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# SIGTTO

Society of International Gas Tanker and Terminal Operators Ltd (SIGTTO)  
17 St Helen's Place  
London EC3A 6DG, UK  
Tel: +44 20 7628 1124  
Fax: +44 20 7628 3163  
E-mail: secretariat@sigtto.org  
Web site: www.sigtto.org

# SIGTTO NEWS

Issue 29

www.sigtto.org

Spring 2013

## MESSAGE FROM GENERAL MANAGER

### Facing up to the challenges ahead

Andrew Clifton, the new SIGTTO General Manager, looks forward to working with the membership in tackling the issues confronting today's most dynamic energy shipping sector

It was a great pleasure and privilege to be offered the role of SIGTTO General Manager. I have been involved with the Society for a number of years now and to be appointed to the position of General Manager is a great honour and I am very pleased and proud to do so.

I firmly believe in the aims, objectives and values of SIGTTO and am fully committed to the core purpose of promoting liquefied gas shipping and terminal operations which are safe, environmentally responsible and reliable.

The Society is as strong now as it has ever been. Our membership owns and operates around 97 per cent of the world's LNG vessels and terminals and accounts for approximately 50 per cent of the LPG market. SIGTTO now has more members than ever before and remains the industry leader for best practice and technical support for liquefied gas shipping and terminals.

There are many challenges in our industry today, but they are challenges, not insurmountable problems. SIGTTO is involved in an ever-increasing range of activities, which can only be beneficial to the industry. The growing portfolio of activities reflects the increases in vessel numbers and size, the introduction of new propulsion system types and the establishment of a high-technology floating LNG sector. Additionally there is the requirement to man the 90-plus new LNG carriers currently on the orderbooks and the emergence of a new sector that is the



Bill Wayne at his October 2012 farewell reception, flanked on his right by Robin Gray, the second ever SIGTTO General Manager, and by Andrew Clifton on his left

use of LNG as a ship's fuel. I will go into this latter topic in more detail later in the article.

With these challenges and the advent of new players into the market there remains an ever-present need for a supply of best practice recommendations and guidance to the industry. We are fortunate to have a very responsible membership who consistently supply staff to working groups and SIGTTO's General Purposes Committee (GPC). All the Society's projects are dictated by the membership, through the Board and the GPC, with the London-based Secretariat overseeing and coordinating the process.

There are some aspects of the Society's operation which I feel need to be reviewed and, potentially, brought forward into a 21st century operating environment. Over the course of my tenure I intend to, where appropriate and with due consultation and approval from the Board, streamline and modernise the Society's activities to increase our capabilities, resources and efficiency.

LNG for use as a ship's fuel is a current hot topic. At SIGTTO we welcome the proposed use of LNG as bunkers. Due to the creation of additional demand the use of LNG as marine fuel will result in more volumes being sold and shipped on LNG vessels.

The worldwide consumption of marine oil bunkers today is the energy equivalent  
...continued on page 3 >

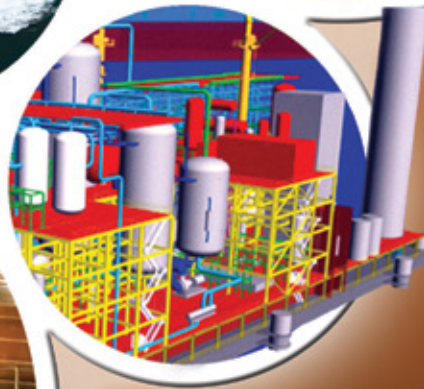
**“There are many challenges in our industry today, but they are challenges, not insurmountable problems.”**

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## "I wish to pay a tribute to my predecessor, Bill Wayne. I am taking over the tiller from what was a very steady hand"

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of approximately 70 per cent of the current LNG export market. Clearly, the impact on the global LNG market will be considerable if even only a small percentage of conventionally powered vessels switch to using LNG as a fuel.

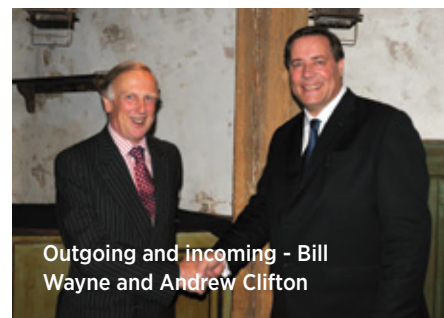
However, SIGTTO believes that operations involving LNG as a fuel should be conducted, in principle, with the same designs, procedures, training, control measures, best practices and, most importantly, safety focus as has been used in the half century of successful LNG carrier operation.

We urge the industry to support this principle and also the new non-governmental organisation (NGO) for LNG bunkering which SIGTTO is proposing. The reasons why the Society has launched the NGO

initiative are explained in a separate article on page 6 in this issue. The formation of the NGO is subject to final Board approval in May. If given the go ahead, it would be established as a sister organisation to SIGTTO and would have, initially, a shared secretariat in our office.

