

The 7th International Navigational Symposium on Marine Navigation and Safety of Sea Transportation TransNav'2007

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Editor of Symposium Proceedings elaborated as Monograph titled "Advances in Navigation and Safety of Sea Transportation"

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*The 7th International Navigational Symposium on Marine Navigation and Safety of Sea Transportation **Trans-Nav'2007**, organized jointly by the Faculty of Navigation, Gdynia Maritime University and the Polish Branch of the Nautical Institute held from 20 to 22 June, 2007 in Gdynia, Poland. The Symposium was addressed to scientists and professionals in order to share their expert knowledge, experience and research results concerning all aspects of navigation, safety at sea and marine transportation.*

1 INTRODUCTION

In today's world, in addition to meeting high standards of safety, environmental protection and efficiency, the international maritime industry has to meet the demands of enhanced security. The theme of this year Navigational Symposium: "Marine Navigation and Safety of Sea Transportation" is, therefore, most timely as it provides participating distinguished delegates who represented Maritime Education and Training (MET) and research institutions, shipping industry, shipowners, classification societies, maritime administrations, ports, services, professional institutes, agencies, societies and navigational instrument manufacturers.

When Symposium on Navigation met for the first time in 1995, one of its highest priorities was "to promote last research in the field of Navigation".

What could be more relevant, therefore, than representatives from 35 countries all over the world coming together to discuss the best possible ways of preparing staff at sea, in shipping companies, ports and maritime administrations to meet these challenges? Hosted by the Gdynia Maritime University there could be no better forum for stimulating interesting and fruitful contributions to discussion of maritime safety issues and for development strategies to address them through maritime education and training.

If we are to uphold and improve standards and ensure continued vigilance, nothing could be of greater importance than the training of the maritime professionals of the future. The papers presented at the **TransNav'2007** covered a full range of topics, from operations, management and organization to engineering and sciences. This Monograph is a set to become a source of inspiration and reference for maritime institutions worldwide and it is of relevance to all who are involved in the maritime industry, especially in maritime **Transport and Navigation**.

Our imagination on positioning and location is never ending. New techniques and ideas are coming. There are so many radio signals and information infrastructures for positioning around us. Seamless and ubiquitous positioning will point and guide you wherever you are and wherever you go. It all depends on our commitment.

2. MAIN TOPICS

The Symposium main topics were the following:

- Marine navigation,
- Safety and security of maritime shipping,
- Sea transport and transportation technology,
- Hydrography, geodesy and marine cartography,
- Geomatics and GIS in maritime applications,
- Electronic chart systems ECS and ECDIS,
- Inland, river and pilot navigation systems,
- Presentation of navigation-related information,
- Route planning and monitoring; passage plan,
- Integration of navigational systems, INS/IBS,
- E-Navigation,
- GPS, Galileo, GNSS and radio based navigational systems,
- Telematics in marine transportation,
- Automation aspects in navigation; algorithms and methods,
- Ships routing and associated protected measures,
- Maritime traffic engineering,
- Systems of control, guidance and monitoring of traffic, VTS,
- Manoeuvrability and hydrodynamics of ships,
- Colregs, anti-collision, radar equipment, ARPA, AIS, VDR,
- Maritime search and rescue issues,
- Human factors, marine accidents, human errors,
- Crew resource management, safe manning, stress and fatigue,
- Navigational systems - the end user experience,
- Marine simulation; full mission bridge, navigational simulators,
- Meteorology and nautical oceanography,
- Standardization of navigational terminology,
- Maritime education and training; model courses validation,
- Decision support systems and Artificial Intelligence methods in maritime transport,
- Data transmission and processing,
- Modelling and numeric methods in maritime industry.

3. HONORARY COMMITTEE

It is my pleasure to inform that the following very important persons have kindly accepted the honorary patronage of the Symposium: Mr. Rafal Wiechecki - Minister of Maritime Economy Ministry of the Republic of Poland, Capt. Nicholas Cooper - President of the Nautical Institute, VAdm Alexandros Maratos, President of the International Hydrographic Bureau, Dr. Wojciech Szczurek - Mayor of Gdynia and Prof. Jozef Lisowski - Rector of Gdynia Maritime University.

