

*The 25th ISOPE Conference Anniversary*

June 21–27, Kona, Hawaii Big Island, USA

at Hilton Waikoloa Village: [www.isopec.org](http://www.isopec.org)

The Twenty-fifth (2015) International  
**Ocean and Polar  
Engineering Conference**

*Including additional ISOPE symposia:*

1st **Materials Reliability & Refinery**

3rd **High Manganese Steel**

4th **Tsunami & Safety**

4th **Asset Integrity**

6th **Arctic Science & Technology**

5th **Arctic Materials**

6th **Renewable Energy & Environment**

7th **Sloshing Dynamics & Design**

7th **Frontier Energy Tech**

9th **Strain-Based Design**

11th **Ocean Mining & Gas Hydrates**

13th **High-Performance Materials**

**ISOPE-2015**

Kona, Big Island, Hawaii, June 21–26

## Technical Program

(Updated April 20, 2015)

Refereed papers from 53 countries in 188 technical sessions  
9 plenary and keynote presentations

**Full Program** with Paper List, General Information, Reservations,  
Publications and Updates on

<http://www.isopec.org/publications/publications.htm>

ISOPE-2015 Conference proceedings

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Forms for Advance Registration and Venue Hotel:

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*Organized by:*

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with cooperating organizations (listed inside)



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## TECHNICAL PROGRAM

### The Twenty-fifth (2015) International Ocean and Polar Engineering Conference Hilton Waikoloa, Hawaii, June 21–26, 2015

The number at the end of the session title indicates the tentative number of the proceedings volume. Only the changes in titles or authors the ISOPE-2015 Technical Program Committee (TPC) received in writing before April 20, 2015 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 978-1-880653-89-0; ISSN 1098-6189) will be available as a set of 4 volumes (6,100 pp. est.) from ISOPE during and after the Conference.

The 11th Ocean Mining and Gas Hydrates (OMS-2015 or OMSGH-2015) Symposium Proceedings is part of ISOPE-2015 Conference proceedings.

All ISOPE publications are indexed by Engineering Index (EI), SCOPUS and others.

FULL CONFERENCE PROGRAM WITH SESSION / PAPER  
LIST: Updated at

<http://www.isopec.org/conferences/conferences.htm>  
<http://www.isopec.org/publications/publications.htm>

**SUNDAY, June 21**

**Welcome Reception**

**17:00**

**Kona Pool**

**MONDAY 08:30**

**1. OPENING GENERAL SESSION:**

**OCEAN AND ARCTIC REVIEW (V. 1)**

**Monday July 16 08:30 Monarchy Ballroom**

**Chair:** H W Jin, ExxonMobil Research & Engineering, USA  
**Co-Chair:** F. Vorpahl, Fraunhofer-IWES, Germany

**Introduction**

Jin S Chung, ISOPE-2015 Conference Co-chair, USA

**Conference Opening Address**

Nol Gresnigt, ISOPE President, Technical University of Delft, Netherlands

**Plenary Speakers**  
**Materials and Corrosion Technology Challenges in Upstream Projects**  
Eric Wright, ExxonMobil Development, USA

**Safe Conduct of Arctic Offshore Pioneering Operations**  
Arno Keinonen, AKAC Inc, Canada

**WEDNESDAY 19:00**

**Annual ISOPE Conference Banquet**  
at Grand Ballroom

**THURSDAY 13:15**

**KEYNOTE III**

**Thursday June 25 13:15 Queens 1**

**Introduction::** Jin S Chung, ISOPE, USA

**Recent Status of Methane Hydrate R&D Program and Research Activities of Methane Hydrate Research Center, AIST, Japan [Oral presentation]**  
Norio Tenma, National Inst of AIST, Japan

**THURSDAY 14:00**

**139. OMGH I:  
Gas Hydrates 1 (OMS-2015)**  
**Thursday June 25 14:00 Queens 1**

**Chair:** T. Komai, Tohoku Univ, Japan

**Numerical Simulation of Gas Hydrate Bearing Sediments for Enhanced Recovery Using Partial Oxidation Method**  
Takeshi Komai, Tohoku Univ; Yasuhide Sakamoto, AIST; Atsushi Kihita, Tohoku Univ; Norio Tenma, AIST, Japan

**Using of Adiabatic Conversion of Dispersed Thermodynamic System in the Development of the Marine Gas Hydrate Deposits**  
Alexander N Gulkov, Victor D Lapshin, Vacheslav V Slesarenko, Alexey A Morozov, Sergey F Solomennik, Far Eastern Federal Univ, Russia

**P-wave Velocity Monitoring during the Dissociation of Methane Hydrate Bearing Sand by Using Giant Pressure Cell**

Tatsuya Yokoyama, Eiki Nakayama, Hideki Saito, OYO Corp, Japan

**Depressurization and Electrical Heating of Hydrate Sediment for Gas Production**

Hideki Minagawa, Sho Kimura, Hiroaki Kaneko, National Inst of AIST; Takuma Ito, Research Inst of Innovative Tech for Earth; Shohei Noda, Hideo Narita, National Inst of AIST, Japan

