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June 17–22, Rhodes (Rodos), Greece

The Twenty-second (2012) International  
**Offshore and Polar  
Engineering Conference**

*In addition ISOPE specialty symposia:*

- 1st Tsunami & Safety
- 1st **Asset Integrity**
- 3rd Arctic Science & Technology
- 2nd Arctic Materials
- 3rd Renewable Energy & Environment
- 4th Sloshing Dynamics & Design
- 4th Frontier & Clean Energy Tech
- 10th High-Performance Materials
- 5th Strain-Based Design

**ISOPE-2012**

Rodos Palace Hotel, Rhodes, Greece, June 17–22

## Technical Program

Refereed papers from **52** countries in **150** technical general  
Plenary and keynote presentations  
General Information, Reservations, Publications and Program  
Updates on [www.isopec.org](http://www.isopec.org) [www.isopec2012.org](http://www.isopec2012.org)  
Forms for Advance Registration and Venue Hotel:  
Inside this program and on [www.isopec.org](http://www.isopec.org) [www.isopec2012.org](http://www.isopec2012.org)

*Organized by:*

Technical Program Committee, ISOPE

*Sponsored by:*

International Society of Offshore and Polar Engineers (ISOPE)  
with cooperating organizations (listed inside)



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ISOPE Awards, Scholarship, and Student Forum:  
Presentation at Banquet



Conference Opening Session



Annual Conference Banquet

More photos on [www.isopec.org](http://www.isopec.org) and [www.isopec2012.org](http://www.isopec2012.org)  
ISOPE-2011 Maui

21st Annual International Ocean and Polar Engineering  
Conference, Maui, June 19-24, 2011

## Welcome to ISOPE-2012 Conference

We greatly appreciate the excellent responses with **1250+** abstracts and help we have received from colleagues around the world in the successful organization of the 22nd International Offshore and Polar Engineering Conference (ISOPE-2012), Rhodes, Greece, June 17–22, 2012. The Conference features **150** sessions of *peer-reviewed* papers and **8** keynote presentations from more than **52 countries**, including the ISOPE specialty symposia as a part of the ISOPE-2012 Conference.

The conference program is issued in 2 versions: Printed and internet ([www.isope.org](http://www.isope.org) and [www.isope2012.org](http://www.isope2012.org)). To meet the page limit, only the first author data are listed in the printed version, and the internet version lists all authors.

The purposes of the ISOPE conference are to:

- \* Promote technological progress and activities, international technological transfer and cooperation, and opportunities for engineers to maintain and improve technical competence; and
- \* Provide a timely international forum for technical activities, cooperation, opportunity and fellowship among researchers and engineers by developing focused session topics with high quality papers (in both originality and significance) accepted through rigorous review, establishing high international standards for publication and worldwide distribution and promoting interdisciplinary interaction between academia and industry.

The International Society of Offshore and Polar Engineers (ISOPE) has already held **49 successful international meetings** with peer-reviewed papers:

- 1st (1990) European Offshore Mechanics Symposium (**EUROMS-90**) Trondheim; EUROMS-99 Moscow;
- 1st (1990) Pacific/Asia Offshore Mechanics Symposium (**PACOMS-90**) Seoul; PACOMS-94 Beijing; 1996 Pusan, 2002 Daejeon, 2004 Vladivostok, 2006 Dalian, 2008 Bangkok, 2010 Busan
- Annual **ISOPE** conferences, starting in Edinburgh, 1991 were held in San Francisco, Singapore, Osaka, The Hague, Los Angeles, Honolulu, Montréal, Brest, Seattle, Stavanger, Kitakyushu, Honolulu, Toulon, Seoul, San Francisco, Lisbon, Vancouver, Osaka, Beijing and Maui. Since 1992, the annual ISOPE conference program has been the world's largest of its kind with peer-reviewed papers;
- 1st (1995) ISOPE Ocean Mining Symposium (**OMS-95**), Tsukuba, 1995, Seoul, Goa, Szczecin, Tsukuba, Changsha, Lisbon; Chennai
- 1st (1996) International Deep-Ocean Technology (**IDOT-96**) Symposium and Workshop, 1996 Los Angeles; 2001 Stavanger and 2009 Beijing;
- ISOPE **HPM** Symposium: Honolulu 2003, Toulon 2004, Seoul 2005, San Francisco 2006, Lisbon 2007, Vancouver 2008; Osaka 2009 and Beijing 2010 ;
- ISOPE Series of specialty symposia : **ANGT**: Seoul 2005-; **Strain-Based Design SBD**: Lisbon 2007-; **Nanotechnology NANOS**: Lisbon 2007 Frontier Energy; **Sloshing Dynamics, Sloshing-2009-**, **Renewable Energy/Environment, REES-2010**; Arctic Science & Tech, **Arctic-2010-**; **Arctic Materials-2011-**; **Asset Integrity-2012-**

On behalf of the Technical Program Committee, it is our pleasure to welcome participants from all over the world to the ISOPE-2012 Conference in Rhodes, Greece.

