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For queries or support, contact Sharon Giordano:
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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]

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

Ground Level
Meeting Rooms

Mezzanine Level
Meeting Rooms
Welcome from the Conference Chair

Professor Atilla Incecik

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
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
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
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

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**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


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, OMAE2018-78146 “Equivalent Layer Approaches to Predict the Bisymmetric 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, OMAE2018-78080 “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, Luis 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


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.

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.

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.
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.

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

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

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

University of Strathclyde
Glasgow

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

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

Visit Scotland

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

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.
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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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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.

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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.
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Visit: www.springernature.com/group and follow @SpringerNature.

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 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.

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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
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 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 OOAЕ Division in 2007, and ASME Best Paper Award, ASME OOAЕ 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, 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, 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, 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 hydrodynamists. 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

**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

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

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
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

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.

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.

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

**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, OQAE Division Chair
Professor Sir Jim McDonald, Principal, University of Strathclyde
Bailie Jacqueline McLaren on behalf of the Lord Provost of Glasgow, Eva Bolander

**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

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**Time** | **Title** | **Location**
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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)
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.

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”.

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.

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

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

Offshore Technology

1-1-2  FPSO and Arctic Structures
Monday June 10
Room SEC, Alsh 1 | 13:30 – 15:00
Session Chair: Ewoud van Haften, 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 OMAE2019-95322
Anil Sablok1 Erlend Hovland1 Svein Ole Stroemmek Andrew Blundon1
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, Haizhen, China

Direct Time Domain Simulations for a FPSO Tandem Offloading Operation OMAE2019-96138
Bonjun Koo, Manoj Jeganathan, Johyun Kyung, Ho-Joon Lim
TechnipFMC, Houston, TX, USA

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

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 Anderson2 David Molyneux3 Dean Steinke3
1. Memorial University of Newfoundland, St. John’s, NL, Canada;
2. Dynamic Systems Analysis,Victoria, BC, Canada

Charles Fernandez1 Arun Dev1 Rose Norman1 Wai Lok Woo1 Shashi Kumar1
1. DNV GL Singapore Pte Ltd, Singapore, Singapore; 2. Newcastle University in Singapore, Singapore, Singapore; 3. Newcastle University, Newcastle, United Kingdom
Numerical Study on the Dynamical Characteristic and Impact Force between Vessel with Rake Bow and Bridge Pier OMAE2019-95602
Ming Cai1 Xu2, Zi Yuan Zhanga, Xiao Qiang Zhanga, Jin Panga, Yi Fei Huanga
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 OMAE2019-95930
Ole Vestrums, Magnus Langseths, Tore Barvik
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

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

Materials Technology
3-1-2 Formulation of the Fracture Parameter
Monday June 10 Room: SEC, Beisdaile 1 | 13:30 – 15:00
Session Chair: Carey L. Walters, Delft University of Science and 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, Ri-Seok Kim1, Woo-Yeon Choa, Myeong-Woo Lee1, Yun-Jae Kim1
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 Steel OMAE2019-96316
Filip Van den Abeele, Anelors/Mittal Global R&D, Zvinzaande, 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

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 Sævik, 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 Queijas de Siqueira1, José Renato M. de Sousa1, George Campello2
1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. UFRJ/COPPE/ LACEO, 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 Gonzalves, Carlos Eduardo Fortis Kwietniewskio
UFRGS, Porto Alegre, RS, Brazil

Frequency Domain Fatigue Analysis for a Unbonded Flexible Riser – Damage Induced by Dynamic Tension OMAE2019-95118
Jiabel 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/UFJF, 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 OMAE2019-95345
Ana Paula Franca de Souza1, Carolina Vilas Boas2
1. ITS/COPPE, Niterói, RJ, Brazil; 2. Vloubour, Belo Horizonte, MG, Brazil

Pipe Development ERW/HFIW Casing API5CT Grade P110 High Collapse OMAE2019-95363
Luis Melo, Wilson Cordeiro, Marcus Ferreira
Apalo Tubulars S/A, Lorena, SP, Brazil
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 OMAE2019-96051
Icaro 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 OMAE2019-96771
Jun Deng, Chao Tian, Yujie Miao, Zhengwei Zhang, Zhanhuo Zhao, Xinyun Ni
China Ship Scientific Research Center, Wuxi, China

Evaluation and Optimization of Trimaran Configurations using Deep Neural Network OMAE2019-96832
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 OMAE2019-96805
Zhifan Zhang, Haoiang 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, UOfT 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 OMAE2019-96335
Felipe Moreno¹, José Amendola², Eduardo Tammaro², 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 OMAE2019-96490
Song An, Dengshuo Chen, Yong Bai
Southern University of Science and Technology, Shenzhen, China

Port Channel Navigation Subjected to Environmental Conditions using Reinforcement Learning OMAE2019-96120
José Amendola¹, Eduardo Tammaro², Fabio Cozman³, Anna Reali Costa³
1. University of São Paulo, São Paulo, SP Brazil; 2. Numerical Offshore Tank - University of São Paulo, São Paulo, SP Brazil; 3. Petrobras, Rio de Janeiro, RJ, Brazil

The Modelling and Optimal Control of a Hybrid Propulsion System for an Ice-capable Ship OMAE2019-95142
Yi Zhou¹, Kayvan Pazouki², Rose Norman³
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: Hyunchul Jang, TechnipFMC, USA

CFD for VIM and Line Forces of a Floating Caisson with Complex Geometry OMAE2019-95789
Boudewijn Decrop, Rohit Kulkarni, Alexander Breugem, Damian Villaverde Vega
IMDC, Antwerp, Belgium

Prediction of Hydrodynamic Damping of Moored Offshore Structures using CFD OMAE2019-95935
Changqing Jiang, Ould el Mocar, Thomas Schellin
University of Duisburg-Essen, Duisburg, Germany

The Vortex and Wall Fluctuating Pressure around Submarine Sail based on DDES Method OMAE2019-96018
Rui Luo¹, Yue Sun², Hang Zhang³, Jin Zhan⁴, Xiao Cai⁵
1. China Ship Design and Development Centre, 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 OMAE2019-96884
Samuel Holmes
Red Wing Engineering, Inc, Palo Alto, CA, USA
Ocean Renewable Energy

9-1-1 Bottom-fixed Wind Turbines

Monday June 10

Session Chair: Wojciech Popko, Fraunhofer Institute for Wind Energy Systems IWS, 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. University of Alberta, Canada

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

OMAE2019-95429

Petroleum Technology

11-7-1 Well Drilling Fluids and Hydraulics I

Monday June 10

Session Chair: Axl Saasen, UiS, Norway
Session Co-Chair: Ergun Kuru, University of Alberta, Canada

RedWIN Foundation Models for Integrated Dynamic Analyses of Offshore Wind Turbines

OMAE2019-95618
Ana Page1 Karin Næs-Jorgensen2 Kristoffer Skau1 Amrit M.Kaynia
1. Norwegian Geotechnical Institute, Oslo, Norway

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

OMAE2019-95678
Ki-Du Kim1 Sorassak Vachirapanyakun2 Pasin Plodpradit3 Van Nguyen Dinh4 Jin Ho Park5
1. Konkuk University, Seoul, Korea; 2. MaREI Centre, University College Cork, Cork, Ireland; 3. Norwegian Geotechnical Institute, Oslo, Norway

Offshore Geotechnics

10-1-1 Seabed Properties and Processes

Monday June 10

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 Kanitz1 Jürgen Grabe2
1. Hamburg University of Technology, Hamburg, Germany

Numerical and Experimental Methods in Hydrodynamics I

Monday June 10

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 Johanning2 Dezhin Ning3 Dongsheng Qiao4
1. University of Exeter, Penryn, United Kingdom; 2. University of Western Australia, Perth, WA, Australia

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

OMAE2019-95393
Anamitra Roy1 Shiao Huey Chow1 Conleth O’Loughlin4 Mark F. Randolph3
1. University of Western Australia, Perth, WA, Australia

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

OMAE2019-95090
David J White1 Jinbo Chen1 Susan Gourvenec1 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

OMAE2019-95699
Shuzhao Li2 Jinbo Chen1 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

Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics

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

Monday June 10

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 Johanning2 Dezhin Ning3 Dongsheng Qiao4
1. University of Exeter, Penryn, United Kingdom; 2. University of Western Australia, Perth, WA, Australia

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

OMAE2019-95090
David J White1 Jinbo Chen1 Susan Gourvenec1 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

OMAE2019-95699
Shuzhao Li2 Jinbo Chen1 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

Petroleum Technology

11-7-1 Well Drilling Fluids and Hydraulics I

Monday June 10

Session Chair: Axl 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
Erik Cayeux1 Norde1 Stein Fager
1. University of British Columbia, Vancouver, BC, Canada

A New Three-layer Model for Gravel Packing Applications

OMAE2019-95164
Aline Saraf Shirazi1 Ian Frigaard2
1. University of British Columbia, Vancouver, Canada

Cuttings Transport Simulation in Large-diameter Inclined Borehole

OMAE2019-95228
Yaroslav Ignatenko1 Andrei Garavul2 Oleg Bokhar2 Roland May3
1. Baker Hughes, Novosibirsk, Russia; 2. Institute of Thermophysics of SB RAS, Novosibirsk, 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 Easa Jafarey
1. University of Western Australia, Perth, WA, Australia; 2. University of Alberta, Edmonton, AB, Canada

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

OMAE2019-95393
Anamitra Roy1 Shiao Huey Chow1 Conleth O’Loughlin4 Mark F. Randolph3
1. University of Western Australia, Perth, WA, Australia
Application of 4-phase Decomposition to the Analysis of Random Time Series from Wave Basin Tests

OMAE2019-95172

Thomas A.A. Adcock1 Xingyu Feng1 Tanning Tang1 Ion S. van den Bremer1
Sandy Day2 Saishuai Dai2 Ye Li3 Zhiliang Lin3 Wentao Xu4 Paul Taylor4
1. University of Oxford, Oxford, United Kingdom; 2. University of Stavanger, Stavanger, Norway; 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
1. University of Oxford, Oxford, United Kingdom; 2. University of Strathclyde, Glasgow, United Kingdom; 3. Shanghai Jiao Tong University, Shanghai, China

Takeshi Kinoshita Honoring Symposium on Offshore Technology

13-7-1 Small Vessel and Related Technology

Monday June 10 Room SEC, Boidsale 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 Srinivasamurthy2 Hiroshi Sakamoto2
Norikazu Maruda3 Naoyuki Har3
1. Osaka Prefecture University, Osaka, Japan; 2. Fractady, 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 Nishikawa1 Yasunori Nihei1
1. Osaka Prefecture University, Osaka, Japan; 2. Fractady, Osaka, Japan

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

OMAE2019-95827

Jaial Han1 Sota Kanno2 Akito Mochizuki3 Daisuke Kitazawa2 Tetsu Maeda3 Hiroshi Itakura3
1. Osaka Prefecture University, Osaka, Japan; 2. The University of Tokyo, Kashiwa, Japan; 3. Management Strategy Corporation, Yokohama, Japan

Machine Learning to Predict Mooring Line Tensions

OMAE2019-96488

Hema Wadhwa
INTECEA, Perth, WA, Australia

Efficient Anchoring System for FPSO in Arbitrary Waters

OMAE2019-96575

Jairo Araujo1 Antonio Carlos Fernandez2 Joel S. Sales Junior2 Mario Santoro3 Ana Thurles2
1. ATNavi, 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

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

OMAE2019-96137

Francisco Tinoco, Kee Ching 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 Pakodzi, SINTEF Ocean, Norway
Session Co-Chair: Lance Manuel, University of Texas at Austin, USA

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 Momopy2 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

OMAE2019-96388
Aldric Baquet1 Hyunchul Jang2 Ho-Joon Lim1 Joohyun Kyoung1
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 Duan2 Qingswei Ma3 Binbin Zhao4 Rong-Gai Han5 Jang Kim4
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, Raynebridge, 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

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 Bhagtni, 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: Zhiquiang Hu, Newcastle University, United Kingdom
Session Co-Chair: Soren Ehlers, Hamburg University of Technology, Germany

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 Nakayama1 Keiji Ueda2 Masahiro Akiki3 Kazuyuki Matsumoto4
1. Mitsubishi Ship Building, Nagasaki, Japan; 2. JFE Steel Corporation, Kurashiki, Japan; 3. JFE Steel Corporation, Tokyo, Japan; 4. Nippon Kajii Hyokai (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, Zhejiang University, Zhejiang, China

Corrosion Behaviour of Cupronickel 90/10 Alloys in Arabian Sea Conditions and its Effect on Maintenance of Marine Structures OMAE2019-96273
Muntazir Abbas, Mahmoud Shafee, Nigel Simms
Cranfield University, Bedford, United Kingdom

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

Kyon Yuasa1 Junji Shimamura2 Satoshi Ig3 Ryuji Murasaka4
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 Homma1 Gen Sasaki2 Kunihiko Hashi3 Fumiyoshi Minami4
1. The Japan Steel Works, Ltd., Munoran, 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 Ichimya1 Keiji Ueda2 Satoshi Ig3 Toshitaka Tanaka2 Akkyu Tsuchi3 Minoru Sawa4
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 Tsurenishi Handa1 Hirakazu Tajika1 Yoshiaki Murakami1 Joe Kondo1
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/UFJF, 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 Shaong Guo1 Yue Kong1 Min Li2 Weiming 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 Vaz1 Marcelo Caire2
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 OMAE2019-96735
Chiemela Victor Amaha1 Jianqiao Ye2 Xiaonan Hou2 Fu-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 Jie1 Peng Cheng1 Peihua Han1 Yong Bai1
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 SL WRs 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 Haug1 Bård Nyhus2
1. Equinor ASA, Fornebu, Norway; 2. SINTEF, Trondheim, Norway
Ocean Engineering

6-4-2 Marine Operations and Vessel Motions

Monday June 10

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
Sitan Sikjong1 Lars T. Kyllingstad2 Karl L. Reite3 Joakim Haugen4
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 Stan Sikjong3 Armin Politzer1 Lars T. Kyllingstad1 Roy-Jostein Fiskerstrand1 Sverre Torben1 Jason D. O. A. Granholm2
1. SINTEF Ålesund, Ålesund, Norway; 2. SINTEF Ocean, Trondheim, Norway; 3. Raffis-Prime Marine AS, Ålesund, Norway; 4. GIG 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 Tammaru3 Alexandre N. Simos4 Antonio Souto-Iglesias5
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 Chaial1 Peter Morel2 Sindhu Mole2 Nadjib Saadali3
1. COMI A/S, Kongens Lyngby, Denmark; 2. COMI A/S, Aarhus, Denmark; 3. COMI A/S, Dubai, United Arab Emirates

Ocean Engineering

6-11-1 Autonomous Vehicle Technology

Monday June 10

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 Hinoostroza2 Carlos Guedes Soares1
1. Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 2. Centre for Marine Technology and Ocean Engineering (CENTEC), Lisbon, Portugal

Ocean Space Utilization

5-6-1 High Tide and Tsunamis

Monday June 10

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 Ikoma3 Hiroaki Eto1
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 Kanayangai2 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 Ikoma2 Yasuhiro Aida1 Masayuki Takada2 Yuta Fukunaga3
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
Mitsuhiko 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

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. Aquino1 Raphael M. Brito2 Domingos A. Rade1
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 Qin2 Xiaojie Zhang3 Jiannan Zhao1 Yong Bai2
1. Southern University of Science and Technology, Shenzhen, China; 2. Zhejiang University, Zhejiang, China

Ocean Engineering
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, Aijit C Pillai, Gavin Tabor, Philipp R. Thies, Lars Johanssen University of Exeter, Exeter, United Kingdom

An Experimental Apparatus for Investigating the Unsteady Aerodynamics of a Floating Wind Turbine OMAE2019-95915
Binrong Wei, Qi Zhang, Hanxue 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 Bayatii Federico Taruffi3 Francesco La Mura4 Alan Facchinetti5 Marco Belloli2 1. Politecnico di Milano, Milano, Italy; 2. MARIN, Wageningen, Netherlands

Alessandro Fontanella1 Ilmas Bayatii Federico Taruffi3 Alan Facchinetti5 Marco Belloli2 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

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 Xiaojian 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 Xiaoan He2 1. CNODC Research Institute, Beijing, China; 2. China MEHECO Corporation, Beijing, China

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, Haisiao Liu Tianjin University, Tianjin, China

CFD Analysis on Similarity Criteria of Hydrodynamic Characteristics for Gravity-installed Anchors OMAE2019-95960
Jiancai Gao, Haisiao 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 OMAE2019-96635
Lijing Yang1, Mo Chen2 Shengcang Li1 1. Huawei University of Science and Technology, Wuhan, China; 2. China National Offshore Oil Company (CNOOC) Research Institute, Beijing, China

Towards the Development of an Ocean Engineering Library for OpenModelica OMAE2019-95954
Savin Viswanathan, Christian Holden Dept. Mechanical and Industrial Engineering, Norwegian University of Science and Technology, Trondheim, Norway

A 6-DOFs Hardware-in-the-loop System for Wind Tunnel Tests of Floating Offshore Wind Turbines OMAE2019-95967
Alessandro Fontanella1 Ilmas Bayatii Federico Taruffi3 Francesco La Mura4 Alan Facchinetti5 Marco Belloli2 1. Politecnico di Milano, Milano, Italy; 2. MARIN, Wageningen, Netherlands

Alessandro Fontanella1 Ilmas Bayatii Federico Taruffi3 Alan Facchinetti5 Marco Belloli2 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
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, Yongjiang 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. Nahnri² Panfeng Wei³ Wei Zhao¹ 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 Honoring 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 Qu, Memorial University of Newfoundland, Canada

Model Experiments of Floating Side-by-side Barges  OMAE2019-92328

Kie Hian Chua¹ Pedro de Melo² Kazuo Nishimoto¹ Yoo Sang Choo¹
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

Liuyi Huang¹ Yuyan Li¹ Yi Ni¹ Hui Cheng¹ Xinxin Wang¹ Gang Wang¹ Fenfang Zhao¹
1. Ocean University of China, Qingdao, China; 2. University of Stavanger, Stavanger, Norway

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

See Afternoon Lecture Series, page 22 for more details.

