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ISOPE-2011 Maui Conference

This 21st annual conference features **149 technical and opening general sessions**, and **6 keynote presentations** with top experts from industry, academia and government. After **peer review of the manuscripts** selected from **1,350 abstracts**, some **750 papers** will be presented and discussed by researchers, engineers and managers from more than **51 countries**.

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All indexed by Engineering Index (EI).

* Continue to next session.

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ISOPE HIGH-PERFORMANCE MATERIALS SYMPOSIUM — HPM

6. HPM I: Shipbuilding Steels (V. 4)
Monday June 20 10:30 Room 5

Chair: KB Kang, POSCO, Korea

Establishment of Required Brittle Crack Arrest Toughness Kca Value with Actual Scale Model Tests
T Inoue, Nippon Steel; T Matsumoto, Nippon Kaiji Kyokai; H Yajima, Nagasaki Inst of Applied Sci; S Aihara, Univ of Tokyo, H Yoshinari, National Maritime Research Inst; K Hirota, Mitsubishi Heavy Industry; M Toyoda, IHI Marine United; T Kiyosue, Kawasaki Shipbuilding; T Handa, JFE Steel, Japan

Development of Brittle Crack Arrest Steel Plates for Large Heat-input Welding for Very Large Containerships
M Kaneko, T Tani, Kobe Steel, Japan

Application of New Structure and High Deformability Steel to Bulbous Bow for Reducing the Damage to the Other Ship during Collisions
K Kamita, Imabari Shipbuilding; Y Funatsu, J Otani, H Shirahata, Nippon Steel; Y Yamada, National Maritime Research Inst, Japan

A Study on the Countermeasures against Unstable Fracture at the Hatch Coaming FCA Butt Weldment Having Embedded Cracks in an Ultra-large Containership
SB Shin, DJ Lee, WS Kim, Hyundai Heavy Industries; JS Lee, Univ of Ulsan, Korea

Improvement of Fracture Toughness, Kc, of Welded Joint: Development of Higher Toughness YP47(460N/mm²) Class Steel Plate for Ultra-large Container Ships-2
H Shirahata, J Otani, Y Funatsu, T Inoue, Nippon Steel, Japan

Improvement of Arrestability for Brittle Crack for Welded Jointed Development of Higher Toughness YP47(460N/mm²) Class Steel Plate for Ultra-large Container Ships-3
J Otani, Y Funatsu, T Inoue, H Shirahata, Nippon Steel, Japan

Proposal for Brittle Crack Arrest Methods Using Various Weld Arrestors: Development of Higher Toughness YP47(460N/mm²) Class Steel Plate for Ultra Large Container Ships-4
T Inoue, Y Funatsu, J Otani, H Shirahata, T Ishikawa, Y Hashiba, Nippon Steel, Japan

Increase of Brittle Crack Arrestability Using Arrest Welding of Thick Steel Plate in Large Container Ship

GB An, KM Ryu, JS Park, POSCO; TD Park, Hyundai Heavy Industries; YT Shin, Samsung Heavy Industries; SK Kang, Shipbuilding & Ocean Research Inst; JS Lee, Hanjin Heavy Industries; BJ Chang, Korean Register of Shipping; Y Shim, ABS, USA; JS Lee, POSCO, Korea

Dynamic Measurement Analysis of Brittle Crack Propagation Behavior in Large-scale Structural Component Model Test for Large Container Ships

T Handa, JFE Steel; T Matsumoto, Nippon Kaiji Kyokai; H Yajima, Nagasaki Inst of Applied Science; H Aihara, Univ of Tokyo; H Yoshinari, National Maritime Research Inst; K Hirota, Mitsubishi Heavy Industries; M Toyoda, IHI Marine United; T Kiyosue, Kawasaki Heavy Industries; T Inoue, Nippon Steel; T Kawabata, Sumitomo Metal Industries, T Tani, Kobe Steel, Japan

16. HPM II: Non-Destructive Testing (V. 4)
Monday June 20 14:00 Room 5

Chair: DI Kwon, Seoul National Univ, Korea

The Study of Engineering Critical Assessment Applications in Welding Flaw Acceptance Criteria for Offshore Pipeline Installation

WB Ding, W Liu, SY Zhang, Offshore Oil Engineering, China

Residual Stresses in Welded Steels with Longitudinal Stiffeners

T Nitschke-Pagel, K Dilger, Univ of Braunschweig, Germany

Laser Based Inspection Systems

J Jennings, C Reichert LaMorte, A Channell, EWI, USA

In-Service Safety Assessment of Industrial Facilities Using Instrumented Indentation

WS Song, YC Kim, WJ Jo, DI Kwon, Seoul National Univ, Korea

25. HPM III: Advanced Materials & Offshore Structures 1 (V. 4)
Monday June 20 16:20 Room 5

Chair: S Herion, Karlsruhe Inst of Technology, Germany

Corrosion Protection - Robust Retrofit of a Gravity Based Production Structure in Frozen Arctic High Scour Conditions