Jin S Chung, USA	Demos Angelides Greece	Ronald H Knapp USA
Xizhao Jiang China	Shigeru Naito Japan	Michael Isaacson Canada

Co-chairmen of the ISOPE-2012 Conference

**SUNDAY JUNE 17**

09:00 ISOPE Board of Directors Meeting Executive D  
10:30 ISOPE-2010 Executive Committee Meeting Executive D  
EUROMS and PACOMS Executive Committees  
15:00-18:00  
**CONFERENCE REGISTRATION** Lobby  
17:00-18:00  
**WELCOME RECEPTION** Outdoor Pool Garden  
Tour Information Visit tour desk in ISOPE registration area:  
[www.isopec.org](http://www.isopec.org)  
Spouse Program Join Tour program: see [www.isopec.org](http://www.isopec.org)

**MONDAY June 18**

**On-Site Registration** starts at 07:30 Lobby  
**07:30 Session Chair/Co-chair Briefing** Lobby  
  
**08:30 Conference Opening** Jupiter  
08:30  
**1. OCEAN AND ENERGY INDUSTRY REVIEW—2011** Jupiter  
  
**10:30**  
**2. LNG SLOSHING I: GTT Progress** Room 1  
**3. VORTEX-INDUCED VIBRATIONS I** Room 2  
**4. RENEWABLE ENERGY I: Wind 1: Foundations 1** Room 3  
**5. TSUNAMI I: 2011 Tohoku Tsunami 1** Room 4  
**6. ASSET INTEGRITY I** Room 5  
**7. ENVIRONMENT I: Oil Spill and Emission** Room 6  
**8. SBD I: Materials** Room 7  
**9. FRONTIER ENERGY I: Clean Energy** Room 8  
**10. RISK & RELIABILITY I** Room 9  
**11. UNDERSEA I: Operation and Communication 1** Room 10  
  
**14:00**  
**12. LNG SLOSHING II: Physics & Coupling** Room 1  
**13. VORTEX-INDUCED VIBRATIONS II** Room 2  
**14. RENEWABLE ENERGY II: Wind 2: Foundations 2** Room 3  
**15. TSUNAMI II: 2011 Tohoku Tsunami 2** Room 4  
**16. ASSET INTEGRITY II** Room 5  
**17. ENVIRONMENT II: Physical & Chemical Processes** Room 6  
**18. SBD II: Numerical Modeling** Room 7  
**19. FRONTIER ENERGY II: Clean Coal** Room 8  
**20. RISK & RELIABILITY II** Room 9  
**21. UNDERSEA II: Operation and Communication 2** Room 10  
  
**16:20**  
**22. LNG SLOSHING III: LNG Tank Design 1** Room 1  
**23. HYDRODYNAMICS I: MetOcean 1** Room 2  
**24. RENEWABLE ENERGY III: Wind 3: Substructures** Room 3  
**25. TSUNAMI III: Generation & Warning 1** Room 4  
**26. ASSET INTEGRITY III** Room 5  
**27. ENVIRONMENT III: Water & Sediment Qualities** Room 6  
**28. SBD III: Strain Capacity Characterization** Room 7  
**29. FRONTIER ENERGY III: Hydrate Fundamental** Room 8  
**30. RISK & FATIGUE** Room 9  
**31. UNDERSEA III: Vehicle and Control 1** Room 10  
  