I look forward immensely to my time as SIGTTO General Manager, not least in meeting and working with the membership. This is a very exciting and challenging time to be in this role and I can promise the membership that I will enthusiastically, conscientiously and diligently serve them throughout my term.

When I was a chief officer on LPG vessels in the 1980s and first read Liquefied Gas Handling Principles, one of the Society's flagship publications,



Outgoing and incoming - Bill Wayne and Andrew Clifton

I would never have imagined that one day I would be managing SIGTTO!

Finally, I wish to pay a tribute to my predecessor, Bill Wayne. Bill was General Manager during a period of unprecedented change and led the Society very capably throughout his entire tenure. I am taking over the tiller from what was a very steady hand. I wish Bill all the very best with his retirement and I hope he pops in for a coffee whenever he is passing the office.

## RETIREMENT RECEPTION

### Not goodbye, but au revoir

Bill Wayne was given a great send-off by some 160 SIGTTO members and guests at the London Docklands Museum on the evening of 11 October 2012. The event was arranged to coincide with the Gastech conference and exhibition in London, an alignment which helped swell the ranks of friends and colleagues who turned out to congratulate Bill on his exemplary five-year tenure as SIGTTO General Manager.

Roger Roue, SIGTTO's long-serving Technical Advisor, was master of ceremonies for the night and he reminded those attending that Bill's association with the Society went back much further than his days as General Manager. Bill represented Shell on SIGTTO's General Purposes Committee (GPC) and was a participant on many of the Society's early working groups devoted to technical issues.

It was during one of these group meetings in The Hague, where Bill was living at the time, that Roger first met Gill, Bill's wife. Invited to dinner at their home, Roger was impressed by the Waynes' next door neighbours - the Dutch royal family!

Amongst the gifts presented to Bill and Gill at the retirement reception was a memorial album with personal messages from friends and colleagues as well as a selection of photos to remind him of his time at SIGTTO.

Robin Gray, who was appointed SIGTTO's second General Manager back in the 1980s, was also in attendance along with many SIGTTO GPC and Board members and a host of the Society's former Technical Advisers.



ABOVE: Chris Clucas presents Gill Wayne with a bouquet of flowers on behalf of SIGTTO  
RIGHT: Bill thanks guests for all his SIGTTO memories ... and, no, he was not runner-up in an oratory contest



UPCOMING MEETINGS 2013	DATE	LOCATION
67th General Purposes Committee	15 Apr	Houston
Spring Board Meeting	16 May	Houston
Pan American Regional Forum	17 May	Houston
Europe/Scandinavia Regional Forum	21 May	Antwerp (TBC)
Mediterranean Regional Forum	30 May	Athens
Asia-Pacific Regional Forum	24 June	Singapore (TBC)
58th Panel Meeting	9-10 Oct	London
68th General Purposes Committee	8 Oct	London
Autumn Board Meeting & AGM	November	London (TBC)
Australia Regional Forum	November	Darwin (TBC)

UPCOMING MEETINGS 2014	DATE	LOCATION
69th General Purposes Committee	27 March	Seoul
Spring Board and Panel Meetings	May	Paris (TBC)

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# Meet the people at SIGTTO

## GENERAL MANAGER Andrew Clifton



As highlighted in the last issue of *SIGTTO News*, Andrew Clifton is the new General Manager and Chief Operating Officer of the Society of International Gas Tanker & Terminal Operators

Ltd (SIGTTO). He succeeds Bill Wayne who occupied the post for five years.

Andrew has over 30 years experience in the liquefied gas shipping industry, including 19 years at sea, three as a ship master. He has a first class honours degree in shipping operations and has been acquiring shore managerial experience over the last 12 years. The latter includes three years working at the UK's Marine Accident Investigation Branch (MAIB), time as a marine superintendent with Golar LNG, almost two years in the SIGTTO Secretariat as a Technical Adviser and, most recently, over five years in Indonesia as LNG shipping operations manager for the BP Tangguh LNG project.

In this most recent posting Andrew was responsible for the project's shipping

activities and overseeing their development, from the early construction days at Tangguh through to the commissioning and entry into service of the marine facilities and the ships built to serve the project.

The SIGTTO Panel Meeting chairman from October 2008 until stepping into his new role, Andrew is the eighth SIGTTO General Manager and also the youngest. He can also lay claim to being the first General Manager who was formerly a Technical Adviser at the Society.

## TECHNICAL ADVISER Rick Boudiette



Rick Boudiette has joined the SIGTTO Secretariat for a three-year secondment as Technical Adviser, beginning on 22 November 2012. Rick arrives from Chevron Shipping Company where, as

Team Leader - Fleet Projects in Chevron's Marine Services Group, he was responsible for several new construction projects as well as technical support to the existing Chevron fleet of ships and FSO/FPSOs.