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

Dr.-Ing. Luiz Alves dos Santos

See Afternoon Lecture Series, page 22 for more details.

ASME & IMECE CONNECT ROUNDTABLE
17:00 – 18:15
Location: Forth Room

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

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

Rodney Eatock Taylor Honoring Symposium on Marine and Offshore Hydrodynamics

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  OMAE2019-99302

Youwei Kang¹ Bing Wang¹ Lei Li¹ Zhao Ziguang¹
1. CIMC Offshore Co. Ltd., Shenzhen, China; 2. COOEC Subsea Technology. Ltd, Shenzhen, China

Dr.-Ing. Luiz Alves dos Santos

See Afternoon Lecture Series, page 22 for more details.

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

Dr.-Ing. Luiz Alves dos Santos

See Afternoon Lecture Series, page 22 for more details.

Afternoon Drinks Reception
18:15 – 19:15
Location: Hall 5 (SEC)
**Tuesday, June 11**

### Offshore Technology

**1-1-3 Floating Wind Platforms**

**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 Collu3 Philipp Thomas1  
1. Fraunhofer IWES (Fraunhofer Institute for Wind Energy Systems), Bremerhaven, Germany; 2. University of Strathclyde, Glasgow, United Kingdom; 3. Universitat Politècnica de Catalunya, Barcelona, Spain

**Effect of Wind Turbulence on Extreme Load Analysis of an Offshore Wind Turbine**  
OMAE2019-95634  
Xiaolou Chen1 Zhiyu Jiang2 Qinyuan Li3 Yefei Li3  
1. Shanghai Jiao Tong University, Shanghai, China; 2. University of Auckland, Auckland, New Zealand; 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 Tedzoglu2 Tim Stratford3 Philipp R. Thies4 Vengatesan Venugopal2  

**A Review of Offshore Structures Science and Engineering for Future Floating Wind Platforms**  
OMAE2019-95795  
Maria Lourdes Salom Ramirez1 Feargal Brennan1  
1. University of Strathclyde, Glasgow, United Kingdom

### Structures, Safety and Reliability

**2-4-1 Fatigue and Fracture Reliability**

**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**  
OMAE2019-95016  
Øystein Gabrielsen1 Inge Morten Kulsbø2 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  
Yutian Xue1 Nianzhong Chen2 Yongchang Pu1  
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 Perez3 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 Jung1 Ju-Yeon Kang1 Nam-Su Huh2  
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 Schamke
MARIN, Wageningen, Netherlands

Numerical Simulation and Analysis of Phase Focused Breaking and Non-breaking Wave Impact on Fixed Offshore Platform Deck
OMAE2019-95193
Rameez Moideen1 Manasa Ranjan Behera2 Arun Kamath3 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, St-Trondelag, Norway

The Impact of Climate Change on the Long-term Response of Offshore Structures: A Study Case
OMAE2019-95261
Irvin Alberto Mosquera1 Luís V.S. Sagrilo2 Paulo M. Videiro1
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 Strehle1 Andreas Kortenhaus1 Corrado Altomare1 Steven Hughes2 Krasimir Marinov2 Bas Hofland3 Yuxue Chen4 Tomohiro Suzuki5 Lorenzo Cappietti3
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. Hasskoning DNV Nederland BV, Rotterdam, Netherlands;
6. Flanders Hydraulics Research, Antwerp, Belgium; 7. Universita degli Studi di Firenze, Firenze, Italy

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
OMAE2019-96101
Philippe Moore1 Borislava Yordanova1 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 Philippe Moore1 Ali Mehmanparast2 Rob Kulka2
1. Cranfield University, Cranfield, United Kingdom; 2. TWI Ltd, Cambridge, United Kingdom

Scattering of Pop-ins during Brittle Fracture Testing
OMAE2019-95368
Okko J Coppejans1 Carey L. Walters2
1. TNO, Venlo, Eindhoven, Netherlands;
2. Delft University of Technology, Delft, Netherlands

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

Flexible Pipes and the Initiation and Arrest Toughness Determined from Small-scale Mechanical Testing
OMAE2019-95130
Israël Marines-Garcia1 Aaron Aguilar2 Kristian Carreón3 Philippe Darcis2
1. Tenaris TSSA, Venlo, Eindhoven, Netherlands;
2. Delft University of Technology, Delft, Netherlands;
3. University of Edinburgh, Edinburgh, United Kingdom

A Symbolic Regression Formulation to Estimate the Lateral Buckling Resistance of the Tensile Armors in Flexible Pipes
OMAE2019-95386
Gabriel Gonzalez1 José Renato M. de Sousa1 Luís V.S. Sagrilo2 Ricardo R. Martins3 Djalone Rocha1
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
OMAE2019-96710
Rafaela Ramos1 Ilon Pasqualina1 Marcelo Igor Lourenço Souza2 Eduardo Ribeiro Nicolosi4
1. Fundação – COPPETEC – Federal University of 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

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 Srisankaradhar Thuraiarajah1 Daryl Clayton1 Graeme Roberts1 Vincent Loentgen1 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. Videiro1 Luís V.S. Sagrilo2
1. Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil;
2. LACEO/COPPE/Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

Four-point Bending of Metallic I-Core Sandwich Beams with Longitudinal Girders
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
Tie In of a Rigid Pipeline to a Flexible Riser — Design and Installation — Challenges and Lessons Learned  OMAE2019-95057
Curti Gianbatista¹ François Lirola² Pirmin Gianluigi¹ Pavone Diego³ Perrin Frederic³
1. Saipem, Fano, Italy; 2. Saipem, Montigny le Bretonneux, France; 3. Saipem, Saint Quentin Vélines, 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 Michael¹ Noel O’Dowd¹ Kamran Nikbin²
1. Technip UK / Imperial College London, Aberdeen, United Kingdom; 2. TechnipFMC, Westhill, United Kingdom; 3. IFP Energies Nouvelles, Salaise, France; 4. University of Limerick, Limerick, Ireland; 5. Imperial College London, London, United Kingdom

Influence of Lined-pipe Fabrication on Liner Wrinkling  OMAE2019-95743
Ilías Gavrilidís¹ Spyros A. Karamanou²
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

Biao Su¹ Karl J. Reite¹ Martin Faree¹ Karl Gunnar Aarsaether¹ Morten Omholt Alver²
Per Christian Endresen³ David Kristiansen³ Joakim Haugen³ Walter Cahani⁴ Andrei Isarau⁵
1. SINTEF Ocean, Trondheim, Norway; 2. Norwegian University of Science and Technology, Trondheim, Norway; 3. SINTEF Ocean, Tromsøe, Norway

Coupled Motion and Sloshing Analysis of a Cylindrical Closed Fish Cage in Regular Waves  OMAE2019-96002
Yueyi 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 Macroalgae Aquaculture under Extreme Environmental Conditions  OMAE2019-96083
Ming Chen¹ Solomon Yim² Daniel Cox¹ Taiqing Wang³ Michael Huesemann³
Zhaoying Yang¹ Thomas Mumford¹ Geoffrey Wood³
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 Aquagonics, LLC, Olympia, WA, USA; 5. Composite Recycling Technology Center, Port Angeles, WA, USA

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 Wenhu Du¹
1. University of Queensland, Brisbane, QLD, Australia; 2. Monash University, Clayton, VIC, Australia

Solitary Wave Interaction with Vertical Porous Barriers  OMAE2019-95194
Vivek Francis¹ Babaji 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 Hayatdavoodi² R. Bengt Erleken³
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 Kartheek Amaranj¹ Per Christian Endresen¹ Kristian Fotland¹
1. OENA, IIT Kharagpur, Kharagpur, India; 2. IIT Kharagpur, Kharagpur, India

Openmodellica Modelling of the Thruster in a Compact Work-class Remotely Operated Vehicle  OMAE2019-96839
Yihan Xing¹ Kristian Fotland¹ Muk Chen Ong¹
1. University of Stavanger, Stavanger, Norway; 2. IKM Technology AS, Bryne, 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 Zou1, Bin Peng1
1. Dalian University of Technology, Dalian, China;
2. Henioet-Watt University, Edinburgh, United Kingdom

Evaluation of the Performance of an Integrated WEC Type of Breakwater System
OMAE2019-95739
Haoyu Ding1, Jun Zang1, Dezhi Ning1, Xuanlie Zhao1
Qiug Chen1, Chris Blenkinoopp1, Junliang Gao1
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 Oscillating Water Column Wave Energy Converters: Findings from the WETFEET Project
OMAE2019-96737
Keri Collins1, Deborah Greaves1, Martyn Hann1, Ben Howey1
Rui P.F. Gomes2, Joao C.C. Henriques2
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 Stansby1, Efrain Carpintero Moreno2
1. University of Manchester, Manchester, United Kingdom;
2. Energo Engineering, a KBR Company, Houston, TX, USA

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 Morooka, University of Campinas, Brazil

An Experimental Study of Snap Loads on a Vertical Hanging Cable System
OMAE2019-96242
Wei-Ting Hu1, Tzu-Ching Chuang2, Wen-Yang Hsu1, Krish Sharma1, Ray-Yeng Yang3
1. Energo Engineering, a KBR Company, Houston, TX, USA; 2. National Cheng Kung University, Tainan, Taiwan; 3. Taiwan University of Science and Technology, Taipei, Taiwan

Experimental and Numerical Study of Motion of Rotating Drill Pipe Owing to Magnus Effect
OMAE2019-96402
Tomooya Inoue1, Hiroshige Suzuki1, Toyohiro Katsuy1, Keita Tsuchiya2, Yuseke Notani2
1. JAMSTEC, Yokosuka, Japan; 2. Osaka University, Suita, Japan; 3. Kobe University, Kobe, Japan

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

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 Jensen1, Joao Caetano2, Casper Klinta 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 Zhou1, Xi Wang1
1. Institute of Mechanics, 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, GustoMBS, Netherlands

Learning from Our Dynamic Positioning Events
OMAE2019-96710
Arne Kvitrud
Petroleum Safety Authority (PSA), Stavanger, Norway
**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:** Carol Johnston, TWI Ltd, United Kingdom

- **Low-cycle-fatigue Crack Closure Effect of Ship Cracked Plate considering the Accumulative Plastic Damage**  
  OMAE2019-99320  
  Yuejin 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**  
  OMAE2019-99666  
  Yordan Garbatov, Huayang Yingcai  
  University of Lisbon, Lisbon, Portugal

- **Comparative Study on Fatigue Damage Assessment of a Structure Member in a Bulk Carrier using Various Environmental Conditions**  
  OMAE2019-99760  
  Fredhi Agung Prasetyo1 Naoki Osawa2 Mohammad Arif Kurniawan3 Siti Komariyah4  
  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**  
  OMAE2019-99608  
  Julian Unglaub, Klaus Thiele  
  Institute of Steel Structures, TU Braunschweig, Braunschweig, Germany

**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**  
  OMAE2019-99098  
  Erik Vanem, Binjie Guo  
  DNV GL, Havik, Norway

- **Long-term Extreme Response Analysis for a Straight Floating Bridge Across the Bjørnafjord**  
  OMAE2019-99212  
  Finn-Idar G. Giske1 Asnt G. Fredriksen2  
  1. Multiconsult, Oslo, Norway; 2. Multiconsult, Tramsø, Norway

**A New Approach for Environmental Contour and Multivariate De-clustering**  
OMAE2019-99993  
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**  
OMAE2019-96372  
Boris Horel1 Benjamin Boussac2 Arnaud Herrien3 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, LACE/COPPE/ Federal University of Rio De Janeiro, Brazil

**Numerical Simulation of Container Stacks Dynamics under Typical Motion Excitation**  
OMAE2019-99644  
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**  
  OMAE2019-99628  
  Ting Liu, Yuansheng Chen, 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**  
  OMAE2019-99924  
  Jianyong Chen, Jun Liu, Yuansheng Chen, 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**  
  OMAE2019-99329  
  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**  
  OMAE2019-99593  
  Doug Fairchild1 Brian Newbury2 Tim Anderson3 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**  
  OMAE2019-99614  
  Brian Newbury1 Doug Fairchild2 Andrew Prescott3 Andrew Wasson4 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 Anderson1
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 Jinseng Ma1 Murilo Augusto Vaz1 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

Qingzhen Lu1 Shanghua Wu2 Dong Wang2 Zhiyun Yang2
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 OMAE2019-95006
Stefan Befroid, Nestor Gonzalez Diez, Harry Kors
TIQ, Delft, Netherlands

Effect of Local Model Dynamics on Flexible Riser Tensile Armor Wire Stress Predictions OMAE2019-95103
Gabriel Rombado1 Krassimir Doynov2 Nathan Cooke2
1. Exxonmobil Upstream Research Company, Spring, TX, USA; 2. ExxonMobil Production Company, Spring, TX, USA; 3. INTECSEA, St. John’s, NL, Canada; 4. INTECSEA, Houston, TX, USA

Ocean Space Utilization

5-2-2 Aquaculture II: Design and Modeling II
Tuesday June 11 Room SEC, Dockha 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 Kamathi1 Hans Biks1
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian University of Science and Technology, Sar-Trondelag, Norway

Hui Cheng1 Karl Gunnar Aarsaether2 Lin Li3 Muk Chen Ong1
1. University of Stavanger, Stavanger, Norway; 2. SINTEF Ocean, Trondheim, Norway

Experimental Study on the Motion of a Flexible Hose Net used in Automated Net-hauling System OMAE2019-95670
Yue Li1 Yoichi Mizukami2 Takero Yoshida3 Qiao Li4 Junlin Han4 Daisuke Kitazawa4
1. The University of Tokyo, Tokyo, Japan; 2. Institute of Industrial Science, The University of Tokyo, Tokyo, Japan; 3. The University of Tokyo, Kashiwa, Japan; 4. College of Marine Sciences, Shanghai Ocean University, Shanghai, China; 4. The University of Tokyo, Kashiwa, Japan

Numerical Simulation of Consecutive Multiple Lateral Impact on the Reinforced Concrete Pier OMAE2019-96508
Shuai Yang1 Xiaozhou Xia1 Qing Zhang2 Yue-gang Wang3 Ying Zong-quan4
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, Qusai 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 Jiao, Zhaohui Qian, Dekai Huang, Pengfei Chen, Lida Meng
1. Zhejiang University, Zhoushan, China; 2. University of Strathclyde, Glasgow, United Kingdom
Wuhan University of Technology, Wuhan, China
The Design and Simulation of Hull Segmentation Docking and Correcting Hydraulic System OMAE2019-95926 Yuhao Zeng, Zhaoyu 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: Craba Pakozdi, SINTEF Ocean, Norway
A Ghost Cell Method Based FDM-FEM Model for Free-surface Flow Interactions with Deformable Structures OMAE2019-95209 Xizeng Zhao, Zhiqian 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
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 Morrow, Andrew A Small
1. Marine Geoengineering Ltd, Aberdeen, United Kingdom; 2. Ristles Group, Aberdeen, United Kingdom
Simplified Numerical Simulation of the Dense Sand Progressive Failure involved in Spudcan Punch-through Failure OMAE2019-95911 Jun Zhao, Futsal 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, Hailin Liu, Ying Liu
Tianjin University, Tianjin, China
Cone Penetration Test in Stiff Over Soft Clay in Centrifuge Test OMAE2019-96018 Qiang Xie, Yuxia Hu, Mark J. Cassidy, Alireza Salehi
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刘**
  - Dalia Gomes\(^1\) Knut Bjerkervoll\(^2\) Kjell Kåre Fjeld\(^1\) Johnny Freyden\(^1\)
  - 1. University of Stavanger, Stavanger, Norway; 2. SINTEF Petroleum, Bergen, Norway

- **Nanomodified Rock-based Geopolymers as Supplement to Portland Cement for Oil Well Cementing**
  - Mahmoud Khalifeh\(^1\) Saeed Salehi\(^1\) Aleksandra Jamrozik\(^1\)
  - 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**
  - 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 Eatoek Taylor Honoring 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
  - Xiaoying Feng\(^1\) Richard H.J. Willden\(^2\) Binzhen Zhou\(^3\) Thomas A.A. Adcock\(^1\)
  - 1. University of Oxford, Oxford, United Kingdom; 2. TechnipFMC, Houston, TX, USA; 3. University of Stavanger, Stavanger, Norway

