



Regulations (p5)



From the Archives (p7) New Members (p11)



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MESSAGE FROM GENERAL MANAGER



SIGTTO's solid foundation for change

At this time of great change in the industry, Andrew Clifton, the SIGTTO General Manager, considers the immutable nature of the Society's legacy

The Society continues to grow and we engage with our membership on a continuous basis during this period of rapid growth in the gas shipping and terminal industry. Our meeting programme consists of the General Purposes Committee (GPC), the Panel and the Board. In addition, SIGTTO's regional forums extend contact opportunities for members to all the key gas tanker and terminal spheres of influence worldwide.

The Society's 61st Panel Meeting, which was kindly hosted by Guangdong Dapeng LNG Company Ltd (GDLNG), China LNG Shipping (Holdings) Ltd (CLNG) and China LNG Shipping (International) Co Ltd (CLSICO), was held in the southern Chinese city of Shenzhen in April 2015. Attended by around 150 members, the two-day event proved to be a great success, as indicated by the universally positive delegate feedback. Shenzhen was SIGTTO's first ever Panel Meeting in China and, with a wide range of speakers and topical presentations on the world's fastest growing LNG and LPG markets, it was a truly memorable event.

China commissioned its first LNG terminal at Guangdong, close to Shenzhen, in 2006 and it is safe to say that the country has never looked back since. The first Chinese-built LNG carrier, the 147,000m³ *Dapeng Sun*, was delivered in 2008 and the world's first Chinese LNGC master was appointed in September 2013.



The Shenzhen Panel Meeting was followed by a visit to the Guangdong Dapeng LNG terminal

Today CLSICO operates six LNG vessels constructed in China and the majority of the company's sea staff are Chinese nationals.

Both GDLNG and CLSICO are active members of SIGTTO and we were pleased to note the election of CLSICO's Paul Oliver as a director of the Society at the annual general meeting (AGM) held in November 2014.

China now has over 10 LNG terminals in operation and many more under construction and planned. In addition, eight Chinese-built LNG carriers are in service while over 25 such vessels are under construction. On the LPG front China imported 6 million tonnes of this liquefied gas in 2014, 50 per cent more than the previous year. By any measurement standard China is now a major player in both the LNG and LPG sectors and this presence is set for continued, strong growth.

The Shenzhen Panel Meeting concluded with a technical visit to the Guangdong LNG terminal. The GDLNG staff laid on a well organised, stimulating tour and we were fortunate that one of the Chinese LNGCs was alongside completing discharge during the visit.

The transportation of liquefied ethane by sea in bulk is a new development in the gas shipping industry. There are a number of vessels under construction that will be dedicated to this trade and the first two

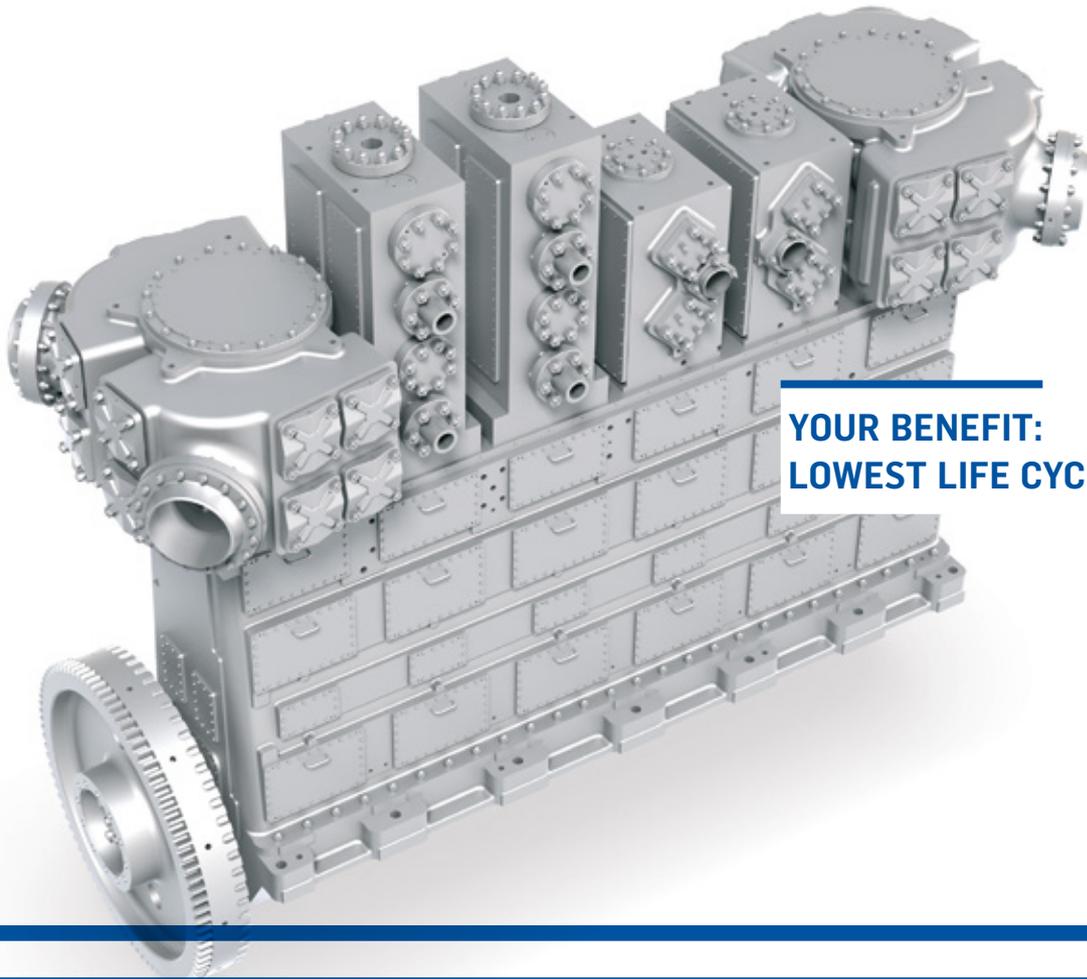
have recently been delivered, notably by a Chinese shipyard, Sinopacific.

