SIGTTO NEWSLETTER

Issue 51 2024 in review

Message from the Secretariat

SIGTTO continues to work to improve the safety of liquefied gas shipping. In recent years, this activity includes emerging issues such as CO_2 shipping, large scale ammonia shipping and hydrogen shipping.

The main focus of SIGTTO for the past few years has been on the revision of the IGC code, which has effectively been completed in September this year at CCC 10, subject to MSC approval and adoption. Updating the IGC code is the final step in a long process that started many years ago at the GPC. All safety improvements are first identified at the GPC and then executed by a working group which results in an industry best practice publication. This new information provides the basis for discussions to improve the IGC code.

The new updates to the IGC code benefit from the work carried out on CO_2 transportation, the use of LPG as a fuel and lessons learnt from incidents. We are honoured to participate in the revision process and are grateful for the support of Flag States and other NGOs at IMO for the collaboration to make the industry safer. Our current safety focus at the IMO is on the use of ammonia as a fuel on gas carriers.

The GPC continues its good work on critical safety items such as Emergency Release Systems, Reliquefaction systems and Training. Emerging issues such as CO_2 pressure relief systems and ammonia as a fuel are also being worked on.

The Environmental Committee continues to work to provide guidance to the industry on measures to reduce CO_2 and methane emissions. The EC has also published a briefing note on calculation of nitrogen in LNG BOG. The EC also considered the application of IMO's CII to LNG carriers and submitted papers to MEPC 82.

SIGTTO held three Regional Panel meetings in 2024 in Houston, London and Shenzhen. The Shenzhen Panel was very kindly hosted by CLSICO and this was a very successful event. The Regional Panels are becoming increasingly popular as they provide useful information and a venue for networking on safety issues. We welcome all members to attend the event closest to their location.

We are very pleased to welcome the following companies became SIGTTO members in 2024 and look forward to working with them to improve the safety of the industry:

1. ABU DHABI MARINE SERVICES CO. - SAFEEN LLC
2. NEXT DECADE
3. RWE SUPPLY & TRADING
4. BOTAS TRADING IC
5. IBAIZABAL TANKERS S.L.U.
6. FLOGAS BRITAIN
7. PT PERTAMINA INTERNATIONAL SHIPPING

We acknowledge the importance of clear communication with members, and there will be an increased focus on this in 2025. We encourage your feedback on our enhanced communication to let us know what is working and what is not. Please also don't hesitate to reach out to us anytime with your feedback or suggestions.

We recognise that the effectiveness and good reputation of SIGTTO is due to the efforts of the industry. Thank you very much for your support.

Upcoming Meetings

1st April, Singapore
General Purposes Committee 90

2nd April, Singapore
Regional Panel

TBC May, Singapore
Spring Board Meeting

7th October, London
General Purposes Committee 91

8th October, London
Regional Panel

12th November, Houston
AGM & Autumn Board Meeting

13th November, Houston
Regional Panel

Board Meetings & AGM

The SIGTTO Spring Board Meeting took place in Nagoya, Japan on the 22nd of May 2024. The Board discussed the current work of the Society and provided guidance for the future.

In addition to the Board meeting, there was the opportunity to meet and discuss with the wider Japanese members at a special members session. On the following day, a visit was organised to JERA's Hekinan Thermal Power Station to where the demonstration testing of ammonia substitution was being carried out.

The discussions at the Board, meeting many Japanese members and the visit to the Thermal Power Station resulted in a very informative and productive week for the Society. We are very grateful to SIGTTO Board Vice-President, Mr Tetsuya Watabe and the Japanese members for kindly hosting the SIGTTO Board members.

The SIGTTO Autumn Board Meeting and Annual General Meeting took place in Athens, Greece on the 13th of November 2024. The finances and membership of the organisation were reviewed and the plan and budget for 2025 were approved. The AGM was a good opportunity to meet with the wider membership and discuss the work of the Society. We are very grateful to SIGTTO Board Director, Andreas Spertos and the team at Maran Gas for kindly hosting the SIGTTO Board members.