**18:30** Find from the bulletin board  
**ISOPE Technical Committee Meetings**

**Tuesday June 19**

<b>07:30</b> Session Chair/Co-chair Briefing	Lobby
<b>08:00</b>	
32. LNG SLOSHING IV: LNG Tank Design 2	Room 1
33. HYDRODYNAMICS II: MetOcean 2	Room 2
34. RENEWABLE ENERGY IV: Wind 4: Dynamics 1	Room 3
35. TSUNAMI IV: Generation & Warning 2	Room 4
36. ASSET INTEGRITY IV	Room 5
37. COASTAL I:Waves & Modeling 1	Room 6
38. SBD IV: Fracture Mechanics	Room 7
39. FRONTIER ENERGY IV: Hydrate Development	Room 8
40. OFFSHORE MECHANICS I: Floating Dynamics 1	Room 9
41. UNDERSEA IV: Vehicle and Control 2	Room 10
<b>10:30</b>	
42. LNG SLOSHING V: Sloshing Tests	Room 1
43. HYDRODYNAMICS III: MetOcean 3	Room 2
44. RENEWABLE ENERGY V: Wind 5: Floating 1	Room 3
45. TSUNAMI V: Generation & Warning 3	Room 4
46. ADVANCED SHIP TECH I: Ultimate Strength	Room 5
47. COASTAL II: Waves & Modeling 2	Room 6
48. SUBSEA, PIPELINES, RISERS I: NORD Stream	Room 7
49. FRONTIER ENERGY V: Hydrate Modeling	Room 8
50. OFFSHORE MECHANICS II: Floating Dynamics 2	Room 9
51. ARCTIC MATERIALS I	Room 10
<b>13:00</b>	
Chung Award Lecture	Room 2
<b>14:00</b>	
52. LNG SLOSHING VI: CFD	Room 1
53. HYDRODYNAMICS IV: Freak and Long Waves	Room 2
54. RENEWABLE ENERGY VI: Wind 6: Floating 2	Room 3
55. TSUNAMI VI: Propagation & Flooding	Room 4
56. ADVANCED SHIP TECH II: At-Sea Explosions	Room 5
57. COASTAL III: Waves & Modeling 3	Room 6
58. SUBSEA, PIPELINES, RISERS II: New Concept Develop.	Room 7
59. GEOTECH I: Suction Piles	Room 8
60. OFFSHORE MECHANICS III: Systems I	Room 9
61. ARCTIC MATERIALS II	Room 10
<b>16:20</b>	
62. LNG SLOSHING VII: Structural Responses	Room 1
63. HYDRODYNAMICS V: Wave Loading	Room 2
64. RENEWABLE ENERGY VII: Wind 7: Analysis Tools	Room 3
65. TSUNAMI VII: Structure & Sediment 1	Room 4
66. HPM I: Adv Materials & Structures 1	Room 5
67. COASTAL IV: Breakwaters & Waves 1	Room 6
68. SUBSEA, PIPELINES, RISERS III: Panel	Room 7
69. GEOTECH II: Offshore Foundations	Room 8
70. OFFSHORE MECHANICS IV: Systems II	Room 9
71. ARCTIC I: Navigation in Pack Ice	Room 10
15:30 Awards Committee Meeting	Executive D
16:30 Board of Editors Meeting	Executive D
<b>18:00</b> Student Forum (advance reservation to <a href="mailto:isope-2@isope-org">isope-2@isope-org</a> )	

**WEDNESDAY JUNE 20**

<b>07:30</b>	<b>Session Chair/Co-chair Briefing</b>	<b>Lobby</b>
<b>08:00</b>		
72.	RENEWABLE ENERGY XVI: Wave 4	Room 1
73.	HYDRODYNAMICS VI: Floating-Body Dynamics 1	Room 2
74.	RENEWABLE ENERGY VIII: Wind 8: Concepts	Room 3
75.	TSUNAMI VIII: Structure & Sediment 2	Room 4
76.	HPM II: Adv Materials & Structures 2	Room 5
77.	COASTAL V: Breakwaters & Waves 2	Room 6
78.	SUBSEA, PIPELINES, RISERS IV: Improved Perform.	Room 7
79.	GEOTECH III: Soil Improvement	Room 8
80.	FRONTIER ENERGY VI: Ocean Mining 1: Minerals	Room 9
81.	ARCTIC II: Ice Mechanics	Room 10
<b>10:30</b>		
82.	RENEWABLE ENERGY XVII: Wave 5	Room 1
83.	HYDRODYNAMICS VII: Floating-Body Dynamics 2	Room 2
84.	RENEWABLE ENERGY IX: Wind 9: Codes & Design	Room 3
85.	TSUNAMI IX: Risk Assessment 1	Room 4
86.	HPM III: Composites	Room 5
87.	COASTAL VI: Breakwaters & Waves 3	Room 6
88.	SUBSEA, PIPELINES, RISERS V: Component Develop	Room 7
89.	GEOTECH IV: Cyclic Loading	Room 8
90.	FRONTIER ENERGY VII: Ocean Mining 2: Systems	Room 9
91.	ARCTIC III: Coastal Arctic Properties	Room 10
<b>12:00</b>	<b>ISOPE Board of Directors Meeting</b>	<b>Executive D</b>
<b>13:15</b>	<b>Plenary Presentation: Pipeline</b>	<b>Room 1</b>
<b>14:00</b>		
92.	RENEWABLE ENERGY XVIII: Wave 6: Resources	Room 1
93.	HYDRODYNAMICS VIII: Floating-Body Dynamics 3	Room 2
94.	RENEWABLE ENERGY X: Wind 10: Resources	Room 3
95.	TSUNAMI X: Risk Assessment 2	Room 4
96.	HPM IV: Fatigue & Fracture 1	Room 5
97.	COASTAL VII: Wave-Structure Interaction	Room 6
98.	SUBSEA, PIPELINES, RISERS VI: Fatigue Assessment	Room 7
99.	GEOTECH V: Slope Stability	Room 8
100.	OFFSHORE MECHANICS V: Deepwater Installation	Room 9
101.	ARCTIC IV: Ice Environment & Forecasting	Room 10
<b>16:20</b>		
102.	RENEWABLE ENERGY XIX: Tidal & Current 1	Room 1
103.	HYDRODYNAMICS XIII: DP & Control	Room 2
104.	RENEWABLE ENERGY XI: Wind 11: Power 4	Room 3
105.	ADVANCED SHIP TECH III: Collision & Vibration	Room 4
106.	HPM V: Fatigue & Fracture 2	Room 5
107.	COASTAL VIII: Estuary Hydraulics	Room 6
108.	SUBSEA, PIPELINES, RISERS VII: Adv Analysis 1	Room 7
109.	GEOTECH VI: Piles & Foundations	Room 8
110.	OFFSHORE MECHANICS VI: Design & Installation	Room 9
111.	LNG SLOSHING VIII: Panel	Room 10

