

CURRICULUM VITAE



Sören Ehlers, D.Sc. (Tech.)
Professor (sustainable Arctic Sea transport)

Department of Marine Technology
Norwegian University of Science and Technology
Otto Nielsens vei 10
7491 Trondheim, Norway
Tel: +47 73 59 5596
Mobile: +47 91 89 7748
Fax: +47 73 59 5697
E-mail: soren.ehlers@ntnu.no
www.ntnu.no

Date and Place of Birth: 19.03.1979, Darmstadt
Nationality: German
Marital status: married

Education

1999 Abitur, Viktoria Schule Darmstadt, Gymnasium

Higher Education

09/2011 Professor for Sustainable Arctic Sea Transport (qualification fellow until spring 2013) Norwegian University of Science and Technology, Trondheim

10/2009 *Doctor of Science in Technology* (Highest Academic Degree given in Finland), Helsinki University of Technology;
Graduation with Distinction in the Field of Naval Architecture

01/2004 Diploma-Engineer for Mechanical Engineering, University of Rostock; Graduation after 8 Semester and Master Thesis (Official time to graduate is 10 Semesters), Grade: Good

10/1999 Mechanical Engineering Studies in the Field of Naval Architecture and Offshore Engineering, University of Rostock
Major: Ship theory and Structural analysis

Occupational History

Since 9/2011 Professor at NTNU in the field of sustainable Arctic Sea transport

Since 2010 Instructor for Doctoral Theses

Since 10/2009 Post-doctoral researcher at the Aalto University

Since 2008 Realization of international Intensive University Courses:
- *Collision and Grounding as Criteria in Ship Design*
- *Non-linear steel structural analysis with LS-DYNA*

Since 2006 Project- and Research-Management for national and EU-Projects, e.g. EU-IMPROVE Project manager

Since 2005 Instructor for Master Theses at the Helsinki University of Technology

Since 2004 Involvement in numerous international and national Projects

Since 2004 Teaching duties at the Helsinki University of Technology:
- Ship Conceptual Design
- Ship Project
- Ship Structures

Since 2004 Researcher at the Helsinki University of Technology in the Marine Technology Group, Research focus: Material modelling, Ship collision analysis and optimisation

Since 2003 Co-founding of the Research and Consultancy company AS2CON

01-02/2003 Practical Training at *Lloyds's Register*, London, Stability of Cruise ships and special vessels, issuing of tonnage certificates

09-12/2002 Practical Training at Helsinki University of Technology within one EU-Project1

1994-1999 Founder and Owner of a Computer Service Company

Language skills

German	Mother Language
English	Fluent
French	Basic skills
Finnish	Basic skills

Other skills

Excellent skills in the following software tools (MATLAB, MATHCAD, Napa, AutoCAD, LS-DYNA, ANSYS, ABAQUS, FINNSAP), good programming language skills (Visual Basic, C, C++, Fortran, HTML) and very good skills with general operating systems (Linux, Macintosh, Windows).

Hobbies

Lightweight construction (last project 2010: Build of a monoqoque greenland style kayak), sailing, hunting, flyfishing and photography

Committees, Boards and Memberships

- Since 2012 Chairman of the International Ship Structures Committee (ISSC) - V.6 Arctic Technology
- Since 2012 NTNU representative on arctic ship design and transportation for the newly established arctic petroleum consortium.
- 2012 Dissertation evaluator and opponent for Richard Villavicencio (Response of ship structural components to impact loading, IST, Portugal)
- 2012 Administrative dissertation committee member for Ronny Sten (Dynamic Simulation of Deep Water Drilling Risers with Heave Compensating System, NTNU, Norway)
- Since 2012 OMAE2012 organizational committee member and session organizer for Arctic Sea Transportation
- Since 2012 Member of the Royal Institute of Naval Architects (MRINA)
- Since 2010 PIANC WG 151 member and responsible for ship impact of lock gates. This working group concerns seismic and impact loading of lock gates. My contribution is within the field of collision impact and consequences assessment.
- 2009-2012 International Ship Structures Committee (ISSC) - V.1 Damage assessment after accidental events
ISSC is the most important international committee for ship structures. The committee V.1 concerns the post accidental strength of offshore structures. I am responsible for a special chapter on material modeling for non-linear finite element simulations. Furthermore, I participate in a benchmark study to simulate the dynamic blast loading on bulkheads.
This international committee resembles an ideal platform to exchange knowledge with experts worldwide and to initiate common research projects.
- 2007-2010 Leading local organizational committee member for the 5th International Conference on Collision and Grounding of Ships (ICCGS)
The ICCGS is the most important and only international conference for collision and grounding of ships and I had the honour to take a lead in the local organizational matters. Furthermore, I am the first editor of the conference proceedings and I initiated a special journal paper issue in a leading international journal acting as one of two guest editors.
- Since 2010 Founding member of the Collision and Grounding Working Group