4. PROGRAMME COMMITTEE

There is a long list of Programme Committee members, exactly one hundred names of distinguished persons in the field of Maritime Transport and Navigation from Poland, Europe and the rest of the world (25 different nationalities):

Prof. Vidal **Ashkenazi**, Nottingham Scientific Ltd, UK
Capt. Trevor **Bailey**, The Nautical Institute, UK
Prof. Andrzej **Banachowicz**, Gdynia Maritime University, Poland
Prof. Lubomir Wlodzimierz **Baran**, University of Warmia and Mazury, Olsztyn, Poland
Prof. Marcin **Barlik**, Warsaw University of Technology, Poland
Prof. Eugen **Barsan**, Constanta Maritime University, Romania
Dr. Angelica **Baylon**, Maritime Academy of Asia and Pacific, Bataan, Philippines
Prof. Knud **Benedict**, University of Wismar, University of Technology, Business and Design, Germany
Prof. Bernard **Berking**, ISSUS, Hamburg, Germany
Prof. Alfred **Brandowski**, Gdańsk University of Technology, Gdynia Maritime University, Poland
Prof. Zbigniew **Burciu**, Gdynia Maritime University, Poland
Prof. Doina **Carp**, Constanta Maritime University, Romania
Prof. Shyy-Woei **Chang**, National Kaohsiung Marine University, Taiwan
Prof. Andrzej **Chudzikiewicz**, Warsaw University of Technology, Poland
Capt. Nicholas **Cooper**, President of The Nautical Institute, UK
Prof. Krzysztof **Czaplewski**, Polish Naval Academy, Gdynia, Poland
Mr. Eric **Dawicki**, President of the Northeast Maritime Institute, USA
Prof. German **de Melo Rodrigues**, Technical University of Catalonia, Barcelona, Spain
Prof. Eamonn **Doyle**, National Maritime College of Ireland, Cork Institute of Technology, Cork, Ireland
Prof. Daniel **Duda**, Naval University of Gdynia, President of Polish Nautical Society, Poland
Prof. Janusz **Dyduch**, Warsaw University of Technology, Poland
R.Adm. Dr. Czeslaw **Dyrcz**, President of Polish Naval Academy, Gdynia, Poland
Prof. Milan **Dzunda**, Technical University of Košice, Slovakia
Prof. Ismail Deha **Er**, Istanbul Technical University, Turkey
Prof. Andrzej **Fellner**, The State School of Higher Education, Chełm, Poland
Prof. Andrzej **Felski**, Polish Naval Academy, Gdynia, Poland
Prof. Włodzimierz **Filipowicz**, Gdynia Maritime University, Poland
Prof. Masao **Furusho**, Kobe University, Japan
Prof. Wieslaw **Galor**, Maritime University of Szczecin, Poland
Prof. Avtandil **Gegenava**, Batumi Maritime Academy, Georgia
Prof. Stanislaw **Gorski**, Gdynia Maritime University, Poland
Mr. Jerzy **Graff**, British Maritime Technology Ltd., UK
Prof. Marek **Grzegorzewski**, Polish Air Force Academy, Dęblin, Poland
Prof. Andrzej **Grzelakowski**, Gdynia Maritime University, Poland
Prof. Lucjan **Gucma**, Maritime University of Szczecin, Poland
Prof. Stanislaw **Gucma**, Maritime University of Szczecin, Poland
Prof. Renkuan **Guo**, University of Cape Town, South Africa
Prof. Hideki **Hagiwara**, Tokyo University of Marine Science and Technology, Japan
Prof. Jerzy **Hajduk**, Maritime University of Szczecin, Poland
Prof. Shogo **Hayashi**, Tokyo University of Marine Science and Technology, Japan
Prof. Michal **Holec**, Gdynia Maritime University, Poland
Prof. Kinzo **Inoue**, Kobe University, Japan
Prof. Igor **Jagniszczak**, Maritime University of Szczecin, Poland
Prof. Jacek **Januszewski**, Gdynia Maritime University, Poland
Prof. Mirosław **Jurdzinski**, Gdynia Maritime University, Poland
Prof. Tadeusz **Kaczorek**, Warsaw University of Technology, Poland
Prof. John **Kemp**, Royal Institute of Navigation, London, UK
Prof. Hiroaki **Kobayashi**, Tokyo University of Marine Science and Technology, Japan
Prof. Lech **Kobyliński**, Polish Academy of Sciences, Poland
Prof. Krzysztof **Kolowrocki**, Gdynia Maritime University, Poland
Dr. Andrzej **Krolkowski**, Maritime Office in Gdynia, Poland
Prof. Bogumil **Laczynski**, Gdynia Maritime University, Poland
Prof. Jozef **Lisowski**, President of Gdynia Maritime University, Poland
Prof. Zhengjiang **Liu**, Dalian Maritime University, China
Prof. Vladimir **Loginovsky**, Admiral Makarov State Maritime Academy, St. Petersburg, Russia
Prof. Mirosław **Luft**, President of Radom University of Technology, Poland