- **Nonlinear Wave Loads on Offshore Wind Turbines: Extreme Statistics and Fatigue**
  - Yu Zhang, Paul Scaleaveous
  - MIT, Cambridge, MA, USA

- **Numerical Simulation of Multidirectional Waves with Full-spectrum using DualSPHysics**
  - OMAE2019-96405
  - Taiga Kanehira\(^1\) Hidemi Mutsuda\(^1\) Samuel Draycott\(^2\) David Ingram\(^3\) Yasuaki Doi\(^1\)

- **Recreating the Draupner Wave in the Laboratory**
  - OMAE2019-96817
  - Mark McAllister\(^1\) Sam Draycott\(^2\) Thomas A.A. Adcock\(^1\) Paul Taylor\(^1\) Ton van den Bremer\(^1\)

### 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**
  - OMAE2019-95230
  - Rodolfo T. Gonçalves\(^1\) Hideyuki Suzuki\(^1\) Fredi Cenci\(^2\) Andre L. C. Fujima\(^3\) Shinichiro Hirabayashi\(^4\)
  - 1. University of Tokyo, Bunkyo, Japan; 2. University of Tokyo, Tokyo, Japan; 3. 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 Hirabayashi\(^1\) Munio M. Cicolin\(^2\) Rodolfo T. Gonçalves\(^1\)
  - 1. The University of Tokyo, Chiba, Japan; 2. University of Sao Paolo, Sao Paolo, SP, Brazil; 3. The University of Tokyo, Tokyo, Japan

### Lunch

**12:00 – 13:30**  
**Location: Hall 5 (SEC)**

### CONCURRENT SESSIONS

**13:30 – 15:00**  
**Room: Crowne Plaza, Barra | 10:30 – 12:00**

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

**Session Co-Chair:** Rodolfo T. Gonçalves, University of Tokyo, Japan

- **Part 1: Development of an Artificial Neural Network Based Model**
  - OMAE2019-96288
  - Djoni Sidarta\(^1\) Ho-joon Lim\(^2\) Jhoyun Kyung\(^3\) Nicolas Theremigneur\(^4\)
  - 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  OMAE2019-96339
Johyun Kyoong1 Ho-Joon Lim3 Dijoni Sidarta1 Nicolas Tcherniguit1 Timothée Lefebvre2 1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC, Paris, France

Response Based Time Domain Structural Analysis on Floating Offshore Platform  OMAE2019-96319
Johyun Kyoong1 Sagar Samantri1 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
Hitoh 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, alsh 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  OMAE2019-96650
Hui Shen1 Huoping Wang2 Weiquan Zhu1 Deyang Wang1 1. COTEC Offshore Engineering Services(Beijing), Beijing, China; 2. CNOK China Ltd., Shenzhen, China

A New Fully Detailed Finite Element Model of Wire Rope for Fatigue Life Estimate of a Mooring Line  OMAE2019-96165
Federico Bussolati1 Martin Guiton1 Pierre-Alain Guidault2 Yann Poirot3 Martinez Michael1 Olivier Alla1 1. IFP Energies Nouvelles, Solaize, France; 2. ENS-Paris-Saclay, Cachan, France

Fatigue Performance of Mooring Chains Subjected to Wear Degradation  OMAE2019-96386
Gilang 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, Kueichong 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 Vannem, DNV GL, Norway
Session Co-Chair: Guillaume de Hauteclocque, Bureau Veritas, France

Wave Load and Response Predictions combining HOSM, CFD and Machine Learning  OMAE2019-95352
Jan Oberhagemann1 Anna Krøneng Ervik1 Ødinn Gramstad1 Jan Kauffmann1 Jens B. Helmers1 Francois-Xavier Sieta1 1. DNV GL, Hamburg, Germany; 2. DNV GL, Hav, 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  OMAE2019-95389
Tomoki 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
Huiling Ren, Gunqing Feng, Hao Liu, Yuecong Hu, Jian Zau Harbin Engineering University, Harbin, China

Analysis of Fatigue Life of Ship Structure under the Non-linear Slamming Load  OMAE2019-95781
Huiling 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/Technical University Delft, Delft, Netherlands

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
Huiling Ren, Gunqing Feng, Hao Liu, Yuecong Hu, Jian Zau Harbin Engineering University, Harbin, China

Analysis of Fatigue Life of Ship Structure under the Non-linear Slamming Load  OMAE2019-95781
Huiling Ren, He Ma Harbin Engineering University, Harbin, China

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  OMAE2019-96092
Jeena Mary John1 Nilanjana Saha1 Ranjananand Sundarawadivel2 1. Department of Ocean Engineering, Chennai, India; 2. Indian Institute of Technology Madras, Chennai, India
**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**  
  **OYMAE2019-95369**  
  Edgar Mamia, Facio Carbon, Luctual Mallcher, Guilherme Freirre, Eduardo Nunes Filho, Raineri Neves, Felipe Canini, Carlo Augusto, Mario Ribeiro, Pedro Teixeira

- **A Comprehensive Set of Round-bar Stress Intensity Factor Solutions for ECA of Mooring Shackles and Chain Components**  
  **OYMAE2019-96631**  
  Pingsha Dong, Jean-Michel Aubert, Jean-Pierre Sauvage

- **Wear Performance of Mooring Chain in Wet Environment with Substitute Ocean Water**  
  **OYMAE2019-95822**  
  Koji Gotoh, Tetsuya Ueda, Koji Murakami, Tomoaki Utsunomiya

**Development of a New Material Technology for Offshore Mooring Chains – High Manganese Steel**  
**OYMAE2019-95541**  
Neerav Verma, Andrew Wasson, Zhen Li, Harpreet Sidhar, Haiping He, Hyunwoo Jin, Hyunsoo Jun, Adnan Oezkicir, Shun Li

**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  
**Session Co-Chair:** Naik Harih, Decnor Edwards, Moorthi Dakshina

- **Corrosion-fatigue Crack Growth Performance of Titanium Grade 29 Welds in Tapered Stress Joints**  
  **OYMAE2019-95715**  
  Gabriel Rombado, David A. Baker, Lars M. Haldorsen, Pedro Craidi, Jim H. Feiger, Stephen J. Hudak

- **Vessel Interface Considerations for Ultra-deepwater Intervention Risers**  
  **OYMAE2019-9519**  
  Rohit Vaidya, Mahesh Sonawane, Ben Toleman, Elaine Whiteley, Jonathan Roure

- **Life Extension of Deepwater Risers used for a Spar Application in Gulf of Mexico**  
  **OYMAE2019-95804**  
  Yongming Cheng, Chenteh Alu Yau, Guangqiang Yang, Manuel Carballo

**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**  
  **OYMAE2019-95134**  
  Mamoon Masud, Suleman Mazhar

- **On the Use of Consumer-grade Remotely Piloted Aircraft Systems for Monitoring Shallow Coral Reefs in Colombia: Case Old Providence Island**  
  **OYMAE2019-95385**  
  Manuela Lopiera-Gil, Rafael E. Vasquez, Carlos A. Zuluaga, Paula Andrea Zapata-Ramirez

- **Integrated Acoustic Communication and Positioning System between an Autonomous Surface Vehicle and Multiple Autonomous Underwater Vehicles**  
  **OYMAE2019-96623**  
  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 Zheng3 Chi Zhang4 Ke Hu4
1. Tianjin Institute of Water Transport Engineering, Tianjin, China; 2. Heilongjiang University, Harbin, China; 3. CCMC Offshore Co. Ltd., Shenzhen, China

Numerical Simulation of Drifting and Run-up Ice Floes driven by Tsunami OMAE2019-95919
Shinji Kikuta1 Maiko Ishida2 Takahiro Takeuchi3
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 Riaz2 Jin Zhu3 Hasan Imani4 Jianu Zhang4
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 OMAE2019-95388
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 Tongjie Moan3
1. Shanghai Jiaotong 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 Kang1 Youwei Kang1 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
Yifan Li1 Shuanguo Guo2 Yue Kong3 Weimin Chen4 Min Li5
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
Shaofu Minta, 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 Liu1 Nikola Vladimir1 Hrvoje Jasak4
1. University of Zagreb, Zagreb, Croatia; 2. University of Stavanger, Stavanger, Norway; 3. Wilki Ltd, Landon, United Kingdom

Computational Methods for Moving and Deforming Objects in Extreme Waves OMAE2019-96321
Arthur Veldman1 Henk Steulers1 Matin Hosseini2 Xing Chang3 Peter Wellens2 Peter van der Pals1 Joop Helder4
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 Rahaida Arini1 Philipp R. Thies1 Lars Johanning1 Edward Ransley2 Scott Brown3 Han Xie4 Deborah Greaves5
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 Bemitsa2 Chen Zhiyun3
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 Armin1 Selda Shahvaghar-Asl1
1. University of Tehran, Tehran, Iran; 2. Liverpool John Moores University, Liverpool, United Kingdom; 3. Sharif University of Technology, Tehran, Iran

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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. McAdam1 Thomas A. Adcock3
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 Gaudin2 Matthew Quah2 Michael Perry3
1. University of Western Australia, Perth, WA, Australia; 2. Keppel, Singapore, Singapore
FEA Based Simplified Integrated Analysis for Mudmat Design OMAE2019-96754
Srikanth Shirigiraju1 Arindam Chakraborty1 Burak Ozturk1 Devvrat Rathore1
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 Torbjørn Vralstad1
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 Skorpa1 Benjamin Werner1 Torbjørn Vralstad1
SINTEF, Trondheim, Norway
A Discussion on Different Types of Cement Bond Strength OMAE2019-96773
Nils Opdal1 Pierre Cerasi3 Torbjørn 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 Salehi1
1. University of Oklahoma, Norman, OK, USA; 2. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

Rodney Eatoek Taylor Honoring Symposium on Marine and Offshore Hydromechanics

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 OMAE2019-95965
Xiantao Zhang1 Scott Draper2 Hugh Wolgamott2 Wenhua Zhao2 Lifen Chen2 Liang Cheng2
1. Shanghai Jiao Tong University, Shanghai, China;
2. University of Western Australia, Perth, WA, Australia
Zaibin Lin1 Ling Qian2 Wei Bai2 Zhihua Ma2 Hao Chen2 Jian Guo Zhou2
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, Havik, Norway; 2. DNV GL, Havik, Norway
Wave Interaction with a Shallowly Submerged Step in 2D OMAE2019-95933
Guy McCaulay1 Hugh Wolgamott1 Scott Draper2 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 Hibarayashi, 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 Koop3 Gustavo R. S. Assi1
Fabiano Rampazzo1 Rodolfo T. Gonçalves1
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 OMAE2019-95867
Yibo Liang1 Weichao Shi2 Longbin Tao2
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 Rheem1
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, Ahl 1 | 15:30 – 17:30**

**Session Chair:** Arjen Koop, MARIN, Netherlands

**Session Co-Chair:** António Maximiano, WavEC - Offshore Renewables, Portugal

**Well Integrity: Preliminary Risk Analysis for Different Well Life Cycle Phases** OMAE2019-95280

Danilo T. M. P. Abreu1 Carlos H. B. Morais1 Joaquim Santos2

Danilo Colomba1 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

**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

**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** OMAE2019-95776

Pengduo Zhao1 Haojie Wang2 Zhigeng Du1 Xiaobin Li2

1. Naval Research Academy, Beijing, China; 2. Wuhan University of Technology, Wuhan, China

**Investigation on Ship Construction Model Localisation Analysis in an X65 Offshore Pipeline Steel** OMAE2019-96786

Martin Kristoffersen, David Morin, Odd Sture Hopperstad, Tore Bervik

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** OMAE2019-96685

Agnes Marie Horn1 Erling Bøhly2 Vigo Ronfeldt3 Finn Kirkemo3

1. DNV GL, Oslo, Norway; 2. DNV GL, Hawik, Norway; 3. Equinor, Tronheim, 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

**Magnetoeleastic Characteristics of Pipeline Steel under Tensile Stress** OMAE2019-95275

Sheng Bao1 Pengfei Jin1 Ashri Mustapha2 Zhengye Zhao3

1. Zhejiang University, Hangzhou, China; 2. Petroleum Safety Authority, Stavanger, Norway; 3. National Research Board, Ottawa, Canada

**Material Property Requirements for High Strength Steels used in Mobile Offshore Units** OMAE2019-96844

Rolf H. Hinderaker

Petroleum Safety Authority, Stavanger, Norway

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**Well Integrity: Preliminary Risk Analysis for Different Well Life Cycle Phases** OMAE2019-95280

Danilo T. M. P. Abreu1 Carlos H. B. Morais1 Joaquim Santos2

Danilo Colomba1 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
Pipelines, Risers, and Subsea Systems

4-2-2 General Design and Analysis II
Tuesday June 11 | 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
KeppelFloTEC, Houston, TX, USA

Seismic Design Challenges of High Pressure Riser Systems on Gravity Based Structures
OMAE2019-96409
Mahesh Sonawane, Rohit Vaidya, Ronak Kadakia, Hunter Haerle, Phil Ward
1. JH Offshore Inc, Houston, TX, USA; 2. Baker Hughes, a GE Company, Houston, TX, USA; 3. JH 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
OMAE2019-95392
Qi Wu, Jianmin Yang, Haining Lu, Wenyue Lu, Tao Peng, Jun Li
Shanghai Jiao Tong University, Shanghai, China

Ocean Space Utilization

5-3-1 Development of Deep Sea Mining and Resources
Tuesday June 11 | Crowne Plaza, Staffa / Shuna | 15:30 – 17:30
Session Chair: Yoshiyasu Watanabe, Tokai University, Japan
Session Co-Chair: Mari Yamamoto, National Maritime Research Institute, Japan

Experimental Study on Bubble Size Measurement for Development of Seafloor Massif Sulfides
OMAE2019-95186
Seira Imai, Yasuharu Nakajima, Motohiko Murai
1. Yokohama National University, Yokohama, Japan; 2. Yokohama National University, Yokohama, Japan; 3. National Maritime Research Institute, Mitaka, Japan; 4. National Maritime Research Institute, Mitaka, Japan

Study on Pipe Wear Evaluation based on Large Scale Experiment for Deep Sea Mining
OMAE2019-95270
Satoru Takano, Hirota Sato, Takashi Terai, Sotaro Masanobu, Seiya Kawasaki

Research and Development on a Self-walking Vertical Mining System using DTH for Seafloor Mining and Sampling
OMAE2019-95394
Yoshiyasu Watanabe, Keisuke Watanabe, Hideyuki Suzuki
Tetsu Ooshima, Yoshiaki Tsukamoto
1. Tokai University, Shizuoka-shi, Shizuoka, Japan; 2. University of Tokyo, Tokyo, Japan; 3. Furukawa Co., Ltd., Tsukuba-shi, Ibaraki, Japan

Development of Reduced-scale Jumper for Deep-sea Mining
OMAE2019-95990
Marcio Yamamoto, Tomo Fujiwara, Shigeo Kanada, Masao Ono, Satoru Takano, Joji Yamamoto
National Maritime Research Institute, Mitaka, Japan

Pipelines, Risers, and Subsea Systems

4-5-1 Flow Assurance I
Tuesday June 11 | 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: Huu Le, CNOC Research Institute Ltd., China

Flow-induced Vibration Analysis of a Water Injection System at Elevated Flow Rates of an FPSO
OMAE2019-95919
Nestor Gonzalez Diez, Oluwaseun M. Awe, Pieter Van Beek
1. TNO, Delft, Netherlands; 2. Shell Nigeria Exploration & Production Ltd., Omuta-city, Japan; 4. National Maritime Research Institute, Tokyo, Japan; 5. Japan Oil, Gas and Metals National Corporation, Meguro-ku, Japan

On Deriving High Pressure Empirical Multiphase Forcing Functions from CFD Analysis
OMAE2019-96133
Oliver Macbain, Stefan Bellford, Lezsek Stachyra, Atle Jensen
1. TechnipFMC, Stavanger, Norway; 2. TNO, Delft, Netherlands; 3. University of Oslo, Oslo, Norway

Examination and Analysis of Four-phase Four-fluid Flow Techniques in Offshore Pipelines
OMAE2019-95005
Mohamed Odan, Faraj Ben Rajib, Mohammad Azizur Rahman, Amer Aboriz, Syed Imtiaz, Yan Zhang
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
OMAE2019-96884
Eugenem Caglar, Y. Zeng, Jeyhooon Khodadadi
Auburn University, Auburn, AL, USA

Automated Subsea Architecture Optimization using Low-dimensional Multi-phase Flow Models
OMAE2019-96291
Zurua Khan, Amine Meziou, Beza Tafeshi, Matthew Franchek, Karolis Grigoriadis
1. Texas A&M University at Qatar, Doha, Qatar; 2. University of Houston, Houston, TX, USA

Ocean Engineering

6-4-6 Towed Cables, Ropes and Mooring Systems
Tuesday June 11 | 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
OMAE2019-95838
Jan Vidar Grindheim, Ken Welker, Inge Revhaug
1. Geomatics, Stavanger, Norway; 2. NMBU, REALTEK, Ås, Norway