As a result of the 5th ICCGS this working group for doctoral and post doctoral researchers has been formed. Currently I am leading the group and we are carrying out one collision benchmark study to be published in a journal article. The current contributing members are from Estonia, Finland, Poland, Sweden and United Kingdom.

- 2009-2010 Chairman of the IMPROVE Usergroup
Currently one EU FP 7 project application is under preparation and one ERASMUS Mundus doctoral school application with active members from Belgium, Croatia, Finland, Germany, Portugal, Spain and United Kingdom.
- 2005-2007 Member of the Collision and Grounding Forum (CANGFOR)
This forum for international exchange and cooperation was formed based on the initiative of doctoral students from Germany (TUHH), United Kingdom (Cambridge University), Finland (TKK), Greek (NTNUA), the Netherlands (Royal Schelde), Norway (NTNU) und Sweden (Chalmers University).
- Since 2003 Member of the German society of Naval Architects (STG)
Active contribution with two publications at an annual meeting 2004 and 2008. Furthermore, I am actively promoting and organising the exchange of finnisch, estonian, croatian and german students. In 2010 three finnisch students will participate the 'Students meet Industry' event in Duisburg funded by STG and Merenkulunsäätö.

Editorial work and peer Reviewer

Editorial:

Special issue for Ships and Offshore Structures 2012

Continuously on-going:

Journal of Marine Structures

Journal of Ships and Offshore Structures

Journal of Ocean Engineering

Journal of Ship Technology Research

Journal of Ship Research

Engineering Structures

Proceedings of the Institution of Mechanical Engineers, Part M, Journal of Engineering for the Maritime Environment

Proceedings of the Institution of Mechanical Engineers, Part C, Journal of Mechanical Engineering Science

Proceedings of the royal society A, Mathematical, Physical and Engineering Science

Proceedings of the Institution of Mechanical Engineers, Part G, Journal of Aerospace Engineering

Proceedings of MARSTRUCT

Proceedings of international conference on collision and grounding of ships

Proceedings of the international Conference on Ocean, Offshore and Arctic Engineering

Proceedings of the International Conference on Port and Ocean Engineering under Arctic Conditions

Teaching expertise

Course participant feedback is available for all courses on request.

- From 2013 Risk-based design for arctic sea transportation (course development and entire teaching process), 10.5 credits PhD course, NTNU
- From 2013 Simulation-based ship design course (course development, lectures and seminars), 7.5 credits course mandatory course at MTS, NTNU
- Since 2012 TMR4565 – specialization module on Sustainable Arctic Sea Transport (course development and entire teaching process), 3.75 credits
- Since 2012 TMR4295 – Design of mechanical systems. Responsible for one half of the lectures, specifically for the introduction of the Finite Element Method, 7.5 credits
- 2012 TMR4115 – Selected lecture on “Introduction to design methods” during Stein Ove Erikstad’s sabbatical
- Since 2011 TMR4130 - Selected lecture on Collision and Grounding of ships
- 2011 Large complex structures (development of this new course for Aalto as well as lecturing the entire course in 2011 in the summer and winter semester)
- 2010 Non-linear steel structural analysis with LS-DYNA (2 day intensive course, mainly PhD students), Rijeka University, Croatia
- 2008/2009 Short course on collision and grounding as criteria in ship design (primarily for PhD students, course concept and half of the course lectures and seminars), Zagreb University, Croatia
- 2010-2011 Ship Structures (Seminars, exercises and selected lectures as well as course preparation), Aalto University
- 2004-2011 Ship conceptual design (selected lectures and all seminars and exercises), Aalto University
- 2004-2011 Ship Project course (lectures, seminars and course structures), Aalto University
- Own participation:
2012-2013 PEDUP at NTNU – Pedagogical training course at NTNU, 80% completed