VAdm. Alexandros **Maratos** (Greece), President of International Hydrographic Bureau, Monaco
 Prof. Andrzej A. **Marsz**, Gdynia Maritime University, Poland
 Prof. Boleslaw **Mazurkiewicz**, Gdańsk University of Technology, Poland
 Prof. Jerzy **Mikulski**, Silesian University of Technology, Katowice, Poland
 Prof. Torgeir **Moan**, Norwegian University of Science and Technology, Trondheim, Norway
 Prof. Leszek **Morawski**, Gdynia Maritime University, Poland
 Prof. Wacław **Morgas**, Polish Naval Academy, Gdynia, Poland
 Prof. Takeshi **Nakazawa** (Japan), World Maritime University, Malmoe, Sweden
 Prof. Nikitas **Nikitakos**, University of the Aegean, Greece
 Prof. Stanisław **Oszczak**, University of Warmia and Mazury in Olsztyn, Poland
 Prof. Gyei-Kark **Park**, Mokpo National Maritime University, Mokpo, Korea
 Prof. Jinsoo **Park**, Korea Maritime University, Pusan, Korea
 Mr. David **Patraiko**, The Nautical Institute, UK
 Prof. Egil **Pedersen**, Norwegian University of Science and Technology, Trondheim, Norway
 Capt. Piotr **Pernaczynski**, Head of Polish Navy Hydrographic Office, Gdynia, Poland
 Prof. Zbigniew **Pietrzykowski**, Maritime University of Szczecin, Poland
 Prof. Malek **Pourzanjani** (UK), Australian Maritime College, Australia
 Prof. Jerzy B. **Rogowski**, Warsaw University of Technology, Poland
 Prof. Władysław **Rymarz**, Gdynia Maritime University, Poland
 Prof. Chaojian **Shi**, Shanghai Maritime University, China
 Prof. Roman **Smierzchalski**, Gdynia Maritime University, Poland
 Capt. Dick **Smith**, President of the International Association of Institutes of Navigation, UK
 Prof. Henryk **Sniegocki**, Gdynia Maritime University, Poland
 Prof. Jac **Spaans**, Netherlands Institute of Navigation, The Netherlands
 Prof. Cezary **Specht**, Polish Naval Academy, Gdynia, Poland
 Cmdr. Bengt **Stahl**, Nordic Institute of Navigation, Sweden
 Prof. Andrzej **Stateczny**, Maritime University of Szczecin, Poland
 Prof. Andrzej **Stepnowski**, Gdańsk University of Technology, Poland
 Prof. Stefan **Trzeciak**, Maritime University of Szczecin, Poland
 Prof. Mykola **Tsybal**, Odessa National Maritime Academy, Ukraine
 Prof. Jozef **Urbański**, Polish Naval Academy, Gdynia, Poland
 Prof. Dang Van Uy, President of Vietnam Maritime University, Haiphong, Vietnam
 Capt. Rein **van Gooswilligen** (Netherlands), Chairman of EUGIN
 Prof. Frantisek **Vejražka**, Czech Technical University in Prague, Czech
 Mr. Philip **Wake**, Chief Executive The Nautical Institute, London, UK
 Prof. Aleksander **Walczak**, Maritime University of Szczecin, Poland
 Prof. Jin **Wang**, Liverpool John Moores University, UK
 Prof. Ryszard **Wawruch**, Gdynia Maritime University, Poland
 Prof. Wojciech **Wawrzynski**, Warsaw University of Technology, Poland
 Prof. Adam **Weintrit**, Gdynia Maritime University, Poland
 Prof. Bernard **Wisniewski**, Maritime University of Szczecin, Poland
 Prof. Adam **Wolski**, Maritime University of Szczecin, Poland
 Capt. Ricardas **Zazeckis**, Klaipeda University, Maritime Institute College, Lithuania
 Prof. Janusz **Zieliński**, Space Research Centre of the Polish Academy of Sciences, Warsaw, Poland.

