

ICETECH 2008

July 20-23, 2008
Banff, Canada



Program and Conference Guide

Sunday 1830-2200

Icebreaker Reception

Hors d'oeuvres, and classic entertainment.
Main dining area.

Gold Sponsor



Silver Sponsors



Monday 1900-2200

Conference Banquet

Alpine entertainment and fun contests.
Main dining area.

Gold Sponsor



Bronze Sponsors



Tuesday 1830-2230

Western BBQ

Local entertainment and traditional Native Hoop Dancing (buses depart at 1830, return at 2230)



Gold Sponsor

Wednesday 1230-2100

Columbia Icefields Tour

Buses depart 1230 (boxed lunch included).



Transport
Canada

Transports
Canada

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ICETECH 08

INTERNATIONAL CONFERENCE AND EXHIBITION on
PERFORMANCE OF SHIPS AND STRUCTURES IN ICE
JULY 20-23, 2008 * BANFF, ALBERTA, CANADA

Organized by the Arctic Section of the Society of Naval Architects and Marine Engineers (SNAME)

ICETECH 08
PO Box 63090
2604 Kensington Road NW
Calgary, Alberta, Canada, T2N 4S3
URL: www.icetech08.org

TO THE PARTICIPANTS OF THE 8TH INTERNATIONAL CONFERENCE ICETECH 2008

Dear Friends, Colleagues, and Associates,

I am pleased to welcome you to ICETECH 08, the International Conference and Exhibition on Ships and Structures in Ice, organized by the Arctic Section of the Society of Naval Architects and Marine Engineers, and held at the Banff Conference Centre in beautiful Banff, Alberta. The theme and subject areas of the conference complement and derive impetus from the current rapid growth of development and associated resurging interest in oil and gas exploration and production in Arctic offshore regions.

Over 60 technical and plenary presentations – covering a wide range of specialty topics within our larger theme of performance in ice, with emphasis on icebreaking ships, ice resistant structures, and operations in ice – will be given during the conference by authors from around the globe. Additionally, we have two special sessions, both at an international level, with one focusing on Arctic Escape, Evacuation, and Rescue (EER), and one focusing on Arctic shipping (Arctic Marine Shipping Assessment (AMSA) and the Arctic Council).

There is also an exhibition portion of the conference to network with leading offshore specialists in ice and offshore operations. Additionally, ICETECH 08 is grateful for the support of our many generous sponsors listed on the next page, who are crucial contributors to the success of this conference by providing funding to enhance events and tours. And finally, we hope you enjoy the social event program and find opportunity to join some of the tours offered by ICETECH to really experience the beauty and majesty of our Banff setting, including Lake Louise (Tuesday) and the Columbia Icefields (Wednesday).

Once again, I thank you for being part of ICETECH 08 by taking part in the technical presentations and sessions that are a central part of the conference, visiting the ICETECH exhibition, recognizing our sponsors, and enjoying the social functions, tours, and other opportunities that are a part of the conference. On behalf of all the organizers of ICETECH 08, we are honoured to have you here with us in Banff, making this exciting international exhibition and conference possible.

Frank G. Bercha
Chair,
Organizing Committee
ICETECH 08



Organizing Committee:

- **Alex Brovkin** – Website
- **Merv Edgecombe** – Program & Exhibits
- **Chris Hill** - Exhibits
- **Dave McGonigal** – Technical Program
- **Karen Muggeridge** - Communications
- **Roger Pilkington** – Papers
- **Colin Revill** – Treasurer
- **Ben Seligman** – Sponsors

Sponsors

Thank you to all of our sponsors; your support has contributed to the success of ICETECH 08.

Sponsoring Organization:

- Society of Naval Architects and Marine Engineers, Artic Section, Canada

Gold Sponsors

- BP Canada
- ConocoPhillips Canada
- Lloyd's Register
- Transport Canada

Silver Sponsors

- Sandwell Engineering
- Shell Exploration and Production Company
- Stena Drilling
- United States Arctic Research Commission

Bronze Sponsors

- AKAC Inc.
- Bercha Group
- Canatec Associates International Ltd.
- Det Norske Veritas

Exhibitors

The ICETECH Exhibition will be open throughout the conference. Be sure to visit our exhibitors.

