

# Curriculum Vitae Dr. Gerd-Michael Würsig (2019)



## Particulars

Family Name: **Würsig** (Wuersig)

First Name: **Gerd-Michael**

Birth: 10.10.1959

Nationality: German

Profession: Mechanical Engineer (Process- and Energy Engineering),  
doctoral degree: Dr.-Ing.

Language: German, English

## Occupational Activity

Dr.-Ing. Gerd Wuersig - GMW Marine, Process-, Energy-Technology Consultancy –  
Independent engineer consultancy for shipping, oil & gas- and process-industry. The main focus of  
my work is shipping.

## Expertise

- Liquefied gases, liquefied gas tanker, gas as ship fuel, alternative fuels for shipping, IGF-Code, IGC-Code.
    - E.g. until 2013 member of the German delegation of “IMO Subcommittee Bulk Liquids and Gases” (BLG, today CCC). Topics: gas as ship fuel (IGF-Code) and liquefied gas transport in bulk (IGC-Code)
  - Safety of Fuel Cell Systems for marine applications.
    - Editor and lead author of first Germanische Lloyd (GL) fuel cell system Guidelines (2003). Lead in safety work package of EU FCSHIP project on fuel cell systems in shipping (2002/2004). Speaker of e4ships NOW (“Nationale Organisation Wasserstoff”). Lighthouse project for fuel cell systems in marine applications (2009/2019) with the main partners Meyer Yard and TKMS.
  - Energy efficiency, propulsion system design evaluations for cargo and passenger ships.
    - E.g. COGES propulsion system for a 20 kTEU class container ship (PERFEct Ship, 2014/2017) with Solar Turbines, ABB, OMT, GTT, CMA-CGM and DNV GL as partners. Gas turbine propulsion system for a liquefied hydrogen carrier (doctoral thesis 1996.)
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- Safety analysis and FMEA studies for maritime, oil/gas and other industries.
  - E.g. AIP-Systems, dispersion in air of combustible liquid chemicals from pools, chlorine plant safety, accidental liquefied gas release at a shipping terminal (Wilhelmshaven, Germany). Development of a safety based maintenance program for valves used by a major oil and gas producer in Asia.
- Concept design of ship propulsion systems for alternative fuels
  - E.g. definition, heading of GL part for GasPax (2009/2011) project of Meyer Werft, Friedrich Lürssen Werft, FSG, TGE. The project results are the base of today's LNG fuelled Cruise Ships of Meyer Yard. First ship: AIDA Nova, order 12/2015, in service 12/2018, IMO No 9781865.
- Special problems in province of thermodynamic and process engineering.
  - E.g. thermal insulation, pressure built up in tanks for cryogenic liquids like liquefied oxygen, liquefied hydrogen (LOX, LH<sub>2</sub>), evaluation of heat exchangers e.g. charge air coolers, ship engine cooling systems, multiphase flow in safety valves and vent line systems (development of IMO Resolution A.829(19)).
  - Air Independent Propulsion (AIP) Systems with fuel cells and closed cycle internal combustion engines for military and civil submarines.
- Reliability analysis and Fault Tree analysis
  - E.g. for multi-phase pumping systems.
- Contribution to ISO work.
  - E.g. for two phase flow in safety devices. ISO 4126-10:2010; specifies the sizing of safety valves for gas/liquid two-phase flow in pressurized systems such as: reactors, storage tanks, columns, etc.

## Miscellaneous

- Member of DECHEMA ProcessNet Committee for "Safe Design of Chemical Plants" since 1999; member of CSE (CSE Center of Safety Excellence).
  - Member of VDI (Verein Deutscher Ingenieure), DECHEMA (Gesellschaft für Chemische Technik und Biotechnologie), STG (Schiffbautechnische Gesellschaft).
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## Employment Record

- July 2019 – today      Independent engineer consultant for shipping, oil & gas- and process-industry. The main focus of my work is shipping.
- 2014 – end June 2019      With DNV GL as „Business Director“ with responsibilities for alternative fuels within global business development of DNV GL maritime division
- 2012 – 2014      With DNV as “Business Director” with responsibilities for alternative fuels within global business development of DNV maritime division. From March 2012 until enforcement of the merger between DNV and GL.
- 1988 - 2012      With Germanischer Lloyd, Head Office, Hamburg; Machinery Div., Advanced Engineering and Strategic Research Div., Engineering Services Div., Strategic Research and Development Div.. Last position: Coordinator Gas Technology, Deputy Head of Department and Head of Group Process- and Gas-Technology.
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## List of Major Publications

Status: August 2019

**Note:** List includes publications with major contribution of Gerd-Michael Würsig to the work and the publication. Most presentations on conferences are not included.

