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SIGTTO

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MESSAGE FROM GENERAL MANAGER



SIGTTO strategy for the 21st century

As LNG shipping embarks on its second half century, Andrew Clifton, the SIGTTO General Manager, looks at the Society's new Strategic Plan

The Society enjoyed a very busy and successful 2014. The highlights of the year were the joint celebration of 50 years of LNG shipping and 35 years of SIGTTO, the Panel Meetings in Paris and Livorno, the publication of our Panama Canal document and the approval of the Society's Strategic Plan.

SIGTTO's membership continues to grow and we engage with our membership on a continuous basis through a busy schedule of meetings, including those of the General Purposes Committee (GPC), the Panel and the Board. In addition our regional forums extend to our contact with members to all the key gas tanker and terminal spheres of influence worldwide.

The 60th Panel Meeting, which was kindly hosted by OLT Toscana, was held in Livorno, Italy last October and was a great success. Mr Giovanni Perrella, deputy general manager of the country's Ministry of Economic Development, gave the keynote speech. Around 150 members attended the two-day event and we received a considerable amount of positive feedback concerning the proceedings from those attending.

The gathering was very much a celebration of 50 years of LNG shipping and 35 years of SIGTTO. The achievements of the industry since the first delivery of a commercial cargo of LNG in October 1964 and the establishment of SIGTTO in 1979 are indeed notable and, we felt,



There was a full house at Livorno for the 60th Panel Meeting

justified our indulgence in recapping the highlights and remembering the pioneers. The Livorno Panel Meeting presentations are covered in more detail on page 6.

It was an honour to have Jim Whyte, some 85 years young, with us in Livorno and making a most impressive presentation on the history of LPG shipping. We also showed a video interview with Roger Ffooks, now 89, which had been recorded a few weeks earlier at his home in the UK. Robin Gray, the second SIGTTO General Manager, was another industry veteran who was unable to be with us in person in Livorno. However, his written contribution, on the pioneers of liquefied gas carrier design, was presented to the delegates by Chris Clucas on his behalf.

Credit needs to be given to these pioneers who contributed to not only the development of design standards and operating procedures during the early days of liquefied gas shipping but also the development of the International Gas Carrier (IGC) Code. The exemplary performance record of gas carriers since the birth of the industry bears testament to the efficacy of ... *continued on page 3* >

"Our new Strategic Plan will help ensure that SIGTTO meets the needs and expectations of its membership in the 21st century."

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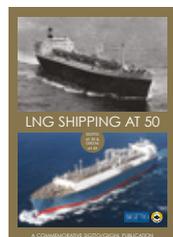


...continued from page 1 >

the safety margins and design provisions incorporated in the first edition of the IGC Code. The pioneers can be justifiably proud of the key role they played in laying the foundation stones on which the industry's excellent safety performance has been built.

The Livorno Panel Meeting concluded with a technical visit to *FSRU Toscana*, the floating regasification vessel moored about 22 km off the coast between Livorno and Pisa. *FSRU Toscana* is the industry's first permanently moored LNG receiving terminal serving in a true offshore working environment. The excursion was exceptional; the weather was good and the FSRU staff laid on a well organised and interesting tour.

LNG Shipping at 50, the commemorative publication compiled for SIGTTO and our colleagues at the International Group of LNG Importers (GIIGNL) by Riviera Maritime Media, has proved to be a most popular production. Copies of the 124-page magazine are available at no charge from the SIGTTO Secretariat for those who have not yet seen a copy or wish further copies for onward distribution.



It is interesting to note that several SIGTTO members have supplied a copy to each vessel in their fleet. We believe it is a rather unique reference document and one of the few publications available that catalogues

the early days of LNG shipping in such depth. *LNG Shipping at 50* follows up its detailed coverage of the pioneering days with investigations into how the LNG shipping industry evolved during its middle years and then examines the numerous technological breakthroughs that have been made over the past decade. The publication concludes with views from a range of experts on where the industry might be in 2029, on the occasion of SIGTTO's 50th birthday!

The next 15 years of the Society's activities

will no doubt be stimulating, as the industry grows and the gas shipping and terminal supply chain continues to expand on a worldwide basis. A very important stepping stone for onward progress at SIGTTO was anchored in place when the Society's Board approved a new Strategic Plan at its autumn meeting in Oslo in November 2014.

The Plan has been formulated to ensure that the Society remains relevant and fit for purpose to meet the needs and expectations of the membership in the 21st century. It will play a key role in the future direction taken by the Society, not least by outlining a 2020 vision of where SIGTTO wishes to be at the end of the decade. To achieve this vision, various actions need to be taken. These include providing an increase in resources and delivering on a range of objectives and key performance indicators (KPIs). The Strategic Plan is described in more detail on page 11.

SIGTTO's Panama Canal publication, *Guidance for LNG carriers transiting the Panama Canal*, was released in June 2014 and reviewed in the Autumn 2014 edition of SIGTTO News. It continues to be a popular

“The exemplary safety performance of gas carriers bears testament to the soundness of the first IGC Code's provisions”

addition to our list of titles, with good sales figures. As has been previously mentioned, the document contains extensive technical guidance for LNG vessels when they transit the enlarged Panama Canal locks that are soon to be commissioned. The guidelines include details of any modifications required in order to make a vessel 'Panama-ready'.

