

June 21–26

Osaka, Japan

www.isopec.org

The Nineteenth (2009) International
**Offshore (Ocean) and Polar
Engineering Conference**

AND

**1st ISOPE Sloshing Dynamics & Design
(SDD-2009) Symposium**

**7th ISOPE High-Performance Materials (HPM-
2009) Symposium**

**3rd ISOPE Strain-Based Design
(SBD-2009) Symposium**

ISOPE-2009

**Osaka International Convention Center
Osaka, Japan; June 21–26**

Technical Program

Refereed papers from **50** countries in **121** sessions and
6 plenary sessions

General Information, Reservations, Publication, Author Index
and Program Updates on www.isopec.org
Forms for Advance Registration and Venue Hotel:
Inside this program and on www.isopec.org

Organized by:

Technical Program Committee, ISOPE

Sponsored by:

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



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Welcome to ISOPE-2009 Conference

We greatly appreciate the excellent responses and help we have received from colleagues around the world in the successful organization of the 19th International Offshore and Polar Engineering Conference (ISOPE-2009), Osaka, Japan, June 21–26, 2009. The Conference features **121 sessions of refereed papers and 6 plenary sessions** from more than **50 countries**, including the symposia of the 1st ISOPE Sloshing Dynamics and Design (SDD-2009), the 7th ISOPE HPM, and the 3rd ISOPE SBD-2009.

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 (in both originality and significance) papers 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 **42 successful international meetings**:

- The 1st (1990) European Offshore Mechanics Symposium (ISOPE **EUROMS-90**) Trondheim, 1990; EUROMS-99 Moscow;
- The 1st (1990) Pacific/Asia Offshore Mechanics Symposium (ISOPE **PACOMS-90**) Seoul; PACOMS-94 Beijing; PACOMS-96 Pusan, PACOMS-2002 Daejeon, PACOMS-2004 Vladivostok, PACOMS-2006 Dalian, PACOMS-2008 Bangkok;
- The **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 and Osaka. Since 1992, the annual ISOPE Conference has been held with the world's largest technical program of its kind with refereed papers;
- The 1st (1995) ISOPE Ocean Mining Symposium (**OMS-95**), Tsukuba, 1995, ISOPE OMS-97 Seoul, OMS-99 Goa, OMS-2001 Szczecin, OMS-2003 Tsukuba, OMS-2005 Changsha and OMS-2007 Lisbon;
- The 1st (1996) International Deep-Ocean Technology (**IDOT-96**) Symposium and Workshop, Los Angeles; and IDOT-2001 Stavanger.
- The ISOPE **HPM** Symposium: Honolulu 2003, Toulon 2004, Seoul 2005, San Francisco 2006, Lisbon 2007, Vancouver 2008;
- The ISOPE **ANGT** Symposium: Seoul 2005.
- The 1st ISOPE **SBD** Symposium: Lisbon 2007, Vancouver 2008
- The ISOPE HPM : 1st **NANOS** Symposium: Lisbon 2007

On behalf of the Technical Program Committee, it is our pleasure to welcome participants from all over the world to the ISOPE-2009 Conference in Osaka.

Jin S Chung, USA	Shigeru Naito Japan	Michael Isaacson Canada
A JNA Sarmento Portugal	Cuneyt Capanoglu, USA	Ro-sik Park, Korea

Co-chairmen of the ISOPE-2009 Conference

SUNDAY JUNE 21

09:00 ISOPE Board of Directors Meeting 801, 8F
12:00
ISOPE-2008 Executive Committee Meeting 801, 8F
EUROMS and PACOMS Executive Committees

15:00-18:00
CONFERENCE REGISTRATION Foyer, 10F

17:00-18:00
WELCOME RECEPTION Rihga Royal Hotel, Sakura Room, 2F

Tour Information Visit tour desk in ISOPE registration area:
www.isopec.org

Spouse Program E-mail-book in advance: Instruction in General
Information on www.isopec.org

Session rooms are located in Osaka International Convention Center.

