jones² Michael Zhang³ Chris Jackson⁴ Nataliya Stashchuk⁵ Alfred R. Osborne⁶ Ole Petersen⁷ Jose da Silva⁸
1. Oceananalysis Ltd, Wallingford, United Kingdom; 2. BP Sunbury-on-Thames, United Kingdom; 3. BP America Inc, Houston, TX, USA; 4. Global Ocean Associates, Alexandria, VA, USA; 5. Independent Author, Plymouth, United Kingdom; 6. Nonlinear Wave Research Corporation, Alexandria, VA, USA; 7. DHI, Horsholm, Denmark; 8. University of Oporto, Oporto, Portugal

CFD & FSI

8-1-7 Propulsion

Thursday June 13 Room SEC, Dochart 1 | 13:30 – 15:00

Session Chair: Karl Halse, Norwegian University of Science and Technology, Norway
Session Co-Chair: Samuel Holmes, Red Wing Engineering, Inc, USA

An Investigation into the Effect of Biofouling on Full-scale Propeller Performance using CFD OMAE2019-95315

Soonseok Song, Yigit Demirel, Mehmet Atlar
University of Strathclyde, Glasgow, United Kingdom

CFD & FSI

8-4-4 VIV Suppression and Control

Thursday June 13 Room SEC, Lomond Auditorium | 13:30 – 15:00

Session Chair: Decao Yin, SINTEF Ocean, Norway
Session Co-Chair: Madhusuden Agrawal, BP, USA

Forced Vibration Tests for In-line VIV to Assess Partially Strake-covered Pipeline Spans OMAE2019-95970

Jie Wu¹ Decao Yin¹ Elizabeth Passano¹ Halvor Lie¹ Ralf Peek² Octavio Sequeiros³ Sze Yu Ang³ Chiara A. Bernardo⁴ Meliza Atienza⁴
1. SINTEF Ocean, Trondheim, Norway; 2. Peek Solutions, St. Andreu de Llavaneres, Spain; 3. Shell Global Solutions International B.V., Rijswijk, Netherlands; 4. Shell Philippines Exploration B.V., Manila, Philippines

Laboratory Investigation of Helical Strakes with Serrated and Twisted Fins to Suppress VIV OMAE2019-95129

Gustavo R. S. Assi, Tommaso Crespi
University of São Paulo, São Paulo, Brazil

Staggered Grooves for the Suppression of Vortex-induced Vibration in Flexible Cylinders OMAE2019-95649

Yun Zhi Law¹ Rajeev Kumar Jaiman²
1. National University of Singapore, Singapore, Singapore;
2. University of British Columbia, Vancouver, BC, Canada

The Investigation of a Circular Cylinder with a Detached Flexible Plate using Immersed Smoothed Point Interpolation Method OMAE2019-95610

Boqian Yan¹ Shuangqiang Wang¹ Guiyong Zhang² Qihang Xiao¹ Peng Wang¹
1. School of Naval Architecture, Dalian University of Technology, Dalian, China; 2. Dalian University of Technology, Dalian, China

Ocean Renewable Energy

9-4-1 Power Take-offs and Experiments

Thursday June 13 Room SEC, Carron 2 | 13:30 – 15:00

Session Chair: Masoud Hayatdavoodi, University of Dundee, United Kingdom
Session Co-Chair: Jerica Nolte, Principle Power, France

Design and Construction of a 1/15th Scale Wave Tank Model of the Azura Commercial Wave Energy Converter OMAE2019-95538

Bradley A. Ling¹ Terry Lettenmaier² Matthew Fowler³ Matthew Cameron³ Anthony M. Viselli³
1. Northwest Energy Innovations, Portland, OR, USA; 2. Williwaw Engineering, South Beach, OR, USA; 3. UMaine Advanced Structures and Composites Center, Orono, ME, USA

Power Take-off Selection for a U-Shaped OWC Wave Energy Converter OMAE2019-96368

Alessandra Romolo¹ Joao C.C. Henriques² Luis Gato³ Giovanni Malara¹ Valentina Laface¹
Rui P. F. Gomes² Juan C. C. Portillo³ Antonio F.O. Falcão² Felice Arena¹
1. *University Mediterranea, Reggio Calabria, Italy*; 2. *IDMEC, Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal*; 3. *Instituto Superior Técnico, Universidade de Lisboa, Lisboa, Portugal*

A Critical Examination of the Hysteresis in Wells Turbines using CFD and Lumped Parameter Models OMAE2019-96518

Tiziano Ghisu¹ Francesco Cambuli² Pierpaolo Puddu¹ Irene Viridis¹ Mario Carta¹ Fabio Licheri¹
1. *University of Cagliari, Cagliari, Italy*; 2. *University of Cagliari, DIMCM, Cagliari, Italy*

Experimental Study on Coupled Motions of a Spar-buoy under Mathieu Instability OMAE2019-95937

Toshio Iseki, Peng Xu
Tokyo University of Marine Science and Technology, Tokyo, Japan

Ocean Renewable Energy

9-5-4 Numerical Analysis II

Thursday June 13 Room SEC, Carron 1 | 13:30 – 15:00

Session Chair: Madjid Karimirad, Queen's University Belfast, United Kingdom
Session Co-Chair: Milad Armin, Liverpool John Moores University, United Kingdom

Investigation of the Flow around a Tidal Stream Turbine OMAE2019-95722

Hassan el Sheshtawy, Ould el Moctar, Thomas Schellin, Satish Natarajan
University of Duisburg-Essen, Duisburg, Germany

The Influence of Tidal Unsteadiness to a Tidal Turbine Blade Flow-induced Vibration OMAE2019-96007

Nu Rhahida Arini¹ Stephen Turnock² Mingyi Tan²
1. *University of Exeter, Penryn, United Kingdom*;
2. *University of Southampton, Southampton, United Kingdom*

An Actuator Disc Analysis of a Ducted High-solidity

Tidal Turbine in Yawed Flow OMAE2019-96014
Mitchell Borg¹ Qing Xiao¹ Atilla Incek¹ Steven Allsop² Christophe Peyrard³
1. *University of Strathclyde, Glasgow, United Kingdom*;
2. *Electricite de France, Chatou, France*; 3. *EDF R&D, Chatou, France*

Hydrodynamic Performance of a Current Energy Generator based on WIG OMAE2019-96378

Wang Jian, Guanghua He, Mo Weijie, Zhang Shijun, Jiangtao Man
Harbin Institute of Technology, Weihai, China

Petroleum Technology

11-1-3 General Petroleum Technology – Drilling and Separation Enhancement

Thursday June 13 Room Crowne Plaza, Jura | 13:30 – 15:00

Session Chair: Stephen Butt, Memorial University of Newfoundland, Canada
Session Co-Chair: Mohammad Rahman, Texas A&M University at Qatar, Qatar

Study of the Relationship between Oriented Downhole Dynamic Weight on Bit and Drilling Parameters in Coring Isotropic Natural and Synthetic Rocks OMAE2019-96176

Abdelsalam Abugarara, John Molgaard, Charles Hurich, Stephen Butt
Memorial University of Newfoundland, St. John's, NL, Canada

Operational Behaviour of Supersonic Separators for Real Gas Mixtures of Methane and Carbon Dioxide, from the Homogeneous Nucleation Point of View OMAE2019-96315

Julian Restrepo¹ Jose R. Simões-Moreira²
1. *Universidade de São Paulo, São Paulo, DF, Brazil*; 2. *Universidade de São Paulo - SISEA Alternative Energy Systems Laboratory, São Paulo, SP, Brazil*

Triaxial Testing of Gas Shale Permeability Dependence on Heterogeneous Stress with Respect to Bedding OMAE2019-96707

Yufei Chen¹ Changbao Jiang¹ Guangzhi Yin¹ Andrew Wojtanowicz² Dongming Zhang¹
1. *Chongqing University, Chongqing, China*; 2. *Louisiana State University, Baton Rouge, LA, USA*

Improvement of the Method for Calculating Downhole Weight on Bit and its Application in Autodriller Systems OMAE2019-96784

Zebing Wu¹ Longlong Guo¹ Shuai Zhang¹ Yuanping Wu² Lantao Lv¹
Wenjuan Wang¹ Yujie Pan¹ Yongyong Wang¹ Adnane El Mokhtari¹
1. *Xi'an Shiyou University, Xi'an, China*; 2. *Drilling Research Institute of CNPC, Jingzhou, China*

Petroleum Technology

11-11-1 Innovations in Drilling, Production and Transport

Thursday June 13 Room Crowne Plaza, Barra | 13:30 – 15:00

Session Chair: Ming Feng, Chongqing University, China
Session Co-Chair: wenting Qin, China University of Petroleum Beijing, China

Optimizing Well Locations in Green Fields using Fast Marching Method: Optimize Well Locations for Millions of Cells using Hundreds of Scenarios and Realizations with High Accuracy in Seconds OMAE2019-95190

Abdulaziz AlQasim¹ Mohan Kelkar²
1. *Saudi Aramco, Dhahran, Saudi Arabia*; 2. *University of Tulsa, Tulsa, OK, USA*

Architectures and Algorithms for a Smart Drilling Robot OMAE2019-95486

Suranga Geekiyanage¹ Erik Andreas Løken² Dan Sui¹ Tomasz Wiktorski¹
1. *University of Stavanger, Stavanger, Norway*; 2. *University of Stavanger, Tananger, Norway*

Feature Analysis and Design for Kick Detection with Machine Learning using Laboratory Scale Rig Data OMAE2019-95496