<b>19:00</b>	<b>Annual Conference Banquet</b>	<b>Super Dome Pool</b>
22nd ISOPE Cultural Event, Best Paper, Best Student Paper, Outstanding Students and Awards		
<i>Don't forget the banquet ticket.</i>		

**THURSDAY JUNE 21**

**07:30 Session Chair/Co-chair Briefing** **Lobby**

**08:00**

112. RENEWABLE ENERGY XX: Tidal & Current 2	Room 1
113. HYDRODYNAMICS IX: CFD 1	Room 2
114. RENEWABLE ENERGY XII: Wind 12:	Room 3
115. ADVANCED SHIP TECH IV: Slamming & Load	Room 4
116. HPM VI: Fatigue & Fracture 3	Room 5
117. COASTAL IX: Coastal Sediment 1	Room 6
118. SUBSEA, PIPELINES, RISERS VIII: Install. & Fabric	Room 7
119. GEOTECH VII: Consolidation & Seepage	Room 8
120. OFFSHORE MECHANICS VII: Moored Structures	Room 9
121. ARCTIC V: Ice Structure Interaction	Room 10

**10:30**

122. RENEWABLE ENERGY XXI: Tidal & Current 3	Room 1
123. HYDRODYNAMICS X: CFD 2	Room 2
124. RENEWABLE ENERGY XIII: Wave 1	Room 3
125. ADVANCED SHIP TECH V: Propulsion	Room 4
126. HPM VII: Shipbuilding Steels	Room 5
127. COASTAL X: Coastal Sediment 2	Room 6
128. SUBSEA, PIPELINES, RISERS IX: Analysis 2	Room 7
129. GEOTECH VIII: Material Testing	Room 8
130. OFFSHORE MECHANICS VIII: FSRU 1	Room 9
131. ARCTIC VI: Operations in Ice)	Room 10

**12:00 Ocean Mining Executive Committee** **Executive D**

**14:00**

132. RENEWABLE ENERGY XXII: Thermal Energy	Room 1
133. HYDRODYNAMICS XI: CFD 3	Room 2
134. RENEWABLE ENERGY XIV: Wave 2	Room 3
135. ADVANCED SHIP TECH VI: System design	Room 4
136. HPM VIII: Advances in Welding Technology 1	Room 5
137. COASTAL XI: Coastal Sediment 3	Room 6
138. SUBSEA, PIPELINES, RISERS X: Flow Effects	Room 7
139. GEOTECH IX: Soil Properties	Room 8
140. OFFSHORE MECHANICS IX: FSRU 2	Room 9
141. ARCTIC VII: Ice Modeling & Operations	Room 10

**16:20**

142. RENEWABLE ENERGY XXIII: Marine Bioenergy	Room 1
143. HYDRODYNAMICS XII: CFD 4	Room 2
144. RENEWABLE ENERGY XV: Wave 3	Room 3
145. ADVANCED SHIP TECH VII: Seakeeping & Resist.	Room 4
146. HPM IX: Advances in Welding Technology 2	Room 5
147. COASTAL XII: Storm Surge & Inundation	Room 6
148. SUBSEA, PIPELINES, RISERS XI: System Integrity	Room 7
149. GEOTECH X: Construction & Materials	Room 8
150. OFFSHORE MECHANICS X: LNG Transport	Room 9

<b>Sunday – Thursday</b>	
<a href="#">Author Practice</a>	Individual session rooms
<a href="#">On-site Registration</a>	Lobby
<a href="#">ISOPE Headquarters</a>	VIP Lounge
<a href="#">Proceedings Pickup</a>	Registration Desk, Lobby
<a href="#">Committee Meetings</a>	Executive D, Mezzanine e

**FRIDAY June 22**

Find Updates in Program on [www.isopec.org](http://www.isopec.org) and [www.isopec2012.org](http://www.isopec2012.org)  
Tours: Click on [General Information](#)

**ISOPE-2012 Rhodes**  
**The Twenty-second (2012) International**  
**Offshore and Polar Engineering Conference**  
Rhodes, Greece, June 17–22, 2012

This 22nd annual conference features **150 technical and opening general sessions**, **1 plenary presentation and 4 keynote presentations** with top experts from industry, academia and government. After peer review of the manuscripts selected from 1,250+ abstracts, some **720** peer-reviewed papers will be presented and discussed by researchers, engineers and managers from more than **52** countries.

The conference proceedings of peer-reviewed papers in PDF files will be available in a set of 4 volumes on CD-ROM (4,200 pp. est.) — paginated within each volume — during the conference and later for worldwide post-conference mail order from ISOPE: **ISBN 978-1-880653-94-4; ISSN 1098-6189**.

The number at end of the session title indicates the tentative number of the proceedings volume. Only the changes on titles or authors the Technical Program Committee received in writing before January 19, 2012 are reflected in this program. Final corrections will be updated in the Conference Proceedings of peer-reviewed papers and the Final Program.