SIGTTO has been engaging with the new players in the ethane market who are not already part of our organisation and the initiative has succeeded in bringing the majority of these companies into the membership. Their inclusion in the Society should go a long way to ensuring that the transportation of bulk ethane by sea is conducted safely, reliably and in accordance with industry best practice.

After several years of preparatory work the revised International Gas Carrier (IGC) Code was adopted at the 93rd Session of IMO's >

IN THIS ISSUE

Message from General Manager.....	1
IMO developments.....	5
Membership benefits.....	5
Shenzhen Panel Meeting.....	6
French LNGC pioneers.....	7
Upcoming SIGTTO Meetings.....	7
Support vessel emergency roles.....	9
Membership fees.....	9
New Associate Member categories... ..	9
New Members.....	11
Member profile - Witherbys.....	12



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MESSAGE FROM GENERAL MANAGER



SIGTTO Board members and guests in Singapore in May 2015

> Maritime Safety Committee (MSC 93) in May 2014. The updated Code will enter into force on 1 January 2016 and the implementation date for the new regime is set at 1 July 2016.

SIGTTO commenced the facilitation of the IGC Code's revision in conjunction with IMO in 2007. Many of the Society's members contributed over several years to both the steering group and the many working groups engaged in the updating exercise. The completion of the IGC Code's revision is a credit to the hard work of all those involved, some of whom have since retired!

I am pleased to announce that our latest publication, *Support Craft at Liquefied Gas Facilities – Principles of Emergency Response and Protection – Onshore*, was approved by both the GPC and the Board in Spring 2015 and is being published as we go to press. I would like to thank the members of this particular working group for their efforts in producing this document and, in particular, Peter Seaman of BP Shipping as the group's chairman. The Offshore version of this document, for floating storage and regasification units (FSRUs) and floating LNG production (FLNG) vessels, is due to be published next year.

At their Spring 2015 meeting in Singapore SIGTTO's Board members agreed to amend the Society's byelaws to allow the organisation to become involved with the development of industry best practice and guidance, if required by the GPC, for compressed natural gas (CNG) and the carriage of LNG, as cargo, in ISO tank containers onboard conventional container ships. The initiative highlights the Society's ability to amend its remit to meet ever-changing industry requirements.

There will be no autumn Panel Meeting this year due to the clash with the Gastech conference in Singapore in October. Also, there will be no spring Panel due to the fact that the LNG18 conference

“The core principles and fundamentals that underpinned the formation of SIGTTO 36 years ago remain as strong as ever today.”

will be held in Perth at the same time. However, SIGTTO will hold a European regional forum in Edinburgh on 1 October 2015, the day after the Autumn GPC. The Committee meeting will be hosted by our publishers Witherbys, and we are grateful for their offer to welcome us. Witherbys is profiled on page 12 in this newsletter.

The SIGTTO Secretariat lost one of its technical advisers, Thierry Descamps, in early 2015 when his secondment was, unfortunately, terminated by his employer for internal restructuring reasons. Thierry had only been with us a short time but had proved to be a likeable and effective team member. We were sorry he had to leave us and wish him and his family well for the future. Details of Thierry's replacement will be advised in the next edition of *SIGTTO News* in early 2016.

Cherian Oommen and Rick Boudiette, SIGTTO's technical staff at the Secretariat, remain extremely busy and continue to push ahead with a portfolio of new publications. I am pleased to announce that we have secured a further year's secondment from Chevron for Rick Boudiette who will now stay with us until December 2016. We are grateful to Chevron for their support with this extension.

I also wish to mention my office manager Andrea Baseley and membership manager Susan Humphrey who continue to work hard in a small but busy office.

As this issue of *SIGTTO News* was going to press we were saddened to hear of the passing of Roger Ffooks at the age of 90. Roger was one of the pioneers of LNG shipping and we, as an industry, owe him a great deal. Published in 1979, his book *Natural Gas By Sea* is one of only a few publications documenting the earliest days of LNG shipping and remains an invaluable reference tool for anyone with an interest in our industry.

Roger Ffooks was directly concerned with the design, construction and operation of the 27,400m³ *Methane Princess* and *Methane Progress*, the first two LNG carriers to carry commercial cargoes. Those vessels incorporated the Conch prismatic tank containment system engineered by Roger and his design team and he subsequently also became involved with the development of the Technigaz membrane design. In addition he was one of the select group tasked with drawing up the original IMO Gas Carrier (GC) Code, the forerunner of today's IGC Code.

