

**Proceedings of ASME 2025  
44th International Conference on  
Ocean, Offshore and  
Arctic Engineering**

**(OMAE2025)**

**Volumes 1-7**

**June 22–27, 2025  
Vancouver, British Columbia, Canada**

**Conference Sponsor  
Ocean, Offshore and Arctic  
Engineering Division**

**THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS**

© 2025, The American Society of Mechanical Engineers, 290 W. Mount Pleasant Avenue, Suite 1400, Bldg. 4, Livingston, NJ 07039, USA ([www.asme.org](http://www.asme.org))

All rights reserved. "ASME" and the above ASME symbols are registered trademarks of the American Society of Mechanical Engineers. No part of this document may be copied, modified, distributed, published, displayed, or otherwise reproduced in any form or by any means, electronic, digital, or mechanical, now known or hereafter invented, without the express written permission of ASME. No works derived from this document or any content therein may be created without the express written permission of ASME. Using this document or any content therein to train, create, or improve any artificial intelligence and/or machine learning platform, system, application, model, or algorithm is strictly prohibited.

INFORMATION CONTAINED IN THIS WORK HAS BEEN OBTAINED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS FROM SOURCES BELIEVED TO BE RELIABLE. HOWEVER, NEITHER ASME NOR ITS AUTHORS OR EDITORS GUARANTEE THE ACCURACY OR COMPLETENESS OF ANY INFORMATION PUBLISHED IN THIS WORK. NEITHER ASME NOR ITS AUTHORS AND EDITORS SHALL BE RESPONSIBLE FOR ANY ERRORS, OMISSIONS, OR DAMAGES ARISING OUT OF THE USE OF THIS INFORMATION. THE WORK IS PUBLISHED WITH THE UNDERSTANDING THAT ASME AND ITS AUTHORS AND EDITORS ARE SUPPLYING INFORMATION BUT ARE NOT ATTEMPTING TO RENDER ENGINEERING OR OTHER PROFESSIONAL SERVICES. IF SUCH ENGINEERING OR PROFESSIONAL SERVICES ARE REQUIRED, THE ASSISTANCE OF AN APPROPRIATE PROFESSIONAL SHOULD BE SOUGHT.

ASME shall not be responsible for statements or opinions advanced in papers or . . . printed in its publications (B7.1.3). Statement from the Bylaws.

For authorization to photocopy material for internal or personal use under those circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, tel:978-750-8400, [www.copyright.com](http://www.copyright.com).

Requests for special permission or bulk reproduction should be addressed to the ASME Publishing Department, or submitted online at: <https://www.asme.org/publications-submissions/journals/information-for-authors/journalguidelines/rights-and-permissions>