The most recent Chevron projects with which Rick was involved include the delivery of three steam-propelled LNG carriers owned by Sonangol for Angola LNG and negotiations and plan approval for a fleet of Chevron dual-fuel diesel-electric (DFDE) LNG carriers. He also worked on oil shuttle tanker, lightering vessel, product tanker and other LNG carrier projects.

Previous to his involvement with new ship construction, Rick held positions of Marine Superintendent, Fleet Technical Manager, Gulf of Mexico Area Manager (Lightering Center of Expertise), Repair Superintendent, Commercial Scheduler and Voyage Manager, working with the full range of Chevron's fleet, from crude and product tankers to gas carriers and FSO/FPSOs. He has participated on the OCIMF Marine Technical Sub-Committee, ABS Ship Operations Committee and ABS Americas Divisional Technical Committee.

Prior to Chevron, Rick worked for the US Navy's Military Sealift Command in various roles, both seagoing and shoreside, including Fleet Manager for Cable Repair Ships. Rick is a graduate of the US Merchant Marine Academy with a Marine Engineer's License; holds a Masters of Engineering degree from Stevens Institute of Technology; and is a licensed Mechanical Professional Engineer in California. In addition, Rick was an Engineering Duty Officer in the US Navy Reserve.



Andrew Clifton thanks Steffen Jacobsen for a sterling term as SIGTTO President.

## PRESIDENT

### Change at the top

Steffen Jacobsen's term as SIGTTO President came to a premature end on 1 February 2013 due to a change in jobs within the Maersk organisation. Steffen has been appointed to a management role within Maersk Drilling, thus bringing to an end his involvement with the company's gas carriers and SIGTTO.

Steffen Jacobsen commenced his tenure as SIGTTO President in 2011, following a two-year period as Vice President and four years on the SIGTTO Board. On that occasion he succeeded Allyn Risley of BG Group as President.

Luc Gillet, Senior Vice President Shipping with Total, has been appointed acting SIGTTO President to maintain continuity until the next Board meeting this coming May. At that gathering Luc is expected to be confirmed as the formal successor to Steffen Jacobsen as SIGTTO President.



The aim of the proposed NGO is to realise benefits for all those involved in the LNG bunkering supply chain

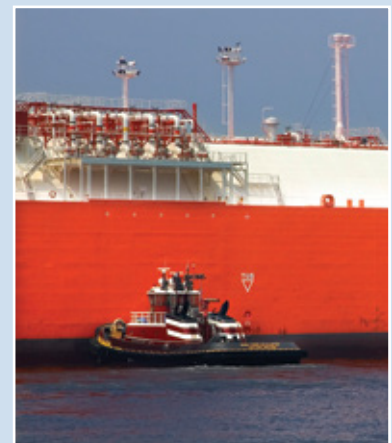
## SUPPORT VESSEL WORKING GROUP

### Emergency response guidance for support vessels

The liquefied gas industry places a strong emphasis on the provision of adequate marine service support for escorting, berthing, un-berthing, standby duties and emergency response for ships in ports and at terminals. The marine service providers have responded to this demand, to the extent that ships calling at most gas terminals have access to modern, highly manoeuvrable support vessels that provide extensive ship assist and firefighting capabilities.

Many gas terminals are provided with support vessels which are capable of providing the full range of services. However, in some liquefied gas ports firefighting services are provided by dedicated fire boats, and the port tugs are only required to provide towage services.

There is no general guidance available to port authorities, marine service providers, terminals and ships either on the use of support vessels in emergency response roles or in the training requirements for support vessel crews to prepare for such eventualities. To fill this gap SIGTTO has established a working group, consisting of marine service providers, port and terminal operators, first responders and gas carrier operators, to develop guidelines for the use of support vessels in emergency response situations.



The SIGTTO initiative aims to provide general guidance on the use of gas terminal support vessels in emergencies

## POLICY

### LNG bunkering - the way forward

The use of LNG as a marine fuel is currently taking up a large part of SIGTTO's resources. Strictly speaking, the subject lies outside the Society's core objectives. These objectives concern liquefied gas carriers and terminals, not LNG bunkers for ships that are not gas carriers.

In view of the growing interest in LNG as a marine fuel and the potential for rapid development of this market over the coming decade, the Board reviewed the issue and decided that SIGTTO had three options. One was to ignore the subject and have nothing to do with it. The second was to take the issue on and absorb it into the Society's general activities and core objectives. The third was to form a new non-governmental organisation (NGO) with an exclusive focus on LNG bunkering safety and operational issues.

The SIGTTO Board did not even consider the first option because it was acknowledged at the outset that the Society has a responsibility to the industry, not least to ensure that proper use is made of the best practice recommendations, guidelines and standards established by the liquefied gas shipping and terminal industry over many decades.

Looking at the two remaining alternatives, it was thought that the second option would just completely swamp the SIGTTO membership and possibly draw the Society away from its core objectives. So, it was decided that the third option offered the best way forward.