Roger was also a great supporter of SIGTTO. As recently as 12 months ago he contributed to LNG shipping's 50th anniversary celebrations by recording a video interview with myself and Chris Clucas at his home in West Dorset near England's south coast. This fascinating piece of film, in which Roger recalls little-known aspects of the *Methane Princess/Methane Progress* project, can be viewed by accessing the link on our web site. Our thoughts at this sad time are with Roger's widow Barbara and his family.

Finally, in engaging with our members during my time as general manager the legacy established by our Society has become very apparent. General managers, directors and Secretariat staff all move on over the course of time but the core principles and fundamentals that underpinned the formation of SIGTTO 36 years ago remain as strong as ever today.

Our Society is the only industry body concerned with establishing industry best practice, safety, guidance and recommendations for both liquefied gas shipping and terminal operations. Founding President Barry Hunsaker of El Paso Natural Gas best summarised the SIGTTO philosophy back in 1979 when he stated that:

“We will best achieve our goals by sharing with each other our non-proprietary technical and safety information and operating experiences through open and frank discussion. Only in this way will each of us benefit from the experience and knowledge gained by all of us and thus maximise the safety of our operations. Remember, the industry will be judged by the record of its least safe operator. Let's help ourselves by helping that operator.”



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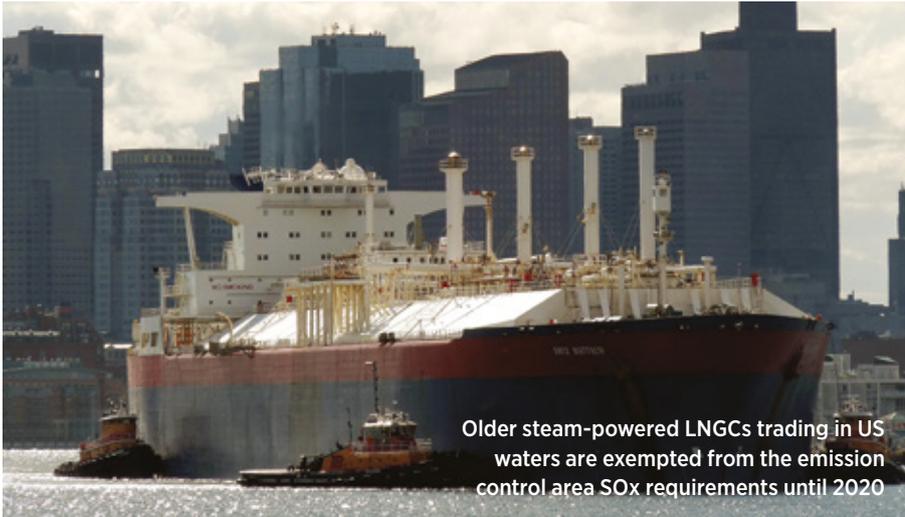
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REGULATIONS



Older steam-powered LNGCs trading in US waters are exempted from the emission control area SOx requirements until 2020

Recent gas-related developments at IMO and EU

IGF Code: The International Code of Safety for Ships using Gases or other Low-Flashpoint Fuels (IGF Code), basis LNG as Fuel, was adopted at the 95th session of IMO's Marine Safety Committee (MSC 95) in June 2015, with an entry-into-force date of 1 January 2017.

Gas carriers are exempt from the IGF Code provided:

(a) they use their cargoes as fuel and comply with the requirements of the International Gas Carrier (IGC) Code; or
(b) they use other low-flashpoint gaseous fuels and the fuel storage and distribution systems design and arrangements for such gaseous fuels comply with the requirements of the IGC Code for gas as a cargo.

Amendments to the Standards of Training Certification and Watchkeeping (STCW) Interim Guidance for mariners on vessels subject to the IGF Code were also approved at MSC 95. Drafting work on IGF Code Phase 2, covering the use of low-flashpoint diesel, fuel cells and methanol as means of propulsion, will be discussed at the second session of IMO's Carriage of Cargoes and Containers Sub-committee (CCC 2) in September 2015.

IGC Code: The IGC Code enters into force on 1 January 2016, and will apply to vessels whose keels are laid on/after 1 July 2016. Several Unified Interpretations have been submitted to CCC 2 for consideration in September 2015.

Harmonized Survey requirements were aligned with IGC Code changes at the second session of IMO's Implementation of IMO Instruments Sub-committee (III 2) in July 2015. Specifically, the examination of cargo spaces on gas carriers at

intermediate surveys for ships of more than 10 years of age is not required.

SIGTTO is working with the Membrane Owners' Group on an Isolated Vapour Pocket Awareness document to clarify IGC Code changes on maximum filling limits.

Australia and Japan proceeded with Interim IGC Code recommendations for the carriage of liquid hydrogen. They have asked CCC 2 to approve a work item and associated correspondence group to develop an annex to the IGC Code covering the carriage of liquefied hydrogen in bulk.

EEDI: Amendments to the Energy Efficiency Design Index (EEDI) relating to gas carriers enter into force on 1 September 2015. These

amendments establish one reference line for LNG carriers, with steam turbine, slow-speed diesel and diesel-electric propulsion systems, and one reference line for all other gas carriers. In May 2015 the 68th session of IMO's Marine Environment Protection Committee (MEPC 68) formally adopted the 2014 guidelines on the survey and certification of EEDI, and approved IACS Procedure PR38 for the calculation and verification of EEDI.