MONDAY June 22

07:30 **On-Site Registration** starts at 07:30 (Monday only) **Foyer, 10F**
07:30 **Session Chair/Co-chair Briefing** **1010, 3F**

09:00
Conference Opening Room 1003, 10F

09:00
1. OFFSHORE & ARCTIC REVIEW (V. 1) **Room 1003, 10F**

13:30
Plenary I LNG Tank Sloshing & Design (V. 3) 1007, 10F
Keynote I LNG Sloshing in Membrane (V. 3) 1007, 10F

13:30
2. SLOSHING DYNAMICS: Reviews (V. 4) Room 1009
3. HYDRODYNAMICS I: CFD 1 – Particle... (V. 3) Room 1008
4. ADVANCE IN ENERGY TECH I; General (V. 1) Room 1001
5. SBD I: Material Modeling & Specifications (V. 4) Room 1002
6. HPM I: Instrumented Indentation (V. 4) Room 1004
7. COASTAL I: Waves & Modeling 1 (V. 3) Room 1006
8. PIPELINES & RISERS I: Multiphase & Dyn (V. 2) Room 1007
9. RISK, SAFETY & RELIAB I: Offshore (V. 4) Room 1005
10. ENVIRONMENT I: Oil Spill (V. 1) Room 1102
11. AUV, ROBOTICS & COMMUNIC... I (V. 2) Room 1101

16:20
12. SLOSHING I: - Sloshing Physics1 (V. 3) Room 1009
13. HYDRODYNAMICS 2: CFD 2 – NWT (V. 3) Room 1008
14. ADV IN ENERGY TECH I; Gas Hydrates (V. 1) Room 1001
15. SBD II: Material Developments (V. 4) Room 1002
16. COASTAL II: Waves & Modeling 2 (V. 3) Room 1006
17. PIPELINES & RISERS II: Riser (V. 2) Room 1007
18. RISK, SAFETY & RELIAB II: Operation 1 (V. 4) Room 1005
19. ENVIRONMENT II: Ocean & Arctic (V. 1) Room 1102
20. AUV, ROBOTICS & COMMUNICATION II (V. 2) Room 1101