Sensitivity Analysis of Different Parameters of Taut Mooring System of a Truss Spar
OMAE2019-95490
Zhuang Kang, Rui Chang, Youwei Kang, Shanchuan Liu
1. Harbin Engineering University, Harbin, China; 2. CMC Offshore Co. Ltd., Shenzhen, China
Experimental Validation of Towed Underwater Cable Codes OMAE2019-96349
Jan Vidar Grindheim1 Antonio Carlos Fernandes1 Joel S. Sales Junior1 Inge Revhaug2
1. Geograf AS, Stavanger, Norway; 2. UFRJ/COPPE, Rio de Janeiro, RJ, Brazil
Laboratory of Waves and Current - LOC - Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 4. NIMR, REALTEK, AS, Norway

Tension Based Heading Control Strategy of the Arctic FPSO with DP Assisted Mooring System OMAE2019-96557
Jaeyong Lee1 Sol-Mi Choi2 Seung Jae Lee2 Kwang Hyo Jung1
1. Dong-eui University, Busan, Korea; 2. Korea Maritime and Ocean University, Busan, Korea; 3. Posun National University, Busan, Korea

Experimental Investigation of Stresses in Winch Drums subjected to Multilayer Spooling Loads from Synthetic Fibre Ropes OMAE2019-95283
Reidar Andre Skarbøvik1 Henry Piehl1 Sverre Torben1

Ocean Engineering

6-11-2 Floating Bodies Technology

Wednesday 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 OMAE2019-95473
Jingxia Yue (Le)1 Wei Li1 Jiayang Fan2 Wengang Mao2 Pengfei Chen1 Xi Wang1
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 and the Beetle Antennae Search Algorithm OMAE2019-95565
Changyuan Chen1 Manasse Tello Ruiz2 Evert Lataire2 Fangjie Mao1 Marc Mansuy1 Tianlong Mei1 Marc Vantore2
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 OMAE2019-96464
Wenhua Wu1 Baidhong Lyu2 Ji Yao1 Qianjin Yue2 Zhang Yantao1 Xinglin Guo1
1. Dalian University of Technology, Dalian, China; 2. Dalian University of Technology, Panjin, China; 3. NOCOAN, Tianjin, China

Effect of Irregular Seabed on the Dynamic Response of Spar-type Floating Offshore Platform OMAE2019-96816
Atul Krishna Banik1 Shovan Roy2
1. 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 OMAE2019-95840
Yingchun Chen1 Chang Wang2 Xinhua Wang2 Wenming Wang2 Wenda Wang2
1. Beijing University of Technology, Beijing, China; 2. China University of Petroleum-Beijing, Beijing, China; 3. China HuainQu 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, Oceanalysis Ltd, United Kingdom
Developments in Metocean HF Radar Technology, Applications and Accuracy OMAE2019-95202
Lucy Wyatt1 M.D. Moorhead1 L.A. Fairley1
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 OMAE2019-95220
Noriaki Hashimoto1 Masao Mitsui1 Koji Kawaguchi1 Takashi Fujiki2
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 OMAE2019-96021
Zhong Peng1, Hazel Grant, Richard Sproson2
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, Aish 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 OMAE2019-96846
Sören Ehlers1
1. Hamburg University of Technology, Hamburg, Germany

Numerical Simulation of Ice Load of a Ship Turning in Level Ice considering Fluid Effects OMAE2019-95694
Baoyu Ni1 Zhipeng Li1 Fan Jiang2 Feng Wu2 Yanzhuo Xue3
1. Harbin Engineering University, Harbin, China; 2. Jiuliang Vocational and Technical College, Jiuliang, China; 3. Guangzhou Marine Engineering Corporation, Guangzhou, China

A Voyage Planning Tool for Arctic Transit of Cargo Ships OMAE2019-95128
Zhiyuan Li1 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 OMAE2019-96732
Reza Zeinali Torbat1 Ian Turnbull2 Rocky Taylor2 Derek Mueller4
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

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**CFD & FSI**

**8-5-1 Wave CFD Modeling Applications**  
Tuesday June 11  
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  
Zurua Khan, Reza Tareshi, Matthew Fancher, Karolos Gligorialis  
1. Texas A&M University at Qatar, Doha, Qatar; 2. University of Houston, Houston, TX, USA  
Numerical Simulation of Ship-Ship Interactions in Waves  
Xueshen Xie, Yuxiang Wang, Hao Liu, Daku Feng  
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 Container Ship  
Ye Li, Pandelis Temarel, Qu Jin, Yousheng Wu, Xinyun Ni, Chao Tian  
1. China Ship Scientific Research Center, Wuhan, China; 2. University of Southampton, Southampton, United Kingdom  
Two-phase MPS Method for Dam-break Flows  
Xiao Wen, Decheng Wan  
Shanghai Jiao Tong University, Shanghai, China  
Numerical Investigations on the Flow Past an Inclined Thin Square Plate at Re=300  
Yaku 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  
Session Chair: Amy Robertson, National Renewable Energy Laboratory, USA  
Performance of a Passive Tuned Liquid Column Damper for Floating Wind Turbines  
Wei Yu, Frank Lemmer, Pu Wen Cheng  
University of Stuttgart, Stuttgart, Germany  
A Novel Semi-submersible Floating Wind Turbine Platform Design based on Tuned Liquid Column Dampers  
Bajin Mao, JiJin Sun, Zecheng Tang, Bo Feng, Weijie Zhang, Dahai Zhang, Yulin Si  
Zhejiang University, Zhezhan, China  
Bottom Supported Tension Leg Tower with Inclined Tethers for Offshore Wind Turbines  
Mohd Ishyibyak, Arunyoti Sarkar  
Indian Institute of Technology, Kharagpur, India  
Coupled Numerical Analysis of a Concept TLB Type Floating Offshore Wind Turbine  
Iman Ramzanpoor, Martin Nuernberg, Longbin Tao  
University of Strathclyde, Glasgow, United Kingdom  
Dynamic Response of a Conceptual Designed Articulated Offshore Wind Turbine  
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  
Session Chair: Manuela Kanitz, Hamburg University of Technology, Germany  
Assessment of Offshore Wind Turbine with Hybrid Monopile Foundation under Lateral Load using Centrifuge Tests  
Xuefei Wang, David Zeng, Jiale Li, Yougang Tang  
1. Hebe 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  
Jianhua Wang, Yifei Fan, Dong Guo  
Tianjin University, Tianjin, China  

**Petroleum Technology**

**11-12-1 Cementing I**  
Tuesday June 11  
Session Chair: Ian Frigaard, University of British Columbia, Canada  
Exchange Flow in Well Abandonment Operations  
Mónica Naccache, Priscilla Vargas, Paulo de Souza Mendes  
1. University of Petroleum and Geological Engineering, Norman, OK, USA; 2. Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA  
Efficient Fluid-Fluid Displacement of Yield Stress Fluids in Axially Rotating Pipes  
Shan Lyu, Saeed Salehi, Catalin Teodoriu  
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  
Hans Joakim Skadsem, Steinan Kragset  
Norwegian Research Centre AS, Stavanger, Norway  
Enhanced Cement Composition for Preventing Annular Gas Migration  
Mustafa Al Ramadan,Saved Saleh, Catalin Teodoriu, George Kwata  
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 Draper3 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 Francisco2 Celso Morooka2
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
Gang Wang1 Rong Wan1 Liuyi Huang1 Fenfang Zhao1 Xinmin Wang1 Wenbin Zhu1 Lei Wang1 Qiong Chang Xu1 Yuyan Li2
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 Iizuka2 Ryo Nishiguchi3 Tomoki Ikoma1 Yasuhiro Aida1 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 Aida1 Koichi Masuda1 Sena Shimomoto4 Yuichi Kitabatake5
1. Nihon University, Funabashi, Japan; 2. Nihon University, Tokorozawa, Japan; 3. 5 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

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

### 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:** Elizaeta M. Bitner-Gregersen, DNV GL, Norway

**Session Co-Chair:** Alexander V. Babarin, University of Melbourne, Australia

**Identifying Higher-order Interactions in Wave Time-series**

OMAE2019-95378

Kevin Evans1, Marios Christou1, Suzanne Illc, Philip Jonathan1


**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 Jolhas2, 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, Carvallis, OR, USA; 4. Northeastern University, Boston, MA, USA

**Nonlinear Airy Wave Pulses on the Sea Surface**

OMAE2019-96298

Igor Shugan1, Seregi 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

#### 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, Li Ma1, 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

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### Offshore Technology

#### 1-5-1 FLNG

**Wednesday June 12**

**Room SEC, Alsh 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 McPhail3

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**

OMAE2019-96115

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

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### Concurrent Sessions

08:30 – 10:00

**Offshore Technology**

1-5-1 FLNG

**Wednesday June 12**

**Room SEC, Alsh 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 McPhail3

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**

OMAE2019-96115

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
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: Xi Wang, Carleton University, Canada

Safe Operations of Bolted Connections in the Oil and Gas Industries  OMAE2019-95260
Morton Langøy, Rolf H. Hindaraker, Terje L. Andersen
Petroleum Safety Authority, Stavanger, Norway

An Improved Methodology to Assess Weldability of Line Pipe Steel  OMAE2019-95573
Laura Alleva1 Mauro Monti1 Emanuele Paravicini Bagliani2
Alessandro Paggi3 Philippe Darcis3
1. Rina Consulting Centro Sviluppo Materiali, Roma, Italy; 2. Balmain 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 Niiino1 Koji Gotob1
1. Shin Kurushima Dockyard Co., Ltd., Imabari, Japan; 2. Kyushu University, Fukuoka, Japan

Standardisation on Measurement and Interpretation of Residual Stress Data  OMAE2019-95615
Ali Mirzaee Sisan1 John Bouchard2 Forough Hosseinzadeh2
1. University of Leicester, Leicester, United Kingdom; 2. TWI Ltd, Cambridge, United Kingdom

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

Flexibles – Pipelines, Risers, and Subsea Systems

4-1-6 Flexible Pipes VI

Wednesday June 12  Room Crowne Plaza, Castle 3 | 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 Bai1
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Controlling Factors of Carcass Fatigue in Unbonded Flexible Pipes  OMAE2019-96310
Upul Fernando1 Andrew Roberts2 Michelle Davidson2
1. Baker Hughes, an 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 Bai1
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Ocean Space Utilization

5-5-1 Floating Systems for Renewable Energy

Wednesday June 12  Room SEC, Dochart 1 | 08:30 – 10:00
Session Chair: Motokiko Mura, 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 Tomaaki Utsumomiy1 Koji Gotob1 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 Jinlin Zhou2 DaiSuke Kitzazawa3
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 Zhengjiang University, Zhoushan, China

On the Hydrodynamic Interaction between Ship and Free-surface Motions on Vessels with Moonpools OMAE2019-99332
Senthuran Ravintharakumar1 Tryge Kristiansen 2 Babak Ommani 1 2 1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Ocean, Trondheim, Norway

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 OMAE2019-95579
Yang Luo1 Qing Xiao2 Guangyu Shi3 Li Wei4 Zhiming Yuan1 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
Xue Liang Wen, Peining Liu, Qilin Qu, Qingchuan Liu Beihang University, Beijing, China
The Development of 3D Hydroelastic Software and its Application on Platform OMAE2019-96122
Xinyun Ni, Zhengqei Zhang, Chao Tian, Ye Lu, Jun Ding China Ship Scientific Research Center, Wuxi, China
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

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 Maximus Thy2 Erin E. Bachynski3 1. Inha Technical College, Incheon, Korea; 2. South Korea / Inha University, Incheon, Korea
Improvement of Wave Loads Estimation using Spatial Pressure Distribution on Ship Hull OMAE2019-95273 Kurniawan T. Waskito, Masakashi 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 Boulogouris2 Osman Turan1 Ogün Hızır1 1. University of Strathclyde, Glasgow, United Kingdom; 2. University of Strathclyde, MSRC, Glasgow, United Kingdom

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 Julide Caroe Kristoferlesen1 Henriks Bredmose2 Christia Thomas Georgakis3 Longbin Tao2 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
Numerical and Experimental Study on the Dynamics of a High Compressed Air Generated Bubble OMAE2019-95232 Shiping Wang1 Xiangang Lu2 Aman Zhang3 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 Kuemelie, Sea2ice Ltd. & Co. KG, Germany
Wear Amount of Steel Structure in Ice-infested Sea by Sliding Wear Test OMAE2019-95654 Takahiro Takeuchi1 Shinji Kikko2 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 Eric 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 Berthelsen2, Halvor Lie1, Vegard Aksnes1, Geir Laland2 1. SINTEF Ocean, Trondheim, Norway, 2. Petroleum Safety Authority Norway, Stavanger, Norway

Eliminating the Uncertainties in Hydraulic and Ice Loads on Bern Breakwaters OMAE2019-95319 Maria Pontikis1, Bernt Leira2 1. University of Delaware, Department of Civil and Environmental Engineering, Newark, DE, USA; 2. Norwegian University of Science and Technology, Trondheim, Norway

Semi-submersible Floating Offshore Wind Turbines A Comparative Study on the Dynamic Response of Three

Effects of Platform Mounting Orientations on the Long-term Performance of a Semi-submersible Floating Wind Turbine OMAE2019-96240 Shengtao Zhou1, Chao Li1, Yingqin Xiao1, Frank Lemmer1, 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 Yang1, Yan Li1, Peng Xie1, Xiaobo Qu2, Bin Wang2 1. Tianjin University, Tianjin, China; 2. CCS, Tianjin, China

CFD & FSI

Ocean Renewable Energy

11-15-1 Well Abandonment I – Rules and Regulations

Wednesday June 12

Petroleum Technology

Wednesday June 12
Wednesday 08:30 – 12:00

12-1-1 Numerical and Experimental Methods in Hydrodynamics

**Rodney Eatock Taylor Honouring Symposium on Marine and Offshore Hydrodynamics**

**Wednesday June 12**

**Session Chair:** Arne Løken, Dr. Ing. Arne E. Løken Engineering & Consulting, Norway

**Session Co-Chair:** Torgeir Bara, DNV GL – Energy & Environment, Oslo, Norway

- **Hydro-elastic Analysis and Validation of an End-anchored Floating Bridge under Wave and Current Loads**
  - Xin Li
  - University of Oslo, Norway

- **Development of an Experimental System for the Twin-lift Decommissioning Operation**
  - Xi Li
  - Shanghai Jiao Tong University, Shanghai, China

- **Edge Effect on Numerical Calculation of Nonlinear Radiation Forces for a Submerged Body**
  - Jianye Yang
  - Dalian University of Technology, Dalian, China

**Room SEC, Carron 2 | 08:30 – 10:00**

- **Hydrodynamic Investigation of a Novel Concept of OWC Type Wave Energy Converter Device**
  - Kourosh Rezanejad
  - Ramboll Offshore Wind, København S, Denmark

**Room SEC, Alsh 1 | 10:30 – 12:00**

- **Component-based Modeling and Simulation of Nonlinear Drill-string Dynamics**
  - Njaal Tengesdal
  - University of Science and Technology, Trondheim, Norway

**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**

**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**
  - Maximilian Liebert
  - Hamburg University of Technology, Hamburg, Germany

- **Evaluation of Impact Loads on Offshore Jacket Platform during Float-over Mating Operation**
  - Gurumurthy Kagita, Mahesh Babu Addala, Gudimella G. S., Ashray, Subramaniam V. R., Sripada Engineers India Limited, Gurugram, India

**Room SEC, Arl 1 | 10:30 – 12:00**

- **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**
  - Mikkel L. Larsen, Ronnie R. Pedersen
  - University of Southern Denmark, Odense, Denmark

**Room SEC, Boisdale 2 | 08:30 – 10:00**

- **Estimation of Expected Loss by Storm Surges along Tokyo Bay Coast**
  - Rikito Hisamatsu
  - Tokyo Institute of Technology, Tokyo, Japan

- **Estimating Extreme Waves in Gulf of Mexico using a Simple Spatial Extremes Model**
  - Ryota Wada
  - Texas A&M University, College Station, USA

**Room SEC, Boisdale 2 | 10:30 – 12:00**

- **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**
  - Mikkel L. Larsen
  - University of Southern Denmark, Odense, Denmark

**Room SEC, Carron 2 | 08:30 – 10:00**

- **The Characteristics of Numerical Solution of NDDE to Solve the Drill Pipe Stick-slip**
  - Tsubasa Kodaira
  - Tsukuba University, Ibaraki, Japan

- **Environmental Restoration for a Small-scale Beach**
  - Heda-Mihama Project
  - Nichimo Co.Ltd, Tokyo, Japan

**Room SEC, Alsh 1 | 10:30 – 12:00**

- **Application of the Spectral Nudging on Global Tides towards a Global Total Water Level Prediction System**
  - Tatsuhisa Inoue
  - University of Tokyo, Tokyo, Japan

- **Asymmetrical Twin-hull Crane Vessel Global Performance Study**
  - Joe Zhou
  - China Merchants Offshore Technology Research Center, Haizhen, China

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**ROOM SEC, Boisdale 2 | 08:30 – 10:00**