SOx compliance: The European Union (EU) allows the use of heavy fuel oil (HFO) pilot fuel as an alternative compliance option under Directive 2012/33/EU, provided that the dual-fuel mixture has a sulphur content in mass of less than or equal to 0.50 per cent. In the US the Code of Federal Regulations (CFR) provisions have been amended to align with MARPOL Annex VI, exempting steam turbine-powered LNGCs (without distillate fuel systems) built before August 2011 from the sulphur oxides (SOx) requirements until 2020.

NOx compliance: MEPC 68 approved MEPC.1/Circular 854 providing guidance for the uniform application of Tier III requirements to dual-fuel and gas-fuelled engines. The guidance highlights potential problems for gas carriers with Tier III-compliant dual-fuel engines while on maiden ballast voyages or heading to/returning from a shipyard without boil-off gas (BOG) onboard. It also provides guidance on disclosing auxiliary control device limitations, i.e. low load, manoeuvring and start/stop operations.

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



SIGTTO held its first ever Panel Meeting in China this past April

Market growth and ship innovation

Those attending SIGTTO's 61st Panel Meeting at Shenzhen in China's Pearl River Delta this past April were treated to a range of stimulating presentations focusing on the themes of LNG in China and innovations in gas carrier design.

China - No 3 and rising

There is great potential for growth in China's LNG market if the country's current level of natural gas use and the government's commitment to clean-burning fuel are anything to go by. In his paper Xue Bo of Guandong Dapeng LNG (GDLNG) explained that natural gas accounts for only 5.1 per cent of China's current energy consumption, the lowest share amongst the world's top 15 economies. Coal dominates as the country's leading energy provider, with 67.5 per cent of the total. No other country can match China for the contribution made by coal to the national energy mix.

Since GDLNG's facility was inaugurated in June 2006, 10 further LNG import terminals have been commissioned along China's 18,000km of coastline, 11 if the mid-scale Wuhaogou installation in Shanghai is included. Eight others are under construction and more are planned. China imported 19.9 million tonnes of LNG in 2014, making it the world's third largest buyer of the product.

Looking to the future, Xue Bo predicted that China's annual gas consumption will double to about 360 billion m³ by 2020, at which point it will account for 10 per cent of the country's energy mix. Domestic production will meet about 60 per cent of China's gas needs in 2020 while pipeline and LNG imports will account for the remaining 40 per cent. To meet its expected

contribution to the nation's natural gas demand, China's LNG imports will need to more than double over the next five years.

Chinese LNGC fleet buildup

Paul Oliver of China LNG Shipping (International) Co Ltd (CLSICO) briefed Shenzhen Panel attendees on the country's commitment to conventional size LNG carriers. CLSICO's own participation as a ship manager was described in the Member Profile article in the Spring 2015 edition of *SIGTTO News*.

To date the Hudong Zhonghua shipyard in Shanghai has delivered eight LNG carriers to Chinese owners and has a further 12 on order. Recently Dalian Shipbuilding has made a breakthrough in LNGC construction, winning an order for two such vessels. The China orderbook is completed by six ships building outside the country. These are 172,000m³ icebreaking LNG carriers that Daewoo in Korea is constructing for a joint venture comprising Teekay and China LNG Shipping (Holdings) Ltd (CLNG). The sextet will be employed in the delivery of cargoes from the Yamal LNG plant in the Russian Arctic on behalf of PetroChina.

Paul Oliver reported on some of the challenges faced by CLSICO as manager

of the first six ships built by Hudong. Because the vessels were built at a time of unprecedented growth in the global LNGC fleet, CLSICO was caught up in the industry-wide drive to provide sufficient seafarers of the required competence. Each new ship requires about 60 people, i.e. two crews of 30 each, and managers have to take into account the fact that it takes at least 15 years for a cadet to progress to the rank of master.

BP Shipping was a 40 per cent shareholder in CLSICO when the latter was established in 2004 and the link has stood the ship manager in good stead. Seafarers were able to gain pre-startup experience on BP LNGCs and the Chinese cadet programme, which currently welcomes 18 new arrivals per year, has benefitted from BP Shipping's expertise.

In late 2012 BP recognised that CLSICO had reached maturity and sold its shares to China National Offshore Oil Corp (CNOOC) but on the switchover 90 per cent of the seagoing officers seconded from BP elected to remain with CLSICO. The company continues to operate with a combination of Chinese and Western staff.

Special case of CNG

At the Shenzhen Panel Meeting Hong Zhu of ABS provided a stimulating roundup of innovative gas carrier projects in China. One of the most notable is the construction of the world's first compressed natural gas (CNG) carrier. The Jiangsu Hantong yard is building the 2,200m³ vessel for an Indonesian owner to a design developed by China's CIMC ORIC.

The containment system features 832 linked vertical cylinders able to hold gas at a pressure of 250 bar. CIMC ENRIC, an affiliate company, is constructing the cylinders which stand 12m high and have a diameter of 615mm and a plate thickness of 19mm. The configuration gives the gas carrier a lightship weight of 6,000 tonnes and provides a cargo hold time of eight days. The 110m long vessel's Wärtsilä 9L34DF dual-fuel engine will enable a 13.9 knot service speed.