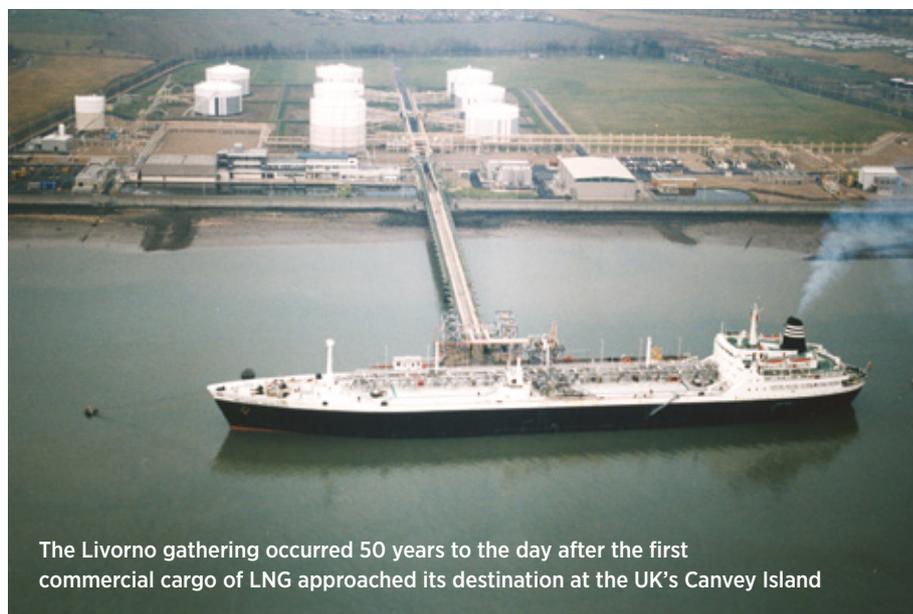
SIGTTO will organise several regional forums in 2015 as well as one Panel Meeting, two GPC meetings and two Board meetings. There will be no autumn Panel this year due to the clash with the October Gastech conference in Singapore.

The Spring 2015 Panel Meeting will be held in Shenzhen, China in mid-April. Paul Oliver and his team at China LNG Shipping (International) Co Ltd (CLSICO) along with the Guangdong Dapeng LNG (GDLNG) terminal are kindly hosting the event. CLSICO's operations are profiled on page 12.

This is our first ever Panel Meeting in China and, with a wide range of speakers and topical presentations lined up, it promises to be an exciting event. An important emerging market, China is already a leading LNG and LPG importer as well as a builder of gas carriers of growing stature. We are also grateful to GDLNG which will host the technical visit to its nearby receiving terminal following our Panel Meeting.

Cherian Oommen, Rick Boudiette and Thierry Descamps, SIGTTO's technical staff at the Secretariat, remain extremely busy and continue to push ahead with a portfolio of new publications. I also wish to mention my office manager Andrea Baseley and membership manager Susan Humphrey who work hard in a small but busy office.

I look forward immensely to the fresh challenges of 2015 and to another busy, but productive, year for the Society.



The Livorno gathering occurred 50 years to the day after the first commercial cargo of LNG approached its destination at the UK's Canvey Island



WMT have ship-specific operating manuals on board the majority of the world's LNG fleet



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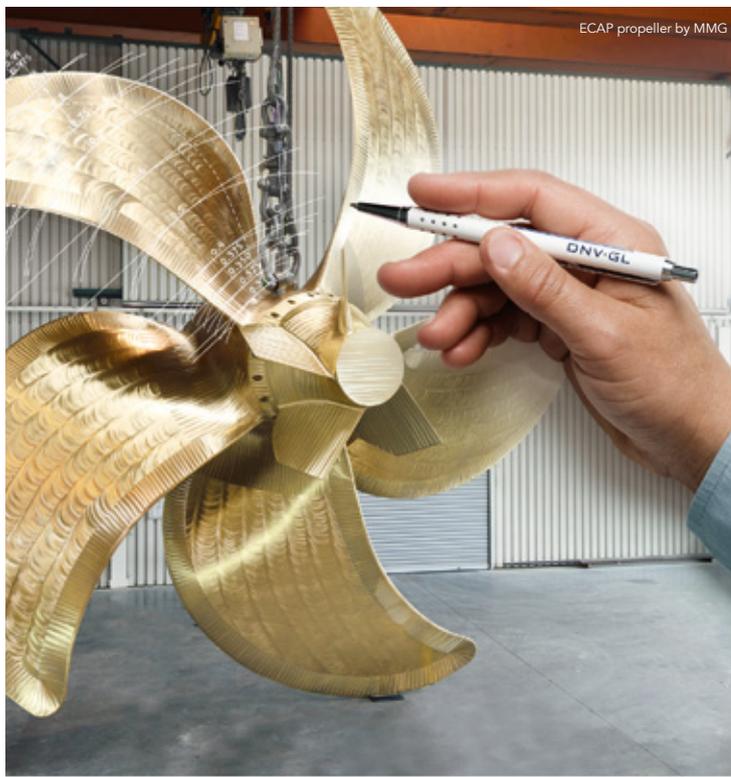
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Recent gas-related developments at IMO and EU

IGC Code update - The Revised International Gas Carrier (IGC) Code will enter into force on 1 January 2016, with an application date for keels laid (or construction identifiable with the ship begins) on or after 1 July 2016. As a reminder, the revised IGC Code will not be retroactive.