Suranga Geekiyanage¹ Adrian Ambrus² Dan Sui¹
1. *University of Stavanger, Stavanger, Norway*; 2. *NORCE, Stavanger, Norway*

The Experimental Investigation of Completion Fluid Working as a Good Thermal Insulation in the Deepwater Production Well OMAE2019-95725

Ming Feng¹ Boyun Guo²
1. *Chongqing University, Chongqing, China*;
2. *University of Louisiana at Lafayette, Lafayette, LA, USA*

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-3-3 Ocean Current Energy, OTEC and Related Technology

Thursday June 13 Room SEC, Boisdale 2 | 13:30 – 15:00

Session Organizer: Yusaku Kyojuka, Nagasaki University, Japan
Session Co-Chair: Motohiko Murai, Yokohama National University, Japan

Optimization of a Horizontal Axis Tidal Current Turbine by Multi-objective Optimization OMAE2019-95829

Takumi Nagataki, Ko Kurokawa, Reiko Yamada, Daisaku Sakaguchi, Yusaku Kyojuka
Nagasaki University, Nagasaki, Japan

Stability Analysis of Free Hanging Riser Conveying Fluid for Ocean Thermal Energy Conversion (OTEC) Utilization OMAE2019-96749

Ristiyananto Adiputra, Tomoaki Utsunomiya
Kyushu University, Fukuoka, Japan

Numerical Estimation of Multiple Positions of Seepage of Dissolved Matter from Seafloor OMAE2019-95733

Shunsuke Kanao¹ Toru Sato²
1. The University of Tokyo, Nagareyama, Japan; 2. The University of Tokyo, Kashiwa, Japan

BioFREE: A Novel System for Monitoring Biofouling and Testing Antifouling Coatings in High-energy Habitats used by the Offshore Renewable Energy Industry OMAE2019-96611

Andrew Want, Joanne Porter
Heriot-Watt University, Stromness, United Kingdom

REFRESHMENT BREAK

15:00 – 15:30

Location: Hall 5 (SEC)

CONCURRENT SESSIONS

15:30 – 17:30

Offshore Technology

1-4-1 Experimental Design and Analysis

Thursday June 13 Room SEC, Alsh 1 | 15:30 – 17:30

Session Chair: M A Hannan, Newcastle University, UK (Singapore Unit), Singapore
Session Co-Chair: David Molyneux, Memorial University of Newfoundland, Canada

Numerical Solutions and Model Test Design for Anti-typhoon Drilling Riser OMAE2019-95196

Jinlong Wang¹ Lihui Li¹ Frank Lim¹ Zhang Hui¹ Xu Liangbin² Sheng Leixiang² Ruijia Jin³
1. 2H Offshore, Beijing, China; 2. CNOOC Research Institute, Beijing, China;
3. Tianjin Research Institute for Water Transport Engineering, Tianjin, China

Vortex-induced-vibration of Jack-ups with Cylindrical Legs in Regular Waves OMAE2019-95764

Sudheesh Ramadasan¹ Longbin Tao² Arun Dev³
1. Newcastle University in Singapore (Cybermarine Technologies Pte Ltd), Singapore, Singapore; 2. University of Strathclyde, Glasgow, United Kingdom;
3. Newcastle University in Singapore, Singapore, Singapore

Numerical Investigation of Wave-frequency Pontoon Responses of a Floating Bridge based on Model Test Results OMAE2019-96545

Yanlin Shao¹ Xu Xiang² Jianyu Liu³
1. Technical University of Denmark, Kongens Lyngby, Denmark; 2. Norwegian Public Roads Administration, Oslo, Norway; 3. Harbin Engineering University, Harbin, China

Lazy Wave Riser Design in High Current and Mild Sour Environment OMAE2019-96588

Rupak Ghosh¹ Carlo Pellegrini² Tyler Visco¹
1. ExxonMobil, Spring, TX, USA; 2. Saipem America, Houston, TX, USA

Investigations on Mode Localization of Offshore

Wind Turbine Blades OMAE2019-96616
Dongsheng Li¹ Yongpeng Zhang² Xin Guo² Xinglin Guo²
1. Shantou University, Shantou, China; 2. Dalian University of Technology, Dalian, China

Structures, Safety and Reliability

2-5-1 Reliability of Marine Structures

Thursday June 13 Room Crowne Plaza, Castle 1 | 15:30 – 17:30

Session Chair: Carlos Guedes Soares, Instituto Superior Técnico, Universidade de Lisboa, Portugal
Session Co-Chair: Paulo M. Videiro, LACEO/COPPE/Federal University of Rio De Janeiro, Brazil

An Approach for Estimating the Corrosion Rates on Aging FPSO Hull Structures OMAE2019-95067

Vicente Larangeira¹ Paulo M. Videiro² José Júnior³ Luis V.S. Sagrilo²
1. LACEO/ Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. LACEO/COPPE/Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 3. Shell Brasil, Rio de Janeiro, RJ, Brazil

Remaining Useful Life Estimation of Subsea Pipelines under the Influences of Multiple Causes OMAE2019-95125

Baoping Cai¹ Xiaoyan Shao¹ Yonghong Liu¹ Xiangdi Kong¹ Hongqi Xu² Weifeng Ge³
1. China University of Petroleum, Qingdao, China;
2. Rongsheng Machinery Manufacture Ltd. of Huabei Oilfield, Renqiu, China;
3. CNOOC Safety & Technology Services Co., Ltd, Tianjin, China

Mode Selection for Offshore Platform Damage Identification using CMSE Sensitivity OMAE2019-95550

Mingqiang Xu, Yuchi Liu, Yufeng Jiang, Shuqing Wang
Ocean University of China, Qingdao, China

A Simple, Safe, and Reliable Nuclear Reactor Power System Concept for Deep Sea Missions OMAE2019-95857

Gu Hu, Weijian An, Xiaobo Sun
China Institute of Atomic Energy, Beijing, China

Random Combination Factors for Still Water and Wave Bending Moments OMAE2019-96665

Wenbo Huang
Harbin Engineering University, Harbin, China

Materials Technology

3-13-1 Dr. John Sharp Honorary Session

Thursday June 13 Room SEC, Boisdale 1 | 15:30 – 17:30

Session Chair: Gerhard Ersdal, Petroleum Safety Authority, Norway
Session Co-Chair: Alexander Stacey, Energy Division, Health & Safety Executive, United Kingdom

Overview of Structural Integrity Research & Development for the Safe Operation of Offshore Installations on the UKCS OMAE2019-95835

Alexander Stacey¹ John Sharp²
1. Energy Division, Health & Safety Executive, London, United Kingdom;
2. Cranfield University, Bedford, United Kingdom

The International Committee on Regulatory Authority Research and Development (ICRARD) an Early History OMAE2019-96598

Charles Smith
Consultant, Bay Roberts, NL, Canada

Inspection and Repair of Ageing Offshore Structures OMAE2019-96842

John Sharp
Cranfield University, Bedford, United Kingdom

Ageing and Life Extension of Offshore Structures OMAE2019-96841

Gerhard Ersdal
Petroleum Safety Authority, Stavanger, Norway

Pipelines, Risers, and Subsea Systems

4-4-2 Subsea Structures II

Thursday June 13 Room **Crowne Plaza, Staffa / Shuna** | 15:30 – 17:30

Session Chair: Duane DeGeer, INTECSEA, USA

Session Co-Chair: Ruud Selker, INTECSEA, Netherlands

The Influence of Piping Arrangement on the Response of Vibration Isolation System under Underwater Explosion Loading OMAE2019-95603

Chen Pan¹ Wei Qiang¹ Liu Zhizhong² Wang Guan¹

1. China Ship Development and Design Center/National Key Laboratory on Ship Vibration & Noise, Wuhan, China; 2. China Ship Development and Design Center, Wuhan, China

A PDE Model for Estimating the Life Time of a Riser OMAE2019-96185

Halvor Snersrud Gustad¹ Per T. Moe² Elena Celledoni³

1. TechnipFMC, Trondheim, Norway; 2. TechnipFMC, Kongsberg, Norway; 3. Norwegian University of Science and Technology, Trondheim, Norway

CFD Simulation of a Flow Homogenizer for

Subsea Pumping Systems OMAE2019-96255

Nicolao Lima, Karla Holzmeister, Raphael Santos, Diener Volpin, Roberto Nunhez State University of Campinas, Campinas, SP, Brazil

Computational Simulation of the Drilling Vessel Motion and its Effects on the Riser/BOP Connection OMAE2019-96367

Xavier Castello¹ José Luis Quispe¹ Segen Estefen²

Marcelo Igor Lourenço Souza² Nilo de Moura Jorge¹

1. COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Multiphase Flow Induced Forces on Bend Structures OMAE2019-96387

Stefan Belfroid, Nestor Gonzalez Diez, Hajo Pereboom, Can Tümer

TNO, Delft, Netherlands

Pipelines, Risers, and Subsea Systems

4-6-2 Innovative Technologies for Deepwater Low-Cost Production II

Thursday June 13 Room **Crowne Plaza, Castle 3** | 15:30 – 17:30

Session Chair: Ping Liu, INTECSEA, Netherlands

Session Co-Chair: Doug Swanek, C-FER Technologies, Canada

Self-healing Concrete for under Water Cementitious Structures: using Urea-decomposable and Urea Non-degradable

Microbial Co-cultures Capsule, Part 1 OMAE2019-96492

Muhammad Salman Haider, Wasif Muhammad, Sajjad Miran

University of Gujrat, Gujrat, Pakistan

Self-healing Concrete for under Water Cementitious Structures: using Urea-decomposable and Urea Non-degradable