Hong Zhu stated that the International Gas Carrier (IGC) Code covers the

The world's first compressed natural gas carrier is being built by China's Jiangsu Hantong shipyard



carriage of gases that are liquefied but not compressed natural gas. However, although CNGCs are not addressed in IMO regulations, the philosophy and intent of the IGC Code can be applied to such ships, with appropriate modifications. The same hazards covered in the IGC Code for an LNG carrier, for example, should be considered for a CNGC.

ABS released its Guide for CNG Carriers in April 2005, using the same format as the IGC Code. However, the Code's provisions were modified to take into account the use of the risk assessment method in ship design, active and passive fire safety scenarios and the characteristics of CNG containment systems. The latter provisions encompass containment system material requirements in terms of fatigue and fracture; in-service inspections; specific safeguards; pressure protection in cargo holds; and probabilistic limit state design.

Another innovative design described by Hong Zhu was the LNT A-Box containment system that will be employed for the first time on a 45,000m³ LNG carrier that Landmark Capital has ordered at Xiamen Shipbuilding for 2017

delivery. Like the CNG carrier, ABS will class the LNT A-Box newbuilding.

IMO Type A independent tanks of this type require a full secondary barrier and with the LNT A-Box system, which has been designed by LNG New Technologies in cooperation with FKAB, the primary and secondary barriers are independent of the ship's structure and the space between them can be accessed and inspected.

Because the sloshing risk is mitigated, there is no limitation on tank fill levels with the LNT A-Box design. The designers point out the the prismatic shape of the cargo tanks provides good utilisation of available underdeck space as well as a flush, uncluttered main deck. In addition the fabrication process presents no undue challenges and enables new shipbuilders to enter the LNGC sector with relative ease.

UPCOMING MEETINGS 2015/16

MEETING	DATE 2015	LOCATION
72nd General Purposes Committee	30 Sep	Edinburgh, Scotland
European Regional Forum	1 Oct	Edinburgh, Scotland
Autumn Board Meeting & AGM	18 Nov	London
Pan American Regional Forum	8 Dec	Houston
MEETING	DATE 2016	LOCATION
73rd General Purposes Committee	11 Apr	Perth
Spring Board Meeting	May	TBC
74th General Purposes Committee	Oct	London
Autumn Board Meeting & AGM	Nov	Nagoya

FROM THE ARCHIVES ...

France also at the forefront

Most of the focus in the recent celebrations of LNG shipping's golden jubilee has been on the UK-built *Methane Princess* and *Methane Progress*, the transporters of the first commercial LNG shipments, and the discharge of the landmark cargo at the Canvey Island import terminal near the mouth of the River Thames in October 1964.

What has not received much airplay is the fact that France was making its own preparations for the LNG era at the same time, and in several respects was ahead of the UK in terms of technical developments. In a joint presentation at the SIGTTO Panel Meeting in Livorno last October, Jean-François Castel of Gazocean and Hugues Malvos of Engie took the opportunity to remind delegates of the significant French contributions to early LNG carrier development.

France, in particular Gaz de France and the Worms Group, had begun investigating the possibility of importing Algerian natural gas back in the mid-1950s and in 1960 Methane Transport, a consortium of a number of the country's shipowners, banks and shipyards, was established to develop an LNG carrier project. As a first step *Beauvais*, a Liberty ship, was converted by the Chantiers de l'Atlantique yard in 1961 through the fitting of three small LNG cargo tanks, each built to a different prototype containment system. The vessel's tanks were loaded

with LNG at the Roche Maurice cryogenic testing facility close to Nantes in 1962.

That same year Gaz Marine was established by Gaz de France, Gazocean and Benett Corp and the new company promptly ordered the 25,840m³ *Jules Verne*, France's first commercial LNG carrier. The ship featured seven cylindrical shape cargo tanks, each with a conical bottom and elliptical top. This was one of the three containment systems tested on *Beauvais*.

As Messieurs Castel and Malvos pointed out at the Livorno Panel Meeting, *Jules Verne* followed the 27,400m³ *Methane Princess* and *Methane Progress* into service by about five months. The groundbreaking French vessel discharged its inaugural cargo of Algerian LNG at a new receiving terminal built in Le Havre in March 1965. A little known fact about *Jules Verne* is that it was involved in the first commercial ship-to-ship LNG transfer operation, in tandem with the 125,000m³ *Edouard LD* at Fos in 1982.

Meanwhile, other LNGC technologies were under development. The 680m³ LNG carrier *Pythagore* delivered to Gazocean in 1967 was fitted with a new type of containment system developed by its affiliate Technigaz. The waffled stainless steel primary and secondary barriers of the ship's two tanks constituted the world's first membrane system.

Gazocean then linked up with Conch to form Conch Ocean and this company developed the Technigaz Mark I membrane system as an improvement on the *Pythagore* design. The 50,000m³ *Descartes*, built for Gazocean in 1968, was the first LNGC to

incorporate Technigaz Mark I cargo tanks. As part of its learning curve, the French shipowner also weighed up the merits of spheres, taking delivery of the small spherical tank LNGC *Euclide* in 1971.

Gaz Transport, a French design company formed in 1965, developed a second membrane cargo containment system. The NO design featured primary and secondary barriers of invar, a high nickel alloy steel, and the first vessels built to this design were the 71,600m³ *Polar Alaska* and *Arctic Tokyo*, delivered by Sweden's Kockums yard in 1969. The pair were recently sent for recycling after logging 45 years of service in the carriage of LNG.