I would like to express my gratitude to the Programme Committee members totally committed to papers review process. Thank you very much for the matter-of-fact critical comments, in general well received by the authors and taken into consideration in the last version of submitted papers.

Let me now to introduce the members of the Organizing Committee:

- Mr Tomasz Neumann, Symposium Secretary, our on-line manager,
- Mr. Andrzej Bomba, chairman of Technical Committee,
- Ms. Hanna Pleger, Finance Minister, Symposium Office
- Mrs Dorota Rajmanska, Registration and Catering Department,
- Mrs. Maria Lozinska, Translator, Ladies Programme,
- Mr. Piotr Kopacz, Transport and Logistic

- Mr. Krzysztof Stawicki, Accommodation
- Mr. Tomasz Degórski, Public Relation
- Capt. Henryk Nitner, World Hydrography Day manager

5. SYMPOSIUM PROCEEDINGS

Symposium Proceedings titled “Advances in Navigation and Safety of Sea Transportation” was organized thematically like a Monograph.

Each paper was reviewed by three members of the Programme Committee. Qualified papers submitted on time are published in the TransNav’2007 Proceedings. Some of them will be presented at plenary sessions, most on parallel thematic sessions and the rest on poster session. The authors were informed that the organizer reserves the right to qualify some papers for the poster session.

After the receipt of information on paper qualification by the Programme Committee an electronic version of the paper in English was submitted at web site <http://transnav.am.gdynia.pl> or as an e-mail attachment. It was informed that the above material shall be with the Symposium Office before the deadline for submission (1st April). Any material received too late (after 1st May) is not published.

5.1. Chapters of Monograph

The Monograph was divided into twenty following chapters:

- Introduction
- Chapter 1 Safety of Navigation
- Chapter 2 Navigation, Manoeuvring and Ship-Handling Simulation
- Chapter 3 Global Navigation Satellite System
- Chapter 4 Ships Routeing and Vessel Traffic Services
- Chapter 5 Automatic Identification Systems
- Chapter 6 Anti-Collision
- Chapter 7 Electronic Navigational Charts and ECS/ECDIS Systems
- Chapter 8 Technical Aids to Navigation
- Chapter 9 Integration of Navigation
- Chapter 10 E-Navigation
- Chapter 11 Weather Navigation and Meteorological Aspects
- Chapter 12 Astronavigation
- Chapter 13 History of Navigation
- Chapter 14 Methods and Algorithms
- Chapter 15 Manoeuvring in Port Area and Pilot Navigation
- Chapter 16 Safety and Security In Sea Transportation
- Chapter 17 Pollution and Environment Protection
- Chapter 18 Human Factors and Crew Resource Management
- Chapter 19 Maritime Education and Training
- Chapter 20 STCW Implementation and Maritime Policy

5.2. World Hydrography Day

The United Nations, in its General Assembly Resolution A/60/30 of 29 November 2005, “*Welcomes the adoption by the International Hydrographic Organization of the “World Hydrography Day”, to be celebrated annually on June 21st, with the aim of giving suitable*

publicity to its work at all levels and of increasing the coverage of hydrographic information on global basis, and urges all States to work with that organization to promote safe navigation, especially in the areas of international navigation, ports and where there are vulnerable or protected marine areas".

On 21st of June (Thursday) - the Second Day of Symposium - special plenary session was organized under chairmanship of RAdm. Dr. Czeslaw Dyrz and Capt. Piotr Pernaczynski, former and present Head of Hydrographic Office of the Polish Navy.

The theme of this year's celebrations was "Electronic Navigational Charts (ENCs); an essential element of safety at sea and efficient maritime operations".

5.3. Round Table Panel

On 21st of June (Thursday) - the Second Day of Symposium - the Round Table Panel Discussion was organized under chairmanship of Prof. Vidal Ashkenazi, UK. It was the most attractive part of Symposium. The title of Round Table Plenary Session was "*Galileo: A Significant Benefit to Marine Navigation?*".