IGF Code update - The draft of the International Code for Ships using Gas or other Low Flash-Point Fuels (IGF Code) was approved in principle at the 94th session of IMO's Marine Safety Committee (MSC94) in November 2014, with a view that the instrument be adopted at MSC95 in June 2015. The Code's entry-into-force date will most likely be January 2017. A key issue which remains outstanding is that regarding the location and size of LNG bunker tanks. It is intended that this matter be resolved at MSC95 prior to adoption of the Code.

The draft IGF Code addresses methane as a vessel fuel but work on other low-flash point fuels has already commenced via a Correspondence Group. This Group is charged with looking at fuel cells, low-flash diesel and methyl-ethyl alcohol.

MSC94 also adopted interim guidelines covering the training of crews on gas-fuelled ships and approved amendments to the Standards of Training Certification and Watchkeeping (STCW) Convention regarding training for crew members on gas-fuelled ships.

EEDI for gas carriers - The International Association of Classification Societies (IACS) is currently revising its Procedure for Calculation and Verification of the Energy Efficiency Design Index (EEDI), known as PR38, to take into account MARPOL Annex VI amendments and guidelines adopted at the IMO Marine Environment Protection Committee meetings held in 2014 (MEPC66 and 67). These amendments require LNG carriers with a non-conventional type of propulsion system to comply with the EEDI regime and enter into force on 1 September 2015. The entry-into-force schedule covers vessels whose shipbuilding contracts were placed on/after 1 September 2015; whose keels were laid on/after 1 March 2016; or whose delivery was on/after 1 September 2019. The PR38 Procedure will be submitted for consideration to IMO's MEPC68 meeting in May 2015.



The IGF Code's provisions regarding LNG bunker tank size and location still need to be finalised

Blending of Liquefied Gas Cargoes - Amended SOLAS Regulation VI/5-2, prohibiting the blending of bulk liquid cargoes during sea voyages effective 1 January 2014, was on the agenda for IMO's Pollution Prevention and Response (PPR) sub-committee meeting in January 2015. Discussion focused on whether the amendment needed clarification. After a fairly lengthy discussion in plenary, the sub-committee determined that no further work was needed on this issue at this time.

MARPOL Annex VI/Regulations 4 and 14 (Equivalency and Sulphur Oxides (SOx)) - Several European flag administrations have begun amending LNG Carrier International Air Pollution Prevention (IAPP) certificates to note equivalency in accordance with the European Commission (EC) decision to allow steam-propelled

LNG carriers to use 0.5 per cent sulphur in dual-fuel mode within the North Sea emission control area (ECA). Recognition of this degree of equivalency obviates the need for extensive modifications such as separate distillate fuel systems and burner management changes.

Work continues in the effort to gain US acceptance of equivalency in the North American and Caribbean ECAs.

MARPOL Annex VI/Regulation 13 (Nitrogen Oxides (NOx)) - Tier III requirements will enter into force in the North American ECA in January 2017. Work is ongoing to clarify the status of diesel-propelled (dual- and tri-fuel) LNG carriers when gas is not normally available, i.e. during the maiden ballast voyage and before/after drydock periods. MEPC68 in May 2015 will consider the matter.

UPCOMING MEETINGS 2015

MEETING	DATE	LOCATION
71st General Purposes Committee	14 Apr	Shenzhen, China
61st Panel Meeting	15-16 Apr	Shenzhen, China
Panel Technical Visit - Guangdong LNG	17 Apr	Shenzhen, China
Spring Board Meeting	27 May	Singapore
Asian Regional Forum	28 May	Singapore
Pan American Regional Forum	16 Jun	Houston
Scandinavian Regional Forum	1 Jul	Copenhagen
72nd General Purposes Committee	30 Sep	Edinburgh, Scotland
European Regional Forum	1 Oct	Edinburgh, Scotland
Autumn Board Meeting & AGM	Nov (Date TBC)	London

Trip down memory lane in Livorno

As mentioned in the General Manager's Message on page 1, the 60th SIGTTO Panel Meeting in the Italian port of Livorno on 8-9 October 2014 was given over to celebrations. The occasion marked the 50th anniversary of LNG shipping and SIGTTO's 35th birthday and the SIGTTO Secretariat organised an impressive array of speakers, including many industry pioneers, to reminisce about the exciting early days when gas carrier and terminal technology was in its infancy.