Today Gazocean is still operating LNGCs and Gaz de France is now Engie, the world's third largest importer of LNG with a charter fleet of 17 LNG tankers. Furthermore, 71 per cent of the world fleet of in-service LNG ships sport a membrane of either the Technigaz or Gaz Transport type. Both technologies are marketed by the amalgamated, Saint-Rémy-lès-Chevreuse-based GazTransport & Technigaz (GTT). French LNG has never been so strong, or so global.

Jules Verne arrives at Le Havre on its maiden voyage



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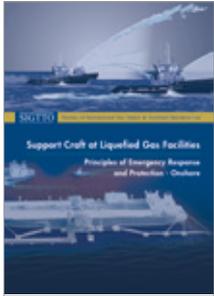


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PUBLICATIONS

Support vessel emergency roles



SIGTTO's latest publication is entitled Support Craft at Liquefied Gas Facilities: Principles of Emergency Response and Protection - Onshore. The membership recognises that terminal

support vessels have a key role to play in emergency situations and has developed the guidance to reinforce the effectiveness of such vessels in maintaining high safety standards at LNG and LPG facilities.

Each gas terminal, as part of its response plan, has traditionally specified the performance standards that the vessels it utilises must comply with. Over the years the variable nature of these requirements has increased with the global spread of the gas terminal network, to the extent that in 2012 a number of support vessel, gas tanker and terminal operators amongst the membership requested the Society to draw up a harmonised set of principles

that could be universally applied.

The end-result of an extensive consultation process, the new document lays down what is believed to be industry best practice guidelines for actions to be taken by gas terminal support vessels to prevent and mitigate accidents. Although the guidance covers a range of vessels that provide support services at gas terminals, it is aimed primarily at the tugs which assist with gas carrier handling and berthing and which, in some cases, remain in attendance while the ship is moored.

The new document covers the use of support vessels at shore-based terminals and nearshore floating storage and regasification units (FSRUs). SIGTTO is working on a companion volume dealing with offshore facilities that is earmarked for spring 2016 completion.

The new principles are applicable for support vessels utilised at LNG and LPG terminals. They are not fully appropriate for facilities handling chemical gases, where different types of hazard may be present.

Every terminal emergency situation will have its own specific characteristics and the document makes no attempt to lay down response measures for every conceivable outcome. Rather, it considers a few chosen scenarios that are based on typical and credible incidents that could befall a gas carrier in port approaches and within the terminal zone.

SIGTTO uses a risk assessment methodology to define the example scenarios and to put the appropriate response measures into context. The Society believes that an understanding of not only the design basis for gas carriers, terminals, support vessels and their equipment but also the mechanics behind the chosen emergency scenarios may assist in improving existing response actions. Appreciation of the credible scenarios should also help the industry in carrying out more effective drills and exercises. To assist with the provision of the most effective response measures in an emergency, the document includes an annex which lays down suggested competency standards for support vessel crews.

"The new publication has been over two years in the making under a SIGTTO working group led by Capt Peter Seaman of BP Shipping," states SIGTTO general manager Andrew Clifton. "The group consisted of tug vessel operators, port authorities, shipowners, major gas companies and terminal operators.

"The risk assessment approach utilised in the document employs the 'bowtie' methodology and terminology to explain the support vessel working environment at the terminal and to define some example incident scenarios and response strategies. The bowtie tool provides a simple and unambiguous overview of a situation where risks have been identified."

MEMBERSHIP

Fee increase

SIGTTO is funded predominantly through membership fees. Unchanged since 2007, these fees remain highly competitive compared to those of similar non-governmental organisations (NGOs). At the spring 2015 Board meeting the Society's directors discussed the topic of fees at length, as a result of which it was decided in principle to increase the membership fees as from 2016. This decision, which is subject to final approval at the AGM in November 2015, has not been taken lightly.

There are two reasons for the proposed increase in fees. Firstly, the Society's operating costs have risen steadily, to the point where they are now equal to the income from members' fees, despite the continuous growth in the number of members over the past decade. An adjustment is thus needed to meet the cost of the current resources and services provided to the membership.

The second reason relates to the future vision for SIGTTO as laid out in the recently agreed Strategic Plan. The new programme allows for a much larger Secretariat in

order to meet the needs and expectations of a growing and changing membership with a more diverse range of requirements.

As this fee increase is the first in nine years and is expected to be relatively modest, SIGTTO hopes that the membership appreciates both the reasons behind the new charges and the extra value that the new Strategic Plan will bring to the membership.

New associates

In his message on page 1 of this newsletter the SIGTTO general manager mentioned that the Board has agreed to amend the Society's byelaws to allow involvement with developing best practice and guidance, if required by the GPC, for compressed natural gas (CNG) and the carriage of LNG, as cargo, in ISO tank containers on board conventional container ships. This will enable operators of CNG carriers and container ships to join the Society as associate members.

A further change to the associate membership criteria permits providers of liquefied gas training to join the

SIGTTO membership ranks, provided certain criteria are complied with. It is considered advantageous to allow training establishments/providers to become associate members of the Society due to the competencies and experience such institutions will bring into the Society. They will also encourage rapid dissemination of SIGTTO's guidelines and standards through their training courses.



