



de Haas  
van Oosterhout

marine experts

# Profile

**Olger Koop M Sc**

marine scientist

ship hydrodynamics | stability and mooring expert

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A M Sc in Applied Mathematics, Chair Numerical Analyses and Computational Mechanics from Twente University with over 10 years of experience as a consultant, forensic analyst and expert witness in ship hydrodynamics, mooring studies, ship's stability (intact and dynamic), motion response (and in particular roll) phenomena, marine simulations and calculations.

Olger is specialised in predicting, analysing and simulating vessel motions in both sea and harbour conditions. He has carried out extensive investigations into roll motion involving large container ships and his analyses and reports were used in several marine litigation procedures. He is also an expert in ship-to-ship interaction, harbour mooring systems and complex wave systems.

To support his forensic analyses, Olger co-developed various mooring analyses and vessel response software (including SHIP-Moorings, Aktis DMA, METRIS MB) packages and has executed many wave propagation assessments using both spectral and time domain wave models.

## Qualifications and education

- M Sc in Applied Mathematics, Chair Numerical Analysis and Computational Mechanics, University of Twente, The Netherlands.

## Expert witness and litigation support studies

- **Ultra large container vessel** Major container loss incident, North Sea. Evaluation of metocean conditions and vessel response in relation to container loss incident
- **CMA CGM G. Washington** Analysis of metocean conditions and the roll motion response in relation to the container loss incident. The evaluation included the development of the METRIS TD software to evaluate parametric roll behaviour. Reports presented to the Maritime Court of Guangzhou, China
- **Hyundai Kingdom** Container loss incident North Pacific. Case study for London and Japanese law firm in preparation of litigation in Japan, investigation into the wave conditions and hydrodynamic properties of the vessel to explain extreme roll motions
- **Wybelsum** Container loss incident, Egypt. Evaluation of metocean conditions and evaluation of IMO criteria
- **Baltic Leopard, Port Harcourt** Forensic investigation of the possible causes of a ship breaking free of its moorings at a berth next to a fairway following the passage of a bulk carrier (passing ship computations)
- **Cosco Nagoya** Container damage incident: Bay of Biscay. Establish and validate wave height and period at the time of the incident. Determine whether Parametric Roll could have occurred according to IMO criteria
- **Guaiba, Brasil** Forensic investigation of moored bulker breaking free of its moorings at a jetty in a port with swell wave exposure. The ship was moored opposite to a larger ship that partially sheltered it. Using Rembrandt DMA, the study accounted for the interaction between the two ships, including sheltering

- **Napoleon Bonaparte** Forensic study for French law firm in connection with high-profile mooring incident in the port of Marseilles. The study involved analyses to investigation correlation between ship motions and timing of wind variations in the port
- **Peru** Wave hind cast (using SWAN) and detailed long wave propagation (using SWASH) modelling for a LNG terminal behind a detached breakwater to assess the waves for three different events of breaking mooring lines
- **Egypt** Expert witness support for a moored vessel breaking free of its berth under the influence of a passing vessel
- **Port of Santos, Brasil** Passing ship computations to support investigations into mooring line failure incident under the influence of a passing vessel.