The proposal for the establishment of the new LNG bunkering NGO is subject to

final Board approval in May. If and when the proposal is given the go-ahead, the NGO would be formed as a sister organisation to SIGTTO. Like the Society, it would be a non-profit-making organisation based in Bermuda with a London liaison office. Initially, it is most likely that SIGTTO and the new NGO would share a secretariat, in much the same way that Intertanko and Intercargo cooperate.

The following words have been drawn up to describe the purpose of the LNG bunkering NGO: **"Newco has been organised to encourage safe and responsible operations of vessels using LNG as a fuel and all marine activities regarding the supply of LNG used for fuel; to develop advice and guidance for best industry practice among its members and promote criteria for best practice to all who have responsibilities for, or an interest in, the use of LNG as a fuel. (Excludes LNG carriers using cargo boil-off for fuel but does include the use of any other liquefied gases as fuel)"**

Membership of the new LNG bunkering NGO would be open to all those interests subject to risks associated with the use of LNG as a fuel. Such interests would include, but not be limited to, LNG fuel suppliers, barge/shipowners and operators, bunker barge operators, regulators, P&I clubs and port authorities.

SIGTTO recently carried out an industry-wide survey to gauge interest in the establishment of, and possible participation in, the proposed LNG bunkering NGO. While the Society expected the response to the survey to be positive, it was surprised by the overwhelming level of support given to the idea of creating a new LNG bunkering NGO.



## The SIGTTO News evolution

This issue of SIGTTO News marks a changing of the guard. Not only does the Society have a new General Manager, the newsletter has a new design. The familiar red "SIGTTO News" front page heading and red banners used throughout Issue Nos 7-28 have been replaced by the "SIGTTO blue" featured in the Society's technical publications and on the website.

On this occasion it is diverting to look back at Issue No 7, published in April 2002 and the first edition your current Editor was involved with. SIGTTO newsletters prior to Issue No 7 consisted of typed sheets with inset photos but the typeset eight-page April 2002 edition, and its high print run, recognised the expansion that was taking place in both SIGTTO activities and the global gas shipping and terminal industries.

The SIGTTO General Manager at the time was John Gyles, a former Shell man, while the Technical Advisers were Roger Roue and Chris Snape. In addition former Technical Adviser John Cumming was temporarily lending a hand at the London Secretariat.

Issue No 7 highlighted seven new members - CMS Trunkline LNG, Pronav Ship Management, Texaco Angola Natural Gas, AES Andres, El Paso Global LNG, Conoco Marine and Knutsen OAS Shipping - that had joined the Society over the previous year. The septet boosted the SIGTTO membership to 113, in contrast to the 192 member companies today.

A key industry issue at the time - the deregulation of the European and Japanese gas industries - was the focus of an industry conference in London chaired by John Gyles. Issue No 7 also carried the news that Bob Lakey, gas shipping stalwart and Gastech conference director, had suffered a stroke but was making a steady recovery and was determined to make Gastech 2002, set for Doha in October, the best in the series to date.

The newsletter's Member Profile company was Dorchester Maritime Ltd (DML), forerunner of today's Bernhard Schulte Shipmanagement (Isle of Man) Ltd. As is the case today, DML was engaged in a wide range of topical technical issues impacting gas shipping. Amongst other things, DML was poised to add a membrane module to its LNG cargo-handling simulator in recognition of the growing popularity of membrane containment systems amongst owners placing orders for new LNG carriers.

Chris Clucas, then DML's gas projects manager, also highlighted the investigative work his company was carrying out on



Knutsen OAS was one of the new shipowner members highlighted in SIGTTO News No 7

the alternatives to the traditional steam turbine propulsion system for LNG ships. These included dual-fuel diesel electric propulsion systems and slow-speed diesel engines in tandem with a reliquefaction plant. Both alternatives went on to command virtually the entire LNG carrier propulsion system market later in the decade.

One of the SIGTTO publications described in Issue No 7 was LNG LOG 26, a statistical record of all LNG carrier voyages completed through 31 December 2000. The LNG LOG series had proved to be one

of SIGTTO's most popular publications, providing as it did a full and comprehensive picture of not only the global LNG shipping industry but also activity at each of the world's growing number of terminals.

However, the format was becoming unwieldy due to the expansion of the industry and the sheer size of the voyage matrix. LNG LOG 26 was to be the last in the series and the task of recording LNG carrier voyages and terminal activity is now in the capable hands of the International Group of Liquefied Natural Gas Importers (GIIGNL).