During the same week in Athens, SIGTTO Board members were invited to visit DESFA's Revithoussa Terminal. This was a good opportunity to learn about the process and new initiatives at the Terminal. We are very grateful to the team at DESFA for very kindly hosting SIGTTO Board members.

New Members

We welcomed the following new members to the Society in 2024:

Full Members:

BOTAS TRADING

PERTAMINA INTERNATIONAL SHIPPING

Associate Members:

FLO GAS

SINCE 1861

NEXTDECADE

RWE

SAFEEN MARINE SERVICES

GPC Update

The SIGTTO General Purpose Committee (GPC) oversees the safety aspects of the Society. Its 88th meeting took place in April 2024 in Houston and the 89th in October in London. Discussion was structured around the ongoing working groups with special focus on Gas as Fuel in Gas Carriers, CO_2 cargo shipping, Emergency Release Systems (ERS), Human Factors and SIGTTO's technical position at the IMO.

Ongoing Working Groups

Emergency Release Systems (ERS)

Emergency Release Systems Working Group

ERS are common in liquefied gas terminals. In response to incidents involving their unintended activation, the General Purposes Committee (GPC) agreed to update LNG Emergency Release Systems (2017). The new publication will include additional liquified gases such as LPG, ammonia and CO_2, and high-pressure gases e.g. gas send-out system of FSRU.

The decision to install an ERS is based on local regulations, international standards, industry best practice or the result of a risk assessment.

The working group will provide guidance on the risks that need to be considered as part of the site selection of a terminal and the cargo transfer system, and, if installed, the integrity requirements of the ERS.

They will provide guidance on how to assess the ERS failure modes, design and operational considerations so that ERS are safely used in a terminal.

Reliquefaction Systems on Gas Carriers

Building on IGC Code Chapter 7 "cargo pressure/temperature control", the safety and GHG related aspects of reliquefaction systems will be further addressed with respect to cargo specification, system design and operation, interface with the fuel system, and ESD system.

Emergency Preparedness of Gas Carrier

The working group continues to focus on topics of gas carrier emergency preparedness, highlighting the importance of contingency plan, information exchange with 3rd parties, credible and thorough drills, and personnel competency management system components.

Minimum Content for LNG Training Courses

Properly trained and competent personnel are a critical part of the risk reduction measures taken for LNG cargo operations.

Based on LNG Shipping Suggested Competency Standards, this publication will provide guidance to training providers to design a model course. Considerations for the minimum recommended content and duration will be provided along with general guidance for assessing and evaluating methods. The course will be structured in a dry dock to dry dock cycle and include simulation exercises.

These training courses are designed for cargo equipment and deck management level officers. It will be the responsibility of the owner to decide the appropriate level of training required, as part of a formal competency management system. Additional training and on-board experience, not covered by this document, will also be required.

Shore Staff Suggested Competency Management System Standards

This publication is part of SIGTTO's human factors series and in particular aims to increase the awareness of the shipping industry on competent management system framework for shore staff. Some best practices will be based on other high-hazard industries such as upstream oil and gas.

Ship-to-Ship Transfer Guide

OCIMF, CDI, ICS and SIGTTO are the four co-authors of this publication, and OCIMF is the lead organization who planned to publish by summer 2025. Comments raised by the industry will be implemented along with other improvements and lessons learnt.
Ship-to-ship (STS) cargo transfer operations are increasing, and useful guidance for ship operators' competence management systems such as LNG and LPG Shipping Suggested Competency Standards will be included. Current STS safety checklists will be updated aligning with the International Safety Guide for Oil Tankers and Terminals (ISGOTT) 6th edition methodology which addresses the human factors aspects related in their use.