List of instructed theses

PhD-thesis (on-going)

1. Rüdiger von Bock und Polach (Mechanics of model ice, main supervisor, NTNU and Aalto University degree)
2. Sandro Erceg (Efficiency of ships in ice, main supervisor)
3. Drazen Polic (The influence of ice loads on the propulsion machinery, main supervisor)
4. Mihkel Kõrgesaar (Fracture propagation in thin shells, assisting supervisor, Aalto University)

Master theses (on-going)

1. Design of ice-going life boats, Erceg, B
2. Design methodology for stress joints, Sævik, E.
3. Design and optimization methodology for ice going supply vessels, Molnes, D.
4. Design evaluation of steel sandwich panels in OSV, Overvåg, C.
5. Design and optimization methodology for ice-going LNG tanker, Pedersen, R.
6. Design and optimization methodology for a multi-purpose offshore supply base, Fossen, S.
7. Risk-based design procedure for OSVs, Raman, A.

Master theses (finalized)

1. An economic transport system of the next generation integrating the northern and southern passages, Omre, A., 2012
2. Numerical simulations of ice loads on conical wind turbine foundation in the eastern Baltic Sea, Rosenthal, R., 2012
3. A Decision Support Model for Merchant Vessels Operating on the Arctic Sea, Sørstrand, S, 2012.
4. Design of an impact tolerant minimum ballast LNG tanker, Korgesaar, M., 2010.
5. Failure mechanism of laser stake welded T-joints, Jutila, M., 2009.
6. GL approval procedure for crashworthiness, Schillo, N., 2006.
7. Statistical analysis of ship collisions, Toivinen, J., 2005.

External funds, project management and experiences

Under evaluation

1. RISKAT – Holistic risk-based design for sustainable arctic sea transport (KMB)
2. Scenario based risk management for arctic shipping and operations (LRET, Lloyd's Register educational trust, application is in the final round within the top 5)

Not-funded, but worthwhile to be mentioned

- 2012 ERC Synergy grant application as main investigator. We reached the top 40% and I will continue trying to obtain ERC funds
- 2012 EU FP7 Matarc Application on lightweight structures in arctic conditions as coordinator. Application passed evaluation threshold, but did not receive funding
- 2012 EU FP7 CA Polarcnet – Coordinated action on the Safety regime of ships operating in the Arctic sea, 22 international partners, NTNU as a member. Highest evaluated project of this kind in the call, threshold passed, but EU decided against funding

Project management

1. EU-Projekt ASDEPP Tempus (*Advanced Ship Design for Pollution Prevention*)
2. EU-Project IMPROVE (Design of Improved and Competitive Products Using an Integrated Decision Support System For Ship Production and Operation)

Leading project contribution

1. TEKES-Project Safedynamics, national Finnish project
2. EU-Project MARSTRUCT (Network of Excellence in Marine Structures)

Project contribution

1. EU-Project BESST (*Breakthrough in European Ship and Shipbuilding Technologies*)
2. FIMECC-Project Light SPR (*Finnish Metals and Engineering Competence Cluster, Light and efficient solutions, Strategic Research Project*), national Finnish project
3. Project SUTERA (*Suljetut täytetyt teräsrakenteet – Closed filled steel structures*), national Finnish project
4. TEKES-Project CONSTRUCT (*Conceptual structural design platform for cruising ships*), national Finnish project
5. EU-Project ERASTAR (*European Research Area - Shipbuilding Technology Applied Research*)
6. EU-Project SAND.CORE (*Coordination Action on Advanced Sandwich Structures in the Transportation Industry*)
7. Langh-Project, national Finnish project
8. EU-Project SANDWICH (*Advanced Composite Sandwich Steel Structures*)

Additional EU project proposals have been written within my role at AS2CON, which is currently the most successful SME concerning EU-project participation in Croatia.