**All ISOPE publications are indexed by Engineering Index (EI).**

**SESSION LIST BY TOPICS**

**OCEAN AND ENERGY INDUSTRY REVIEW (V. 1)**

**1. OCEAN AND ENERGY INDUSTRY REVIEW—2011** Jupiter

**FRONTIER ENERGY, GAS HYDRATES & OCEAN MINING (V. 1)**

<b>9. FRONTIER ENERGY I: Clean Energy</b>	Room 8
<b>19. FRONTIER ENERGY II: Clean Coal</b>	Room 8
<b>29. FRONTIER ENERGY III: Hydrate Fundamental</b>	Room 8
<b>39. FRONTIER ENERGY IV: Hydrate Development</b>	Room 8
<b>49. FRONTIER ENERGY V: Hydrate Modeling</b>	Room 8
<b>80. FRONTIER ENERGY VI: Ocean Mining 1: Minerals</b>	Room 9
<b>90. FRONTIER ENERGY VII: Ocean Mining 2: Systems</b>	Room 9

**RENEWABLE ENERGY (OFFSHORE WIND AND OCEAN)  
AND ENVIRONMENT (V. 1)**

<b>4. RENEWABLE ENERGY I: Wind 1: Foundations 1</b>	Room 3
<b>14. RENEWABLE ENERGY II: Wind 2: Foundations 2</b>	Room 3
<b>24. RENEWABLE ENERGY III: Wind 3: Substructures</b>	Room 3
<b>34. RENEWABLE ENERGY IV: Wind 4: Dynamics 1</b>	Room 3
<b>44. RENEWABLE ENERGY V: Wind 5: Floating 1</b>	Room 3
<b>54. RENEWABLE ENERGY VI: Wind 6: Floating 2</b>	Room 3
<b>64. RENEWABLE ENERGY VII: Wind 7: Analysis Tools</b>	Room 3
<b>74. RENEWABLE ENERGY VIII: Wind 8: Concepts</b>	Room 3
<b>84. RENEWABLE ENERGY IX: Wind 9: Codes &amp; Design</b>	Room 3
<b>94. RENEWABLE ENERGY X: Wind 10: Resources</b>	Room 3
<b>104. RENEWABLE ENERGY XI: Wind 11: Power 4</b>	Room 3
<b>114. RENEWABLE ENERGY XII: Wind 12:</b>	Room 3
<b>124. RENEWABLE ENERGY XIII: Wave 1</b>	Room 3
<b>134. RENEWABLE ENERGY XIV: Wave 2</b>	Room 3
<b>144. RENEWABLE ENERGY XV: Wave 3</b>	Room 3
<b>72. RENEWABLE ENERGY XVI: Wave 4</b>	Room 1
<b>82. RENEWABLE ENERGY XVII: Wave 5</b>	Room 1
<b>92. RENEWABLE ENERGY XVIII: Wave 6: Resources</b>	Room 1
<b>102. RENEWABLE ENERGY XIX: Tidal &amp; Current 1</b>	Room 1
<b>112. RENEWABLE ENERGY XX: Tidal &amp; Current 2</b>	Room 1
<b>122. RENEWABLE ENERGY XXI: Tidal &amp; Current 3</b>	Room 1
<b>132. RENEWABLE ENERGY XXII: Thermal Energy</b>	Room 1
<b>142. RENEWABLE ENERGY XXIII: Marine Bioenergy</b>	Room 1

**7. ENVIRONMENT I: Oil Spill and Emission** Room 6



17. ENVIRONMENT II: Physical & Chemical Processes	Room 6
27. ENVIRONMENT III: Water & Sediment Qualities	Room 6

#### OFFSHORE MECHANICS AND HYDRODYNAMICS (V. 1)

40. OFFSHORE MECHANICS I: Floating Dynamics 1	Room 9
50. OFFSHORE MECHANICS II: Floating Dynamics 2	Room 9
60. OFFSHORE MECHANICS III: Systems I	Room 9
70. OFFSHORE MECHANICS IV: Systems II	Room 9
100. OFFSHORE MECHANICS V: Deepwater Installation	Room 9
110. OFFSHORE MECHANICS VI: Design & Installation	Room 9
120. OFFSHORE MECHANICS VII: Moored Structures	Room 9
130. OFFSHORE MECHANICS VIII: FSRU 1	Room 9
140. OFFSHORE MECHANICS IX: FSRU 2	Room 9
150. OFFSHORE MECHANICS X: LNG Transport	Room 9

#### GEOTECHNICAL ENGINEERING (V. 2)

59. GEOTECH I: Suction Piles	Room 8
69. GEOTECH II: Offshore Foundations	Room 8
79. GEOTECH III: Soil Improvement	Room 8
89. GEOTECH IV: Cyclic Loading	Room 8
99. GEOTECH V: Slope Stability	Room 8
109. GEOTECH VI: Piles & Foundations	Room 8
119. GEOTECH VII: Consolidation & Seepage	Room 8
129. GEOTECH VIII: Material Testing	Room 8
139. GEOTECH IX: Soil Properties	Room 8
149. GEOTECH X: Construction & Materials	Room 8