Ongoing Working Groups

The following new working groups have started this year:

Auxiliary Systems on Gas Carriers Using Gas as Fuel

The industry of liquified gas transported by ship is evolving and the use of LNG as fuel is fairly common in LNG carriers. In the coming years, it is expected that LNG and other fuels such as LPG, ethane and ammonia are used in gas carriers.

The working group will provide guidance on auxiliary systems related to the design and operation of these systems.

Spare Parts and Special Tools of Safety Critical Equipment on Gas Carriers

The aim of this working group is to produce guidance for the identification of the safety critical equipment of gas carriers and on the considerations of spare parts and special tools carried on board.

This publication will take into account OCIMF Safety Critical Equipment and Spare Parts Guidance and IACS No. 26 to 30 on Spare Parts but applicable specific to gas carriers and including considerations on gaseous fuels.

CO_2 Pressure Relief Systems

As part of the work on the recent publication, Carbon Dioxide Cargo on Gas Carriers, it was identified the need to assist with safe design and operation of CO_2 pressure relief systems considering the unique properties of CO_2. The working group will review the existing regulations and industry standards and provide useful references and clarifications when applied.

IMO Activities

Safety

IGC Code

SIGTTO's focus at IMO is the safety of gas carriers. Over the last few years the principal IMO instrument for gas carriers, the IGC Code, has been under review. During this time SIGTTO has submitted or co-sponsored ten papers contributing to this work. The detailed work is carried out in the Sub-committee on Carraige of Cargoes and Containers (CCC) that last met in September 2024 (CCC 10). In related work Interim Guidelines for use of LPG cargo as fuel under the IGC Code have been developed and issued as MSC.1/Circ.1679; and MSC.565(108) on Revised interim recommendations for carriage of liquefied hydrogen in bulk published.

The CCC 10 meeting finalised the technical aspects of the IGC Code revision and MSC 109 approved it in December. The draft will now be subject to adoption later this year and it is anticipated to enter into force in January 2028. There have been over 80 amendments. Many are clarifications, for example clarifying text that has been the subject of Unified Interpretations, others are more substantive including: ESD requirements, the carriage of CO_2, isolation of PRVs, the use of LPG as fuel and filling limits.

To permit the use of ammonia cargo as fuel, the prohibition of the use of toxic cargo as fuel was amended in chapter 16. This change was fast tracked through the approval process and will enter into force in January 2026. To support this change, guidelines for the use of ammonia as fuel are being developed through a correspondence group that will report to CCC 11 next September, when the guidelines are expected to be finalised. SIGTTO work in this area is guided by the principles laid out in our information paper Gas as Fuel on Gas Carriers.

Safe Decarbonization

In response to the drive to 'net zero', and the new fuels and technologies this may involve, MSC 107 formed a correspondence group to consider the development of a regulatory safety framework to support the IMO GHG agenda. The CG has developed a list of alternative fuels and new technologies being considered by the shipping industry, and considered the technical aspects, hazards and risks, and regulatory barriers and gaps associated with these fuels and technologies. This work continues through the Maritime Safety Committee.

Environment (GHG)

The Marine Environment Protection Committee (MEPC) continues its work towards 'net zero' GHG emissions in support of the IMO 2023 GHG Strategy. MEPC 82, meeting last October, further progressed this work focusing on the review of the short-term measures and development of mid-term measures.

It was agreed to split the review of the CII and EEXI into two phases to facilitate the consideration of c. 80 papers submitted on this topic (CII). Phase one will be concluded at MEPC 83 (Spring) to ensure implementation of any agreements in 2026 and will include the CII reduction factors for 2027-2030. It is expected that most proposals will be considered in detail in the second phase.

It is widely agreed the mid-term measure will consist of both a technical (on GHG fuel intensity) and economic (some form of carbon pricing) measure. A framework of what such measures may look like was further developed, essentially highlighting the components that will be necessary. The work going forwards will involve the development of not only the measures themselves, but a Comprehensive Impact Assessment, Lifecycle Assessment Guidelines, and a fifth IMO GHG study. It is anticipated the mid-term measure will be agreed at MEPC 83 in spring this year.