It is my pleasure to present 5 distinguished panellists:

- Jean-Pierre Barboux
Galileo Applications Development Manager, Thales, France
- Carlo des Dorides
Head of the Concession Department European GNSS Supervisory Authority (GSA), EU
- Rolf Backstrom
Finnish Maritime Administration and IALA, Finland
- Capt R A Smith
President of the International Association of Institutes of Navigation, UK
- Prof Adam Weintrit
Head of Navigational Department, Gdynia Maritime University, Poland

Discussion was very interesting and answers of panellists were unique and original. Prof. Ashkenazi was as always fresh, clever and professional.

6. PARTICIPANTS

In the Symposium participated distinguished delegates from over 60 institutions from 35 countries around the world: Australia, Bahama, China, Croatia, Czech Republic, Denmark, France, Finland, Georgia, Germany, Greece, Iran, Ireland, Italy, Japan, Korea, Lithuania, Monaco, Netherlands, Norway, Pakistan, Philippines, Portugal, Romania, Russia, Slovakia, South Africa, Spain, Sweden, Taiwan, Turkey, Ukraine, United Kingdom, United States and Vietnam. Between of them were: presidents and rectors of universities, deans of faculties, directors of institutes, heads of departments, scientists, professors, lecturers and students, representatives of maritime administration, hydrographic, meteorological and oceanographic offices, institutes of navigation, space agencies, shipping industry, shipowners, classification societies, and marine manning agencies.

I would like to mention:

- RAdm Dr Czeslaw Dyrz, President of Polish Naval Academy in Gdynia
- Prof. Dang Van Uy, Rector of Vietnam Maritime University in Haiphong,
- Capt. Dick Smith President of International Association of Institutes of Navigation (IAIN),
- Capt. David Patraiko distinguished representative of the Nautical Institute,

- former and present presidents of national Institutes of Navigations: Prof. Frantisek Veyrazka, Vice-Rector of 300 years old Czech Technical University in Prague, the oldest technical university in Europe, Cmdr Bengt Stahl (Nordic Institute of Navigation), Prof. Jac Spaans (The Netherlands Institute of Navigation).
- distinguished delegates from maritime universities and academies, the members of International Association of Maritime Universities IAMU: Prof. Takeshi Nakazawa (World Maritime University, Malmo, Sweden); Prof. German de Melo (Technical University of Catalonia, Barcelona, Spain), Prof. Eugen Barsan (Constanta Maritime University, Romania), Prof. Ismail Deha Er (Istanbul Technical University, Istanbul, Turkey), Prof. Masao Furusho and Prof. Kinzo Inoue (Kobe University, Japan), Prof. Gyei-Kark Park (Mokpo National Maritime University, Mokpo, Korea), Prof. Chaojian Shi (Shanghai Maritime University, China).
- distinguished delegates from Polish institutions: Maritime University of Szczecin, Polish Naval Academy, University of Warmia and Mazury in Olsztyn, Warsaw University of Technology, Gdansk University of Technology, Silesian University of Technology, Casimir Pulaski Technical University of Radom, University of Wrocław, The Polish Air Force Academy in Dęblin, The State School of Higher Education in Chełm, Maritime Office in Gdynia, Head Office of Geodesy and Cartography, Warsaw, Space Research Centre, Polish Academy of Sciences, Unity Line Ltd. and others
- distinguished delegates from over 60 places around the world: Arundel, Barcelona, Bataan, Batangas, Batumi, Beijing, Bremen, Brisbane, Bruxelles, Carquefou, Chabahar, Chełm, Chios, Constanta, Cork, Dalian, Dęblin, Douglas (Isle of Man), Gdansk, Gdynia, Göteborg, Hamburg, Heiphong, Helsinki, Høvik, Iloilo City, Istanbul, Kalmar, Kaohsiung, Karachi, Katowice, Kiel, Klaipeda, Kobe, Kosice, Lisboa (Paço de Arcos), Liverpool, London, Malmö, Mokpo, Monaco, Naga City, Nottingham, Odessa, Olsztyn, Plymouth, Prague, Pusan, Radom, Rauma, Seoul, Shanghai, Sigtuna, Southampton, Split, St. Petersburg, Svendborg, Szczecin, Teddington, Tokyo, Trondheim, Warnemünde, Warsaw, Washington, Wismar, Wrocław and Xiamen

7. AWARDS

7.1. Best Presentation Award

To encourage the authors to give their best concerning the paper presentation, at the end of the Symposium, the best presentation was awarded. The Best Presentation Award Committee (session chairmen) made its decision by looking for:

- high quality and innovative scientific papers,
- best and most innovative paper,
- best performance of the presentation.

