

**MICHAEL HARRISON**

**FIXED & FLOATING OBJECT DAMAGE ENGINEER (FFOD) / AIS & VDR ANALYST**

Imperial College of Science & Technology, BSc Mechanical Engineering 1982

Member of PIANC, Chairman of PIANC Working Group 145 (Ship Berthing Speeds)

Member of the Nautical Institute

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Michael is a mechanical and structural engineer with 30 years' experience in the analysis, design and construction of berthing structures, in particular fenders and moorings. This encompasses the critical interactions of vessels and structures, safe working loads and limits, operating procedures and practices. Michael has investigated many allision incidents involving fixed and floating object damage, fender failures, moored vessel motions, structural dilapidation, equipment defects (including latent and design defects), related operational and maintenance issues.

His background also includes the development of precision navigation systems and Michael applies this knowledge to the extraction of critical static and dynamic information from AIS and VDR records for collision and allision incidents. Michael is experienced in the accurate reconstruction, replay and visualisation of ship manoeuvres. Over the last decade he has attended many vessels of all classes and size during channel approaches and berthings as a specialist advisor and trainer to pilots in the use of portable navigation and docking aids.

Michael has provided written and oral expert evidence for a number of high profile cases involving bridge, jetty, dolphin and other structural damage as well as fender and mooring failures and related losses. This work has combined forensic investigations with ship manoeuvring information to determine event sequences and causation assessments. He has advised clients on post-incident responses to minimise operational disruptions; to retain control of costs; to enhance procedures and to mitigate the risk of future repetitions.

During his career Michael has been active in the construction of many berths and terminals around the world. He is conversant with most types of structures, engineering materials including physical properties and degradation in marine environments, testing and investigation techniques, maintenance regimes, hazard identification and risk assessments. Michael advises on berth upgrades and extending the service life of marine structures; quantum; alternatives for obsolete equipment; betterment issues.



Michael chairs PIANC Working Group 145, an international committee tasked to investigate the berthing speeds and angles of large ships; identifying factors which govern berthing speeds; implications of findings for new and existing structures; measuring and monitoring of berthing vessels and associated mitigation of risks. The WG145 report is due for publication in 2016.

### SPECIALIST SKILLS

- Fixed and floating object damage (FFOD)
- Berthing and mooring studies
- Fenders and mooring equipment design
- Materials and equipment testing
- Facility upgrades and service life extensions
- Hazard identification and risk assessments
- Precision navigation equipment
- Data extraction from VDR and AIS logs
- Navigation data analysis
- Reconstruction of collisions and allisions using various data sources
- 2D and 3D visualisations (static and dynamic)

### RECENT WORK - FFOD

- Jetty allision damage to loading platform and fenders (Malaysia)
- Dolphin damage during berthing at products terminal (Philippines)
- Dolphin collapse during berthing at oil terminal (Indonesia)
- Pile damage to berthing dolphin (Singapore)
- Dolphin damage during berthing at bulk terminal (Brazil)
- Jetty pile and crane damage at post-Panamax container terminal (China)
- Passing vessel wash damage to moored vessel and oil terminal (Argentina)
- Jetty allision structural damage investigation (Vietnam)
- Weather related damage to loading platform and dolphin, fenders and moored vessel (Indonesia)

### RECENT WORK – STRUCTURAL & EQUIPMENT

- Report into and advice on cylindrical fender failures (Belgium)
- Fender performance and material property testing protocols (UK)
- Port equipment installation and operation manuals (UK)
- Fender damage causation report (Poland)
- Fender testing reports (various clients)

### RECENT WORK – NAVIGATION DATA

- VDR data extraction, incident reconstruction and 2D visualisation for collision(China)
- Assessments of AIS, VDR, VTS and radar data for ferry collision (China)
- VDR data extraction, incident reconstruction and 2D/3D visualisations for collision (Singapore)
- VDR data extraction, incident reconstruction and 2D visualisation for collision (Middle East)
- VDR data extraction, incident reconstruction and 2D/3D visualisations for collision (West Africa)

### EMPLOYMENT HISTORY

2013 to Present	Solis Marine Consultants, United Kingdom & Hong Kong Fixed and Floating Object Damage (FFOD) Specialist AIS/VDR Navigation Data Analyst
2011 to 2013	Inshore Systems Ltd, United Kingdom Director / Precision Navigation Equipment Specialist
2008 to 2011	SystemFender Consulting Ltd (assigned to QuayQuip BV), United Kingdom Director / Engineering Consultant / Precision Navigation Equipment Specialist
1994 to 2008	Trelleborg AB, Marine Systems Division (formerly Fentek GmbH) Divisional Director
	2006 to 2008 Fentek Asia (Singapore) – Director
	2002 to 2006 Fentek Middle East (Dubai) – Director
	1994 to 2002 Fentek UK – Sales Director / General Manager
	1987 to 1994 Svedala Trellex - Technical Sales Director
	1987 to 1990 Trellex Burleigh – Technical Sales Manager
1983 to 1987	Avon Rubber plc (Offshore Division) Offshore Engineer