VOLUME 1 ISBN: 978-0-7918-8890-2

VOLUME 2 ISBN: 978-0-7918-8891-9

VOLUME 3 ISBN: 978-0-7918-8892-6

VOLUME 4 ISBN: 978-0-7918-8893-3

VOLUME 5 ISBN: 978-0-7918-8894-0

VOLUME 6 ISBN: 978-0-7918-8895-7

VOLUME 7 ISBN: 978-0-7918-8896-4

## TABLE OF CONTENTS

Case Study: Munin Unmanned Platform Walk-to-Work Landing Elevation Design Considerations.....	1
<i>Mohammad Hajjarab, Martin Gutsch, Halgeir Ludvigsen, Jakob Ravnas</i>	
Low-Draft, Low-Motion, and Cost-Effective SCR-Compatible Semi-Submersible Hull for the Central GOM.....	6
<i>Jun Zou</i>	
Sensitivity Analyses of Dominant Design Variables for Semi-Submersible Type Substructure of a 15MW Floating Offshore Wind Turbine .....	16
<i>SooBin Lee, Joonmo Choung</i>	
Impact Load Identification Based on Strain Measurements Using a Hierarchical Bayesian Framework.....	26
<i>Kelu Li, Longfei Xiao, Handi Wei, Yufeng Kou</i>	
Comparison Study of Shallow Water and Deepwater Dynamic Power Cable Systems for Floating Offshore Substation .....	34
<i>Hyoungchul Kim, Sejin Kim, Thiago Miliante, Bonjun Koo, Yuho Rho, Chul Min Kim, Kwang Su Chae</i>	
Using Pink Noise Data to Train Neural Networks for Estimating FPSO Resonant Frequency for Assessing Mooring Line Integrity .....	47
<i>Asdrubal do Nascimento Queiroz Filho, Gustavo Augusto Casco Silva Rodrigues Alves, Felipe Biasuz Cordeiro, Rodrigo Augusto Barreira, Marcel Rodrigues de Barros, Eduardo Aoun Tannuri, Anna Helena Reali Costa, Edson Satoshi Gomi</i>	
Mooring Spread Design Challenges for Stalk-On Riser Installations in Congested Offshore Fields.....	55
<i>Toms Jacob, Mashood Munaz Kalathingal, Vijoy Kootungal</i>	
Automation and Optimization of Mooring Line Designs .....	66
<i>Hamid Shayanfar, Anskey Miranda, Ronald D. Haynes, Kevin Doyle</i>	
A Practical Assessment Method in Prediction Minimum Propulsion Power to Ensure Safe Navigation of FLNGs and FPSOs in Adverse Condition .....	77
<i>Hye-Jong Son, Joo-Sung Kim, Hee-Dong Lee, Yong-Chul Lee</i>	
Numerical Study on Form Factor Determination for Trimarans With Different Outrigger Layouts .....	86
<i>Shangming Wang, Minh Jimmy Le, Guang Yin, Muk Chen Ong</i>	
Optimizing Fatigue Life Predictions for Floating Offshore Wind Turbines: Impact of Binning and Data Duration .....	93
<i>Prokopios Vlachogiannis, Christophe Peyrard, Ajit C. Pillai, David Ingram, Maurizio Collu</i>	
Free-Hanging Riser Fatigue Improvement Using High Strength Steel .....	100
<i>Andre Ramiro Amorim, Fernanda Cristina de Moraes Takafuji, Peyman Asgari, Vincent Loentgen, Peter Tanscheit</i>	
The Response of a Weathervaning Vessel in Cyclonic Conditions: A New Tool.....	111
<i>Michael Binsar Lubis, Yuriy Drobyshevski, Mehrdad Kimiaei, James R. Whelan, Michael Morris-Thomas</i>	
Study on the Application of Hybrid Power Systems in Autonomous Small Surface Vehicles .....	125
<i>Chun-Cheng Lin, Kai-Chieh Chang, Ching-Cheng Su, Kai-Xiang Chang</i>	