Microbial Co-cultures Capsule, Part 2 OMAE2019-96498

Muhammad Salman Haider, Wasif Muhammad, Sajjad Miran

University of Gujrat, Gujrat, Pakistan

Submerged Production Unit: Design and Method for Launch and Tow to Field OMAE2019-95291

Venkatesan Arumugam Elumalai¹ Sigbjørn Daasvatn¹

Daniel Karunakaran¹ Kjell Larsen² Bernt Leira³

1. Subsea 7 Norway AS, Stavanger, Norway; 2. Equinor ASA, Trondheim, Norway; 3. Norwegian University of Science and Technology, Trondheim, Norway

Ocean Engineering

6-7-4 Metocean Criteria II

Thursday June 13

Room **SEC, M4** | 15:30 – 17:30

Session Chair: Gus Jeans, Oceanalysis Ltd, United Kingdom

Session Co-Chair: Kevin Ewans, MetOcean Research Ltd, New Zealand

Spatial and Seasonal Variability of Metocean Design Criteria in Southern South China Sea from Covariate

Extreme Value Analysis OMAE2019-95913

Vadim Anokhin¹ Emma Ross² David Randell¹ Philip Jonathan³

1. Sarwak Shell Bhd, Kuala Lumpur, Malaysia; 2. Shell Global Solutions BV, Amsterdam, Netherlands; 3. Shell Research Ltd., London, United Kingdom

Metocean Criteria for the Fatigue Analysis of Subsea Pipelines OMAE2019-96363

Richard Gibson, Marios Christou

Offshore Consulting Group, London, United Kingdom

The Derivation and Interpretation of Directional Design Criteria OMAE2019-96586

Graham Feld¹ Philip Jonathan² David Randell³

1. Shell U.K. Limited, Aberdeen, United Kingdom; 2. Shell Research Ltd., London, United Kingdom; 3. Shell Global Solutions BV, Amsterdam, Netherlands

On Environmental Contours for Marine Design OMAE2019-96587

Emma Ross¹ Ole Christian Astrup² Elzbieta M. Bitner-Gregersen² Nigel Bunn³ Graham Feld⁴

Ben Gouldby³ Arne Huseby⁵ Ye Liu³ David Randell¹ Erik Vanem² Philip Jonathan⁶

1. Shell Global Solutions BV, Amsterdam, Netherlands; 2. DNV GL, Høvik, Norway; 3. HR Wallingford Ltd, Wallingford, United Kingdom; 4. Shell U.K. Limited, Aberdeen, United Kingdom; 5. University of Oslo, Oslo, Norway; 6. Shell Research Ltd., London, United Kingdom

CFD & FSI

8-5-2 VIV Theory and CFD&FSI Symposium Workshop

Thursday June 13

Room **SEC, Lomond Auditorium** | 15:30 – 17:30

Session Chair: Yiannis Constantinides, Chevron, USA

Session Co-Chair: Owen H. Oakley, Jr, Retired, USA

Dispersion Relation for Flow Induced Oscillations (VIV/Galloping) Revealed at the Fluid-Structure Interface OMAE2019-96823

Michael Bernitsas, James Ofuegbe, Jau-Uei Chen, Hai Sun

University of Michigan, Ann Arbor, MI, USA

Ocean Renewable Energy

9-2-6 Hybrid Systems and Farm Analysis

Thursday June 13

Room **SEC, Carron 1** | 15:30 – 17:30

Session Chair: Maurizio Collu, University of Strathclyde, United Kingdom

Session Co-Chair: K A Abhinav, University of Strathclyde, United Kingdom

Characterizing Impacts of Atmospheric Turbulence on Wind Farms through Large Eddy Simulation (LES) OMAE2019-95837

Jahrul Alam¹ Anton Afanassiev² Jagdeep Singh¹

1. Memorial University of Newfoundland, St John's, NL, Canada;

2. University of British Columbia, Vancouver, BC, Canada

Development of a Hybrid Power Generation Platform Combining Floating Wind Turbine and Oscillating Water

Column Wave Energy Converters OMAE2019-95968

Zheng Chen, Weijian Zeng, Ming Tan, Dahai Zhang, Yulin Si

Zhejiang University, Zhoushan, China

Design Methodology for a Floating Offshore Wind Turbine Large-scale Outdoor Prototype OMAE2019-95979

Alessandro Fontanella, Federico Taruffi, Muggiasca Sara, Marco Belloli
Politecnico di Milano, Milano, Italy

Hybrid Renewable Energy Systems Configuration for Offshore Multi-purpose Platforms OMAE2019-96017

Luis Recalde¹ Hong Yue¹ William Leithead¹ Olimpo Anaya-Lara¹ Hongda Liu² Jiang You²
1. University of Strathclyde, Glasgow, United Kingdom; 2. Harbin University, Harbin, China

Progress on the Development of a Holistic Coupled Model of Dynamics for Offshore Wind Farms, Phase II: Study on a Data-driven Based Reduced-order Model for a Single Wind Turbine OMAE2019-95542

Zi Lin¹ Adrian-Mihai Stetco² Jesus Carmona-Sanchez² Debora Cevasco¹
Maurizio Collu¹ Goran Nenadic² Ognjen Marjanovic² Mike Barnes²
1. University of Strathclyde, Glasgow, United Kingdom;
2. Manchester University, Manchester, United Kingdom

Ocean Renewable Energy

9-3-3 Wave Energy: CFD Simulations

Thursday June 13 Room SEC, Carron 2 | 15:30 – 17:30
Session Chair: Jennifer van Rij, National Renewable Energy Laboratory, USA

A Validation of a Pivoted Point Absorber Type Wave Energy Converter using CFD OMAE2019-96030

Injun Yang, Tahsin Tezdogan, Atilla Incecik
University of Strathclyde, Glasgow, United Kingdom

Extreme Load CFD Analysis and Verification for a Multi-body Wave Energy Converter OMAE2019-96397

Jennifer van Rij¹ Yi-Hsiang Yu¹ Alan McCall² Ryan Coe³
1. National Renewable Energy Laboratory, Golden, CO, USA; 2. Ecomerit Technologies, Santa Barbara, CA, USA; 3. Sandia National Laboratories, Albuquerque, NM, USA

A Study of Harbor Resonant Wave Energy Harvester OMAE2019-95325

Bang-Fuh Chen, Yun-Da Si
National Sun Yat-Sen University, Kaohsiung, Taiwan

Experimental and Numerical Analysis of Performance of Oscillating Water Column Wave Energy Converter Applicable to Breakwaters OMAE2019-96500

Sewan Park, Kyong-Hwan Kim, Bo Woo Nam, Jeong-Seok Kim, Keyyong Hong
Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea

Petroleum Technology

11-11-2 Innovations in Drilling, Production and Transport

Thursday June 13 Room Crowne Plaza, Barra | 15:30 – 17:30
Session Chair: Ming Feng, Chongqing University, China
Session Co-Chair: Wenting Qin, China University of Petroleum Beijing, China

Optimization of Temporary Plugging Parameters under Rough Fractures OMAE2019-95748

Lishan Yuan¹ Fujian Zhou¹ Jianbo Huang² Ben Li¹ Junjie Gao¹ Caizhong Wang¹ Yanxin Tan¹
1. China University of Petroleum-Beijing, Beijing, China;
2. PetroChina Xinjiang Oilfield, Xinjiang, China

Study on Acid Fracturing Technology for Carbonate Reservoirs in Ordos Basin OMAE2019-95802

Lufeng Zhang, Fujian Zhou, Jianye Mou, Jie Wang, Jin Wang, Yuechun Wang
China University of Petroleum-Beijing, Beijing, China

The Tentative Case Study of Annulus Build Up Pressure in the Deepwater Gas Production Well in South China Sea OMAE2019-95847

Ming Feng
Chongqing University, Chongqing, China

Study on Desulfurization and Decarbonization Technology of Natural Gas on Bohai Offshore Platform OMAE2019-96733

Ping Lu, Zhaoguang Qu, Guoqiang Gao, Yan Huang, Xin Qian, Lin Cheng
Bohai Oilfield Research Institute, Tianjin Branch, CNOOC China Limited, Tanggu, China

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-3-1 Wind Energy

Thursday June 13 Room SEC, Boisdale 2 | 15:30 – 17:30
Session Organizer: Tomoaki Utsunomiya, Kyushu University, Japan
Session Co-Organizer: Hideyuki Suzuki, University of Tokyo, Japan

At-sea Experiment on Durability and Residual Strength of Polyester Rope for Mooring of Floating Wind Turbine OMAE2019-95388

Tomoaki Utsunomiya¹ Iku Sato² Koji Tanaka²
1. Kyushu University, Fukuoka, Japan; 2. TODA CORPORATION, Tokyo, Japan

Weathervane Performance and Stability Analysis of Single Point Moored FOWTs under Wind-current Coexisting Field OMAE2019-95404

Sharath Srinivasamurthy¹ Kazuki Hashimoto¹ Kazuhiro Iijima² Yasunori Nihei¹
1. Osaka Prefecture University, Osaka, Japan; 2. Dept of NAOE, Osaka University, Osaka, Japan

New Spar Design for Floating Offshore Wind Turbine with Damping Plates OMAE2019-95688

Shigesuke Ishida, Yasutaka Imai
Saga University, Saga, Japan

Comparison of Dynamic Response in a 2MW Floating Offshore Wind Turbine during Typhoon Approaches OMAE2019-95889

Koji Tanaka¹ Iku Sato¹ Tomoaki Utsunomiya² Hiromu Kakuya³
1. Toda Corporation, Tokyo, Japan; 2. Kyushu University, Fukuoka, Japan; 3. Hitachi, Ltd, Hitachi-shi, Japan

Response Characteristics of a Floating Structure with Moon Pools Installed with Vertical-axis Wind Turbines OMAE2019-96045

Mitsuru Nakamura¹ Tomoki Ikoma¹ Hiroaki Eto¹ Yasuhiro Aida² Koichi Masuda¹
1. Nihon University, Funabashi, Japan; 2. Nihon University, Chiba, Japan

Farewell Reception

17:30 – 19:00
Location: Argyll Suite, Crowne Plaza
See Social Events, page 14 for more details.