#### SUBSEA, PIPELINES AND RISERS (V. 2)

PLENARY: PNG PIPELINE	Room 7
48. SUBSEA, PIPELINES, RISERS I: NORD Stream	Room 7
58. SUBSEA, PIPELINES, RISERS II: New Concept Development	Room 7
68. SUBSEA, PIPELINES, RISERS III: Panel	Room 7
78. SUBSEA, PIPELINES, RISERS IV: Improved Perform.	Room 7
88. SUBSEA, PIPELINES, RISERS V: Component Develop	Room 7
98. SUBSEA, PIPELINES, RISERS VI: Fatigue Assessment	Room 7
108. SUBSEA, PIPELINES, RISERS VII: Adv Analysis 1	Room 7
118. SUBSEA, PIPELINES, RISERS VIII: Install. & Fabric	Room 7
128. SUBSEA, PIPELINES, RISERS IX: Analysis 2	Room 7
138. SUBSEA, PIPELINES, RISERS X: Flow Effects	Room 7
148. SUBSEA, PIPELINES, RISERS XI: System Integrity	Room 7

#### UNDERSEA VEHICLE, COMMUNICATION AND CONTROL (V. 2)

11. UNDERSEA I: Operation and Communication 1	Room 10
21. UNDERSEA II: Operation and Communication 2	Room 10
31. UNDERSEA III: Vehicle and Control 1	Room 10
41. UNDERSEA IV: Vehicle and Control 2	Room 10

#### ARCTIC SCIENCE & TECHNOLOGY (V. 1)

71. ARCTIC I: Navigation in Pack Ice	Room 10
81. ARCTIC II: Ice Mechanics	Room 10
91. ARCTIC III: Coastal Arctic Properties	Room 10
101. ARCTIC IV: Ice Environment & Forecasting	Room 10
121. ARCTIC V: Ice Structure Interaction	Room 10
131. ARCTIC VI: Operations in Ice)	Room 10
141. ARCTIC VII: Ice Modeling & Operations	Room 10

#### ARCTIC MATERIALS (V. 4)

51. ARCTIC MATERIALS I	Room 10
61. ARCTIC MATERIALS II	Room 10

#### HYDRODYNAMICS (V. 3)

23. HYDRODYNAMICS I: MetOcean 1	Room 2
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33. HYDRODYNAMICS II: MetOcean 2	Room 2
43. HYDRODYNAMICS III: MetOcean 3	Room 2
53. HYDRODYNAMICS IV: Freak and Long Waves	Room 2
63. HYDRODYNAMICS V: Wave Loading	Room 2
73. HYDRODYNAMICS VI: Floating-Body Dynamics 1	Room 2
83. HYDRODYNAMICS VII: Floating-Body Dynamics 2	Room 2
93. HYDRODYNAMICS VIII: Floating-Body Dynamics 3	Room 2
103. HYDRODYNAMICS XIII: DP & Control	Room 2
113. HYDRODYNAMICS IX: CFD 1	Room 2
123. HYDRODYNAMICS X: CFD 2	Room 2
133. HYDRODYNAMICS XI: CFD 3	Room 2
143. HYDRODYNAMICS XII: CFD 4	Room 2

#### TSUNAMI AND SAFETY SYMPOSIUM (V. 3)

5. TSUNAMI I: 2011 Tohoku Tsunami 1	Room 4
15. TSUNAMI II: 2011 Tohoku Tsunami 2	Room 4
25. TSUNAMI III: Generation & Warning 1	Room 4
35. TSUNAMI IV: Generation & Warning 2	Room 4
45. TSUNAMI V: Generation & Warning 3	Room 4
55. TSUNAMI VI: Propagation & Flooding	Room 4
65. TSUNAMI VII: Structure & Sediment 1	Room 4
75. TSUNAMI VIII: Structure & Sediment 2	Room 4
85. TSUNAMI IX: Risk Assessment 1	Room 4
95. TSUNAMI X: Risk Assessment 2	Room 4

#### SLOSHING DYNAMICS AND DESIGN (V. 3)

2. LNG SLOSHING I: GTT Progress	Room 1
12. LNG SLOSHING II: Physics & Coupling	Room 1
22. LNG SLOSHING III: LNG Tank Design 1	Room 1
32. LNG SLOSHING IV: LNG Tank Design 2	Room 1
42. LNG SLOSHING V: Sloshing Tests	Room 1
52. LNG SLOSHING VI: CFD	Room 1
62. LNG SLOSHING VII: Structural Responses	Room 1
111. LNG SLOSHING VIII: Panel	Room 10