- Arno Keinonen Arctic Consultants Inc. (AKAC Inc.)
- Aker Yards Marine
- Amphibex - NormRock Industries Inc.
- ASL Environmental Sciences
- ARKTOS Developments Ltd.
- Canatec Associates International Ltd.
- Informa PLC
- Lloyd's Register
- Oceanic Consulting Corporation
- Transport Canada

Registration and General Notes

Notes to All Registrants:

- Full delegate registration includes Sunday Night Icebreaker Reception and other meals. Please note that the accompanying person package does not include coffee breaks or lunches. Lunches at the Banff Centre may be purchased through the Banff Centre. Please note that tickets for accompanying children must be purchased in advance for the evening events. Additional event tickets can be purchased at the Registration Desk.
- The main evening events included in full and accompanying registrations are as follows:
 - Icebreaker Reception and buffet sponsored by BP-Sunday evening-6:30 pm at Banff Centre Max Bell foyer
 - Banquet sponsored by Lloyd's Register-Monday evening-7 pm at Banff Centre Donald Cameron Hall
 - Icetek BBQ Banquet-sponsored by ConocoPhillips-Tuesday evening at 7:15 pm-at Brewster outdoor centre-bus transport will be included and first bus will leave professional Centre at 6:45 pm
- If you plan to participate in the Icetek tours, go to the Desk and sign up. Although these tours are free for Icetek registrants (except for incidentals such as museum or chairlift tickets and off site food). The following tours require advance sign up:
 - Monday - Walking tours in town of Banff covering Banff museum, Indian museum, art gallery, local shops—small groups of accompanying persons organized ad hoc Monday morning at the tour desk. An introduction to Banff and surrounds.
 - Tuesday - Bus to Lake Louise, Moraine Lake, and other spots. Sponsored by Bercha Group. 9am to 3 or 4pm. Opportunity to walk in these scenic locations. Please sign up for this at registration. Accompanying persons have priority. Bus seats are limited (to 50).
 - Wednesday - Tour to Columbia Icefields sponsored by Transport Canada (noon until 8pm) including box lunch. Travel approx 2.5 hours each way but very scenic, and 3 hours at Icefields (with option to purchase (\$38.00) on-ice tour in tracked vehicle). Although one can walk to the glacier itself. You must sign up at registration for both bus and for on-ice reservations. This is for both delegates and accompanying persons. Space is limited (bus has a 52 person capacity).
- If you plan to go on major independent tours and have not pre-booked these on line, there will be a Brewster tour comp any desk near the registration area on Sunday July 20th in the evening and Monday July 21st in the morning. The discount tour rate is effective for Icetek delegates to July 23.
- The dress for Icetek for all sessions and events is informal and we encourage a western theme.
- If you have any questions or concerns please contact one of our Icetek Team members (identified with a blue badge) or Banff Centre staff.

Notes on Presentations

- **All presenters** (Plenary and Technical) should contact their session chairs prior to the session in an ad hoc manner.
- **All presenters** should go to their presentation room 15 minutes before their session starts to download their presentations to the session laptop.
- **Session chairs** have the responsibility to attend **Chair Briefing** by Dave McGonigal, Roger Pilkington, or Merv Edgecombe at the breakfast on the day of their session. The briefing starts ½ hour prior to start of the conference and takes approx 10 minutes.
- There will be three prizes for the **best presentations** based on chair and Team evaluations considering content and relevance, communication ability, experience, and timeliness. These will be awarded at the closing ceremony.
- **No continuous photo or videography** is allowed during presentations or discussion.
- If you have any questions or concerns, please contact one of our Icetek Team members (identified with a blue badge).

Conference Program: Sunday, July 20 (evening)

Conference Registration – Sunday, July 20, 1700-2000

The ICETECH Conference Registration Desk will be open from 5:00 to 8:00pm on Sunday, July 20th, at the Max Bell Central Foyer (near the Icebreaker Reception). The Desk will be open each morning of the conference as needed.

ICEBREAKER RECEPTION – Sunday, July 20, 1830-2200 – Sponsored by BP

All registered delegates and accompanying persons are welcome at the BP Icebreaker Reception on Sunday, July 20 from 6:30 to 10:00pm. Tasty *hors d'oeuvres* and classical entertainment are featured. Location: Main dining area.



Conference Program: Monday, July 21 (morning)

Room A

Room B

M-OC-1 OPENING CEREMONIES AND WELCOME 815-900

ICETECH 2008 Conference Chair: Frank Bercha
 SNAME Arctic Section Chair: Dave McGonigal
 Mayor of Banff - John Stutz
 National Energy Board - Bharat Dixit

M-PL-1 PLENARY SESSIONS 900-1000

Chair: Colin Revill

- #151 *Arctic Operations and Responsibilities of the Canadian Coast Guard*, David Jackson 900-930
- #165 *Design of Offshore Structures in Ice Environments*, John Fitzpatrick 930-1000

Walking Tour of Banff for Accompanying Persons
 Meet at ICETECH Registration Desk at **900**.