LIST OF PUBLICATIONS

h-index

- **6** - Scopus recorded citations are 97 (5.12.2012)
- **9** - Scopus citations are 150 considering papers, which are in-press/accepted and which I am aware of (I keep detailed statistics of these, because the Scopus response time is so slow)
- **8** - Google scholar

Journal articles

1. Dai L, Ehlers S, Rausand M, Bouwer Utne I. Risk of collision between service vessels and offshore wind turbines. *Reliability Engineering and System Safety*; 2013;109; 18–31.
2. Erikstad SO, Ehlers S. Decision support framework for exploiting northern sea route transport opportunities. *Ship Technology Research*, 2012.
3. Montewka J, Ehlers S, Tabri K. Modelling risk of a collision between a LNG tanker and a harbour tug. *Marine Systems & Ocean Technology*, 2012;7(1),5-15.
4. Jelovica J, Romanoff J, Ehlers S, Varsta P. Influence of weld stiffness on buckling strength of laser-welded web-core sandwich plates. *Journal of Constructional Steel Research*, 2012; 77; 12-18.
5. Ehlers S. Østby E. Increased crashworthiness due to arctic conditions - The influence of sub-zero temperature. *Marine Structures*, 2012. doi:10.1016/j.marstruc.2012.05.004
6. Ehlers S. Tabri K. A combined numerical and semi-analytical collision damage assessment procedure. *Marine Structures*, 2012. doi:10.1016/j.marstruc.2012.05.005
7. Ehlers S. A Particle Swarm Algorithm-Based Optimization for High-Strength Steel in crashworthy ship structures. *Journal of Ship production and Design*
8. von Bock und Polach RUF, Ehlers S. Heave and pitch motions of a ship in model ice: an experimental study on ship resistance and ice breaking pattern. *Cold Regions Science and Technology*, 2011; 68; 49-59.
9. Ehlers, S. A review of collision and grounding damage assessment metho. *Marine Systems & Ocean Technology*, 2011; 6(1); 5-15.
10. Ehlers S, Remes H, Klanac A, Naar H. A multi-objective optimisation-based structural design procedure for the concept stage - a chemical product tanker case study. *Ship Technology Research, Schiffstechnik*, 2010; 57(3): 182-197.

11. Ehlers S. Optimisation for Crashworthiness. *Brodogradnja-Shipbuilding* 2010; 61(4): 341-346.
12. Rigo P, Žanić V, Ehlers S, Andrić J. Design of Innovative Ship Concepts using an Integrated Decision Support System for Ship Production and Operation. *Brodogradnja-Shipbuilding* 2010; 61(4): 367-381.
13. Ehlers S, Tabri K, Romanoff J, Varsta P. Numerical and Experimental Investigation on the Collision Resistance of the X-core Structure. *Journal of Ships and Offshore Structures, Special Issue on Collision and Grounding*, 2010; xx(xx), 1–9.
14. Ehlers S. A procedure to assess the damage of a grounded ship: a full-scale validation case study. *Ship Technology Research*, 2010; 57(1); 50-64.
15. Ehlers S. The influence of the material relation on the accuracy of collision simulations. *Marine Structures*, 2010; 23; 462-474.
16. Kõrgesaar M, Ehlers S. An Assessment Procedure of the Crashworthiness of an LNG Tanker Side Structure. *Ship Technology Research, Schiffstechnik*, 2010; 57(1): 50-64.
17. Ehlers S. A procedure to optimize ship side structures for crashworthiness. *Journal of Engineering for the Maritime Environment* 2009; 224: 1-12.
18. Ehlers S. Strain and stress relation until fracture for finite element simulations of a thin circular plate. *Thin-Walled Structures* 2009; 48(1); 1-8.
19. Klanac A, Ehlers S, Jelovica J. Optimization of crashworthy marine structures, *Marine Structures* 2009; 22(4); 670-690.
20. Ehlers S, Varsta P. Strain and stress relation for non-linear finite element simulations. *Thin-Walled Structures* 2009; 47; 1203-1217.
21. Ehlers S, Broekhuijsen J, Alsos HS, Biehl F, Tabri K. Simulating the collision response of ship side structures: A failure criteria benchmark study. *Int Ship Progress* 2008; 55: 127-144.

Accepted:

22. Sormunen O, Ehlers S, Kujala P. Chemical tanker spill modeling using FEM and statistical metamodels. *Journal of Engineering for the Maritime Environment*.
23. Jelovica J, Ehlers S, Romanoff J, Aromaa J. Experimental and Numerical Investigation on the Ultimate Strength of Corroded Steel Sandwich Beams. *Marine Structures*.