The winner of the best paper award, Mr. Oguzhan Gurel (Turkey), was presented to the audience at the end of the Symposium during the Closing Ceremony.

7.2. Best Paper Award

To encourage the authors to give their best concerning the paper quality, at the end of the Symposium, the best paper was awarded. The Best Paper Award Committee (rewriters) made its decision by looking for:

- originality,
- significance,
- technical Soundness
- clarity
- overall Assessment, and

- quality of English

The winner of the best paper award, Prof Frantisek Vejrazka (Czech Republic), was presented to the audience at the end of the Symposium during the Closing Ceremony.

8. CONCLUSIONS

It was a great pleasure of the Faculty of Navigation, Gdynia Maritime University in association with the Nautical Institute to host this year's Symposium and to invite scientists, theoretical and practical navigators, manufacturers, service providers, design engineers and representatives of national and international organizations, agencies and societies to meet the navigation community in Gdynia, Poland.

The 7th Symposium was accompanied by a small exhibition (Imtech, Transas, C-Map by Jappesen, PC Maritime), which will display the latest developments in on-board equipment, education and training, safety and navigation infrastructure, and navigation technologies and equipment.

I would like to express my gratitude to distinguished chairmen, speakers, exhibitors, sponsors, participants and all members of Honorary, Programme, Organizing and Technical Committees for their great contribution for expected success of the 7th International Symposium on Navigation **TransNav'2007**. I congratulate the authors for their work.

Seven such meetings were already held. This monograph is a collection of 132 various papers of the 7th International Symposium TransNav'2007. I hope that you can find something captivating and inspiring for everybody.

All TransNav'2007 papers are presented at <http://transnav.am.gdynia.pl> and the Coordinates web site.

MESSAGE FROM THE PRESIDENT OF THE NAUTICAL INSTITUTE

Opening Address for TransNav'07 at Gdynia Maritime University

The Nautical Institute congratulates its Poland Branch members for pro-actively working together with the Gdynia Maritime University to organise this impressive Conference. The issues facing the maritime industry today are certainly no fewer than those that drove the Founding Members to form The Nautical Institute back in 1971 so the need for our members to work with other professionals from diverse sectors to address issues facing the industry is as important as ever. Indeed the tasks and regulations with which today's mariners have to cope are even more complex and extensive. Evidence of this complexity can be seen in many different ways:

- The increase in technology aboard ship with integrated bridge and navigation systems in some cases and an array of stand-alone equipment in others.
- The increase in alarm systems, each of which is designed to help the mariner, but which may actually distract and confuse the watchkeeper.
- The increase in the regulatory burden which can be accurately measured by the doubling in size and content of the 2nd Edition of the Institute's publication "The Shipmaster's Business Companion" in just six years.
- The changes in the structure of shipping as regards manning and management.
- The detrimental effect these changes are having on the experience and competence of watchkeeping officers worldwide, and the increasing workload this is putting on the senior officers.

Many of these changes have had a positive effect on the safety and efficiency of shipping but all change needs to be managed in a thoughtful and properly planned manner. This requires leadership and ensuring that those affected by the change understand it and have a constructive input into it. In this way, the change will be made more effective. The Nautical Institute continues to play an important part in this process of change and constructively questions particular proposals, practices, or regulations where we feel it is professionally necessary to do so. The branches have a major role in this process on both an international and local level and working with the maritime universities and colleges is essential in ensuring that future generations of seafarers are properly educated and training for their responsible and demanding role of providing a safe and efficient shipping service.

The Council of The Nautical Institute and the Secretariat will continue to work closely with the Poland Branch and Gdynia Maritime University in helping to resolve the professional issues of today and the future so as to promote and develop high standards of education and training. It is indeed impressive that over 130 Papers have been received for this Conference on a wide range of relevant issues, and, having reviewed some myself, I am aware that they are of a high quality. I congratulate the authors for the work they have put in and I am sorry not to be able to attend in person to hear the best presented but I have had to return to my ship.

*The President of The Nautical Institute
Captain Nicholas Cooper, FNI
Shipmaster*