Training establishments are a new SIGTTO Associate Member category



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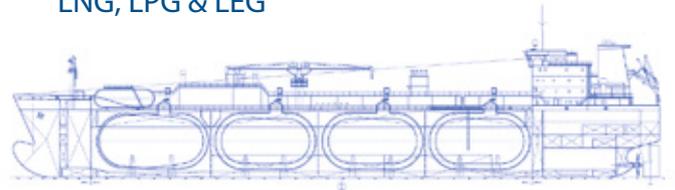
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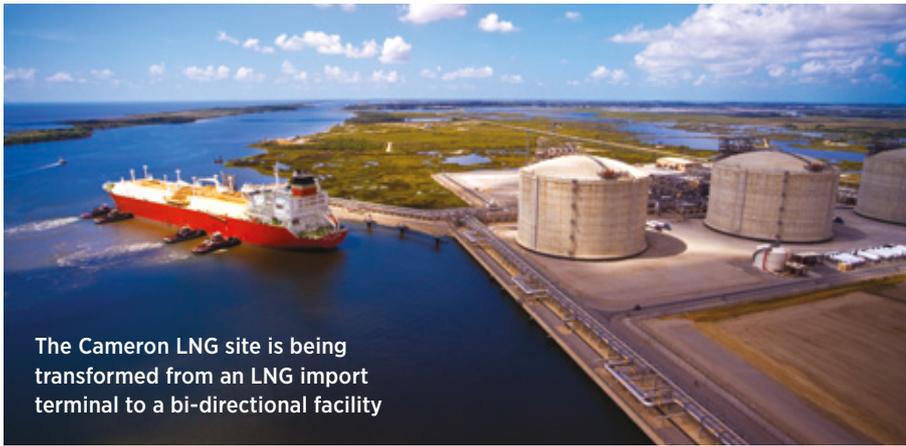
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The Cameron LNG site is being transformed from an LNG import terminal to a bi-directional facility

NEW MEMBERS

Nine join ship

Nine 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 137 full members, 44 associate members and 25 non-contributory members.

Cameron LNG	1 April 2015
China Energy Ship Mgmt	1 April 2015
Synergy Maritime	1 May 2015
Woodfibre LNG	1 June 2015
LNG Canada	1 June 2015
WesPac Midstream	1 July 2015
GTT Training	1 August 2015
H-Energy Gateway	1 September 2015
Venture Global LNG	1 September 2015

Cameron LNG operates an LNG import terminal on the Calcasieu Ship Channel in Hackberry, Louisiana. The company is currently building a three-train liquefaction plant at the site to give the facility a bi-directional capability and the capacity to export 12 million tonnes per annum (mta) of LNG. All three trains are expected to commence operations in 2018. Earlier this year Cameron LNG initiated the permitting process for an expansion project that would add two further trains, each with a capacity of 5 mta, at the terminal.

Hong Kong-based **China Energy Ship Management Co Ltd (CESM)** will operate and maintain a fleet of eight ships that load cargoes at the Asia Pacific LNG (APLNG) terminal at Gladstone in Australia and deliver them primarily to receiving facilities in China operated by Sinopec. The principal destinations for the LNG will be Beihai, Qingdao-Shandong, Tianjin, Wenzhou and Lianyungang and shipments are due to begin in 2016. The vessels are being built at the Hudong Zhonghua and Dalian Shipbuilding yards in China. China Shipping LNG Investment has a 41 per cent stake in the CESM-operated ships, Sinopec 39 per

cent and Mitsui OSK Lines 10 per cent. **Synergy Maritime Pvt Ltd** is a ship management firm headquartered in Chennai and its principal satellite office in Singapore. Technical, commercial and crew management services are available as is newbuilding supervision. Gas carriers are amongst the wide range of vessels managed by the company and a Synergy Group affiliate owns two very large gas carriers (VLGCs).

Woodfibre LNG is proposing to build a modest-size liquefaction plant and LNG export terminal at the site of a former pulp mill about 7km southwest of the town of Squamish in the Canadian province of British Columbia. The plan calls for a land-based facility able to produce up to 2.1 mta of LNG for a period of 25 years and the use of two LNG carriers moored at the site as floating storage and offloading (FSO) vessels. Woodfibre has joined the Society as an associate member and anticipates becoming a full member once the facility is in operation. The company is targeting a final investment decision (FID) on the project by the end of this year.

LNG Canada is a Shell-led Canadian LNG export project whose other participants are Korea Gas Corp (Kogas), Mitsubishi Corp and PetroChina. The group plans to build a terminal on the Douglas Channel near Kitimat in British Columbia that would have two trains, each of 6.5 mta capacity, in the initial phase. In June 2015 the Canadian government approved the environmental aspects of the scheme, an important step on the road towards a FID for LNG Canada.

WesPac Midstream (WesPac) is an energy infrastructure company established to develop, build, own and operate midstream assets in North America. The primary focus is on the infrastructure needed to support the use of LNG as a transportation fuel for marine vessels, trains and vehicles. Amongst current WesPac projects is the construction of North America's first LNG bunker vessel. The company ordered the 2,200m³ barge at Conrad Orange Shipyard earlier this year in tandem with its affiliate Clean Marine Energy. To be delivered in early 2016, the bunker barge will be utilised in fuelling Totem Ocean Trailer Express (TOTE) ro-ro and container ships as well as other LNG-powered vessels.

GTT Training Ltd is a wholly owned subsidiary of Gaztransport & Technigaz SA (GTT). Based in the UK and with a training centre in Paris, the company was formed in June 2014 to support the LNG industry through the provision of high-quality, specialist training and technical services. GTT Training is the first company to join SIGTTO under the Society's new training providers membership category.