The Livorno speakers and their presentations were as follows:

- LNG Shipping - A General History by Doug Brown, Poten & Partners
- BGT and the Aquarius class - A Short History by Ed Carr and Warren Bluestein, BGT
- Methane Pioneer and the Early Days by Roger Ffooks, via a video interview
- Canvey Island and the First Commercial LNG Discharge by Roger Roue, former SIGTTO Technical Adviser
- Methane Princess and Progress by Bill Wayne, former SIGTTO General Manager
- 50 Years of Membrane Containment Systems by David Colson, GTT
- French LNG Shipping History by Jean-François Castel, Gazocean and Hugues Malvos, GDF Suez
- History of SIGTTO by Andrew Clifton, SIGTTO General Manager
- Pioneers of Liquefied Gas Shipping Design by Robin Gray, former SIGTTO General Manager; presented on his behalf by Chris Clucas, BSM
- LPG Shipping History by Jim Whyte, formerly with LGE

LNG shipping has now been with us long enough to log a history that would fill several volumes. Doug Brown's brief but informative summary of the highlights of that history provided Panel delegates with an appreciation of the giant strides that have been made over the past 50 years and the trends currently emerging. In five years, following the first trial shipments by the 5,000m³ *Methane Pioneer* in 1959, the industry went to vessels of 27,400m³ and the first delivery of a commercial cargo in October 1964. Five years after that LNG carriers of 71,500m³ were in service and within another five years the first 125,000m³ ships had been built.

After making due allowance for the special case of Qatar, with its 31 Q-flex ships of 216,000m³ and 14 Q-max ships of



Let the celebrations begin; Livorno provided the venue for the golden anniversary reminiscences

266,000m³ built to realise economy of scale benefits in delivering its export cargoes, the current maximum size of LNGC is in the 160-177,000m³ range. In contrast to the early vessels, which were built for specific trades, the emphasis today is on 'standard' ships, able to trade worldwide and compatible with most of the world's terminals.

As regards containment systems, the established Moss spherical tank and GTT membrane tank designs consolidated their leading positions in the LNGC sector over the decades, with only relatively minor modifications to the original designs. In more recent years the advantages offered by membrane tanks have won over most shipowners, to the extent that GTT membranes have been specified for 86 per cent of the LNGCs currently on order.

Innovation has been more to the fore in the choice of propulsion systems. At the start of the millennium dual-fuel diesel-electric (DFDE) systems made their breakthrough, upsetting the virtual monopoly held by steam turbine propulsion. While DFDE propulsion has been the system of choice for ships ordered over the past decade, during 2014 a new dual-fuel contender emerged. Approximately one-half the 60-plus LNG carriers ordered last year were specified with low-speed gas-injection engines.

Ed Carr and Warren Bluestein provided a fascinating insight into the life and times of the *Aquarius*-class LNGCs, those eight 126,300m³ spherical tank LNG carriers built by the General Dynamics Quincy yard for Burmah Gas Transport in the late 1970s. The vessels are well known for the sterling service

they provided in the carriage of Indonesian LNG to Japan over many years. Indeed, all eight vessels served on the route for 20 years and six of the ships had their Pertamina charters renewed to enable them to provide a further 10 years of service to the project.

Burmah Gas Transport originally planned to mount an Algeria-US East Coast project as well as the Indonesia-Japan LNG scheme but the Algeria-US deal collapsed for a variety of reasons. Pertamina in Indonesia and the 'Western Buyers' in Japan, comprising Chubu Electric, Osaka Gas, Kansai Electric, Kyushu Electric, Nippon Steel and, later, Toho Gas, stepped up their plans and agreed sales deals that would require the services of all the *Aquarius*-class LNGCs. Nissho Iwai, known as LNG Japan today and a Japanese trading company that enjoyed an established relationship with Indonesia, was a key enabler in the negotiations. The availability of US financing and the fact that Japanese shipyards had full orderbooks at the time resulted in the decision to build the vessels at Quincy.

In their presentation Ed Carr and Warren Bluestein outlined some mechanical faults and operational mishaps that befell the fleet, especially in the early days of its operation. While comparatively minor in the context of the exemplary performance record of the vessels over many years, each incident served as a wake-up call and provided a valuable lesson. As the authors pointed out to the Livorno delegates, their purpose in highlighting the incidents was to raise awareness of the challenges that the early LNG projects faced; to encourage

the continued sharing of incident details among SIGTTO members; and to ensure that the hard lessons that have been learned are never taken for granted!

In his presentation Bill Wayne, Andrew Clifton's predecessor as SIGTTO General Manager, described what made *Methane Princess* and *Methane Progress* special, reprising an article entitled "The sisters that launched an industry" he compiled for the *LNG Shipping at 50* publication. The 27,400m³ pair, the first LNG carriers to go into service, were built at the Vickers Armstrong and Harland & Wolff yards in the UK at a cost of £4.75 million each. The vessels were sisterhips and Vickers Armstrong, as the lead yard, took responsibility for drawing up the working plans and placing material orders for the pair.

The cargo containment system on the two ships was designed by Conch International Methane. The system was based on that utilised on *Methane Pioneer* for its 1959 trial voyages and for which Conch held the design patents. JJ Henry, the New York-based consulting naval architect firm, was closely involved with the hull design of the two vessels while Shell supervised their construction.

Bill Wayne had many photos and diagrams of the *Methane Princess* and *Methane Progress* to illustrate their design and construction as well as their specialist equipment and operation. Although the ships were built over 50 years ago, their cargo-handling system was not too dissimilar to those found on modern LNGCs.

It is also a credit to the designers of the groundbreaking duo that their construction and equipment features were found to be basically in alignment with the provisions of the first International Gas Carrier (IGC) Code which was adopted almost 20 years later, in 1983. In particular, the design of the cargo containment system satisfied the requirements of the cargo tank IMO Type A designation while their gas-burning system was essentially in compliance with the requirements of Chapter 16 of the IGC Code.