- **Estimation of Extreme Waves in Gulf of Mexico using a Simple Spatial Extremes Model**
  - Ryota Wada
  - Texas A&M University, College Station, USA

- **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**
  - Mikkel L. Larsen
  - University of Southern Denmark, Odense, Denmark

- **Asymmetrical Twin-hull Crane Vessel Global Performance Study**
  - Joe Zhou
  - China Merchants Offshore Technology Research Center, Haizhen, China

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**ROOM SEC, Alsh 1 | 10:30 – 12:00**

- **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**
  - Mikkel L. Larsen
  - University of Southern Denmark, Odense, Denmark

- **Asymmetrical Twin-hull Crane Vessel Global Performance Study**
  - Joe Zhou
  - China Merchants Offshore Technology Research Center, Haizhen, China
Structures, Safety and Reliability

2-1-1 Abnormal or Rogue Waves II
Wednesday June 12 Room Crowne Plaza, Castle 1 | 10:30 – 12:00
Session Chair: Alexander V. Babamin, University of Melbourne, Australia
Session Co-Chair: Ling Zhu, Saikat Dan, Shanghai Jiao Tong University, China
Comparison of Temporal and Spatial Statistics of Nonlinear Waves OMAE2019-95357
Elzbieta M. Bitner-Gregersen, Odin Gramstad
NNVL GL, Havik, Norway

Effect of Spectrum Tail Length on Modulational Instability and Freak Wave Occurrence in JONSWAP Sea States OMAE2019-95740
Caroli Kirecci, Alexander V. Babamin
University of Melbourne, Melbourne, VIC, Australia

Predicting Extreme Waves from Wave Spectral Properties using Machine Learning OMAE2019-96061
Odn Gramstad, Elzbieta M. Bitner-Gregersen
NNVL GL, Havik, Norway

“Three Sisters” Measured as a Triple Rogue Wave Group OMAE2019-96387
Anne Karin Magnusson1, Karsten Trulsen1, Elzbieta M. Bitner-Gregersen2
1. Norwegian Meteorological Institute, Bergen, Norway; 2. University of Oslo, Oslo, Norway

Structures, Safety and Reliability

2-1-2 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 Zhang1, Tongxi Yu2
1. Wuhan University of Technology, Wuhan, China; 2. Lloyd’s Register, Southampton, United Kingdom

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 Murakami1
1. Oshima Shipbuilding Co., Ltd., Saikai, Japan; 2. Fukuoka 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 Aabed el Andaloussi1, Luc Mouton2, Firas Sayed Ahmad3
Stéphane Maherault-Mougin4, Stéphane Paboeuf5, Xavier Erolabehere3
1. COLD, PARIS, France; 2. Bureau Veritas, Nantes, France; 3. Bureau Veritas, Poitiers, France

Numerical Investigation on Surface Crack Growth in Steel Plates Repaired with Carbon Fiber-reinforced Polymer OMAE2019-95746
Zongchen Li, Xiaodan 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, Young Bae2, Jiannan Zhao1, Xiao Li2
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, Zhikun Yang1, Liang Yang1, Jiakun Fan2
1. Dalian University of Technology, Dalian, China; 2. CNCC 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. Tecnip 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 Ovulation and Gap OMAE2019-95642
Xiao Li1, Xiaoli Jiang1, Hans Hopman2
1. Delft University of Technology, Delft, Netherlands; 2. TU Delft, Delft, Netherlands
### 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**  
Shagun Agarwal, Siram Venkatachalam, K. Muruli  
Indian Institute of Technology Madras, Chennai, India  
**Numerical Simulation of Fully Nonlinear Interaction between Regular and Irregular Waves and a 2D Floating Body**  
Haoran Li, Ern E. Bachynski  
Norwegian University of Science and Technology, Trondheim, Norway  
**Gap Resonance of Fixed Floating Multi Caissons**  
Limin Chen, Guanghua He, Harry B. Bingham, Yanlin Shao  
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**  
Yanfai Deng, Wei Feng, Lei Li, Youwei Kang, Xia 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**  
Arun Kamath, Tobias Martin, Hans Bihs  
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian University of Science and Technology, Sur-Trøndelag, Norway  
**Parametric Rolling in Regular Head Waves of the KRISO Container Ship (KCS): Numerical and Experimental Investigation in Shallow Water**  
Arun Kamath, Tobias Martin, Hans Bihs  
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian University of Science and Technology, Sur-Trøndelag, Norway  
**Wave Effects on the Turning Circle Ability of an Ultra Large Container Ship in Shallow Water**  
Arun Kamath, Tobias Martin, Hans Bihs  
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian University of Science and Technology, Sur-Trøndelag, Norway  
**System Identification of Abkowitz Model for Ship Maneuvering Motion based on Epsilon-support Vector Regression**  
Bin Liu, Yuting Jin, Allan Magee, Lucas J. Yiew, Shari Zhang  
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 Maneuvering Model Tests on a Modern Ferry, with Emphasis on Heel Angles OMAE2019-95513
Anton Kijeski1, Frans H. H. A. quadling2, Victor Ferrant2
1. MARIN, Oss, Netherlands; 2. MARIN, Wageningen, Netherlands

Biofouling Characterization and its Effect on Resistance of Surface Ship OMAE2019-96220
Della Thomas, S. Suresh, Nilesh J. Vasa
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. Esperanca2, Mauro C. de Oliveira2
1. LabOcean – Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; 2. LabOcean/COPPE/Universidade Federal do Rio de Janeiro, 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 Holloway3, Michael Davis4, Giles Thomas4

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

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 Alam1, Nitish Kumar2, Ujjwal K. Saha3
1. Indian Institute of Technology Guwahati, Guwahati, India; 2. Larsen and Toubro, Mumbai, India

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

Plastic Accumulation in Front of a Plate in Cross Flow – Model Scale Test and CFD-DEM Modeling OMAE2019-96095
Hendrik Wrenger1, Bruno Sainte-Rose2, Christoph Goni1a, Renan Hilberta
1. The Ocean Cleanup, Rotterdam, Netherlands; 2. DCS Computing, Lüneburg, 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 Jr1, Liang-Yee Cheng2
1. South Ural State University, Chelyabinsk, Russia; 2. University of Sao Paulo, Sao Paulo, SP, Brazil

Numerical Study on Vortex Induced Motion of Circular Cylinder with Low Aspect Ratio in Currents OMAE2019-95525
Jaewel 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 Iltel, Ugur Oral Unal
Istanbul Technical University, Istanbul, Turkey
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
Geometrical Optimization of U-Oscillating Water Columns in Random Waves
OMAE2019-95973
Andrea Scialo, Giovanni Malaara, Felice Arena
Mediterranea University, Reggio Calabria, Italy

Oscillating Water Column Motion inside Circular Cylindrical Structures
OMAE2019-96048
Daniel de Oliveira Costa1, Joel S. Sales Junior2, 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
OMAE2019-96123
Irene Simonetti, Lorenzo Cappietti
University of Florence, Florence, Italy

Improving the Hydrodynamic Performance of OWC Wave Energy Converter by Attaching a Step
OMAE2019-96008
Kourosh Rezanejad1, Jorge Filipe Marques Gadelho1, Ivan López2
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

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, US, Norway
Cement Plug Sealing Studies of Silica Cement System
OMAE2019-95929
Anisa Noor Corina1, Nils Opedal2, Torbjorn Vråstad3, Sigbjørn Sangesland4
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. SINTEF Industry, Trondheim, Norway; 3. SINTEF, Trondheim, Norway

Effect of Well Construction on Efficient P&A Process
OMAE2019-96067
Farzad N. Shoghli1, Arild Saaser1, Mahmoud Khalifeh2
1. Equinor ASA, Stavanger, Norway; 2. University of Stavanger, Stavanger, Norway

Expanding the Hydrodynamic Performance of Oscillating Water Columns

OMAE2019-96008
Kourosh Rezanejad1, Jorge Filipe Marques Gadelho1, Ivan López2
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

A Simplified Fatigue Assessment Procedure for Drilling Pipes of Scientific Vessels
OMAE2019-96639
Martina Aguiari1, Cesare Mario Rizzo2, Tomoya Inoue3
1. University of Genoa - DITEN, Genova, Italy; 2. Universita Degli Studi di Genova, Genova, Italy; 3. JAMSTEC, Yokosuka, Japan

A Simplified Fatigue Assessment Procedure for Drilling Pipes of Scientific Vessels
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1. University of Genoa - DITEN, Genova, Italy; 2. Universita Degli Studi di Genova, Genova, Italy; 3. JAMSTEC, Yokosuka, Japan

Evaluation of Flow Field in the Layouts of Cross-shaped Artificial Reefs
OMAE2019-95192
Yanli Tang1, Qi Hu1, Xinxin Wang1, Fenfang Zhao1, Liuyi Huang1, Yan Li Tang1, Peng Sun1
Ocean University of China, Qingdao, China

Nonlinear Wave Surface Elevation Characteristic Analysis around a Multi-body Offshore Platforms System
OMAE2019-95203
Xiudi Ren1, Yibo Liang1, Longbin Tao2
University of Strathclyde, Glasgow, United Kingdom

Two-Dimensional Numerical Simulation of Vortex Shedding of Multiple Stranded Rope
OMAE2019-95225
Xinxin Wang1, Liuyi Huang1, Yanli Tang1, Fenfang Zhao1, Peng Sun2
Ocean University of China, Qingdao, China

Experimental Study on the Hydrodynamic Characteristics of Artificial Reefs
OMAE2019-96019
Fenfang Zhao1, Muk Chen Ong1, Yanli Tang1, Xinxin Wang2
1. Ocean University of China, Qingdao, China; 2. University of Stavanger, Stavanger, Norway

Lunch
12:00 – 13:30
Location: Hall 5 (SEC)
**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

### Materials Technology

### 3-11-1 Developments in BS 7910 and other Fitness-for-service Procedures: Session I

**Wednesday June 12**

**Room Crowne Plaza, Castle 3 | 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**

OMAE2019-95126

OMAE2019-96619

Isabel Hadley

TWI Ltd, Cambridge, United Kingdom

**Emerging Technology in Fitness-for-service**

**Assessment of Crack-like Flaws**

OMAE2019-95787

Ted Anderson

TL Anderson Consulting, Longmont, CO, USA

**Estimating Fracture Toughness from Charpy Data**

OMAE2019-95456

Henryk Pisarski, Bostjan Bezensek

1. Independent Consultant, Cambridge, United Kingdom;
2. Shell, Laurencekirk, United Kingdom

**Residual Stress in Girth Welds: Seeing Measurement Data Differently**

OMAE2019-96422

Ali Mirzae Sian, Guiy Wu

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, Dana Williams

Wood PLC, Galway, Ireland
Mitigated Riser Response during Submerged BOP Move through use of Drilling Active Heave Compensation System OMAE2019-95809
Lucas Sevillano¹ Cezar Morooka² Sibgyarn Sangesiland²
1. University of Campinas, Campinas, SP Brazil; 2. Norwegian University of Science and Technology, Trondheim, Norway

Advances in Riser Management Technology: Improved Efficiency for Deepwater and Harsh Environment Drilling OMAE2019-96261
Donogh Lang¹ Paul Bohan² Victor Gomez² Germain Venere² 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. Kurni¹ Hayden Marcello² Andrew A. Kilner³
Daniel Johnston¹ Andrew E. Potts¹ Peter Peetz¹ Tricia Hill⁴
1. AMOG Consulting, Houston, TX, USA; 2. AMOG Consulting, Netting Hill, VIC, Australia; 3. Matrix Composites and Engineering, Henderson, WA, Australia; 4. Matrix Composites and Engineering, Houston, TX, USA

Hydrodynamic Model Tests with a Large Floating Hydrocarbon Storage Facility OMAE2019-96761
Fonseca Nuno¹ Chi Zhang² Jose Miguel Rodrigues¹
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 Magee² Xiao Liu¹ Oyvind Hellan¹ 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 OMAE2019-95924
Davide Mirelli¹ Michael Walker² Lars Canizares² Aaron Smith² Dominique Roddier²

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, Dochart 1 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

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 Nuno¹ Allan Magee¹ Nianxin Ren¹
1. National University of Singapore, Singapore, Singapore; 2. SINTEF Ocean, Trondheim, Norway

Alexandre Immas, Mohammad-Reza Alam
University of California, Berkeley, CA, USA

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

Avilash Sahoo¹ Santosh K. Dwivedi² P. S. Robi³
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, Mohtsen Saadat, Jesus Navarro, Matthew Drake, Julie Shen, Mohammad-Reza Alam
University of California, Berkeley, Berkeley, CA, USA

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 Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
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Session Organizer: Torgeir Kikholm Vada, DNV GL, Norway
Vortex Shedding and Roll Damping from Hulls with Rounded Bilges OMAE2019-95629
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Ocean Engineering
6-3-3 Damping and Viscous Effects
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Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
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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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
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Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
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Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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

Ocean Engineering
6-3-3 Damping and Viscous Effects
Wednesday June 12
Room SEC, M4 | 13:30 – 15:00
Session Organizer: Torgeir Kikholm 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
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
Froydis Solasa1 Fredrik Mentzonii, Mia Abrahamsen-Priii, Trygve Kristiansen1
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
Zhenlin Tian, Zhaochen Sun, Shuxia 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-Parker1 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 Mux-Pavic1 Dmitry Ponkratov2

Numerical Simulation of the Ducted Propeller and Application to a Semi-submerged Vehicle OMAE2019-96799
Guohe Tan1 Jin Zou1 Jae Xu2
1. Harbin Engineering University, Harbin, China; 2. Changqing Changan Automobile Co., Ltd, Changqing, China

Research on the Estimated Error of Wave Action by using Wave Elevation Data OMAE2019-96657
Jiabin Liu, Aoxin 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, Guqing 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 Mylrand
HSVA, Hamburg, Germany

Anti-icing and De-icing of Pipe Structures on Marine Vessels using Waste Heat Recovery OMAE2019-96689
Lene Aaes1 Henry Pielh1 Palmar Bjornoy2
1. Norwegian University of Science and Technology, Trondheim, Norway; 2. Norwegian University of Science and Technology, Ålesund, Norway; 3. Ulmect Pyn, Gamlem, Norway

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

Elchaman Sahef
Safier Ingenierie SAS, Serris, France
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**  
  Qian Ma1 Tullio M. Moreira2 Thomas A.A. Adcock3  
  1. University of Oxford, Oxford, United Kingdom; 2. University of Minas Gerais (UFMG), Belo Horizonte, Brazil

- **Numerical Study on Aero-hydrodynamics with Inter-turbine Spacing Variation for Two Floating Offshore Wind Turbines**  
  OMAE2019-95530  
  Yang Huang, Decheng Wan  
  Shanghai Jiao Tong University, Shanghai, China

- **Evaluation of Entropy Generation Methods in Wells Turbines**  
  OMAE2019-95613  
  Fabio Licheri1 Tiziano Ghisu1 Irene Virdi2 Pierpaolo Puddu3 Francesco Cambuli3  
  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 Aabet1, Ru Bhadhia Armi1, Philipp R. Thies1, Lars Johannes1  
  University of Exeter, Penryn, United Kingdom

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 Prasad1 Andrew Wojtanowicz2  
  1. Louisiana State University, Baton Rouge, LA, USA; 2. University of Cagliari, Cagliari, Italy

- **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 Chen2 Otto Santos3  
  Wesley Williams1 Paulo Ribeiro1 Felipe Chagas1  
  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 Iafrati, CNR-INM (Institute of Marine Engineering), Italy

- **On Signatures and Features of Modulatory Instability in Ocean Waves**  
  OMAE2019-95633  
  Alexander V. Babanin1  
  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 Nose2 Tsubasa Kodaira2  
  1. The University of Tokyo, Kashiwa, Japan; 2. ME&AD InterRisk Research & Consulting, Inc., Tokyo, Japan; 3. Waseda University, Tokyo, Japan

- **On the Rogue Wave Occurrence in Crossing Wave Fields**  
  OMAE2019-96029  
  Shuai Liu1 Xinshu Zhang1 Xingyu Song2 Ke Chen1  
  Shanghai Jiao Tong University, Shanghai, China

- **Generalized Nonlinear Fourier Analysis for Water Waves**  
  OMAE2019-96613  
  Alfred R. Osborne1  
  Nonlinear Wave Research Corporation, Alexandria, VA, USA

REFRESHER BREAK

15:00 – 15:30  
**Location:** Hall 5 (SEC)
**Offshore Technology**

**1-3-2 Fluid-Structure Interaction**

*Wednesday June 12*  
Session Chair: Taschin 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  
Yunfei Tong², Liang Cheng¹, Hongwei An¹, Feifei Tong¹  
1. University of Western Australia, Perth, WA, Australia; 2. AMOG Consulting, Notting Hill, VIC, Australia

**The Effect of Aspect Ratio on the Drag of Bare Cylinders**  
Douglas A. Potts¹, Jonathan R. Binns¹, Andrew E. Potts¹, Hayden Marcollo²  
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**  
Joo-Sung Kim, Seo Oh Yoo, Hyun Hoe Kim, Jong Hun Lee, So Lyunghun Han, Dong Yeeon Lee  
Samsung Heavy Industries, Daejeon, Korea