Simplifying Damping Matrix Calibration in Coupled Offshore Systems Using Parameter Reduction Through Modal Decomposition.....	134
<i>Maarten van der Leij, Wim Kleermaker, Arjan J. Voogt</i>	
Offshore Oil Wells Selection: Methodology and Computational Process for Configuration Selection.....	142
<i>Joaquim R. dos Santos, Carlos Alberto L. Chinchay, Danilo T. M. P. Abreu, Eric Tierre A. Rodrigues, Danilo Colombo, Marcelo R. Martins</i>	
FPSO Vent Post Gas Dispersion Analysis - Alternatives to Minimize Hydrocarbons Return in Critical Conditions .....	150
<i>Daniel Fonseca de Carvalho e Silva, Mauro Cresta de Barros Dolinsky, Fernando Andrade Rodrigues</i>	
A Numerical Investigation of the Impact of Waves on a Large Floating Wind Farm in Northwest Atlantic .....	159
<i>Jahrul M. Alam</i>	
Wake Dynamics and Vortex Interaction Around Tripile Foundations for Offshore Wind Turbines .....	169
<i>Saroj Gautam, Kevin Pope, Baafour Nyantekyi-Kwakye</i>	
The Mooring Digital Twin: Fatigue and Integrity Monitoring to Support Life Extension .....	179
<i>Kanishka Jayasinghe, Adrian Eassom, Clare Thomas, Callum Stevens, Larry Blair</i>	
A Relaxation Scheme for Solving Convolutional Forces in Adaptive Time Step ODE Solvers.....	188
<i>Yu Ma, Muk Chen Ong, Zhiyu Jiang, Lin Li</i>	
Inferring Structural Motion and Properties in Fluid Through Wake Flow Sensing .....	196
<i>Vivian Wilfred Paulraj Oletty, Leixin Ma</i>	
A Markup Language for Maritime Systems: Advancing Data Interoperability .....	205
<i>Janica A. Bronson, Henrique Gaspar, Icaro A. Fonseca</i>	
Advanced Sensors and Digital Twin Technology for Reliable Mooring Integrity Assessment Through Physics Based Models .....	218
<i>Suvabrata Das, Hossein Agheshlui, Soma S. Maroju</i>	
Energy's Digital Frontier: Remote, Integrated, and Autonomous Operations for Minimally Staffed Facilities .....	232
<i>John Pretlove, Steve Royston</i>	
A Bayesian Approach to Significant Wave Height Modeling Using Measurement Data .....	246
<i>Qingqing Miao, Ying Min Low</i>	
Goodness-Of-Fit of Crest Height Distributions in Varying Sea States .....	255
<i>Erik Vanem, Odin Gramstad, Alexander Babanin, Riccardo De Bin, Karsten Trulsen</i>	
Dynamic Stability Analysis of Small-Diameter Pipelines Using New Fourier-Type Hydrodynamic Force Coefficients .....	266
<i>Yang He, Dang Zhao, Mengyao Guan, Bin Lin, Bairen Chen, Yunfei Teng, Yan Qu, Liang Cheng</i>	
Long-Term Response Estimation of a Floating Offshore Wind Turbine With IFORM-Based Models .....	272
<i>Guanhua Zhao, Sheng Dong</i>	
Slamming and Green Water Loads on a Cruise Ship Subjected to Extreme Seas .....	281
<i>Shan Wang, Maria Ines Pinto Rodrigues, Suresh Rajendran, Carlos Guedes Soares</i>	