**Geological Constraint on Gas Hydrate Accumulation in Qilian Mountain Permafrost – A Case in DK-9 Hole**

Zhengquan Lu, Gangyi Zhai, China Geological Survey; Yongqing Zhang, Inst of Exploration Techniques, CAS; Shiqi Tang, China Geological Survey; Panpan Tan, Inst of Mineral Resources, CAS; Ting Wang, Hui Liu, Youhai Zhu, China Geological Survey, China

**Effect of Fines on Shear Strength of Methane Hydrate Bearing Sand**

Masayuki Hyodo, Akira Nishimura, Shintaro Kajiyama, Yamaguchi Univ, Japan

**Experimental Study of Mud Erosion Phenomena at Sand Mud Alternate Layer**

Hiroyuki Oyama, Shungo Abe, Toru Sato, Univ of Tokyo, Japan

**Phase Equilibrium of Methane Hydrate in the Presence of TBAB and Salt**

Jitendra S Sangwai, Gaurav Pandey, Deepjyoti Mech, IIT Madras, India

**149. OMGH II:  
Gas Hydrates 2 (OMS-2015)**

Thursday June 25 16:20 Queens 1

Chair: Zhengquan Lu, Gangyi Zhai, China Geological Survey, China  
China

**Experimental Investigation on Tuning Patterns of Methane Inclusion in Isoxazole Clathrate Hydrates**

Jae W Lee, KAIST; Minjun Cha, Kangwon National Univ; Seungjun Baek, Wonhee Lee, KAIST; Kyushul Shin, Kyungpook National Univ, Korea

**Displacement of Solution and Hydrates Formation in Cooled Glass Beads**

Mingjun Yang, Yongchen Song, Oanoan Jiang, Dalian Univ of Tech, China

**Analysis of Gas Hydrate Formation in Subsea External Sleeve Choke**

Biao Hu, Hongwu Zhu, Xianwen Duan, Fangling Xu, Youjiang Zhang, China Univ of Petroleum-Beijing, China

**Pore-Scale Simulation of Methane Hydrate Formation and Permeability in Sand Layers**

Kentaro Kamada, Toru Sato, Hiroyuki Oyama, Takero Yoshida, Univ of Tokyo, Japan

**Numerical Studies on Geomechanical Response of UBGH-2 Hydrate Bearing Sediments during Gas Production in the Ulleung Basin, Korea**

Yung-Mok Kim, Sejong Univ, Korea; Jonny Rutqvist, Lawrence Berkeley National Lab, USA

**The Reverse Circulation (RC) Drilling Techniques for the Mineral Resources Exploration and Production in Ocean**

Yongqin Zhang, Chinese Geological Survey, China

**Numerical Simulation on the Deformation of Stratum Due to Gas Hydrate Dissociation**

L Lu, X B Lu, X H Zhang, S Y Wang, Inst of Mechanics, CAS, China

**Mesoscale Modeling of Methane Hydrate Dissociation in Homogeneous Porous Media**

Wu-Yang Sean, Chung-Yuan Christian Univ; Pei-I Yu, Ray-Quan Hsu, Chiao-Tung Univ, Taiwan, China

**Shear Behaviour and Localized Deformation of Methane Hydrate-bearing Sand by High Pressure Plane Strain Shear Tests**

Shintaro Kajiyama, Masayuki Hyodo, Yamaguchi Univ, Japan

**159. OMGH III:  
Gas Hydrates 3 (OMS-2015)**

Friday

June 26

08:00

Queens 1

Chair: Zhengquan Lu, China Geological Survey, China

**Experiments for Warming Sediments under the Seabed by Exothermic Heat of CO<sub>2</sub> Hydrate through Injecting CO<sub>2</sub>/Water Emulsion for Enhanced Methane Hydrate Recovery**

Yojiro Ikegawa, Hiroshi Suenaga, Shiro Tanaka, Kenji Kubota, Nohara, Shintaro Nohara, Central Research Inst of Electric Power Industry, Japan

**Numerical Simulation of Mud Erosion by Water Flow in Porous Media Using Lattice Boltzmann Method**

Takero Yoshida, Tosu Sato, Hiroyuki Oyama, Univ of Tokyo, Japan

**Friction Strength between Well and Sediment under Confining Pressure for Methane Hydrate Production Well Integrity**

Masayo Kakumoto, Jun Yoneda, Norio Tenma, Kuyuki Miyazaki, Kazuo Aoki, National Inst of AIST; Ryuichi Itoi, Kyushu Univ, Japan

**Electric-Submersible-Pump Performance under Methane/Water/Methane-Hydrate Pipe Flows**

Tsutomu Shimizu, Yoshitaka Yamamoto, Norio Tenma, Hideo Narita, AIST, Japan

**Experimental Study on Gas Hydrate Inhibitors for Hydrate Control during Deep-Sea Drilling**

Xin Zhao, Zhengsong Qiu, Guowei Zhou, Weian Huang, Ganghua Chen, China Univ of Petroleum, China