18:30
ISOPE Technical Committee Meetings Find from the bulletin board

TUESDAY JUNE 23

07:30	Session Chair/Co-chair Briefing	1010, 3F
08:00	27. PIPELINES: Reviews (V. 2)	Room 1007
	Plenary 2 LEDA - Multiphase Flows in Pipelines (V. 2)	
	Keynote 2 Sakhalin Pipeline – Technical Challenges (V. 2)	
	21. SLOSHING II: LNG Sloshing Mechanics (V. 3)	Room 1009
	22. HYDRODYNAMICS III: CFD 3 (V. 3)	Room 1008
	23. GEOTECH I: Cyclic Loading & Liquef... (V. 2)	Room 1001
	24. SBD III: Tensile Capacity & Fracture I (V. 4)	Room 1002
	25. HPM II: Composite Materials (V. 4)	Room 1004
	26. COASTAL III: Wave-Structure 1 (V. 3)	Room 1006
	27. PIPELINES: Reviews (V. 2)	Room 1007
	28. RISK, SAFETY & RELIAB III: Operation 2 (V. 4)	Room 1005
	29. ENVIRONMENT III: Numerical Modeling (V. 1)	Room 1102
	30. AUV, ROBOTICS & COMMUNICATION III (V. 2)	Room 1101
10:30		
	31. SLOSHING III: - SLOSHEL JIP (V. 3)	Room 1009
	32. HYDRODYNAMICS IV: CFD 4 & MetOcean (V. 3)	Room 1008
	33. GEOTECH II: In-Situ Test (V. 2)	Room 1001
	34. SBD IV: Tensile Capacity & Fracture 2 (V. 4)	Room 1002
	35. HPM III: Adv Materials & Structures 1 (V. 4)	Room 1004
	36. COASTAL IV: Wave-Structure 2 (V. 3)	Room 1006
	37. PIPELINES & RISERS III: Risers & Mooring (V. 2)	Room 1007
	38. RISK, SAFETY & RELIAB IV: Human ... (V. 4)	Room 1005
	39. ENVIRONMENT IV: Water Quality (V. 1)	Room 1102
	40. AUV, ROBOTICS & COMMUNICATION IV (V. 2)	Room 1101
12:10	Student Forum	TBD
13:00		
	Jin S Chung Award Lecture (IJOPE)	1008, 10F
	Green Growth – Multiple Energy Sources	
14:00		
	41. SLOSHING IV: Sloshing in LNG–Membrane (V. 3)	Room 1009
	42. HYDRODYNAMICS V: CFD 5 & MetOcean (V. 3)	Room 1008
	43. GEOTECH III: Seepage & Soil Improvement (V. 2)	Room 1001
	44. SBD V: Compressive Capacity (V. 4)	Room 1002
	45. HPM IV: Adv Materials & Structures 2 (V. 4)	Room 1004
	46. VORTEX-INDUCED VIBRATIONS I (V. 3)	Room 1006
	47. PIPELINES & RISERS IV: Riser & SCR (V. 2)	Room 1007
	48. EARTHQUAKE & ENGINEERING (V. 4)	Room 1005
	49. ENVIRONMENT V: Coastal Monitoring (V. 1)	Room 1102
	50. AUV, ROBOTICS & COMMUNICATION V (V. 2)	Room 1101
16:20		
	51. SLOSHING V: CFD 1 (V. 3)	Room 1009
	52. HYDRODYNAMICS VI: CFD 6 & MetOcean (V. 3)	Room 1008
	53. GEOTECH IV: Consolidation & Embank... (V. 2)	Room 1001
	54. SBD VI: Recent Developments (V. 4)	Room 1002
	55. VORTEX-INDUCED VIBRATIONS II (V. 3)	Room 1006
	56. IMPACT & COLLISION (V. 4)	Room 1005
	57. ARCTIC, ANTARCTIC & ICE I (V. 1)	Room 1102
15:30	Awards Committee Meeting	801, 8F
16:30	Board of Editors Meeting	801, 8F

SPOUSE PROGRAM: Reserve a seat by email to isope-2@isope.org

WEDNESDAY JUNE 24

07:30 Session Chair/Co-chair Briefing 1010, 3F

08:00

Plenary 3 Lagrangian Particle Method (V.3)	1008, 10F
Plenary 4 Liquefied Sand – Pipe Foundation (V.3)	1001, 10F
Keynote 3 2008-SBD Symposium Review(V.3)	1007, 10F
58. SLOSHING VI: - Load & Strength (V.3)	Room 1009, 10F
59. HYDRODYNAMICS VII: CFD 7 -Nonlinear (V.3)	Room 1008
60. GEOTECH V: Soil Properties 1 (V.2)	Room 1001
61. SBD VII: Panel Discussions (V.4)	Room 1002
62. HPM V: Tubular Structures (V.4)	Room 1004
63. COASTAL V: Breakwaters (V.3)	Room 1006
64. PIPELINES & RISERS V: Riser & Dynamics (V.2)	Room 1007
65. OFFSHORE SYSTEM I: LNG, FLNG... (V.1)	Room 1005
66. ARCTIC, ANTARCTIC & ICE II (V.1)	Room 1102, 11F
67. OCEAN & WIND ENERGY I: Biomass & .. (V.1)	Room 1101

10:30

68. SLOSHING VII: - Sloshing Physics2 (V.3)	Room 1009
69. GEOTECH VI: Soil Properties, Centrifuge 2 (V.2)	Room 1001
70. HPM VI: NDE (V.4)	Room 1004
71. COASTAL VI: Floating Breakwaters (V.3)	Room 1006
72. PIPELINES & RISERS VI: Pipe-Soil ... 1 (V.2)	Room 1007
73. OFFSHORE SYSTEM II: Installation & ... (V.1)	Room 1005
74. ARCTIC, ANTARCTIC & ICE III (V.1)	Room 1102
75. OCEAN & WIND ENERGY II: Waves 1 (V.1)	Room 1101