Submitted:

24. Ehlers S, Soa T, Kujala P. Optimization-based material parameter identification for the numerical simulation of sea ice in 4-point bending. Cold Regions Science and Technology.
25. von Bock und Polach R, Ehlers S, Kujala P. Model scale ice as a material – Part A: Experiments. Cold Regions Science and Technology.
26. Von Bock und Polach R, Ehlers S. Model scale ice as a material – Part B: Numerical Model. Cold Regions Science and Technology.

In process:

27. List available on demand, too length to be placed here.

Guest editor

28. Wang G, Ehlers S. Special Issue on Collision and Grounding of Ships. Journal of Ships and Offshore structures.

ISSC Reports

29. 2009-2012: Committee member: V.1: Damage Assessment Following Accidents. 2012. Jerzy Czujko (Chairman), Natacha Buannic, Sören Ehlers, Chen-Far Hung, Frank Klæbo, Spiro J. Pahos, Mark Riley, Wenyong Tang, Alex Vredeveldt, John Wægter.
30. 2012-2015: Committee chairman: V.6: Arctic Technology. Alexei Bereznitski, Fai Cheng, Ian Jordaan, Walter Kuehnlein, Pentti Kujala, Yu Luo, Yeong Tae Oh, Kai Riska, Jaideep Sirkar, Koji Terai, Janne Valkonen.

Invited speaker

31. Arctic Sea transportation and vessel Design. The 5th Seoul International Maritime and Shipbuilding Conference, SIMS, Busan, Korea, November 2012.
32. Design and construction of vessels for the High North. Russian Norwegian Working Group on Shipbuilding. Ålesund, Norway, October 2012.
33. Ports for Container Ships of Future Generations, Workshop, TUHH, 2011. Grounding and Collision of Ships - a state of the art review, pp. 123-136.

Conference proceedings

34. 5th International Conference on Collision and Grounding of Ships edited by Ehlers S, Romanoff J. 2010. 263 pages.

Summary articles

35. Ehlers S, Tabri K, Varsta P. Collision strength of Ship Structures – A state of the art review. To appear in: CENTEC (Lisbon) 15th anniversary book 2009/10.

Conference articles

36. Ehlers S. von Bock und Polach. Arctic ship design challenges – ice loading and the influence of sub-zero temperature. Annual meeting of the society of german naval architects, November 2012.
37. Montewkaa J, Ehlers S, Goerland F, Hinz T, Kujalaa P. A model for risk analysis of RoPax ships - the Gulf of Finland case. In the proceedings of ESREL 2012 conference, 23rd-27th of June 2012, Helsinki.
38. Omre A, Sørstrand S, Ehlers S, von Bock und Polach R. A sustainable transport system for the arctic sea. IMDC2012.
39. Ståhlberg K, Ehlers S, Kujala P. Design scenario modeling for assessing passenger vessel crashworthiness. IMDC2012
40. Storheim M, Kim E, Amdahl J, Ehlers S. Iceberg shape sensitivity in ship impact assessment in view of existing material models. OMAE2012
41. von Bock und Polach R, Janardanan V, Ehlers S. Ice model tests in context of the investment value of an offshore vessel. OMAE2012
42. Tabri K, Ehlers S, Korgesaar M, Ståhlberg K, Heinvee M. Collision consequence assessment of ROPAX vessels operating in the Baltic Sea. OMAE2012
43. Erikstad SO, Ehlers S. A Decision Support Framework for Exploiting Northern Sea Route Transport Opportunities. Compit 2012.
44. Jelovica J, Romanoff J, Ehlers S, Aromaa A. Experimental investigation on ultimate strength of corroded web-core sandwich panel stripes, International conference on composite materials (ICCM 18), 21-26 August 2011, Jeju, Korea.
45. Montewka J, Goerlandt F, Ehlers S, Kujala P, Erceg S, Polić D, Klanac A, Hinz T, Tabri K. A model for consequence evaluation of ship-ship collision based on Bayesian Belief Network. In Rizutto&Guedes Soares (eds), Sustainable Maritime Transportation and Exploitation of Sea Resources, Taylor&Francis, London, 2011; 721-728.
46. Ehlers S. A Particle Swarm Algorithm-Based Optimisation for High-Strength Steel Structures. COMPIT 2011.
47. Ehlers S, Klanac A, Schröder M. An investigation of a Suezmax tanker grounding accident. Hamburg, Deutschland. Marstruct 2011.
48. D. Polić, D. Frank, A. Klanac, S. Ehlers. Finite element-based shape optimization of an asymmetric steel sandwich panel joint. Marstruct 2011.
49. Montewka J, Ehlers S, Tabri K. Elements of risk analysis for LNG tanker maneuvering with tug assistance in a harbor. 11th Symposium on