**2-2-2 Probabilistic and Spectral Wave Models II**

*Wednesday June 12*  
Session Chair: Felice Arena, Univ Mediterranea, Italy  
Session Co-Chair: Carlos Guedes Soares, Instituto Superior Tecnico, Universidade de Lisboa, Portugal  
Quantitative Evaluation of Ship Operational Effect in Actually Encountered Sea States  
Rei Miratsu, Tatsuya Futakai, Toshiyuki Matsumoto, Tingyao Zhu  
Nippon Kaisi Kyokai (ClassNK), Tokyo, Japan

**Estimation and Comparison of Accuracy in Various Data Resolutions on Optimal Ship Routing across the North Pacific Ocean**  
Kenji Sasa¹, Takuya Fujimoto¹, 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**  
Roberto Vettori¹, Carlos Guedes Soares¹  
1. Centre for Marine Technology and Ocean Engineering, Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal; 2. Instituto Superior Técnico, Universidade de Lisboa, Lisbon, Portugal

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**Structures, Safety and Reliability**

**2-6-1 Reliability of Mooring and Riser Systems I**

*Wednesday June 12*  
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

**Numerical Modelling of the Mooring Line Failure Induced Performance Changes of a Marine Fish Cage in Irregular Waves and Currents**  
Hun­-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**  
Mark 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**  
Marina L. Simão¹, Paulo M. Videira¹, Maurício C. de Oliveira¹, Luís 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. CENPES/PETROBRAS, Rio de Janeiro, RJ, Brazil

**Application of Machine Learning Techniques as a Means of Mooring Integrity Monitoring**  
Jonathan M. Gumley, Hayden Marcollo, Stuart Wales, Andrew E. Potts, Christopher J. Carra  
AMOG Consulting, Notting Hill, VIC, Australia

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**Materials Technology**

**3-11-2 Developments in BS 7910 and other Fitness-for-service Procedures; Session II**

*Wednesday June 12*  
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**  
Bostjan Bezensek¹, Yuri Tkach (WG)¹, John Sharpeles², Harry Coules³  
1. Shell, Laurencekirk, United Kingdom; 2. Wood PCL, Aberdeen, United Kingdom; 3. Wood PCL, 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**  
Andrew Cosham¹, Robert Andrews², John Sharples³  
1. Ninth Planet Engineering Ltd, Newcastle upon Tyne, United Kingdom; 2. ROSEN Group, Newcastle upon Tyne, United Kingdom
Wednesday 15:30 – 17:30

**Pipelines, Risers, and Subsea Systems**

**4-2-4 SCR and SLWRs I**
Wednesday June 12  
Room: Crowne Plaza, Castle 3 | 15:30 – 17:30

**Session Chair:** Alan Whoolery, 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**  
OMAE2019-96952  
Stael Ferreira Sena1, Ludimar L. Aguia1, Eduardo Hippert1, Alexandre G. Garmb1, Marcelo Dos Santos1, Marcos Andre Duarte Martins1, Luis Manoel Paiva Nunes1  
1. Petrobras, Rio de Janeiro, RJ, Brazil; 2. Petrobras, São José dos Campos, SP, Brazil; 3. Petrobras (cpenas), Rio de Janeiro, RJ, Brazil

**The Impact of Second-order FPSO Motions on the Fatigue Performance of Large Diameter SCRs**  
OMAE2019-96451  
Rasoul Hejaizi, Andrew Grime, Mark F. Randolph, Mike Ethymiou  
University of Western Australia, Perth, WA, Australia

**Effect of Flexible Joint Modelling Method on Deep Water Catenary Riser Hang-off Fatigue Response**  
OMAE2019-96426  
Guanyu Hu1, Chaojun Huang1, Fengjie Yin1, Mark Cerkovnik1, Guangqiang Yang1  
1. 2H Offshore Inc., Houston, TX, USA; 2. ExxonMobil Production Company, Spring, TX, USA

**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, Chengfeng Li, Xueqian Zhou, Feng Liu  
Harbin Engineering University, Harbin, China

Hydrodynamic Design of a Morphic 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  
Jiaoyuan Zhuang1, Cao Jian2, Yang Xi1, Xinzhao Yu1  
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

**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  
Huaili Yi1, Yun Hao2, 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 Yao2  
1. Hohai University, Nanjing, China; 2. Hohai University, Han, China; 3. Sun yat-sen University, Guangdang, China

Introducing a Novel MEG/EtOH Mixture to Improve Gas Hydrate Blockages Removal during Offshore Oil and Gas Production  
OMAE2019-95808  
Paulo Paz1, Theodoro Netto1  
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, Yong Weiren, Xu Jiangguo, Wang Zhaoqiang  
Shanghai Waigaoqiao Shipbuilding Co., Ltd., Shanghai, China

**Hydrodynamics**

**4-2**

**Review of Available Probabilistic Models of the Crack Growth Parameters in Paris Equation**  
OMAE2019-96161  
Peyman Amirafshari1, Alexander Stacey2  
1. University of Strathclyde, Glasgwo, 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
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 Sundararavindraju, 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 Ruby
Plymouth University, Plymouth, United Kingdom

Piston-modal Resonance in a Box-wall System OMAE2019-95006
Sheng-Chao Jiang1 Yu-Xin Huang2 Boai 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 Yang1 Haining Lu2 Xin Li2 Wenyue Lu1 Lei Liu1
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 Schamke, 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 Steen2 Adil Rasheed3
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 Altay, 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, Alsh 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 Li1 Yuan Qian1 Yan Feng1 Weijia Sheng1 Hao Jin Li2
1. Harbin 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 Azafari1 Rocky Taylor2 Robert Sarracino3 Marjan Taghi Boroujerdi
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 Wang1 Kaibo Zheng2
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 Mocar, University of Duisburg-Essen, Germany

Andreas Giannoulis1 Karl Halse2
1. Norwegian University of Science and Technology, Alesund, 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
Waleda Yehia1 M. M. Mostafa2 Adel A. Tawfik3 A. Nasef4
1. Port Said University, Port Said, Egypt; 2. Egyptian Authority for Maritime Safety, Suez, Egypt

Peng Zhou1 Liewei Liu1 Lixiang Guo2 Qing Wang2 Xianzhou Wang3
1. Shanghai Division, China Ship Development and Design Center, Shanghai, China; 2. Huazhong University of Science and Technology, Wuhan, China

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Wednesday 15:30 – 17:30

CFD & FSI

8-4-1 Cylinder VIV

Wednesday June 12  Room SEC, Dochart 1 | 15:30 – 17:30
Session Chair: Michael Bernttas, 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 Shi, Xiaohao 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, Jungsuo Wang1, Haoyi 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 Lie2, Ralf Peek2
Octavio Sequeiros3, Szé Yu Ang4, Chiara A. Bernardo4, Meliza Atienza5
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

Hyunchul 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 TELLWIND Platform OMAE2019-96380
Tommaso Battistella1, José Armesto1, Álvaro Rodriguez Luis1, Lucia Meneses2, Bernardo Coulauger3, José Serna2, Raúl Guanche1, Joaquin Urbano2, Sergio Hernandez2, José Fernandez2
1. Environmental Hydraulics Institute of Cantabria, Santander, Spain; 2. Esteyco S.A.B 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 OMAE2019-96243
Daniel Milano1, Christophe Peyrair2, Matteo Capaldo1
David Ingram3, Qing Xiao1, Lars Johanning4
1. University of Edinburgh, Edinburgh, United Kingdom; 2. EDF R&D, Chatou, France; 3. EDF Lab Sasclay, 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 Amal, Feliçen Bonnefoy, Jean-Christophe Gilloireaux, Sandrine Aubran
École 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 OMAE2019-95159
Sigrid Siksø 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 Medico1, Pieter-Jan Daems2, Cédric Peeters3
Dirk Deschrijver1, Tom Dhame2, Patrick Guillaume3, Jan Helsen1
1. Vrije Universiteit Brussel, Brussel, Belgium; 2. Ghent University, Gent, Belgium

The Effect of Operational Parameters on Vibration Signals of Wind Turbine Gearboxes OMAE2019-96720
Sofia Koukoura1, Eric Bechhoefer1, James Carroll2, Alasdair McDonald2
1. University of Strathclyde, Glasgow, United Kingdom; 2. GPM, 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 Balesra1, Amir R. Nejad1, Giovanni Naldi3
1. University of Bologna, Cervia, Italy; 2. Norwegian University of Science and Technology, Trondheim, Norway; 3. University of Bologna, Bologna, Italy
Afternoon Lecture Series

17:40 – 18:30  Location: Lomond Auditorium (SEC)

**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

## Structures, Safety and Reliability

### 2-13-1 Risk Analysis and Management I

**Thursday June 13**

**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  
OAE2019-96269  
Carlos H. B. Morais1 Danilo T. M. P. Abreu2 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  
OAE2019-96292  
Michaela Ibrion, Nirola 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  
OAE2019-95339  
Tobiolu Elusakin, Mahmood Shafiee, Tosin Adedipe

Cranfield University, Bedford, United Kingdom

Subsea Spares Analysis Optimisation  
OAE2019-96100  
Tiaman 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  
OAE2019-95845  
Mintaek Yoo

Korea Railroad Research Institute, Ui Wang, Korea

### 2-6-2 Reliability of Mooring and Riser Systems II

**Thursday June 13**

**Session Chair:** Luis V.S. Sagrilo, LACEO/COPPE/ Federal University of Rio De Janeiro, Brazil

**Session Co-Chair:** Marcelo Ramos Martins, LabRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, Brazil

Mean Load Impact on Mooring Chain Fatigue Capacity -- Lessons Learned from Full Scale Fatigue Testing of Used Chains  
OAE2019-95803  
Öystein Gabrielsen1 Kjell Larsen2 Oddgeir Dalane3 Hans B. Lie4 Svein-Arne Reinholtseth4

1. Equinor, Trondheim, Norway; 2. Equinor ASA, Trondheim, Norway; 3. Equinor ASA, Stavanger, Norway; 4. Equinor ASA, Sandvik, Norway; 5. Equinor ASA, Stjørdal, Norway

Finite Element Analysis of the Effect of Twist on Chain Fatigue Performance  
OAE2019-95276  
Justin Jones

Petrofac, Woking, United Kingdom

Fatigue Tests on Corroded Mooring Chains Retrieved from Various Fields in Offshore West Africa and the North Sea  
OAE2019-95618  
Kai-tung Ma1 Øystein Gabrielsen2 Zhen Li3 David A. Baker4 Aifeng Yao5

1. Samsung Heavy Industries, Daejeon, Korea; 2. Samsung Heavy Industries, Seoul, Korea; 3. Williams, Galway, Ireland; 4. Cranfield University, Bedford, United Kingdom; 5. Petrofac, Woking, United Kingdom

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## Concurrent Sessions

### 08:30 – 10:00

#### Offshore Technology

**1-1-1 Semi-submersibles and TLPs**

**Thursday June 13**

**Session Chair:** Jinho Yun Young, 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  
OAE2019-95272  
Raehyoung Yuck1 Daeheon Kang1 Eung-su Kim2 Munsung Kim2

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  
OAE2019-96661  
Jiagou Feng1 Yi Yu2 Yan Qu1 Weihui Xie1 Min Wu1 Jinqiu Zhao2

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  
OAE2019-96232  
Jeffrey D. Otten1 Vinu Kuniankum1 Shakh Amini1

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 Modelling  
OAE2019-96259  
Lorenzo Cappiatti1 Irene Simonetti1 Ilaria Crema1

University of Florence, Florence, Italy

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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 Wu1 Jens Tormsdottr1 Daqin Xu1
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
Petrinio Zumpano Júnior1 Alexandre G. Gambô1 Diogo O. Moraes1
1. Petrobras, Rio de Janeiro, RJ, Brazil

Assessment of Weld Overlays in a Cladded Piping Systems with Varied Thicknesses
OMAE2019-96148
Bridget Koga1 Bin Wang1 Luiz Wrobel2 Mahmoud Chizari2
1. Brunel University London, Uxbridge, 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 Provazi, Clóvis 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 Zhengqin Yuan4 Yueju Li5
1. Southern University of Science and Technology, Shenzhen, China; 2. CNIOC Research Institute, Beijing, China; 3. Hengtong Submarine Cable Ltd, Changshu, China; 4. Hengtong Submarine Cable Ltd, Jiangsu, China

Effect of Weld Porosity on Super Duplex Stainless Steel Umbilical Tubes under Hydrogen Induced Stress
OMAE2019-95986
Mariana Socarioanu, Xiaorui 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
Perdman 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
Duggavilasa Suresh Kumar, Mohammad Rabbie Sunny, Trilochan Sahoo
Indian Institute of Technology Kharagpur, Kharagpur, India

Pipeline Rockberg 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
Martín Gallegillo1 Michele Cerulli2 Ali Hashigh2 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: Attila Inceck, 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
Shukai Liu1 Apostolos Papanikolaou2 Peiyuan Feng3 Shuming Fan4
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
Khaleed Elsherbeny1 Tashin Tezlogan2 Mohamed Khotb3 Attila Inceck4 Sandy Day2
1. University of Strathclyde, Glasgow, United Kingdom; 2. Arab Academy for Science, Technology and Maritime Transport, Alexandria, Egypt
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 OMAE2019-95663

Marco Klein1, Matthias Duder2, Günther Claus2, Norbert Hoffmann1, Jasper Behrendt1, Sören Ehlers1
1. Hamburg University of Technology, Hamburg, Germany; 2. Neue Warnow Design & Technology GmbH, Rostock, 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

Qinge Fang1, Cunbao Zhao2, Amin Guo3
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, Yumiang You, Xinxu 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 Mechanics, Chinese Academy of Sciences, Beijing, China

Ocean Engineering

6-7-1  Regional Metocean

Thursday June 13  | Room SEC, M4  | 08:30 – 10:00
Session Chair: Gus Jeans, Oceanalysis 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, Xue Ren1, Jiagang Li2, Wenyang Du3, Junming Wang2, Binbin Zhao1
1. OVOOC 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, Jiaolian 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 Ceolho, Chunjue 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  Risers, Jumpers and Pipelines

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 LNKC OMAE2019-95171

Frédéric Jaouën, Arjen Koop, Lucas Vatine
1. MARIN, Wageningen, Netherlands; 2. MARIN Academy, Wageningen, Netherlands

Predicting Roll Damping for Barge-type FPSO using CFD OMAE2019-95306

Arjen Koop, Frédéric Jaouën, Xavier Wadbled, Erwan Corbineau
1. MARIN, Wageningen, Netherlands; 2. MARIN Academy, Wageningen, Netherlands

Numerical Simulations of KCS Parametric Rolling in Head Waves OMAE2019-95563

Shuang Wang1, Junkai Wei1, Xiaoshu Chen2, Liwei Liu2, ZhiGuo Zhang2
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 OMAE2019-94625

ZhiGuo Zhang1, Lixiang Guo2, Shuang Wang2, 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 OMAE2019-95930

Juan Pontaza1, Meng Luo2, Varadarajan Nadathur3, John Rosche3
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 Orsino, Guilherme Lopes1, Celso Pesce1, Guilherme Franzini1, Fernanda Takaufuji1
1. University of São Paulo, São Paulo, SP, Brazil; 2. University of São Paulo – Escola Politécnica, São Paulo, SP, Brazil


Youn-Wook Moon1, Narakorn Sirini1, 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 Blassioli, Fario 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  OMAE2019-96925
Rachel Chester1 Can Desmond1 Jimmy Murphy2 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  OMAE2019-96195
Casey M. Fontana1 Sanjaya R. Arwade1 Don J. Degroot1 Spencer Hallowell2
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  OMAE2019-96880
Magnus Harrold1 Philipp R. Thies2 David Newsam2
1. University of Exeter, Penryn, United Kingdom; 2. Teqniqa Systems Ltd., Lavister, 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 Xiao2 Fengmei Jing1
1. Shanghai Jiao Tong University, Shanghai, China; 2. Harbin Engineering University, Harbin, China

Local Blockage Effects for Idealised Turbines in Tidal Channels  OMAE2019-95547
Lei Chen1 Paul A.J. Bonar2 Christopher Vogel1 Thomas A.A. Adcock1

Numerical Analysis of Tidal Turbine Performance for Floating Platform  OMAE2019-95884
Xiaojing Xing1 Chang Wei Kang2 George Xu2 Jing Lou1 Ken Takagi1 Jarrod Sinclair1
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 Donadapat, 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 AlHadhi
Saudi Aramco, Dhahran, Saudi Arabia

Experimental and Numerical Investigation of Gas-yield Power-law Fluids in a Horizontal Pipe  OMAE2019-95219
Abdalsalam Ibmoudah1 M. M. Awad1 Mohammad Azizur Rahman1 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 Yao2 Fan Fan1 Lishan Yuan1 Yanpeng Xue1
1. China University of Petroleum-Beijing, Beijing, China; 2. Tarim Oilfield, CNPC, Karla, 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. Nahir1 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
Ninami Nwaka, Yuanhang Chen
Louisiana State University, Baton Rouge, LA, USA