12:00 ISOPE Board of Directors Meeting 801, 8F

14:00

Plenary 5 Full-scale Test – 5,100-m-Long Pipe (V.2)	Room 1007
76. SLOSHING VIII: CFD 2 (V.3)	Room 1009
77. HYDRODYNAMICS VIII: CFD 8 Forces (V.3)	Room 1008
78. GEOTECH VII: Anchor & Caisson(V.2)	Room 1001
79. OFFSHORE SYSTEM III: Jacket & Jackup (V.1)	Room 1002
80. HPM VII: Shipbuilding Steel (V.4)	Room 1004
81. COASTAL VII: Rubble- Breakwater (V.3)	Room 1006
82. MECHANICS ... I: Comput Meth (V.4)	Room 1005
83. ARCTIC, ANTARCTIC & ICE IV (V.1)	Room 1102
84. OCEAN & WIND ENERGY III: Waves 2 (V.1)	Room 1101

16:20

85. SLOSHING IX: Hydroelasticity (V.3)	Room 1009
86. HYDRODYNAMICS IX: Tsunami (V.3)	Room 1008
87. GEOTECH VIII: Foundation & Pile (V.2)	Room 1001
88. OFFSHORE SYSTEM IV: TLP/SPAR/... 1 (V.1)	Room 1002
89. COASTAL VIII: Submerged Structures (V.3)	Room 1006
90. PIPELINES & RISERS VII: Pipe-Soil... 2 (V.2)	Room 1007
91. MECHANICS... II: Ultimate Strength (V.4)	Room 1005
92. OCEAN & WIND ENERGY IV: Waves 3 (V.1)	Room 1101

Find Updates in Program on <http://www.isope.org>

19:00

Event Hall ABC, 3F

Annual Conference Banquet

Cultural Event, Best Paper, Scholarships and Awards

Don't forget the banquet ticket.

THURSDAY JUNE 25

07:30 Session Chair/Co-chair Briefing **1010, 3F**

08:00

93. SLOSHING X: Cargo Design (V. 3)	Room 1009
94. HYDRODYNAMICS X: CFD 9 & Dynamics 1 (V. 3)	Room 1008
95. GEOTECH IX: Landslide & Stability (V. 2)	Room 1001
96. OFFSHORE SYSTEM V: TLP/SPAR/...2 (V. 1)	Room 1002
97. HPM VIII: Fatigue & Fracture 1 (V. 4)	Room 1004
98. COASTAL IX: Estuary & Waves (V. 3)	Room 1006
99. PIPELINES & RISERS VIII: Pipeline 1 (V. 2)	Room 1007
100. ADV SHIP I: System and Design (V. 4)	Room 1005
101. HYDRODYNAMICS XIII: Roll & Damping (V. 3)	Room 1102
102. OCEAN & WIND ENERGY V: Tidal (V. 1)	Room 1101

10:30

103. SLOSHING XI: - Panel Sloshing Dynamics	Room 1009
104. HYDRODYNAMICS XI: CFD 10 & Dyn 2 (V. 3)	Room 1008
105. GEOTECH X: Modeling & Simulation (V. 2)	Room 1001
106. OFFSHORE SYSTEM VI: TLP/SPAR/... 3 (V. 1)	Room 1002
107. HPM IX: Fatigue & Fracture 2 (V. 4)	Room 1004
108. COASTAL X: Tsunami & Long Waves (V. 3)	Room 1006
109. PIPELINES & RISERS IX: Pipeline 2 (V. 2)	Room 1007
110. ADV SHIP II: Production & Maintenance (V. 4)	Room 1005
111. HYDRODYNAMICS XIV: Dynamics & ... (V. 3)	Room 1102
112. OCEAN & WIND ENERGY VI: Wind 1 (V. 1)	Room 1101