Sponsored by Greater Ft. Lauderdale Convention Bureau
GREATER FORT LAUDERDALE
CONVENTION & VISITORS BUREAU

Technical Tours: Friday, June 14

The Local Organizing Committee has arranged two technical day tours that promise to be an excellent addition to your conference experience. On Friday, June 14th you have the option of a morning tour of either the University of Strathclyde's Advanced Forming Research Centre (AFRC) or the Glasgow Subsea 7 facilities. Both tours will join together for lunch and then visit the Falkirk Wheel for a boat tour of the world's only rotating boatlift. A stop to visit the iconic Kelpies is included on the way to the Wheel.

Tour 1: Advanced Forming Research Centre (AFRC) and Falkirk Wheel

Tour 2: Subsea 7 and Falkirk Wheel

Registration: Pre-purchased tickets for the tour are provided with your name badge. Additional tickets will be for sale at the Registration Desk if space is still available.

Meeting Point for Technical Tour: Main Entrance / Lobby of the Crowne Plaza Hotel

Technical Tour Departure Times:

- Subsea 7 and Falkirk Wheel Departure: **08:30**
- Advanced Forming Research Centre (AFRC) and Falkirk Wheel Departure: **09:15**

Approximate Return Time: 18:30

Technical Tour Ticket: £65 (includes 20% VAT, lunch and Falkirk Wheel boat admission)

Advanced Forming Research Centre

The University of Strathclyde's Advanced Forming Research Centre (AFRC) is a globally-recognised centre of excellence in innovative manufacturing technologies, engineering research and development, and metal forming and forging research.

For almost a decade the centre has been at the heart of manufacturing research in Scotland. It is the only High Value Manufacturing Catapult centre in the country, one of only 7 in the UK making it the critical link between manufacturers in Scotland and the rest of this world-class network of manufacturing innovation and expertise.

The AFRC helps to fill the gap between fundamental



University of Strathclyde Advanced Forming Research Centre

academic research and industry. We help companies to turn innovative technologies and ideas into a commercial reality that will increase their competitiveness, boost their business and secure the manufacturing sector in Scotland and the UK for generations to come.

We offer world-class expertise and cutting edge technologies that help firms develop solutions that bring about real business benefits for companies of all sizes from across the UK and internationally.

Subsea 7

Subsea 7 is a global leader in the delivery of offshore



projects and services for the evolving energy industry.

Subsea 7's Global Pipeline Welding Development Centre is a world-class facility that supports the continued development of leading-edge welding and material technology to meet demands of high-integrity pipelines for the subsea oil and gas industry. Built in 2013 it serves as a technical authority for the rolling-out of welding enhancements and polymer lining solutions to all Subsea 7 fabrication bases globally.

The centre provides and uses:

- Integrated R&D welding and inspection capability
- Pre-fabrication welding qualification and procedures
- Wide range of welding technologies & solutions
- Ultrasonic & radiographic NDE testing
- Laboratory & sectioning capability.
- Home to Swagelining, the world's leading polymer lining specialist for subsea pipelines

Falkirk Wheel

The Falkirk Wheel is a rotating boat lift in central Scotland, connecting the Forth and Clyde Canal with the Union Canal. The lift is named after Falkirk, the town in which it is located. It reconnects the two canals for the first time since the 1930s. It opened in 2002 as part of the Millennium Link project.

The wheel raises boats by 24 metres (79 ft), but the Union Canal is still 11 metres (36 ft) higher than the aqueduct which meets the wheel. Boats must also pass through a pair of locks between the top of the wheel and the Union Canal. The Falkirk Wheel is the only rotating boat lift of its kind in the world, and one of two working boat lifts in the United Kingdom, the other being the Anderton Boat Lift.



Subsea 7 Glasgow Facilities

13th Annual Outreach for Engineers Specialty Forum

“I have learned a lot on so many levels and I am so thankful to the Committee for having granted me a scholarship for this event. The forum has given me great insights on what working in industry could represent and thanks to that I am now considering new stimulating options for my future career.”

—Comment from an Outreach attendee.

Overview

The Ocean, Offshore and Arctic Engineering Division (OOAE) of ASME is hosting a specialty forum at the 2019 International Conference on Ocean, Offshore and Arctic Engineering (OMAE) in Glasgow, United Kingdom. The specialty forum is designed for students and early professionals who may not be familiar with the industry as well as those who have already specialized in this area.

This is the thirteenth year of the Outreach for Engineers Forum. Highlights of the Forum will include presentations of the various technologies required (e.g. from ocean and/or offshore engineering, civil engineering, petroleum engineering, aerospace engineering, mechanical/structural engineering and project management), types of job opportunities, possible career paths and a team building activity. As each year is different, a site tour or job fair may be included.

In addition, Outreach for Engineers Specialty Forum delegates will be provided with the opportunity to participate at OMAE 2019 as full conference delegates. This conference will showcase over 900 technical papers from engineers and scientists from around the world, with 13 Symposia representing the range of technologies.

Attendee Profile

- Senior Undergraduate Students enrolled in Engineering or Science Curricula
- Graduate Students (both Master and Doctoral levels) with specialization in fields such as ocean and/or offshore engineering, civil engineering, mechanical engineering, petroleum engineering, and aerospace engineering
- Early professionals with an interest in the oil & gas industry and ocean, offshore & arctic engineering

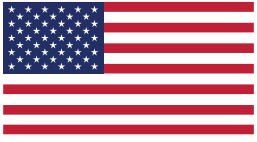
Scholarships

Through funding provided by the OOAE Division of ASME and corporate sponsors, the organizers of the Outreach to Engineers Specialty Forum will be offering scholarships to cover registration costs and a limited number of travel subsidies. The scholarships are open to students and early professionals from around the world. If you qualify and have not been a recipient yet, please feel free to apply for OMAE 2020 on the conference website.

Conference Schedule with Outreach Events

Date	Event	Time	Location
Saturday, June 8	Outreach Team Building Exercise	17:00 – 19:00	Staffa/Shuna (Crowne Plaza)
Saturday, June 8	Outreach Welcome Dinner	19:00	Off-site
Sunday, June 9	Outreach Welcome & Introductions plus Industry Presentations	08:00 – 17:00	Castle 1 (Crowne Plaza)
	OMAE 2019 Conference Registration	13:00 – 20:00	Hall 5 (SEC)
	OMAE 2019 Conference Welcome Reception	18:30 – 20:30	Glasgow Science Centre
Monday, June 10	OMAE 2019 Conference	See detailed program for session locations and times.	
Tuesday, June 11	OMAE 2019 Conference	See detailed program for session locations and times.	
Wednesday, June 12	OMAE 2019 Conference	See detailed program for session locations and times.	
	OMAE 2019 Conference Banquet	19:00 – 24:00	Merchant Square
Thursday, June 13	Outreach Breakfast / Feedback Session	07:30 – 10:00	Alsh 2 (SEC)
	OMAE 2019 Conference	See detailed program for session locations and times.	
Friday, June 14	OMAE Technical Tour (Optional)	See Technical Tour on page 87 for locations and times.	

Note: Outreach only events are bolded.



OMAE 2020

FORT LAUDERDALE



Professor Manhar R. Dhanak



Professor Ronald W. Yeung

Invitation to OMAE 2020

Please join us for the 39th International Conference on Ocean, Offshore and Arctic Engineering (OMAE 2020) in Fort Lauderdale, Florida, USA June 28 – July 3.

Located in southeast Florida, Fort Lauderdale is home to Port Everglades, one of the top three cruise ports in the world and among the most active containerized cargo ports in the United States. It is South Florida’s main seaport for petroleum products including gasoline and jet fuel.

The City of Fort Lauderdale is famous for its award-winning, palm-fringed, golden-sand beaches, arts, culture and events. It provides a water-centric culture from the ocean and blue wave beaches to the exotic Everglades, and includes shopping malls, fine dining, entertainment, boat rides along canals, and golf courses. The City features a landscaped beachfront promenade, luxury hotels, a front to its historic New River, and mansions and yachts dotting its Millionaires Row. The Stranahan House is a preserved 1900s home furnished with antiques of the era. The “red brick road” of Riverwalk leads to the Arts and Entertainment District, where the Museum of Discovery and Science typically has substantial exhibits with thousands of visitors annually. The NSU Art Museum is home to diverse and innovative collections of art from around the world. The City’s Flamingo Gardens features over 3000 species of tropical plants and a sanctuary of 90 native wildlife species.