Well Control Simulation with Non-aqueous Drilling Fluids  OMAE2019-96736
Felipe Chagas1 Paulo Ribeiro2 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
### 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, Lubrit - 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:**  
Ludfi Pratiwi Bowo, Ramdhani Eka Prilana, Masao Furusho  
Kobe University, Kobe, Japan

**Human Reliability Analysis of Ship Maneuvers in Harbor Areas:**  
OMAE2019-96251  
Danilo T.M. P. Abreu1 Marcelo C. Maturana2 Marcelo Ramos Martins3 Siegberto R. Schenck Jr.1  
1. LubRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, São Paulo, Brazil; 2. Centro Tecnológico da Marinha em São Paulo, São Paulo, Brazil; 3. Brazilian Maritime Pilots Association (CONAPRA), Rio de Janeiro, RJ, Brazil

**Analysing Dependent Failures in a Bayesian Belief Network:**  
OMAE2019-95853  
Mei Ling Fami1 Dimitrios Konovessis2 Xuhong He3 Lin Seng Ong4 Hoon Kiang Tan5  

**Risk Assessment of Ship Systems based on Forward FTF Method:**  
OMAE2019-95320  
Song Yan Mai1 Ji Zeng2 Qi Feng2 Renan Liu3 Yan Chen3  
1. Shanghai Maritime University, Shanghai, China; 2. Shanghai Honghua Ocean Oil & Gas Equipment Co., Ltd., Shanghai, China; 3. AFGCO Flow Control (Shanghai) Co., Ltd, Shanghai, China

**Risk Assessment in Offshore Salt caverns to Store CO2:**  
OMAE2019-96230  
Marco A. Pestana1 Carlos H. B. Moral1 Alvaro M. Costa2 Camila Brandão1 Marcelo Ramos Martins1  
1. LubRisk - Analysis, Evaluation and Risk Management Laboratory - University of São Paulo, São Paulo, Brazil; 2. MODECOM - Tecnologia em Geomecânica e Modelagem Cepotusional, Rio de Janeiro, RJ, Brazil; 3. Shell Brasil Ltda., Rio de Janeiro, RJ, Brazil

### Offshore Technology

#### 13-3-2 Wave Energy I

**Thursday June 13**  
**Room SEC, Beisdale 2 | 08:30 – 10:00**

**Session Organizer:** Tomoki Ikoma, Nihon University, Japan  
**Session Co-Organizer:** Hélio Morishita, Tomoki Ikoma

**Nonlinear Analysis of a Heaving Point Absorber in Frequency Domain via Statistical Linearization**  
OMAE2019-95785  
Leandro Souza Pinheiro da Silva1 Hélio Morishita2 Celso Pesce3 Rodolfo T. Gonçalves3  
1. Universidade de São Paulo, São Paulo, SP, Brazil; 2. University of São Paulo - Escola Politecnica, São Paulo, SP, Brazil; 3. University of Tokyo, Tokyo, Japan

**A Fundamental Study on Development of Numerical Method for Evaluation of Wave Power Generating Systems with Pendulum Type by the Particle Method**  
OMAE2019-95669  
Kazuki Murata1 Tomoki Ikoma2  
1. Institute of Industrial Science, The University of Tokyo, Meguro-ku, Japan; 2. The University of Tokyo, Tokyo, Japan

**A Strategy of a Control Algorithm for a Point Absorber Wave Energy Converter**  
OMAE2019-95836  
Qiao Li1 Motohiro Murai2  
1. Yokohama National University, Yokohama, Japan; 2. 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**  
OMAE2019-95669  
Kazuki Murata1 Tomoki Ikoma2  
1. Institute of Industrial Science, The University of Tokyo, Meguro-ku, Japan; 2. The University of Tokyo, Tokyo, Japan

**Experimental Evaluation of Wave Impact Loads on Semi-submersible Structure according to Trimming Angle**  
OMAE2019-95406  
Min-Guk Seo1 Yoon-Jin Ha2 Nam-Woo Kim3 Bo-Woo Nam4 Kang-Su Lee5  
1. Korea Research Institute of Ships and Ocean Engineering, Daejeon, Korea; 2. laboratory 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 Bunnik1 Jule Scharnke2 Erik-Jan de Ridder3  
1. MARIN, Wageningen, Netherlands; 2. TechnipFMC, Houston, TX, USA

**Effect of Non-Gaussian Distribution in Fully-nonlinear Waves on Offshore Platform Motion Responses**  
OMAE2019-95645  
Aldric Baquet1 Ho-Joon Lim2 Jang Kim3  
1. TechnipFMC, Houston, TX, USA; 2. TechnipFMC, Houston, TX, USA; 3. TechnipFMC, Houston, TX, USA
Numerical Methods for Interlink Stiffness Formulations and Parameters Sensitivity of Out-of-plane Bending
Fatigue Failure in Mooring Chains OMAE2019-96042
Cezar 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 Songqing Ding2 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 Kim1
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 OMAE2019-96145
Israel Marines-Garcia1 Aaron Aguilar2 Ramon Aguilar2 Mauricio Pelcastre2 Philippe Dancis4
1. Tenaris ITSA, 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 Connaire1 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 OMAE2019-95447
Sheng Bao, Chengye Zhao, Qiang Luo, Yibin Gu
Zhejiang University, Hangzhou, China

Data Mining for Estimating Fatigue Strength based on Composition and Process Parameters OMAE2019-95155
Arvind Keppate, 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 Cheng2 Yi Zhao2
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 Hu2 Qi Su2 Qingzheng Lu2 Zhixun Yang2 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
Yuanchao Yin1 Qingchen Lu1 Shanghua Wu2 Jun Yan1 Qianjin Yue1 Jinlong Chen2
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 Gao2 Yong Bai2 Ting Liu1
1. Zhejiang University, Hangzhou, China; 2. Zhejiang University, Zhejiang, China

Ocean Engineering

6-13-2 Ship Maneuverability 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 Maneuverability in Regular Waves OMAE2019-95249
Tianlong Mei1 Yi Liu1 Manases Tello Ruíz2 Marc Vantorre2
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 Yang1 Jiawei Yu1 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

THURSDAY 10:30 – 12:00
System Based Prediction of Ship’s Maneuverability in Varying Water Depth Area  
OMAE2019-95686
Shi He1 Atilla Incercik2 Zhiming Yuan3 Paula Kellely4
1. Shanghai Maritime University, Shanghai, China; 2. University of Strathclyde, Glasgow, United Kingdom; 3. University of Strathclyde, NAOMI, 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. Adcock3

Numerical Simulation of Water Wave Propagation over Porous Slope Bottom by using Two-domain Method  
OMAE2019-95664
Eun-Hong Min, Wonschool 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, Daytona Beach, FL, USA

Numerical Modeling of the Nonlinear Standing Waves in a Rectangular Tank and Damping Devices  
OMAE2019-95790
Xin Lin1 Pengbi 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 Jeas, Oceanalysis Ltd, United Kingdom
Session Co-Chair: Kevin Evans, 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 Vasyl Vasenko2 Igor Kazetov3 Nataliya Stashchuk4
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

Global Assessments of Surface Winds and Waves from an Ensemble Forecast System using Satellite Data  
OMAE2019-96627
Ricardo Campos1 Andrea D’Agostini2 Leandro Machado Cruz3
Bruna Reis Leite Franca4Carlos Guedes Soares4
1. CENTEC - Instituto Superior Técnica, Universidade de Lisboa, Lisbon, Portugal; 2. Centro de Hidrografia da Marinha CHM, Secção de Modelagem Oceánica/REMO, Marinha do Brasil, Niteroi, RJ, Brazil; 3. Oceanographic Modeling and Observation Network (REMO), Niteroi, RJ, Brazil; 4. Instituto Superior Técnica, Universidade de Lisboa, Lisbon, 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 Kim3 Young-Bum Lee4

Wind and Current Loads on Barges and Ships  
OMAE2019-95716
Oudel Mocart, Thomas Schellin, Jens Neugebauer
University of Duisburg-Essen, Duisburg, Germany

Cargo Liquefaction and Influence on Ship Stability  
OMAE2019-96448
Rie Hian Chua1 Yali Zhang2 Dimitrios Konovessis2

Numerical Study on Scale Effect of KCS  
OMAE2019-95831
Yujie Zhou1 Liwei Liu1 Xiao Kai2 Dakui Feng2 Bin Guo3
1. Huazhong University of Science and Technology, Wuhan, China; 2. China Ship Design and Development Center, Wuhan, China

Ocean Engineering  
6-7-2 CFD & FSI  
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

Interference, Proximity and Geometry Effects  
OMAE2019-96827
Mohammad Mohammad Beigi Kasaei1 Mohammad Hossein Kazeminezhad2 Abbas Yeganeh-Bakhtiary3
1. Iranian National Institute for Oceanography and Atmospheric Science, Tehran, Iran; 2. Iran University of Science and Technology, Tehran, Iran

Numerical Investigation on Vortex Dynamics around Vibrant Monopile Regarding Cross-sectional Shape and Keulegan-Carpenter Number  
OMAE2019-96287
Ricardo Campos1 Carlos Guedes Soares1
1. CENTEC - Instituto Superior Técnica, Universidade de Lisboa, Lisbon, Portugal; 2. Instituto Superior Técnica, Universidade de Lisboa, Lisbon, 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 Técnica, Universidade de Lisboa, Lisbon, Portugal; 2. Instituto Superior Técnica, Universidade de Lisboa, Lisbon, Portugal

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 Study on Scale Effect of KCS  
OMAE2019-95831
Yujie Zhou1 Liwei Liu1 Xiao Kai2 Dakui Feng2 Bin Guo3
1. Huazhong University of Science and Technology, Wuhan, China; 2. China Ship Design and Development Center, Wuhan, China

Ocean Engineering  
6-7-2 Regional Metocean II  
Thursday June 13  
Room SEC, M4 | 10:30 – 12:00
Session Chair: Gus Jeas, Oceanalysis Ltd, United Kingdom
Session Co-Chair: Kevin Evans, 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 Vasyl Vasenko2 Igor Kazetov3 Nataliya Stashchuk4
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 Andrea D’Agostini2 Leandro Machado Cruz3
Bruna Reis Leite Franca4Carlos Guedes Soares4
1. CENTEC - Instituto Superior Técnica, Universidade de Lisboa, Lisbon, Portugal; 2. Centro de Hidrografia da Marinha CHM, Secção de Modelagem Oceánica/REMO, Marinha do Brasil, Niteroi, RJ, Brazil; 3. Oceanographic Modeling and Observation Network (REMO), Niteroi, RJ, Brazil; 4. Instituto Superior Técnica, Universidade de Lisboa, Lisbon, 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 Técnica, Universidade de Lisboa, Lisbon, Portugal; 2. Instituto Superior Técnica, Universidade de Lisboa, Lisbon, 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 Kim3 Young-Bum Lee4

Wind and Current Loads on Barges and Ships  
OMAE2019-95716
Oudel Mocart, Thomas Schellin, Jens Neugebauer
University of Duisburg-Essen, Duisburg, Germany

Cargo Liquefaction and Influence on Ship Stability  
OMAE2019-96448
Rie Hian Chua1 Yali Zhang2 Dimitrios Konovessis2

Numerical Study on Scale Effect of KCS  
OMAE2019-95831
Yujie Zhou1 Liwei Liu1 Xiao Kai2 Dakui Feng2 Bin Guo3
1. Huazhong University of Science and Technology, Wuhan, China; 2. China Ship Design and Development Center, Wuhan, China
Numerical Investigation of Steady Flow Induced Rotary Response of Circular Cylinder with Splitter Plate  OMAE2019-95584
Dan Pang, Huili Xi, Zhonghong 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 EKWC, Port Hueneme, CA, USA

Three-Dimensional Direct Numerical Simulations of Flows Past an Inclined Cylinder Near a Plane Boundary  OMAE2019-95466
Chunning Ji, Zhimeng Zhang, Dong Xu, Narakorn Sinni
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 Gillotteaux, Ecole Centrale de Nantes, France

Yang Zhou, Qing Xiao, Yuanchuan Liu, Atilla Inscekin, Christophe Peyrand
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 Wullaume, Aurelien Babarit, Mattias Lynch, Pierre Ferrant
1. LHEEA Ecole Centrale de Nantes / INNSEEA, Nantes, France; 2. Centrale Nantes, Nantes, France; 3. INNSEA, 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 Jonkmans, Fabian Wendt
National Renewable Energy Laboratory, Golden, CO, USA

On Motion and Hydroelastic Analysis of a Floating Offshore Wind Turbine  OMAE2019-96034
Azn Lamei, Masoud Hayatdavoodi, Carlos Wong, Bin Tang
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 Umeda, Tomoki Taniguchi, Toshifumi Fujiwara
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, Wooncheol 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, Hancheol 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 Yim, Nasim Adami, Biet Bosma, Ted Brekken, Ming Chen, Leila Ghorban Zadeh, David Glennon, Yushun Lian, Pedro Lomonaco, Ali Mohit, Tuba Oezkan-Haller, Jim Thompson
1. Oregon State University, Corvallis, OR, USA; 2. O.H. Ninsdale 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 Yao, Jie Wang, Yangpeng Xue, Fujian Zhou, Le Zhang, Yafei Li
1. China University of Petroleum-Beijing, Beijing, China; 2. Tarim Oilfield, CNPC, Karla, 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 Abgharaha, 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 Alhammad, Mohammad Rahman, Stephen Butt, Jahrun Alam
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. Nahr, Jianjun Zhu, Wesley Williams, Otto Santos
Louis Thibodeaux, Yuanhang Chen
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

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 Dumitrescu² Catalin Teodoriu² Codrut-Stefan Saranu²  
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  
*OMAE2019-96200*  
Catalin Teodoriu, Saeed Salehi  
Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

How Heuristics and Biases Impact Judgment and Decision Making in Well Integrity Operations  
*OMAE2019-96200*  
Catalin Teodoriu, Saeed Salehi  
Mewbourne School of Petroleum and Geological Engineering, Norman, OK, USA

**Technical Session Organizers’ Lunch**  
12:00 – 13:30  
Location: Hall 5 (SEC)  
Thursday lunch sponsored by 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  
*OMAE2019-96403*  
Babak Ommani, SINTEF Ocean, Norway  
Session Chair: Babak Ommani, SINTEF Ocean, Norway  
Wave Impact Load and Corresponding Nonlinear Response of a Semi-submersible  
*OMAE2019-95699*  
Yinghao Guo¹ Longfei Xiao¹ Handi Wei² Lei Li¹ 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 Grassi¹ Roger Schouten¹ Arjen Tjallinga²  
¹. MARIN, Wageningen, Netherlands; ². The Ocean Cleanup, Rotterdam, Netherlands

**Structures, Safety and Reliability**  
2-14-1 Risk Based Maintenance  
*OMAE2019-95137*  
Mahmood Shafiee¹ Carlos Guedes Soares²  
¹. Cranfield University, Bedford, United Kingdom; ². Instituto Superior Técnica, 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  
*OMAE2019-95390*  
David Barreto¹ Abdolmajid Moghtadaei¹ Majidir Karimirad³ 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

**Structures, Safety and Reliability**  
2-14-1 Risk Based Maintenance  
*OMAE2019-95137*  
Mahmood Shafiee¹ Carlos Guedes Soares²  
¹. Cranfield University, Bedford, United Kingdom; ². Instituto Superior Técnica, Universidade de Lisboa, Lisboa, Portugal

Sensitivity Analysis of a 5MW Bottom Fixed Offshore Wind Turbine using the Environmental Contour Method  
*OMAE2019-95390*  
David Barreto¹ Abdolmajid Moghtadaei¹ Majidir Karimirad³ 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

Takeshi Kinoshita Honoring Symposium on Offshore Technology  
13-3-4 Wave Energy II  
Thursday June 13  
Session Chair: Yasunori Nihei, Osaka Prefecture University, Japan  
A Basic Study on Influence of Airchamber Volume on OWC Models to Power Conversion Performance  
*OMAE2019-9925*  
Tomoki Ikoma¹ Yoshiyuki Kihara¹ Shota Hirai¹ Yasuhiro Aida¹ 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 Yoshimoto¹ Ryota Wada¹ Ken Takagi¹  
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

**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
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 Wittenbergh, 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 Wittenbergh, 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

4-6-1 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
OMAE2019-95314
Stéphanie Harchambois1, Vincent Le Tourou2, Geoffrey Guindeuil3
Romain Vivet2, François-Xavier Pasquet2, Guillaume Tosi2
Thierry Palermo2, Christophe T’Joen2, Gilbert Herrera1
1. TechnipFMC, Rueil-Malmaison, France; 2. Total, Pau, France; 3. Shell, Rijswijk, Netherlands

CFD Modelling of an Electrically Traced Heat Blanket
OMAE2019-95493
Vincent Le Tourou1, Stéphanie Harchambois1, Geoffrey Guindeuil3
Romain Vivet2, François-Xavier Pasquet2, Guillaume Tosi2
Thierry Palermo2, Gilbert Herrera1, Christophe T’Joen2
1. TechnipFMC, Rueil-Malmaison, France; 2. TechnipFMC, Rueil-Malmaison, France; 3. Total, Pau, France; 4. Shell, Houston, TX, USA