#### **Vessel motion response and mooring studies (selection)**

- **Greece** Support for mooring analysis for innovative LNG transfer system, 2020
- **Nigeria** Approach channel depth study, infragravity wave assessment and Dynamic Mooring Analysis for a staged port development
- **Peru** Mooring analysis of container vessels, bulkers and car carriers at multiple new terminals subject to harbour oscillations and utilising the Shore Tension system, 2019 / 2020
- **Mauritania** Buoy mooring, anchor design and motion response analysis of bulk carriers performing side-by-side rock dumping operations for the Greater Tortue berm breakwater construction, 2019 / 2020
- **China** Mooring analysis of research vessels moored side-by-side at an existing terminal subject to passing vessel and close to Guangzhou city, 2019
- **Morocco** Mooring analysis including Shore Tension for bulk carriers, 2019
- **England** Mooring analysis of an existing terminal including the application of ShoreTension for the port of Liverpool, 2018
- **North Sea** Motion response analysis of barges in North Sea conditions transporting topsides for an offshore wind farm
- **Saudi-Arabia** Metocean design conditions and design of a spread moored and single point mooring system for shallow and deep water locations, 2017
- **Marocco** Evaluation of a port layout including a detached breakwater for bulk export berths. To reduce the down-time because of long wave activity the application of the Shore Tension has been investigated, 2017
- **Hong Kong** FSRU and Ship-to-Ship dynamic mooring response analysis for an I-shaped jetty for LNG transfer up to Tropical Storm category 3 conditions, 2016 / 2017
- **The Netherlands** Turning induced roll motions and associated UKC reduction for an additional feature in PROTIDE, 2016
- **Jamaica / Saba** Site selection and heading analysis for a weathervaning LNG Ship-toShip transfer for both a single and a multi-body configuration, 2016
- **Hawaii** Bending (Sagging and Hogging) and mooring loads on a floating (loaded/ empty and submerged) drydock in a sheltered port under severe harbour oscillations, 2016
- **Ivory Coast** FSRU moored on a jetty - survivability assessment of FSRU subject to squalls, 2016
- **Russia** Dynamic standby/supply vessel mooring analysis for vessel moored at and in close proximity of a series of production platforms off Sakhalin – for Shell/STASCO, 2015
- **India** Passing ship hydrodynamic loads in the Port of Cochin, 2016
- **Cyprus** FSRU ship-to-ship dynamic mooring response analysis for jetty and spread mooring Solutions, 2015
- **The Netherlands** Wind induced roll motions and associated UKC reduction for wind sensitive ships on the Westerschelde (WESP-VTS), 2015
- **Cyprus** Underkeel clearance study for approach channel and berths of oil terminal
- **Panama** Investigation into effect of passing ship on ships moored near the entrance to the new Panama canal locks, 2014
- Joint development of a full 6 DoF time domain Wave Response Module for intended implementation in OPTIMOOR (TTI), 2011 / 2013

- **United Kingdom** Operability and Survivability assessment for the Seaforth Liverpool2 container of a new container terminal, including effects of passing ships, 2013
- **China** Dynamic response simulations of an LNG FRSU in 6 DoF at a jetty under the influence of wind, waves (2D wave spectra) and current. Fully dynamic computations were carried out in a mooring analysis hindcast for 9 years of contemporaneous metocean time series, 2013
- **Canada** Orcaflex multi-body mooring layout analysis for floating walkways and work platforms in a tailings pond (>1200 model elements), 2013
- **Arctic** Offshore operations including multi-body ship-to-ship cargo handling operations in an arctic environment
- **Indonesia** Feasibility, berth optimisation and down-time assessment for bulk carrier and barges moored in a spread mooring systems at exposed locations, 2012 / 2013
- **Oman** Modelling Heavy Lift ship loaded with cranes for Port of Sohar, 2012
- **The Netherlands** Analysis Shore Tension applications for vessels subject to passing ships, Port of Rotterdam, 2010
- **The Netherlands** Analysis of Shore Tension applications on wind sensitive ships (ULCS), Port of Rotterdam, 2010
- **Oman** Modelling Heavy Lift ship loaded with cranes for Port of Sohar, 2010
- **The Netherlands** Probabilistic admittance policy for access channels of Port of Rotterdam (Europoort) and Port of IJmuiden & Amsterdam (IJgeul), 2009 / 2010
- **The Netherlands** Ships moored in buoys subject to passing vessels (Dutch: boeispan), Calandkanaal, Port of Rotterdam, 2009
- **The Netherlands** Passing ships in Calandkanaal, Port of Rotterdam and the effect on moored vessels: derivation of operational relations between hull to hull separation distance and ship velocity, 2009
- **United Kingdom** Ro-Ro side-by-side mooring in Multi-Body including a linkspan with a floating pontoon, Grimsby, 2008
- **Algeria** Arzew LNG terminal layout, 2007.