Practical Design of Ships and Other Floating Structures, Rio de Janeiro, Brasil 2010.

50. Frank D, Klanac A, Kniep M, Polić, Ehlers S. Optimization system for design of laser-welded steel-sandwich structures. 11th Symposium on Practical Design of Ships and Other Floating Structures, Rio de Janeiro, Brasil 2010.
51. Ehlers S, Tabri K, Romanoff J, Varsta P. Numerical and Experimental Investigation on the Collision Resistance of the X-core Structure. 5th Intl. Conference on Collision and Grounding of Ships. 2010; 18-24.
52. Ehlers, S. A material relation for ship collision simulations. 5th Intl. Conference on Collision and Grounding of Ships. 2010; 113-117.
53. Klanac A, Duletić T, Erceg S, Ehlers S, Frank D. Environmental risk of collisions in the enclosed European waters: Gulf of Finland, Northern Adriatic and the implications for tanker design. 5th Intl. Conference on Collision and Grounding of Ships. 2010; 55-65.
54. Varsta P, Ehlers S, Klanac A, Tabri K. Collision and Grounding of Ship Structures. In Advanced Ship Design for Pollution Prevention. 2010; 191-204.
55. Ehlers S. Optimization for Crashworthiness. 10th Finnisch Mechanics Days. Jyväskylä, Finland. 2009; 85-93.
56. Ehlers S, Klanac A, Remes H, Kapuścik K, Naar H, Andric J, Zanic V, Grgic M, Pircalabu, E, Bair F. The IMPROVED chemical tanker. IMPROVE-Conference, Dubrovnik, Kroatien. 2009; 136-145.
57. Ehlers S, Kapuścik K, Khalid H, Turan O. The basic design, performance and stability of the IMPROVED chemical tanker. IMPROVE-Conference, Dubrovnik, Kroatien. 2009; 131-135.
58. Remes H, Klanac A, Varsta P, Ehlers S. ConStruct – Platform for Conceptual Structural Design. IMPROVE-Conference, Dubrovnik, Kroatien. 2009; 86-91.
59. Ehlers S, Klanac A, Körgesaar M. A design procedure for structures against impact loading. Vorgetragen in der Jahreshauptversammlung der Schiffbautechnischen Gesellschaft in Hamburg 2008, die schriftliche Fassung erschien im Jahrbuch 2008.
60. Ehlers S, Klanac A, Tabri K. Increased safety of a tanker and a RO-PAX vessel by implementing a novel sandwich structure. 4th Intl. Conference on Collision and Grounding of Ships. Germany, 2007; 109-115.

61. Tabri K, Alsos H, Broekhuijsen J, Ehlers S. A benchmark study on ductile failure criteria for shell elements in multiaxial stress state. *Advancements in Marine Structures*. 2007; 401-409.
62. Ehlers S, Tabri K, Schillo N, Ranta J. Implementation of a novel ship side structure into a tanker and a ropax vessel for increased crashworthiness. 6th European LS-DYNA Users' Conference, Gothenburg, Sweden. 2007; 4.111-4.120.
63. Klanac A, Tabri K, Ehlers S, Nekic A. Multi-Attribute Design of Crashworthy Structures in the Bi-Stakeholder Environment, International Marine Design Conference – IMDC, Ann Arbor, 2006.
64. Ehlers S. Design of steel sandwich panel joints with respect to fatigue life. *Sommertagung der Schiffbautechnischen Gesellschaft in Stettin 2004*. Erschienen im Jahrbuch 2006, Band 98, ISBN 3-540-27423-5.
65. Klanac A, Ehlers S, Tabri K, Rudan S, Broekhuijsen J. Qualitative design assessment of crashworthy structures. *Proc Int Maritime Association of Mediterranean*, Portugal. 2005; 461-469.
66. Klanac A, Ehlers S, Tabri K. Analysis of crashworthy structures. *Maritime Research News* 2005, Vol. 20.
67. Ehlers S. Design of steel sandwich panel joints. *Ship structural design seminar*, Espoo, Finland 2005.
68. Kujala P, Romanoff J, Tabri K, Ehlers S. All Steel Sandwich Panels – Design Challenges for Practical Applications on Ships. 9th Symposium on Practical Design of Ships and Other Floating Structures, Lübeck-Travemünde, Deutschland 2004.