EC Update

The SIGTTO Environmental Committee (EC) met for its fourth and fifth meetings, in Houston and London, last year. Under the chairmanship of John Boreman (BP), and with a focus on decarbonization, the topics discussed included reduction of CO_2 and methane emissions on gas carriers and LNGCs, the revision of IMO's CII, and the deduction of nitrogen in DCS reporting.

Publications

As the IMO SEEMP guidelines allows nitrogen to be deducted from LNG consumption for propulsion (as it does not contribute to CO_2 emissions), the EC has finalized a briefing note on its quantification IMO Data Collection System (DCS): Calculation of N2 in LNG. With the aim of ensuring consistent DCS reporting across the industry, it is recommended the calculation is done using data from gas chromatography or detailed information on cargo composition at both receiving and discharge terminals. It is recommended that the ship operator is provided with the cargo composition at both loading and discharge terminals. It is available now as a free download.

Also, the EC reviewed the draft publications Reduction of Gas Carrier CO_2 Emissions and Reduction of LNGC Methane Emissions provided by the respective working groups. These documents discuss and make recommendations on the reduction of GHG emissions through design and construction, operations, and inspection and maintenance. It is anticipated they will be published as free downloads soon.

The publications build on two previous documents Measurement and Reporting of CO_2 Emissions from Gas Carriers and Detection and Reporting of Fugitive Methane Emissions from LNG Carriers, published in 2022. This collection of GHG focused guidelines aims to assist the industry in its efforts to reduce its impact on the environment and meet the goals in the IMO 2023 GHG strategy. As the IMO GHG regulations are reviewed and further developed, and industry experience gained, it is anticipated these documents will be revised to ensure they reflect the latest best practices.

CII

Throughout last year the EC has been carefully considering the application of the IMO's CII to LNG carriers, with reference to the CII review being conducted at IMO. The EC has developed an information paper providing technical explanations of LNGC operation, with an emphasis on boil off gas management; and a substantive paper raising concerns with the application of the CII to LNG carriers. SIGTTO submitted these papers to MEPC 82 providing background information and making proposals concerning port waiting times, ship to ship transfers, and LNGCs operating as bunker vessels.

Methane Slip

As part of the IMO work on fuel lifecycle assessment guidelines (LCA) the EC has been scrutinizing the work of the IMO correspondence group considering the impact of methane slip and continues to consider SIGTTO's position on this topic.

Regional Panels

Houston

The Houston Regional Panel was held on Wednesday, 17th April. Eleni Lazaratou from Maran Gas Maritime Inc. chaired and she with assitance from secretary, Technical Adviser, Adrian Ruiz who opened the day with an update on SIGTTO activities.

Maxime Le Poupon of Bureau Veritas presented on LNG carrier efficient design regarding GHG emission reductions and leak detection and repair.

James Sneddon of Risktec then presented on the application of ALARP within a prescriptive regulatory environment.

The US Coast Guard then shared three presentations: one from Dr Cynthia Woodlock regarding an update on filling limits and the Coast Guard's approach to updating US Regulations and IMO rules, one from LCDR Jason Ryu on the top 5 deficiencies and National Centre of Expertise highlights in the past year and one from LCDR Brent Mellen on the US Coast Guard's HQ vision, updating Qualship 21 and what is on the horizon.

The USCG and SIGTTO Technical Adviser, Adrian Ruiz

Nazmul Rahmani of the Mary Kary O'Connor Process Safety Center at Texas A&M University presented on dynamic (operational) risk management in the shipping operation before the group broke for lunch.

Upon reconvening, Matthew Davidson from ABS kicked off the afternoon session with a presentation on statutory emission regimes and issues related to gas carriers.

Stephanie Wynn of Babcock LGE shared on cargo handling systems for liquefied carbon dioxide and very large ammonia carriers.

Philippe Lavagna of Imodco/SBM Offshore followed with a presentation on ammonia single point mooring.