H-Energy Gateway Pvt Ltd, part of the Hiranandani Group, is embarking on a project to build an LNG import terminal at Jaigarh in India's Maharashtra state. The facility, to the south of Mumbai, will be configured as the country's first tolling terminal, with 100 per cent of the regasification capacity offered to third party users. The plan calls for a shore-based facility able to handle up to 8 mta of LNG to be operational by 2018. H-Energy is also evaluating the feasibility of 6 mta LNG import terminal on the country's east coast based on the use of a floating storage and regasification unit (FSRU) stationed near Digha in the Bay of Bengal.

Venture Global LNG Inc plans to build a 10 mta LNG export terminal on the Calcasieu Ship Channel in Louisiana, near where the waterway meets the Gulf of Mexico, and is in the midst of the permitting process. Subject to the necessary approvals, construction work will begin in late 2016 to enable the first cargoes to be loaded in late 2019. Venture Global points out that it aims to be a long-term, low-cost provider of LNG through the use of its highly efficient, mid-scale liquefaction technology.



WesPac's bunker barge will have a GTT Mark III Flex containment system

Witherbys at 275



The Witherbys Publishing Group is celebrating its 275th anniversary this year, the company having

commenced operations, as Witherbys, in a coffee shop in London in 1740. This was around the time that the Lloyd's marine insurance market was launched and *Lloyd's List* was first published.

While originally founded as stationers, Witherbys quickly became involved in the marine industry, drawing up articles of agreement between merchants, shipowners and captains and preparing marine insurance clauses, something the company still does to this day.

For seven generations Witherbys passed from father to son, until it merged with Seamanship International to form the Witherbys Publishing Group in January 2008. Since then the company has continued to expand and, as SIGTTO members will know, become more actively engaged at SIGTTO Panel and working group meetings around the world.

The group's employee numbers have grown over the period and there are teams based at Livingston in Scotland and the Indian capital Delhi focused on meeting all customer and market demands.

In 2007 Witherbys received the Queen's Award for International Trade and in 2008 it won the Lloyd's List Training Award. The company set up a charitable trust in 2011 with the aim of supporting sport and arts education in Scotland and in 2013 it was voted one of the top three companies to work for in Scotland, and one of the top 10 in the UK.

Witherbys has available more than 600 titles covering the shipping and insurance sectors. In addition to its SIGTTO commitments, the company publishes for OCIMF, INTERTANKO, CDI and the UK Chamber of Shipping and provides digital publishing services for the International Chamber of Shipping and IMO. Witherbys publications are delivered in many different physical and digital formats to more than 110 countries worldwide each year.

Witherbys has been involved with SIGTTO since the Society was founded in 1979. The most recent SIGTTO publication to appear, in August 2015, is *Support Craft at Liquefied Gas Facilities, Principles of Emergency Response and Protection - Onshore*.

The group has roots in the gas industry that go beyond publishing, as evidenced by the fact that two of Witherbys directors have seagoing gas carrier experience. Technical director Johan Machtelinckx sailed on LPG and LNG carriers with Exmar for 11



The Witherbys team celebrates a notable birthday

years and managing director Iain Macneil sailed on LPG carriers for seven years with Bibbys. Another director, Kat Heathcote, has shoreside experience in the natural gas sector through involvement with the original operation of the Qatar gas field and work on gas-to-liquids (GTL) technology projects.

"Having hands-on and current technical experience has definitely been an important factor in the company's development over the last 10 years," points out Iain Macneil. "It has coloured how we respond to and work with publishing partners such as SIGTTO, and how we adapt to the Society's and the wider Industry's changing needs."

Witherbys has worked closely with SIGTTO technical adviser Rick Boudiette over the last two years on the 4th edition of *Liquefied Gas Handling Principles on Ships and Terminals (LGHP4)*, which is due for publication in the third quarter of 2016.

In addition, the concept of an LNG Port Information Guide was proposed by Witherbys at SIGTTO's General Purposes Committee (GPC) meeting in October 2014. The publisher suggested creating a document for each LNG terminal detailing all the information that an arriving LNGC would require, including pre-arrival information, in order to ensure a safe passage from the sea buoy to the berth.

In April 2015, in Guangdong, SIGTTO's GPC approved the project and this support was endorsed by the Society's Board in Singapore in May 2015. To bring the initiative to fruition Witherbys will invite terminals and operators to work with them as they document and compile a standardised layout for presenting LNG port information, visiting each location in the process. "Investment projects such as this demonstrate our commitment to serving the continuously evolving gas carrier and terminal sectors," explains Iain Macneil.

Witherbys' directors are delighted, as part of the 275th anniversary celebrations, to be hosting the 72nd SIGTTO GPC Meeting in Edinburgh on 30 September 2015. The dinner will be held onboard the royal yacht *Britannia* in Edinburgh's Leith Docks where she has been in cold lay-up since 1998.

The evening will begin with guests being piped onboard by a piper from the St Mary School of Music in Edinburgh, and there will be an opportunity for guests to enjoy a technical visit of *Britannia* in the best SIGTTO fashion! The dinner will also enable those attending to meet both old and new friends from the gas world in Scotland, before the evening is brought to a close with 'a wee dram'.

SIGTTO

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