MB Surkein, JP LaFontaine, ExxonMobil Development, USA

Strength of T-joint with Volumetric Surface Defect under Cyclic Inner Pressure

P Yukhymets, EO Paton Electric Welding Inst, Ukraine

Ferrite to Austenite Transformation Behavior of a Martensite and Bainite Microstructure with Various Heating Rate

T Hara, G Shigesato, N Sugiyama, Nippon Steel, Japan

Microstructure Evaluation of Arctic Steel during In-situ Deformation at Sub Zero Temperatures in High Resolution Scanning Electron Microscope

SP Astad, Statoil; JH Pedersen, NTNU; M Karlsen, Statoil; J Hjelen, JK Solberg, NTNU; OM Akselsen, E Østby, SINTEF, Norway

Microstructure Examination of Arctic Steel during In-situ Heat Treatment in High Resolution Scanning Electron Microscope

SP Astad, Statoil; AJ Ensjø, NTNU; M Karlsen, Statoil; J Hjelen, JK Solberg, NTNU; OM Akselsen, E Østby, SINTEF, Norway

Material Design Concept in Heavy Wall X100 High Strain Pipelines for Seismic Region

J Shimamura, M Okatsu, N Ishikawa, K Nishimura, Y Murakami, JFE Steel, Japan

High Strength Linepipes with Excellent Toughness for Corrosive Environments

A Mannucci, P Novelli, Tenaris, Italy

35. HPM IV: Advanced Materials & Offshore Structures 2 (V. 4)
Tuesday June 21 08:00 Room 5

Chair: P Jukes, MCS Kenny; USA

The Research on Hysteretic Behavior of Rectangular Section Components of Cold-formed Thin-wall Steel

YN Zhong, N Yang, Beijing Jiaotong Univ; QT Meng, Beijing Bidding for Construction Projects Management Office, China

Dynamic Response Control of a Jacket Platform Using MR Dampers Based on an Inverse Dynamic Model

XC Yu, HS, Kang, LQ Huang, Texas A&M Univ, USA; YH Xie, Zhejiang Ocean Univ, China; Q Zhai, Univ of Wisconsin Milwaukee, USA; GJ Chen, Shanghai Jiao Tong Univ, China

Study on the Accuracy of Influence Factor Method when Applied to Surface Cracks in a Welded Joint of a Ship Structure

N Osawa, J Sawamura, Osaka Univ; S Okada, Nippon Kaiji Kyokai; K Shigeta, T Tsuji, Osaka Univ, Japan

Finite Element Analyses on Fracture Toughness Demands in Butt Weld of Steel Box Column with Thick Plate

YQ Wang, H Zhou, YJ Shi, H Chen, Tsinghua Univ, China

Experimental Study on the Dynamic Behavior of Concrete under Tension-Compression Dynamic Stress States

YP Song, Dalian Univ of Tech; HL Wang, Dalian Univ, China

Polychloroprene Behaviour in Sea Water: Comparison between Accelerated and Natural Ageing

PY Le Gac, IFREMER; V Le Saux, Y Marco, Laboratoire Brestois de Mécanique et des Systèmes, France

Characterizing Oxygen Permeation of Polymer Materials Used for Infrastructure Repair

R Sen, C Khoe, VR Bhethanabotla, Univ of South Florida, USA

Comparison of Shell and Solid Elements for Hot Spot Stress Analysis of Complex Welded Joints

G Liu, Y Huang, Dalian Univ of Tech, China

Study on the Preciseness of Hot Spot Stress of Welded Joints Derived from Shell Finite Element Analyses

N Osawa, Osaka Univ; N Yamamoto, Nippon Kaiji Kyokai; J Sawamura, S Maeda, H Nakajima, Osaka Univ, Japan

Structural Optimization of Bridge Wing for Anti-Vibration Design using Genetic Algorithm

J Noguchi, T Kiyosue, T Shimoda, H Nishikawa, N Izumi, Kawasaki Heavy Industries, Japan

Continue at 10:30

53. HPM V: Fatigue & Fracture I (V. 4)

Tuesday June 21 14:00 Room 5

Chair: HW Jin, ExxonMobil Research & Engineering, USA

Numerical Simulation of Cleavage Crack Path in a Welded Joint

S Aihara, N Hiroaki, Univ of Tokyo, Japan

Drop Weight Tear Testing of Seamless Linepipe

A Hasenhütl, M Erdelen-Peppler, Salzgitter Mannesmann Forschung; T Schmidt, V&M Deutschland, Germany

Effect of Separation on Ductile Crack Propagation Behavior during Drop Weight Tear Test