13:00

Committee Meeting 801, 8F

14:00

113. HYDRODYNAMICS XII: CFD 11 & Dyn 3 (V. 3)	Room 1008
114. GEOTECH XI: Geohazard & Geoinfor... (V. 2)	Room 1001
115. OFFSHORE SYSTEM VII: TLP/SPAR/...4 (V. 1)	Room 1002
116. HPM X: Advance in Welding Tech (V. 4)	Room 1004
117. COASTAL XI: Sediment Transport (V. 3)	Room 1006
118. PIPELINES & RISERS X: Pipeline 3 (V. 2)	Room 1007
119. ADVANCED SHIP III: Motion & Perform...(V. 4)	Room 1005
120. HYDRODYNAMICS XV: Dyn 4 & Meas (V. 3)	Room 1102
121. OCEAN & WIND ENERGY VII: Wind 2 (V. 1)	Room 1101

Sunday - Thursday	
Author Practice	Individual session rooms
On-site Registration	Foyer, 10F
Conference Headquarters	Preparation Room, 10F
Proceedings Pickup	Foyer, 10F
Committee Meetings	Room 801, 8F

FRIDAY June 26

Osaka-Kyoto-Nara Tours: Click on www.iso.org

<http://www.osaka-info.jp/index.phphellobc.com>; English version
<http://www.osaka-info.jp/en>
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Find further details on www.iso.org.

ISOPE-2009 Osaka Conference

This 19th annual conference features **121 technical and opening general sessions** and **6 plenary sessions** with top experts from industry, academia and government. About **580 papers** after peer review of some **900 abstracts** will be presented and discussed by researchers, engineers and managers from more than **50 countries**. The conference proceedings of peer-reviewed papers in PDF files will be available in a set of 4 volumes on CD-ROM (3,500 pp. est.) — **paginated within each volume** — during the conference and later for worldwide post-conference mail order from ISOPE: ISBN 978-1-880653-53-1; ISSN 1098-6189, indexed by **Engineering Index (EI)**.

SESSION LIST BY TOPICS

OFFSHORE & ARCTIC INDUSTRY REVIEW

- | | |
|--|------------|
| 1. OFFSHORE & ARCTIC REVIEW (V. 1) | G Ballroom |
| 4. ADVANCE IN ENERGY TECH I; General (V. 1) | Room 1001 |
| 14. ADV IN ENERGY TECH I; Gas Hydrates (V. 1) | Room 1001 |

OFFSHORE MECHANICS AND TECHNOLOGY

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| 65. OFFSHORE SYSTEM I: LNG, FLNG... (V. 1) | Room 1005 |
| 73. OFFSHORE SYSTEM II: Installation & ... (V. 1) | Room 1005 |
| 79. OFFSHORE SYSTEM III: Jacket & Jackup (V. 1) | Room 1002 |
| 88. OFFSHORE SYSTEM IV: TLP/SPAR/... 1 (V. 1) | Room 1002 |
| 96. OFFSHORE SYSTEM V: TLP/SPAR/...2 (V. 1) | Room 1002 |
| 106. OFFSHORE SYSTEM VI: TLP/SPAR/... 3 (V. 1) | Room 1002 |
| 115. OFFSHORE SYSTEM VII: TLP/SPAR/...4 (V. 1) | Room 1002 |

OCEAN AND OFFSHORE WIND ENERGY

- | | |
|--|-----------|
| 67. OCEAN & WIND ENERGY I: Biomass & ... (V. 1) | Room 1101 |
| 75. OCEAN & WIND ENERGY II: Waves 1 (V. 1) | Room 1101 |
| 84. OCEAN & WIND ENERGY III: Waves 2 (V. 1) | Room 1101 |
| 92. OCEAN & WIND ENERGY IV: Waves 3 (V. 1) | Room 1101 |
| 102. OCEAN & WIND ENERGY V: Tidal (V. 1) | Room 1101 |
| 112. OCEAN & WIND ENERGY VI: Wind 1 (V. 1) | Room 1101 |
| 121. OCEAN & WIND ENERGY VII: Wind 2 (V. 1) | Room 1101 |

OCEAN AND ARCTIC ENVIRONMENT

- | | |
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| 10. ENVIRONMENT I: Oil Spill (V. 1) | Room 1102 |
| 19. ENVIRONMENT II: Ocean & Arctic (V. 1) | Room 1102 |
| 29. ENVIRONMENT III: Numerical Modeling (V. 1) | Room 1102 |
| 39. ENVIRONMENT IV: Water Quality (V. 1) | Room 1102 |
| 49. ENVIRONMENT V: Coastal Monitoring (V. 1) | Room 1102 |