#### FLOW-INDUCED VIBRATIONS (V. 3)

3. VORTEX-INDUCED VIBRATIONS I	Room 2
13. VORTEX-INDUCED VIBRATIONS II	Room 2

#### COASTAL HYDRODYNAMICS (V. 3)

37. COASTAL I: Waves & Modeling 1	Room 6
47. COASTAL II: Waves & Modeling 2	Room 6
57. COASTAL III: Waves & Modeling 3	Room 6
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77. COASTAL V: Breakwaters & Waves 2	Room 6
87. COASTAL VI: Breakwaters & Waves 3	Room 6
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#### HIGH-PERFORMANCE MATERIALS (V. 4)

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#### ASSET INTEGRITY (V. 4)

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#### STRAIN-BASED DESIGN (V. 4)

8. SBD I: Materials	Room 7
18. SBD II: Numerical Modeling	Room 7
28. SBD III: Strain Capacity Characterization	Room 7
38. SBD IV: Fracture Mechanics	Room 7

#### RISK & RELIABILITY (V. 4)

10. RISK & RELIABILITY I	Room 9
20. RISK & RELIABILITY II	Room 9
30. RISK & FATIGUE	Room 9

#### ADVANCED SHIP TECHNOLOGY (V. 4)

46. ADVANCED SHIP TECH I: Ultimate Strength	Room 5
56. ADVANCED SHIP TECH II: At-Sea Explosions	Room 5
105. ADVANCED SHIP TECH III: Collision & Vibration	Room 4
115. ADVANCED SHIP TECH IV: Slamming & Load	Room 4
125. ADVANCED SHIP TECH V: Propulsion	Room 4
135. ADVANCED SHIP TECH VI: System design	Room 4
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# TECHNICAL PROGRAM

## The Twenty-second (2012) International Offshore and Polar Engineering Conference Rhodes, Greece, June 17–22, 2012

The number at end of the session title indicates the tentative number of the proceedings volume. Only the changes on titles or authors the ISOPE-2012 Technical Program Committee (TPC) received in writing before January 19, 2012 are reflected in this program. Final corrections will be updated in the Conference Proceedings of peer-reviewed papers and the Final Program. Conference proceedings (ISBN 978-1-880653-94-4; ISSN 1098-6189) will be available as a set of 4 volumes (4,200 pp. est.) from ISOPE during and after the Conference. Proceedings papers are indexed by Engineering Index and Compendex and others.

### SUNDAY, June 17 Conference Reception

17:00 Outdoor Pool Garden

#### 1. Opening General Session: OCEAN AND ENERGY INDUSTRY REVIEW (V. 1)

Monday June 18 08:30 Jupiter

Chair: Jin S. Chung, ISOPE, USA  
Co-Chair: I Langen, Univ of Stavanger, Norway

**Conference Opening Address**  
Raghavan Ayer, ISOPE President, ExxonMobil Research & Engineering, USA

**From the Longest to the Deepest Sealines**  
Roberto Bruschi, Director, SAIPEM Energy Services, Fano, Italy

**2 MW Floating Offshore Wind WinFloat Prototype and Futue Plan**  
[Oral presentation]  
Antonio Vidigal, CEO, EDP Inovation, Portugal

#### ASSET INTEGRITY (V. 4)

Monday June 18 10:30 Room 5

Chair: JK Na, Edison Welding Inst, USA

**Operational Experience with Structural Threats on Transport Subsea Pipelines**  
LD Oosterkamp, AO Lind, Statoil, Norway

**Deepwater High Pressure and Temperature Pipeline Asset Integrity Inspection**

C Piovesan, M Meade, K Fogleman, H Green, M Peterson, NDT Systems & Services, USA

**SIRIS: A New Concept for In-Situ Riser Inspection**

MF Santos, SUBSIN; LL Menegaldo, UFRJ; DC Ristow, MO Brito, SUBSIN, Brazil

**Advanced Tools and Auto-Monitoring Systems for Subsea Equipments**

SD Soares, PETROBRAS, Brazil

**The Development, Integration, and Validation of a Fully Distributed Fiber Optic Strain & Temperature Sensor within a Power Umbilical**

DW DuToit, Omnisens, USA; H Rochat, Omnisens, Switzerland; P Willemoes, H Little, Aker Solutions, USA

**Using Acoustic Resonance Technology to Obtaining Accurate Thickness Measurements of Coated Pipes and Structures**

P Norli, N-O Negerd, E Heland, E Bergh, Det Norske Veritas, Norway

**Detection of Corrosion Damage in Pipes with Electromagnetic-acoustic Transducers (EMATs)**

JK Na, RL Spensor, EWI, USA

**EMD-HHT Based Structural Performance Assessment of an Offshore Platform**

SQ Wang, Ocean Univ of China, China

**Smart Coatings for Corrosion Detection - A Review of Recent Advances**

HG Wheat, Univ of Texas at Austin, USA

**Monday**                      **16. ASSET INTEGRITY II (V. 4)**                      **Room 5**  
**June 18**                      **14:00**

**Chair:** A Kumar, ExxonMobil Upstream Research, USA

**Technologies and Methodologies for Automated Ultrasonic Testing Quantification**

EI Todorov, R Spencer, N Porter, Edison Welding Institute; MG Lozev, BP Products North America, USA