#### **Metocean Studies and analysis (selection)**

- **The Netherlands** Development of HBH-Havens software for the Dutch Directorate General for Public Works, 2017
- **Myanmar** Wave Transformation of ambient and extreme design conditions for the Yadana Field pipeline, 2016
- **Ghana** Squalls analysis using scatterometer data and metocean conditions for a FSRU moorings, 2016
- **Cyprus** Wave hindcast to support two adjacent terminals providing 2D wave spectra time series, 2015
- **Cameroon** Wave hindcast for a FSRU feasibility assessment, 2015
- **France/La Reunion** Wave hindcast to support the construction of a highway above the ocean, 2014
- **United Kingdom** Detailed WW3 hindcast for derivation of 2D wave spectra time series for FPSO design purposes offshore field, Falkland Islands, 2013
- **Benin & Ghana** Monthly variations in wave climate for Port of Cotonou and Port of Tema to support container crane offloading operations, 2012
- **Barrow Island (Australia)** Expert review of Hmax/Hs design conditions for a pioneer MOF, 2012
- **Fujairah, UAB** Metocean conditions for pipeline design and SPM, 2012
- **Tobago** Metocean conditions for LNG export terminal and pipeline design, 2012
- **France** Metocean wave hindcast for SPM location close to Frontignan, 2012
- **Tobago** Metocean conditions for mooring facilities and manoeuvring analysis, 2011 / 2012
- **India** Metocean conditions for the support of an FPSRU site selection close to Diga, 2011
- **The Netherlands** Preparation and calibration of wave propagation and wave penetration instrumentation (SWAN) for Port of IJmuiden, 2011
- **Togo** Offshore wave conditions and wave penetration study, Port of Lomé, Togo, 2010
- **The Netherlands** Detailed SWAN hindcasts within SBW Wadden Sea project
- **The Netherlands** SWAN wave penetration study for new Terneuzen locks, 2007.

## Publications

- Bos, M., Koop, O.R, Bolt, E. SAFETY LEVEL OF A PROBABILISTIC ADMITTANCE POLICY, proceedings of the ASME 2011 30th int. conf. on Ocean, Offshore and Arctic Engineering, OMAE, Rotterdam, The Netherlands. June 19-24, 2011
- Westhuysen, A.J. van der, Huisman, B., Enet, F., Koop, O.R., Vledder, G.Ph. van WAVE PROPAGATION THROUGH TIDAL INLET SYSTEMS. Deltares and Alkyon report 1200114-002-HYE-0006
- Vledder, G.Ph. van, Koop, O.R. ANALYSIS OF WAVE PENETRATION INTO THE EASTERN WADDEN SEA. Alkyon Report A2302
- Adema, J., Vledder, G.Ph. van, Koop, O.R. SWAN HINDCAST IN THE EASTERN WADDEN SEA AND EEMS-DOLLARD ESTUARY DURING THE STORM OF 9 NOVEMBER 2007. Alkyon Report A2191
- Koop, O.R. CONTINUOUS AND DISCONTINUOUS GALERKIN FINITE ELEMENT METHODS ON VARIATIONAL BOUSSINESQ WATER-WAVE MODELS. M Sc Thesis, University of Twente, Enschede. Oct. 2006
- Koop, O.R. SECOND-ORDER DRIFT FORCES ON SHIPS IN MULTI-DIRECTIONAL RANDOM WAVES. Trainee Period report, University of Twente, Enschede. Sept. 2005.

## Software applications

Aktis DMA (in-house by Aktis Hydraulics)

METRIS UKC, Time-Domain, Multi-Body, En-route (in-house by Aktis Hydraulics)

SHIP-Moorings (Arcadis)

ORCAFLEX (Orcina)

OPTIMOOR (TTI)

AQWA (Ansys)

DIFFRAC (MARIN)

NEMOH (Open Source)

SWAN (TU Delft)

SWASH (TU Delft)