Coffee Break 1000-1020
 Sponsored by: Canatec Associates International Ltd.



M-SH-1 Ships in Ice 1 – Performance 1020-1120

Chair: Arno Keinonen

- #106 *"Yury Topchev" and "Vladislav Strizhov" Multipurpose Ice-Breaking Vessels for Platform "Prirazlomnaya" Platform Maintenance: Field and Model Tests*, V. Belyashov, A. Grozdov, ? Sazonov, and A. Tumashik 1020-1040
- #111 *Latest Development in Ice Model Testing*, G. Wilkman, A. Forsén, and T. Mattsson 1040-1100
- #125 *Resistance and Propulsion Tests of CCGS TERRY FOX in Ice - From Model Tests to Full Scale Correlation*, J. Wang and S. Jones 1100-1120

M-ST-1 Structures in Ice 1 - Ice Loads

Chair: John Fitzpatrick

- #103 *Iceberg Design Load Methodology*, P. Stuckey, F. Ralph and I. Jordaan
- #117 *Protection Barrier for Shallow Arctic Waters*, O. Gudmestad, A. Gürtner, A. Llamazares and J. Berger

M-SH-2 Ships in Ice 2 - Propulsion 1 1120-1220

Chair: Robert Allan

- #108 *A Study on Bow Hull Form Design and Propulsion Type for Icebreaking Vessel with the Balance of Open and Ice Performance*, H. Park, Y. Lee, S. Ahn, S. Hwangbo, H. Jung and J. Lee 1120-1140
- #101 *Designing Electric Propulsion and Azipod® Systems in Icebreaking Vessels*, S. Hänninen, A. Sallinen and A. Uuskallio 1140-1200
- #145 *Performance of Podded Propulsors*, A. Akinturk and M. Lau 1200-1220

M-ICE-1 Ice 1 - Properties and Observations

Chair: Marie-France Gauthier

- #149 *Guide for Understanding and Identifying Old Ice in Summer*, M. Johnston and G. Timco
- #142 *First-year Ice Keels in Northumberland Strait*, K. Obert and T. Brown
- #150 *Extremely Thick Multi-Year Ice Still Exists - But Will It Last?*, M. Johnston

Lunch (Vistas Dining Room) 1220-1350
 Sponsored by: Sandwell Engineering



Conference Program: Monday, July 21 (afternoon)

Room A

Room B

M-PL-2 PLENARY SESSION 1350-1420

Chair: Ben Seligman

#166 *Sakhalin II Phase 2 Project*, Allan Reece 1350-1420

M-SK-1 Sakhalin Developments 1420-1500

Chair: Robin Browne

#127 *Ice Management Experience in the Sakhalin Offshore with Azimuth Icebreakers*, A. Keinonen and E. Martin 1420-1440

#130 *Ice Management Effectiveness Predictions*, E. Martin, A. Keinonen and H. Brown 1440-1500

Coffee Break

Sponsored by: Canatec Associates International Ltd.

1500-1520



M-SH-3 Ships in Ice 3 - Offshore Operations 1520-1620

Chair: Keith Jones

#115 *Arctic Patrol Hovercraft: An Initial Feasibility Study*, D. Dickins, M. Cox and J. Thorliefson 1520-1540

#169 *Field Program for Simulation of Station-keeping Conditions for Arctic Drilling and Production Vessels*, J. Valkonen, G. Cammaert and M. Mejlænder-Larsen 1540-1600

#102 *Green Propulsion Plants for Arctic Shipping*, J. Femenia 1600-1620

M-GOU-1 Ice Scouring/Gouging

Chair: Bob Marcellus

#174 *Probabilistic Pipeline Burial Analysis for Protection against Iceberg Scour*, A. King, R. Phillips and J. Barrett

#176 *Offshore Pipelines in Cold Regions – Environmental Loadings and Geotechnical Considerations*, M. Paulin, S. Kenney, A. Palmer, K. Been and J. Caines

#133 *Ice Scouring in a Large Flume: Test Set-Up and Preliminary Observations*, P. Barrette and G. Timco

M-ICE-2 Ice 2 - Detection and Mapping 1620-1720

Chair: Chris Hill

#109 *Historical Data Added to the Grand Banks Iceberg Database*, B. Hill, A. Ruffman and K. Ivany 1620-1640

#141 *Three-Dimensional Mapping of the Sea Ice Underside from AUVS and Applications to the Offshore Industry*, P. Wadhams, M. Doble and J. Wilkinson 1640-1700