OMAE 2020 will be hosted by the Department of Ocean and Mechanical Engineering (OME) and its Institute for Ocean and Systems Engineering (IOSE) at Florida Atlantic University, one of ten state universities in Florida with a student body of 30,000 students. The Department is part of FAU’s College of Engineering and Computer Science and offers B.S., M.S. and PhD degrees in ocean engineering and mechanical engineering. The ocean engineering program, initiated in 1965 as the world’s first undergraduate program of its kind, aims to provide an

outstanding academic environment for education, research, and development of ocean technologies. IOSE, established in 1999 as an extension of the ocean engineering program, is located on eight acres of land between the Atlantic Ocean and the Intra Coastal water-way at FAU’s SeaTech campus in Dania Beach. The Department and IOSE have been involved in a period of sustained sponsored research activity over the past twenty years, culminating in an aggregate of over \$60 million expenditures in ocean engineering research and technology development, together with granting of over 400 degrees in ocean engineering. The Institute has research focus areas in marine vehicles, hydrodynamics and physical oceanography, marine materials and corrosion, control and automation, nano-composites, and acoustics and vibrations. It provides the means for technology advancement, and transition of research products to applications. R&D projects at IOSE have included unmanned underwater and surface vehicles, multi-domain, multi-vehicle maritime autonomy, ocean energy technologies, air-deployable buoys, durability of fiber-reinforced concrete and composite materials in seawater, nano-composites, underwater communication, and seabasing technologies. These projects complement basic research in ocean engineering as well as training and education of the next generation of ocean engineering workforce.

A strong technical program in offshore engineering is being put together for OMAE 2020, with thematic foci on renewable ocean energy and automation in maritime systems. The technical tours will include a visit to Port Everglades. The social program will include water and sports activities, shopping tours, everglades airboat adventure, Intracoastal boat tours, and much more.

We very much hope you can join us for OMAE 2020 and look forward to welcoming you to Fort Lauderdale next year.

—Professor Manhar R. Dhanak
Conference Chair, OMAE 2020

Professor and Chair, Dept. of Ocean and Mechanical Engineering
Director, Institute for Ocean and Systems Engineering
Florida Atlantic University, USA

—Professor Ronald W. Yeung
Conference Co-Chair, OMAE 2020
Distinguished Professor (E.) of
Hydromechanics and Ocean Engineering
University of California at Berkeley, USA





OMAE 2020

FORT LAUDERDALE



39th International Conference on Ocean, Offshore and Arctic Engineering

Fort Lauderdale, Florida, USA
June 28 to July 3, 2020



Abstract Submission Date:
Monday, November 4, 2019





OMAE 2020 Fort Lauderdale CALL FOR PAPERS

We welcome you to the 39th ASME International Conference on Ocean, Offshore and Arctic Engineering (OMAE 2020) to be held in Fort Lauderdale, Florida, United States from June 28 – July 3, 2020.

Abstract Submission is now open!

Please visit the OMAE 2020 conference website (www.asme.org/events/omae) to view the conference details.

Following OMAE 2019, we anticipate another successful conference showcasing the excellent technical content that OMAE has become known for internationally.

Abstract/Paper Submission Guidelines

Authors should submit a title/abstract to begin the paper submission process. Prior to the date noted below, authors should then submit full-length manuscripts for peer review. Draft manuscripts and final-paper submissions must conform to ASME publication guidelines.

Important Dates and Information

- **Monday, November 4, 2019 – Deadline for Abstract Submission**

NOTE: Abstracts submitted to individual topics will be automatically accepted by the system and assigned a paper number. Submission of the draft paper for review must be before the stated deadline. Presentation-only abstracts must be 400~650 words.

- **Monday, January 13, 2020 – Full-length Draft Paper Submission**
- **Monday, February 17, 2020 – Notification of Draft Paper Acceptance / Rejection**
- **Monday, March 30, 2020 – Final Paper Submission**

For the full publications schedule and to submit your Abstract and Draft Paper, please visit www.asme.org/events/omae.

PLEASE NOTE THAT THESE DEADLINES ARE FIRM AND WILL NOT BE EXTENDED. Due to the tremendous success of the OMAE conferences, the number of papers has increased steadily over the years hence we need to uphold firm deadlines to ensure proper management of the review and publication process. Your cooperation in adhering to the publication schedule and making OMAE 2020 a success will be greatly appreciated.

We ask that you return home from OMAE 2019 and start working on your Abstract and Full-length Draft Paper soon! We look forward to your contribution to a very successful OMAE 2020.

Sincerely,

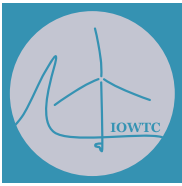
Professor Manhar R. Dhanak
Conference Chair, OMAE 2020
Professor and Chair,

Department of Ocean and Mechanical Engineering
Director, Institute for Ocean and Systems Engineering
Florida Atlantic University, USA

Professor Ronald W. Yeung
Conference Co-Chair, OMAE 2020
Distinguished Professor (E.) of
Hydromechanics and Ocean Engineering
University of California at Berkeley, USA

Professor Antonio C. Fernandes
Technical Program Chair, OMAE 2020
Head, Ocean Engineering Program of COPPE/UFRJ LOC
(Laboratório de Ondas e Correntes – Waves and Currents
Laboratory), Coordinator LabOceano,
Director for International Affairs

To submit your abstract, visit:
www.asme.org/events/omae



ASME® 2019 IOWTC

2nd International Offshore Wind Technical Conference

CONFERENCE
NOV 3 – 6, 2019

Corinthia St. George's Bay Hotel,
St. Julian's, Malta

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- » New Fixed Offshore Concepts
- » New Floating Concepts
- » Mooring & Foundations
- » Offshore Turbines Modeling
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- » Offshore Wind Turbine Drivetrains
- » Metocean
- » Model Testing
- » Field Data

PROJECT DEVELOPMENT TRACK

- » Farms / Layouts
- » Permits
- » Environmental Issues
- » Fabrication & Industrialization
- » Installation / Commissioning
- » O&M
- » Decommissioning
- » Asian Projects
- » American Projects
- » European Projects
- » LCOE & Financing Challenges



We are pleased to invite you to participate in the sponsoring program of the 2nd International Offshore Wind Technical Conference (IOWTC 2019) and we encourage you to consider sponsoring a range of activities to provide maximum exposure for your company.

If you wish to purchase a sponsorship or a booth, or have any questions regarding the opportunities, please contact:

Prof. Tonio Sant

Tel.: +356 2340 2437

E-mail: tonio.sant@um.edu.mt



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<https://event.asme.org/IOWTC>

Listing of Committees

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Professor Krish Thiagarajan Sharman,
Technical Program Chair

Local Organizing Committee

Annabel Anderson
Feargal Brennan
Sandy Day
Julia Race
Willie Reid
Tahsin Tezdogan
Osman Turan
Dracos Vassalos
Qing Xiao

Volunteers

The Conference Organizing Committee would like to express their gratitude to all the OMAE 2019 volunteers. We sincerely appreciate all the support they provide!

Technical Program Committee

SYMP 1: Offshore Technology

Symposium Coordinator: R. Cengiz Ertekin,
University of Hawaii

SYMP 2: Structures, Safety and Reliability

Symposium Coordinator: Carlos Guedes Soares, *Instituto Superior Técnico*

SYMP 3: Materials Technology

Symposium Coordinator: Mamdouh Salama,
ConocoPhillips

SYMP 4: Pipelines, Risers, and Subsea Systems

Symposium Coordinator: Theodoro A. Netto, *COPPE/ UFRJ*
Symposium Co-Coordinator: Duane DeGeer, *INTECSEA*

SYMP 5: Ocean Space Utilization

Symposium Coordinator: Tomoki Ikoma,
Nihon University
Symposium Co-Coordinator: Dominique Roddier, *Principle Power, inc.*

SYMP 6: Ocean Engineering

Symposium Coordinator: Solomon Yim,
Oregon State University
Symposium Co-Coordinator: Antonio Carlos Fernandes, *UFRJ/COPPE*

SYMP 7: Polar and Arctic Sciences and Technology

Symposium Coordinator: Walter Kuehnlein,
sea2ice Ltd. & Co. KG
Symposium Co-Coordinator: Professor Dr. Sören Ehlers, *Hamburg University of Technology*

SYMP 8: CFD & FSI

Symposium Coordinator: Yiannis Constantinides, *Chevron*
Symposium Co-Coordinator: Owen H. Oakley, Jr, *Retired*

SYMP 9: Ocean Renewable Energy

Symposium Coordinator: Krish Thiagarajan Sharman, *University of Massachusetts*
Symposium Co-Coordinator: Charles Smith, *Consultant*

SYMP 10: Offshore Geotechnics

Symposium Co-Coordinator: Horst Brandes,
University of Hawaii at Manoa

SYMP 11: Petroleum Technology

Symposium Co-Coordinator: Andrzej Wojtanowicz, *Louisiana State University*

SYMP 12: Honoring Symposium for Rodney Eatock Taylor on Marine and Offshore Hydrodynamics

Symposium Coordinator: Allan Magee,
National University of Singapore

SYMP 13: Honoring Symposium for Takeshi Kinoshita on Offshore Technology

Symposium Coordinator: Hideyuki Suzuki,
University of Tokyo

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1-3: ORGANIZER: Longbin Tao, *University of Strathclyde, United Kingdom*
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2-14: ORGANIZER: Bernt Leira, *NTNU, Norway*

2-15: ORGANIZER: YeongAe Heo, *Case Western Reserve University, United States*

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3-2: ORGANIZER: Carol Johnston, *TWI Ltd, United Kingdom*
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3-9: ORGANIZER: Sheng Bao, *Zhejiang University, China*
3-11: ORGANIZER: Isabel Hadley, *TWI Ltd, United Kingdom*; CO-ORGANIZER: Bostjan Bezensek, *Shell Global Solutions UK, United Kingdom*

3-13: ORGANIZER: Gerhard Ersdal, *Petroleum Safety Authority*, Norway; CO-ORGANIZER: Alexander Stacey, *Offshore Safety Division, Health & Safety Executive*, United Kingdom; CO-ORGANIZER: Charles Smith, *Consultant*, Canada