T Fujishiro, T Hara, Nippon Steel, Japan

CO₂ Anthropogenic Pipeline Transportation

A Lucci, G Demofonti, Centro Sviluppo Materiali; CM Spinelli, Eni Gas & Power, Italy

CCTS (Carbon Capture Transportation & Storage) Transportation Issues

A Lucci, G Demofonti, Centro Sviluppo Materiali; CM Spinelli, Eni Gas & Power, Italy

63. HPM VI: Fatigue & Fracture II (V. 4)

Tuesday June 21 16:20 Room 5

Chair: DP Fairchild, ExxonMobil Upstream Research Co, USA

Application of BS7910 Fatigue Assessment Standard in Offshore Engineering

CR Li, ZT Fang, CNPC, China

Research Progress of Methods to Improve Fatigue Strength of Welded Structures

ZT Fang, DY Tang, YH Hu, CR Li, CNPC, China

Influence of Environmental and Mechanical Parameters on Fatigue Behavior of Metals: Implications on Fatigue life Assessments

TM Ahmed, Wood Group Integrity Management, USA

Effects of Post Weld Treatment and Loading Condition on the Fatigue Life of Ultra High Strength Steels

T Ummenhofer, S Herion, R Puthli, P Weidner, Karlsruhe Inst of Tech, Germany

Fatigue Crack Growth Behaviour of Steel Connections under Combined Actions Using Boundary Element Method

HB Liu, XL Zhao, Monash Univ, Australia

Low Cycle Fatigue Behaviour of High-strength Steel Butt Welds

S Herion, J Hrabowski, T Ummenhofer, Karlsruhe Inst of Tech, Germany

Dependency of Static and Fatigue Resistance of Steel Members on Wall Thickness and Temperature

J Hrabowski, S Herion, Center for Competence for Tubes and Hollow Sections, Germany

73. HPM VII: Corrosion (V. 4)
Wednesday June 22 08:00 Room 5

Chair: KY Kim, POSTECH, Korea

Design of a Cathodic Protection System for a Refurbished Jetty

MB Surkein, JP LaFontaine, RE Tanner, ExxonMobil Development, USA

Effect of Microstructure on Electrochemical Property and Hydrogen Diffusion Behavior of Pressure Vessel Steel

KY Kim, SJ Kim, POSTECH; HG Jung, POSCO, Korea

Steel Constructions Corrosion Wear Processes Modelling of Sea Hydraulic Engineering Structures

AT Bekker, RG Kovalenko, VS Lyubimov, LV Kim, Far-Eastern National Tech Univ, Russia

Phase-field Model for the Corrosion and Cracking of Metals in Aqueous Environments

E Fried, McGill Univ, Canada; MN da Silva, FP Duda, COPPE/UFRJ, Brazil

A Discussion of Relationship between Corrosion Ratio of Reinforcement and Crack Width

ZQ Ying, H Lv, LW Su, CCCC Fourth Harbor Engineering, China

Influence of Environmental Factors on Corrosion Fatigue Properties of Seamless Linepipes

J Nakamura, K Kobayashi, T Omura, K Hitoshio, Sumitomo Metal Industries, Japan

Condensing Corrosion Modelling, Reality and Design in Deep Water Wet Gas Pipelines

C Selman, Wood Group Integrity Management, Australia

The Corrosion Behavior of X70 Steel in the Supercritical CO₂ mixed with SO₂ and Saturated Water

Y Xiang, Z Wang, XX Yang, WD Ni, Z Li, Tsinghua Univ, China

Effect of Sour Service Environment on Sulfide Stress Cracking Resistance of X65 Reeled Linepipe and Girth Welds

WH Van Geertruyden, L De Pari, CC Monahan, ExxonMobil Development, USA

Corrosion-Sensing Coatings for Steel and Aluminum Alloys

HG Wheat, G Liu, A Alonzo, K Johnson, Univ of Texas at Austin, USA

82. HPM VIII: Advances in Welding Technology 1 (V. 4)
Wednesday June 22 10:30 Room 5

Chair: H Murakawa, Osaka Univ, Japan

Control of the Excessive Welding Distortion during the Manufacturing of Aluminum SPB Type LNG Tank

DJ Lee, HG Kim, SB Shin, Hyundai Heavy Industries, Korea

Prediction of Welding Distortion of Thin Deck Plate Considering Assembly Boundary Condition

TJ Kim, CD Jang, Seoul National Univ; HC Song, GH Lee, Mokpo National Univ, Korea

Prediction and Control of Laser Welding Deformation of Sandwich Panel Using Shell Element

JW Kim, CD Jang, Seoul National Univ; YT Kim, Daewoo Shipbuilding & Marine Engineering; SW Kang, Seoul National Univ, Korea

Application of Inherent Strain Analysis Using Idealized Explicit FEM for Prediction of Welding Deformation in Ship Block Building