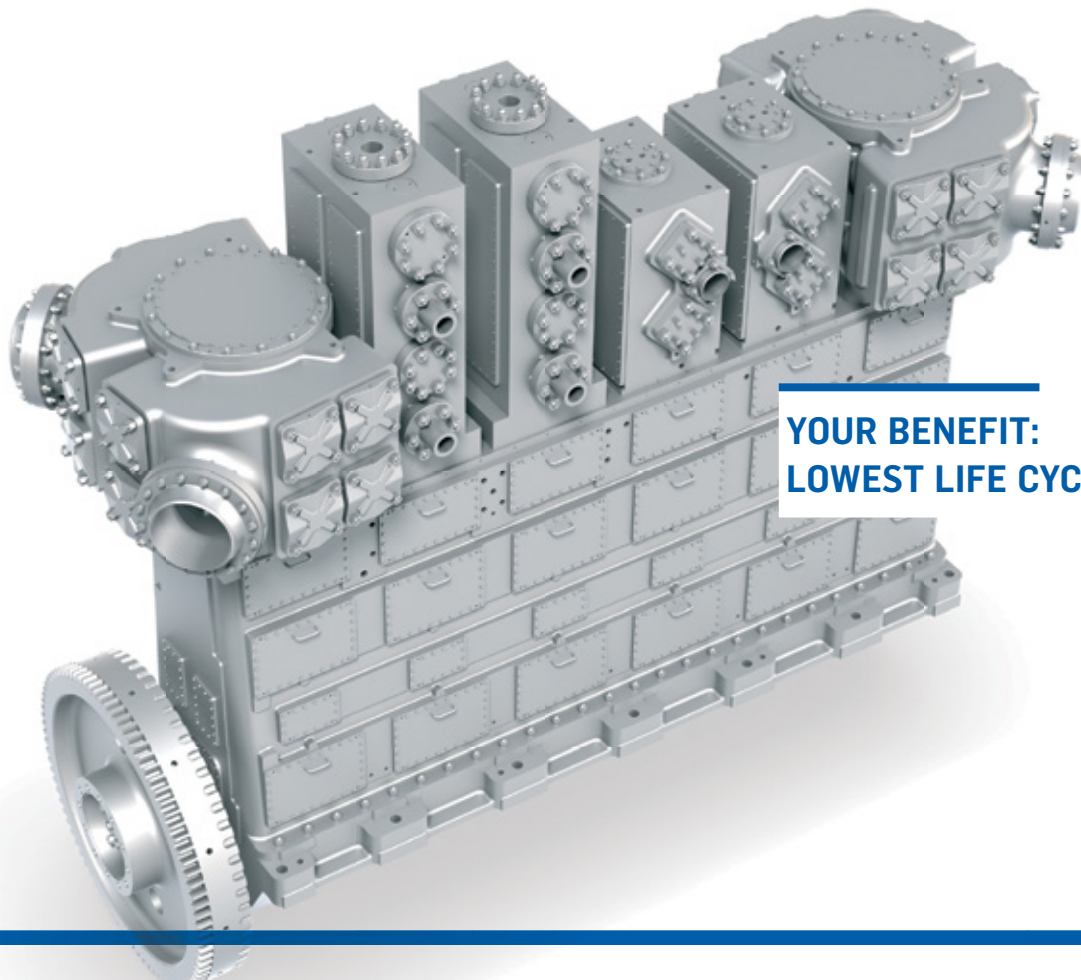
## BENEFITS OF SIGTTO MEMBERSHIP

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
- 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
- Access to the very comprehensive technical library maintained in the London Office
- Submitting proposals for projects and studies to the General Purposes Committee

- Participating in discussion forums with other members each year on topics of particular and mutual interest
- Contact details of all members of SIGTTO
- New members receive a copy of all publications, free of charge, produced by SIGTTO
- Regular updates on matters affecting the industry such as legislation, either new or pending, technical or operational developments.
- 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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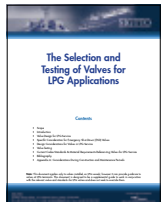


## LPG valve selection

SIGTTO has prepared a document entitled *The Selection and Testing of Valves for LPG Applications* (SIGTTO Information Paper - 2012) to provide designers and operators with guidance on the general requirements for valves for liquefied petroleum gas (LPG) service. Valves used in LPG applications are generally designed for an operating temperature range of -55°C to +80°C.

When selecting a valve for LPG service, it is important to ensure that the valve is designed and manufactured to the relevant standard/code and is appropriate for the working pressure, application and the system considered. Care should be taken to ensure that the valves are selected and maintained to be compatible with all cargoes listed on the LPG carrier's certificate of fitness.

Specific design requirements apply for valves in low-temperature systems to ensure that a valve will work effectively. For example, the design of the valve incorporated in such a system should take into consideration thermal expansion and contraction and still provide a tight shutoff without leakage across the seat. At the same time it is important that the valve design is also in compliance with the relevant design codes and standards.