**Advanced Structural Integrity Assessment of Subsea Pipelines in Operation**

HS Alsos, SO Kvarme, AC Hordsve, Reinertsen AS, Norway

**Analysis of a Corroded Pipeline Using Finite Element Method**

A Nikkhaah, Advance Analysis; M Radzi Ismail, SLT-Engineering, Malaysia

**Failure Risk Assessment of Marine Pipeline for Time-independent Factors Using Fuzzy Rule-based Synthetic Evaluation**

YT Liu, H Hu, Shang Jiao Tong Univ, China

**Underwater Acoustic for Leak Inspection and Monitoring**

L Barbagelata, Co.L.Mar. srl, Italy



**Enhanced Reliability for Pipeline Leak Detection System**

MG Kulkarni, J Buitrago, H Arslan, ExxonMobil Upstream Research; F Bardi, ExxonMobil Production, USA

**Monday**                      **26. ASSET INTEGRITY III (V. 4)**  
**June 18**                      **16:20**                      Room 5

**Chair:** S Damasceno, Petrobras, Brazil

**Reinforced Liners for Pipeline Rehabilitation**

TD Anderson, MG Kulkarni, ML Macia, ExxonMobil Upstream Research, USA

**Subsea Repair Challenges in the Australian Region**

AG Low, Wood Group Integrity Management, Australia

**Investigating Remote Pipeline Repair Using Laser Cleaning and Welding**

SL Asher, A Kumar, N Verma, D Fairchild, M Macia, ExxonMobil Upstream Research, USA

**Options in Material, Coating and Chemical Selection to Mitigate Failure in Hydrocarbon Production**

JC Price, GATE Engineering, USA

**Development and Application of Rust Conversion Coatings Based on Compound of Polyphosphoric Acid and Tannin**

HY Hu, XQ Fan, Y Liu, Zhejiang Ocean Univ, China

**The Design Concept of Marine Anti-Biofouling Electrolysis Membrane**

Y Chang, JY Lee, RC Kao, National Cheng Kung Univ, Taiwan, China

**Experience with the Application of DEH**

H Kulbotten, JK Lervik, SINTEF Energy Research, Norway

**Numerical Simulations of Liquid Motion in SPB Tank**

H Kobayakawa, H Kusumoto, M Toyoda, IHI Marine United, Japan

**Tuesday**                      **36. ASSET INTEGRITY IV (V. 4)**  
**June 19**                      **08:00**                      Room 5

**Chair:** S. Maleki, TWI Ltd, UK

**Assessing Industry Trends in Risk Based Asset Management Practices**

UR Bharadwaj, TWI Ltd, UK

**Managing Assets during Deferred Nuclear Decommissioning**

PI Burrows, Health and Safety Executive, UK

**Asset Integrity Management (AIM) Through Implementation of Structural Health Monitoring (SHM) Technology**

JK Na, EWI, USA

**AC Corrosion Protection of Direct Electric Heating Pipeline**

A Pedersen, SINTEF Energy Research; A Nysveen, NTNU; M Hoyer-Hansen, SINTEF Energy Research, Norway

**Seismic Analysis for Offshore Industry: Promoting the State of the Practice toward the State of the Art**

JB Jia, Aker Solutions, Norway

**Examples of Disaster Prevention to Change Defective Safety Culture and Overcome Organizational Inertia**

B Wittkower, B Poblete, A Botto, J Garcia, B Singh, P Jukes, J P Kenny, USA

## Annual ISOPE-2012 Conference

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#### Advance Registration Deadlines:

*Presenting Authors:* March 24 or before the PDF file of the final revised manuscript

*Non-Authors and non-presenting authors and co-authors:* May 20

Conference Update on [www.isope.org](http://www.isope.org) and [www.isope2012.org](http://www.isope2012.org)

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It is strongly recommended to make reservation **early in March** to secure a room at **ISOPE room rates**, though deadline is **May 20**. Only a **limited number of rooms** are given to ISOPE.  
Reservation by online, email or fax only

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(c) Fax this form to +30 22410 25350 (ISOPE-2012).

*\*\*No reservations will be considered without credit card and signature for E-mail and Fax confirmations*

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Prospective authors are invited to submit abstract to:

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The 23rd (2013) International  
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First

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[www.isopec.org](http://www.isopec.org); [www.isopec2013.org](http://www.isopec2013.org)

**Abstract Deadline**

**October 20, 2012**

**Manuscript (for review) Deadline**

**January 15, 2013**

The **International Society of Offshore and Polar Engineers (ISOPE)** is organizing some 100 sessions of refereed papers including special sessions of timely topics in cooperation with international technical program committee (TPC) members and cooperating organizations. Delegates from more than 50 countries are expected as in 2012. All manuscripts will be peer-reviewed prior to the final acceptance. The conference proceedings (indexed by Engineering Index) will be available at the conference. Papers of archival value may be further reviewed for possible publication in the *International Journal of Offshore and Polar Engineering*.

#### *Main fields of interest are:*

Frontier/Clean Energy Tech	Hydrodynamics	High Perform. Mats
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