S Itoh, M Hata, M Shibahara, M Mochizuki, Osaka Univ, Japan

Prediction of Heat-induced Deformation due to Line Heating Using Inherent Strain Method

A Vega, Tech Univ of Panama, Panama; H Murakawa, R Sheriff, N Osawa, Osaka Univ; Y Tango, IHI Marine United; M Ishiyama, IEM Co, Japan

Measurement of Welding Deformation Using Digital Image Correlation Technique

M Shibahara, S Tsuboi, Osaka Prefecture Univ; S Itoh, Osaka Univ; T Fukasawa, Osaka Prefecture Univ, Japan

Investigation of Buckling Deformation of Thin Plate Welded Structures

JC Wang, S Rashed, M Shibahara, H Murakawa, Osaka Univ, Japan

Prediction of Longitudinal Bending Deformation of Ship Produced by Block Assembly

H Murakawa, H Serizawa, Osaka Univ; T Uesugi, Mitsui Engineering & Shipbuilding; S Iwasaki, Osaka Univ, Japan

Experimental Analysis and Modelling of the Thermomechanical Behaviour of Field Joint of Thermally Insulated Pipeline

D Choqueuse, INFREMER; T Phan, J-Y Cognard, ENSIETA; L Sohier, Univ de Bretagne Occidentale, France

Reduction of Welding Distortion based on Theoretical Prediction Using Inherent Deformation Method

H Murakawa, Y Okumoto, Osaka Univ; M Sano, Naikai Zosen; S Rashed, Osaka Univ, Japan

92. HPM IX: Advances in Welding Technology 2 (V. 4)

Wednesday June 22 14:00 Room 5

Chair: N Osawa, Osaka Univ, Japan

Properties of Non-load-carrying Welds of Structural Steel with Yield Strength 960 MPa

I Valkonen, J Kuoppala, Rautaruukki OYJ, Finland

Compression Behavior of Girth-welded Steel Pipes

CH Lee, KH Chang, Chung-Ang Univ, Korea

Guidelines for use of Hybrid Laser-arc Welding in Building of Ships and Offshore Structures

PW Lohne, J-O Nøkleby, Det Norske Veritas, Norway

The Study of Engineering Critical Assessment Applications in Welding Flaw Acceptance Criteria for Offshore Pipeline Installation

Computational Scheme for Large-scale Transient Problems in Welding Mechanics Using Explicit FEM

K Ikushima, Osaka Prefecture Univ; S Itoh, Osaka Univ; M Shibahara, T Fukasawa, Osaka Prefecture Univ, Japan

E-Training System of Welding Work

Y Okumoto, Osaka Univ; K Murase, Kinki Univ; K Hiyoku, IHI Marine United, Japan

Intelligent Recognition of Trajectory Deviation and Seam Tracking of Underwater Rotating Arc Welding

YH Shi, GR Wang, JH Du, CX Liu, South China Univ of Tech, China

Influence of Heat Input during GMAW on the Mechanical Properties of Seamless Line Pipe Steels up to X80

J Wiebe, W Scheller, Salzgitter Mannesmann Forschung; C Bruns, T Schmidt, V&M Deutschland, Germany

Impact of FCAW on the Mechanical Properties of Seamless Line Pipe Steels of Grades X65 and X80

J Wiebe, Salzgitter Mannesmann Forschung; C Bruns, V&M Deutschland; W Scheller, Salzgitter Mannesmann Forschung; T Schmidt, V&M Deutschland, Germany

102. HPM X: Composites (V. 4)

Wednesday June 22 16:20 Room 5

Chair: HG Wheat, Univ of Texas at Austin, USA

Co-Chair: RH Knapp, Univ of Hawaii, USA

Modeling of Composite Ocean Current Turbine Blades under Fatigue Loading

H Mahfuz, MW Akram, Florida Atlantic Univ, USA

Microstructural Examination and Compressive Properties of Replicated Aluminum Composite Foams

S Asavavisithchai, E Wichianrat, Y Boonyongmaneera, Chulalongkorn Univ, Thailand

Tension Softening Behavior Obtained by 4-point Bending Tests on Ductile-Fiber-Reinforced Cementitious Composites Using 3 Kinds of Fine Aggregate

K Watanabe, M Nakamura, H Kato, M Fujii, Tokai Univ, Japan

Material Properties of Ductile-Fiber-Reinforced Concrete Using Recycled Aggregate

M Nakamura, K Watanabe, H Kato, Tokai Univ, Japan

Fundamental Study on the Pile-tip Protection Using DFRCC

H Kato, K Watanabe, Tokai Univ; Y Asai, Toyoasano Foundation; M Fujii, M Nakamura, Tokai Univ, Japan

The Flexural Behavior of Offshore Concrete Structures Reinforced with Anti-corrosive FRP Composites

YC Wang, National Central Univ, Taiwan, China