Active Control of Flexible Riser Vibration by Boundary Control based on LQR Controller
OMAE2019-95639
Jin Xin Yu1, Weimin Chen2
1. Institute of Seismology, China Earthquake Administration, 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 Sanchez1, Stéphanie Harchambois1, Romain Vivet2, Thierry Palermo2, François-Xavier Pasquet2, Guillaume Tosi2
1. TechnipFMC, Rueil-Malmaison, France; 2. TechnipFMC, Rijswijk, Netherlands

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 Xu2, Xueqian Zhou1, Serge Sutulov2, 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, Runchuan Zhu, Shun Huang
Shanghai Jiao tong University, Shanghai, China

Improved Transient FSI Model in SPH Method and its Applications OMAE2019-95257 Aman Zhang1, Pingping Wang2, Furen Ming2, Pengjun Sun4
1. Harbin Engineering University, Harbin, China; 2. Ecole Centrale Nantes, Nantes, France

Ocean Engineering
6-7-3 Metocean Criteria I Thursday June 13 Room SEC, M4 | 13:30 – 15:00
Session Chair: Gus Jeans, Oceanalysis 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 Stephens1, Ben Rabb2, Richenda Connell3, Jon Upton3
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

ABPmer, Southampton, United Kingdom

Decisional Criteria for Offshore Operations Interruption due to Adverse Weather OMAE2019-96086 Michele Drago1, Luigino Vitali2, Andrea Del Guzzo2, Federico Gaggiotti3
1. Saipem S.p.A., Fano, Italy; 2. Saipem, Kuala Lumpur, Malaysia; 3. BP America Inc, Houston, TX, USA

A New Method for Deriving Soliton Design Criteria OMAE2019-96637 Gus Jeans1, Oliver Jones2, Michael Zhang2, Chris Jackson3, Nataliya Stashchuk1, Alfred R. Osborne1, Ole Petersen4, Jose da Silva5

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 Soonsoek Song, Yigit Demirel, Mehmet Atlar
University of Strathclyde, Glasgow, United Kingdom

Research on The Blade Element Theory Coupled with Viscous Flow OMAE2019-95887 Zhiheng Li1, Jiawei Yu1, Dakui Feng2, Kaijun Jiang1, Yueji Zhou4
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 Wu1, Peng Wei1, Shuang Wang5, Livie 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, Xiaojing Xing
Institute of High Performance, A*STAR, Singapore, Singapore

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

1. Northwest Energy Innovations, Portland, OR, USA; 2. Williwave 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. Henriques1 Luis Gato1 Giovanni Malarà1 Valentina Laface1 Rui P.F. Gomes2 Juan C. C. Portillo2 Antonio E.O. Falcão3 Felice Arena3
1. University of Mediterranean, Reggio Calabria, Italy; 2. IMDEA, 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 Ghisa1 Francesco Cambelli2 Pierpaolo Puddu1 Irene Virdi1 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 OMAE2019-99537
Toshio Ikeki, Peng Xu
Tokyo University of Marine Science and Technology, Tokyo, Japan

Ocean Renewable Energy
9-5-4 Numerical Analysis II

Power Take-off Selection for a U-Shaped OWC
Wave Energy Converter OMAE2019-96368
Alessandra Romolo1 Joao C.C. Henriques1 Luis Gato1 Giovanni Malarà1 Valentina Laface1 Rui P.F. Gomes2 Juan C. C. Portillo2 Antonio E.O. Falcão3 Felice Arena3
1. University of Mediterranean, Reggio Calabria, Italy; 2. IMDEA, 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 Ghisa1 Francesco Cambelli2 Pierpaolo Puddu1 Irene Virdi1 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 OMAE2019-99537
Toshio Ikeki, 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 Shehityawy1, Ould el Moctar1, Thomas Schellin2, Satish Natarajan1
1. University of Duisburg-Essen, Duisburg, Germany
2. University of Exeter, Penryn, United Kingdom
The Influence of Tidal Unsteadiness to a Tidal Turbine Blade Flow-induced Vibration OMAE2019-96007
Nu Rahaida 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 inYawed Flow OMAE2019-96014
Mitchell Borg1 Qing Xiao1 Atilla Incecik1 Steven Allsop2 Christophe Peyrard1
1. University of Strathclyde, Glasgow, United Kingdom; 2. University of Cagliari, Cagliari, Italy
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

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
Abdelsamah Abuhraraha1, John Molgaard1, Charles Hurich1, Stephen Butt2
1. Memorial University of Newfoundland, St. Johns, NL, Canada; 2. Superior Técnicos, Universidade de Lisboa, Lisboa, Portugal
Operational Behaviour of Supersonic Separators for Real Gas Mixtures of Methane and Carbon Dioxide, from the Homogeneous Nucleation Point of View OMAE2019-96315
Julian Restrepo2 José R. Simões-Moreira2
1. Universidade de São Paulo, São Paulo, SP, 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
Yuefei Chen1 Changbao Juan1 Guanzhi Yin1 Andrew Wojtanowicz2 Dongming Zhang1
1. Changqing University, Qingqing, China; 2. Louisiana State University, Baton Rouge, LA, USA
Improvement of the Method for Calculating Downhole Weight on Bit and its Application in Autodrillers Systems OMAE2019-96784
Zebin Wu1 Longlong Guo1 Shuai Zhang1 Yuqiang Wu1 Lantao Lv2 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
11-1-1 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
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 Gekiyaganne1 Erik Andreas Løken1 Dan Sui2 Tomasz Viktorski2
1. University of Stavanger, Stavanger, Norway; 2. University of Stavanger, Trondheim, Norway
Feature Analysis and Design for Kick Detection with Machine Learning using Laboratory Scale Rig Data OMAE2019-95496
Suranga Gekiyaganne1 Adrian Amburu3 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 Boyan Guo2
1. Chongqing University, Chongqing, China; 2. University of Louisiana at Lafayette, Lafayette, LA, USA

Petroleum Technology
11-1-3 Ocean Current Energy, OTEC and Related Technology

Thursday June 13 Room SEC, Boisdale 2 | 13:30 – 15:00
Session Chair: Tatsuya Kyozuka, 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 Kyozuka
Nagasaki University, Nagasaki, Japan

Petroleum Technology
11-1-3 Ocean Current Energy, OTEC and Related Technology

Thursday June 13 Room SEC, Boisdale 2 | 13:30 – 15:00
Session Chair: Tatsuya Kyozuka, 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 Kyozuka
Nagasaki University, Nagasaki, Japan
Stability Analysis of Free Hanging Riser Conveying Fluid for Ocean Thermal Energy Conversion (OTEC) Utilization  OMAE2019-96749
Ristiyanto Adiputra, Tomaoki Utsumomiya  
Kyushu University, Fukuoka, Japan  

Numerical Estimation of Multiple Positions of Seepage of Dissolved Matter from Seafloor  OMAE2019-95733
Shunouke Kanao1 Yori Sato2  
1. The University of Tokyo, Nagoya-ku, Japan; 2. The University of Tokyo, Kashiwa, Japan

Andrew Want, Joanne Porter  
Heriot-Watt University, Stromness, United Kingdom

REFRESHER 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 Lim2 Zhang Hui2 Xu Liangbin3 Sheng Leixiang3 Ruijia Jin2  
1. ZH Offshore, Beijing, China; 2. CNODC 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 Jinyua Liu2  
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 Visco3  
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 Zhang1 Xin Guo1 Xinglin Guo1  
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. Videira, LACEO/COPPE/ Federal University of Rio De Janeiro, Brazil

Remaining Useful Life Estimation of Subsea Pipelines under the Influences of Multiple Causes  OMAE2019-95125
Baoping Cai1 Xiaoyan Shao1 Yonghong Liu1 Xiandong Kong2 Hongqi Xu3 Weifeng Ge4  
1. China University of Petroleum, Qingdao, China; 2. Rongsheng Machinery Manufacture Ltd. of Huabei Oilfield, Renqiu, China; 3. CNODC Safety & Technology Services Co., Ltd, Tianjin, China

Mode Selection for Offshore Platform Damage Identification using CMSE Sensitivity  OMAE2019-95550
Mingqiang Xu1 Yuchi Liu1 Tufeng Jiang1 Shuqing Wang1  
Ocean University of China, Qingdao, China

A Simple, Safe, and Reliable Nuclear Reactor Power System Concept for Deep Sea Missions  OMAE2019-95857
Gu Hu1 Weijian An2 Xiaobo Sun3  
China Institute of Atomic Energy, Beijing, China

Random Combination Factors for Still Water and Wave Bending Moments  OMAE2019-96665
Weibo 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 Qiang2 Liu Zhizhong3 Wang Guan3
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**  
OMAE2019-96235

Nicolo Lima1 Karla Holzmeister, Raphael Santos, Diener Volpin, Roberto Nunhez1 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 Estefer1
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 Belfroid1 Nestor Gonzalez Diez, Hajo Peroboom, Can Tuner1 TNO, Delft, Netherlands

### Ocean Engineering

#### 6-7-4 Metocean Criteria II

**Thursday June 13**  
Room: SEC, M4  
15:30 – 17:30

**Session Chair:** Guis Jeans, Oceanalys 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

Vladim Anokhin1 Emma Ross2 David Randell2 Philip Jonathan4
1. Sarawak 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

**The Derivation and Interpretation of Directional Design Criteria**  
OMAE2019-96386

Graham Field1 Philip Jonathan2 David Randell1

**On Environmental Contours for Marine Design**  
OMAE2019-96587

Emma Ross1 Ole Christian Astrup1 Elizibeta M. Bittner-Gregersen2 Nigel Bunn2 Graham Field2 Ben Gouldby3 Arne Huseby3 Ye Liu3 David Randell3 Erik Vannem3 Philip Jonathan5

### 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

**Characterizing Impacts of Atmospheric Turbulence on Wind Farms through Large Eddy Simulation (LES)**  
OMAE2019-95837

Jahurul Alam1 Anton Afanassiev2 Jagdeep Singh3
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

**Spatial and Seasonal Variability of Metocean Design Criteria in Southern South China Sea from Covariate Extreme Value Analysis**  
OMAE2019-95913

Vladim Anokhin1 Emma Ross2 David Randell2 Philip Jonathan4
1. Sarawak Shell Bhd, Kuala Lumpur, Malaysia; 2. Shell Global Solutions BV, Amsterdam, Netherlands; 3. Shell Research Ltd, London, United Kingdom

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OMAE2019-96587

Emma Ross1 Ole Christian Astrup1 Elizibeta M. Bittner-Gregersen2 Nigel Bunn2 Graham Field2 Ben Gouldby3 Arne Huseby3 Ye Liu3 David Randell3 Erik Vannem3 Philip Jonathan5

### 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

Jahurul Alam1 Anton Afanassiev2 Jagdeep Singh3
1. Memorial University of Newfoundland, St John’s, NL, Canada; 2. University of British Columbia, Vancouver, BC, Canada

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OMAE2019-95913

Vladim Anokhin1 Emma Ross2 David Randell2 Philip Jonathan4
1. Sarawak 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**  
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Richard Gibson, Marios Christou

**The Derivation and Interpretation of Directional Design Criteria**  
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Graham Field1 Philip Jonathan2 David Randell1

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OMAE2019-96587

Emma Ross1 Ole Christian Astrup1 Elizibeta M. Bittner-Gregersen2 Nigel Bunn2 Graham Field2 Ben Gouldby3 Arne Huseby3 Ye Liu3 David Randell3 Erik Vannem3 Philip Jonathan5

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**Room, Crowne Plaza, Staffa / Shuna**  
**Room: SEC, M4**  
**Room: SEC, Lomond Auditorium**  
**Room: SEC, Carron 1**  
**Room, Crowne Plaza, Castle 3**

**Thursday 15:30 – 17:30**
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

Luis Recalde1 Hong Yue2 William Leithhead3 Olimpo Ayaya-Lana1 Hongda Liu1 Jiang You1
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 Stetco1 Jesus Carmona-Sanchez1 Debra Cevason1
Maurizio Colla1 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, Tahirin Tezdogan, Attila Inciçek
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 McCall1 Ryan Coco1
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 OMAE2019-95650
Sewon Park, Kyong-Hwan Kim, Bo Woo Nam, Jeong-Seok Kim, Keyjong 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 Gao2 Caizhong Wang1 Yaxin 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 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 the world-class network of manufacturing innovation and expertise.

The AFRC helps to fill the gap between fundamental 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.

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University of Strathclyde Advanced Forming Research Centre
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

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, June 8</td>
<td>Outreach Team Building Exercise</td>
<td>17:00 – 19:00</td>
<td>Staffa/Shuna (Crowne Plaza)</td>
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<tr>
<td>Saturday, June 8</td>
<td>Outreach Welcome Dinner</td>
<td>19:00</td>
<td>Off-site</td>
</tr>
<tr>
<td>Sunday, June 9</td>
<td>Outreach Welcome &amp; Introductions plus</td>
<td>08:00 – 17:00</td>
<td>Castle 1 (Crowne Plaza)</td>
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<td></td>
<td>Industry Presentations</td>
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<tr>
<td></td>
<td>OMAE 2019 Conference Registration</td>
<td>13:00 – 20:00</td>
<td>Hall 5 (SEC)</td>
</tr>
<tr>
<td></td>
<td>OMAE 2019 Conference Welcome Reception</td>
<td>18:30 – 20:30</td>
<td>Glasgow Science Centre</td>
</tr>
<tr>
<td>Monday, June 10</td>
<td>OMAE 2019 Conference</td>
<td>See detailed program for session locations and times.</td>
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<tr>
<td>Tuesday, June 11</td>
<td>OMAE 2019 Conference</td>
<td>See detailed program for session locations and times.</td>
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<tr>
<td>Wednesday, June 12</td>
<td>OMAE 2019 Conference</td>
<td>See detailed program for session locations and times.</td>
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<tr>
<td></td>
<td>OMAE 2019 Conference Banquet</td>
<td>19:00 – 24:00</td>
<td>Merchant Square</td>
</tr>
<tr>
<td>Thursday, June 13</td>
<td>Outreach Breakfast / Feedback Session</td>
<td>07:30 – 10:00</td>
<td>Alsh 2 (SEC)</td>
</tr>
<tr>
<td>Friday, June 14</td>
<td>OMAE 2019 Conference</td>
<td>See detailed program for session locations and times.</td>
<td></td>
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</tbody>
</table>

Note: Outreach only events are bolded.
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
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

W e 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
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

https://event.asme.org/IOWTC
### Listing of Committees

**Conference Organizing Committee**
Professor Atilla Incecik, Conference Chair  
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: Theo 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 Yin, 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 Eateck 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

### Topic Organizers

**Offshore Technology**

- 1-1: ORGANIZER: Anil Sablok, TechnipFMC, United States  
- 1-2: ORGANIZER: Allan Magee, National University of Singapore, Singapore  
- 1-3: ORGANIZER: Longbin Tao, University of Strathclyde, United Kingdom  
- 1-4: ORGANIZER: Olaf Waals, MARIN, Netherlands; CO-ORGANIZER: Masoud Hayatdavoodi, University of Dundee, United Kingdom  
- 1-5: ORGANIZER: Wenhua Zhao, University of Western Australia, Australia; CO-ORGANIZER: Marc Cahay, TechnipFMC, France  
- 1-6: ORGANIZER: Zhenjia (Jerry) Huang, ExxonMobil Upstream Research Company, United States; CO-ORGANIZERS: Jang Kim, TechnipFMC, United States; Guanyu Wu, Chevron, United States  
- 1-7: ORGANIZER: Nuno Fonseca, SINTEF Ocean, Norway

**Structures, Safety and Reliability**

- 2-1: ORGANIZER: Elizbieta M. Bitner-Gregersen, DNV GL AS, Norway; CO-ORGANIZER: Alexander V. Babuin, University of Melbourne, Australia  
- 2-2: ORGANIZER: Carlos Guedes Soares, Instituto Superior Técnico, Universidade de Lisboa, Portugal; CO-ORGANIZER: Felice Arena, Univ Mediterranea, Italy  
- 2-3: ORGANIZER: Lance Manuel, University of Texas at Austin, United States  
- 2-4: ORGANIZER: Yordan Garbatov, University of Lisbon, Portugal  
- 2-5: ORGANIZER: Carlos Guedes Soares, Instituto Superior Técnico, Universidade de Lisboa, Portugal  
- 2-6: ORGANIZER: Ying Min Low, National University of Singapore, Singapore; CO-ORGANIZER: Luis V.S. Sagrilo, LACEO/COPPE/Federal University of Rio De Janeiro, Brazil  
- 2-7: ORGANIZER: Zhen Gao, Norwegian University of Science and Technology, Norway; CO-ORGANIZER: John Sorensen, Aalborg University, Denmark  
- 2-8: ORGANIZER: Max Russo, Kongsberg, Norway  
- 2-9: ORGANIZER: Carlos Guedes Soares, Instituto Superior Técnico, Universidade de Lisboa, Portugal  
- 2-10: ORGANIZER: Sören Ehlers, Hamburg University of Technology, Germany; CO-ORGANIZER: Zhiqiang Hu, Newcastle University, United Kingdom  
- 2-11: ORGANIZER: Masahiko Fujikubo, Osaka University, Japan  
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