Detection of Failed Mooring Lines of Spread-Moored FPSO Using Platform Motions and Artificial Neural Networks.....	289
<i>Omar Jebari, Do-Soo Kwon, Sung-Jae Kim, Chungkuk Jin, MooHyun Kim</i>	
Experimentation and a Data-Driven Machine Learning Approach for Strength Prediction of Non-Uniformly Corroded Rebar.....	296
<i>Bing Chen, Wei Zhao, Baorun Wang, Jie Li, Ke Sun</i>	
Discussion on the HAZ Softening Effect on the Impact Responses of Welded Aluminum Structures.....	304
<i>Yue Lu, Shuai Zong, Kun Liu, Zili Wang</i>	
Fatigue Reliability Assessment of Floating and Bottom-Fixed Offshore Wind Turbines.....	314
<i>Hadi Amlashi, Madjid Karimirad</i>	
Experiences With Duplex Stainless Steels in Offshore Grating Systems .....	326
<i>Rodrigo Signorelli, Peder Claesson, Mikko Palosaari, Edwin Maalderink</i>	
Compressive Strain Capacity Reliability of Hydrogen-Carrying Steel Pipelines in Permafrost .....	335
<i>Smitha D. Koduru</i>	
Investigation on the Effect of Bimodal Sea States on Mooring Systems' Extreme Response Offshore Brazil .....	344
<i>Marina Leivas Simao, Paulo Mauricio Videiro, Luis Volnei Sudati Sagrilo, Mauro Costa de Oliveira</i>	
Fatigue Assessment of Free-Span Subsea Pipelines .....	355
<i>Bianca Pinheiro, Valtercio Barros, Ilson Pasqualino</i>	
Fatigue Assessment for Gearbox of a Floating Offshore Wind Turbine (FOWT).....	361
<i>Tingsen Zheng, Nian-Zhong Chen</i>	
A Cost-Effective Computational Approach to Integrate Offshore Inspections Planning and Routing Vessels .....	368
<i>Rodrigo Menas Tamasi, Andre Luis Debiaso Rossi, Gabriel Silva Malta, Adriana Miralles Schleder, Leonardo Oliveira De Barros, Rene Thiago Capelari Orlowski, Andre Bergsten Mendes, Marcelo Ramos Martins</i>	
Using Artificial Intelligence to Analyse Incidents Involving Falling Outfitting Structures .....	376
<i>Morten A. Langoy, David R. Watson, Bahram Momeni, Abdillah Suyuthi</i>	
Anomaly Detection in Unattended Machinery Plant Using an Bi-LSTM-DVAE Approach.....	387
<i>Ahmad BahooToroody, Mohammad Mahdi Abaei, Mingyang Zhang, Victor Bolbot, Mahsa Khorasani</i>	
Resilient Power Infrastructure: Atmospheric Ice Accretion Emergency Events Management Strategies .....	394
<i>Ali Nouri, Javad Barabady, Abbas Barabadi, Mohsen Vahabbi</i>	
Automated Detection of Icebergs in the North Atlantic Using RCM Dual-Polarimetric SAR Imagery for Offshore Safety .....	402
<i>Zahra Jafari, Pradeep Bobby, Ebrahim Karami, Rocky Taylor</i>	
Fatigue Life Assessment of an In-Service Subsea Riser Tower Subjected to Flow Induced Vibration: Part 1 of 2 - Measurement .....	409
<i>Mike Lewis, Aurelien Petitgas, Gernot Wally, Nick Horder, Jerome Sarrasin</i>	