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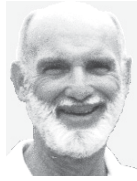


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Calle Gonzales, Miguel Angel	OMAE2019-95772 (2-10-2)	Chen, Lei	OMAE2019-95347 (9-2-3)	Clayton, Daryl	OMAE2019-95051 (2-12-1)
Cambuli, Francesco	OMAE2019-96513 (9-6-1)	Chen, Lifen	OMAE2019-95198 (12-7-1)	Coe, Ryan	OMAE2019-95216 (9-3-1)
	OMAE2019-96518 (9-4-1)		OMAE2019-95865 (12-5-2)		OMAE2019-95383 (9-4-2), OMAE2019-96382 (9-4-3)
Cameron, Matthew	OMAE2019-95538 (9-4-1)	Chen, Limin	OMAE2019-96383 (6-3-2)		OMAE2019-96397 (9-3-3), OMAE2019-96523 (2-2-1)
Campello, George	OMAE2019-96372 (4-1-1)	Chen, Ming	OMAE2019-96802 (9-4-3)	Coelho Del Sarto, Yuri	OMAE2019-95204 (13-2-5)
			OMAE2019-96803 (5-2-1)	Coelho, Henrique	OMAE2019-96179 (6-7-1)
				Coffey, Tiarnan	OMAE2019-96100 (2-13-1)