#153 *Digital Camera Application for Sea Surface Mapping and Measurements*, I. Sheykin and P. Truskov 1700-1720

M-REG-1 Codes, Regulations and Standards

Chair: Victor Santos-Pedro

#113 *Methods and Approaches for the Classification of Ships Designed for Stern First Operation in Ice*, R. Hindley and R. Tustin

#135 *The Development of Requirements for the Winterisation of Ships*, R. Bridges

#138 *Examination of Shipping Regulations in the Canadian Arctic - Time for Revisions*, I. Kubat, G. Timco and A. Collins

Social Hour Bar

(Donald Cameron Dining Room)

Sponsored by: Det Norske Veritas

1800-1900



Conference Banquet

(Donald Cameron Dining Room)

Sponsored by: Lloyd's Register

1900-2200




Conference Program: Tuesday, July 22 (morning)

Room A


Room B

<p>T-AN-1 ANNOUNCEMENTS</p> <p style="padding-left: 20px;">Alex Brovkin</p>	<p>8:45-900</p> <p>900</p>
<p>T-PL-3 PLENARY SESSIONS</p> <p>Chair: Roger Pilkington</p> <p>#175 <i>Shipping, the Changing Arctic and the International System: The View from Canada</i>, Rob Huebert</p> <p>#161 <i>Arctic Marine Shipping Assessment: Status and Results of an Arctic Marine Incidents Workshop</i>, Lawson Brigham</p>	<p>900-1000</p> <p>900-930</p> <p>930-1000</p>

Lake Louise Tour Bus for Accompanying Persons departs at 900 and returns at 1500.




Sponsored by: 

Coffee Break 
 Sponsored by: AKAC Inc. **1000-1020**

<p>T-AMS1 Arctic Marine Shipping Assessment (AMSA)</p> <p>Chair: Ben Ellis</p> <p>#160 <i>The Future of Arctic Marine Navigation in Mid-Century - Scenario Narratives</i>, B. Ellis, E. Smith and L. Brigham</p> <p>#177 <i>Arctic Governance - the Good, the Bad and Changes Underway</i>, V. Santos-Pedro</p> <p>#178 <i>Arctic Shipping Infrastructure</i>, M. Williams and T. Wojahn</p>	<p>1020-1120</p> <p>1020-1040</p> <p>1040-1100</p> <p>1100-1120</p>
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<p>T-AMS2 AMSA Panel</p> <p>Co-Chairs: Lawson Brigham and Ben Ellis</p>	<p>1120-1220</p> <p>1120-1140</p> <p>1140-1200</p> <p>1200-1220</p>
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<p>T-ST-2 Structures in Ice 2 – Ice Mechanics</p> <p>Chair: Brian Wright</p> <p>#116 <i>Modelling of Ice Rubble Accumulation around Offshore Structures</i>, R. McKenna, B. Marcellus, K. Croasdale, D. McGonigal and P. Stuckey</p> <p>#120 <i>Reliability of Arctic Offshore Structures</i>, F. Bercha and O. Gudmestad</p> <p>#167 <i>Ice and Tundra Road Design for Module Transport</i>, P. Spencer, A. Strandberg and W. Maddock</p>	<p>1120-1140</p> <p>1140-1200</p> <p>1200-1220</p>
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Lunch (Vistas Dining Room) 
 Sponsored by: Shell International Exploration & Production Ltd. **1220-1350**

Conference Program: Tuesday, July 22 (afternoon)

Room A

Room B

T-PL-4 PLENARY SESSION 1350-1420

Chair: Dave McGonigal

#121 *State of Art of Arctic EER*, Frank Bercha 1350-1420

T-EER-1 Arctic EER Systems - 1 1420-1520

Chair: Ian Denness

#114 *Performance Trials of a Totally Enclosed Motor Propelled Survival Craft*, G. Igloliorte, A. Kendrick, R. Brown and J. Boone 1420-1440

#119 *Transport Canada EER Research and Development Program*, F. Bercha, E. Radloff and F. Leafloor 1440-1500

#139 *ARKTOS Full-Scale Evacuation Tests*, B. Seligman, F. Bercha and P. Hatfield 1500-1520


T-SH-4 Ships in Ice 4 – Ice Loads / Hull Strength

Chair: Robin Browne

#162 *Ice Load Prediction Formulas for Icebreaking Cargo Vessels*, K. Choi, S. Jeong and J. Nam

#122 *First Year Hull-Ice Interaction Loads Measured on the Louis S. St-Laurent During the 1995 Gulf of St. Lawrence Trials*, R. Ritch

#146 *Structural Response of Cargo Containment Systems in LNG Carriers under Ice Loads*, B. Wang, H. Yu, R. Basu, H. Lee, J. Kwon, B. Jeon, J. Kim, C. Daley and A. Kendrick

Coffee Break 1520-1540
 Sponsored by: AKAC Inc. 