Evaluating Natech Risks in the Liquid Hydrogen Maritime Bunkering Infrastructure .....	417
<i>Federica Tamburini, Federica Ricci, Valerio Cozzani</i>	
Design Methodology for Implementing an Offshore Operations Simulation Center .....	426
<i>Marcos Coelho Maturana, Danilo Taverna Martins Pereira de Abreu, Rene Thiago Capelari Orłowski, Marcelo Ramos Martins</i>	
Decision-Making Approach to Support the Selection of Remotely Operated Inspection Methods of FPSO Tanks .....	436
<i>Renan Favarao da Silva, Gilberto Francisco Martha de Souza, Marjorie Maria Bellinello, Adherbal Caminada Netto</i>	
FEM-Based Assessment of Steel-Lightweight Concrete-Steel Sandwich Composite Beams for FPSO Applications: Behavior, Failure, and Design.....	444
<i>Igor Fraga, Mariane Rita, Ana Beatriz Silva, Eduardo Fairbairn, Jose Claudio Telles, Alexandre Landesmann, Nicolau Antonio dos Santos Rizzo</i>	
Global and Local Response of Submerged Floating Tunnels to Hydrodynamic Loads .....	452
<i>Stefano Corazza, Francesco Foti, Luca Martinelli, Vincent Denoel</i>	
Numerical Methodology for Local Analysis of Sandwich Panels in FPSO Hull Structures .....	462
<i>Waldy Zuniga, Paulo Mauricio Videiro, Newton Bruno de Almeida Costa, Jose Renato Mendes de Sousa, Luis Volnei Sudati Sagrilo, Nicolau Antonio dos Santos Rizzo</i>	
A Stress-Corrosion Model to Simulate Degradation Process of Steel Structure in Marine Environment .....	471
<i>Youyuan Xiao, Zhiliang Wang, Miao Li, Linfang Shen</i>	
Study of Radial Crushing for the Interlocking Layer of a Flexible Riser With Four V-Shape Shoes.....	480
<i>Jose P. Quispe, Luis C. Flores, Adriely Martins, Geovana Drumond, Marcelo Igor Lourenco de Souza, Lucas Ferreira, Anderson Barata Custodio, Alexandre Cordeiro</i>	
Comparison of Different Methods for Ultimate Strength Assessment of Ship Model in Bending .....	489
<i>Thomas Lindemann, Alessandro La Ferlita, Patrick Kaeding</i>	
A Numerical Method to Estimate the Collapse Pressure of a 2-D Steel-Concrete-Steel Sandwich Ring .....	499
<i>Hung-Chun Lin, Matthew D. Collette</i>	
Ultimate Strength of FPSO Stiffened Panels With Pitting Corrosion.....	509
<i>John H. Chujutalli, Lucas Navarro Brito Zacharias, Marcelo I. Lourenco de Souza</i>	
Influence of Design Parameters on the Ultimate Torsional Strength of Wind Turbine Tower Structure .....	520
<i>Won Seok Choi, Jung Min Sohn, Sang Jin Kim</i>	
Evaluation and Optimization of the GISSMO Damage Model in AH36 Steel.....	530
<i>JwaYun Kim, SangJin Kim, Dae Kyeom Park, Jung Min Sohn</i>	
Dynamic Response Estimation of Constant Mass Steel Plates With Different Exposed Area Configurations Under Air Blast Loads .....	538
<i>Murlidhar Patel, Shivdayal Patel, Suhail Ahmad, Carlo Guedes Soares, Prince Arora</i>	
Structural Health Monitoring of High-Speed Crafts: Phase1 Development of Solution via Digital Twinning.....	548
<i>Zhiping Cheng, Chuan Wei Louis Tan, Jing Liu, Minbo Cai, Yingying Chen, Mathai Pambrakaran Pathrose</i>	

Predictive Health Analysis for Future Maintenance Planning in Aging Containership Hull Structures Within Digital Healthcare Engineering Systems .....	561
<i>Hyeong Jin Kim, Yuheng Xie, Jeom Kee Paik</i>	
Utilizing an Acceleration-Strain Transmissibility Relationship for the Prediction of Midship Strain on a Polar Vessel.....	571
<i>Gerhard Durandt, Anriette Bekker</i>	
Comparative Analysis of Machine Learning Methods for Predicting Structural Responses in Ship Hull Monitoring.....	579
<i>Simon Haberl, Moritz Braun, Soren Ehlers</i>	
Coherent Sour Toughness Testing Across NACE Regions: Data Analysis Across Multiple Projects, Sources, and Environments With Guidance to Consistently Measure Meaningful Lower Bound Toughness Results .....	588
<i>Justin Crapps, Greg Pioszak, Rajil Saraswat, David Baker</i>	
Assessment of Tensile Strain Capacity of Girth Welds in X70 and X100 Pipeline With Surface Cracks Under Bending .....	598
<i>Xinping Yu, Dong-Yeob Park, Xin Wang</i>	
Microstructure and Effect of Orientation on Toughness of X65 Steel Pipe Electric Resistance Seam Weld.....	607
<i>Tirdad Niknejad, Cheng Qian, Bill Tyson, Su Xu</i>	
Investigation of Crack Tip Opening Displacement Behavior for Cryogenic Steel Considering Strength Mismatch Effects .....	616
<i>Ji Hoon Kim, Young Cheon Jeong, Dong Pil Cho, Myung Hyun Kim</i>	
Study on Fracture Prediction for Cracks Under Mode II and III Loading Combined With Mode I.....	623
<i>Takuya Akahoshi, Koji Azuma, Tsutomu Iwashita</i>	
Fit for Purpose and Inspection of Subsea Equipment Dissimilar Welds.....	631
<i>Petronio Zumpano Jr., Milton Santos, Daniel Correia Freire Ferreira</i>	
Fatigue Design Guidance for Risers in Sour Service via Full Scale Testing .....	639
<i>Carol Johnston</i>	
Polymer Inner Liner Strain Boundaries - From Factory to Service.....	646
<i>Martin Helgesen, Christian Wang, Miguel Dantas, Laetitia Fraise</i>	
Influence of Hydrogen on Overload-Affected Fatigue Crack Growth in Pipeline Steels.....	652
<i>Leonardo Giannini, Hisao Matsunaga, Sungcheol Park, Shogo Tanaka, Antonio Alvaro</i>	
Burst Pressure Prediction of Defective Pipeline Test Spools by Metal Magnetic Memory Method .....	660
<i>Choong Meng Lam, Sheng Bao, Muhammad Ashri Mustapha, Patricia Liew Fung Mee</i>	
Development of a Wear Coupon Test Machine to Reproduce the Severe-Mild Wear Transition for Mooring Chains of Floating Offshore Wind Turbines.....	667
<i>Takaaki Takeuchi, Yuko Onishi, Eisuke Nozoe</i>	
Methodology Proposal for Assessing SCC-CO2 Susceptibility in Flexible Pipe Armor Wires .....	674
<i>Mariana R. Tagliari, Derek Fonseca, Waleska C. Guaglianoni, Fabricio P. Santos, Marcelo F. Borges</i>	