Colbourne, Bruce	OMAE2019-95799 (8-2-3)	de Souza Mendes, Paulo	OMAE2019-95131 (11-12-1)	Dumitrescu, Andrei	OMAE2019-96279 (11-10-1)
Collins, Keri	OMAE2019-96573 (12-4-1)	de Souza, Ana Paula França	OMAE2019-95145 (4-3-1)		OMAE2019-96283 (11-10-1)
Collu, Maurizio	OMAE2019-95210 (1-1-3)		OMAE2019-95768 (4-3-1)	Duz, Bulent	OMAE2019-96201 (13-2-2)
	OMAE2019-95542 (9-2-6), OMAE2019-96104 (5-1-2)	de Vroom, Joris	OMAE2019-96549 (2-15-1)		OMAE2019-96225 (13-2-2)
	OMAE2019-96171 (5-1-2), OMAE2019-96212 (5-1-2)	Decrop, Boudewijn	OMAE2019-95789 (8-1-1)	Dvergsnes, Erik W.	OMAE2019-95062 (11-2-1)
	OMAE2019-96282 (5-1-2)	Degroot, Don J.	OMAE2019-96395 (9-1-5)	Dwivedy, Santosha K.	OMAE2019-95345 (6-15-1)
Colombo, Danilo	OMAE2019-95069 (11-4-1)	Deguchi, Junichi	OMAE2019-95817 (3-3-1)		
	OMAE2019-96269 (2-13-1), OMAE2019-96280 (2-8-1)	Deguchi, Mitsuyasu	OMAE2019-96623 (5-4-1)	E	
Cong, Cui	OMAE2019-95226 (2-11-1)	Del Guzzo, Andrea	OMAE2019-96086 (6-7-3)	E. Karam, Qusaie	OMAE2019-95236 (6-2-2)
Connaire, Adrian	OMAE2019-96516 (3-5-1)	Delefortrie, Guillaume	OMAE2019-95565 (6-11-2)	Eca, Luis	OMAE2019-96099 (8-2-3)
Connell, Richenda	OMAE2019-95205 (6-7-3)		OMAE2019-96341 (6-5-2), OMAE2019-96346 (6-5-2)	Eckert-Gallup, Aubrey	OMAE2019-96523 (2-2-1)
Connellan, Michael	OMAE2019-95337 (6-5-3)	Demirel, Yigit	OMAE2019-95315 (8-1-7)	Eduardo, Decnop	OMAE2019-95160 (4-2-1)
Cooke, Nathan	OMAE2019-95303 (4-1-3)		OMAE2019-96276 (6-5-4)	Edward, Ceasar	OMAE2019-96042 (2-6-3)
Coppejans, Okko J.	OMAE2019-95368 (3-1-1)	Deng, Di	OMAE2019-95522 (8-4-1)	Efthymiou, Mike	OMAE2019-96451 (4-2-4)
Corbineau, Erwan	OMAE2019-95306 (8-1-5)	Deng, Yanfei	OMAE2019-95070 (6-3-2)	Ehlers, Sören	OMAE2019-95063 (6-17-1)
Cordeiro, Wilson	OMAE2019-95363 (4-3-1)		OMAE2019-95693 (1-7-2)		OMAE2019-95116 (7-4-1), OMAE2019-95907 (2-15-1)
Corina, Anisa Noor	OMAE2019-95928 (11-15-2)	Derbanne, Quentin	OMAE2019-95953 (2-9-2)		OMAE2019-96740 (7-4-1), OMAE2019-96846 (7-1-1)
Corrigan, Hugues	OMAE2019-96261 (4-2-3)	Deschrijver, Dirk	OMAE2019-96731 (9-7-1)	El Chahal, Ghassan	OMAE2019-95312 (6-5-4)
Cosham, Andrew	OMAE2019-95529 (4-3-6)	Desmond, Cian	OMAE2019-96295 (9-1-5)		OMAE2019-95313 (6-2-2)
	OMAE2019-95532 (3-11-2)	Dev, Arun	OMAE2019-95126 (1-3-1)	el Moctar, Ould	OMAE2019-95716 (8-1-6)
Costa, Alvaro M.	OMAE2019-96250 (2-13-2)		OMAE2019-95485 (1-2-1), OMAE2019-95764 (1-4-1)		OMAE2019-95722 (9-5-4), OMAE2019-95935 (8-1-1)
Costa, Beethoven G. S.	OMAE2019-95069 (11-4-1)		OMAE2019-96042 (2-6-3)		OMAE2019-96138 (8-1-2)
Coules, Harry	OMAE2019-96327 (3-11-2)	Devaney, Ronan J.	OMAE2019-96516 (3-5-1)	el Sheshtawy, Hassan	OMAE2019-95722 (9-5-4)
Couñago, Bernardino	OMAE2019-96380 (9-1-2)	Dewhurst, Tobias	OMAE2019-96388 (6-4-5)	El-Chayeb, Abdul	OMAE2019-96662 (4-3-3)
Cox, Daniel	OMAE2019-96803 (5-2-1)	Dhaene, Tom	OMAE2019-96731 (9-7-1)	Elsanoose, Abadelhalim	OMAE2019-96311 (11-4-1)
Cozman, Fábio	OMAE2019-96120 (6-4-1)	Dhanak, Manhar	OMAE2019-96674 (6-17-2)	Elsherbiny, Khaleel	OMAE2019-95790 (6-13-1)
Crabtree, Christopher	OMAE2019-95561 (2-7-1)	Diambra, Andrea	OMAE2019-95938 (10-6-1)	Elusakin, Tobiloba	OMAE2019-95539 (2-13-1)
Craidy, Pedro	OMAE2019-95175 (4-2-1)	Diaz, Brian	OMAE2019-96395 (9-1-5)	Endo, Yusuke	OMAE2019-95818 (3-6-1)
Crema, Ilaria	OMAE2019-96259 (1-1-1)	Diego, Pavone	OMAE2019-95055 (4-3-5)	Endresen, Per Christian	OMAE2019-95414 (5-2-1)
Crespi, Tommaso	OMAE2019-95129 (8-4-4)		OMAE2019-95056 (4-4-1), OMAE2019-95057 (4-1-2)		OMAE2019-96375 (5-2-1)
Cross, Colin	OMAE2019-95444 (4-3-7)	Dietz, Matt	OMAE2019-95938 (10-6-1)	Enet, Francois	OMAE2019-96549 (2-15-1)
	OMAE2019-95448 (4-3-7), OMAE2019-95450 (4-3-6)	Dimopoulos, Simon	OMAE2019-95882 (2-6-3)	Erceg, Sandro	OMAE2019-96740 (7-4-1)
Crump, Jennifer	OMAE2019-96233 (3-2-1)	Ding, Haoyu	OMAE2019-95739 (12-4-1)	Ercoli-Malacari, Luca	OMAE2019-96343 (4-3-3)
Cuellar, Pablo	OMAE2019-96078 (10-7-1)	Ding, Jun	OMAE2019-96122 (6-3-1)	Errotabehere, Xabier	OMAE2019-96239 (3-3-1)
Cui, Luning	OMAE2019-96193 (12-1-1)		OMAE2019-96771 (6-1-2)	Ersdal, Gerhard	OMAE2019-96841 (3-13-1)
Cui, Weicheng	OMAE2019-95327 (2-4-3)	Ding, Qian	OMAE2019-96719 (11-7-3)	Ertekin, R. Cengiz	OMAE2019-96013 (6-2-1)
Cunha, Bruno R. M.	OMAE2019-96358 (3-2-1)	ding, Songxiong	OMAE2019-96114 (2-6-3)	Ervik, Anna Kringlen	OMAE2019-95352 (2-9-3)
		Ding, Yong	OMAE2019-95438 (8-1-2)	Esperança, Paulo de Tarso T.	OMAE2019-96334 (6-8-2)
		Dinh, Van Nguyen	OMAE2019-96778 (9-1-1)		OMAE2019-96569 (6-8-1)
D		Dinita, Alin	OMAE2019-96279 (11-10-1)	Estefen, Segen	OMAE2019-96367 (4-4-2)
D, Adarsh	OMAE2019-95331 (6-4-3)		OMAE2019-96283 (11-10-1)	Eto, Hiroaki	OMAE2019-95408 (5-6-1)
D'Agostini, Andressa	OMAE2019-96626 (6-7-2)	Dobashi, Daisuke	OMAE2019-95881 (5-6-1)		OMAE2019-95925 (13-3-4), OMAE2019-96045 (13-3-1)
D'Arcy Evans, Nicholas	OMAE2019-95875 (2-6-3)	Dodhiba, Gjergj	OMAE2019-96040 (5-3-1)		OMAE2019-96482 (13-2-5), OMAE2019-96493 (13-2-5)
da Silva, Jose	OMAE2019-96637 (6-7-3)	Doi, Yasuaki	OMAE2019-96405 (12-5-1)	Etrati, Ali	OMAE2019-95180 (11-12-1)
Daasvatn, Sigbjørn	OMAE2019-95291 (4-6-2)	Donatini, Luca	OMAE2019-96346 (6-5-2)	Ewans, Kevin	OMAE2019-95408 (5-6-1)
Daems, Pieter-Jan	OMAE2019-96731 (9-7-1)	Dondapati, Varun	OMAE2019-96287 (9-5-3)		OMAE2019-95451 (2-2-1)
Dahi Taleghani, Arash	OMAE2019-96421 (11-3-1)	Dong, Pingsha	OMAE2019-96631 (3-3-2)		
Dai, Saishuai	OMAE2019-95172 (12-1-1)	Dong, Qing	OMAE2019-96578 (6-3-4)	F	
Dai, Xiaojuan	OMAE2019-96094 (11-7-3)	Dong, Sheng	OMAE2019-95791 (6-7-1)	Facchinetti, Alan	OMAE2019-95967 (9-2-1)
Dakshina, Moorthy	OMAE2019-95160 (4-2-1)	Dong, Xingjian	OMAE2019-95915 (9-2-1)		OMAE2019-95976 (9-2-1)
Dalane, Oddgeir	OMAE2019-95083 (2-6-2)	dos Reis Tagliari, Mariana	OMAE2019-96423 (4-1-1)	Faedo, Nicolás	OMAE2019-95216 (9-3-1)
Dale, Stein	OMAE2019-95819 (11-6-1)	Dos Santos, Marcelo	OMAE2019-96592 (4-2-4)	Failla, Giuseppe	OMAE2019-96212 (5-1-2)
	OMAE2019-95995 (11-6-1)	Doshi, Karan	OMAE2019-95867 (2-11-2)		OMAE2019-96282 (5-1-2)
Dan, Saikat	OMAE2019-95867 (2-11-2)	Doynov, Krassimir	OMAE2019-95303 (4-1-3)	Fairchild, Doug	OMAE2019-96556 (3-4-1)
Dankowski, Hendrik	OMAE2019-95295 (2-3-1)	Drago, Michele	OMAE2019-96086 (6-7-3)		OMAE2019-96593 (3-4-1), OMAE2019-96614 (3-4-1)
Dao, Cuong	OMAE2019-95561 (2-7-1)	Drake, Matthew	OMAE2019-96270 (6-15-1)	Fairley, I.A.	OMAE2019-95202 (6-12-1)
Darcis, Philippe	OMAE2019-95130 (3-1-1)	Draper, Scott	OMAE2019-95198 (12-7-1)	Falcão, Antonio F.O.	OMAE2019-96368 (9-4-1)
	OMAE2019-95953 (3-6-1), OMAE2019-96345 (3-5-1)		OMAE2019-95557 (4-3-8), OMAE2019-95865 (12-5-2)	Falchi, Massimo	OMAE2019-95756 (13-1-4)
Dassanayake, Darshana T.	OMAE2019-96262 (6-3-4)		OMAE2019-95933 (12-5-2)	Falkenberg, Erik	OMAE2019-95469 (1-2-2)
Datta, Indra	OMAE2019-96603 (1-4-2)	Draycott, Samuel	OMAE2019-96405 (12-5-1)	Falzarano, Jeffrey	OMAE2019-95620 (6-3-1)
Davidson, Michelle	OMAE2019-96310 (4-1-6)		OMAE2019-96817 (12-5-1)	Fam, Mei Ling	OMAE2019-95853 (2-13-2)
Davies, Graham	OMAE2019-95949 (13-1-3)	Driscoll, Blake	OMAE2019-95383 (9-4-2)	Fan, Fan	OMAE2019-95326 (11-1-1)
Davis, Michael	OMAE2019-96562 (6-8-2)	Du, Bo	OMAE2019-96052 (2-4-3)		OMAE2019-95480 (11-5-1)
Day, Sandy	OMAE2019-95172 (12-1-1)	Du, Junfeng	OMAE2019-96553 (1-3-2)	Fan, Jiakun	OMAE2019-96144 (4-1-7)
	OMAE2019-95784 (8-1-4), OMAE2019-95790 (6-13-1)	Du, Zhipeng	OMAE2019-95776 (2-9-4)	Fan, Shejun	OMAE2019-95442 (13-1-1)
de Arruda Martins, Clovis	OMAE2019-95033 (4-1-10)	Du, Zunfeng	OMAE2019-95673 (6-4-2)	Fan, Sheming	OMAE2019-95113 (6-13-1)
de Hauteclocque, Guillaume	OMAE2019-95993 (2-9-2)	Duan, Chuanjie	OMAE2019-95392 (2-4-3)	Fan, Tianhui	OMAE2019-96759 (9-1-5)
	OMAE2019-96272 (2-9-2)	Duan, Menglan	OMAE2019-95141 (4-1-3)	Fan, Yifei	OMAE2019-95422 (10-4-1)
de Leeuw, Lawrence	OMAE2019-95938 (10-6-1)		OMAE2019-95876 (4-5-2)		OMAE2019-95752 (10-7-1)
de Mello, Pedro	OMAE2019-95238 (12-2-1)	Duan, Songchang	OMAE2019-95209 (8-2-2)	Fang, Qinghe	OMAE2019-95831 (6-17-1)
	OMAE2019-96670 (6-4-2)	Duan, Wenhui	OMAE2019-95860 (6-2-1)	Farokhi, Hamed	OMAE2019-96256 (9-2-2)
de Moura Jorge, Nilo	OMAE2019-96367 (4-4-2)	Duan, Wenyang	OMAE2019-95224 (8-2-1)		OMAE2019-96769 (9-2-1)
de Oliveira Costa, Daniel	OMAE2019-96048 (9-3-2)		OMAE2019-95675 (1-6-1), OMAE2019-95779 (6-7-1)	Farrow, Gary H.	OMAE2019-95875 (2-6-3)
de Oliveira, Felipe F.	OMAE2019-96051 (6-1-2)		OMAE2019-96181 (8-1-3), OMAE2019-96581 (6-5-4)		OMAE2019-95882 (2-6-3)
de Oliveira, Mauro C.	OMAE2019-96210 (2-6-1)	Duarte Martins, Marcos Andre	OMAE2019-96592 (4-2-4)	Favaro Borges, Marcelo	OMAE2019-96423 (4-1-1)
	OMAE2019-96334 (6-8-2)	Dudek, Matthias	OMAE2019-95063 (6-17-1)	Feeney, Allan	OMAE2019-96219 (4-3-2)
de Ridder, Erik-Jan	OMAE2019-95481 (1-7-1)	Duffy, Brian	OMAE2019-96139 (1-1-5)	Feiger, Jim H.	OMAE2019-95175 (4-2-1)
de Sousa, José Renato M.	OMAE2019-95506 (4-1-7)				
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Feld, Graham	OMAE2019-96586 (6-7-4)	Furukawa, Yoshitaka	OMAE2019-96056 (1-2-2)	Gotoh, Koji	OMAE2019-95817 (3-3-1)
	OMAE2019-96587 (6-7-4)	Furusho, Masao	OMAE2019-96663 (2-13-2)		OMAE2019-95818 (3-6-1), OMAE2019-95822 (3-3-2)
Feng, Bo	OMAE2019-95945 (9-2-3)				OMAE2019-96750 (5-5-1)
Feng, Dakui	OMAE2019-95714 (8-1-2)	G		Gou, Ying	OMAE2019-95421 (12-1-2)
	OMAE2019-95727 (6-13-2), OMAE2019-95737 (8-5-1)	Gabrielsen, Øystein	OMAE2019-95083 (2-6-2)	Gouldby, Ben	OMAE2019-96587 (6-7-4)
	OMAE2019-95887 (8-1-7), OMAE2019-96020 (8-1-4)		OMAE2019-95084 (2-4-1), OMAE2019-95618 (2-6-2)	Gourvenec, Susan	OMAE2019-95800 (10-1-1)
	OMAE2019-96831 (8-1-6)		OMAE2019-96000 (2-4-1)	Gowri Shankar, C.	OMAE2019-95895 (6-2-1)
Feng, Guoqing	OMAE2019-95586 (7-11-1)	Gadelho, Jorge Filipe Marques	OMAE2019-96408 (9-3-2)	Grabe, Jürgen	OMAE2019-95151 (10-1-1)
	OMAE2019-95777 (2-9-3)	Gaggiotti, Federico	OMAE2019-96086 (6-7-3)	Graham-Parker, Keegan	OMAE2019-95337 (6-5-3)
Feng, Jianguo	OMAE2019-96601 (2-12-3)	Galinos, Christos	OMAE2019-95429 (9-1-1)	Graham, J. Michael R.	OMAE2019-95629 (6-3-3)
	OMAE2019-96661 (1-1-1)	Gallagher, Conor	OMAE2019-95213 (4-2-3)	Gramstad, Odin	OMAE2019-95352 (2-9-3)
Feng, Ming	OMAE2019-95725 (11-11-1)	Gallegillo, Martin	OMAE2019-95505 (4-3-7)		OMAE2019-95357 (2-1-2), OMAE2019-96061 (2-1-2)
	OMAE2019-95847 (11-11-2)	Gambarine, Dennis	OMAE2019-95353 (13-2-4)	Granholt, Jason D. D. A.	OMAE2019-95885 (6-7-4)
Feng, Peiyuan	OMAE2019-95113 (6-13-1)	Gao, Fu-Ping	OMAE2019-96655 (10-3-1)	Grant, Hazel	OMAE2019-96021 (6-12-1)
Feng, Qi	OMAE2019-95320 (2-13-2)	Gao, Guoqiang	OMAE2019-96733 (11-11-2)	Grasso, Nicola	OMAE2019-96207 (1-7-2)
Feng, Wei	OMAE2019-95070 (6-3-2)	Gao, He	OMAE2019-95456 (2-11-3)	Gray-Stephens, Angus G D	OMAE2019-95784 (8-1-4)
Feng, Xingya	OMAE2019-95161 (12-5-1)	Gao, Hongtao	OMAE2019-96782 (6-4-3)	Greaves, Deborah	OMAE2019-95998 (9-5-2)
	OMAE2019-95172 (12-1-1)	Gao, Jiancai	OMAE2019-95960 (10-3-1)		OMAE2019-96573 (12-4-1)
Feng, Yan	OMAE2019-96131 (7-12-1)	Gao, Junjie	OMAE2019-95748 (11-11-2)	Green, Mattias	OMAE2019-96621 (6-7-2)
Fernandes, Antonio Carlos	OMAE2019-96048 (9-3-2)	Gao, Junliang	OMAE2019-95739 (12-4-1)	Greene, John	OMAE2019-96100 (2-13-1)
	OMAE2019-96349 (6-4-6), OMAE2019-96575 (1-4-3)	Gao, Yifan	OMAE2019-95457 (4-1-4)	Grey, Stephen	OMAE2019-96245 (6-7-1)
	OMAE2019-95485 (1-2-1)		OMAE2019-96596 (4-1-11)	Griffiths, Terry	OMAE2019-95557 (4-3-8)
Fernandez, Charles	OMAE2019-95485 (1-2-1)	Gao, Yonghai	OMAE2019-96719 (11-7-3)		OMAE2019-95585 (1-3-2)
Fernandez, José	OMAE2019-96380 (9-1-2)	Gao, Yu	OMAE2019-96719 (11-7-3)	Grigoriadis, Karolos	OMAE2019-96293 (4-5-1)
Fernando, Upul	OMAE2019-96310 (4-1-6)	Gao, Zhen	OMAE2019-96686 (2-7-1)		OMAE2019-96305 (8-5-1)
Ferrant, Pierre	OMAE2019-96296 (9-1-8)		OMAE2019-96793 (6-4-5)	Grimaldo, Eduardo	OMAE2019-95350 (3-9-1)
Ferrari, Victor	OMAE2019-95513 (6-8-2)	Garbatov, Jordan	OMAE2019-96666 (2-4-2)	Grime, Andrew	OMAE2019-96451 (4-2-4)
Ferreira Senra, Stael	OMAE2019-96592 (4-2-4)	Garmbis, Alexandre G.	OMAE2019-96297 (4-2-5)	Grindheim, Jan Vidar	OMAE2019-95038 (6-4-6)
Ferreira, Guilherme	OMAE2019-95369 (3-3-2)		OMAE2019-96358 (3-2-1), OMAE2019-96592 (4-2-4)		OMAE2019-96349 (6-4-6)
Ferreira, Marcos	OMAE2019-96335 (6-4-1)	Garner, Alistair	OMAE2019-95001 (1-3-1)	Growcock, Frederick B.	OMAE2019-96675 (11-3-1)
Ferreira, Marcus	OMAE2019-95363 (4-3-1)	Gaspar, Henrique M.	OMAE2019-96051 (6-1-2)		OMAE2019-96676 (11-3-1)
Ferri, Francesco	OMAE2019-95216 (9-3-1)	Gatin, Inno	OMAE2019-95293 (8-1-3)		OMAE2019-96676 (11-3-1)
Fischer, David	OMAE2019-96556 (3-4-1)		OMAE2019-96026 (8-2-3)	Gu, Xiechong	OMAE2019-95562 (13-2-1)
Fiskerstrand, Roy-Jostein	OMAE2019-95885 (6-4-2)	Gato, Luis	OMAE2019-96368 (9-4-1)	Gu, Yibin	OMAE2019-95547 (3-5-1)
Fjelde, Kjell Kåre	OMAE2019-95214 (11-6-1)	Gaudin, Christophe	OMAE2019-96541 (10-6-1)	Guan, Wang	OMAE2019-95603 (4-4-2)
Flamant, Nicolas	OMAE2019-95100 (11-12-2)	Gavriliadis, Ilias	OMAE2019-95743 (4-3-2)	Guanche, Raúl	OMAE2019-96380 (9-1-2)
Foglia, Aligi	OMAE2019-96109 (10-7-1)	Gavrilov, Andrey	OMAE2019-95228 (11-7-1)	Guedes Soares, Carlos	OMAE2019-95137 (2-14-1)
Fogliani, Antonino	OMAE2019-95557 (4-3-8)	Gayen, Rupanjita	OMAE2019-95498 (6-3-4)		OMAE2019-95287 (2-2-2), OMAE2019-96151 (6-13-3)
Fonseca, Bruno	OMAE2019-95131 (11-12-1)	Ge, Han	OMAE2019-96715 (5-5-1)		OMAE2019-96408 (9-3-2), OMAE2019-96510 (12-1-2)
Fonseca, Ícaro A.	OMAE2019-96051 (6-1-2)	Ge, Weifeng	OMAE2019-95125 (2-5-1)		OMAE2019-96618 (6-11-1), OMAE2019-96626 (6-7-2)
Fontana, Casey M.	OMAE2019-96395 (9-1-5)	Geekiyanaage, Suranga	OMAE2019-95217 (11-11-1)		OMAE2019-96627 (6-7-2)
Fontanella, Alessandro	OMAE2019-95967 (9-2-1)		OMAE2019-95486 (11-11-1), OMAE2019-95496 (11-11-1)	Guidault, Pierre-Alain	OMAE2019-96165 (11-2-4)
	OMAE2019-95976 (9-2-1), OMAE2019-95979 (9-2-6)	Gemilang, Gilang Muhammad	OMAE2019-96386 (1-2-4)	Guillaume, Patrick	OMAE2019-96731 (9-7-1)
Ford, Eric Patrick	OMAE2019-96546 (11-15-2)	Geng, Baolei	OMAE2019-95006 (6-3-4)	Guindeuil, Geoffrey	OMAE2019-95354 (4-6-1)
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AIM-ALE 2020