The shipping industry in general was also confident in the ability of these ships to perform as required, despite their novel design and the challenging cargo. This is illustrated by the fact that the insurance market insured *Methane Princess* and *Methane Progress* with no additional premium or deductible compared with the then going rate for clean product tankers.

Robin Gray, another former SIGTTO General Manager, also prepared a paper for Livorno. As Robin was unable to attend the event, the presentation was made by SIGTTO General Purposes



Jim Whyte - helped introduce the UK to liquefied gas shipping

Committee chairman Chris Clucas.

Robin Gray's cavalcade of gas shipping industry pioneers included Frank Phillips, WK Warren, Oivind Lorentzen, Knud Tholstrup, Rene Boudet, Talal Zein, Jim Whyte, Roger Ffooks, Bob Lakey and Barry Hunsaker. His collection of 60-plus illustrations included several images of *Rasmus Tholstrup*, a small Danish-flag coastal vessel delivered in 1953 and the first ship built solely for the carriage of LPG. The majority of the gas carrier's original 12 vertically mounted pressure vessel tanks were removed in 1959, to be replaced by three spherical tanks. The original tanks are still in use, as storage vessels at a small coastal gas terminal in Guernsey.

Robin Gray was SIGTTO's second general manager, having succeeded Maurice Holdsworth in March 1985. In describing the early SIGTTO projects, Robin Gray's Livorno paper overlapped with that of Andrew Clifton on the history of the Society. Robin pointed out that the inaugural issues included cargo strainers for LNG carriers, hydrates in LPG cargoes, alleviation of pressure surge, relief valve capacities, LPG cargo calculations and compliance with Europe's Seveso Directive.

In his presentation Andrew Clifton stated that it is interesting to note that most of those topics considered by SIGTTO in the early days are still the subject of attention by the Society's GPC to some degree or another! Ongoing innovation and the introduction of new technologies ensure that

these subjects remain under the spotlight.

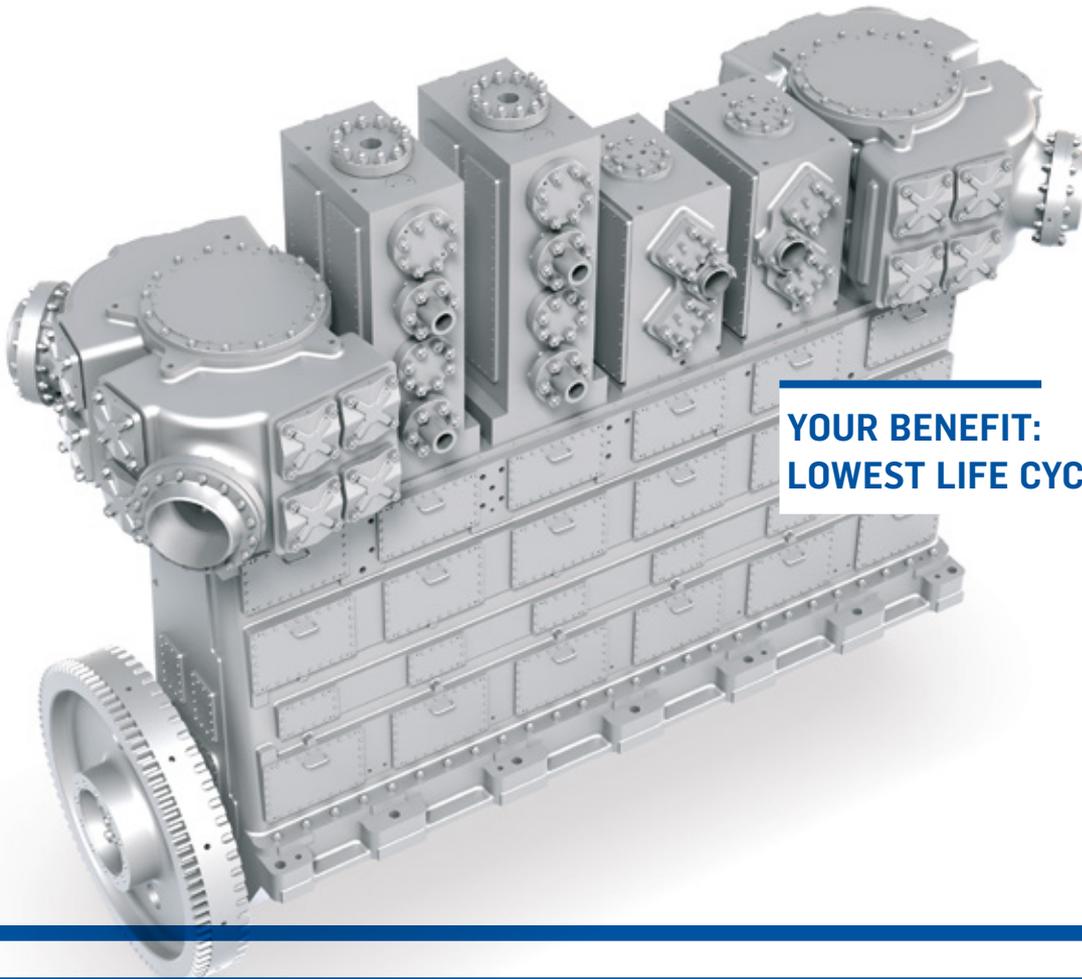
Jim Whyte, 85 years young, quickly secured the attention of the Livorno Panel Meeting delegates with his talk on LPG shipping history or, more specifically, his own role in helping to develop the Edinburgh-based shipping company George Gibson into a pioneering gas tanker operator. When Jim joined Gibson in 1960, it was a dry cargo operation and one of the services undertaken by the company was the carriage of packaged chemicals for ICI. When the chemical company needed a shipowner to carry anhydrous ammonia in bulk from Heysham in the UK across the Irish Sea to Dublin, Belfast and Arklow, Gibson offered its services and Jim Whyte set about providing a vessel able to meet the needs of the contract.