Futa Ito of Fukui shared on design, selection and testing of pressure relief valves in liquefied carbon dioxide carriers and liquefied hydrogen carriers.

Paul Raisig of SVT then presented on MLA components, maintenance and inspection.

The final presentation of the day was given by Matt Richardson of Trelleborg Westbury, Klaw Products on an overview of the LNG hose transfer.

London

The London Regional Panel was held on Wednesday, 9th October and received a record-breaking number of registrations.

Eleni Lazaratou reprised her role as Chair for the morning session which started with another update on SIGTTO activities by Technical Adviser, Yunzhe (Jack) He.

Early presentations focused on ammonia, with Tsutomu Sakai of JERA sharing a presentation on a demonstration test of substitution with 20% ammonia at Hekinan Thermal Power Station. Paul Coppin of 3M followed this with a product demonstration on working with ammonia in the maritime sector.

Dr Eleanor Lister from Last Fire shared on the transition to PFAS free firefighting foam, focusing on research, design standard changes and the challenges ahead.

Lloyd's Register's Jack Dalope presented on the design considerations of membrane tank technology for the carriage of LH2 before Equinor's Knut Maråk brought the morning session to a close with a presentation on the

technology development for LCO_2 ship transport.

The afternoon session, chaired by Hans Weverbergh of Excelerate Energy, commenced with a presentation by Pablo Vega Perez from Shell on the lifecycle integrity management framework for Emergency Release System (ERS).

The afternoon session was chaired by Excelerate Energy's Hans Weverbergh

The IMO's Camille Bourgeon shared a brief view of their energy efficiency and greenhouse gas strategy.

Neil Wilson of Cryostar then presented on LNG carrier boil-off gas management using subcoolers and Ajay Edakkara of BP Trading and Shipping presented on the reduction of LNG carrier methane emissions.

The penultimate presentation was given by Rotoboost's Kaisa Nikulainen on rethinking carbon capture through precombustion carbon removal and the day came to a close with a final presentation from UNEP's Lisa Solomchuk and the Oil & Gas Methane Partnership 2.0 and the developments associated with the LNG value chain.

Shenzhen

Our Shenzhen Regional Panel, sponsored by CLSICO, took place on Thursday, 24th October. The event was chaired by CLSICO's Andrew Johnston and opened with a keynote speech from Xu Hui, Vice President of China Merchants Energy Shipping Co. Ltd.

The morning session started with an update for regional members on SIGTTO activities from Technical Adviser, Yunzhe (Jack) He.

Hong Huiyong of the Maritime Safety Administration of China shared on the PSC case on LNG Ships and Alan Ng from China LNG Shipping International Co., Ltd. presented on using IAS management to enhance safety and reliability on LNG vessels.

Wang Lei presented on new technology in LNG carriers at the Hudong-Zhonghua Shipyard and Lloyd's Register's Shi Ruzhang presented on a safety case using hydrogen as fuel.

Sun Lei from the China Classification Society closed the morning session with a presentation on advanced trends of liquefied gas carrier technology and design.

The afternoon session started with a comparative analysis of strengths and challenges in the overall picture of the CCS value chain, focused on medium and low pressure LCO_2 carrier types, presented by TGE Marine Gas Engineering.

Emerson's Lee Yong Tat then presented on isolation and piping considerations in tank safety valves and Hiroshi Kawasakiof Riken Keiki followed with a presentation on the necessity of gas detection on vessels.

Rotoboost's Kaisa Nikulainen presented on rethinking carbon capture through precombustion carbon removal again, followed by Chang Yuan of the Shanghai Marine Diesel Engine Research Institute insights on LNG re-liquefaction systems.