Accepted:

69. Borch OJ, Westvik MH, Ehlers S, Berg TE. Sustainable arctic field and maritime operations. *OTC, Offshore Technology Conference*.

Submitted:

70. Ehlers S. A particle swarm optimization-based procedure to obtain a crashworthy ice classed LNG tanker. *ICCGS 2013*.
71. Ehlers S, Benson S, Misirlis K. Ultimate strength of an intact and damaged LNG vessel subjected to sub-zero temperature. *ICCGS 2013*.
72. Ehlers S, Kujala P. Cost optimization for ice-loaded structures. *Marstruct 2013*.
73. Montewka J, Ehlers S, Goerlandt F, Hinz T, Tabri K, Kujala P. A framework for risk assessment for maritime transportation systems - a case study for open sea collisions involving RoPax vessels.

In progress for 2013 with accepted abstracts:

74. OMAE - The Northern Sea Route from a liner vessel perspective
75. POAC - Limit state identification for ice-strengthened hull structures using measured long-term loads
76. ISOPE – A numerical model for model scale ice and its significance for arctic marine design

Reports

77. Jelovica J, Romanoff J, Ehlers S, Remes H. Ultimate strength tests of corroded web-core and corrugated-core sandwich beams. Aalto University, Dept. of Applied Mechanics. Research Report. 2011. http://lib.tkk.fi/SCIENCE_TECHNOLOGY/2011/isbn9789526044347.pdf
78. Ehlers S, Enquist B. Uni axial tensile necking of steel dog-bone specimens. Helsinki University of Technology, Ship Laboratory, M-303, 2007.
79. Ehlers S. A thin circular plate under hemi-spherical punch; An experimental study of a plate subjected to a displacement controlled punch. Helsinki University of Technology, Department of Applied Mechanics, TKK-AM-7, 2009.

Books with societal impact

80. Guedes Soares C, Parunov J, Blagojević B, Grubišić R, Zamarin A, Žiha K, Ehlers S, Klanac A, Tokić G. Experience and Sustainability of International Curriculum Development in Naval Architecture. 2010. 88 pages, ISBN 978-953-7738-00-6.
81. Grubišić R, Prpić-Oršić J, Parunov J, Ehlers S, Kujala P, Guedes Soares C. Advanced Studies of Naval Architecture in Croatia, Finland and Portugal. 2010. 125 pages, ISBN 978-953-7738-01-3.

Research scope

The world wide increasing trend and interest in the Arctic Sea requires sound design concepts and regulations to cope with the distinct regional challenges in order to make northern transport feasible. Therefore, I am developing a holistic risk-based design environment for ships operating in Arctic conditions and thereby assess the vessels' performance and strength operating in ice, which can further be used to assess and minimize the operational risk as well as the environmental and global cost.

Basic research

- Fluid-Ice-Structure Interaction suitable for optimization
- New materials and structures
- Methods to assess the environmental impact and cost of transport systems for the Arctic Sea

Applied research

- Risk-based design methods for Arctic Sea transport systems
- Sustainable and competitive concepts
- Innovative solutions for operations in Arctic conditions
- Active and passive safety features
- Design requirements to fulfill the demands for the northern passages in the future

Within both research areas I am developed a close international cooperation and network with the leading experts in the field of Arctic research, namely with the Aalto University in Finland, the Memorial University in Newfoundland and CARD, the center of Arctic Research and Development in Newfoundland. Additionally, a close industrial cooperation is naturally part of research process to ensure a fast implementation of the developed innovations.