GEOTECHNICAL AND GEOENVIRONMENTAL ENGINEERING

- | | |
|---|-----------|
| 23. GEOTECH I: Cyclic Loading & Liquef... (V. 2) | Room 1001 |
| 33. GEOTECH II: In-Situ Test (V. 2) | Room 1001 |
| 43. GEOTECH III: Seepage & Soil Improvement (V. 2) | Room 1001 |
| 53. GEOTECH IV: Consolidation & Embank... (V. 2) | Room 1001 |
| 60. GEOTECH V: Soil Properties 1 (V. 2) | Room 1001 |
| 69. GEOTECH VI: Soil Properties, Centrifuge 2 (V. 2) | Room 1001 |
| 78. GEOTECH VII: Anchor & Caisson (V. 2) | Room 1001 |
| 87. GEOTECH VIII: Foundation & Pile (V. 2) | Room 1001 |
| 95. GEOTECH IX: Landslide & Stability (V. 2) | Room 1001 |
| 105. GEOTECH X: Modeling & Simulation (V. 2) | Room 1001 |
| 114. GEOTECH XI: Geohazard & Geoinfor... (V. 2) | Room 1001 |

OFFSHORE AND ARCTIC PIPELINES, RISERS AND MOORING

- | | |
|---|-----------|
| 8. PIPELINES & RISERS I: Multiphase & Dyn (V. 2) | Room 1007 |
| 17. PIPELINES & RISERS II: Riser (V. 2) | Room 1007 |

27. PIPELINES: Reviews (V. 2)	Room 1007
37. PIPELINES & RISERS III: Risers & Mooring (V. 2)	Room 1007
47. PIPELINES & RISERS IV: Riser & SCR (V. 2)	Room 1007
64. PIPELINES & RISERS V: Riser & Dynamics (V. 2)	Room 1007
72. PIPELINES & RISERS VI: Pipe-Soil ... 1 (V. 2)	Room 1007
90. PIPELINES & RISERS VII: Pipe-Soil... 2 (V. 2)	Room 1007
99. PIPELINES & RISERS VIII: Pipeline 1 (V. 2)	Room 1007
109. PIPELINES & RISERS IX: Pipeline 2 (V. 2)	Room 1007
118. PIPELINES & RISERS X: Pipeline 3 (V. 2)	Room 1007

DEEP OCEAN ROV, AUV AND COMMUNICATION

11. AUV, ROBOTICS & COMMUNICATION I (V. 2)	Room 1101
20. AUV, ROBOTICS & COMMUNICATION II (V. 2)	Room 1101
30. AUV, ROBOTICS & COMMUNICATION III (V. 2)	Room 1101
40. AUV, ROBOTICS & COMMUNICATION IV (V. 2)	Room 1101
50. AUV, ROBOTICS & COMMUNICATION V (V. 2)	Room 1101

ICE SCIENCE AND ENGINEERING

57. ARCTIC, ANTARCTIC & ICE I (V. 1)	Room 1102
66. ARCTIC, ANTARCTIC & ICE II (V. 1)	Room 1102
74. ARCTIC, ANTARCTIC & ICE III (V. 1)	Room 1102
83. ARCTIC, ANTARCTIC & ICE IV (V. 1)	Room 1102

FIRST ISOPE SLOSHING DYNAMICS SYMPOSIUM

2. SLOSHING DYNAMICS: Reviews (V. 4)	Room 1009
12. SLOSHING I: - Sloshing Physics1 (V. 3)	Room 1009
21. SLOSHING II: LNG Sloshing Mechanics (V. 3)	Room 1009
31. SLOSHING III: - SLOSHEL JIP (V. 3)	Room 1009
41. SLOSHING IV: Sloshing - LNG Membrane (V. 3)	Room 1009
51. SLOSHING V: CFD 1 (V. 3)	Room 1009
58. SLOSHING VI: - Load & Strength (V. 3)	Room 1009
68. SLOSHING VII: - Sloshing Physics2 (V. 3)	Room 1009
76. SLOSHING VIII: CFD 2 (V. 3)	Room 1009
85. SLOSHING IX: Hydroelasticity (V. 3)	Room 1009
93. SLOSHING X: Cargo Design (V. 3)	Room 1009
103. SLOSHING XI: - Panel Sloshing Dynamics	Room 1009