The logistics offered significant challenges. The refrigerated storage facility at Heysham was about 5km distant from the loading jetty, while at the receiving end Arklow could accept fully refrigerated cargoes but discharges at Belfast and Dublin would have to be under pressure at ambient temperature. To fulfil the seven-year contract the chosen ship would have to be of the semi-pressurised/fully refrigerated (semi-ref) configuration. It would also need to have a high-capacity heater as well as relatively large compressors and generators.

George Gibson decided to convert *Quentin*, one of its dry cargo fleet, for the job. The rather rusty 1940-built, single-hatch vessel would be 25 years old when the contract was due to start in September 1965. Amongst other things, the conversion entailed the provision of a single 680m³ prismatic tank, a single deepwell pump and two booster pumps.

The *Quentin* conversion proved successful, as did her seagoing career. ICI extended the contract for four years and *Quentin* served in the trade until the ICI ammonia plant at Heysham was shut down in 1976. The vessel also served as the foundation stone for a growing commitment by Gibson to gas shipping. In 1966 the newbuildings *Teviot* and *Traquair* were put into service in North West Europe, again on behalf of ICI. These were the first ships devoted to the carriage of ethylene.

Following on, four further ships in the owner's dry cargo fleet were converted into semi-ref gas carriers. Jim Whyte left Gibson in 1967 to establish LGE. The new company was contracted by the shipowner to supply and install the tanks and cargo-handling equipment for the last three of the four conversions. LGE went on to become a leading gas plant engineering company and a gas carrier owner in its own right. Jim remained involved until 2002 when he sold the last of his holdings and retired at the age of 73.



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WORKING GROUPS

Project updates

The following paragraphs review the progress made by SIGTTO's latest four working groups. Their projects have either just been completed, are nearing completion or have recently been launched.



1 Competency Assurance for Key Staff involved with LNG Operations (Human Factors)

This working group (WG) was established at the 64th SIGTTO General

Purposes Committee (GPC) meeting in September 2011. The WG was charged with creating a quality training regime for shore-based staff and trainers, based on the existing SIGTTO crew competency standards. The WG has completed its task as far as practicable, and recommends that further work on competency assurance, including additional training of shore staff, human factors and process safety should be carried out as per GPC direction.

A key achievement of the WG's deliberations is the publication *Suggested Quality Standards for LNG Training Providers*. In November 2014 it was made available as a free download from the SIGTTO website. The document encourages the adoption of quality control measures in training. Quality control and standardisation of the services supplied by training providers creates a framework that helps to ensure a more efficient interaction with the industry.

While it is appreciated that organisations contracted by a training provider to vet a training package will use their own standards of verification, the SIGTTO document proposes minimum goal-based objectives that may be considered in assessing training providers and their training programmes. SIGTTO recognises training as an integral part of risk management for the liquefied gas industry, and intends to create relevant competence standards as required. Future competence standards and new training service providers should be subject to the same standards of verification.

2 Use of Support Vessels in the Emergency Response and Protection of Liquefied Gas Carriers and Terminals

This WG was established at the 66th GPC meeting in October 2012. It first met in December 2012 and there have since been nine further meetings. The WG is tasked with defining the expected response, by emergency response craft, for incidents relating to liquefied gas carriers at onshore terminals and offshore facilities.

The WG is aiming to produce a publication



One SIGTTO working group is focused on the capabilities of emergency response craft at LNG terminals

on onshore emergency response and submit it for approval at the 71st GPC meeting in April 2015. This will enable the publication to be printed and made available by mid-2015. This should be followed by an offshore version toward the end of 2015.

3 LPG Ship/Shore Interface

This WG was established at the 70th GPC meeting in October 2014. It first met in February 2015. The WG is tasked with identifying the possible root causes of LPG ship/shore interface-related incidents and updating or rewriting the SIGTTO's 1997 publication *Ship/Shore Interface Safe Working Practice for LPG and Liquefied Chemical Gas Cargoes*.

The work is being carried out in order to raise the safety awareness of the LPG shipping industry and avoid or at least greatly reduce the occurrence of LPG

ship/shore interface-related incidents in the future. The WG is aiming to produce a publication and submit it for approval at the 73rd GPC meeting in April 2016. This will enable the publication to be printed and available by mid-2016.