**The new LPG valves document is available as a free download on the 'Publications and Downloads' section of the SIGTTO website ([www.sigtto.org](http://www.sigtto.org)).**

## Guidance on terminal berthing operations

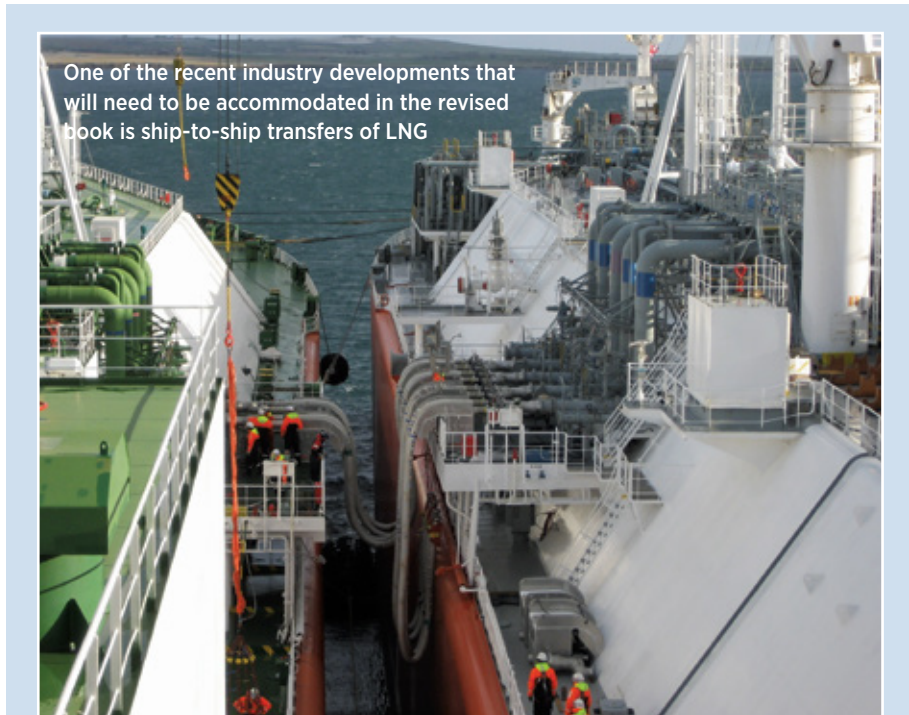


The World Association for Waterborne Transport Infrastructure (PIANC) has issued a report which identifies and discusses the safety issues associated with the manoeuvring operations of oil and

gas tankers in port and at terminals.

Entitled *Aspects Affecting the Berthing Operations of Tankers to Oil and Gas Terminals*, the document was compiled by PIANC's MarCom Working Group 116, on which SIGTTO participated. In its deliberations on guidelines for both oil tanker and gas carrier operations in approaching and departing terminals, the working group covered the full spectrum, from sea buoy to terminal transits and manoeuvring to berthing and mooring.

In addition to considerations such as



One of the recent industry developments that will need to be accommodated in the revised book is ship-to-ship transfers of LNG

## Revision of key cargo-handling guide

Long overdue, the task of revising SIGTTO's *Liquefied Gas Handling Principles* book has commenced in earnest. There have been many technological advances and industry changes since the last revision of the document in 2000 and these need to be reflected in an updated edition of one of the Society's most important publications.

A Steering Group comprised of focus area experts met at SIGTTO's London offices on 21 January 2013 to review the path forward and determine who should be invited to assist with the revision. A timetable for the update work was also agreed.

The schedule is aggressive, as the Society is looking to have the revised document cleared and ready for review in time for the March 2014 meeting of the General Purposes Committee (GPC). Following the accommodation of any decisions taken by the GPC, the updated book will be sent to the Board for final approval in May 2014.

To assist the Secretariat in accomplishing this work, Jason Clifton-Samuel has been taken onboard as a consultant to assist with managing the project.

terminal procedures and the impact of wind, wave and current forces acting on the vessel, the report focuses on critical issues associated with vessel manoeuvring operations and provides guidance on measures to mitigate the risks involved in vessel operations at oil and gas terminals.

In compiling this PIANC report, the industry is seeking to promote a unified approach to managing safety within ports and terminals, not least by providing guidance which builds on existing, sometimes disparate, recommendations and requirements. The establishment of a common and mutual understanding of these terminal safety aspects and risks, in turn, provides a sound basis for making recommendations to national authorities.

This report identifies and discusses the significant safety aspects associated with the arrival, berthing and unberthing operations of oil and gas tankers at terminals.

Factors considered included the terminal's safety management and risk assessment procedures and the impact of wind, wave and current forces acting on the tanker.

Oil and gas terminals pose safety hazards and environmental risks which can be controlled and minimised through proper design and the application of sound operating practices.

Industry guidance, together with national codes of practice, such as the UK's Port Marine Safety Code, promotes a unified approach to managing safety within ports and terminals. The guidance contained within this document aims to build on such existing recommendations and requirements and focuses on the critical issues associated with a tanker's harbour approach and berthing/unberthing operations.