HYDRODYNAMICS

3. HYDRODYNAMICS I: CFD 1 – Particle... (V. 3)	Room 1008
13. HYDRODYNAMICS 2: CFD 2 – NWT (V. 3)	Room 1008
22. HYDRODYNAMICS III: CFD 3 (V. 3)	Room 1008
59. HYDRODYNAMICS VII: CFD 7 -Nonlinear (V. 3)	Room 1008
77. HYDRODYNAMICS VIII: CFD 8 Forces (V. 3)	Room 1008
86. HYDRODYNAMICS IX: Tsunami (V. 3)	Room 1008
94. HYDRODYNAMICS X: CFD 9 & Dynamics 1 (V. 3)	Room 1008
101. HYDRODYNAMICS XIII: Roll & Damping (V. 3)	Room 1102
104. HYDRODYNAMICS XI: CFD 10 & Dyn 2 (V. 3)	Room 1008
111. HYDRODYNAMICS XIV: Dynamics & ... (V. 3)	Room 1102
113. HYDRODYNAMICS XII: CFD 11 & Dyn 3 (V. 3)	Room 1008
120. HYDRODYNAMICS XV: Dyn 4 & Meas ... (V. 3)	Room 1102

METOCEAN

32. HYDRODYNAMICS IV: CFD 4 & MetOcean (V. 3)	Room 1008
42. HYDRODYNAMICS V: CFD 5 & MetOcean (V. 3)	Room 1008
52. HYDRODYNAMICS VI: CFD 6 & MetOcean (V. 3)	Room 1008

COASTAL ENGINEERING

7. COASTAL I: Waves & Modeling 1 (V. 3)	Room 1006
16. COASTAL II: Waves & Modeling 2 (V. 3)	Room 1006
26. COASTAL III: Wave-Structure 1 (V. 3)	Room 1006
36. COASTAL IV: Wave-Structure 2 (V. 3)	Room 1006
63. COASTAL V: Breakwaters (V. 3)	Room 1006
71. COASTAL VI: Floating Breakwaters (V. 3)	Room 1006

81. COASTAL VII: Rubble- Breakwater (V. 3)	Room 1006
89. COASTAL VIII: Submerged Structures (V. 3)	Room 1006
98. COASTAL IX: Estuary & Waves (V. 3)	Room 1006
108. COASTAL X: Tsunami & Long Waves (V. 3)	Room 1006
117. COASTAL XI: Sediment Transport (V. 3)	Room 1006

FLOW-INDUCED VIBRATIONS

46. VORTEX-INDUCED VIBRATIONS I (V. 3)	Room 1006
55. VORTEX-INDUCED VIBRATIONS II (V. 3)	Room 1006

The 7th ISOPE HIGH-PERFORMANCE MATERIALS SYMPOSIUM — HPM

6. HPM I: Instrumented Indentation (V. 4)	Room 1004
35. HPM III: Adv Materials & Structures 1 (V. 4)	Room 1004
45. HPM IV: Adv Materials & Structures 2 (V. 4)	Room 1004
62. HPM V: Tubular Structures (V. 4)	Room 1004
70. HPM VI: NDE (V. 4)	Room 1004
80. HPM VII: Shipbuilding Steel (V. 4)	Room 1004
97. HPM VIII: Fatigue & Fracture 1 (V. 4)	Room 1004
107. HPM IX: Fatigue & Fracture 2 (V. 4)	Room 1004
116. HPM X: Advance in Welding Tech (V. 4)	Room 1004