4 Emergency Release System (ERS) Failures

This WG was established at the 70th GPC meeting in October 2014. It first met in January 2015. The WG is tasked with examining all safety aspects of emergency release systems (ERS) operations. The aim is to identify the possible root causes of ERS-related incidents and develop guidelines and best practices to avoid such incidents in the future. The WG is aiming to produce a publication and submit it for approval at the 73rd GPC meeting in April 2016. This will enable the publication to be printed and available by mid-2016.

BENEFITS OF SIGTTO MEMBERSHIP

SIGTTO members are actively encouraged to promote membership when dealing with any new players in the industry. Please direct them to our website and to the London Liaison Office for further details of how to join.

In addition to the credibility in the industry that membership brings, SIGTTO members benefit by:

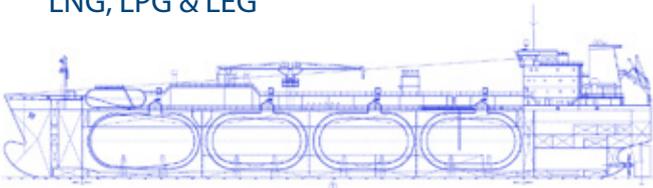
- Access to information that is exclusive to members, such as casualty information and industry statistics
- Regular updates on matters affecting the industry such as legislation, either new or pending, technical or operational developments
- Access to the very comprehensive technical library maintained in the London Office
- Submitting proposals for projects and studies to the General Purposes Committee

- Access to the Technical Advisers in the London Liaison Office who can give advice and obtain advice, on behalf of a member, from within the Society
- Participating in discussion forums with other members each year on topics of particular and mutual interest
- New members receive a copy of all publications, free of charge, produced by SIGTTO
- Free access to the LNGwebinfo portal for updated LNG information as required to conduct compatibility studies. This information is restricted to members of SIGTTO and GIIGNL only

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NEW MEMBERS

Half dozen onboard

Six companies have joined the SIGTTO membership since the last Newsletter was published. The new members and their date of joining the Society are shown below. The SIGTTO membership now stands at 138 full members, 41 associate members and 25 non-contributory members.

G&H Shipping Srl	1 Oct 2014
ClassNK	1 Jan 2015
Eletricidade do Brasil SA (EBRASIL)	1 Jan 2015
First Gas Terminal LLC	1 Jan 2015
H-Line Shipping	1 Feb 2015
BW LPG	1 Mar 2015

G&H Shipping Srl is the shipowning joint venture established by Gas and Heat SpA of Livorno and Marine Engineering Services (MES) of Trieste in Italy. The company owns gas carriers designed by MES and equipped with gas-handling plant supplied by Gas and Heat. The G&H Shipping fleet includes four *Scali*-class semi-pressurised/fully refrigerated (semi-ref) LPG carriers of 3,300m³ delivered over the 2010-14 period and operated in the Lauritzen Kosan gas carrier pool.



The light green of BW LPG is a dominant colour in the VLGC trades

Tokyo-based **Nippon Kaiji Kyokai**, also known as ClassNK or NK, is Asia's longest established ship classification society. ClassNK had 8,872 ships totalling 232.8 million gross tons, or approximately 20 per cent of the world's merchant fleet, on its register as of the end of 2014. Reflecting the status of Japan as the largest importer of LNG and LPG worldwide by a wide margin, ClassNK is heavily involved with gas carriers, not least in rule development and the survey of vessels and their equipment.

Through its subsidiaries, **Eletricidade do Brasil SA (EBRASIL)** is engaged in the generation and supply of thermoelectric power in Northeast Brazil. The privately owned company was founded in 2008 and is headquartered at Recife in the state of Pernambuco.

First Gas Terminal LLC plans to provide an LNG import facility for Ukraine on the Black Sea coast by making use of a floating storage and regasification unit (FSRU). The joint venture partners in First Gas Terminal are the stevedoring company TIS and Odessagaz, a private gas supply company.

H-Line Shipping Co Ltd is the divested bulk shipping unit of Korea's Hanjin Shipping. The LNG department operates four fully owned and three partially owned ships on long-term charter to Korea Gas Corporation (Kogas).

BW LPG is the world's largest owner and operator of very large gas carriers (VLGCs), based on number of VLGCs and LPG-carrying capacity. The 37-ship fleet has a cargo-carrying capacity of close to 3 million m³ while a further 504,000 m³ of capacity is on order in Korea. BW LPG has 35 years of operating experience in the seaborne transport of LPG. BW LNG, another BW Group company, is already a SIGTTO member.

SIGTTO STRATEGY

Setting new, broader targets

As mentioned in the General Manager's Message which begins on page 1, SIGTTO's Board approved a new Strategic Plan at its autumn meeting in Oslo in November 2014. It has been formulated to ensure that the Society remains relevant and fit for purpose to meet the needs and expectations of the membership in the 21st century.

The new Strategic Plan will play a key role in the future direction taken by SIGTTO, not least by outlining a 2020 vision of where the Society wishes to be at the end of the current decade. To achieve this vision, various actions need to be taken. These include providing an increase in resources and delivering on not only a range of long-term strategic objectives but also a number of short-term goals and key performance indicators (KPIs).