**The publication is available to purchase on the PIANC website ([www.pianc.org](http://www.pianc.org)) as a PDF download.**



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## REGULATIONS

### Recent IMO developments

**IGC Code update** - The revised International Gas Carrier (IGC) Code has been making its way through the IMO legislative process, with input from various IMO subcommittees, with the intention of having it approved at MSC 92 in June 2013.

Once approved, it will then go through a final review phase with a target adoption at MSC 93 in May 2014. It will then enter into force in January 2016.

A big vote of thanks goes out to all SIGTTO members who participated on the many working groups over the past several years to produce this document!

**IGF Code** - The Secretariat, with assistance from various members, has been participating in the IMO Correspondence Group developing the International Code for Ships using Gas or other Low Flash-Point Fuels (IGF Code).

The current focus of IGF Code development is centred on the use of LNG as marine fuel, although work over the next few months will expand, at the direction of IMO's Bulk Liquids and Gases (BLG) Sub-Committee, to include methyl alcohol and low-flash diesel.

In terms of the timing of the implementation of the new regime, the IGF Code is approximately one year behind the IGC Code. The expected entry into force date for the new IGF Code is 2017.

The IGF Code will cover what is expected to be a rapidly growing fleet of LNG-powered vessels



**EEDI for LNG carriers** - IMO's Energy Efficiency Design Index (EEDI) regime entered into force on 1 January 2013 as part of amendments to Annex VI of the Marine Pollution (Marpol) Convention. The new requirements make it mandatory for new ships to achieve an acceptable Energy Efficiency Design Index (EEDI) rating and for all ships to carry a Ship Energy Efficiency Management Plan (SEEMP). The new EEDI regime applies to all liquefied gas carriers except steam turbine and diesel-electric propelled carriers.

The Secretariat has been following the issue of non-conventional propulsion systems - including diesel-electric, steam turbine and hybrid propulsion systems - since IMO's Marine Environment Protection Committee (MEPC) tasked a working group

with developing a framework for applying EEDI to ships with non-conventional propulsion systems. For LNG carriers such non-conventional propulsion systems included steam turbines and DFDE systems.

Japan will submit a proposal to the Committee's 65th Session (MEPC 65) in May 2013 that will divide gas carriers into two categories - Gas Carriers (except for LNG) and LNG Carriers. Each category will have its own EEDI reference lines and reduction factors.

It is notable that under the Japanese proposal the new LNG carrier reference line will include all LNG carriers, as of the entry into force date, regardless of propulsion system. If accepted, it is expected that the entry into force date for these gas carrier requirements will be January 2016.

### NEW MEMBERS - Quartet welcomed

Four companies have joined SIGTTO as members since the last Newsletter was published. The listing of the four new members below shows their date of joining the Society. The SIGTTO membership now stands at 131 full members, 40 associate members and 21 non-contributory members.

<b>Alphagas SA</b>	<b>1 Oct 2012</b>
<b>Moran Towing Corp</b>	<b>Jan 2013</b>
<b>OSG Ship Management (UK) Ltd</b>	<b>1 Jan 2013 (rejoined)</b>
<b>Koch Shipping Inc</b>	<b>1 Mar 2013</b>

Athens-based **Alphagas** is part of the family-owned shipping company Alpha Tankers & Freighters. The two 159,700 m<sup>3</sup> dual-fuel diesel electric (DFDE) LNG carriers ordered by Alphagas at STX Offshore and Shipbuilding in South Korea in 2011 and 2012 mark the first foray by the group into the LNG sector. The pair of ships are due for delivery in 2015.

**Moran Towing Corp** provides escort and berthing tug services at four US LNG import terminals - Cove Point, Elba Island, Freeport and Cameron - and at the Costa Azul receiving terminal in Baja California on Mexico's Pacific Coast. As an example of each terminal's tug commitment, Moran operates four escort tugs of the *SMBC Monterey* class at Costa Azul jointly with Grupo Boluda of Spain. Built by Union Naval Valencia of Spain to Robert Allan's RAStar 3200 design, the tugs have a bollard

pull of 75 tonnes. They are also provided with special winches capable of handling the sea swells that can be encountered in the approaches to Costa Azul's exposed coastal location.

The demand for LNG, and hence ship traffic, at US import terminals, including the four serviced by Moran, have dropped in recent years as a result of the development of the rich shale gas resources in the US. However, the operators of the Cove Point, Elba Island, Freeport and Cameron LNG terminals have each applied for permission to provide their facilities with a bi-directional capability through the construction of onsite liquefaction plants. All four terminals are aiming to initiate LNG exports, and to keep the Moran tugs busy handling loading tankers, in the years ahead.