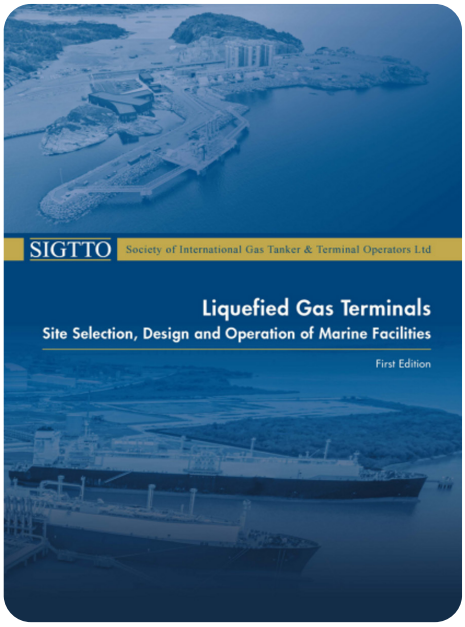
Wakabayashi Yoichi & Amano Keisuke from Mitsui O.S.K Lines closed the day with a presentation on installing a wind challenger on LNG carriers.

We thank Andrew Johnston and CLSICO for their great effort to host an excellent event.

CLSICO's Andrew Johnston and Technical Adviser, Jack He

New Publications

Liquified Gas Terminals - Site Selection, Design and Operation of Marine Terminals

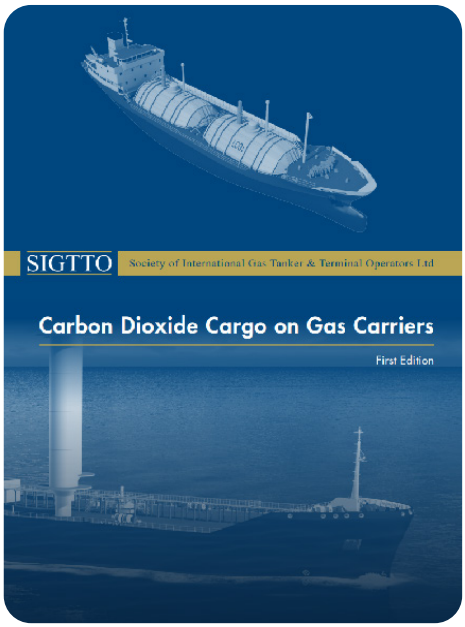


This document provides high-level recommendations on risk reduction measures for terminals that are designed using prescriptive (e.g. NFPA 58) or risk-based (e.g. EN 1473) approaches. While this document does not advocate for any one approach, risk-based language is used to help communicate best practice effectively.

Focus is given to the safety philosophy of marine aspects of shore-based terminals such as gas carrier approach, mooring, cargo transfer, emergency response and some human related aspects. Nearshore terminals that are within a port facility may also find the general information useful.

Products such as LNG, LPG, ammonia and CO_2 are covered by this document in response to the growing demand in the liquefied gas industry.

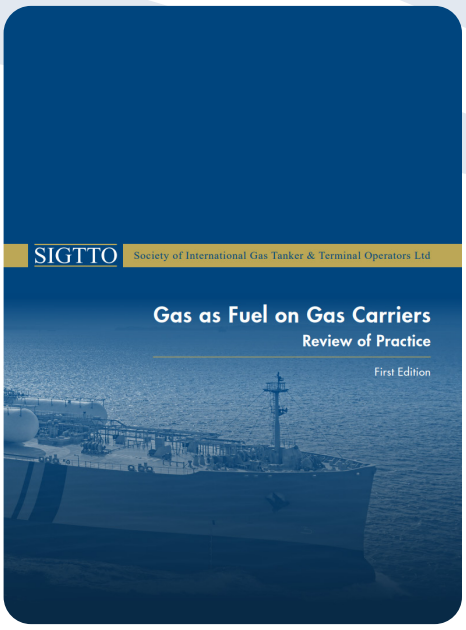
Carbon Dioxide Cargo on Gas Carriers



This document provides high-level guidance to assist the gas shipping industry with the emerging carriage of liquid CO_2 (LCO_2). This safety-focused review first identifies key properties of CO_2 and its hazards alongside other products that are commonly carried by gas carriers. Current liquefied gas regulations and guidelines are then reviewed with suggestions on what may be considered for LCO_2 shipping. Finally, this document provides design and operational considerations in context of LCO_2's unique properties.