The 3rd ISOPE STRAIN-BASED DESIGN SYMPOSIUM

5. SBD I: Material Modeling & Specifications (V. 4)	Room 1002
15. SBD II: Material Developments (V. 4)	Room 1002
24. SBD III: Tensile Capacity & Fracture 1 (V. 4)	Room 1002
34. SBD IV: Tensile Capacity & Fracture 2 (V. 4)	Room 1002
44. SBD V: Compressive Capacity (V. 4)	Room 1002
54. SBD VI: Recent Developments (V. 4)	Room 1002
61. SBD VII: Panel Discussions (V. 4)	Room 1002

COMPOSITES & SMART STRUCTURES

25. HPM II: Composite Materials (V. 4)	Room 1004
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RELIABILITY & ADVANCED SHIP TECHNOLOGY

9. RISK, SAFETY & RELIAB I: Offshore (V. 4)	Room 1005
18. RISK, SAFETY & RELIAB II: Operation 1 (V. 4)	Room 1005
28. RISK, SAFETY & RELIAB III: Operation 2 (V. 4)	Room 1005
38. RISK, SAFETY & RELIAB IV: Human ... (V. 4)	Room 1005
48. EARTHQUAKE & ENGINEERING (V. 4)	Room 1005
56. IMPACT & COLLISION (V. 4)	Room 1005
82. MECHANICS ... I: Comput Meth (V. 4)	Room 1005
91. MECHANICS... II: Ultimate Strength (V. 4)	Room 1005
100. ADV SHIP I: System and Design (V. 4)	Room 1005
110. ADV SHIP II: Production & Maintenance (V. 4)	Room 1005
119. ADVANCED SHIP III: Motion & Perform...(V. 4)	Room 1005

Conference Reception

17:00 Sunday June 21 Rihga Royal Hotel, Sanraku Room, 2F

Mr. Toru Hashimoto, Governor of Osaka Prefecture, Japan

Conference Opening Address

09:00 Monday June 22 Event Hall, 3F

19:00 Event Hall ABC, 3F

Annual Conference Banquet

Cultural Event, Best Paper, Scholarships and Awards

Monday Plenary Presentation I (V. 3)
Monday June 22 14:00 Room 1009
LNG Tank Sloshing Assessment Methodology - The New Generation
Kuo, J F et al. ExxonMobil Upstream Research; ExxonMobil
Development; ExxonMobil Production, USA

Tuesday Plenary Presentation II (V. 2)
Tuesday June 23 08:00 Room 1007
**Progress in Modeling of Multiphase Flows and Thermodynamics in Oil
and Gas Pipelines**
Hellan, Ø et al., SINTEF, Norway; ConocoPhillips; Total

Student Forum (All Student Participants Are Invited)
Tuesday July 8 12:10 Port Abernethy
E-mail by **June 1** your intention of attending this meeting to
isope-2@isope.org.

Jin S Chung Award Lecture 2009 (JJOPE)
Tuesday June 23 13:00 Room 1007
Green Growth: The Right Approach to Multiple Energy Sources
Koo, Jay, President, SK Energy, Korea

Wednesday Plenary Presentation III (V. 3)
Wednesday June 24 13:00 Room 1008
**Lagrangian Particle Method - Advanced Technology for Numerical
Wave Flume**
Gotoh, H, Kyoto Univ, Japan

Wednesday Plenary Presentation IV (V. 2)
Wednesday June 24 08:00 Room 1001
**Rate Dependent Nature of Liquefied Sand Undergoing Large Flow-
Deformation and its Interaction with Group Pile Foundation**
Towhata, I, Univ of Tokyo; Motamed, R, Tokyo Inst of Tech; Thi Lan Anh,
T, Univ of Tokyo, Japan; Sesov, V, Univ of St. Cyril and Methodius,
Macedonia

Plenary Presentation V (V. 2)
Wednesday June 24 14:00 1007
**The Hughes Glomar Explorer and a 5,100-m-long Heavy-Lift Pipe:
Coupled Ship and Pipe Motions Measured in the North Pacific Ocean**
Chung, J S, ISOPE, USA

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