Investigating Through-Thickness Crack Propagation From Local Hard Zones in TMCP Steel Exposed to Wet Sour Service .....	681
<i>Khalid A. Babakri, Saad M. Al-Muaili</i>	
Reinforcement Effect and Adhesive Strength of CFRP Reinforced Steel Plate Based on Accelerated Testing Method in Seawater Environments .....	687
<i>Tsuyoshi Matsuo, Akio Sakurai, Fuminori Yanagimoto, Yuya Hidekuma, Shunta Sakurai</i>	
Additive Manufacturing of Maritime Structural Components - A Classification Perspective .....	693
<i>Elizabeth McCaig, Mario Lopes de Castro, Adam Saxty, Yikun Wang, Gina Mullarkey</i>	
The Impacts of Long-Term Submersion in Seawater on Thermoplastic-Matrix Composite Materials .....	703
<i>Ione L. M. Smith, James M. Maguire, Machar Devine, Edward D. McCarthy, Philipp R. Thies, Selda Oterkus, Winifred Obande</i>	
Modelling Orthotropic Plasticity in Thermoplastic Composite Pipes .....	711
<i>Mehdi Yasae</i>	
Numerical Validation of a Composite Propeller Design by Using Different Hydro-Structural Coupling Methods .....	717
<i>Kashan Ali, Maxime Deydier, Stephane Paboeuf, Pauline Regnier, Gabriel Heguy, Thibaut Alleau</i>	
Numerical Study on the Dynamic Response of Composite Protective Covers Under Ship Anchor Impact .....	725
<i>Zhang Haidian, Qu Yan, Wang Kang, Ding Qingqiang</i>	
A Composite Shielding of Subsea Assets for Maximum Energy Absorption: Model Experiments .....	732
<i>Heinrich Welmans, Cheslav Balash, Eric Curwood, Rafael Sumah, David MacLean, Guy MacLean</i>	
Unit Cell Approach: Verifying Flowline Insulation Coating Capacity Under High Tension Conditions .....	739
<i>Jose Manuel Torres III, Sabesan Rajaratnam</i>	
Alternative Alloys for Mechanically Lined Pipes: Material Performance, Weldability and Inspection Requirements for Subsea Systems .....	747
<i>Petronio Zumpano Jr., Bruno Diehl Neto, Eduardo Hippert Jr., Alexandre Galiani Garmbis, Bruno Rocha Marques da Cunha</i>	

## **Author Index**