Asset Integrity Management –
Aging and Life Extension

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PSA offices, Stavanger, Norway

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11-5-1	Well Inflow Control and Reservoir Management	Wednesday June 12
11-6-1	Integrity of Well Barriers I	Tuesday June 11
11-6-2	Integrity of Well Barriers II	Tuesday June 11
11-7-1	Well Drilling Fluids and Hydraulics I	Monday June 10
11-7-2	Well Drilling Fluids and Hydraulics II	Tuesday June 11
11-7-3	Well Drilling Fluid and Hydraulics III	Monday June 10
11-10-1	New Materials for Well Construction	Thursday June 13
11-11-1	Innovations in Drilling, Production and Transport	Thursday June 13
11-11-2	Innovations in Drilling, Production and Transport	Thursday June 13
11-12-1	Cementing I	Tuesday June 11
11-12-2	Cementing II	Wednesday June 12
11-13-1	LSU Workshop on Riser Gas Management and Well Control	Thursday June 13
11-15-1	Well Abandonment I - Rules and Regulations	Wednesday June 12
11-15-2	Well Abandonment II - Research and Operational Experiences	Wednesday June 12

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

12-1-1	Numerical and Experimental Methods in Hydrodynamics I	Monday June 10
12-1-2	Numerical and Experimental Methods in Hydrodynamics II	Wednesday June 12
12-2-1	Multi-Body Hydrodynamics	Monday June 10
12-4-1	Hydrodynamic Aspects of Offshore Renewable Energy	Tuesday June 11
12-5-1	Non-Linear Waves and Wave Effects I	Tuesday June 11
12-5-2	Non-Linear Waves and wave Effects II	Tuesday June 11
12-7-1	Large-Amplitude Non-Linear Ship Motions	Tuesday June 11

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-1-1	Extremes and Environmental Modelling	Wednesday June 12
13-1-2	Fluid Body Interaction	Wednesday June 12
13-1-3	Nonlinear Waves I	Wednesday June 12
13-1-4	Nonlinear Waves II	Wednesday June 12
13-2-1	Numerical Methods	Monday June 10
13-2-2	Experiments and Numerical Validation	Tuesday June 11
13-2-3	Flow-Induced Motions (FIM)	Tuesday June 11
13-2-4	Fluid-Structure Interactions (FSI)	Tuesday June 11
13-2-5	Others	Tuesday June 11
13-3-1	Wind Energy	Thursday June 13
13-3-2	Wave Energy I	Thursday June 13
13-3-3	Ocean Current Energy, OTEC and Related Technology	Thursday June 13
13-3-4	Wave Energy II	Thursday June 13
13-7-1	Small vessel and Related Technology	Monday June 10

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