T-EER-2 Arctic EER Systems - 2 1540-1620 / 1640

Chair: Dave Dickins

#168 *Design an Ice-Strengthened Lifeboat*, R. Browne, E. Gatehouse and A. Reynolds 1540-1600

#173 *Development of a Novel Concept for Evacuation in Dynamic Ice Conditions*, T. Cole, A. Warrillow and K. Drover 1600-1620

1620 – 1640

TST-3 Structures in Ice 3 – Ice Loads

Chair: Ove Gudmestad


#143 *February 13, 2007 Limit Driving Force Event on the Confederation Bridge*, D. Tripathi, N. Shrestha and T. Brown


#158 *Discrete Element Analysis of Ice Loads on Ships and Structures*, M. Lau, K. Lawrence and L. Rothenburg

#144 *Assessment of Flexural Failure Models with Extreme Events*, S. Tibbo and T. Brown

T-EER-3 Arctic EER Panel (1620-1700) 1620 – 1700

Chair: Ian Denness

Social Hour Bar 1730-1815
 (PDC Lounge #301)
 Sponsored by: Stena Drilling 

Buses (3) leave from front entrance of PDC taking delegates to BBQ location. **1830-1915** 

Western BBQ 1900-2200
 (Mountainview BBQ)
 Sponsored by: ConocoPhillips 

Conference Program: Wednesday, July 23

Room A

Room B

W-AN-2 ANNOUNCEMENTS 815-830

Merv Edgecombe

W-PL-5 PLENARY SESSIONS 830-930

Chair: Karen Muggeridge

- #128 *Design Challenges for a Large Arctic Crude Oil Tanker*, Aleksandr Iyerusalimskiy and Peter Noble 830-900
- #140 *Arctic Sea Ice Changes under Global Warming*, Peter Wadhams 900-930

W-SH-5 Ships in Ice 5 – Icebreaker Designs 930-1030

Chair: Peter Hatfield

- #104 *Design and Construction of Icebreakers for Operation in the Barents Sea*, T. Chenghui 930-950
- #112 *Icebreaking Ore Carrier Project for Baffinland Iron Mines Corporation*, G. Wilkman, M. Arpiainen, R. Kiili, T. Mattson, R. Cooper and J. Stubbs 950-1010
- #126 *Natural Breaker Drillship/FPSO Concept for Ice Offshore*, A. Keinonen 1010-1030

W-ICE-3 Ice 3 – Ice Detection and Monitoring

Chair: Michelle Johnston

- #124 *Renewed Focus on the Arctic Sea Ice - Future Ice Services*, M. Gauthier
- #136 *Marine Radar for Improved Ice Detection*, B. O'Connell
- #134 *Advances in Marine Ice Profiling for Oil and Gas Applications*, D. Fissel, J. Marko and H. Melling

Coffee Break 1030-1050
Sponsored by: Bercha Group



W-SH-6 Ships in Ice 6 – Propulsion 2 1050-1150

Chair: Colin Revill

- #123 *Ice Controllable Pitch Propeller - Strength Check Based on IACS Polar Class Rule*, S. Lee 1050-1110
- #163 *Assessment of Periodical Loads Acting on Screw Propeller During its Interaction with Ice*, M. Karulina, E. Karulin, V. Belyahsov and I. Belov 1110-1130

W-OS-1 Oil Spills – Protection and Response

Chair: Dave Dickins

- #118 *Prediction of Oil Spill Occurrence Probabilities in the Alaskan Beaufort and Chukchi Seas OCS*, F. Bercha, R. Prentki, C. Smith and M. Cerovsek
- #157 *STOP (Stern Tube Oil Pollution)*, C. Carter
- #172 *Oil Spill Prevention and Response for Shell's Offshore Exploration Program in the Alaskan Beaufort Sea*, S. Moore

CLOSING CEREMONIES 1150-1215
Acknowledgements, awards, and closing remarks. Chair: Frank Bercha

Lunch (Vistas Dining Room) 1230-1330
Sponsored by: US Arctic Research Commission
(or box lunch on bus to Columbia Icefields)



Bus leaves from front entrance of PDC for Columbia Icefields Tour
BOX LUNCH PROVIDED ON BUS
Please pre-register for this event 1230



Columbia Icefields Tour 1230-2100
Sponsored by: Transport Canada



Transport Canada

Transports Canada