### Publications (2010 – 2019)

- G.-M. Würsig; Future Fuels in Shipping – Opportunities and Costs; 7<sup>th</sup> Ship Efficiency Conference; Hamburg 23/24 of Sept. 2019; full paper
- G.-M. Würsig; key note paper: The development of THE INTERNATIONAL CODE OF SAFETY FOR SHIPS USING GASES OR OTHER LOWFLASHPOINT FUELS (IGF CODE) – IMO MSC.391(95); Motorship Conference – Gas Fuelled Ships 2015; Hamburg, 10/12 Nov. 2015
- G.-M. Würsig; paper: Overview of alternative fuels and technologies for shipping; Motorship Conference - Gas Fuelled Ships 2017, On Board of MS Viking Mariella (Stockholm/Turku) 13-17 Nov 2017
- Dr. Gerd Würsig; presentation: Introduction to PERFECTShip concept - Piston Engine Room Free Efficient Container Ship - ”; Workshop at MARINTEC China 2017; 7<sup>th</sup> December 2017, Shanghai
- Torsten Mundt, Dr. Gerd-Michael Würsig; Alternative Fuels and Technologies; paper 2019/461, CIMAC 2019 Congress, Vancouver, 10-14 June 2019.
- Dr. Gerd-Michael Würsig; Future Fuels in Shipping – Opportunities and Costs; proceedings of STG „Ship Efficiency Conference“, Hamburg 23/24.09.2019.

### Publications (2001 – 2009)

- J. Schmidt, L. Friedel, F. Westphal, G. Würsig, J. Wilday, M. Gruden, C. van der Geld: Sizing of safety valves and connected inlet and outlet lines for gas/liquid two-phase flow; 10<sup>th</sup> Symposium: Loss Prevention and Safety Promotion in the Process Industries; Stockholm 19<sup>th</sup> - 21<sup>st</sup> June 2001
  - R. Krapp, H. Pauli, M. Schmidt, G.-M. Würsig: The Technical Challenges And Benefits Of Fuel Cell Propulsion; Conference: Ship Propulsion Systems; Hamburg 9<sup>th</sup>/10<sup>th</sup> October 2001
  - G.-M. Würsig, R. Krapp, H. Pauli: Using Fuel Cell Technology in the Marine Market; Conference: Exploiting the Commercial and Marine Market, London 26<sup>th</sup> April 2002
  - G.-M. Würsig: Brennstoffzellen: Möglichkeiten, Nutzen und Sicherheitsanforderungen; Seminarvortrag: Institut für Schiffbau und Meerestechnik, TU-Berlin, 14<sup>th</sup> June 2002
  - G.-M. Würsig, H. Pauli: Fuel Cell Systems in Confined Spaces: Safety Requirements and System Concepts; Conference: ESMG Symposium 2003, Nürnberg, 9<sup>th</sup> October 2002
  - G.M. Würsig, R. Krapp; Marine Fuel Cell Applications: Conference: Ensus 2002, 18<sup>th</sup> December 2002, New Castle, UK
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- G.-M. Würsig; Sicherheitsaspekte bei der Verwendung von Brennstoffzellen-Systeme in geschlossenen Räumen; Technische Überwachung Nr. 12/2002, Springer Verlag
- G.-M. Würsig; Brennstoffzellen in maritimen Anwendungen; VDI-Seminar, Universität Bremen, 28<sup>th</sup> January 2003
- G.-M. Würsig, L. Petersen: Services for Submarines considering different concepts for Air Independent Propulsion Systems for Submarines; Conference ASW Asia 2003, 5<sup>th</sup> March 2003
- G.-M. Würsig; Safety Application of Marine Fuel-Cell Systems; Conference: In Water Tec 2003, Kiel, 12<sup>th</sup> June 2003
- G.-M. Würsig; Safety Aspects of Marine Fuel-Cell Systems; Conference: F-Cell 2003, Stuttgart, 30<sup>th</sup> September 2003
- G.-M. Würsig; Maritime Anwendungen von Brennstoffzellensystemen, Seminar des NBZ-Netz Norddeutschland, Universität Hamburg, Hamburg, 25<sup>th</sup> November 2003
- G.-M. Würsig; Brennstoffzellen in maritimen Anwendungen, VDI Seminar FH-Hannover, 12<sup>th</sup> January 2004
- G.-M. Würsig, G. Filip; Fuel Cell Technology in Marine Applications: HYFORUM-2004, Beijing, 25<sup>th</sup> - 28<sup>th</sup> May 2004
- G.-M. Würsig; Fuel Cell Systems in Marine Applications; H2-Expo, Hamburg 2004-09-16/17
- Kähler, Würsig, Weidner; Energy demand of ships – Long-term measurements within the scope of the "Fuel Cell Ship" Project; 9th International Symposium on Practical Design of Ships and other Floating Structures PRADS 2004, Travemünde
- G.-M. Würsig; Gas as Ship Fuel for Motors Today; for Fuel Cells in Future; InterFerry Conference, Athens, 5/7 of October 2005
- G.-M. Würsig, L. Petersen; Germanischer Lloyd Rules for Naval Submarines – Certification of AIP Systems; Royal Institution of Naval Architects, Conference: Safety Regulations and Naval Class, London 24/24 of November 2005
- G.-M. Würsig; Possible Application of Fuel Cell Systems for Seagoing Vessels; International Congress on Ship Technology, Hamburg 13<sup>th</sup> of September 2007
- G.-M. Würsig; Fuel Efficiency and Emission Reduction with Fuel Cells, Interferry Conference, Stockholm 2007-09-29
- G.-M. Würsig; Fuel-Cell Systems for Seagoing Vessels: an Overview; STG Jahrbuch 2007
- Gerd-Michael Wuersig (Dr.-Ing.) GL, James Gaughan ABS, Benjamin Scholz GL, Lars Sannes Moss Maritime, Stephan Kabelac (Prof. Dr.-Ing.) IT, Alfred Leder (Prof. Dr.-Ing.) Ism; Effects of Enveloping Pool Fires on LNG tank Containment Systems; GASTECH-2009, Abu Dhabi, May 2009