**OSG Ship Management (UK)** is the operator and part owner of four Q flex-size LNG carriers, i.e. *Tembek*, *Al Hamla*, *Al Gattara* and *Al Gharrafa*. The 217,000m<sup>3</sup> *Tembek* and *Al Hamla* were built by Samsung Heavy Industries while the 216,000m<sup>3</sup> *Al Gattara* and *Al Gharrafa* were completed by Hyundai Heavy Industries. Delivered in October 2007, *Tembek* and *Al Gattara* were amongst the first three of 45 Q-flex and Q-max ships built over a three-year period for service in the export of LNG cargoes from Qatar. OSG Ship Management was previously a SIGTTO member but resigned in March 2010. The company has now decided to re-join.

**Koch Shipping Inc** is a trader of ammonia and a charterer of ammonia carriers. The company also operates the Taft ammonia import terminal in Louisiana. Koch Fertilizer, an affiliate company, purchased the Taft terminal in 1995 and since then has grown to become one of the world's largest producers and marketers of fertilisers.

## New era for gas in US Gulf

The choice of Houston as the venue for the first three SIGTTO meetings of 2013 is particularly appropriate in view of what has been taking place in the region. The development of the rich shale gas resources of Texas and Louisiana is transforming the prospects for the US Gulf region. It is also impacting the global energy picture.

Realisation of the shale gas potential of the Gulf and other parts of the US is not only driving the country towards self-sufficiency in natural gas, it is also creating the opportunity for significant export volumes in the form of LNG.

The reverberations are also being felt in other sectors. Up until 2009 the US was a net importer of LPG; now, thanks to shale gas, it is a net exporter. US petrochemical exports, too, are blossoming as a result of the availability of low-cost ethane feedstock derived from shale gas.

Developers of 23 individual US LNG projects have drawn up plans for liquefaction facilities and sought permission from the US Department of Energy (DOE) for permission to export LNG to those countries with which the US has a free trade agreement (FTA). Most of the project promoters are also seeking clearance for the export of US LNG to non-FTA countries.

If only a fraction of the unprecedented portfolio of US plans for LNG export projects materialise, the nation will still be a major global player. Overseas gas buyers are attracted to the prospect of US LNG due to the low cost of gas in that country and its status as a sound and secure business partner.

Another positive factor is the relative speed at which a major US LNG export terminal can be realised. The US is blessed with a number of new import terminals built to handle vast volumes of inbound LNG which, as a result of the shale gas revolution, never materialised.

Many of the proposed export schemes call for the addition of liquefaction trains at these existing, underutilised LNG import facilities to provide a bi-directional capability. The ability to utilise storage tanks and jetties that are in place yield savings in time and cost compared to those entailed in a greenfield construction project.

The majority of the LNG export projects that have been tabled are for locations along the coasts of Texas and Louisiana. Shipments of LNG from these facilities to Asia - the area of greatest demand - would be facilitated by the opening of the enlarged Panama Canal lock system in late 2014. The new capability



US Gulf gas export plans include an Excelsior proposal for an FLNG facility in Texas

**'Shale gas production now accounts for about 35 per cent of the country's natural gas supply and the share is growing.'**

will enable the waterway to accommodate all today's conventional size LNG ships.

One LNG export scheme has already received all the necessary approvals and a final investment decision (FID) to proceed has been made. This is the project being developed by Cheniere Energy at its Sabine Pass LNG import terminal in southwestern Louisiana.

Cheniere's FID covers the construction of two liquefaction trains at the terminal, each capable of producing 4.5 million tonnes of LNG per annum (mta), to come onstream in 2015 and 2016. However, the company has already lined up sales for the output of two additional trains and is investigating the potential for Trains 5 and 6.

The 23 US LNG schemes tabled to date call for the export of as much as 200 mta of LNG in aggregate. Domestic political sensitivities would never allow such a volume to be shipped overseas and, in any case, the market for such a volume is not there. Nevertheless, the consensus is that the US will be exporting in the region of 50 mta of LNG by 2020.

An LNG export volume of 50 mta is the equivalent of about 10 per cent of current US domestic gas consumption.

Shale gas production now accounts for about 35 per cent of the country's natural gas supply and the share is growing.

Shale gas has also transformed the US LPG picture. As recently as 2005 the US was a net importer of LPG to the tune of 4.5 mta. Following the 2009 crossover, exports have been climbing. Net exports reached 3.5 mta in 2012 and are set to top 5 mta in 2015.

As part of the changing scenario, competitively priced US LPG exports to Atlantic Basin customers are displacing those from other suppliers and prompting projects to expand and upgrade US Gulf LPG terminal capacity.

**SIGTTO**

SIGTTO News is the Newsletter of the Society of International Gas Tanker and Terminal Operators Ltd and is published in March and September each year.

**Editor:** Mike Corkhill

**SIGTTO Contact:** Linda Murray, Office Manager

**Advertisement Sales:** Ian Pow, Riviera Maritime Media Ltd  
ian.pow@rivieramm.com

**Design:** Jez Harris -  
jezharrisdesign@me.com

**Printing:** Warners Midlands  
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