The efforts of this working group have produced guidance for organisations that are involved in the design and operation of CO_2 carriers and terminals. It does not provide specific information for ship or terminal design. Once the liquefied gas industry has more experience in the transportation of CO_2, additional information will become available.

Gas as Fuel on Gas Carriers



It is SIGTTO's policy to support IMO's environmental goals. This document aims to help to achieve these targets by providing technical background and the basis for the development of the regulatory framework for gas carriers using LPG and ammonia as fuel.

Aligned with the IMO "one ship, one code" philosophy, this document suggests extending existing knowledge and experience to new fuels, rather than to have two different safety philosophies on the same ship.

It reviews the current safety philosophy when LNG cargo is used as fuel, and when LPG and ammonia are carried as cargo. Risk-based language is used to review the hazards from first principles and highlights the existing control measures that are given in the IGC Code, standards and industry best practice. However, it recognizes that this is an early stage of the process of full implementation of these new fuels.

Recommendations for Liquefied Gas Carrier Manifolds, Second Edition (2018 - Addendum)

An addendum has been published to provide alternative design for drip trays and clarification for LPG and ammonia bunker manifolds. Additionally, due to a change on ASME committee rounding policy, flange and fitting dimensions have changed and it is clarified that the clarified that the dimensions should follow the latest edition of the ASME code.

This is a free download from the SIGTTO website.

Condolences

Robin Gray, former SIGTTO General Manager

Robin Gray
General Manager of SIGTTO
1984 -1991

Robin joined SIGTTO in May 1984, taking over from the founding General Manager, Maurice Holdsworth. Prior to SIGTTO, he worked for Hawthorn Leslie shipyard, which then merged in 1968 with Swan Hunter and Vickers Naval Yard to form Swan Hunter and Tyne Shipbuilders. He was involved in the construction of several refrigerated LPG ships over his career in the shipyards.

His work went beyond the confines of the shipyards. He was involved with the Universities of Durham and Newcastle in developing the Swan Hunter Liquefied Gas Familiarisation Course in the early 70s. He sat on a UK government committee, reviewing the work which led to the creation of the first version of the IGC Code.

He was also working with the International Chamber of Shipping to understand the issues around the surge phenomenon generated in emergency shutdown systems.

Robin wrote "Hydrates in LPG Cargoes - A technical review", which is still the definitive document on the hydrate issue (written before joining SIGTTO).

In 1984, my employer, Shell, put me forward to be a member of the Society's General Purposes Committee (GPC). To this new boy on the block, to whom most other members seemed a generation older, Robin could not have been more welcoming or supportive.

Shortly thereafter Robin invited me to join a working group (WG) examining the issues around establishing safe filling limits for pressurised LPG tanks in event of a severe fire. At the first meeting I attended, and without any prior warning, Robin put me forward as chairman of the WG. I was duly elected!

The IMO rules as then written proposed a filling limit based on some apparently conservative assumptions. This formulation had been put forward by a group led by a redoubtable gentleman from USCG, Bob Lakey.

With much work, including some ground-breaking computer analysis by Professor Jim Venart at the University of New Brunswick, Canada, we were able to demonstrate convincingly that the 'conservative' assumptions in the rules did not lead to the best, i.e. safest, outcomes.

Robin then gave a masterclass in how to get complex amendments through the IMO committee system. We were ultimately successful and the formulation the WG developed still stands.

Robin and I worked closely on this over a number of years and, as a result, became firm friends. He was generous of spirit, kind and friendly – he could justifiably be described as a 'gentleman' of the old school variety.

He was ably supported by his wife, Mary, who, despite a heavy SIGTTO travel schedule, kept his feet firmly based in Northumberland.

Bill Wayne

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