## Publications (1991 – 2000)

- G. Würsig, M. Schüle: Analysis of the Energy Consumption for Intercontinental Seaborn Liquid Hydrogen Transport;ACHEMA-91, DECHEMA, Frankfurt a. M. 1991
  - G. Würsig: Shipping Liquid Hydrogen; Marine Engineers Review 10 (1991), p. 10-14, London
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- Dr. U. Schmidtchen, G. Würsig: Storage and Seaborn Transport of Large Liquid Hydrogen Quantities. The Seaborn Transport of "Euro-Québec Hydro-Hydrogen Pilot Project"; BAM, Research Report No. 195, Berlin 1993
  - G. Würsig, Dr. rer. nat. R. Horn: Ships, Tanks and Propulsion Systems for Seaborn Liquefied Hydrogen Transport; Int. Congress for Ship Technology; Hamburg 1993
  - G. Würsig: Gas-Turbines for Tankers; Schiff & Hafen 5 (1994), S. 36-42
  - U. Petersen, R. Krapp, G. Würsig: Design and Safety Considerations for Large-Scale Sea-Borne Hydrogen Transport; Int. J. Hydrogen Energy, 7(1994)19, USA
  - M. Böckenhauer, R. H. Chadburn, G. Würsig, B. O. Bauer-Nilsen: The New Cargo Tank Loading Limit Requirements in the IMO Gas Carrier Codes; GASTECH-94 Conference, Paper 6.2, October 94, Kuala Lumpur, Malaysia
  - G. Würsig, A. Wulf, M. Scheufele: Alternative Propulsion Systems for Liquefied Gas Tankers; Statusseminar des BMBF am 17.10.95, Published by Verlag TÜV-Rheinland, Düsseldorf 1995
  - Dr. G. Würsig, Dr. U. Petersen: Early Stage Safety Analyses for Hydrogen Process Systems; 11<sup>th</sup> World Hydrogen Energy Conference, Stuttgart, 23<sup>rd</sup> -24<sup>th</sup> June 1996
  - Dr. G. Würsig: Design of Prime Movers for Liquefied Hydrogen Tankers Fuelled with Hydrogen; Verlag Mainz, Aachen, 1996
  - Dr. G. Würsig, Dr. U. Schmidtchen: Safe Transport of Liquefied Hydrogen; Technische Überwachung 38(1997), Nr. 4, S. 26-30
  - Dr. U. Petersen, Dr. G. Würsig, N. Wöhren: Investigation into the operating behaviour of 61 cum liquid hydrogen tank; Congress: Hypothesis II, 18<sup>th</sup>, 22<sup>nd</sup> August 1997, Grimstad Norway
  - Dr. G. Würsig; Seaborn Liquefied Hydrogen Transport Research and Development 1986/today; Congress: DKV-Jahrestagung, 20<sup>th</sup> November 1998, Würzburg, Germany
  - Dr. Würsig: Development of a Multiphase Pumping Unit for Subsea Application, Berlin, March 2000, DECHEMA working party safety in process engineering
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