In the process of drawing up the Strategic Plan it was concluded that SIGTTO's growing membership is encompassing a wider range of shipping and terminal activities than was the case in the past. Floating LNG production

and regasification vessels, LNG bunker ships and terminals with multifunctional hub roles are examples of the how the gas supply chain is now being extended.

These new activities, and the issues associated with them, have to be accommodated in the service package that SIGTTO offers to its members. At the same time, while additional resources may be required to cover a wider portfolio of commitments, it is important that costs be kept under control and

that value is delivered to members.

SIGTTO's Board recognises that the correct resources and full industry participation will be required to maintain both a portfolio of relevant publications and the high performance levels achieved by the industry. In addressing a broadening range of responsibilities the Society will need to continue to place a heavy emphasis on process safety, human factors and training in order to preserve the industry's exemplary safety record.



The new Strategic Plan recognises that the gas supply chain is being extended

CLSICO plays key role in Chinese LNG shipping

China LNG Shipping (International) Co Ltd (CLSICO) is playing host to SIGTTO's 61st Panel Meeting at Shenzhen in southern China on 15-16 April 2015 in tandem with China LNG Shipping (Holdings) Ltd (CLNG) and Guangdong Dapeng LNG (GDLNG). The Panel, the first to be in China, will be followed by a technical visit to GDLNG's terminal, China's first LNG receiving facility, on 17 April.

Based in Hong Kong, CLSICO was established in July 2004 as a joint venture between CLNG and BP Shipping, initially to manage two Chinese-built LNG carriers. CLNG itself is a 50/50 joint venture between China Ocean Shipping Co (COSCO) and China Merchants. Today CLSICO operates six 147,000m³, steam turbine-powered LNG carriers that were built by the Hudong Zhonghua yard in Shanghai. CLNG is the largest shareholder in the six CLSICO-managed ships.

The CLSICO ships were the first LNG carriers to be constructed in China. *Dapeng Sun*, *Dapeng Moon* and *Dapeng Star* are engaged in the delivery of LNG from Australia's North West Shelf (NWS) project to the GDLNG terminal while *Min Rong* and *Min Lu* load cargoes at the Tangguh plant in Indonesia for transport to Fujian, China's second import terminal. The final vessel in the fleet, *Shen Hai*, transports LNG from the Bintulu export plant in Malaysia to the Shanghai LNG terminal.

CLSICO traces its origins back to the country's first LNG import project. In August 2002 GDLNG signed a sales and purchase agreement with the NWS joint venture partners in Australia covering the delivery of 3.7 million tonnes per annum (mta) of LNG to the GDLNG receiving terminal for 25 years. Construction work on the facility began in December 2003 and the inaugural commissioning cargo was discharged at Guangdong in May 2006.

COSCO and China Merchants had earlier formed the Guangdong LNG Transportation Project Office (GLTPO) to design and implement the LNG transport arrangements that enabled Chinese participation in the shipping required for the project. As part of the bidding process for the supply of LNG, bidders offered shipping collaboration proposals, including a commitment to support a new LNG ship management company.

In 2004 GLTPO was incorporated as CLNG. As one of the participants in the NWS project, BP - through its subsidiary BP Shipping



Dapeng Moon's crew gather for a moonrise photo

- agreed to act as the 'foreign partner' in the ship management joint venture, and to provide support, mainly by secondments of experienced sea and shore staff.

In July 2004 BP Shipping joined CLNG in establishing CLSICO, with CLNG holding a 60 per cent stake and BP Shipping 40 per cent. Ship Management Agreements for the three GDLNG ships, the two Fujian vessels and the LNG carrier for Shanghai LNG followed. Hudong Zhonghua delivered the sextet over a four-year period, beginning with *Dapeng Sun* in March 2008 and finishing with *Shen Hai* in March 2012.

"By June 2012 CLSICO had become sufficiently mature to enable BP Shipping to announce its intention to exit the venture in mid-2013," states Paul Oliver, CLSICO general manager. "The decision was consistent with the original shareholder agreement between CLNG and BP Shipping. Although BP Shipping sold its shares in CLSICO to China National Offshore Oil Corp (CNOOC) in August 2013, CLNG decided that CLSICO should continue to be resourced by a combination of Chinese and Western seafarers, both in the office and on the ships, for the foreseeable future."

CLSICO employs about 380 people, including 350 sea and 30 office staff, and the majority of these are Chinese. The ship manager was pleased to appoint its first Chinese master - and the world's first Chinese LNG carrier master - in September 2013.

Another significant safety milestone was achieved in 2014 when CLSICO reported that its ships had sailed for a total of 18 months without any recordable safety incidents. "Credit for this achievement can be attributed to the strong safety culture that has been established on board our ships," points out Paul Oliver. "This safety culture is supported by very high levels of staff loyalty and the continuity of

manning that this provides. We regard this low staff turnover as a great strength.

"We are enthusiastic members of SIGTTO and have been since the company was founded," adds Oliver. "LNG shipping has built up a superb safety record over its 50 years of service and it is up to each individual participant to play its part in preserving the exemplary reputation achieved by our industry. SIGTTO plays a critical role in sharing industry best practice and in maintaining the high standards required of our sector.

"Our mission is to manage LNG ships to the highest international standards to meet China's growing demand for clean energy. Fulfilment of this mission is facilitated by our SIGTTO membership."

SIGTTO

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