**FRIDAY 10:30**

**KEYNOTE IV**

**Friday          June 26          10:30          Queens 1**

**Deep Ocean Mining Systems and Technology, Past and Present [Oral presentation]**

Jin S Chung, ISOPE, USA

**KEYNOTE V**

**Friday          June 26          10:50          Queens 1**

**Introduction::** Jin S Chung, ISOPE, USA

**The Summary of Environmental Baseline Survey for Mining the Cobalt-Rich Ferromanganese Crust on Deep Seamount in Japan Fs License Area**

Teruyoshi Narita, Junya Oshika, Nobuyuki Okamoto, Japan Oil, Gas and Metals National Corporation (JOGMEC), Japan

**169. OMGH IV: Deep Ocean Mining 1: (OMS-2015)  
Recent Programs, Technology Assessment, Exploration,  
Environment**

**Friday          June 26          10:30          Queens 1**

**Chair:** Jin S Chung, ISOPE, USA

**The Solwara 1 Deepwater Mining Project [Invited Oral presentation]**

Roland Berndt, Nautilus Minerals, Australia

**PNG Preparing to Embrace Deep Sea Mining [Invited Oral presentation]**

Mohan Singh, Mineral Resources Authority, Papua New Guinea

**EU Blue Mining Project - An Overview [Oral presentation]**

Frank Lim, 2H Offshore, UK

## Ocean Mining Lunch

Hosted by ISOPE  
Following session 169.

All OMS-2015 participants are invited:

**Reservation is required by June 14:** Janice at  
[isope-2@isope.org](mailto:isope-2@isope.org)

[ ] Attend

[ ] Not attend

### 178. OMGH V: Deep Ocean Mining 2 (OMS-2015)

Friday June 26 14:00-16:00 Queens 1

**Chair:** Benjamin C McLellan, Kyoto Univ, Japan

#### **Environmental Management in Seafloor Mining [Oral presentation]**

Renee Grogan, Nautilus Minerals, Australia

#### **Reconsideration of Polymetallic Nodule Processing Methods -- Further Improvement of Existing Methods**

Kenji Haiki, Masatsugu Okazaki, Tadayuki Ishiyama, Deep Ocean Resource Development, Japan

#### **Effect of Size Distribution of Deep-Sea Polymetallic Nodule on Estimation of the Abundance from Seafloor Photograph Based on the Classic Formulae**

Akira Tsune, Deep Ocean Resources Development, Japan

#### **Research on Variably Accelerated Sedimentation of Coarse Mineral Particles in Still Water**

Dasheng Tang, Yuxiang Chen, Dehuai Xu, Hong Xiao, Changsha Research Inst of Mining & Metallurgy, China

#### **Change of Biogenic Ba Content in Pacific Ferromanganese Crusts since Cenozoic –A Signal of Paleoproductivity Pulses?**

Guoqing You, Jiahua Pan, Wenhong Sun, Shuqin Liu, Chinese Academy of Geological Sciences, China

#### **Comparison of the Lifecycle Impacts of Seafloor Mining with Onshore Equivalents**

Benjamin C McLellan, Ran Motoori, Tetsuo Tezuka, Kyoto Univ, Japan

#### **Investigation into Rheological Behavior of Bentonite Paste to Study Mechanical Behavior of Deep Sea Soil**

Shankar Krishnapillai, Sangam L Kute, Krishna Kannan, IIT Madras, India

**Investigation of Rheological Behavior of Bentonite Paste to Study Mechanical Behavior of Deep Sea Soil**

Sangam L Kute, Shangkar Krishnapillai, Krishna Kanna, IIT Madras, India

**186. OMGH VI: Deep Ocean Mining 3 (OMS-2015)**

Friday June 26 10:00 AM 2015 Queens 1

**Chair:** Masatsugu Okazaki, Deep Ocean Resource Development, Japan

**Co-Chair:** Jianxin Xia, Minzu Univ of China, China

**Economic Feasibility Impacts of Waste and Waste Water Treatment Regulations for Deep Ocean Hydrothermal Ore Mining in Japan**

Ran Motoori, Benjamin C McLellan, Tetsuo Tezuka, Kyoto Univ, Japan

**Study on Mining Posture of Deep-sea Mining Arm**

Jinzhong Zhou, Guizhou Inst of Tech; Zhi Yang, Xiangtan Electric Manufacturing Group; Pinghong Tang, Changsha Research Inst of Mining & Metallurgy, China

**Spatial Configurations and Particle Transportation Parameters of Flexible Hose in Deep-sea Mining System**

Yun Peng, Jianxin Xia, Huatang Ren, Minzu Univ of China, China

**Water-hammer Pressure in the Hydraulic Lifting Pipeline of Deep-sea Mining System**

Yi Zou, Cao Bin, Jianxin Xia, Minzu Univ of China, China

**Hyperbaric Excavation: From Fundamental Research to Applied Development [Oral presentation]**

Wiebe Boomsma, IHC Mining, Netherland

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